BURNSIDE

Niagara Village Transportation Study

2592693 Ontario Inc.

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R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga ON L5N 8R9 CANADA

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R.J. Burnside & Associates Limited

Report Prepared By:

Cindy Chung, EIT
Transportation Planner
CC:sp

Report Reviewed By:

David Argue, P.Eng, PTOE
Vice President - Transportation
DA:sp

Executive Summary

The existing Thundering Water Golf Club located in the south area of the developed portion of the City of Niagara Falls is proposed to be redevelopment by 2592693 Ontario Inc. The proposed development will consist of a total 974 residential homes. This is a reduction from the 1,134 residential homes and 930 m^2 (101,010 ft^2) of commercial space originally proposed.

Access to the proposed development will be provided via the following connections:

- John Daly Way (to a couple of infill residential lots);
- Eaglewood Drive (to a couple of single detached residential homes);
- Drummond Road;
- Oldfield Road; and
- Ramsey Road.

Drummond Road will extend to the south and swing to the east to connect to Ramsey Road.

Thundering Waters Boulevard currently provides a connection to the golf course and will remain in its present form but is not proposed to be connected to the new development, but rather continue to provide access to the existing development. A future connection will be protected to allow the connection. Thundering Waters Boulevard is private roadway and redevelopment of the golf course does not come with access to the roadway. Therefore, we have not assumed assess. With the Marina Homes development (through which a portion of Thundering Waters Boulevard passes), there is an opportunity for the City to obtain that portion of Thundering Waters Boulevard as a public road. However, there is a public utility to the south through which a right-of-way would also need to be obtained. This is not assumed in the analysis as the development can operate and function based upon the proposed connections to Drummond Road and Ramsey Road.

The CP Montrose Subdivision (railway track) runs through the proposed development. As a result, within the proposed development, two at-grade crossing points are proposed.

Official Plan Amendment, Zoning By-law Amendment and Draft Plan applications will be required. R.J. Burnside & Associates Limited (“Burnside”) was retained to undertake the Transportation Study among other studies, which forms part of those applications. As part of the original application, Burnside had submitted a Transportation Study, dated March 2020 (“2020 TIS”), to Niagara Region (“Region”) and the City of Niagara (“City”) that was based on a slightly different concept plan. The Region did not have any comments on the 2020 TIS other than requiring an updated study if the concept plan changed. The City’s comments will be addressed in this study and in the overall comment matrix submitted as part of the application.

Existing Conditions

Under existing conditions, all study intersections are operating with excess capacity during both peak hours.

The southbound left turn queue at the Drummond Road / McLeod Road intersection exceeds the existing storage by one to two vehicles during the weekday AM and PM peak hours and the City may want to review to provide additional storage.

Background 2027 Conditions

Intersections within the study area are projected to operate with excess capacity with some exceptions, which can be mitigated as follows.

At the Drummond Road / McLeod Road and the Stanley Avenue / Marineland Parkway / Thundering Waters intersections, it is recommended that the existing afternoon signal timing plan be optimized, while maintaining the existing cycle length. With the signal timing adjustments, all movements will have excess capacity.

Due to background growth (including the Riverfront Community Development), Chippawa Parkway and Lyons Creek Road intersections with Stanley Avenue will exceed capacity during both peak hours as stop-controlled intersections. Although the intersections are not warranted for a signal under OTM Book 12, it is recommended that a traffic signal be implemented due to operations. This is consistent with the Riverfront TIS. In addition, at the Stanley Avenue / Chippawa Parkway intersection, the following improvements that are also consistent in the Riverfront TIS, are also needed:

- Exclusive left turn lanes for all approaches; and
- Exclusive southbound right turn lane.

With the recommended improvements at both intersections, all movements will have excess capacity during the 2027 background traffic conditions.

Total 2027 Conditions

Under total 2027 conditions, all study intersections are projected to operate with excess capacity during both peak hours with the exception of the Drummond Road / McLeod Road intersection. The Region has plans to make improvements along McLeod Road by 2031. Consistent with the Riverfront TIS conclusions, it is recommended that the following 2031 improvements be accelerated and be implemented under total 2027 conditions at the Drummond Road / McLeod Road intersection to assist with capacity constraints:

- Exclusive northbound left turn lane;
- Exclusive westbound left turn lane; and
- Exclusive eastbound left turn lane.

With the recommended improvements, all movements will have excess capacity.

Background 2032 Conditions

The Region completed an EA along McLeod Road / Marineland Parkway in 2010 with improvements expected to be started by 2026 and in place by 2031. The following improvements are planned:

- Drummond Road / McLeod Road intersection:
  - Additional eastbound, westbound and northbound left turn lanes; and
  - Additional southbound right turn lane.
- Marineland Parkway / Portage Road intersection:
  - Additional eastbound left turn lane.

The improvements are considered to be in place for 2032 background conditions.

Under background 2032 conditions with the planned improvements by the Region, all study intersections will operate with excess capacity and will experience level of service D or better with the exception of Stanley Road intersections with Progress Street and Don Murie Street. The eastbound movements at both intersections will experience a delay resulting in a level of service D. It is recommended that exclusive turn lanes on Progress Street and Don Murie Street be added to improve the volume to capacity ratio and the delay to left turns from the side streets for left turns will remain similar. No additional recommendations are made at this time. The City should monitor both these intersections for additional improvements.

Total 2032 Conditions

With the recommended and planned improvements, under total 2032 conditions, all study intersections are projected to operate with excess capacity during both peak hours.

Queue Review

Synchro 95th percentile queues were reviewed for all movements. Based upon the existing queues, there are no improvements recommended. Under future conditions, Table A summarizes the recommended improvements due to critical movements (queues projected to exceed existing or proposed storage).

Table A: Summary of Queue Review

Intersections	Movements	Implementation Year	Recommended Improvements
Drummond / McLeod	SBL	Existing	The City should be monitoring as the queue is exceeding the existing storage.
	WBL	Total 2027	The queues will spill onto the through lane during the PM peak hour. The storage length in the planned EA is not sufficient to accommodate for the projected queue and widening will be needed to further lengthen the planned storage length. It is recommended that the City monitor this movement for mitigations. As the projected queue can utilized the through movement as additional storage, no further recommendations are made at this time.
	NBL	Total 2027	The storage length in the planned EA is not sufficient to accommodate for the projected queue. It should be lengthened to 60 m to accommodate for projected queue. This can be timed with widening of McLeod Road.
Stanley / Chippawa	EBL and NBL	Background 2027	Recommended storage of 60 m
	WBL, SBL and SBR		Recommended storage of 40 m.
Stanley / Lyons Creek	EBL	Background 2027	Recommended storage of 120 m.

Road Classification

All roads within the development will be classed as local roads with the exception of the continuation of Drummond Road and Street K. Drummond Road should be changed in classification between McLeod Rod and Oldfield Road to either a major collector as identified by the City in their comments on the 2020 TIS or as an arterial as this would tie in Oldfield Road (which is an arterial road) to McLeod Road (which is an arterial road). Drummond Road is also an arterial road north of McLeod Road. Street K should be designated as a collector road and provide road allowance in accordance with City standards.

Traffic Control

All roads within the development are recommended to have two-way stop control with the exception of Drummond Road Extension / Oldfield Road / Eaglewood Drive intersection, which is recommended to be under all-way stop control.

Proposed Railway Crossing

There will be two at-grade crossing within the development occurring north of Drummond Extension / Street F / Street C and Street K / Street C intersections. It is recommended that the railway crossing warning system be located at the intersections, approximately a minimum of 15.0 m from the centre of the intersection. Traffic heading northbound will be stopped at the rail before crossing the intersection. While traffic heading southbound will be stopped at the intersection. Eastbound and westbound traffic at both intersections will not be affected.

Proposed Pedestrian and Cyclist Accommodation

The site is well designed to accommodate access by all modes of travel.

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Abbreviations

The following summarizes abbreviations that are utilized within this report:

- 2020 TIS – Niagara Village Transportation Study, Burnside, March 2020
- City – City of Niagara
- CP – Canadian Pacific
- ITE – Institute of Transportation Engineers
- LOS – level of service
- LUC – Land Use Code
- Region – Niagara Region
- TOR – Terms of Reference
- Traffic Movements
  - EB – Eastbound
  - SB – Southbound
  - NB – Northbound
  - WB – Westbound
  - L – left turn
  - T – through
  - R – right turn
  - LT – shared left-through movement
  - LTR – shared left-through-right movement
  - TR – shared through-right movement
- TTS – Transportation Tomorrow Survey
- v/c – volume to capacity ratio

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1.0 Introduction

1.1 Background

2592693 Ontario Inc. (the Client) is planning for the redevelopment of the existing Thundering Water Golf Club located in the City of Niagara Falls. The site is generally located south of McLeod Road / Marineland Parkway and west of Stanley Avenue. The location of the subject site is illustrated in Figure 1.

Figure 1: Site Location

The concept plan for the proposed redevelopment is for residential homes. An Official Plan Amendment, a Zoning By-law Amendment and a Draft Plan of Subdivision applications will be required for the development. R.J. Burnside & Associates Limited ("Burnside") was retained to undertake a Transportation Study among other studies,

which would be part of those applications. Burnside had submitted a Transportation Study, dated March 2020 ("2020 TIS"), as part of the application, which had a slightly different concept plan that had more development. Comments were received from the Region dated November 23, 2020 and from the City via email dated April 22, 2020 on that application. All transportation comments received are provided in Appendix A.

The Region confirmed they do not have any comments but required an updated study if the concept plan changed. The City's comments are addressed in this study and in the overall comment matrix submitted as part of the application.

In subsequent discussions with the City Staff, they requested that an additional background development located at the southwest quadrant of Marineland Parkway / Stanley Avenue / Thundering Waters Boulevard intersection known as Marina Homes Development be included. We do note that that development application did not consider the Niagara Village development application as part of their transportation analysis. Details regarding this development are provided in Section 3.2.

1.2 Scope of Work

Prior to this study, the Region and the City had requested for the following memos to be provided:

- Proposed Connection Review;
- Trip Generation and Attraction Analysis; and
- Trip Distribution Analysis.

Comments and feedback were provided by the Region and City were received on November 5, 2018 and November 14, 2018, respectively. Updated memos incorporating their feedback were resent for their review. The Region confirmed that they have no further comment in an email dated November 21, 2018. The memos are provided in Appendix B.

The essential change to the concept plan from the 2018 memos is that the number of residential units and commercial space has changed, and there will not be direct access to Thundering Waters Boulevard. The intent and approach outlined in the memos has been followed.

The study scope of work summarized below was discussed and confirmed with the Region and City staff prior to conducting the study.

Analysis Scenarios	• Existing traffic conditions • 2026 background and total traffic conditions • 2031 background and total traffic conditions
Analysis Time Periods	• Weekday AM peak hour (7:00 AM – 9:00 AM) • Weekday PM peak hour (4:00 PM – 6:00 PM)

Analysis Intersections

- Drummond Road / McLeod Road
- Drummond Road / Oldfield Road
- Marineland Parkway / Stanley Avenue / Thundering Waters Boulevard
- Marineland Parkway / Stanley Avenue (South Leg)
- Marineland Parkway / Portage Road
- Ramsey Road / Stanley Avenue
- Progress Street / Stanley Avenue
- Don Murie Street / Stanley Avenue
- Chippawa Parkway / Stanley Avenue
- Lyons Creek Road / Stanley Avenue

Also, the following documentations were used as relevant background information:

- *Niagara Falls Sustainable Transportation Master Plan Final Report (*City TMP), AECOM Canada Limited, October 2011.
- *Niagara Region Transportation Master Plan (*Region TMP), IBI Group, October 2017.
- *Riverfront Community Transportation Assessment (*Riverfront Community TIS), Paradigm Transportation Solutions Limited (Paradigm), April 2018.
- *Traffic Impact Study for Marina Homes* (Marina Homes TIS), JD Northcote Engineering Inc., September 11, 2020.

1.3 Intersection Analysis Methodology

Intersection operations were assessed for intersections in the study area using the software program Synchro 11, which employs methodology from the *Highway Capacity Manual (HCM2000, HCM 2010 and HCM 6)*, published by the Transportation Research Board National Research Council. Synchro 11 can analyze both signalized and stop controlled intersections in a road corridor or network taking into account spacing, interaction, queues and operations between intersections. The analysis has utilized the HCM2000 methodology.

Signalized intersection analysis considers two separate measures of performance:

- The capacity of all intersection movements, which is based on a volume to capacity ratio that measure of the degree of capacity utilized.
- The level of service (LOS) for all intersection movements, which is based on the average control delay per vehicle for the various movements through the intersection and overall. Delay is an indicator of how long a vehicle must wait to complete a movement and is represented by a letter between A and F, with F being the longest delay. The link between LOS and delay (in seconds) for signalized intersections is summarized below.

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

Stop controlled intersection analysis considers two separate measures of performance:

- The capacity of the intersection's critical movements, which is based on a volume to capacity ratio.
- The level of service for the critical movements, which is based on the average control delay per vehicle for the various critical movements within the intersection. The link between LOS and delay (in seconds) for stop controlled intersections is summarized below.

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

2.0 Existing Conditions

2.1 Area Context

The subject site is currently occupied by Thundering Water Golf Club located in the south area of the built-up portion of the City. A Canadian Pacific (CP) rail corridor runs through the middle of the site, essentially splitting it in two. Adjacent to the CP rail corridor is the Conrail Drainage Channel, which is a drainage feature that conveys upstream flows ultimately to the Welland River located southwest of the site. To the north is McLeod Road / Marineland Parkway; to the east is Stanley Avenue; to the south is Ramsey Road; and to the west is Drummond Road, industrial lands and provisionally significant wetland.

The site is bounded single-family homes to the north, vacant lands / industrial lands and residential development to the west and industrial uses to the east and south. Major roadways by the site include Regional Road 49 (McLeod Road / Marineland Parkway) to the north, Stanley Avenue to the east, and Queen Elizabeth Way (QEW) to the west.

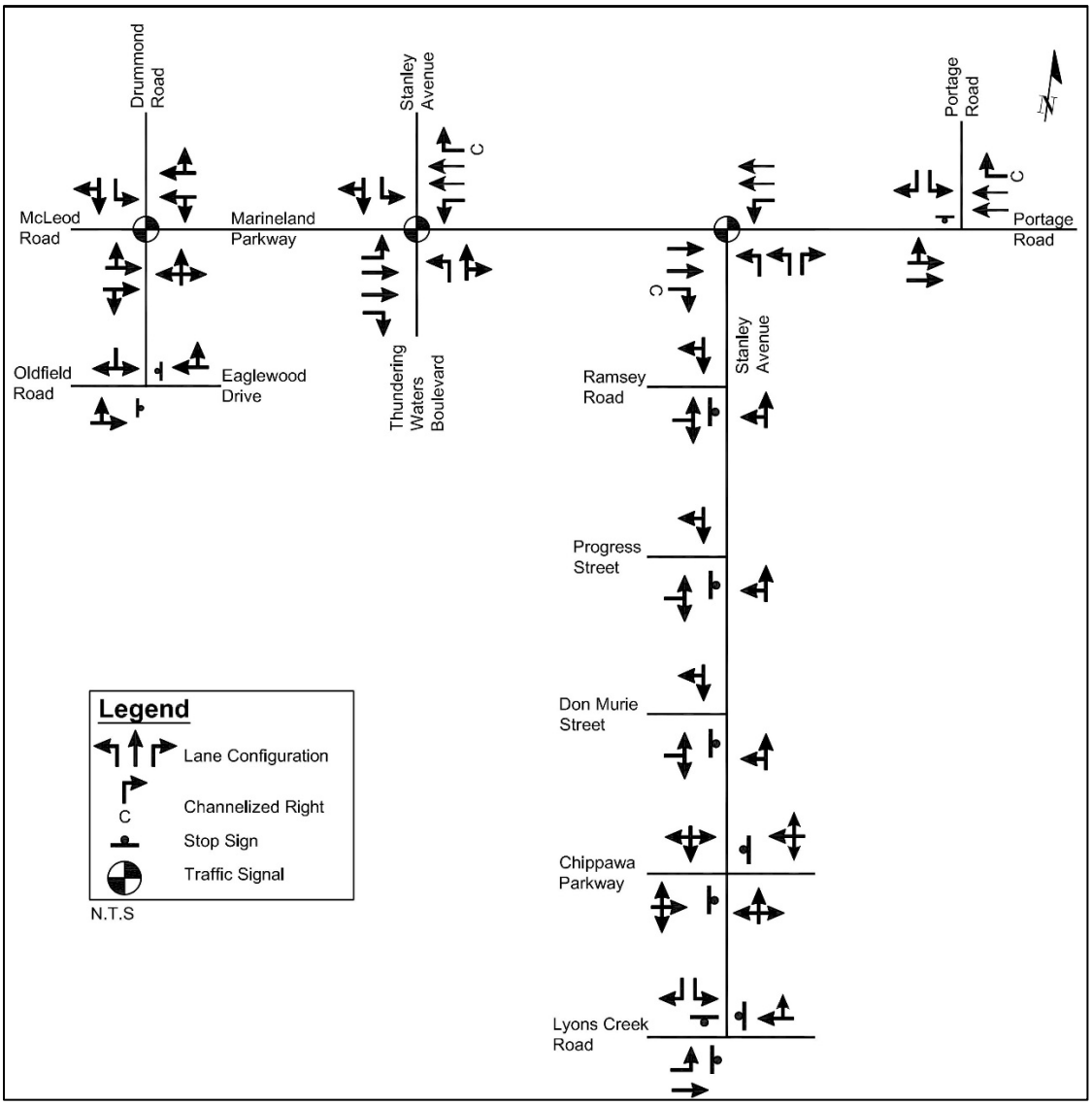
The subject site is located within an area where intensification through mix-use development is encouraged. For example, the vacant lands adjacent to the site are part of the Riverfront Community (formerly known as Thundering Waters Secondary Plan area). Details regarding this development will be provided in Section 3.2.

2.2 Road Network

The existing road network is described below and illustrated in Figure 2, including existing traffic control.

Drummond Road	Drummond Road is a north-south arterial road, north of McLeod Road and transitions into a local road, south of McLeod Road. The roadway is under the jurisdiction of the City. Drummond Road has a posted speed limit of 50 km/h and consists of a 2-lane urban cross section. Bicycle lanes are provided on both sides of the road and terminates at Hawkins Street / Village Crescent (north of McLeod Road). Sidewalks are provided on both sides of the street. Parking is prohibited on both sides of the street, north of McLeod Road and parking is prohibited on the east side, south of McLeod Road.

Figure 2: Existing Road Network



McLeod Road / Marineland Parkway / Portage Road (Region Road 49)	McLeod Road / Marineland Parkway is an east-west arterial road. Approximately 200 m east of Alex Avenue, the roadway transitions into Marineland Parkway and continues east as a collector road. The roadway then transitions into Portage Road, east of Portage Road. The roadway is under the jurisdiction of the Region west of Stanley Avenue (south leg) and is under the jurisdiction of the City east of Stanley Avenue. McLeod Road has a 4-lane urban cross section with a posted speed limit of 50 km/h. Sidewalks are provided on both sides and the sidewalk to the south terminates east of Drummond Road. The sidewalk to the north continues and terminates when the roadway transitions to Marineland Parkway. Parking is prohibited on both sides of the road. Marineland Parkway consists of a 2-lane urban cross section with a posted speed limit of 50 km/h. Sidewalks are provided on the north side of the road, east of Stanley Avenue (north leg) and terminates at the south leg of Stanley Avenue. Sidewalks are then continued on the south side of the road. Parking is prohibited on both sides of the road. East of Portage Road (north leg), Marineland Parkway continues as Portage Road. The roadway consists of a 4-lane urban cross section with an assumed unposted speed limit of 50 km/h. Sidewalks are provided on the south side and terminates 330 m, east of Portage Road (north leg).
Portage Road (north leg)	Portage Road (north leg) is a north south arterial road under the jurisdiction of the City. The roadway consists of a 2-lane rural cross section with a posted speed limit of 50 km/h. Sidewalks are provided on the west side of the road and terminates 200 m north of the Portage Road / Marineland Parkway intersection. Stopping is prohibited on both sides of the road.
Oldfield Road / Eaglewood Drive	Oldfield Road is an east west arterial road under the jurisdiction of the City. The roadway consists of a 2-lane rural cross section with an assumed unposted speed limit of 50 km/h. Sidewalks are provided on the north side of the road and terminates west of Sam Iorfida Drive. To the west of Dorchester Road, Oldfield Road continues as Dorchester Road.

	To the east of Drummond Road, Oldfield Road continues as Eaglewood Drive, a private road. The roadway consists of a 2-lane cross section with an assumed unposted speed limit of 50 km/h.
Stanley Avenue (Regional Road 102) / Thundering Waters Boulevard	Stanley Avenue is a north-south major arterial road under the jurisdiction of the Region. The roadway offsets at Marineland Parkway creating west Stanley Avenue and east Stanley Avenue, which are approximately 270 m apart. Stanley Avenue (north leg) has a 4-lane urban cross section with a posted speed limit of 50 km/h. Sidewalks are provided on both sides of the road and the sidewalk to the east terminates at McLeod Road. Bicycle lanes are provided on both sides of the road. Parking is prohibited on both sides of the road. Stanley Avenue (north leg), south of Marineland Parkway, transitions into a local road named Thundering Waters Boulevard. Thundering Waters Boulevard consists of a 2-lane urban cross section with an assumed unposted speed limit of 50 km/h. Thundering Waters Boulevard currently is a private road and provides access to Thundering Waters Golf Club and a residential community. Stanley Avenue (south leg), south of Marineland Parkway, consists of a 2-lane rural cross section with a posted speed limit of 60 km/h. Parking is prohibited on both sides of the road.
Ramsey Road	Ramsey Road is an east-west collector road under the jurisdiction of the City. The roadway consists of a 2-lane rural cross section with a posted speed limit of 50 km/h.
Progress Street	Progress Street is an east-west collector road under the jurisdiction of the City. The roadway consists of a 2-lane urban cross section with an assumed unposted speed limit of 50 km/h. Parking is prohibited on the north side of the road.
Don Murie Street	Don Murie Street is an east-west collector road under the jurisdiction of the City. The roadway consists of a 2-lane urban cross section with an assumed unposted speed limit of 50 km/h. Parking is prohibited on the south side of the road.

Chippawa Parkway	Chippawa Parkway is an east-west roadway consisting of a 2-lane rural cross section under the jurisdiction of the City. The roadway is classified as an arterial road, west of Stanley Avenue and transitions into a collector road to the east. Chippawa Parkway has a posted speed limit of 60 km/h.
Lyons Creek Road (Regional Road 47)	Lyons Creek Road is an east-west arterial road under the jurisdiction of the Region. The roadway consists of a 2-lane rural cross section. The roadway has a posted speed limit of 60 km/h east of Stanley Avenue and a posted speed limit of 70 km/h west of Stanley Avenue. Bicycle lanes are provided on both sides of the road.

2.3 Rail Line

A CP rail corridor runs through the middle of the site, which is an existing tertiary spur rail line owned by CP that is classified as an Industrial Spur Line. The rail line is identified to be CP Montrose Subdivision and services the industrial facilities in the area. Table 1 summarizes the information provided by CP for this rail line. Other detailed information can be found in Appendix C.

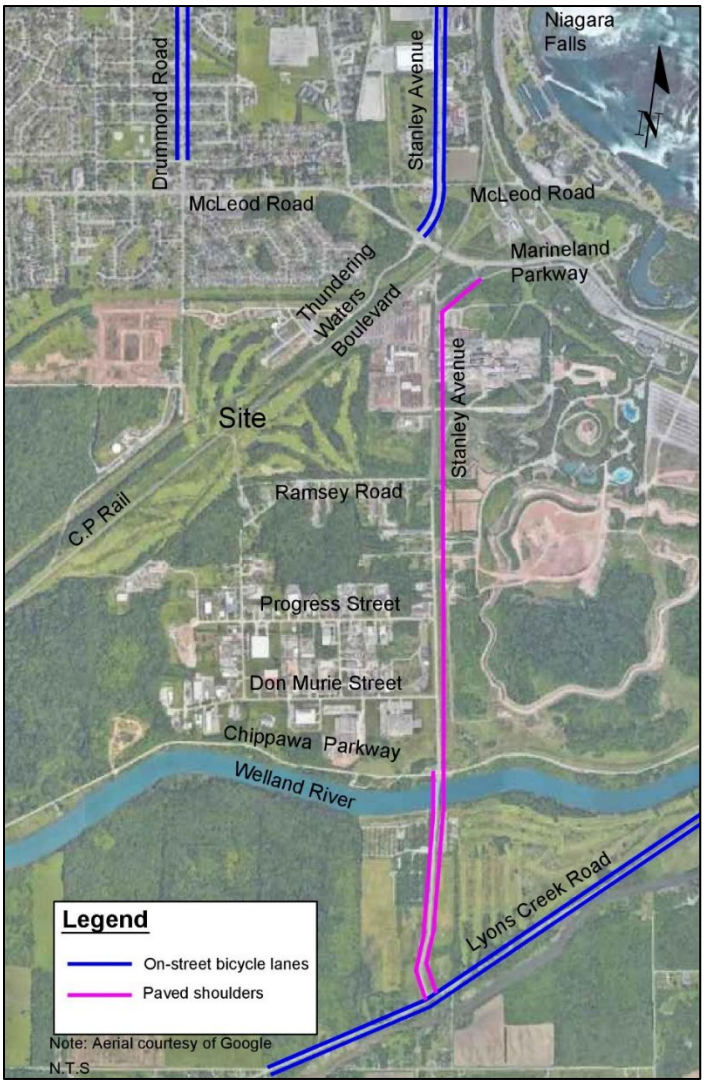
Table 1: CP Montrose Subdivision Status

Attributes	Values
Number of freight trains between 7:00 a.m. to 11:00 p.m.	0
Number of freight trains between 11:00 p.m. to 7:00 a.m.	2
Maximum cars per train freight.	20
Number of locomotives per train.	2
Maximum permissible train speed.	41 km/h (25 mph)
Normal train speed.	25 km/h (15 mph)

2.4 Cycling Network

Cycling infrastructures consist of on-street bicycle lanes and paved shoulders. Existing cycling facilities are shown in Figure 3.

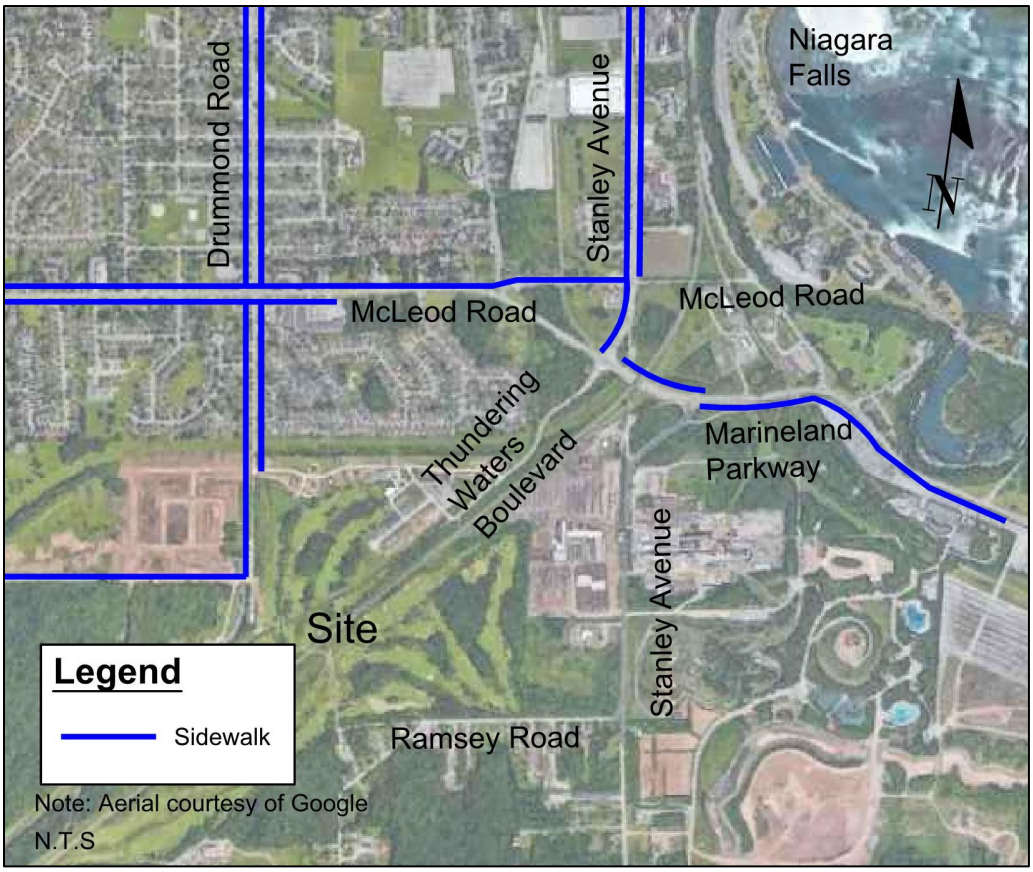
Figure 3: Existing Cycling Network



2.5 Pedestrian Network

Pedestrian infrastructure consists of sidewalks. Existing pedestrian facilities on the major roads are shown in Figure 4.

Figure 4: Existing Pedestrian Network



2.6 Transit

Niagara Falls Transit provides several bus routes north of the site 7 days a week. Transit stops are located at the following intersections:

- McLeod Road / Drummond Road
- Marineland Parkway / East Stanley Road

The transit stops are approximately a 10 to 12 minute walk from the site. Table 2 summarizes the route frequency during the adjacent street peak period.

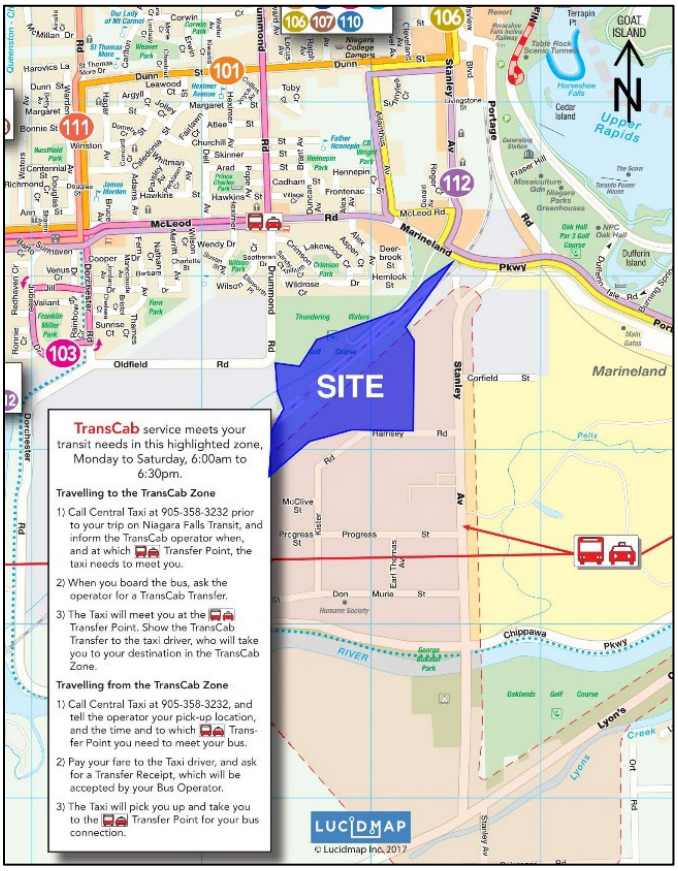
Table 2: Transit Service

Route Number	Direction	Via	Frequency
103	Between Niagara Square Shopping Centre and To Main & Ferry	McLeod Road and Drummond Road	60 minutes
203 (Evenings and Sundays)			30 minutes
106	Between Main & Ferry and Chippawa Area	Stanley Avenue and Marineland Parkway	60 minutes
206 (Evenings and Sundays)			30 minutes
112	Between Niagara Square Shopping Centre and Chippawa Area	Marineland Parkway and McLeod Road	60 minutes

South of the site is served by Niagara TransCab, who provides services for areas of the City not served by regular Niagara Falls Transit. TransCab operate Monday to Saturday 6:00 a.m. to 7:15 p.m. The cab will pick up the user at a booked time and connect them to a regular Niagara Transit bus route.

Local transit routes and TransCab service area are illustrated in Figure 5.

Figure 5: Existing Transit Routes



Reference: Niagara Transit

2.7 Existing Traffic Volumes

Existing traffic counts were undertaken during the weekday morning (7:00 a.m. to 9:00 a.m.) and afternoon (4:00 p.m. to 6:00 p.m) peak periods. These periods were selected to reflect the peak travel characteristics of this particular type of development. The turning movement counts for all study intersections were conducted by Pyramid Traffic Inc., on behalf of Burnside on Thursday, March 22, 2018 with the exception of the intersections summarized in Table 3. The turning movement counts for these intersections were taken from the Riverfront Community TIS and Marina Homes TIS as these traffic counts were more recent or supplemented information. Due to the COVID-19 pandemic, new traffic counts were not collected for the study intersections as they would not be reflective of pre-COVID traffic patterns.

Table 3: Traffic Count Exceptions

Location	Source	Dates
Marineland Parkway / Stanley Avenue / Thundering Waters Boulevard	Marina Homes TIS	Wednesday, September 11, 2019
Marineland Parkway / Stanley Avenue (south leg)		
Marineland Parkway / Portage Road	Riverfront Community TIS	Wednesday, September 2, 2015
Drummond Road Oldfield Road [1]		April 2017

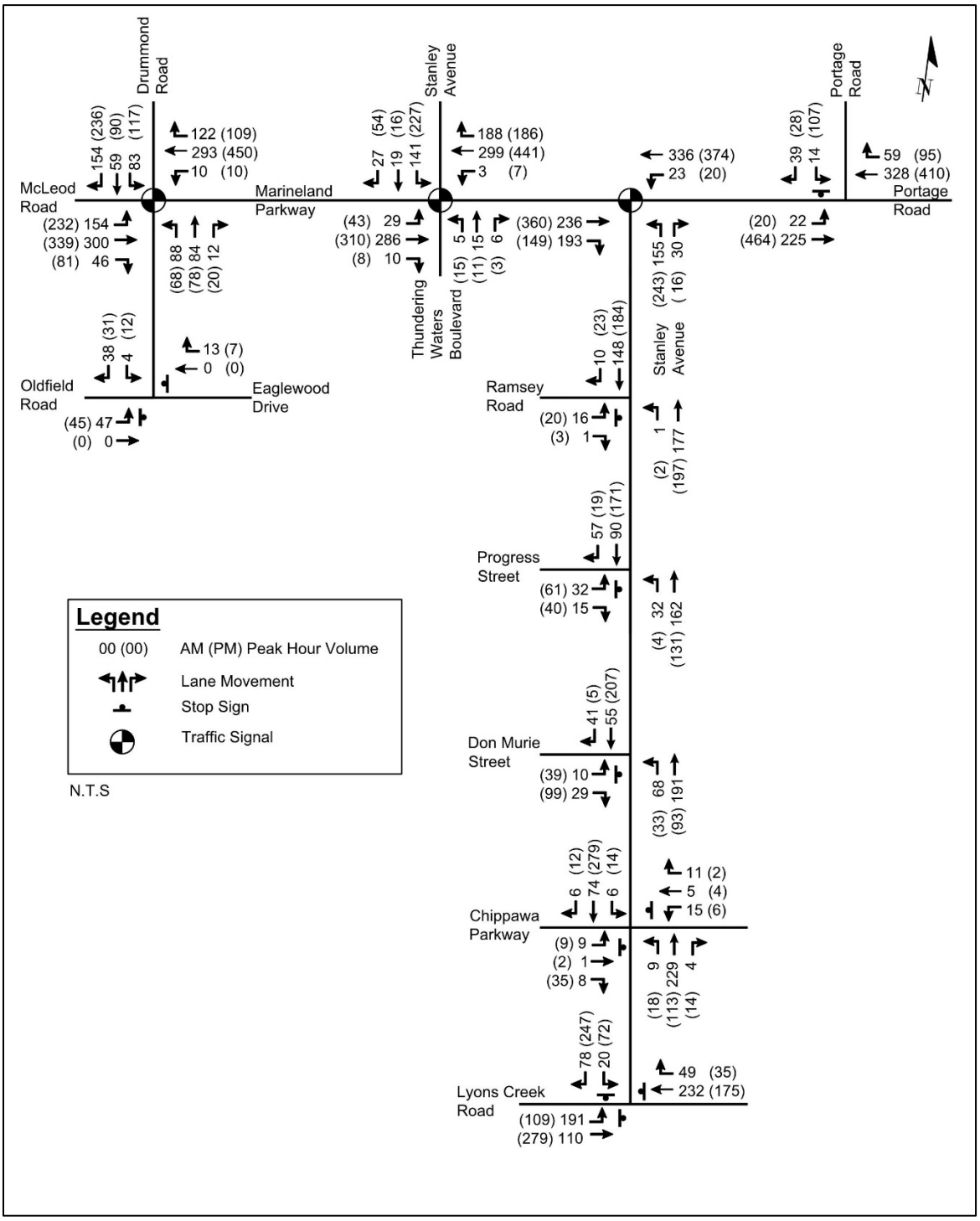
Notes: 1. As noted in the Riverfront Community TIS, the counts at this intersection were provided to them by the City.

Based on the findings and methodology outlined in Section 3.1, growth was applied to the traffic volumes to represent the existing year (2021). An imbalance was observed in the traffic data along Marineland Parkway / Portage Road. Adjustments were not made to be consistent with the historical traffic count patterns.

In addition, Eaglewood Drive was not open when the counts were conducted. Trips coming in and out of Eaglewood Drive was based upon the information contained in the publication *Trip Generation Manual, 10th Edition* (Trip Generation Manual) published by the Institute of Transportation Engineers (ITE). The land use code (LUC) for Single-Family Detached Housing (LUC 210) based on a general urban / suburban environment was used in the generation of trips for the single-family homes along Eaglewood Drive. It was assumed that half of those homes along Eaglewood Drive will utilized the access at the Drummond Road / Oldfield Road intersection. All trips will be heading to and from north on Drummond Road.

The existing traffic counts are illustrated Figure 6 and traffic counts are provided in Appendix D.

Figure 6: Existing Traffic Volumes



3.0 Future Background Conditions

Future background traffic consists of existing traffic, background traffic growth and traffic from other developments. Background traffic growth and traffic from other developments are discussed below. The horizon year of 2027 and 2032 were selected for the analysis. Future road network, transit and active transportation improvements in the vicinity of the site and within the study's horizon year, are also discussed.

3.1 Background Traffic Growth

The existing traffic counts collected by Burnside in March 2018, 2015 counts in the Riverfront Community TIS, City's 2012 and 2015 average annual daily traffic (AADTs) were reviewed. The traffic data generally indicates a negative growth trend for the study area. However, for a more conservative approach and to be consistent with the Riverfront Community TIS, a growth rate of 0.5% compounded annually was applied to all movements long McLeod Road / Marineland Parkway / Portage Road and a growth rate of 1% compounded annually was applied to all other study intersections. No growth was applied to turning movements associated with Oldfield Road and Thundering Waters Boulevard.

3.2 Background Developments

As discussed with the City, three background developments were identified to be within the vicinity of the site and are anticipated to be built within the study horizon years as follows.

Riverfront Community

- This proposed development was formerly known as the Thundering Waters Secondary Plan.
- Located south of Oldfield Road and west of the site.
- Proposed development is 312 condominium / townhomes, 567 single detached homes, 238 continuing care / retirement facility rooms, 450 hotel rooms, and 26,012 m^2 (280,000 ft^2) of retail space.
- Weekday AM and PM peak hour site volumes were based on Riverfront Community TIS.

Nina's Court Condominium

- Located southeast of Old Mcleod Road / Marineland Parkway.
- Proposed development is 43 townhomes and 125 condominium units.
- Weekday AM and PM peak hour site volumes were based on *Nina's Court Traffic Impact Study*, prepared by Paradigm, dated May 2017. As the intersection at Lyons Creek Road and Stanley Avenue was not part of their study intersection, assumptions were made based on existing travel patterns.

Marina Homes

- Located at 5500 Marineland Parkway, southwest of Marineland Parkway / Stanley Avenue / Thundering Waters Boulevard intersection.
- Proposed development is 292 townhomes.
- Weekday AM and PM peak hour site volumes were based on Marina Homes TIS.

The related background development traffic figures are provided in Appendix E. It is noted that this development did not include the Niagara Village development proposal in their analysis, which was subsequent to our original submission. Marina Homes has been included in this analysis.

3.3 Future Road Network

The Region completed an Environmental Assessment (EA) along McLeod Road / Marineland Parkway in 2010. The following improvements are planned in the EA:

- At Drummond Road / McLeod Road intersection:
  - Additional eastbound, westbound and northbound left turn lanes; and
  - Additional southbound right turn lane.
- At Marineland Parkway / Portage Road intersection:
  - Additional eastbound left turn lane.

For the above improvements, the Region had indicated that construction will begin 2026 and completed by 2031. Therefore, the improvements are considered in the 2032 background conditions.

3.4 Transit and Active Transportation Improvements

There are no planned transit, pedestrian and cyclist facility improvements planned within the study area up to the study horizon years.

3.5 Future Background Traffic Volumes

Background traffic volumes consist of the application of the growth per annum (up to the horizon year 2027 and 20312 to existing volumes as shown in Figure 6, in addition to traffic from background developments. The resulting traffic volumes are illustrated in Figure 7 and Figure 8 for horizon years 2027 and 2032, respectively.

Figure 7 : 2027 Background Traffic Volumes

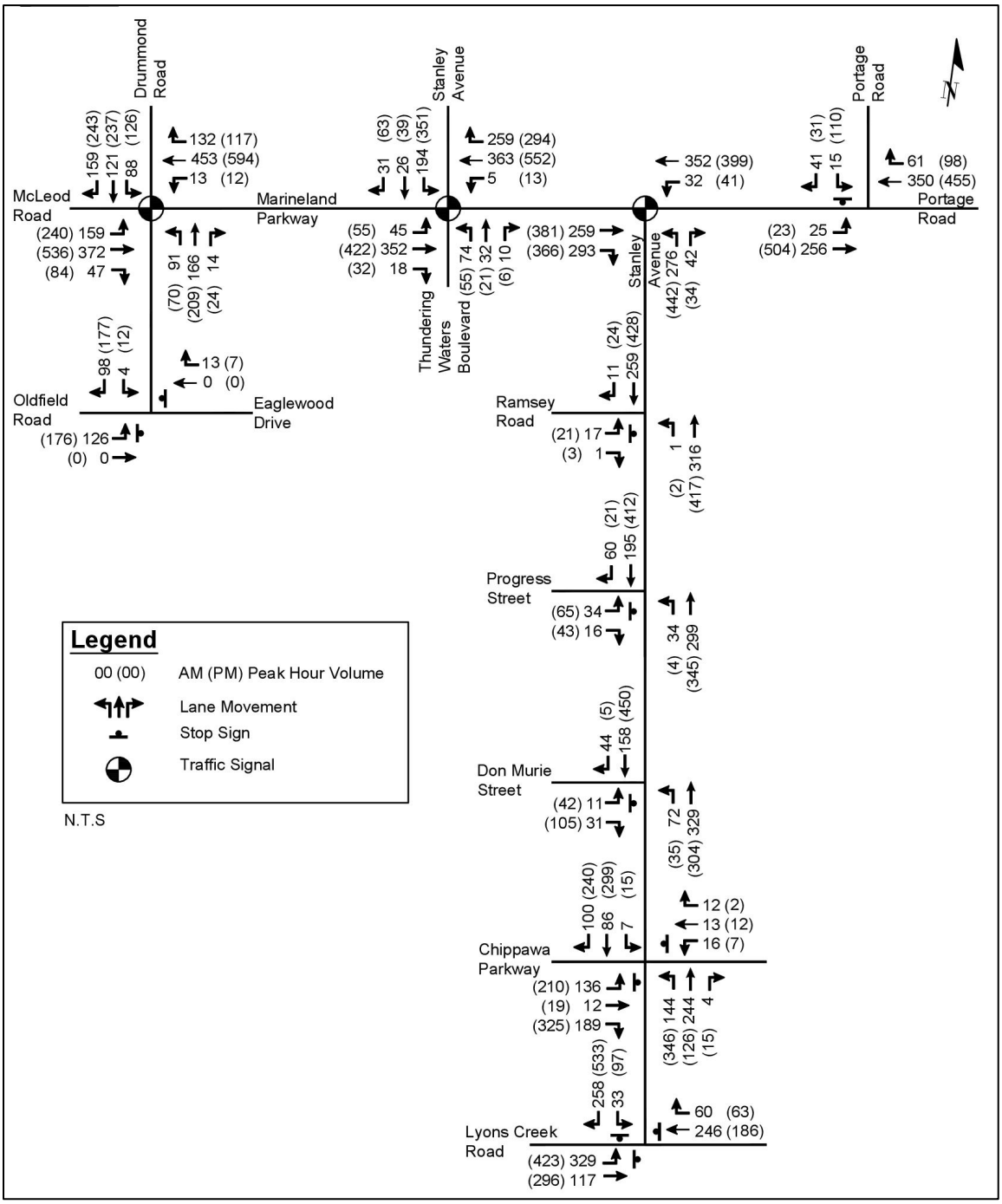
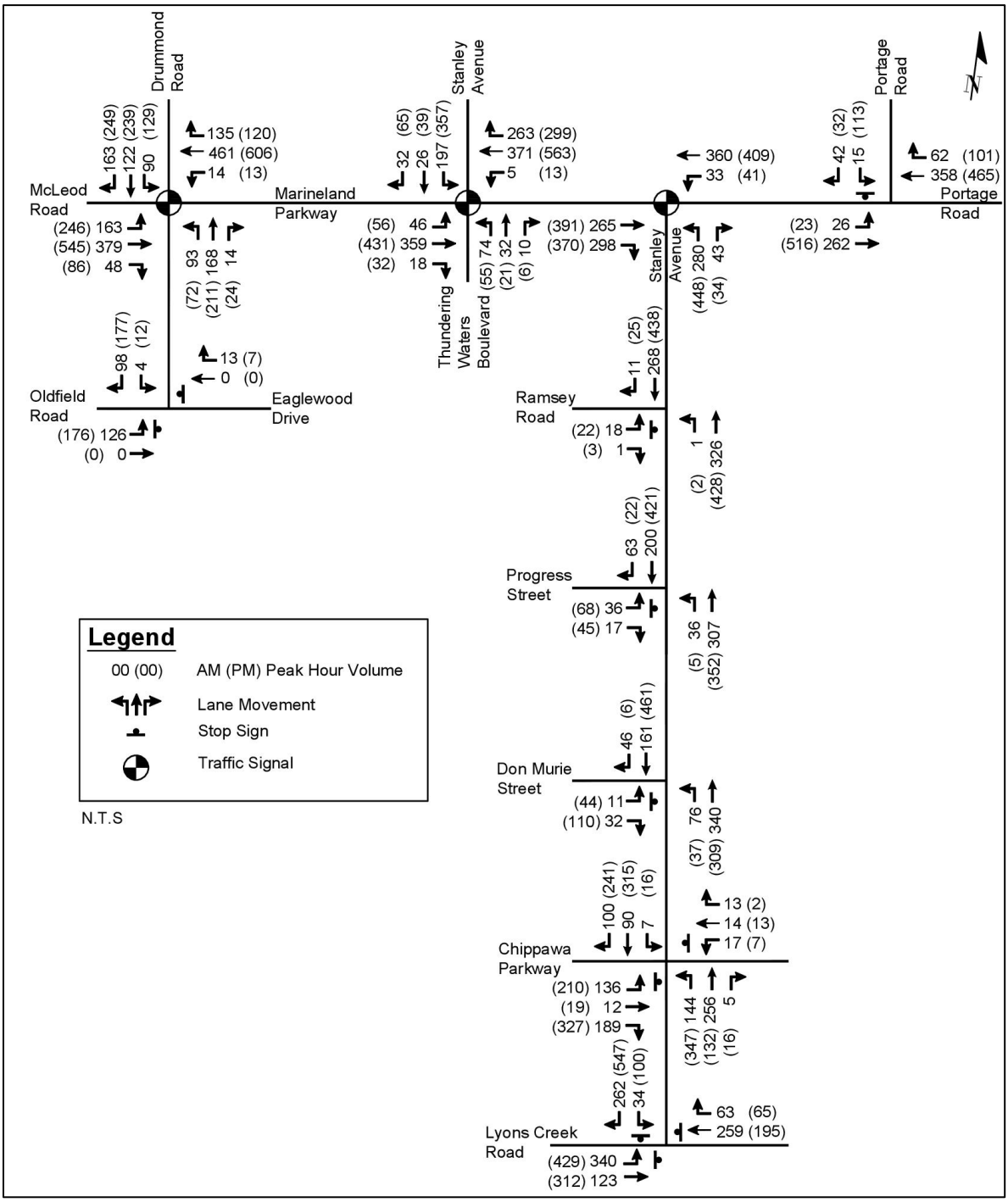


Figure 8 : 2032 Background Traffic Volumes



4.0 Proposed Development

The proposed development will consist the following:

- 262 single detached residential homes;
- 69 street townhomes;
- 79 low density residential units;
- 247medium density residential units; and
- 665 high density residential units.

In total, the proposed development will have 1,322 units of residential, which is an increase of 188 residential units since the last submitted 2020 TIS. The 930 m^2 commercial component has also been removed. The proposed concept plan is provided in Figure 9. Access to the proposed development will be provided via the following connections:

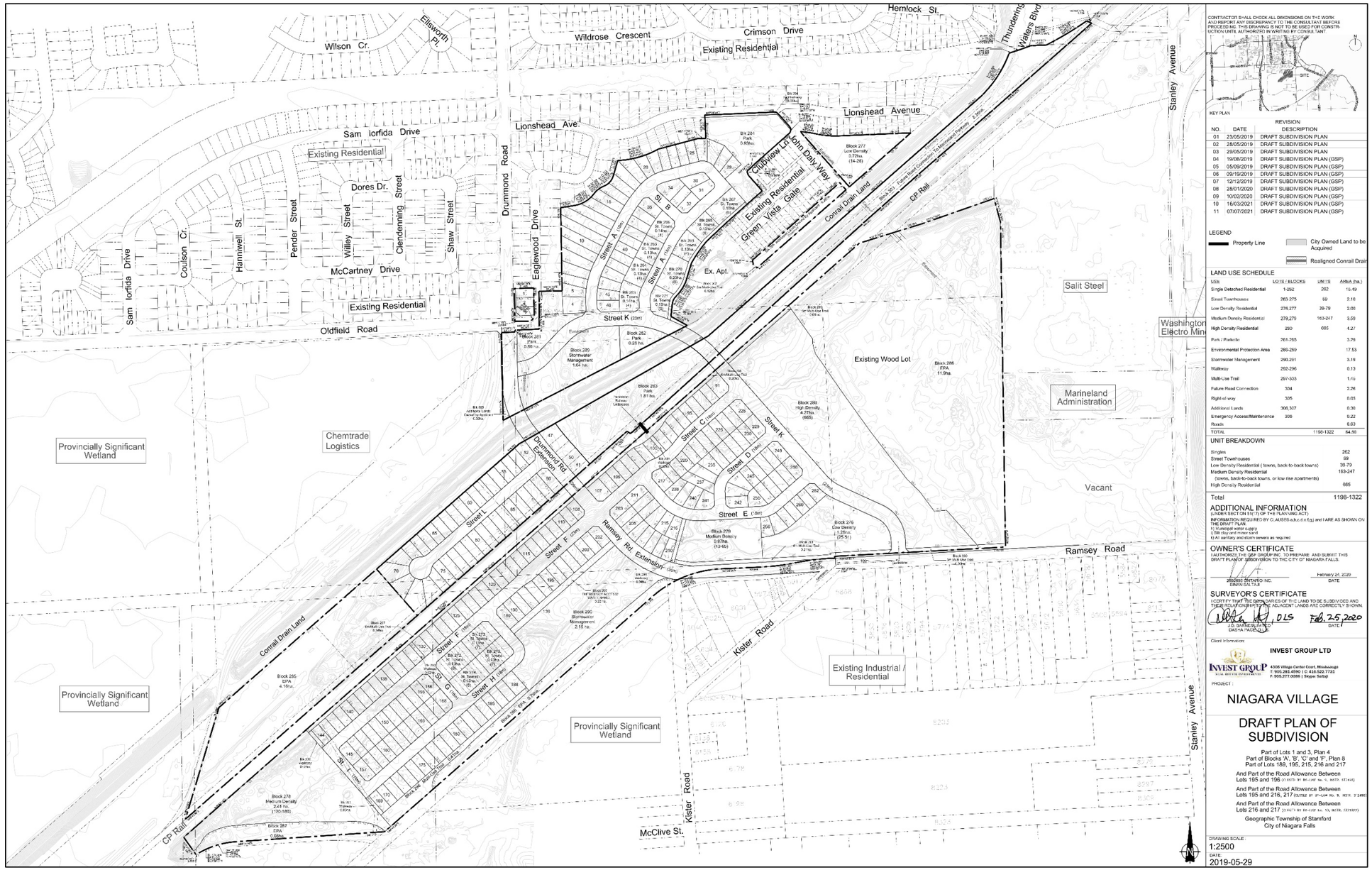
- John Daly Way (to a couple on infill residential lots);
- Eaglewood Drive (to a couple of single detached residential homes);
- Drummond Road;
- Oldfield Road; and
- Ramsey Road.

Drummond Road will extend to the south and swing to the east to connect to Ramsey Road. For the purpose of this report, Drummond Road is assumed to be a north-south connection tying into Ramsey Road extension at Street F / Street C. Thundering Waters Boulevard could be extended in the future for a connection with Street K. With this connection, a future roundabout could be considered. However, at this time, Thundering Waters Boulevard is not proposed to be extended as its connection to Marineland Parkway is as a private road.

The City expressed an interest in having a connection out to Marineland Parkway opposite Stanley Avenue via Thundering Waters Boulevard. However, Thundering Waters Boulevard is through private lands including a utility corridor and the Marina Homes lands. The redevelopment of Thunder Waters Golf Club does not continue to have access. With Marina Homes development, there is an opportunity for the City to transfer the section of Thundering Waters Boulevard through Marina Homes lands to a public road. This is not assumed in the analysis as the Niagara Village development can operate and function based upon the proposed connections to Drummond Road and Ramsey Road.

As mentioned in Section 2.1, CP Montrose Subdivision runs through the proposed development. As a result, within the proposed development there are two at-grade crossings proposed.

Figure 9: Concept Plan



In addition, the City had a concern with Street F being the only outlet for the residential homes in that block. The updated concept plan illustrates an emergency / maintenance access to the south connecting into the Ramsey Road extension acting as a secondary access.

Street K previously aligned opposite Oldfield Road at Drummond Road. However, Eaglewood Drive is a private road opposite Oldfield Road and access at this location cannot be obtained. This resulted in shifting the Street K south.

4.1 Trip Generation

Trip generation for the proposed development was based upon the information contained in the publication Trip Generation Manual. The following land use code (LUC) were used in the generation of trips based on a general urban / suburban environment:

- Single detached residential homes: Single-Family Detached Housing (LUC 210);
- Street townhomes: Multifamily Housing – Low-Rise (LUC 220); and
- Low, Medium and High-density residential units (blocks): Multifamily Housing – Mid-Rise (LUC 221).

Note that the high-density residential block will be comprise of three to six storey townhomes and apartments. The resulting trip generation is summarized in Table 4.

Table 4: Development Trip Generation Summary

Land Use (Size)	Weekday AM Peak Hour			Weekday PM Peak Hour		
	In	Out	Total	In	Out	Total
Single-Family Detached Housing (LUC 210) - 262 units						
New Trips	51	153	204	171	100	271
Multifamily Housing - Low-Rise (LUC 220) - 69 units						
New Trips	7	27	34	29	17	46
Multifamily Housing - Mid-Rise (LUC 221) - 991 units						
New Trips	93	263	356	267	170	437
Total Residential – 974 units						
Total Trips	**151**	**443**	**594**	**467**	**287**	**754**

In comparing the number of trips generated from the previous 2020 TIS to the current proposal, there would be 58 more trips in the AM peak hour and 60 more trips in the PM peak hour.

4.2 Trip Distribution and Assignment

Trip distribution and assignment of new residential trips were based upon existing traffic patterns, the available road network, and a review of the 2016 Transportation Tomorrow Survey (TTS) results published by the Data Management Group at the University of

Toronto Transportation Research Institute. TTS does not provide data on specific home to work trips within the areas of the City. Assumptions were made for the based on the City's Official Plan future land uses, urban structure plan and general location of employment area within the City.

The estimated distribution of site trips is summarized in Table 5.

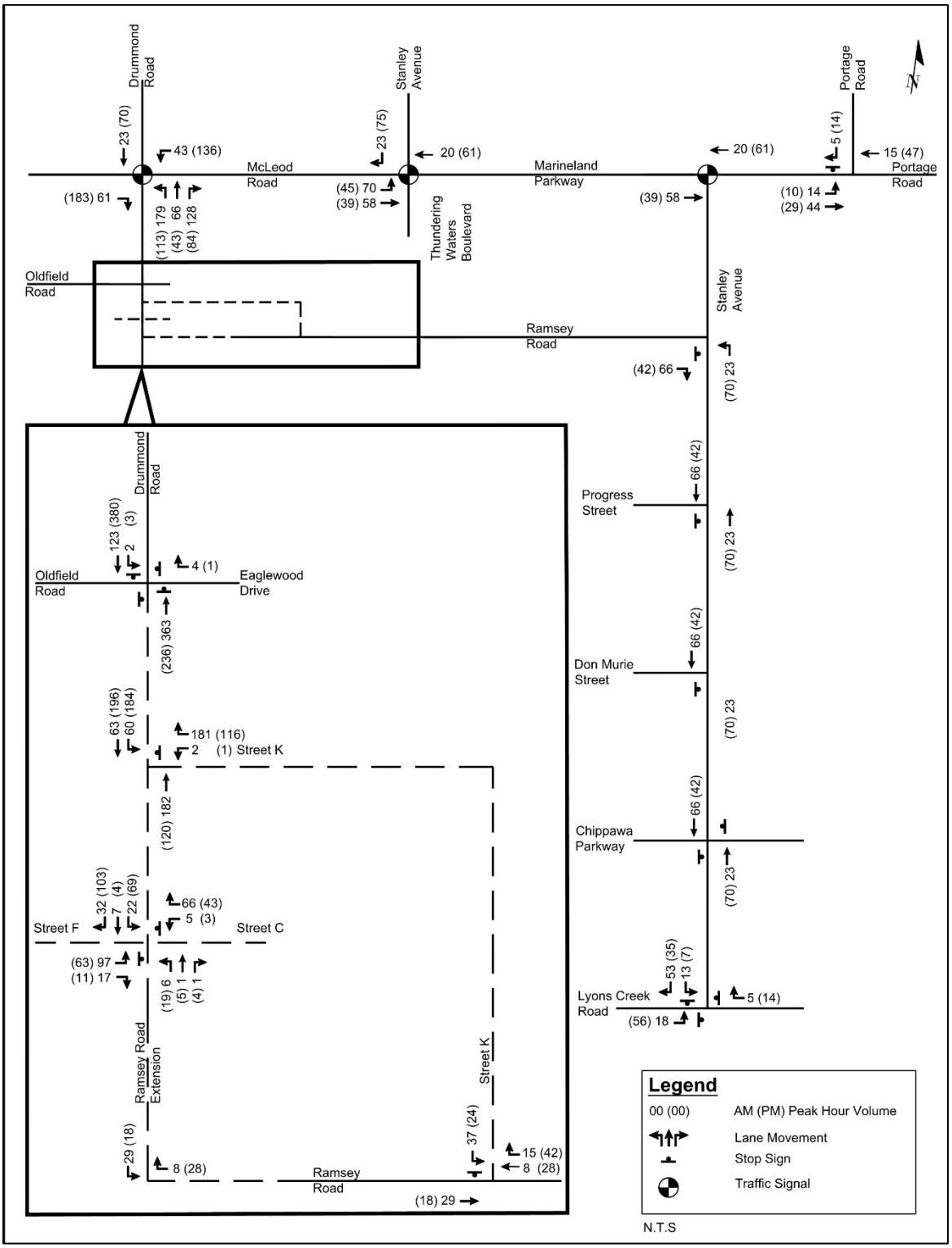
Table 5: Trip Distribution

To/From	Via	Residential Distribution
North	Drummond Road	15%
	Stanley Avenue	16%
	Portage Road	3%
East	Portage Road / Marineland Parkway	10%
	Lyons Creek Road	3%
West	McLeod Road	40%
	Lyons Creek Road	12%
Internal	Industrial Lands [1]	1%
	Total	**100%**

Notes: 1. Industrial lands located west of Stanley Avenue between Ramsey Road and Chippawa Parkway.

Development generated total site trips are illustrated in Figure 10.

Figure 10: Niagara Village Site Development Trips



5.0 Total Traffic Conditions

5.1 Total Traffic Volumes

Total traffic volumes consist of background traffic volumes for horizon years 2026 and 2031 plus the site trips illustrated in Figure 13. The resulting 2027 and 2032 total traffic volumes are in Figure 14 and Figure 15, respectively.

Figure 11: 2027 Total Traffic Volumes

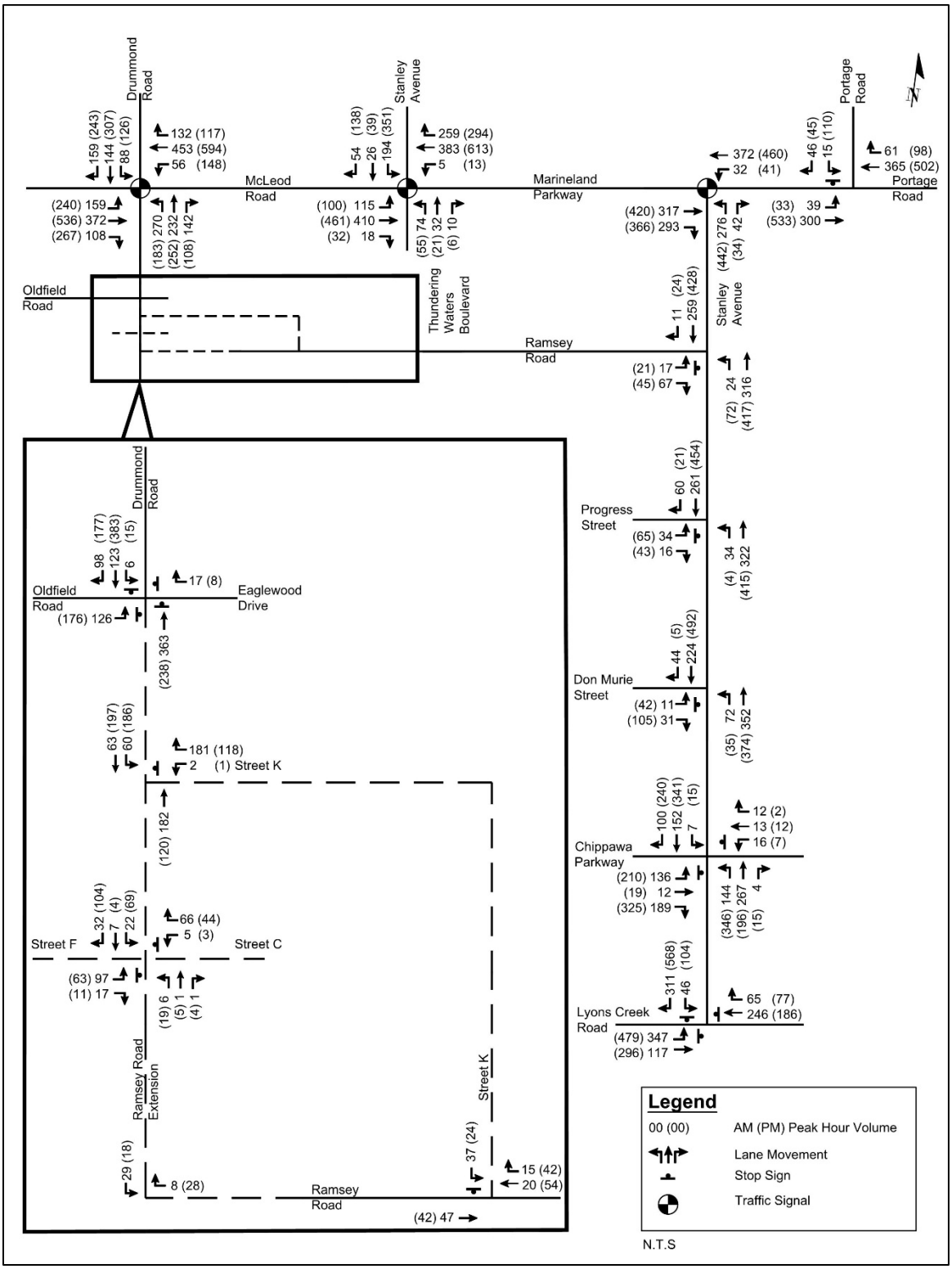
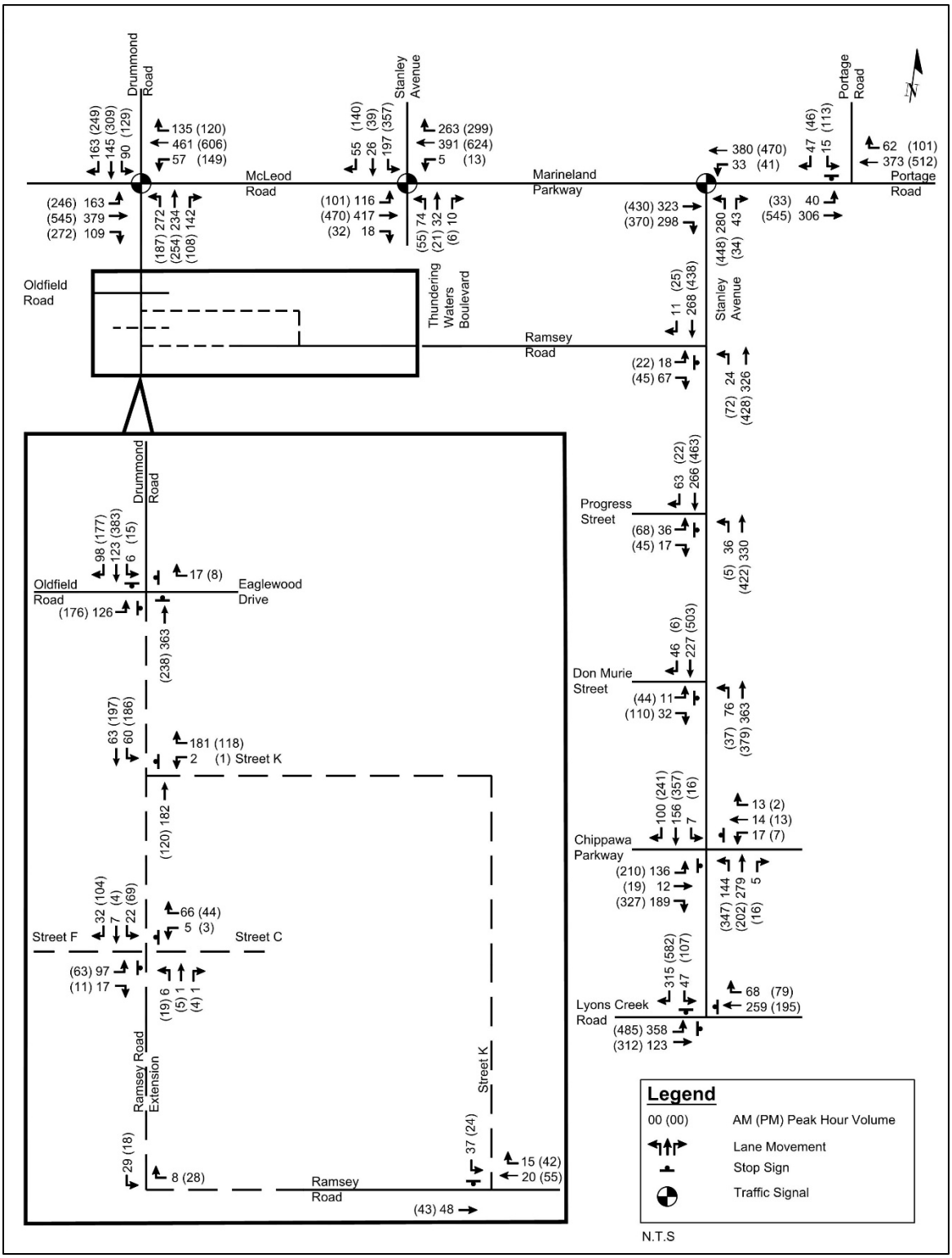


Figure 12: 2032 Total Traffic Volumes



6.0 Traffic Operations Analysis

Traffic operations analyses were conducted under existing and future traffic conditions for the weekday AM and PM peak hours at study area intersections. Queueing was reviewed using Synchro's 95th percentile queue. A comparison of the existing storage and projected queues are summarized for all movements. Detailed Synchro reports are provided in Appendix F to Appendix J for existing, 2027 and 2032 background and total conditions, respectively.

6.1 Drummond Road / McLeod Road Intersection

Existing and future traffic operations are summarized in Table 6 for the Drummond Road / McLeod Road intersection.

Table 6: Drummond / McLeod Operations

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Existing Conditions							
Overall	-	0.47	B	-	0.56	C	-
EBLTR	300+	0.44	B	45	0.59	B	63
WBLTR	300+	0.26	B	30	0.33	B	43
NBLTR	300+	0.48	C	53	0.47	C	48
SBL	20	0.24	C	26	0.31	C	34
SBTR	300+	0.26	C	33	0.46	C	61
Background 2027 Conditions							
Overall	-	0.66	C	-	1.05	D	-
EBLTR	300+	0.55	B	57	0.81	C	104
WBLTR	300+	0.38	B	48	0.43	B	58
NBLTR	300+	0.78	D	96	1.36	F	139
SBL	20	0.30	C	28	0.44	C	39
SBTR	300+	0.47	C	64	0.82	D	140
Background 2027 Conditions (Recommended Improvements: Optimization)							
Overall	-	Not needed for AM Peak Hour			0.92	C	-
EBLTR	300+				0.91	D	129
WBLTR	300+				0.47	B	66
NBLTR	300+				0.88	D	111
SBL	20				0.36	C	35
SBTR	300+				0.70	C	116

Table 6: Drummond / McLeod Operations (continued)

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Background 2032 Conditions							
Overall	-	0.40	C	-	0.64	C	-
EBL	95	0.43	B	27	0.85	D	58
EBTR	300+	0.25	B	33	0.39	B	55
WBL	25	0.05	B	6	0.05	B	6
WBTR	300+	0.46	C	66	0.54	C	78
NBL	24	0.24	C	28	0.19	C	21
NBTR	300+	0.31	C	48	0.34	C	54
SBL	48 [1]	0.27	C	28	0.34	C	35
SBT	300+	0.22	C	34	0.34	C	55
SBR	50	0.11	D	14	0.18	C	17
Total 2027 Conditions							
Overall	-	1.27	F	-	2.09	F	-
EBLTR	300+	0.61	B	65	1.16	F	178
WBLTR	300+	0.48	B	56	0.98	D	138
NBLTR	300+	2.22	F	301	3.14	F	235
SBL	20	0.38	C	30	0.45	C	38
SBTR	300+	0.52	C	72	0.82	D	156
Total 2027 Conditions (with recommended improvements)							
Overall	-	0.67	C	-	0.94	C	-
EBL	95	0.65	C	39	0.93	E	71
EBTR	300+	0.41	C	53	0.57	C	79
WBL	25	0.44	D	25	0.86	E	67
WBTR	300+	0.82	D	95	0.69	D	89
NBL	24	0.61	C	71	0.90	E	81
NBTR	300+	0.44	B	69	0.46	C	73
SBL	20	0.24	B	21	0.35	C	32
SBTR	300+	0.34	B	48	0.69	C	124
Total 2032 Conditions							
Overall	-	0.60	C	-	0.76	C	-
EBL	95	0.66	C	39	0.85	D	58
EBTR	300+	0.42	C	53	0.49	B	68
WBL	25	0.45	D	26	0.67	D	57
WBTR	300+	0.83	D	98	0.54	C	78
NBL	24	0.48	B	60	0.60	C	57
NBTR	300+	0.44	B	70	0.54	C	85
SBL	48 [1]	0.25	B	22	0.48	C	40
SBT	300+	0.17	B	28	0.44	C	73
SBR	50	0.11	B	10	0.18	C	17

Note: 1. Taper creates more storage; as a result, the storage length is closer to the reported length.

Existing Conditions

Under existing conditions during both peak hours, all movements are operating with excess capacity and level of service C or better. The southbound left turn queue exceeds storage by 6 m and 14 m during AM and PM peak hour, respectively. This is equivalent to one to two vehicles. The City should review and lengthen the storage if required.

Future 2027 Conditions

Under background 2027 conditions during both peak hours, the intersection will operate with excess capacity with the exception of the northbound approach and overall intersection during the PM peak hour. The northbound left-through-right movement is projected to exceed capacity and will experience a delay resulting in level of service F. As this is a background concern, it is recommended that the City monitor this intersection for improvement. It appears that the existing PM signal timing plan can be optimized, while maintaining the existing cycle length to provide more capacity. The operation for this improvement is summarized in Table 6 and details can be found in Appendix K.

The southbound left turn queue will continue to exceed storage by one to two vehicles length. As per existing recommendations, the City should be monitoring this.

Under total 2027 conditions, the overall intersection and northbound approach will exceed capacity during both peak hours. Also, the eastbound approach is projected to exceed capacity during the PM peak hour. All the noted movements will experience a delay resulting in a level of service F. As mentioned, in Section 3.3 improvements for this intersection are a part of the Region's planned EA that will occurred in 2031. However, some improvements should be brought forward sooner including:

- Exclusive northbound left turn lane;
- Exclusive westbound left turn lane; and
- Exclusive eastbound left turn lane.

This also coincides with Riverfront TIS, which recommended that all of the planned improvements (including the exclusive southbound right turn lane) in the EA be implemented in 2026.

With the recommended improvements, all movements will have excess capacity as illustrated in Table 6 and details can be found in Appendix L.

There are several movements with projected queue lengths that exceed storage. This includes:

- Westbound left turn queue: Exceeds by 42 m during PM peak hour.

- Northbound left turn queue: Exceeds by 47 m and 57 m during AM and PM peak hour, respectively.
- Southbound Left turn queue: Exceeds by 12 m during the PM peak hour, respectively. As this is equivalent to two vehicles, no further improvements are recommended.

Both movements will exceed the planned storage in the EA. For the westbound left turn, it appears more property will be required to lengthen the storage. The Region should consider lengthening the storage for this movement.

For the northbound left turn, it appears there is sufficient right-of-way to extend the storage to 60 m to accommodate for the projected queue (under full built-out of the intersection in 2032). It is recommended that the Region considers lengthening the storage when all improvements at this intersection is implemented.

Future 2032 Conditions

Under background and total 2032 conditions with the planned improvements as per the Region's EA, all movements will operate with excess capacity during both peak hours.

Under total 2031 conditions, the movements with projected queue lengths that exceed storage include:

- Westbound left turn queue: Exceeds by 32 m during PM peak hour.
- Northbound left turn queue: Exceeds by 36 m and 33 m during AM and PM peak hour, respectively.

Under ultimate total conditions, it is recommended that the Region considers lengthening the storage for the northbound left turn to 60 m and the westbound left turn to 60 m.

6.2 Stanley Avenue / Marineland Parkway / Thundering Waters Boulevard Intersection

Existing and future traffic operations at the Stanley Avenue / Marineland Parkway / Thundering Waters Boulevard intersection are summarized in Table 7.

Table 7: Stanley / Marineland / Thundering Waters Operations

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Existing Conditions							
Overall	-	0.28	B	-	0.43	B	-
EBL	120	0.07	A	6	0.11	B	8
EBT	300+	0.17	B	21	0.19	B	22
EBR	40	0.01	A	1	0.01	A	0
WBL	27	0.01	B	2	0.02	B	3
WBT	250	0.22	B	28	0.32	B	41
WBR	67	0.15	B	11	0.14	B	10
NBL	30	0.01	C	3	0.04	C	6
NBTR	300+	0.03	C	7	0.02	C	6
SBL	200+	0.39	C	38	0.62	C	61
SBTR	200+	0.06	C	10	0.08	C	11
Background 2027 Conditions							
Overall	-	0.37	B	-	0.62	C	-
EBL	120	0.11	B	8	0.16	B	9
EBT	300+	0.21	B	25	0.26	B	30
EBR	40	0.01	A	2	0.02	A	4
WBL	27	0.01	B	3	0.04	B	5
WBT	250	0.27	B	34	0.41	B	52
WBR	67	0.20	B	13	0.23	B	11
NBL	30	0.19	C	21	0.15	C	16
NBTR	300+	0.07	C	12	0.05	C	9
SBL	200+	0.55	C	53	0.98	E	117
SBTR	200+	0.08	C	12	0.13	C	16
Background 2027 Conditions (Recommended Improvements: Optimization)							
Overall	-	Not needed for AM Peak Hour			0.62	C	-
EBL	120				0.20	B	11
EBT	300+				0.31	B	36
EBR	40				0.02	B	4
WBL	27				0.04	B	5
WBT	250				0.49	C	58
WBR	67				0.23	C	13
NBL	30				0.12	B	14
NBTR	300+				0.04	B	8
SBL	200+				0.80	C	93
SBTR	200+				0.11	B	14

Table 7: Stanley / Marineland / Thundering Waters Operations (continued)

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Background 2032 Conditions							
Overall	-	0.38	B	-	0.64	C	-
EBL	120	0.11	B	8	0.21	B	12
EBT	300+	0.21	B	26	0.31	B	37
EBR	40	0.01	A	2	0.02	B	4
WBL	27	0.01	B	3	0.04	B	5
WBT	250	0.27	B	35	0.49	C	59
WBR	67	0.21	B	13	0.23	C	13
NBL	30	0.19	C	21	0.12	B	14
NBTR	300+	0.07	C	12	0.04	B	8
SBL	200+	0.56	C	54	0.81	C	98
SBTR	200+	0.08	C	12	0.11	B	14
Total 2027 Conditions							
Overall	-	0.40	B	-	0.66	C	-
EBL	120	0.27	B	18	0.38	B	18
EBT	300+	0.24	B	29	0.33	B	39
EBR	40	0.01	A	2	0.02	B	4
WBL	27	0.02	B	3	0.05	B	5
WBT	250	0.31	B	39	0.56	C	65
WBR	67	0.20	B	14	0.23	C	13
NBL	30	0.19	C	21	0.14	B	15
NBTR	300+	0.07	C	12	0.04	B	8
SBL	200+	0.55	C	53	0.80	C	93
SBTR	200+	0.10	C	13	0.17	B	16
Total 2032 Conditions							
Overall	-	0.41	B	-	0.67	C	-
EBL	120	0.27	B	18	0.39	B	19
EBT	300+	0.24	B	30	0.34	B	40
EBR	40	0.01	A	2	0.02	B	4
WBL	27	0.02	B	3	0.05	B	5
WBT	250	0.32	B	40	0.57	C	66
WBR	67	0.20	B	14	0.23	C	13
NBL	30	0.19	C	21	0.14	B	15
NBTR	300+	0.07	C	12	0.04	B	8
SBL	200+	0.56	C	54	0.81	C	98
SBTR	200+	0.10	C	14	0.17	B	16

Existing Conditions

Under existing conditions during both peak hours, all movements are operating with excess capacity and level of service B or better. All queues are within existing storage.

Future 2027 Conditions

Under background 2027 conditions during both peak hours, the intersection will operate with excess capacity with the exception of the southbound left turn movement during the PM peak hour. The southbound left turn is projected to approach capacity and will experience a delay resulting in level of service E. As this is a background concern, it is recommended that the City monitor this intersection for improvement. It appears that the existing PM signal timing plan can be optimized, while maintaining the existing cycle length to provide more capacity. The operation for this improvement is summarized in Table 7 and details can be found in Appendix K.

Under total 2027 conditions during both peak hours, all movements are projected to operate with excess capacity and a level of service C or better. The projected queues will be within existing storage.

Future 2032 Conditions

Under 2032 background and total conditions during both peak hours, all movements will operate with excess capacity and a level of service C or better. All queues and projected queues are and will be within existing storage.

6.3 Stanley Avenue / Marineland Parkway Intersection

Existing and future traffic operations are summarized in Table 8 for the Stanley Avenue / Marineland Parkway intersection.

Table 8: Stanley Avenue / Marineland Parkway Operations

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Existing Conditions							
Overall	-	0.20	B	-	0.26	B	-
EBT	250	0.19	B	20	0.30	B	29
EBR	200+	0.14	B	11	0.13	B	18
WBL	50	0.06	B	7	0.07	B	6
WBT	300+	0.26	B	28	0.32	B	30
NBL	100+	0.14	B	14	0.21	B	20
NBR	71	0.02	B	5	0.01	B	3

Table 8: Stanley Avenue / Marineland Parkway Operations continued

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Background 2027 Conditions							
Overall	-	0.26	B	-	0.36	B	-
EBT	250	0.21	B	21	0.32	B	31
EBR	200+	0.21	B	14	0.32	B	10
WBL	50	0.08	B	8	0.14	B	10
WBT	300+	0.28	B	30	0.34	B	33
NBL	100+	0.25	B	23	0.38	B	35
NBR	71	0.03	B	6	0.03	B	5
Background 2032 Conditions							
Overall	-	0.27	B	-	0.37	B	-
EBT	250	0.21	B	22	0.33	B	32
EBR	200+	0.22	B	14	0.32	B	10
WBL	50	0.09	B	9	0.14	B	10
WBT	300+	0.28	B	30	0.35	B	33
NBL	100+	0.25	B	24	0.39	B	36
NBR	71	0.03	B	6	0.03	B	4
Total 2027 Conditions							
Overall	-	0.27	B	-	0.39	B	-
EBT	250	0.25	B	27	0.35	B	34
EBR	200+	0.21	B	14	0.32	B	10
WBL	50	0.09	B	9	0.15	B	10
WBT	300+	0.29	B	31	0.39	B	38
NBL	100+	0.25	B	24	0.38	B	35
NBR	71	0.03	B	6	0.03	B	4
Total 2032 Conditions							
Overall	-	0.28	B	-	0.39	B	-
EBT	250	0.26	B	27	0.36	B	35
EBR	200+	0.22	B	14	0.32	B	10
WBL	50	0.09	B	9	0.15	B	10
WBT	300+	0.30	B	32	0.40	B	38
NBL	100+	0.25	B	24	0.39	B	36
NBR	71	0.03	B	6	0.03	B	4

Under existing, background and total conditions during both peak hours, all movements are and will operate with excess capacity and a level of service B. All queues and projected queues are and will be within existing storage.

6.4 Marineland Parkway / Portage Road Intersection

Existing and future traffic operations at the Marineland Parkway / Portage Road intersection are summarized in Table 9.

Table 9: Marineland Parkway / Portage Road Operations

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Existing Conditions							
EBLT	300+	0.02	A	1	0.02	A	1
SBL	66	0.03	B	1	0.32	C	10
SBR	200+	0.05	A	1	0.04	A	1
Background 2027 Conditions							
EBLT	300+	0.02	A	1	0.02	A	1
SBL	66	0.04	B	1	0.36	C	1
SBR	200+	0.06	A	1	0.05	B	1
Background 2032 Conditions							
EBL	300+	0.03	A	1	0.02	A	1
SBL	66	0.04	B	1	0.39	C	13
SBR	200+	0.06	A	1	0.05	B	1
Total 2027 Conditions							
EBLT	300+	0.04	A	1	0.04	A	1
SBL	66	0.04	C	1	0.40	D	14
SBR	200+	0.06	A	2	0.07	B	2
Total 2032 Conditions							
EBL	300+	0.04	A	1	0.03	A	1
SBL	66	0.04	C	1	0.43	D	16
SBR	200+	0.07	B	2	0.07	B	2

Under existing, background and total conditions during both peak hours, all critical movements are and will operate with excess capacity and a level of service D or better. All queues and projected queues are and will be within existing storage.

6.5 Stanley Road / Ramsey Road Intersection

Existing and future traffic operations are summarized in Table 10 for the Stanley Road / Ramsey Road intersection.

Table 10: Stanley Road / Ramsey Road Operations

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Existing Conditions							
EBLR	200+	0.04	B	1	0.05	B	1
NBLT	200+	0.00	A	0	0.00	A	1
Background 2027 Conditions							
EBLR	200+	0.07	C	2	0.12	C	3
NBLT	200+	0.00	A	0	0.00	A	1

Table 10: Stanley Road / Ramsey Road Operations (continued)

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Background 2032 Conditions							
EBLR	200+	0.08	C	2	0.13	C	3
NBLT	200+	0.00	A	1	0.00	A	1
Total 2027 Conditions							
EBLR	200+	0.21	B	6	0.26	C	8
NBLT	200+	0.03	A	1	0.09	A	2
Total 2032 Conditions							
EBLR	200+	0.22	B	6	0.28	C	9
NBLT	200+	0.03	A	1	0.09	A	3

Under existing, background and total conditions during both peak hours, all critical movements are and will operate with excess capacity and a level of service C or better. All queues and projected queues are and will be within existing storage.

The City and Stanley Avenue Industrial Park had expressed concern on residential traffic infiltrating the business community. Under total conditions, development traffic will contribute approximately 12% to the intersection. Ramsey Road provides the most direct way to access the development. Residential traffic is not anticipated to be utilizing other roadways in the Industrial Park given the road pattern to get to and from their homes unless the resident worked within the park itself. As a result, it is anticipated that there will be little to no infiltration of residential traffic in the business community.

6.6 Stanley Road / Progress Street Intersection

Existing and future traffic operations at the Stanley Road / Progress Street intersection are summarized in Table 11.

Table 11: Stanley Road / Progress Street Operations

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Existing Conditions							
EBLR	200+	0.10	B	3	0.20	B	6
NBLT	200+	0.03	A	1	0.00	A	1
Background 2027 Conditions							
EBLR	200+	0.16	C	4	0.44	C	16
NBLT	200+	0.04	A	1	0.01	A	1

Table 11: Stanley Road / Progress Street Operations (continued)

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Background 2032 Conditions							
EBLR	200+	0.18	C	5	0.47	D	18
NBLT	200+	0.04	A	1	0.01	A	1
Background 2032 Conditions (Recommended improvement: exclusive eastbound)							
EBL	30	0.14	C	4	0.35	D	12
EBR	200+	0.03	B	1	0.11	B	3
NBLT	200+	0.04	A	1	0.01	A	1
Total 2027 Conditions							
EBLR	200+	0.19	C	6	0.52	D	21
NBLT	200+	0.04	A	1	0.01	A	1
Total 2027 Conditions (Recommended improvement: exclusive eastbound)							
EBL	30	0.16	C	4	0.40	D	14
EBR	200+	0.04	B	1	0.11	B	3
NBLT	200+	0.04	A	1	0.01	A	1
Total 2032 Conditions							
EBL	30	0.17	C	5	0.43	E	15
EBR	200+	0.04	B	1	0.12	B	3
NBLT	200+	0.04	A	1	0.01	A	1

Under existing, background and total conditions during both peak hours, all critical movements are and will operate with excess capacity and a level of service C or better with the exception of the eastbound movement.

Under total 2027 and background 2032 conditions during the PM peak hour, the eastbound movement will experience a delay of 31 seconds and 26 seconds, respectively resulting in a level of service D. Under both conditions, site traffic will not contribute to the eastbound movements. Under total conditions, development traffic will contribute approximately 17% and 9% to the northbound and southbound through movements, respectively. There will be delays for vehicles to make a left or right out of Progress Street. It is recommended that an exclusive eastbound turn lane be added in either total 2027 conditions or background 2032 conditions. This will result in a significant improvement in the volume to capacity ratio, but delay will remain similar for left turns from the Progress Street. As there will be sufficient capacity, no further recommendation is made at this time.

All queues and projected queues are and will be within existing storage.

6.7 Stanley Road / Don Murie Street Intersection

Existing and future traffic operations are summarized in Table 12 for the Stanley Road / Don Murie Street intersection.

Table 12: Stanley Road / Don Murie Street Operations

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Existing Conditions							
EBLR	200+	0.08	B	2	0.28	B	9
NBLT	200+	0.07	A	2	0.04	A	1
Background 2027 Conditions							
EBLR	200+	0.12	B	3	0.56	D	25
NBLT	200+	0.08	A	2	0.06	A	1
Background 2032 Conditions							
EBLR	200+	0.13	B	3	0.62	D	30
NBLT	200+	0.09	A	2	0.06	A	2
Background 2032 Conditions (Recommended improvement: exclusive eastbound)							
EBL	30	0.07	C	2	0.31	D	9
EBR	200+	0.06	B	2	0.31	C	10
NBLT	200+	0.09	A	2	0.06	A	2
Total 2027 Conditions							
EBLR	200+	0.15	C	4	0.67	E	34
NBLT	200+	0.09	A	2	0.06	A	2
Total 2027 Conditions (Recommended improvement: exclusive eastbound)							
EBL	30	0.08	C	2	0.36	E	12
EBR	200+	0.07	B	2	0.31	C	10
NBLT	200+	0.09	A	2	0.06	A	2
Total 2032 Conditions							
EBL	30	0.08	C	2	0.39	E	13
EBR	200+	0.07	B	2	0.33	C	11
NBLT	200+	0.10	A	2	0.07	A	2

Under existing, background and total conditions during both peak hours, all critical movements are and will operate with excess capacity and a level of service C or better with the exception of the eastbound movement.

Under total 2027 and background 2032 conditions during the PM peak hour, the eastbound movement will experience a delay of 39 seconds and 31 seconds, respectively resulting in a level of service E and D respectfully. Under both conditions, site traffic will not contribute to the eastbound movements. Under total conditions, development traffic will contribute approximately 18% and 8% to the northbound and southbound through movements, respectively. There will be delays for vehicles to make a left or right out of Don Murie Street. It is recommended that an exclusive eastbound turn lane be added in either total 2026 conditions or background 2031 conditions. This

will result in a significant improvement in volume to capacity ratio, with delays remaining the same for left turn movements from Don Murie Street. As there will be sufficient capacity with the additional turn lanes, no further recommendation is made at this time.

All queues and projected queues are and will be within existing storage.

6.8 Stanley Road / Chippawa Parkway Intersection

Existing and future traffic operations at the Stanley Road / Chippawa Parkway intersection are summarized in Table 13.

Table 13: Stanley Road / Chippawa Parkway Operations

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Existing Conditions							
EBLTR	200+	0.03	B	1	0.10	B	3
WBLTR	200+	0.06	B	2	0.04	B	1
NBLTR	200+	0.01	A	1	0.02	A	1
SBLTR	200+	0.01	A	1	0.01	A	1
Background 2027 Conditions							
EBLTR	200+	1.03	F	99	NA[1]	F	NA[1]
WBLTR	200+	0.23	D	6	2.74	F	33
NBLTR	200+	0.14	A	4	0.49	B	21
SBLTR	200+	0.01	A	1	0.01	A	1
Background 2027 Conditions (Recommended Improvements: Signalized)							
Overall	-	0.34	B	-	0.70	C	-
EBL	60	0.69	D	42	0.70	D	54
EBTR	200+	0.23	D	16	0.32	C	13
WBL	30	0.14	C	8	0.12	D	6
WBTR	200+	0.05	C	8	0.18	D	8
NBL	60	0.25	A	6	0.65	B	49
NBTR	200+	0.24	A	9	0.16	A	21
SBL	30	0.01	A	2	0.04	B	8
SBT	200+	0.10	A	13	0.53	C	95
SBR	30	0.09	A	5	0.33	C	34
Background 2032 Conditions							
Overall	-	0.34	B	-	0.72	C	-
EBL	60	0.69	D	42	0.70	D	54
EBTR	200+	0.23	D	16	0.32	C	13
WBL	30	0.14	C	8	0.12	D	6
WBTR	200+	0.06	C	9	0.20	D	9
NBL	60	0.25	A	6	0.66	C	49
NBTR	200+	0.25	A	9	0.17	A	22
SBL	30	0.01	A	2	0.05	B	8
SBT	200+	0.10	A	14	0.57	C	104
SBR	30	0.09	A	5	0.35	C	37

Table 13: Stanley Road / Chippawa Parkway Operations (continued)

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Total 2027 Conditions							
Overall	-	0.35	B	-	0.73	C	-
EBL	60	0.69	D	42	0.70	D	54
EBTR	200+	0.23	D	16	0.32	C	13
WBL	30	0.14	C	8	0.12	D	6
WBTR	200+	0.05	C	8	0.18	D	8
NBL	60	0.27	A	6	0.69	B	49
NBTR	200+	0.26	A	10	0.25	A	31
SBL	30	0.01	A	2	0.05	B	8
SBT	200+	0.17	A	22	0.62	C	117
SBR	30	0.09	A	5	0.36	C	40
Total 2032 Conditions							
Overall	-	0.36	B	-	0.75	C	-
EBL	60	0.69	D	42	0.70	D	54
EBTR	200+	0.23	D	16	0.32	C	13
WBL	30	0.14	C	8	0.12	D	6
WBTR	200+	0.06	C	9	0.20	D	9
NBL	60	0.27	A	6	0.71	B	49
NBTR	200+	0.27	A	10	0.26	A	32
SBL	30	0.01	A	2	0.05	C	8
SBT	200+	0.17	A	23	0.64	C	125
SBR	30	0.09	A	5	0.37	C	41

Note: 1. Synchro reported an “Error” as queue length was too large.

Existing Conditions

Under existing conditions, all movements have excess capacity and a level of service B or better.

Future 2027 Conditions

Under background 2027 condition, the eastbound approach will exceed capacity and will experience a delay resulting in a level of service F during both peak hours. In addition, the westbound approach will exceed capacity during the PM peak hour and will have a delay resulting in a level of service D and F during the AM and PM peak hour, respectively. All other movements have excess capacity and level of service B or better.

This is primarily due to background developments and growth i.e. Riverfront Community Development. It is recommended that the City monitor this intersection for improvements. A traffic signal can improve the operations. As a result, a traffic signal warrant analysis for this intersection under background conditions was conducted based

on the methodology contained in the Ontario Traffic Manual Book 12 (OTM Book 12), published by Ministry of Transportation.

The results are summarized in Table 14. Detailed analyses are provided in Appendix M.

Table 14: Stanley / Chippawa Signal Warrant Analysis

Justification	Justification 1 Minimum Vehicular Volume[1]		Justification 2 Delay to Cross Traffic [1]		Justification 3 Combination [2]	
	1A	1B	2A	2B	3A	3B
Compliance	90%	140%	57%	133%	90%	57%
Justified	No		No		No	

Note: 1. 1A and 2A are total intersection volumes while 1B and 2B are crossing (of the main road) volumes.
2. 3A is Justification 1, while 3B is Justification 2.

For each justification, the lower percentage governs the warrant. A signal can be warranted by just one of the justifications, provided that it meets the threshold for both categories. The threshold required for each justification is 120% for projected volumes. Although this justification is met for the crossing road, it is not met for the major road. Therefore, a traffic signal is not warranted based upon the OTM. However, it is our opinion that a traffic signal is needed for operations and hence recommended, which is consistent with the Riverfront TIS. They also recommended the following additional improvements:

- Exclusive eastbound, westbound, northbound, southbound left turn lanes; and
- Exclusive southbound right turn lane.

As illustrated in Table 13 with signalization and recommended lane configuration, the intersection will have excess capacity. Detail synchro reports can be found in Appendix K. The intersection will continue to have excess capacity under total conditions as a signalized intersection.

In addition, it is recommended that eastbound and northbound left turn lanes have a storage of 60 m and the remaining exclusive turn lanes all have a storage of 30 m.

Future 2032 Conditions

Under 2032 conditions, all movements will have excess capacity and a level of service D or better.

6.9 Stanley Road / Lyons Creek Road Intersection

Existing and future traffic operations are summarized in Table 15 for the Stanley Road / Lyons Creek Road intersection.

Table 15: Stanley Road / Lyons Creek Road Operations

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Existing Conditions							
EBL	53	0.17	A	4	0.10	A	3
SBL	35	0.07	C	2	0.28	C	9
SBR	200+	0.12	B	3	0.36	B	13
Background 2027 Conditions							
EBL	53	0.29	A	9	0.42	B	16
SBL	35	0.25	E	7	1.78	F	79
SBR	200+	0.39	B	14	0.82	D	68
Background 2027 Conditions (Recommended Improvements: Signalized)							
Overall	-	0.48	B	-	0.65	C	-
EBL	53	0.60	B	68	0.73	B	88
EBT	200+	0.12	A	17	0.27	A	33
WBTR	200+	0.30	B	41	0.22	A	25
SBL	35	0.09	C	12	0.30	D	34
SBR	200+	0.20	D	13	0.40	D	18
Background 2032 Conditions							
Overall	-	0.49	B	-	0.68	C	-
EBL	53	0.63	B	73	0.76	B	94
EBT	200+	0.12	A	18	0.28	A	35
WBTR	200+	0.31	B	43	0.24	A	26
SBL	35	0.09	C	12	0.32	D	35
SBR	200+	0.21	C	14	0.41	D	18
Total 2027 Conditions							
Overall	-	0.51	C	-	0.73	C	-
EBL	53	0.63	B	75	0.80	B	105
EBT	200+	0.12	A	17	0.25	A	28
WBTR	200+	0.30	B	41	0.23	A	21
SBL	35	0.13	C	16	0.40	D	38
SBR	200+	0.25	D	18	0.43	D	19
Total 2032 Conditions							
Overall	-	0.54	C	-	0.75	C	-
EBL	53	0.67	B	82	0.82	C	113
EBT	200+	0.13	A	18	0.27	A	30
WBTR	200+	0.32	B	44	0.24	A	23
SBL	35	0.14	C	16	0.41	D	39
SBR	200+	0.25	D	19	0.44	D	18

Existing Conditions

Under existing conditions, all movements have excess capacity and a level of service C or better.

Future 2027 Conditions

Under background 2027 condition, the southbound left will exceed capacity and will experience a delay resulting in a level of service F during the PM peak hour. All other movements will have excess capacity and level of service E or better. This is primarily due to background development i.e. Riverfront Community Development. It is recommended that the City monitor this intersection for improvements. A traffic signal can improve the operations. As a result, a traffic signal warrant analysis for this intersection under background conditions was conducted based on OTM Book 12. The results are summarized in Table 16. Detailed analyses are provided in Appendix M.

Table 16: Stanley Road / Lyons Creek Road Signal Warrant Analysis

Justification	Justification 1 Minimum Vehicular Volume[1]		Justification 2 Delay to Cross Traffic [1]		Justification 3 Combination [2]	
	1A	1B	2A	2B	3A	3B
Compliance	92%	135%	60%	44%	92%	44%
Justified	No		No		No	

Note: 1. 1A and 2A are total intersection volumes while 1B and 2B are crossing (of the main road) volumes.
2. 3A is Justification 1, while 3B is Justification 2.

For each justification, the lower percentage governs the warrant. A signal can be warranted by just one of the justifications, provided that it meets the threshold for both categories. The threshold required for each justification is 120% for projected volumes. Justifications are not met; therefore, a traffic signal is not warranted based upon the OTM. However, it is our opinion that a traffic signal is needed for operations and hence recommended. This coincides with the Riverfront TIS recommendations.

As illustrated in Table 15 with signalization, the intersection will have excess capacity. Detail Synchro reports can be found in Appendix K. The intersection will continue to have excess capacity under total conditions as a signalized intersection.

In addition, under 2027 conditions, the eastbound left turn queue will exceed storage by 52 m during the PM peak hour. The development will only contribute approximately 12% to this movement. The majority of the storage is being utilized by the background traffic and it is recommended that the Region considers this improvement. It appears that there is sufficient space to widen to accommodate for the projected queue length.

Future 2032 Conditions

Under 2032 conditions, all movements will have excess capacity and a level of service D or better. The eastbound left turn queue will continue to exceed storage by 60 m during the PM peak hour. As recommended above, there is sufficient space that the Region can consider improvements.

6.10 Oldfield Road / Eaglewood Drive / Drummond Road Intersection

Existing and future traffic operations at the Oldfield Road / Eaglewood Drive / Drummond Road intersection are summarized in Table 17.

Table 17: Oldfield Road / Eaglewood Drive / Drummond Road Operations

Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Existing Conditions (Two-way Stop)							
EBLT	200+	0.05	A	1	0.05	A	1
WBTR	200+	0.01	A	1	0.01	A	1
Background 2027 Conditions (Two-way Stop)							
EBLT	200+	0.15	A	4	0.23	B	7
WBTR	200+	0.04	A	1	0.01	A	1
Background 2032 Conditions (Two-way Stop)							
EBLT	200+	0.15	A	4	0.23	B	7
WBTR	200+	0.01	A	1	0.01	A	1
Total 2027 Conditions (Two-way Stop)							
EBLTR	200+	0.35	C	12	0.66	E	32
WBLTR	200+	0.03	B	1	0.01	A	1
SBLTR	200+	0.01	A	1	0.01	A	1
Total 2032 Conditions (Two-way Stop)							
EBLTR	200+	0.35	C	12	0.66	E	32
WBLTR	200+	0.03	B	1	0.01	A	1
SBLTR	200+	0.01	A	1	0.01	A	1

Under existing, background and total conditions during both peak hours, all critical movements are and will operate with excess capacity and a level of service E or better.

6.11 Development Access Intersections

The development access intersections include the following:

- Drummond Extension / Street K intersection
- Drummond Extension / Ramsey Extension / Street F / Street C intersection
- Ramsey Road / Street K intersection

The internal traffic volumes do not differ between total 2027 and 2032; as a result, total 2032 operations are summarized in Table 18 below. All development access intersections will be two-way stop controlled.

All intersections will have excess capacity and a level of service B or better for critical movements. All projected queues will be within storage length.

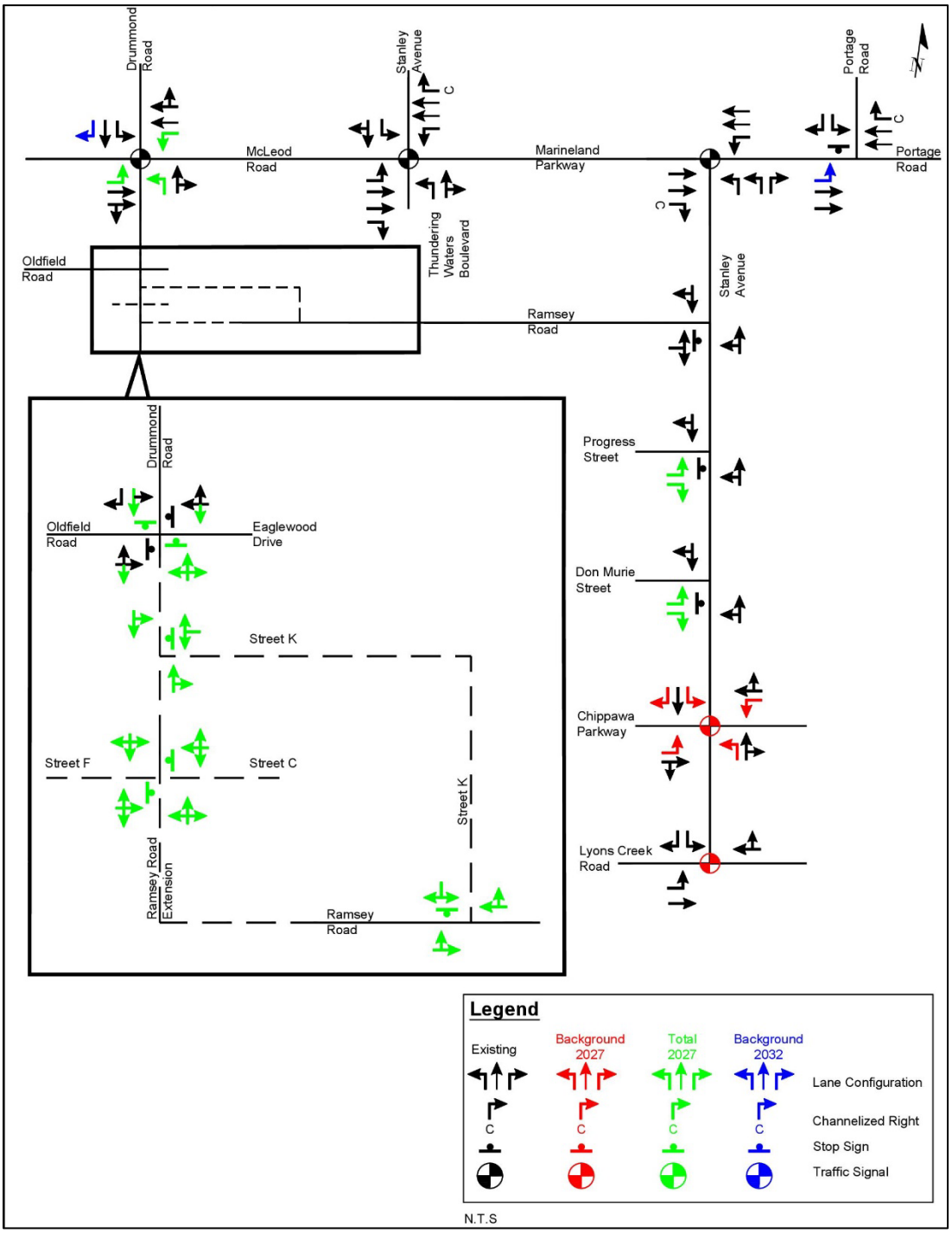
Table 18: Site Access Intersection Operations

Intersection & Movement	Existing Storage / Link Distance (m)	Weekday AM Peak Hour			Weekday PM Peak Hour		
		v/c	LOS	95th Queue (m)	v/c	LOS	95th Queue (m)
Drummond Extension / Street K							
WBLR	200+	0.24	A	7	0.08	A	2
Drummond Extension / Ramsey Extension / Street F / Street C							
EBLTR	200+	0.16	B	5	0.13	B	3
WBLTR	200+	0.07	A	2	0.05	A	2
Ramsey Road / Street K							
SBLR	200+	0.03	A	1	0.02	A	1

Note: 1. Length to CP Rail

The proposed and recommended future road network is illustrated in Figure 13.

Figure 13: Proposed and Recommended Road Network



7.0 Concept Plan Review

7.1 Waste Collection Access Review

All the streets within the development are designed based on City's standards, which would have taken the refuse collection truck into consideration. But, as per the City's comment, an analysis of access and circulation was conducted for a Region refuse truck. Details analyses for the Block Low and Medium density homes are subjected to further review during the site plan application stage. The vehicle movement analysis analyses using AutoTURN are provided in Appendix N.

7.2 Road Classification

All roads within the development are recommended to be designated as local roads based on function and the required traffic capacity with the exception of the continuation of Drummond Road to Ramsey Road and Street K. The Official Plan identifies Drummond Road as a local road south of McLeod Road, where to the north of McLeod Road it is an arterial Road. It is noted that at its terminus to the south, that Oldfield Road is designated as an arterial Road. Therefore, the City should consider upgrading Drummond Road to a major collector road or an arterial road. The City had agreed with this recommendation of upgrading Drummond Road to a major collector road classification based upon their comment the 2020 TIS. Street K should be a collector road.

7.3 Traffic Control

All roads within the development are recommended to have two-way stop control. It is also recommended that the intersection of Drummond Road extension and Oldfield Road / Eaglewood Drive be under all-way stop control.

7.4 Proposed Railway Crossing

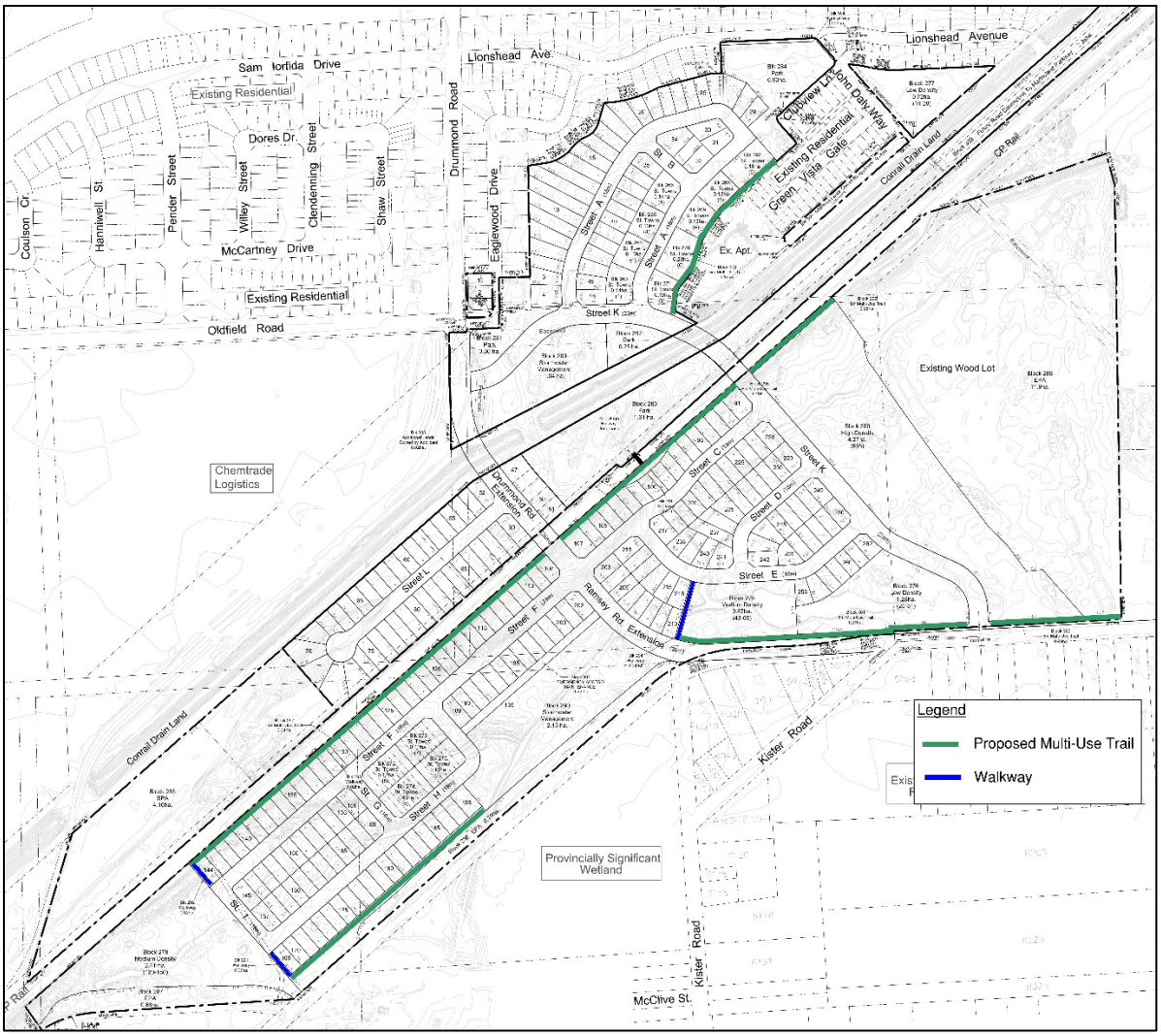
As mentioned, there will be two at-grade crossings within the development occurring north of Drummond Extension / Street F / Street C and Street K / Street C intersections. As mentioned in Section 2.3, the rail line is primarily servicing the industrial area. The service occurs outside the morning and afternoon peak and provides infrequent services (two trains per day between the hours of 11:00 PM and 7:00 AM). There will be minimal vehicular impact and operation concerns at the crossing. It is recommended that the railway crossing warning system be located at both intersections, approximately 15 metres from the centre of the intersection. Traffic, both vehicular and pedestrian entering the intersections will be governed by the crossing's warning system in an appropriate design for ultimate safety considerations. Details will be subjected to rail authority approval and also determined through the detailed design of the roads.

7.5 Proposed Pedestrian and Cyclist Accommodation

Pedestrian accommodation will be provided by sidewalks on one side of all local streets and both sides of the collector street. Currently, there are on-street bike lanes on Stanley Avenue and Drummond Street, north of McLeod. It is recommended that signed bike routes be extended into the development from the two roadways and where appropriate to connect with existing and future active transportation pathways and facilities.

In addition, multi-use trails are proposed within the development and shown in Figure 14.

Figure 14: Proposed Multi-Use Trails and Walkways



8.0 Conclusion

8.1 Existing Conditions

Under existing conditions, all study intersections are operating with excess capacity during both peak hours. The McLeod Road / Drummond Road intersection southbound left turn queue is extending beyond the existing storage during the weekday AM and PM peak hours by one to two vehicles. The City may want to consider lengthening of this lane.

8.2 Background Conditions

Background 2027 Conditions

Under 2027 background conditions, all study intersections will operate with excess capacity and will experience a level of service C or better except for:

- Drummond Road / McLeod Road;
- Stanley Avenue / Marineland Parkway / Thundering Waters Boulevard;
- Stanley Avenue / Chippawa Parkway; and
- Stanley Avenue / Lyons Creek Road.

At the Drummond Road / McLeod Road intersection, the northbound left-through-right movement and the overall intersection is projected to exceed capacity and will experience a delay resulting in level of service F during the PM peak hour. It is recommended that the existing PM peak hour signal timing plan be optimized, while maintaining the existing cycle length. With the signal timing adjustments, all movements will have excess capacity.

At the Stanley Avenue / Marineland Parkway / Thundering Waters intersection, the southbound left movement will approach capacity and will experience a delay resulting in level of service F during the PM peak hour. It is recommended that the existing PM peak hour signal timing plan be optimized, while maintaining the existing cycle length. With the signal timing adjustments, all movements will have excess capacity.

At the Stanley Avenue / Chippawa Parkway intersection, the eastbound movement is projected to exceed capacity during both the AM and PM peak hours and the westbound movement will exceed capacity during the PM peak hour. This is primarily due to background development i.e., Riverfront Community Development. The following is recommended and is consistent with the Riverfront TIS:

- Signalization
  - Although it does not warrant a signal based on OTM Book 12, a signal is recommended for operations.
- Exclusive eastbound, westbound, northbound, southbound left turn lanes.

- Exclusive southbound right turn lane.

With the recommended improvements, all movements will have excess capacity.

At the Stanley Avenue / Lyons Creek Road intersection during the PM peak hour, the southbound left turn movement will exceed capacity. This is primarily due to background development i.e., Riverfront Community Development. The intersection does not warrant a signal under OTM Book 12; however, it is recommended for operations. With signalization, all movements will have excess capacity.

Background 2032 Conditions

Under background 2032 conditions with the planned improvements by the Region, all study intersections will operate with excess capacity with the exception of Stanley Road intersections with Progress Street and Don Murie Street. The eastbound movements at both intersections will experience a delay resulting in a level of service D. It is recommended that exclusive turn lanes be added at both the intersections, this will significantly improve the volume to capacity ratio, while the delay for left turns from the minor street will remain similar. As there will be sufficient capacity, no additional recommendations are made at this time. The City should monitor both these intersections for additional improvements.

8.3 Total Conditions

Under total 2027 conditions, all study intersections are projected to operate with excess capacity during both peak hours with the exception of the Drummond Road / McLeod Road intersection. There are several movements that will exceed capacity during both peak hours. This intersection is part of the Region's planned improvements to McLeod Road that are expected to occur in 2031. The Riverfront TIS recommended that all of the planned improvements in the EA be implemented in 2026. It is recommended that the following improvements be implemented at the Drummond Road / McLeod Road intersection under total 2027 conditions:

- Exclusive northbound left turn lane;
- Exclusive westbound left turn lane; and
- Exclusive eastbound left turn lane.

With the recommended improvements, all movements will have excess capacity.

With the recommended and planned improvements, under total 2032 conditions, all study intersections are projected to operate with excess capacity during both peak hours.

8.4 Queue Review

Synchro's 95th percentile queues were reviewed for all movements. Critical movements with projected queues that will extend pass existing storage or link distances are summarized below for each condition.

Existing Conditions

Under existing conditions, the southbound left turn queue at Drummond Road / McLeod Road intersection exceeds storage by 6 m and 13 m during AM and PM peak hour, respectively. This is equivalent to one to two vehicles. The City should consider lengthening the left turn lane.

Horizon Year 2027 and 2032 Conditions

The queue results for both respective horizon years are very similar. Table 19 summarizes the critical movements (queues projected to exceed existing or proposed storage) of each intersection and provides the recommended improvements and timing of those improvements.

Table 19: Summary of Queue Review

Intersections	Movements	Implementation Year	Recommended Improvements
Drummond / McLeod	WBL	Total 2027	The queues will spill onto the through lane during the PM peak hour. The storage length in the planned EA is not sufficient to accommodate for the projected queue and widening will be needed to further lengthen the planned storage length. It is recommended that the City monitor this movement for mitigations. As the projected queue can utilized the through movement as additional storage, no further recommendations are made at this time.
	NBL	Total 2027	The storage length in the planned EA is not sufficient to accommodate for the projected queue. It should be lengthened to 60 m to accommodate for projected queue. This can be timed with widening of McLeod Road.
Stanley / Chippawa	EBL and NBL	Background 2027	Recommended storage of 60 m.
	WBL, SBL and SBR		Recommended storage of 40 m.
Stanley / Lyons Creek	EBL	Background 2027	Recommended storage of 120 m.

8.5 Concept Plan Review

Road Classification

All roads within the development will be designated and classified as local roads with the exception of the continuation of Drummond Road and Street K. It is recommended that these two to be classified as collector roads. The City may even want to consider classification of Drummond Road between Oldfield Road and McLeod Road as an arterial road, which would provide the arterial connectivity between Oldfield Road and McLeod Road.

Traffic Control

All roads within the development are recommended to have two-way stop control and the Drummond Road Extension / Oldfield Road / Eaglewood Drive intersection is recommended to be under all-way stop control.

Proposed Railway Crossing

There will be two at-grade crossing within the development occurring north of Drummond Extension /Street F / Street C and Street K / Street C intersections. It is recommended that the railway crossing warning system be located at both intersections, approximately 15 metres from the centre of the intersection. Rail traffic is expected to be minimal and therefore will have limited impacts on any vehicular crossings. Details for rail crossing and intersection layouts can be confirmed through design process.

Proposed Pedestrian and Cyclist Accommodation

The site is well designed to accommodate access by all modes of travel.

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Appendix A

Region and City Comments

From: John Grubich <jgrubich@niagarafalls.ca>
Sent: Wednesday, April 22, 2020 10:03 AM
To: Andrew Bryce
Cc: Mathew Bilodeau; Nick Golia
Subject: AM-2020-005 - Niagara Village

Andrew;

The following are high level transportation comments on the proposed Niagara Village draft plan:

The applicant should be getting a guarantee from CP on the proposed road/rail crossings. Riverfront was not granted a crossing. Secondly, as we had commented on the Riverfront application, Transportation Staff would only support one at-grade rail crossing.

The lots are separated from the rail right-of-way by a 6 metre wide green space / multi-use trail. Typically rail spur lines require a 15 metres setback measured from the mutual property line to the building face for new residential development. The applicant should also be getting direction from CP on appropriate setbacks/buffers from their rail line.

Any new at grade rail crossing will need to be designed to meet all federal regulations, which includes providing minimum sight lines and providing safety warning systems. Having roads curve on approach to the rail crossing may with abutting residential dwellings may obstruct the required sight lines of the warning system.

Converting Thundering Waters Boulevard into a public road provides an additional connection to a major arterial road, especially since most of the development traffic is destined to the north or west. Thundering Waters Boulevard should connect with the Oldfield Road extension to provide connectivity to the subdivision. There is a note for a future roundabout where these two roads meet; however we have concerns with two major roads intersecting so close to a rail line. A minimum 30 metre distance between the railway right-of-way and any vehicular ingress/egress is required. One reason for realigning the drainage channel may be to provide additional setback of Thundering Waters Boulevard to the rail line as it connects with Oldfield Road.

The proposal abuts the Stanley Avenue Industrial Park and Ramsey Road is used as a secondary means in and out of the subdivision. Ramsey Road consists of a mix of small industrial uses and residential. Heavy industrial are located south. We had a traffic count done on Kister Road south of Ramsey Road last year. Although the road only carried about 300 cars a day, 13% of the traffic was a vehicle with or without a trailer that has a total length above 10 metres, even though trucks are prohibited from using Ramsey Road. GR Can has initially proposed to use the former Ramsey Road allowance as an additional outlet at the onset but concerns were raised by the Stanley Avenue Industrial Park on residential traffic infiltrating the business community.

The part of the subdivision accessed through Street F has one outlet only for 108 single family dwellings and up to 231 medium density units. A secondary means of egress is strongly recommended, especially since the only means of access is within 50 metres of the rail line. I assume Fire will provide similar comments on the one access.

The traffic report estimated that 85% of the development traffic would use Drummond Road, and the remaining 15% on Ramsey Road. The Official Plan classifies Drummond Road as a local road south of McLeod Road. Drummond Road should be upgraded to a major collector road classification. New left turn lanes will be required for north, east and westbound traffic at Drummond Road & McLeod Road and it is our understanding that these improvements are scheduled in a future phase by the Region. The traffic report strictly was an analysis of how this subdivision would impact the surrounding road network and it did not address any of the above comments.

Let me know when you require final comments and if the applicant proposes changes to the plan.

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

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Appendix B

Technical Memos to Region and City

R.J. Burnside & Associates Limited 1465 Pickering Parkway Suite 200 Pickering ON L1V 7G7 CANADA
telephone (905) 420-5777 **fax** (905) 420-5247 **web** www.rjburnside.com

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Technical Memorandum

Proposed Connection Review Update

Date: November 13, 2018 **Project No.:** 300041230.0000

Project Name: Niagara Village - Thundering Waters Village

Client Name: Niagara Village Land Owners Group

Submitted To: Robert Alguire (Niagara Region) and John Grubich (City of Niagara Falls)

Submitted By: Cindy Chung, EIT, Transportation Planner

Reviewed By: Brad Hale, Senior Transportation Specialist

Niagara Village Land Owners Group (Client) is planning for the redevelopment of the existing Thundering Waters Golf Club located in the City of Niagara Falls. Official Plan Amendment, Zoning By-law Amendment and Draft Plan applications will be required. R.J. Burnside & Associates Limited (Burnside) was retained to undertake a Transportation Study, which will form parts of those applications. As per the pre-consultation meeting on August 2, 2018 and an email dated September 28, 2018, the Niagara Region (Region) had requested for the following memos to be provided prior to the submission of the Transportation Study:

- Trip Generation and Attraction Analysis
- Proposed Connection Review
- Trip Distribution Analysis

All three memos were submitted to the Region and City on Wednesday, October 17, 2018. The Region had provided feedback on Monday, November 5, 2018. All feedback and comments are incorporated into this updated memo. The focus of this memo is with respect to the second noted study above. The other two studies are the subjects of separate memos. As discussed with the Region, the following were reviewed for this memo:

- Planned Road Network Improvements;
- Planned Transit and Active Transportation Improvements;
- Proposed Development Road Network Connections;
- Proposed Transit Accommodation; and
- Proposed Pedestrian and Cyclist Accommodation.

Details are discussed in the following sections of this memo.

1.0 Planned Road Network Improvements

The Region completed an Environmental Assessment (EA) along McLeod Road / Marineland Parkway in 2010. The following improvements are planned in the EA:

- At Drummond Road / McLeod Road intersection:
  - Additional eastbound, westbound and northbound left-turn lanes
  - Additional southbound right-turn lane
- At Marineland Parkway / Portage Road intersection:
  - Additional eastbound left-turn lane

For the above improvements, the Region's Capital Plan indicates that design and construction will be undertaken in the 2026 – 2031 planning horizon. Therefore, the improvements are considered in the 2031 background conditions.

2.0 Planned Transit and Active Transportation Improvements

There is no planned transit, pedestrian facility and cyclist facility improvements within the study horizon year.

Currently, Niagara Transit (City) provides several bus routes north of the site 7 days per week. Transit stops are located at the following intersections:

- McLeod Road / Drummond Road
- Marineland Parkway / East Stanley Road

The transit stops are approximately a 10 to 12 minute walk from the proposed development. Table 1 summarizes the route frequency during the adjacent street peak period.

Table 1: Transit Service

Route Number	Direction	Via	Frequency
103	Between Niagara Square Shopping Centre and To Main & Ferry	McLeod Road and Drummond Road	60 minutes
203 (Evenings and Sundays)			30 minutes
106	Between Main & Ferry and Chippawa Area	Stanley Avenue and Marineland Parkway	60 minutes
206 (Evenings and Sundays)			30 minutes
112	Between Niagara Square Shopping Centre and Chippawa Area	Marineland Parkway and McLeod Road	60 minutes

South of the proposed development is served by Niagara TransCab, which provides services for areas of the City not served by regular Niagara transit. The TransCab operate Monday to Saturday 6:00 AM to 6:00 PM. The cab will pick up the user at a booked time and connect them to a regular Niagara Transit bus route.

As per the Region's comment, Niagara Regional Transit would also be considered in our analysis and approach for the overall review of the need for the development. Currently, Niagara Regional Transit Route 22 and Route 60/65 provide services along Montrose Road. There are no stops within the vicinity of the proposed development

Pedestrian infrastructure consists of sidewalks and cycling infrastructures consist of on-street bicycle lanes and paved shoulders.

Attachment 1 illustrates the existing transit services, pedestrian facilities and cyclist facilities.

3.0 Proposed Development

3.1 Proposed Connection

As the proposed development site plan is currently being refined, the intention is to have access to the proposed development be provided via the following connections:

- Thundering Waters Boulevard
- John Daly Way
- Drummond Road
- Oldfield Road
- Ramsey Road

Attachment 2 illustrates the proposed connections. Analysis will be undertaken at the above connections as site traffic will be assigned to these intersections. If deficiencies are noted, further analysis will be performed to determine necessary improvements to operate under capacity and at adequate levels of service.

All roads within the development will be classified as local roads based on function and the required traffic capacity with the exception of the continuation of Drummond Road (Street B) and Thundering Waters Boulevard. Due to the connectivity of the two roadways, they are recommended to be classified as collector roads.

3.2 Proposed Railway Crossing

An existing tertiary branch rail line owned by Canadian Pacific (CP) runs through the proposed development. The rail line is identified to be CP Montrose Subdivision and services the industrial facilities within the adjacent area. Within the proposed development, there will be two

at-grade crossings. The Transportation Study will analyze and taken into consideration the following:

- Traffic operations at the crossing
- Potential queueing across the railway crossing

As requested by the Region, we acknowledged that there can be potential for the crossing to be not approved by authorities. However, we are still proposing the two crossing and approval from authorities will be pursued and dealt with during the process. When that time comes, an alternative plan for the development will be discuss. But currently, we will be moving forward with the two crossings.

3.3 Proposed Transit Services

An analysis will be conducted of possible transit routing through the development to provide access to transit by the majority of future residents. It will be based on access to transit within a 5-10 minute walk or a 400 m radius was used from the route to determine accessibility.

3.4 Proposed Pedestrian and Cyclist Accommodation

Pedestrian accommodation will be provided by sidewalks on one side of all local streets and both sides of the collector street. Currently, there are on-street bike lanes on Stanley Avenue and Drummond Street, north of McLeod. As the proposed development site plan is still conceptual, it is recommended that signed bike routes be extended into the development from the two roadways.

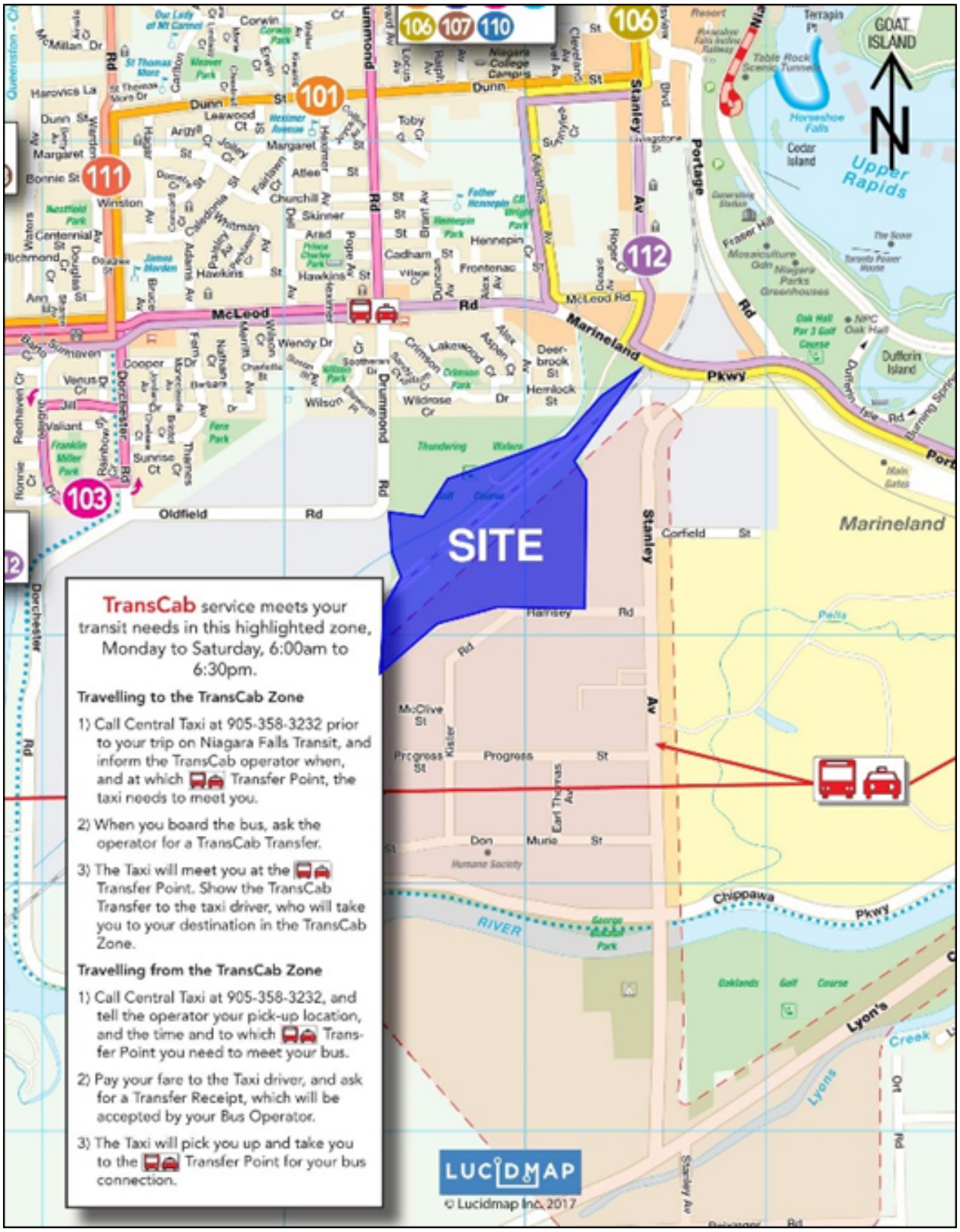
Should you have any questions or concerns, please contact our office.

R.J. Burnside & Associates Limited

CC:cv

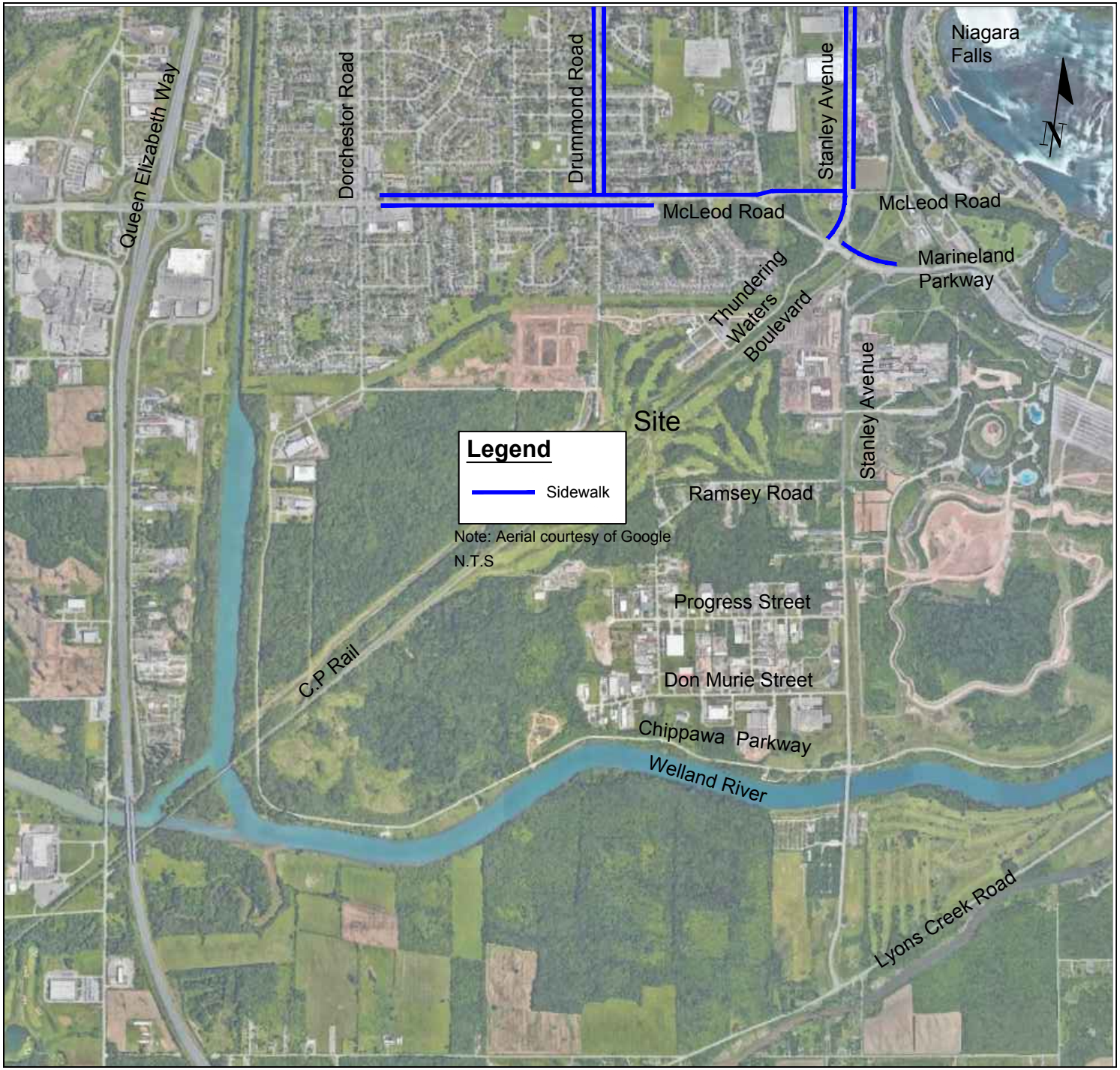
Enclosure(s) Attachment 1: Existing Transit Services, Pedestrian and Cyclist Facilities
Attachment 2: Proposed Connections

Existing Transit Services

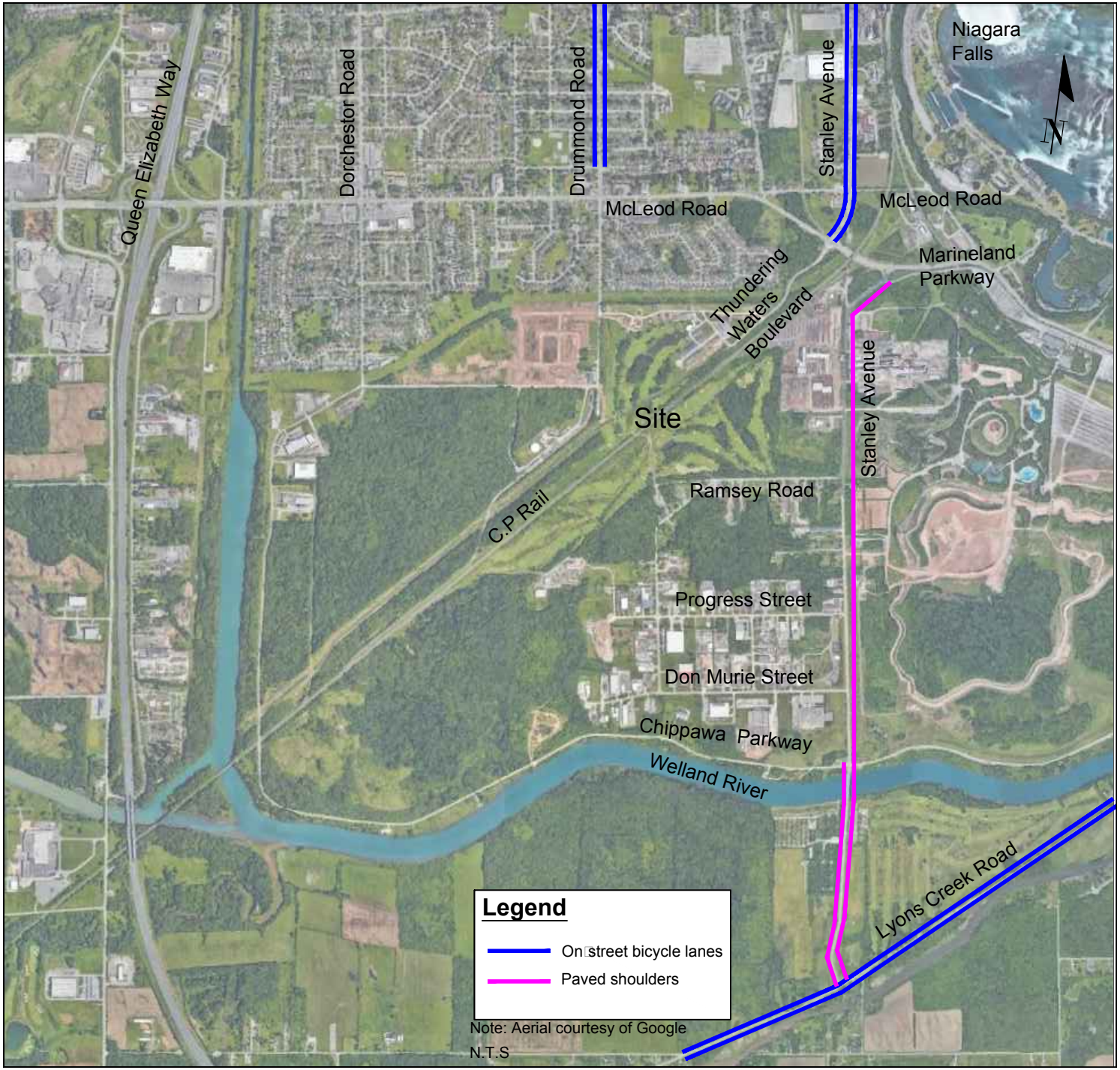


Reference: Niagara Transit

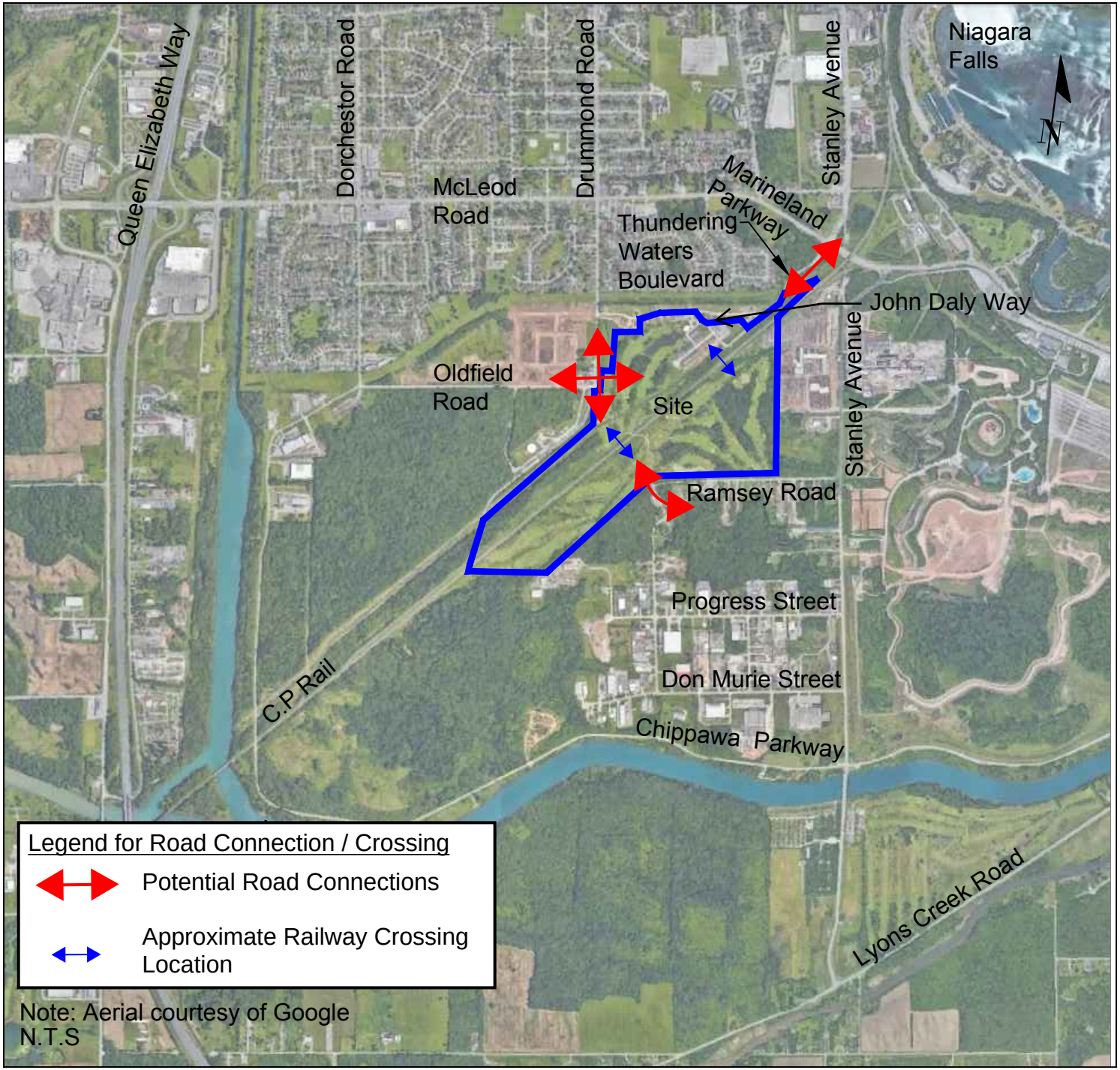
Existing Pedestrian Facilities



Existing Cycling Facilities



Attachment 2



R.J. Burnside & Associates Limited 1465 Pickering Parkway Suite 200 Pickering ON L1V 7G7 CANADA
telephone (905) 420-5777 **fax** (905) 420-5247 **web** www.rjburnside.com

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Technical Memorandum

Trip Generation and Attraction Analysis Update

Date: November 13, 2018 **Project No.:** 300041230.0000

Project Name: Niagara Village - Thundering Waters Village

Client Name: Niagara Village Land Owners Group

Submitted To: Robert Alguire (Niagara Region) and John Grubich (City of Niagara Falls)

Submitted By: Cindy Chung, EIT, Transportation Planner

Reviewed By: Brad Hale, Senior Transportation Specialist

Niagara Village Land Owners Group (Client) is planning for the redevelopment of the existing Thundering Waters Golf Club located in the City of Niagara Falls. Official Plan Amendment, Zoning By-law Amendment and Draft Plan applications will be required. R.J. Burnside & Associates Limited (Burnside) was retained to undertake a Transportation Study, which will form parts of those applications. As per the pre-consultation meeting on August 2, 2018 and an email dated September 28, 2018, the Niagara Region (Region) had requested for the following memos to be provided prior to the submission of the Transportation Study:

- Trip Generation and Attraction Analysis
- Proposed Connection Review
- Trip Distribution Analysis

All three memos were submitted to the Region and City on Wednesday, October 17, 2018. The Region had provided feedback on Monday, November 5, 2018. All feedback and comments are incorporated into this updated memo. The focus of this memo is with respect to the first noted study above. The other two studies are the subjects of separate memos. As discussed with the Region, the following were reviewed for this memo:

- Classification of Land Use Codes (LUC) from *Trip Generation Manual, 10th Edition* published by the Institute of Transportation Engineers (ITE) with the proposed land uses,
- Trips generated based on full build-out of the development, and
- Development of a phasing strategy.

Details are discussed in the following sections of this memo.

1.0 Proposed Development

The proposed development is intended to consist the following:

- 362 villa homes (see land use classification in the section below)
- 345 townhomes
- 60 residential apartment units
- 242 mixed use residential units
- 111 retirement homes
- 6,605 m^2 (71,096 ft^2) commercial space

In total, the propose development will have 1,120 units of residential development with 6,605 m^2 (71,096 ft^2) of commercial space. At this stage, the proposed development is being refined and there may be minor adjustments to the accounts above.

2.0 Trip Generation and Attraction

Trip generation for the proposed development was based upon the information contained in the publication *Trip Generation Manual, 10th Edition* published by the Institute of Transportation Engineers (ITE). The following land use codes (LUC) were used in the generation of trips:

- Villa homes: Single-Family Detached Housing (LUC 210)
- Townhomes: Multifamily Housing – Mid-Rise (LUC 221)
- Residential apartments and mixed-use residential units: Multifamily Housing – High-Rise (LUC 222)
- Retirement homes: Senior Adult Housing – Detached (LUC 251)
- Commercial: Shopping Centre (LUC 820)

The City and Region have a collective transportation vision to achieve a greater sustainable transportation system by promoting and encouraging alternative modes of travel, including walking, cycling and transit. A review was conducted of the following:

- *Niagara Region Transportation Master Plan – Context, Vision and Directions Report,* prepared by IBI Group, dated April 2016 (Region TMP)
- *Niagara Falls Sustainable Transportation Master Plan,* prepared by AECOM, dated October 2011 (City TMP)
- Data from 2016 Transportation Tomorrow Survey (TTS)
- *Riverfront Community Transportation Assessment*, prepared by Paradigm Transportation Solutions Limited, dated April 2018 (Riverfront TIS)

Existing and projected travel mode percentages with the associated sources are summarized in Table 1.

Table 1: Travel Mode Comparisons

Source	Non-Auto Travel Mode (transit, walking, cycling and other non-auto based modes)
Region TMP: Existing	10%
City TMP: Existing	8%
City TMP: Targeted 2031	18%
2016 TTS: Planning District 57[1]	18%[2]
Riverfront TIS	10%

Notes: 1. Planning District 57 is City of Niagara Falls.
2. Includes school bus, which accounts for 8%.

As a result, a non-modal split of 10% was assumed for all land uses and for both peak periods. This is consistent with the existing modal split, Riverfront TIS and at the same time recognizes the City's projected target of achieving a greater non-auto travel mode.

For residential component, all generated trips will be assumed to be new trips. The new trips will account for all home based work and vice versa trips. For the commercial or retail part of the development, there are three types of trips: new trips, internal capture and pass-by. As well, due to the location of the development, diverted link trips are also considered.

New trips are additional traffic added to the road network. The primary purpose of the trip is to visit the development. For example, the customer would leave their home, travel to the development and return home. Therefore, the primary trip purpose was to visit the development.

Interaction trips are trips that make stops at multiple adjacent facilities. There can be two types: external and internal interaction (internal capture). External interaction would occur for trips travelling between other adjacent developments. The external interaction will be accounted for in the new trips, no addition reduction will need to be applied. Internal interaction trips are trips that make stops at multiple adjacent facilities within the site. In this case, internal trips would be from the onsite residents. The proposed retail component is predominantly meant to serve local residents within the development. A conservative internal capture of 30% was assumed for both peak hours. This is based on our experience with similar size and use of development.

Pass-by trips are trips that are already using the road network and passing by the site. For example, a person leaves work and happens to see the development on their way home or plans on visiting the development on their way home along their typical route. They continue on their way home after shopping. They do not add any additional trips to the road network but result in adjustments to traffic volumes at the site driveways only. Pass-by rates for this site were derived based upon experience and information published in the Trip Generation

Manual, 9th Edition and 10th Edition. A pass-by rate of 10% were assumed for the AM and PM peak hour.

Diverted link trips attract traffic on roadways within the vicinity of the development. For example, a person leaves work to head home, but diverts from their usual route to visit the site/development. Diverted trips may add traffic to streets adjacent to a site and could remove trips on streets from which it was diverted from. In this case, it is expected that the proposed commercial may attract some residential neighborhood east and west of Drummond Road and south of McLeod Road. We assumed a diverted link rate for the PM peak hour and was derived based upon experience and knowledge of travel patterns within the study area. A diverted link rate of 20% was assumed.

The resulting trip generation is summarized in Table 2.

Table 2: Site Trip Generation Summary

Land Use (Size)		Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Residential	**Single-Family Detached Housing (LUC 210) - 362 units**						
	Total Trips	67	201	268	226	132	358
	Non-Modal Split (10%)	-7	-20	-27	-23	-13	-36
	New Trips	60	181	241	203	119	322
	Multifamily Housing - Mid-Rise (LUC 221) - 345 units						
	Total Trips	32	92	124	93	59	152
	Non-Modal Split (10%)	-3	-9	-12	-9	-6	-15
	New Trips	29	83	112	84	53	137
	Multifamily Housing - High-Rise (LUC 222) - 302 units						
	Total Trips	23	74	97	68	43	111
	Non-Modal Split (10%)	-2	-8	-10	-7	-4	-11
	New Trips	21	66	87	61	39	100
	Senior Adult Housing - Detached (LUC 251) - 111 units						
	Total Trips	15	29	44	32	20	52
	Non-Modal Split (10%)	-1	-3	-4	-3	-2	-5
	New Trips	14	26	40	29	18	47
	Total Residential – 1,120 units						
	Total Trips	137	396	533	419	254	673
	Non-Modal Split Total	-13	-40	-53	-42	-25	-67
	New Trips	124	356	480	377	229	606

Table 2: Site Trip Generation Summary continued

Land Use (Size)		Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Commercial	**Shopping Centre (LUC 820) - 71,096 ft²**						
	Total Trips	116	71	187	203	219	422
	Non-Modal Split (10%)	-12	-7	-19	-20	-22	-42
	Interaction (AM/PM: 30%)	-31	-19	-50	-55	-59	-114
	Pass-by (AM/PM: 10%)	-9	-9	-18	-19	-19	-38
	Diverted Link (PM: 20%)	-	-	-	-38	-38	-76
	New Trips	64	36	100	71	81	152
Total	**Site Total**						
	Total Trips	253	467	720	622	473	1,095
	Non-Modal Split	-25	-47	-72	-62	-47	-109
	Interaction	-31	-19	-50	-55	-59	-114
	Pass-by	-9	-9	-18	-19	-19	-38
	Diverted Link	-	-	-	-38	-38	-76
	New Trips	188	392	580	448	310	758

3.0 Development Phasing Assessment

With the size of the development, a phasing strategy for the development will be considered and analyzed to coincide with traffic capacity of the road network. This will ensure that adequate levels of service at all the study intersections are maintained at each development phasing time period.

A review of the area road improvements planned by the City and the Region will be conducted. Those improvements will be assessed and a suitable phasing strategy for the development to coincide with traffic capacity in order to ensure adequate levels of service at all intersections within the study area are maintained at each development phasing time period.

We will assess and identify specific road and or intersection improvements that are required to support specific phasing of development over and above the future Capital Works projects being undertaken by the agencies. Details to the access requirements related to the phasing strategy outlined in this study.

Should you have any questions or concerns, please contact our office.

R.J. Burnside & Associates Limited

CC:cv

R.J. Burnside & Associates Limited 1465 Pickering Parkway Suite 200 Pickering ON L1V 7G7 CANADA
telephone (905) 420-5777 **fax** (905) 420-5247 **web** www.rjburnside.com

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Technical Memorandum

Trip Distribution Update

Date: November 13, 2018 **Project No.:** 300041230.0000

Project Name: Niagara Village - Thundering Waters Village

Client Name: Niagara Village Land Owners Group

Submitted To: Robert Alguire (Niagara Region) and John Grubich (City of Niagara Falls)

Submitted By: Cindy Chung, EIT, Transportation Planner

Reviewed By: Brad Hale, Senior Transportation Specialist

Niagara Village Land Owners Group (Client) is planning for the redevelopment of the existing Thundering Waters Golf Club located in the City of Niagara Falls. Official Plan Amendment, Zoning By-law Amendment and Draft Plan applications will be required. R.J. Burnside & Associates Limited (Burnside) was retained to undertake a Transportation Study, which will form parts of those applications. As per the pre-consultation meeting on August 2, 2018 and an email dated September 28, 2018, the Niagara Region (Region) had requested for the following memos to be provided prior to the submission of the Transportation Study:

- Trip Generation and Attraction Analysis
- Proposed Connection Review
- Trip Distribution Analysis

All three memos were submitted to the Region and City on Wednesday, October 17, 2018. The Region had provided feedback on Monday, November 5, 2018. All feedback and comments are incorporated into this updated memo. The focus of this memo is with respect to the last noted study above. The other two studies are the subjects of separate memos. As discussed with the Region, the following were reviewed for this memo:

- Existing Travel Pattern Analysis;
- Trip Distribution based on 2016 Transportation Tomorrow Survey (TTS) and Retail Catchment Area;
- Other Background Development Distribution; and
- Proposed Distribution for the development.

Details are discussed in the following sections of this memo.

1.0 Existing Travel Pattern Review

Existing traffic counts were conducted by Pyramid Traffic Inc. at study intersections, on behalf of Burnside, for the weekday morning (7:00 AM to 9:00 AM) and afternoon (4:00 PM to 6:00 PM) peak periods on Thursday, March 22, 2018 except for:

- Marineland Parkway / Stanley Avenue (east leg) intersection
- Marineland Parkway / Portage Road intersection

The turning movement counts from the above intersections were taken from the *Riverfront Community Transportation Assessment* (Riverfront Community TIS), prepared by Paradigm Transportation Solutions Limited, dated April 2018. The weekday morning and afternoon peak period counts were taken on Wednesday, September 2, 2015 for Marineland Parkway / Portage Road intersection and Wednesday, September 9, 2015 for Marineland Parkway / Stanley Avenue intersection. To be consistent with the Riverfront Community TIS, an annual growth rate of 1% was applied to the traffic volumes to represent the existing year (2018). A minor imbalance was observed in the traffic data. Adjustments were made at Marineland Parkway / Stanley Road / Thundering Waters Boulevard intersection to be consistent with the Riverfront Community TIS and historical counts patterns. This includes adjustments to the following movements:

- Southbound left turn
- Eastbound through
- Westbound right turn
- Westbound through

The existing traffic counts are provided in Attachment 1. Table 1 summarizes the existing travel patterns for weekday AM and PM peak hours. As requested by the Region, Attachment 1 also provides a figure illustrating the distribution of the existing travel patterns.

Table 1: Existing Travel Patterns

To / From	Via	Weekday AM Peak Hour		Weekday PM Peak Hour	
		Trips	%	Trips	%
East	Portage Road / Marineland Parkway	545	23%	861	27%
	Lyons Creek Road	67	3%	104	3%
West	McLeod Road	717	30%	924	29%
	Lyons Creek Road	261	11%	346	11%

Table 1: Existing Travel Patterns continued

To / From	Via	Weekday AM Peak Hour		Weekday PM Peak Hour	
		Trips	%	Trips	%
North	Drummond Road	343	14%	388	12%
	Stanley Avenue	391	16%	495	16%
	Portage Road	60	3%	48	2%
Total		**2,341**	**100%**	**3,166**	**100%**

2.0 2016 Transportation Tomorrow Survey and Retail Catchment Area Review

Trip distribution and assignment of new residential trips were based upon existing traffic patterns, the available road network, and a review of the 2016 Transportation Tomorrow Survey (TTS) results published by the Data Management Group at the University of Toronto Transportation Research Institute. TTS does not provide data on specific home to work trips within the areas of the City. Assumptions were made for the based on the City's Official Plan future land uses, urban structure plan and general location of employment area within the City. Detailed route choices using TTS are provided in Attachment 2. As requested by the Region, Attachment 2 also provides a figure illustrating the residential distribution based on TTS.

The assumed retail distribution for the site is a result of an analysis of where customers will originate and be destined to. It takes into account route choice and the assumption that many residents will take the easiest path to the development. In the development of the distribution, Burnside reviewed the Niagara Falls census tract areas to determine the potential catchment area for the retail. Adjacent wards including Welland and Thorold were not taken into consideration due to the size of the proposed retail development. The proposed retail is predominantly meant to serve local residents within the development. Once the catchment area was determined, the population for each census tract areas were reviewed. Trip distribution for each of the areas was based upon the available road network and expected origins / destination of patrons. Route choice was carefully reviewed, where it was assumed that shoppers and employees will take the shortest and least congested route to/from the development. Detailed census tracts area, catchment area calculations and route choices are provided in Attachment 3. As requested by the Region, Attachment 3 also provides a figure illustrating the retail distribution based on catchment area.

The estimated distribution for residential and retail site trips is summarized in Table 2. The same distribution was assumed for both peak periods.

Table 2: Distribution based on 2016 TTS and Retail Catchment Area

To / From	Via	Residential Distribution	Retail Distribution
East	Portage Road / Marineland Parkway	2%	3%
	Lyons Creek Road	3%	7%
West	McLeod Road	37%	16%
	Lyons Creek Road	12%	5%
North	Drummond Road	28%	31%
	Stanley Avenue	16%	29%
	Portage Road	2%	9%
Total		**100%**	**100%**

3.0 Comparison with Background Developments

As discussed with the City, there are two background developments planned within the vicinity of the site that are anticipated to be built within the study horizon years. This includes:

- Riverfront Community Development
  - Located south-west of the site.
  - Consists of 26,012.85 m^2 (280,000 ft^2) of retail-commercial, 312 condominium / townhomes, 567 single-detached homes, 238 continuing care retirement rooms and 450 hotel rooms.
  - Trip distribution was based on findings in Riverfront Community TIS.
- Nina Court Residential Development
  - Located south-east of McLeod Road / Marineland Parkway / Alex Avenue intersection
  - Consists of 168 condominium / townhomes.
  - Trip distribution was based on findings in *Nina's Court on Marineland Transportation Impact Study*, prepared by Paradigm Transportation Solutions Limited, dated May 2017.

Distribution of the trips generated from the two background developments were reviewed and summarized in Table 3. As both developments included different road networks, the distributions were summarized based on our study's road network. Excerpts from the two reports are provided in Attachment 4. As requested by the Region, Attachment 4 also provides figures illustrating the distribution of both background developments.

Table 3: Background Developments' Assumed Distribution

To / From	Via	Riverfront Community	Nina's Court	
			AM Peak Hour	PM Peak Hour
East	Portage Road / Marineland Parkway	4%[1]	15%	15%
	Lyons Creek Road	2%	-[2]	-[2]
West	McLeod Road	43% [3]	41%	37%
	Lyons Creek Road	10% [3]	-[2]	-[2]
North	Drummond Road	11%	9%	10%
	Stanley Avenue	10%	13%	13%
	Portage Road	-	3%	4%
Other Considerations	Internal [4]	20%	-	-
	To / From South Stanley Avenue	-	9%	8%
	To / From East / West Dunn Street	-	5%	8%
	To / From South Drummond Road	-	5%	5%
Total		**100%**	**100%**	**100%**

Note: 1. Includes 2% to / from east of Chippawa Parkway as the trips are most likely to be coming to and from east of Portage Road.
2. Was not part of the Study's road network but could be part of the 8% to / from south Stanley Avenue.
3. Assumed that half of the trips to / from south of QEW and Montrose will be utilizing McLeod Road. The remaining will be utilizing Lyons Creek Road.
4. Internal includes Internal North: Walmart site via Dorchester – McLeod – Oakwood, Dorchester – McLeod, Drummond – McLeod via Oldfield, adjacent lands south of McLeod and Internal South: Lyons Creek via Chippawa - Stanley

4.0 Proposed Trip Distribution

The estimated distribution for residential and retail site trips is based on the review of all the information above. Table 4 summarizes the comparison and provides the proposed distribution to be used in the Transportation Study. Also, note that an 1% distribution was assumed to account for residents from the development working at the industrial lands located west of Stanley Avenue between Ramsey Road and Chippawa Parkway. The same distribution was assumed for both peak periods. As requested by the Region, Attachment 5 also provides a figure illustrating the proposed distribution used for the Transportation Study.

Table 4: Trip Distribution Comparison and Proposed Distribution

To / From	Via	Existing Travel Patterns		2016 TTS and Retail Catchment		Background Development [1]		Proposed Distribution for Transportation Study	
		AM Peak %	PM Peak %	Residential	Retail	Riverfront Community	Nina Court[2]	Residential	Retail
East	Portage Road / Marineland Parkway	23%	27%	2%	3%	4%	15%	**10%**	**5%**
	Lyons Creek Road	3%	3%	3%	7%	2%	-[3]	**3%**	**5%**
West	McLeod Road	30%	29%	37%	16%	43%	41%	**40%**	**25%**
	Lyons Creek Road	11%	11%	12%	5%	10%	-[3]	**12%**	**10%**
North	Drummond Road	14%	12%	28%	31%	11%	9%	**15%**	**25%**
	Stanley Avenue	16%	16%	16%	28%	10%	13%	**16%**	**20%**
	Portage Road	3%	2%	2%	10%	-	3%	**3%**	**10%**
Internal	Industrial Lands [4]	-	-	-	-	-	-	**1%**	**-**
Total		**100 %**	**100%**	**100%**	**100%**	**80%**	**81%**	**100%**	**100%**

Note: 1. Only the trip distribution for the study road network was compared. Details for the remaining distribution can be found in the previous sections of this memo.
2. Only AM peak hour distribution was considered.
3. Was not part of the Study's road network, but to / from east and west via Lyons Creek Road would be part of the 8% to/from south Stanley Avenue.
4. Industrial lands located west of Stanley Avenue between Ramsey Road and Chippawa Parkway.

Should you have any questions or concerns, please contact our office.

R.J. Burnside & Associates Limited

CC:cv

Enclosure(s) Attachment 1: Existing Traffic Volumes
Attachment 2: TTS 2016 Residential Route Choices
Attachment 3: Retail Catchment Area
Attachment 4: Excerpts from Background Development Traffic Studies
Attachment 5: Proposed Distribution for Transportation Study Figure

Attachment 1

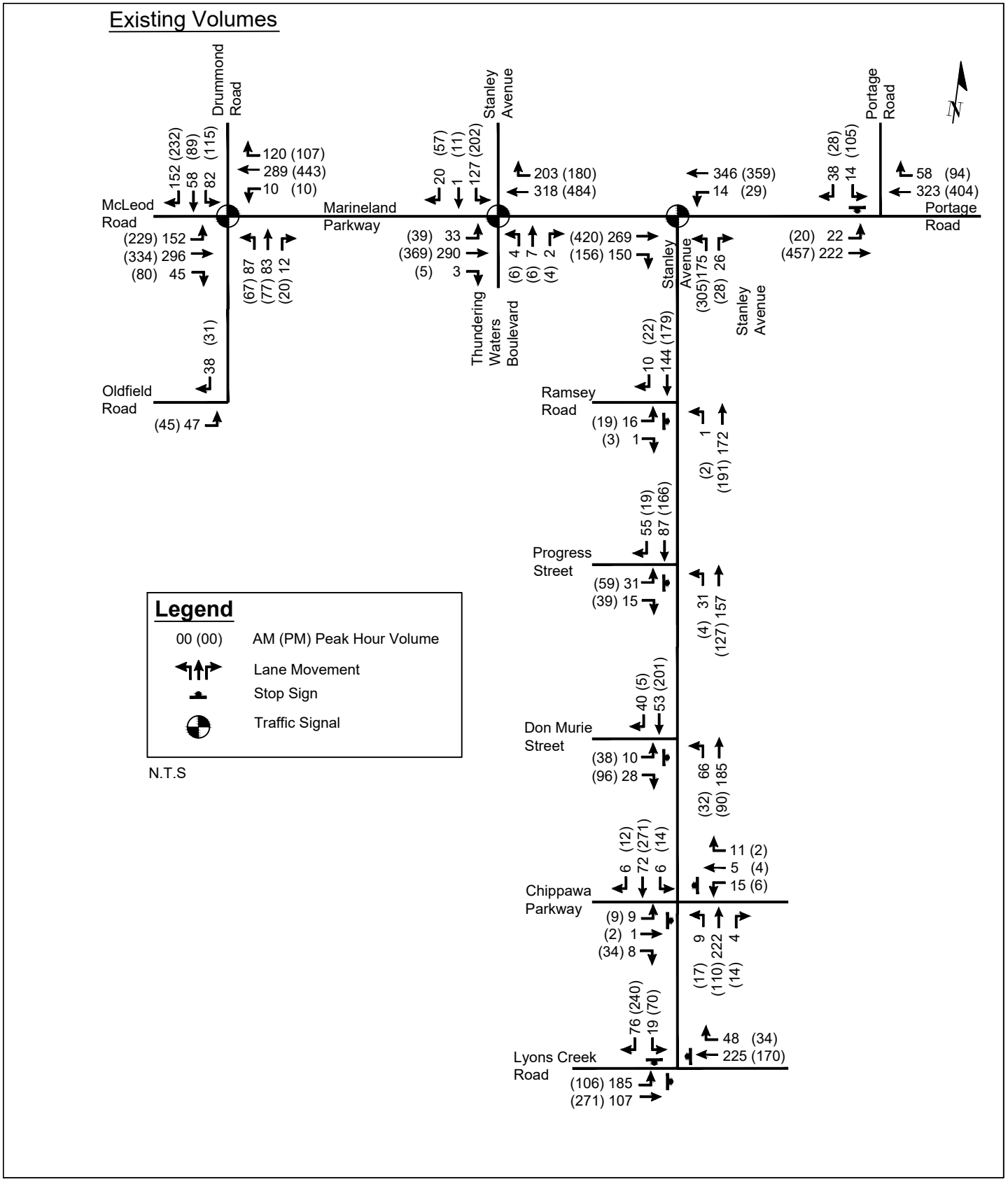
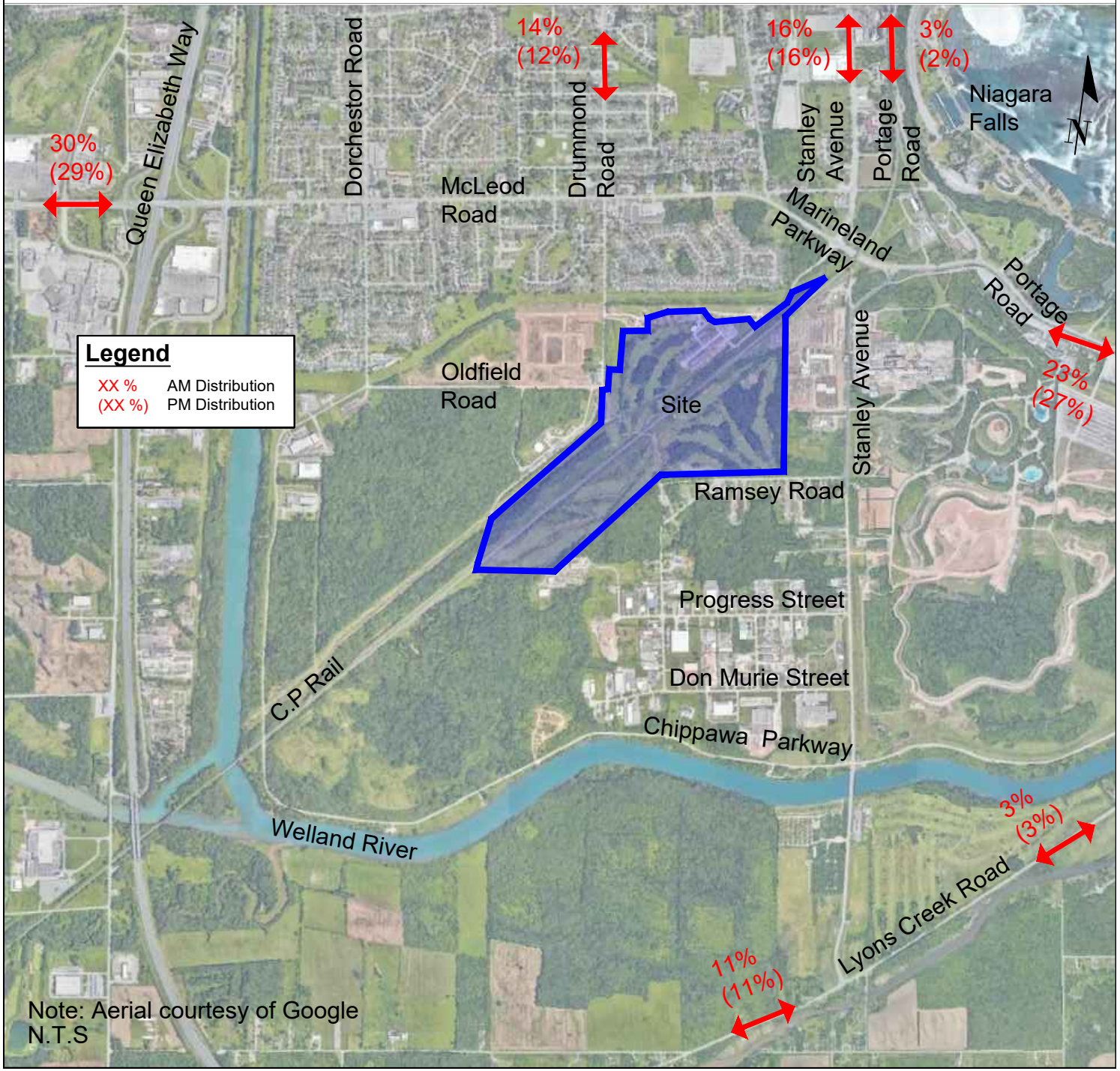


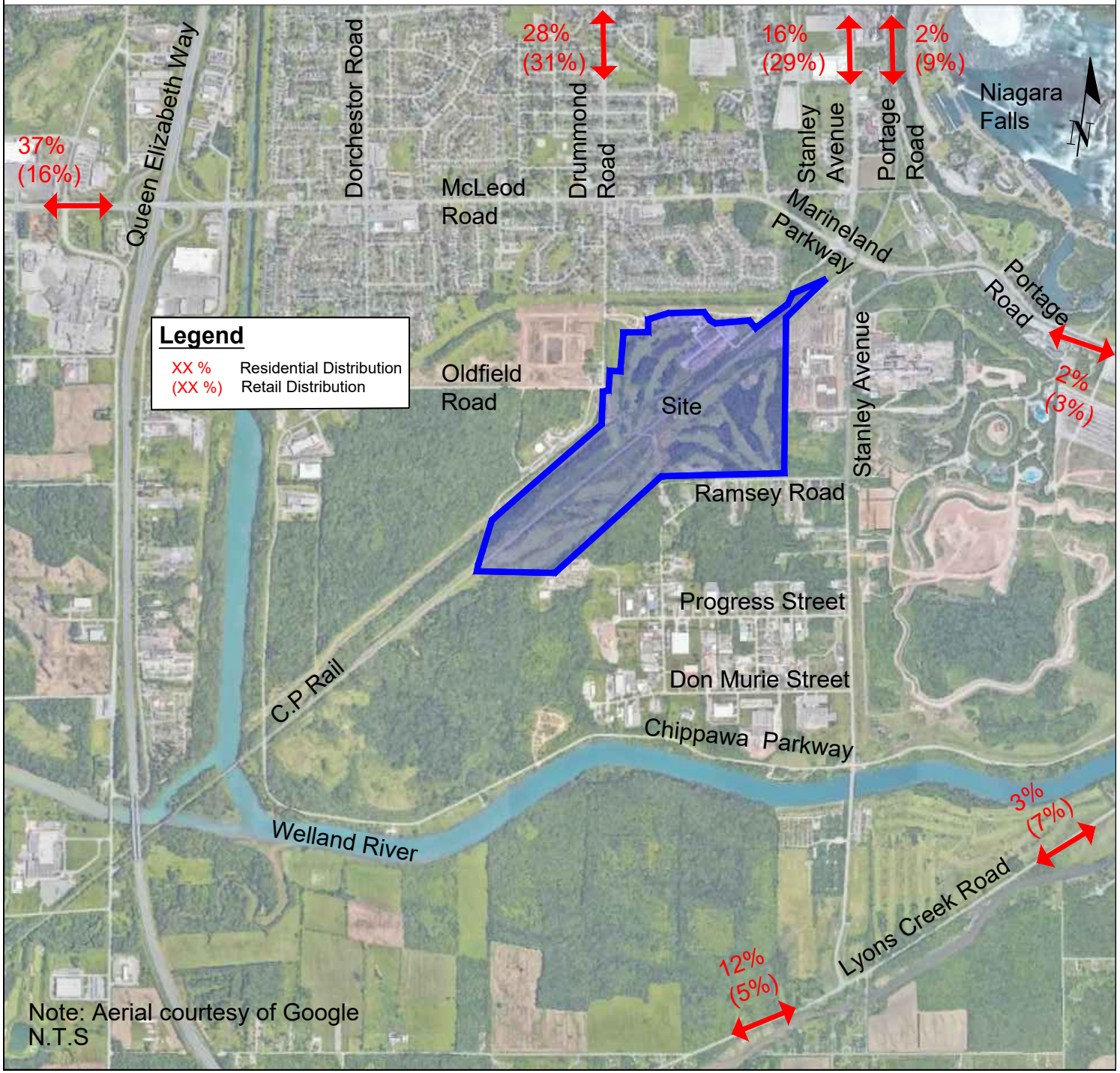
Figure 1 : Existing Travel Patterns



Detailed Residential Trip Distribution

				% routing							Trips							
				East		West		North			East		West		North			
PD / Ward	2016 TTS Trips (see Raw TTS)	% Attraction	Adjusted Trips	Portage/ Marineland	Lyons Creek Rd	McLeod (QEW Access)	Lyons Creek (QEW Access)	Drummond	Stanley	Portage	Total	Portage/ Marineland	Lyons Creek Rd	McLeod (QEW Access)	Lyons Creek (QEW Access)	Drummond	Stanley	Portage	Total
External (PD excluding Niagara Falls)																			
PD 1 of Toronto	31	100%	31			100%					100%	0	0	31	0	0	0	0	31
PD 2 of Toronto	16	100%	16			100%					100%	0	0	16	0	0	0	0	16
PD 9 of Toronto	31	100%	31			100%					100%	0	0	31	0	0	0	0	31
Mississauga	106	100%	106			100%					100%	0	0	106	0	0	0	0	106
Oakville	60	100%	60			100%					100%	0	0	60	0	0	0	0	60
Burlington	107	100%	107			100%					100%	0	0	107	0	0	0	0	107
Stoney Creek	27	100%	27			100%					100%	0	0	27	0	0	0	0	27
Hamilton	485	100%	485			100%					100%	0	0	485	0	0	0	0	485
Grimsby	158	100%	158			100%					100%	0	0	158	0	0	0	0	158
Lincoln	91	100%	91			100%					100%	0	0	91	0	0	0	0	91
Pelham	107	100%	107			25%	10%	55%	10%		100%	0	0	27	11	59	11	0	108
Niagara-on-the-Lake	1287	100%	1287			35%		45%	15%	5%	100%	0	0	450	0	579	193	64	1286
St. Catharines	2480	100%	2480			30%		40%	30%		100%	0	0	744	0	992	744	0	2480
Thorold	590	100%	590			20%		45%	30%	5%	100%	0	0	118	0	266	177	30	591
Niagara Falls	7193	0%	0								0%	0	0	0	0	0	0	0	0
Welland	671	100%	671			10%	85%	5%			100%	0	0	67	570	34	0	0	671
Port Colborne	15	100%	15			20%	80%				100%	0	0	3	12	0	0	0	15
Fort Erie	494	100%	494	20%	40%	10%	30%				100%	99	198	49	148	0	0	0	494
Haldimand-Norfolk	107	100%	107	0%	20%	20%	45%	15%			100%	0	21	21	48	16	0	0	106
Other	163	100%	163	15%	15%	15%	15%	15%	15%	10%	100%	24	24	24	24	24	24	16	160
External Total	**7026**										**Total**	123	243	2615	813	1970	1149	110	7023
											TTS %	2%	3%	37%	*12%*	*28%*	*16%*	*2%*	*100%*

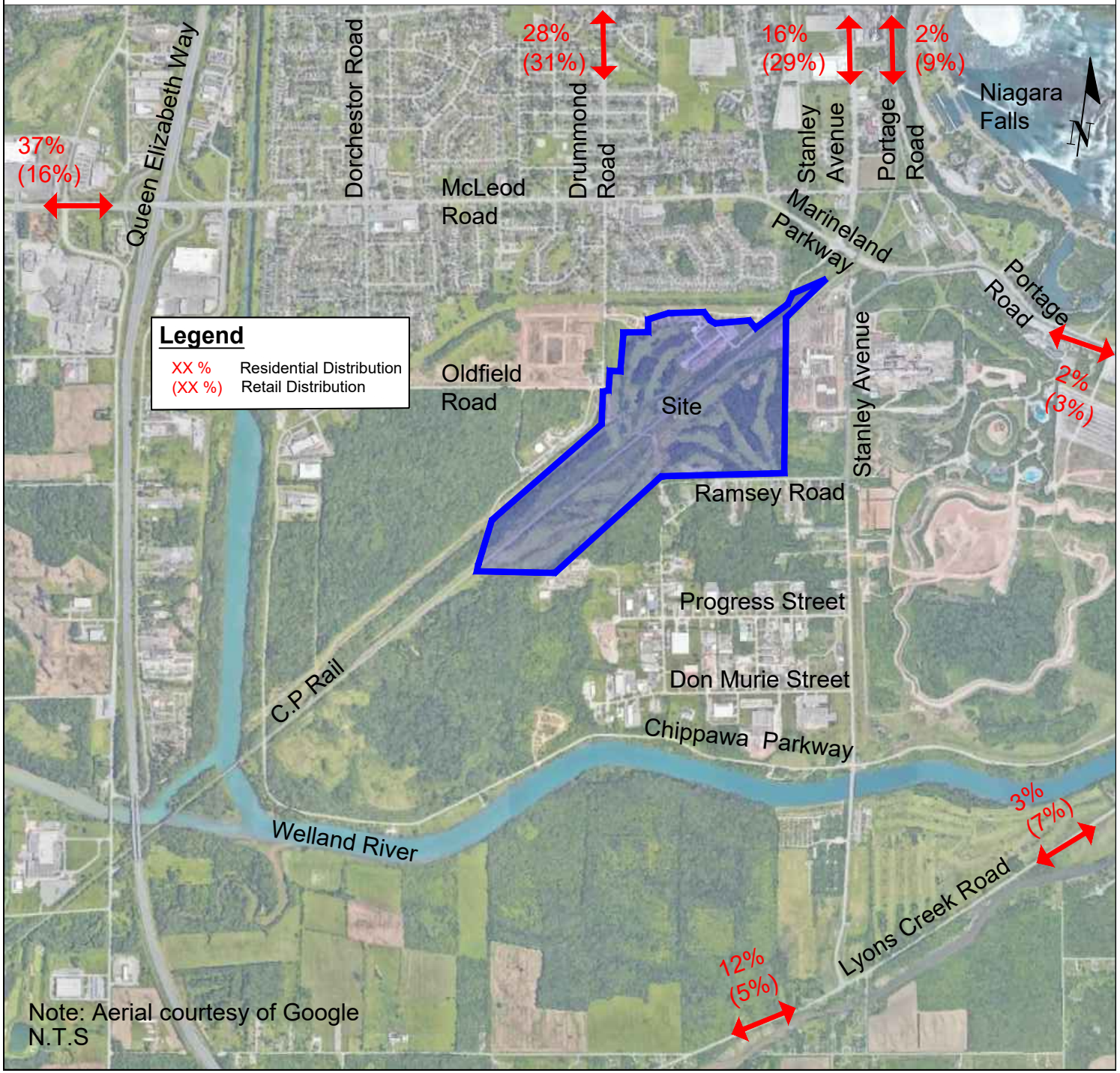
Figure 2 : Distribution based on 2016 TTS and Retail Catchment Area



Detailed Retail Trip Distribution

PD / Ward	2016 TTS Trips (see Raw TTS)	% Attraction	Adjusted Trips	% routing East		West		North			Total	Trips East		West		North			Total
				Portage/ Marineland	Lyons Creek Rd	McLeod (QEW Access)	Lyons Creek (QEW Access)	Drummond	Stanley	Portage		Portage/ Marineland	Lyons Creek Rd	McLeod (QEW Access)	Lyons Creek (QEW Access)	Drummond	Stanley	Portage	
External (PD excluding Niagara Falls)																			
200	3187	10%	319		40%	10%	50%				100%	0	128	32	160	0	0	0	320
201	5068	25%	1267	30%	70%						100%	380	887	0	0	0	0	0	1267
202	1137	100%	1137			60%	40%				100%	0	0	682	455	0	0	0	1137
203.01	5282	100%	5282			10%		40%	35%	15%	100%	0	0	528	0	2113	1849	792	5282
203.02	3549	70%	2484			5%		40%	45%	10%	100%	0	0	124	0	994	1118	248	2484
204	6780	20%	1356			15%		40%	35%	10%	100%	0	0	203	0	542	475	136	1356
205	1545	10%	155						60%	40%	100%	0	0	0	0	0	93	62	155
206	4983	0%	0								0%	0	0	0	0	0	0	0	0
207	5806	0%	0								0%	0	0	0	0	0	0	0	0
208	5803	0%	0								0%	0	0	0	0	0	0	0	0
209.03	5306	20%	1061			45%		35%	20%		100%	0	0	477	0	371	212	0	1060
209.04	3509	15%	526			25%		45%	30%		100%	0	0	132	0	237	158	0	527
209.05	6396	0%	0								0%	0	0	0	0	0	0	0	0
209.06	2973	0%	0								0%	0	0	0	0	0	0	0	0
210	8777	0%	0								0%	0	0	0	0	0	0	0	0
211	4261	0%	0								0%	0	0	0	0	0	0	0	0
212	1916	0%	0								0%	0	0	0	0	0	0	0	0
213	2980	0%	0								0%	0	0	0	0	0	0	0	0
214	4539	0%	0								0%	0	0	0	0	0	0	0	0
215	4274	0%	0								0%	0	0	0	0	0	0	0	0
External Total	**79294**										**Total**	380	1015	2178	615	4257	3905	1238	13588
											TTS %	3%	7%	16%	*5%*	*31%*	*29%*	*9%*	*100%*

Figure 2 : Distribution based on 2016 TTS and Retail Catchment Area



3.5 Trip Distribution and Assignment

Niagara Region provided the 2031 and 2041 auto and transit trip matrices from their recently updated travel demand model (EMME software). Since both the 2031 and 2041 matrices were similar in terms of trip distribution, the 2041 matrices were used to determine the geographic distribution of trips to and from the Riverfront Community lands.

Table 3.3 summarizes the trip distribution by cardinal direction and by roadway providing access to or within the study area. It also includes a component of the trip distribution referred to as "Internal". The "Internal" area includes the model zone that the subject site is also located within or adjacent to and would account for the percentage of trips between the development lands and nearby complementary land uses.

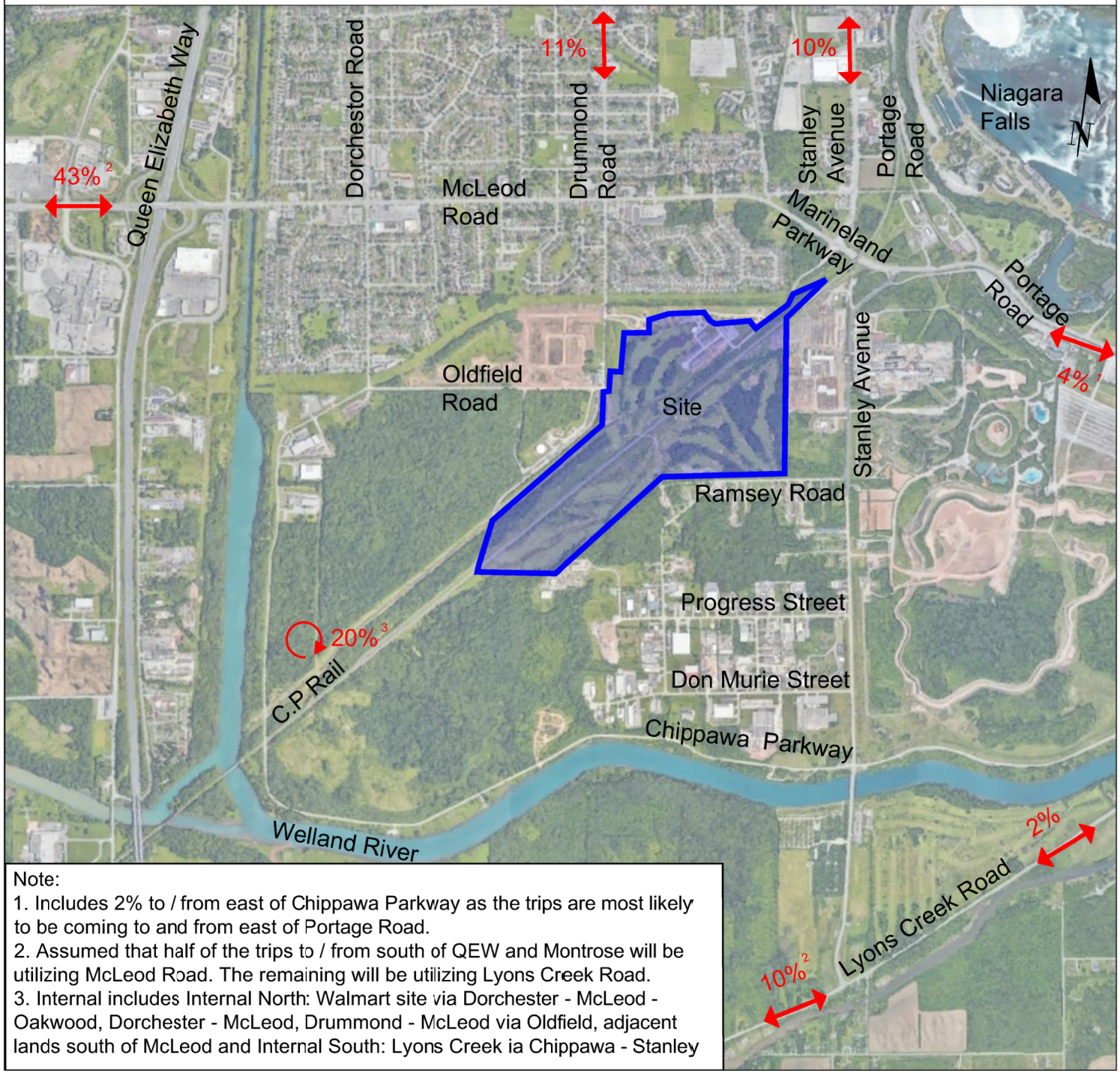
TABLE 3.3: TRIP DISTRIBUTION

Trip Distribution Zone	Distribution
West (McLeod)	4%
North (Montrose)	7%
North (QEW)	14%
North (Dorchester)	11%
North (Drummond)	11%
North (Stanley)	10%
East (Portage)	2%
East (Chippawa Parkway)	2%
East (Lyons Creek)	2%
South (QEW)	5%
South (Montrose)	8%
West (Biggar)	3%
West (Chippawa Creek)	1%
Internal North (Walmart site via Dorchester-McLeod-Oakwood)	4%
Internal North (Dorchester-McLeod)	3%
Internal North (Drummond-McLeod via Oldfield)	3%
Internal North (adjacent lands south of McLeod)	6%
Internal South (Lyons Creek via Chippawa-Stanley)	4%
Total	**100%**

The trips shown in **Table 3.2** were manually assigned to the study area road network based on the traffic distribution pattern in **Table 3.3** and using the following rationale for route selection:

- While the majority of site traffic (approximately 70-75%) would be oriented to the north, there is and will be limited capacity in the McLeod Road corridor to accommodate the site trips on the most direct routes to the north (i.e. primarily Dorchester Road);
- Consequently, site traffic was assigned approximately 50% to the arterial-collector routes accessing the McLeod Road corridor to the

Figure 3 : Background Development Riverfront Community Assumed Distribution



Note:
1. Includes 2% to / from east of Chippawa Parkway as the trips are most likely to be coming to and from east of Portage Road.
2. Assumed that half of the trips to / from south of QEW and Montrose will be utilizing McLeod Road. The remaining will be utilizing Lyons Creek Road.
3. Internal includes Internal North: Walmart site via Dorchester - McLeod - Oakwood, Dorchester - McLeod, Drummond - McLeod via Oldfield, adjacent lands south of McLeod and Internal South: Lyons Creek ia Chippawa - Stanley

3.2.3 Trip Generation

Table 3.2 summarizes the trip generation estimates for the weekday AM, PM and Saturday peak hours. These estimates consider the reductions noted above.

A total of 86 AM, 103 PM and 116 Saturday peak hour new vehicle trips are forecast to be added to the area roadways.

TABLE 3.2: TRIP GENERATION ESTIMATES

Land Use Code	Units	Trips	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
			Rate	In	Out	Total	Rate	In	Out	Total	Rate	In	Out	Total
232 - High-Rise Condominium/Townhouse (Units)	125	Total	eq.	12	53	65	eq.	36	22	58	eq.	29	38	67
		Mode Split	5%	1	3	3	5%	2	1	3	5%	1	2	3
		New	95%	11	50	62	95%	34	21	55	95%	28	36	64
230 - Condominium/Townhouse (Units)	43	Total	eq.	5	21	26	eq.	32	18	50	eq.	30	25	55
		Mode Split	5%	0	1	1	5%	2	1	3	5%	2	1	3
		New	95%	5	20	25	95%	30	17	48	95%	29	24	52
Total Trip Generation		**Total**	-	17	74	**91**	-	68	40	**108**	-	59	63	**122**
		Mode Split	-	1	4	**5**	-	3	2	**5**	-	3	3	**6**
		New	-	16	70	**86**	-	65	38	**103**	-	56	60	**116**

3.3 Development Trip Distribution and Assignment

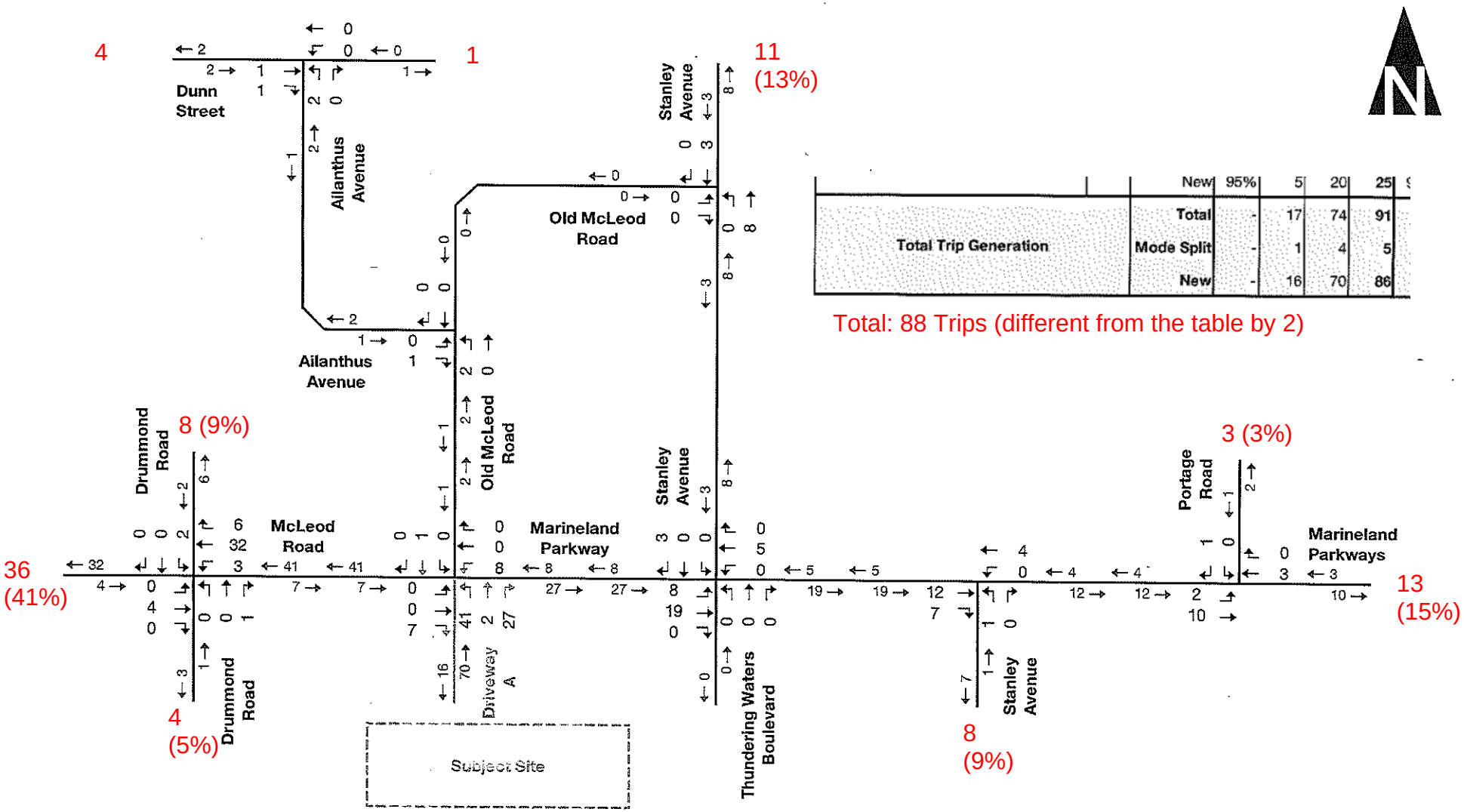
The 2011 Transportation Tomorrow Survey (TTS) data for the City of Niagara Falls was used to determine the trip distribution for the residential uses proposed. The TTS was examined for the weekday AM and PM peak hour corresponding to the weekday commuter hours that are typically used in the assessment of residential developments.

The survey data were assessed for weekday AM peak period (7:00 AM-9:00 AM) trips originating within the City of Niagara Falls when residents would be leaving home for the day. Similarly, trips destined to City of Niagara Falls were tabulated.

The weekday PM peak hour was developed utilizing the same methodology between the hours of 4:00 PM and 6:00 PM.

Table 3.3 details the estimated trip distribution for the development. The Saturday peak hour is assumed to have similar directional distribution as the weekday AM peak hour.

RJB notes in red**



		New	95%	5	20	25
Total Trip Generation	Total		-	17	74	91
	Mode Split		-	1	4	5
	New		-	16	70	86

Total: 88 Trips (different from the table by 2)

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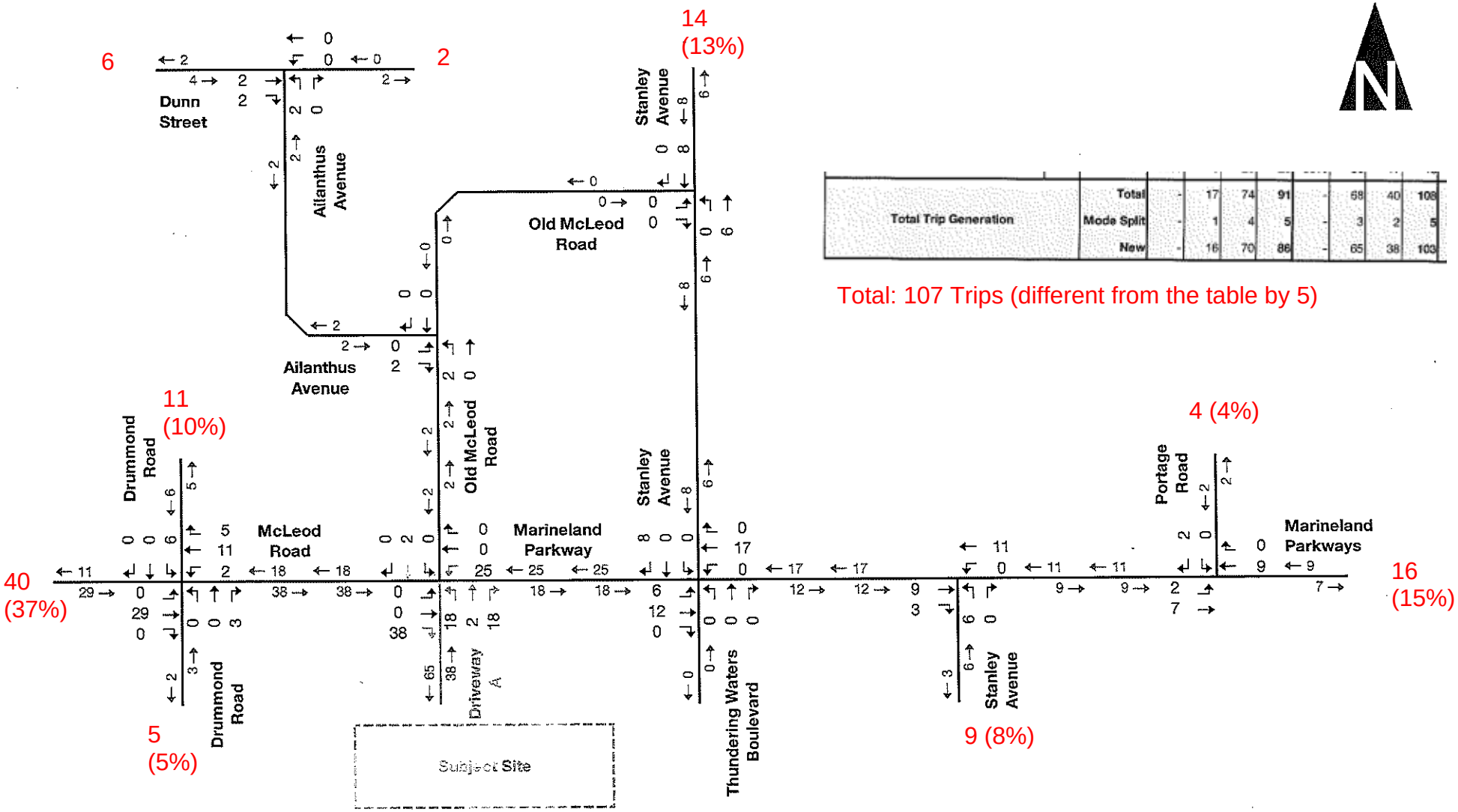
Site Generated AM Peak Hour Traffic Volumes

RJB notes in red**



Total Trip Generation	Total	-	17	74	91	-	68	40	108
	Mode Split	-	1	4	5	-	3	2	5
	New	-	16	70	86	-	65	38	103

Total: 107 Trips (different from the table by 5)

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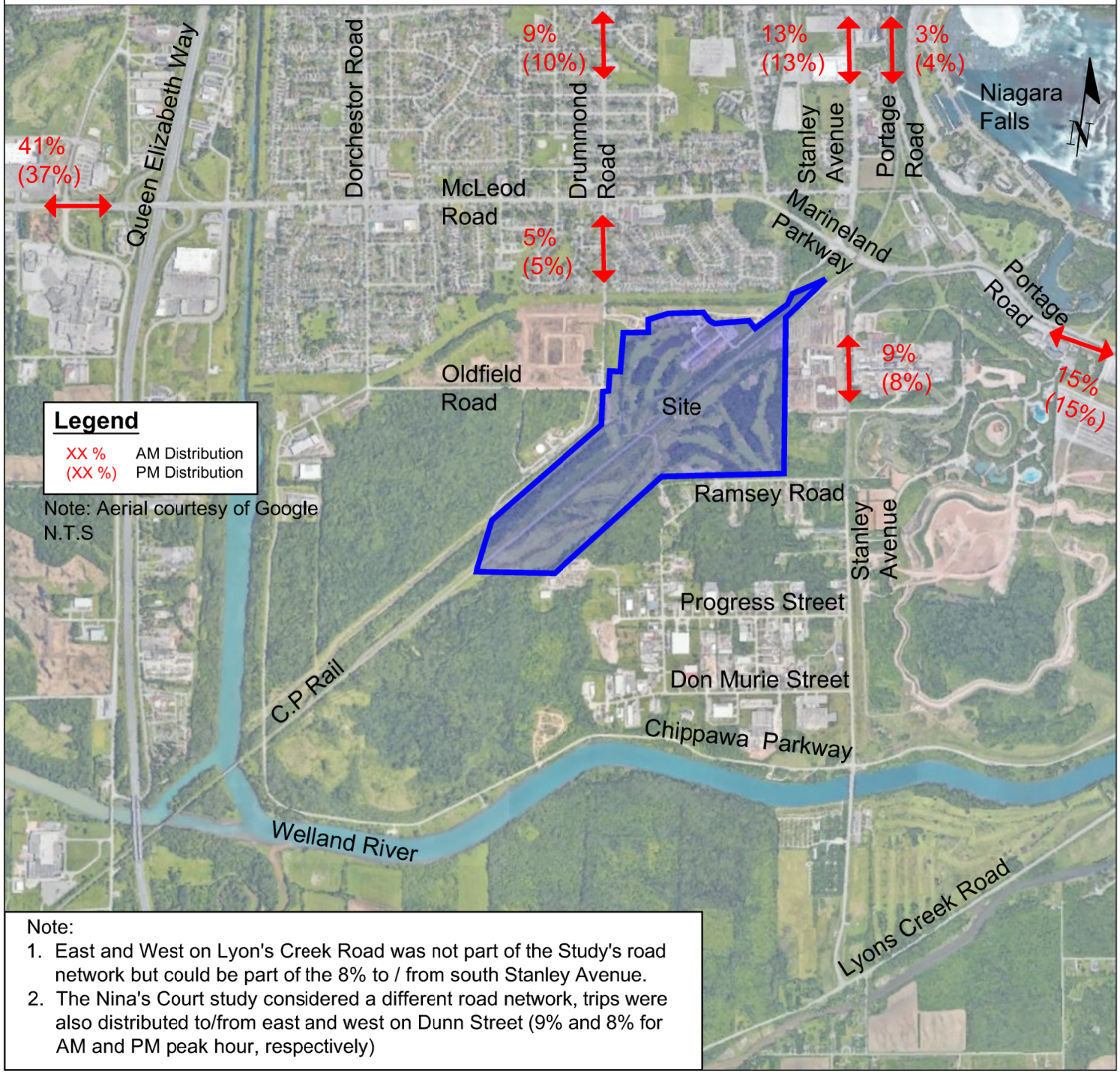
Site Generated PM Peak Hour Traffic Volumes

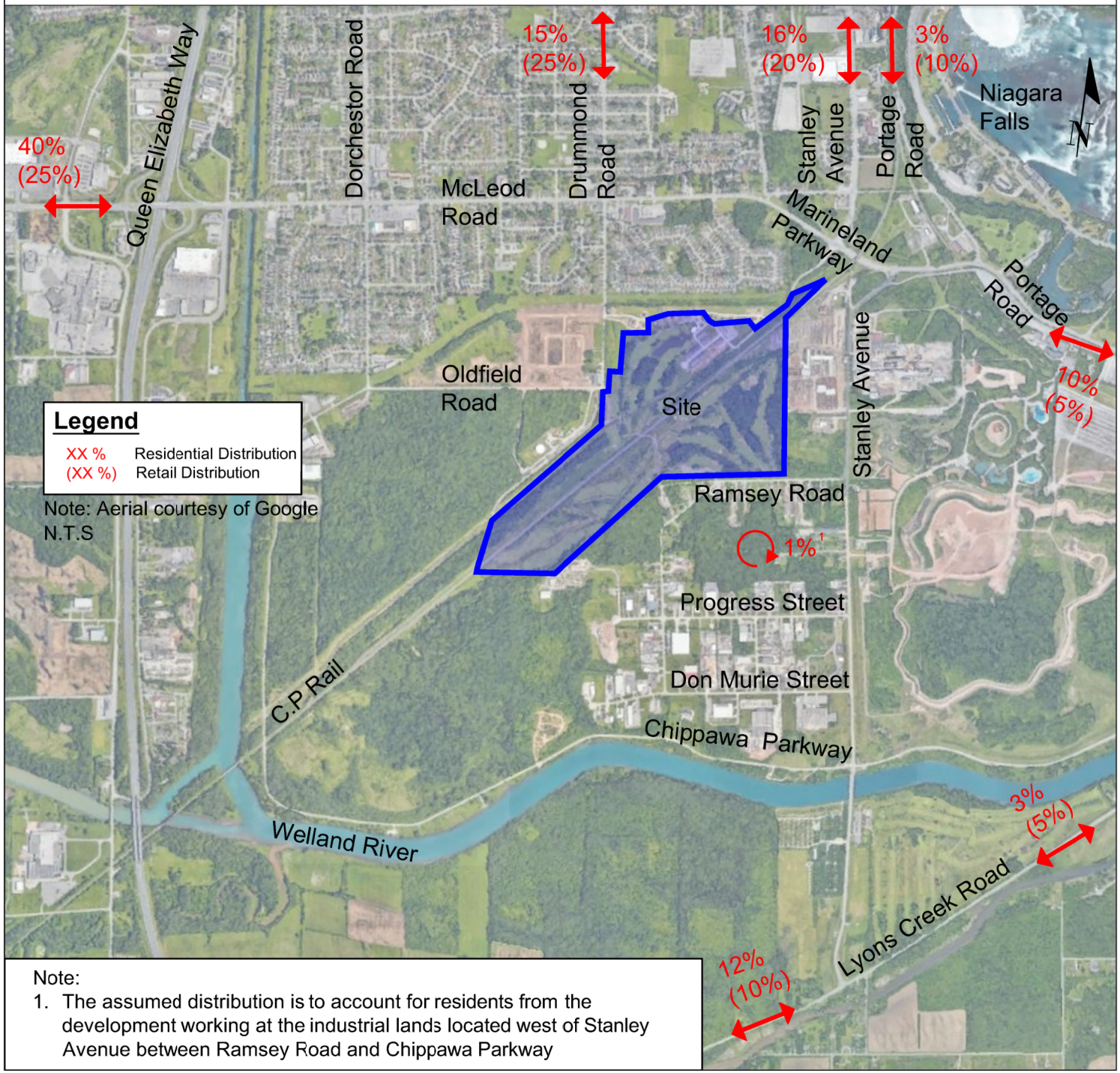
Figure 4 : Background Development Nina's Court Assumed Distribution



Note:

1. East and West on Lyon's Creek Road was not part of the Study's road network but could be part of the 8% to / from south Stanley Avenue.
2. The Nina's Court study considered a different road network, trips were also distributed to/from east and west on Dunn Street (9% and 8% for AM and PM peak hour, respectively)

Figure 5 : Proposed Distribution for Transportation Study



Note:

1. The assumed distribution is to account for residents from the development working at the industrial lands located west of Stanley Avenue between Ramsey Road and Chippawa Parkway

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Appendix C

CP Rail Information

800 - 1290 Central Parkway West
Mississauga, Ontario
Canada L5C 4R3

T 905 803 3429
E josie_tomei@cpr.ca

November 6, 2018

Via email: scicak@golder.com

Stefan Cicak
Golder Associates Ltd.
6925 Century Avenue
Suite 100
Mississauga, ON L5N 7K2

Dear Sir/Madam:

Re: Rail Traffic Volumes, CP Mileage 4.0, Montrose Subdivision, Marineland Parkway, Niagara Falls

This is in reference to your request for rail traffic data in the vicinity of Marineland Parkway in the City of Niagara Falls. The study area is located in the vicinity of mile 4.0 of our Montrose Subdivision, which is classified as an Industrial Spur line.

The information requested is as follows:

1. Number of freight trains between 0700 & 2300: 0
   Number of freight trains between 2300 & 0700: 2

2. Maximum cars per train freight: 20

3. Number of locomotives per train: 2

4. Maximum permissible train speed: 25 mph (normal speed 15 mph)

5. Grade crossings are located at Biggar Road, Grassy Brook Road and Montrose Road, however whistling is prohibited at these locations. Please note, the whistle may be sounded if deemed necessary by the train crew for safety reasons at any time.

6. The Montrose Spur services industrial facilities in the area only. There is a main track and siding with additional leads into industrial facilities all with jointed track. There is also a cross-over switch in the study area.

The information provided is based on recent rail traffic. Variations of the above may exist on a day-to-day basis. Specific measurements may also vary significantly depending on customer needs.

Yours truly,

Josie Tomei SR/WA
Specialist Real Estate Sales & Acquisitions – Ontario

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Appendix D

Existing Traffic Counts and Signal Timing Plans

Drummond Rd @ McLeod Rd

Morning Peak Diagram

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

One Hour Peak
From: 8:00:00
To: 9:00:00

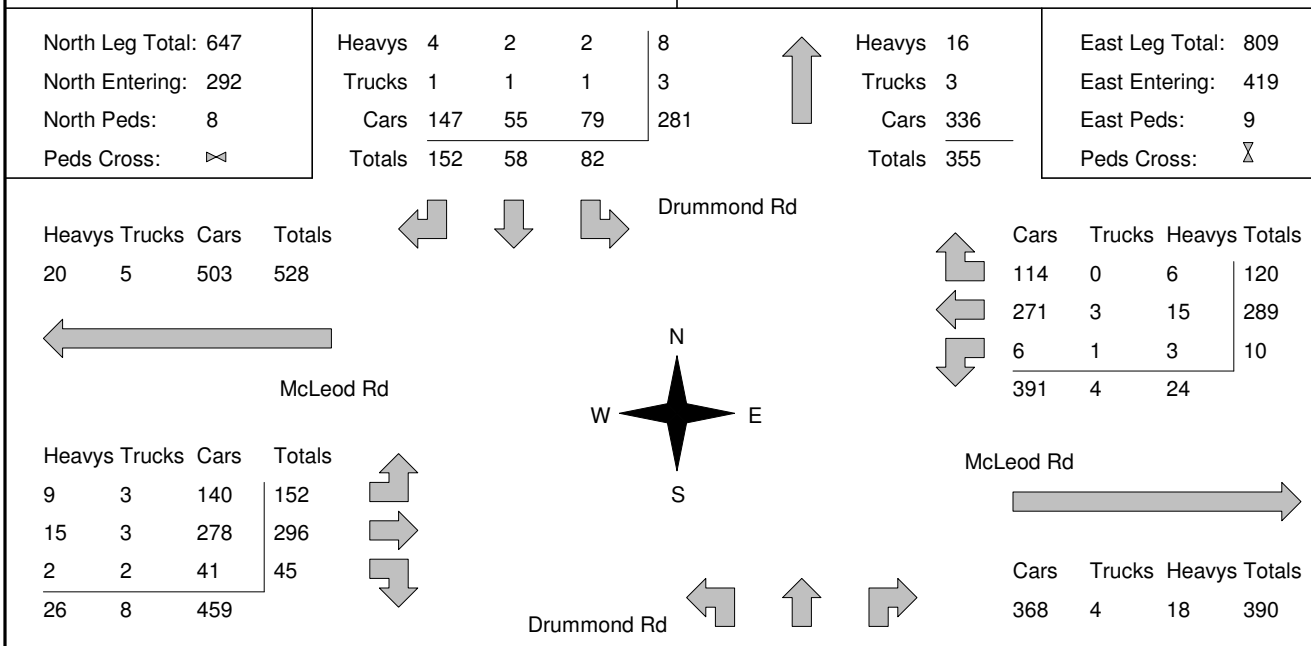
Municipality: Niagara Falls
Site #: 0000000001
Intersection: McLeod Rd & Drummond Rd
TFR File #: 1
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: McLeod Rd runs W/E



Comments

Drummond Rd @ McLeod Rd

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

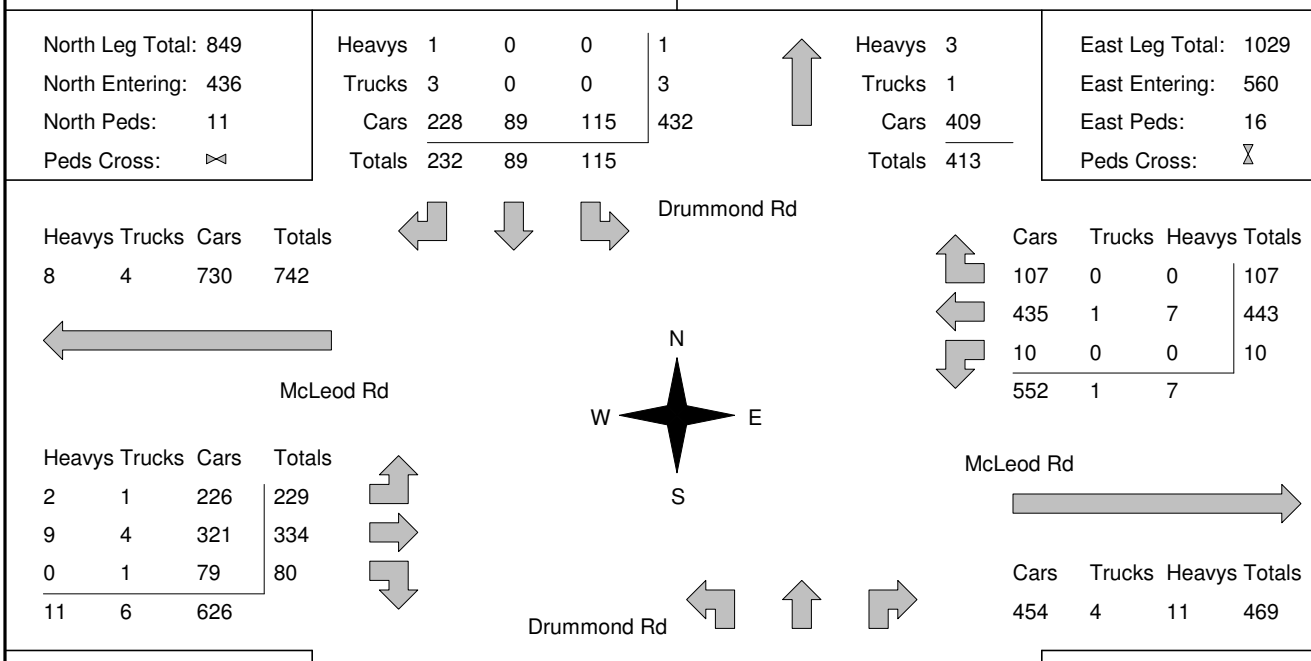
Municipality: Niagara Falls
Site #: 0000000001
Intersection: McLeod Rd & Drummond Rd
TFR File #: 1
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: McLeod Rd runs W/E



Comments

taken from *Traffic Impact Study for Marina Homes*, prepared by JD Northcote Engineering Inc., September 11, 2020.

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

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

One Hour Peak
From: 7:45:00
To: 8:45:00

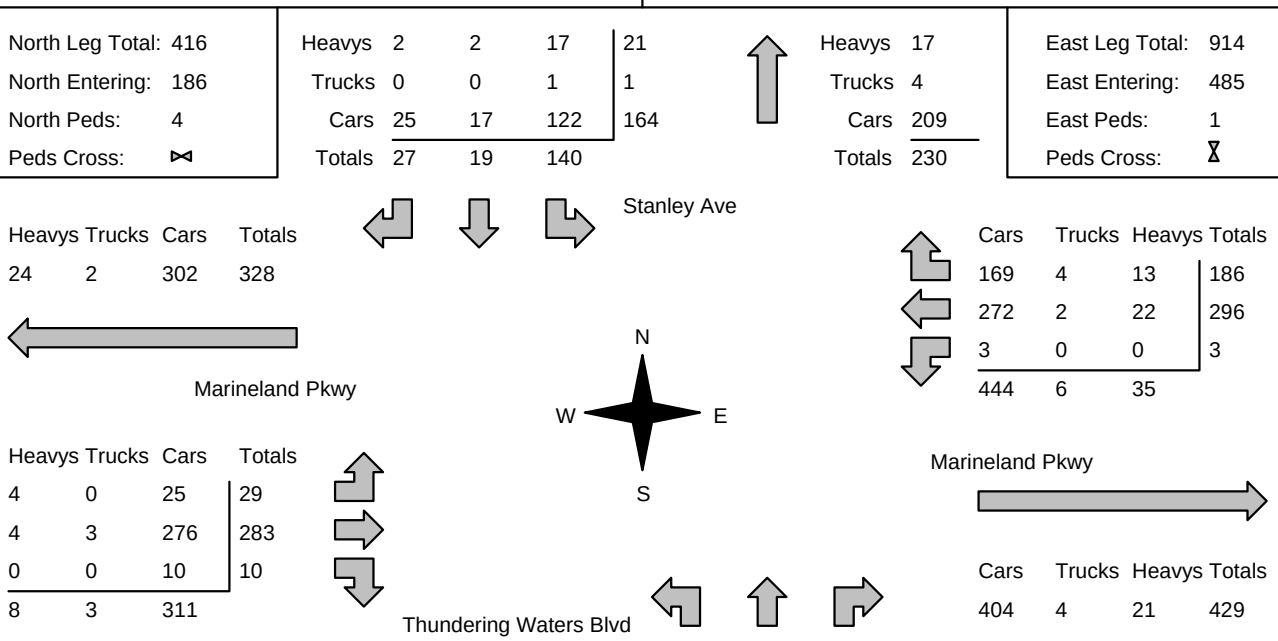
Municipality: Niagara Falls
Site #: 1914900001
Intersection: Marineland Pkwy & Stanley Ave
TFR File #: 1
Count date: 11-Sep-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Marineland Pkwy runs W/E



Comments

taken from *Traffic Impact Study for Marina Homes*, prepared by JD Northcote Engineering Inc., September 11, 2020.

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 19:00:00

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

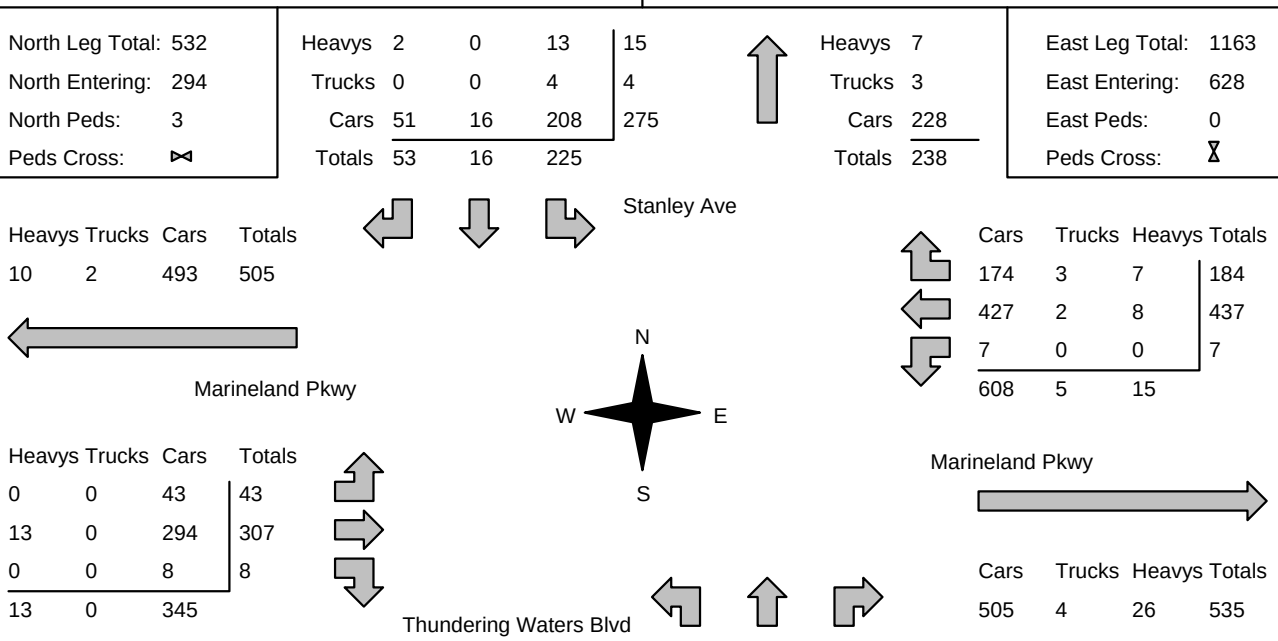
Municipality: Niagara Falls
Site #: 1914900001
Intersection: Marineland Pkwy & Stanley Ave
TFR File #: 1
Count date: 11-Sep-19

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Marineland Pkwy runs W/E



Comments

taken from *Traffic Impact Study for Marina Homes*, prepared by JD Northcote Engineering Inc., September 11, 2020.

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period		One Hour Peak	
From:	7:00:00	**From:**	7:45:00
To:	9:00:00	**To:**	8:45:00

Municipality: Niagara Falls
Site #: 1914900002
Intersection: Marineland Pkwy & Stanley Ave
TFR File #: 1
Count date: 11-Sep-19

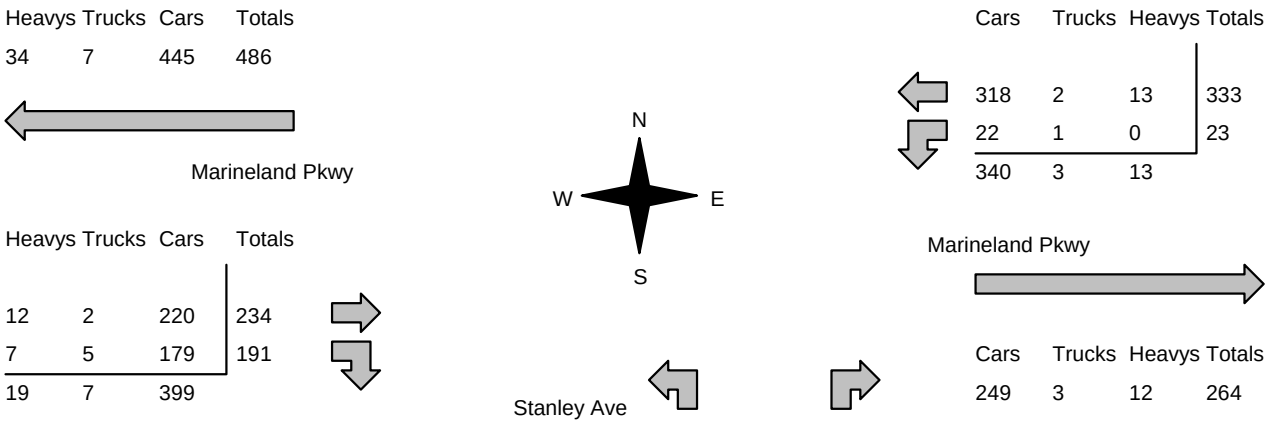
Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Marineland Pkwy runs W/E

East Leg Total: 620
East Entering: 356
East Peds: 1
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 425
West Leg Total: 911

Cars 201
Trucks 6
Heavys 7
Totals 214

Cars 127 29 156
Trucks 5 1 6
Heavys 21 0 21
Totals 153 30

Peds Cross: ⋈
South Peds: 0
South Entering: 183
South Leg Total: 397

Comments

taken from *Traffic Impact Study for Marina Homes*, prepared by JD Northcote Engineering Inc., September 11, 2020.

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 19:00:00

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

Municipality: Niagara Falls
Site #: 1914900002
Intersection: Marineland Pkwy & Stanley Ave
TFR File #: 1
Count date: 11-Sep-19

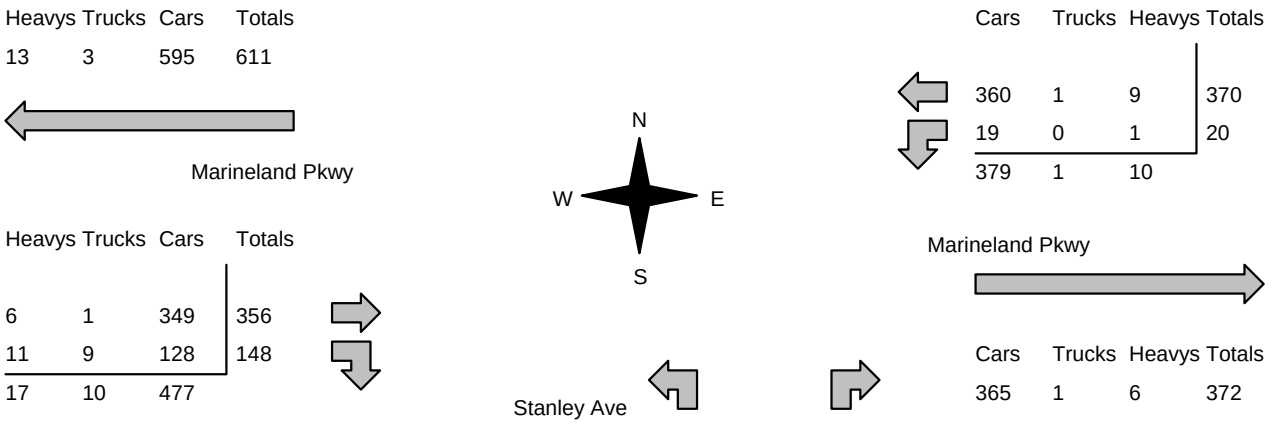
Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Marineland Pkwy runs W/E

East Leg Total: 762
East Entering: 390
East Peds: 4
Peds Cross: ⧗



Peds Cross: ⧗
West Peds: 0
West Entering: 504
West Leg Total: 1115

Cars 147
Trucks 9
Heavys 12
Totals 168

Cars 235 16 251
Trucks 2 0 2
Heavys 4 0 4
Totals 241 16

Peds Cross: ⋈
South Peds: 0
South Entering: 257
South Leg Total: 425

Comments

Stanley Ave @ Ramsey Rd

Morning Peak Diagram

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

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

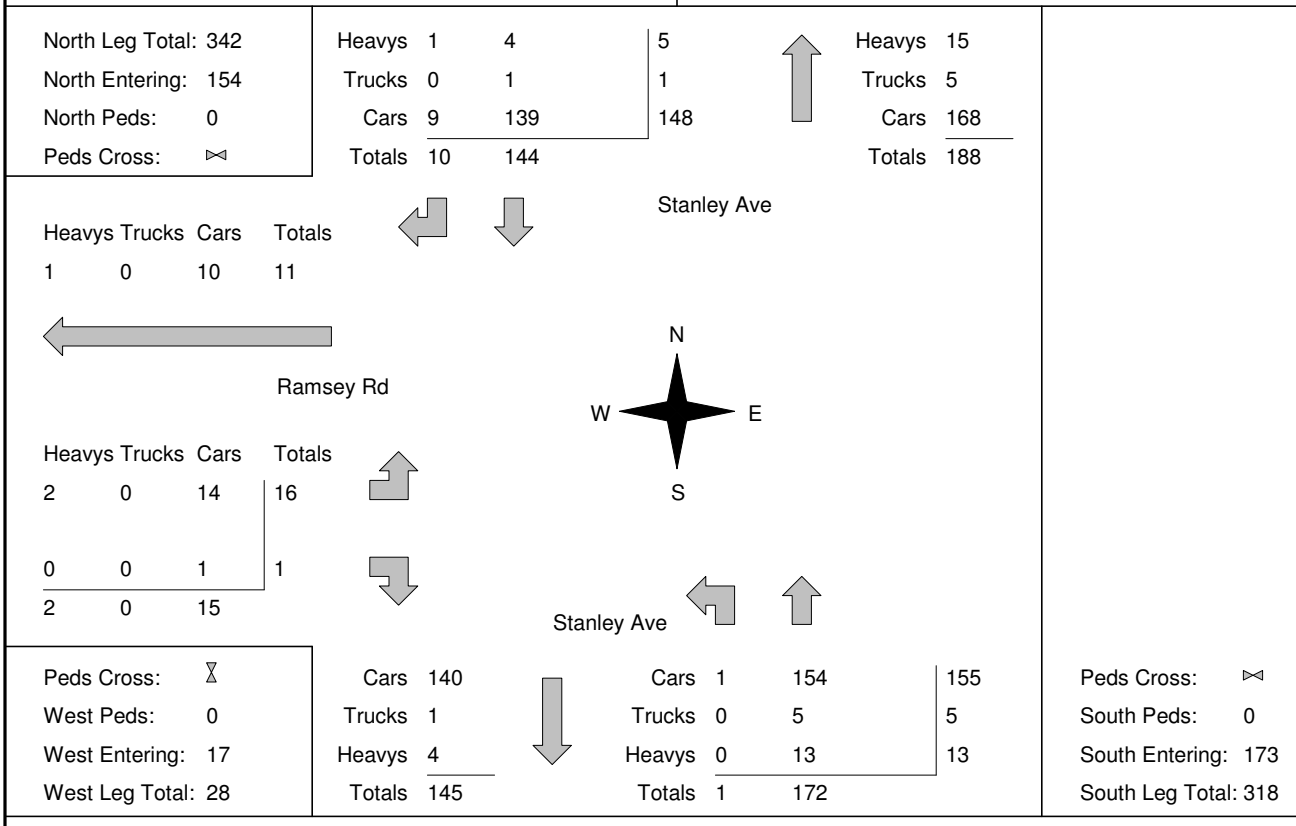
Municipality: Niagara Falls
Site #: 0000000003
Intersection: Stanley Ave & Ramsey Rd
TFR File #: 3
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Stanley Ave runs N/S



Comments

Stanley Ave @ Ramsey Rd

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

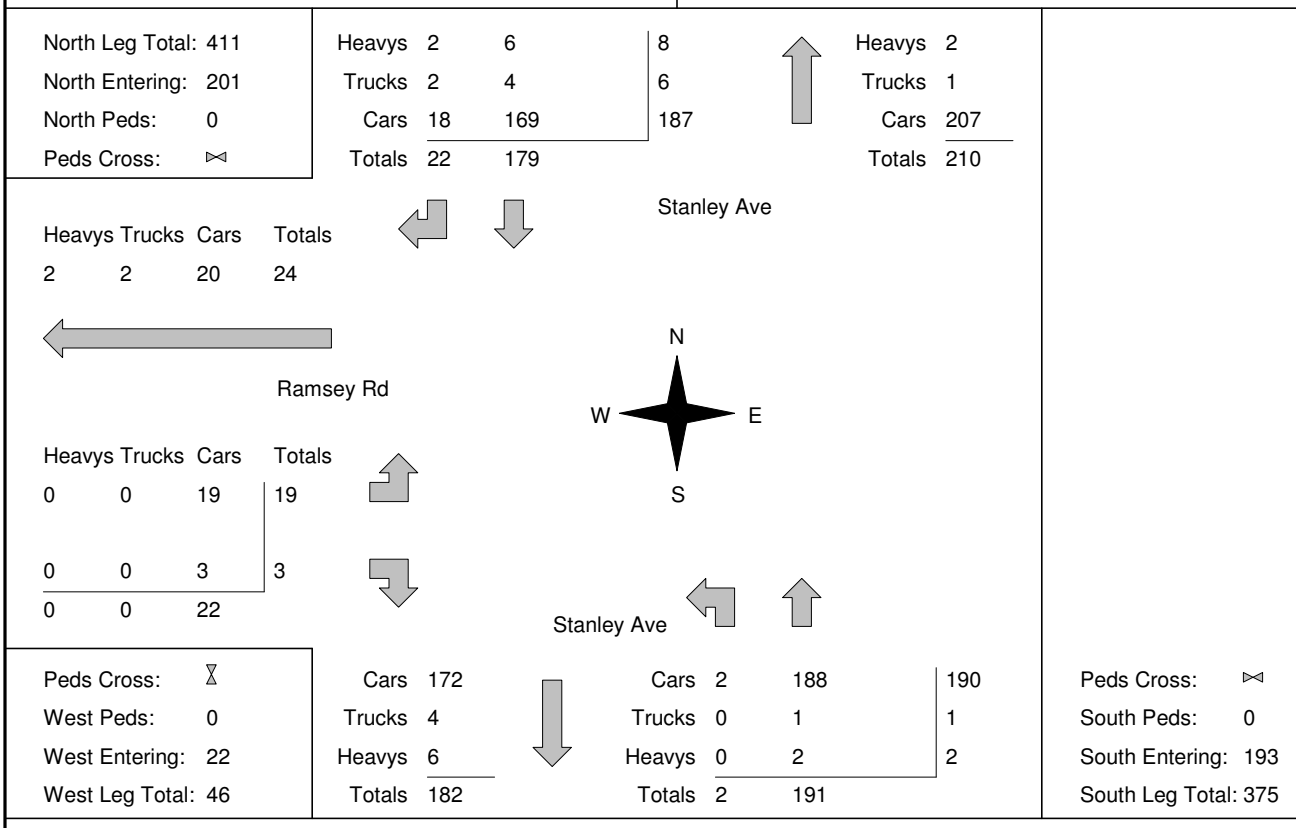
Municipality: Niagara Falls
Site #: 0000000003
Intersection: Stanley Ave & Ramsey Rd
TFR File #: 3
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Stanley Ave runs N/S



Comments

Stanley Ave @ Progress St

Morning Peak Diagram

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

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

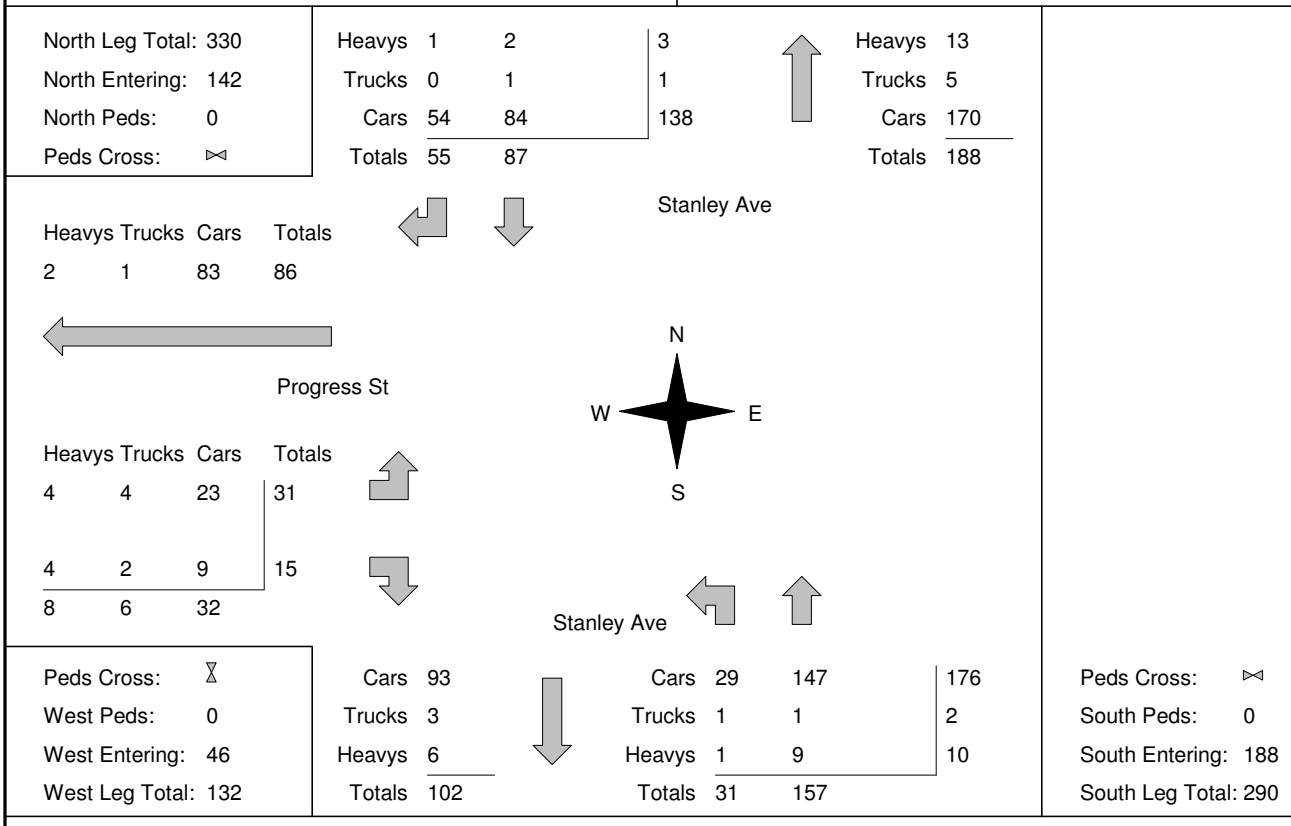
Municipality: Niagara Falls
Site #: 0000000004
Intersection: Stanley Ave & Progress St
TFR File #: 4
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Stanley Ave runs N/S



Comments

Stanley Ave @ Progress St

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

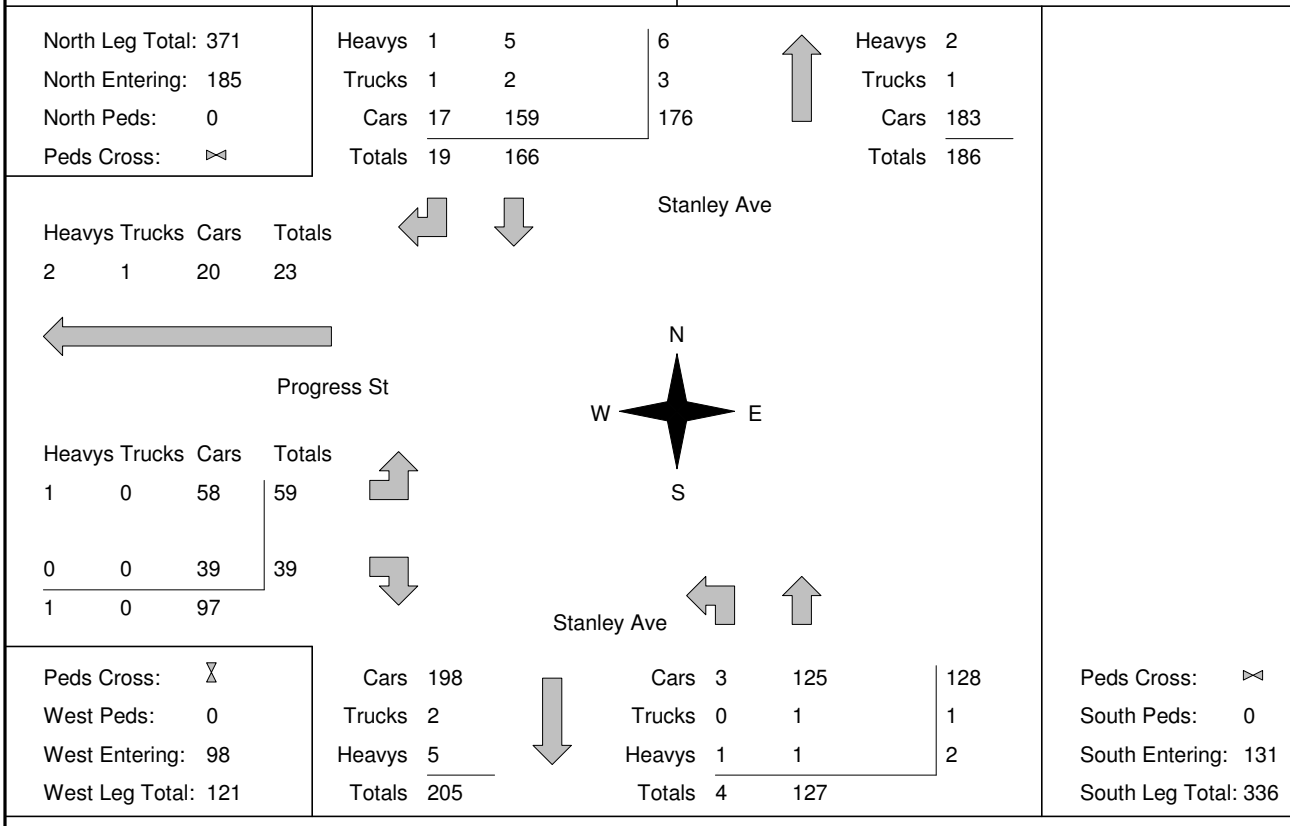
Municipality: Niagara Falls
Site #: 0000000004
Intersection: Stanley Ave & Progress St
TFR File #: 4
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Stanley Ave runs N/S



Comments

Stanley Ave @ Progress St

Total Count Diagram

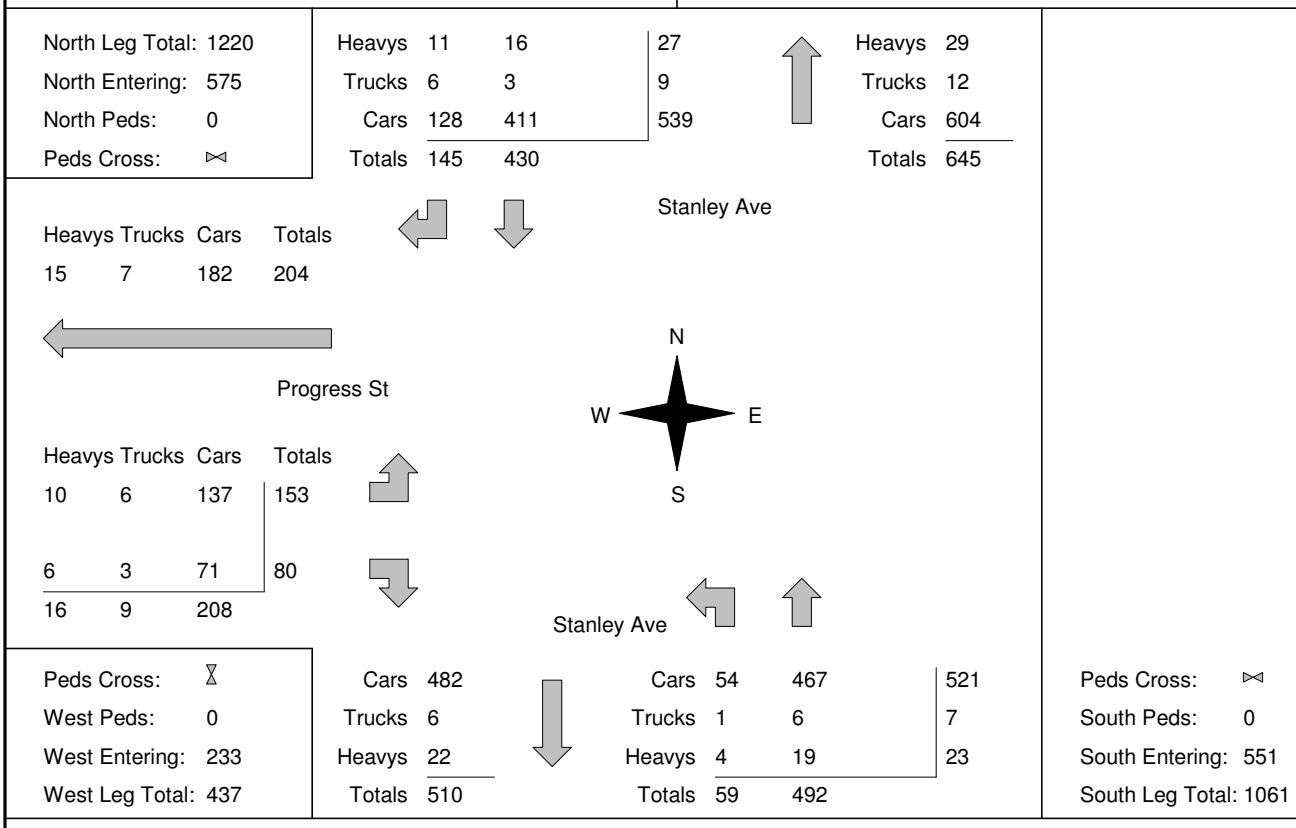
Municipality: Niagara Falls
Site #: 0000000004
Intersection: Stanley Ave & Progress St
TFR File #: 4
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Stanley Ave runs N/S



Comments

Stanley Ave @ Don Murie St

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

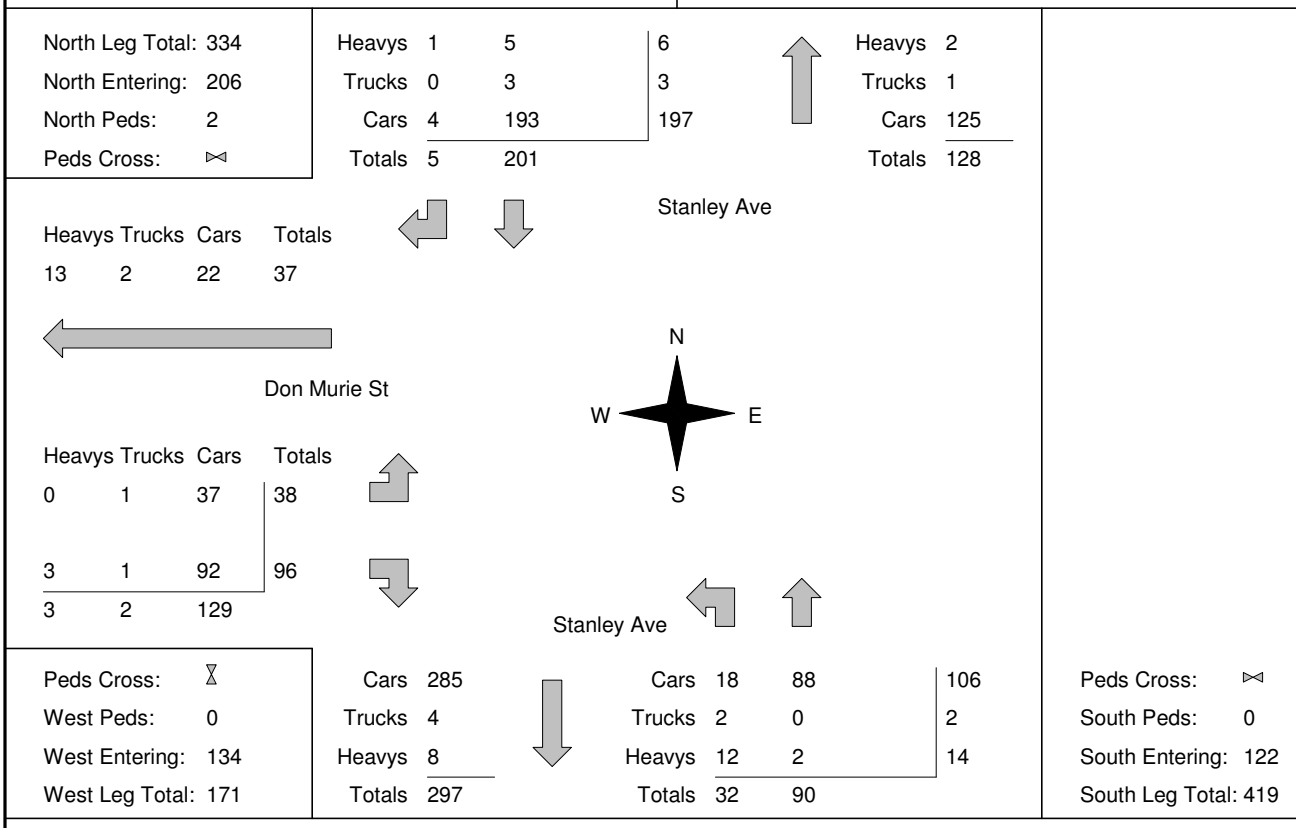
Municipality: Niagara Falls
Site #: 0000000005
Intersection: Stanley Ave & Don Murie St
TFR File #: 5
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Stanley Ave runs N/S



Comments

Stanley Ave @ Chippawa Pkwy

Morning Peak Diagram

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

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

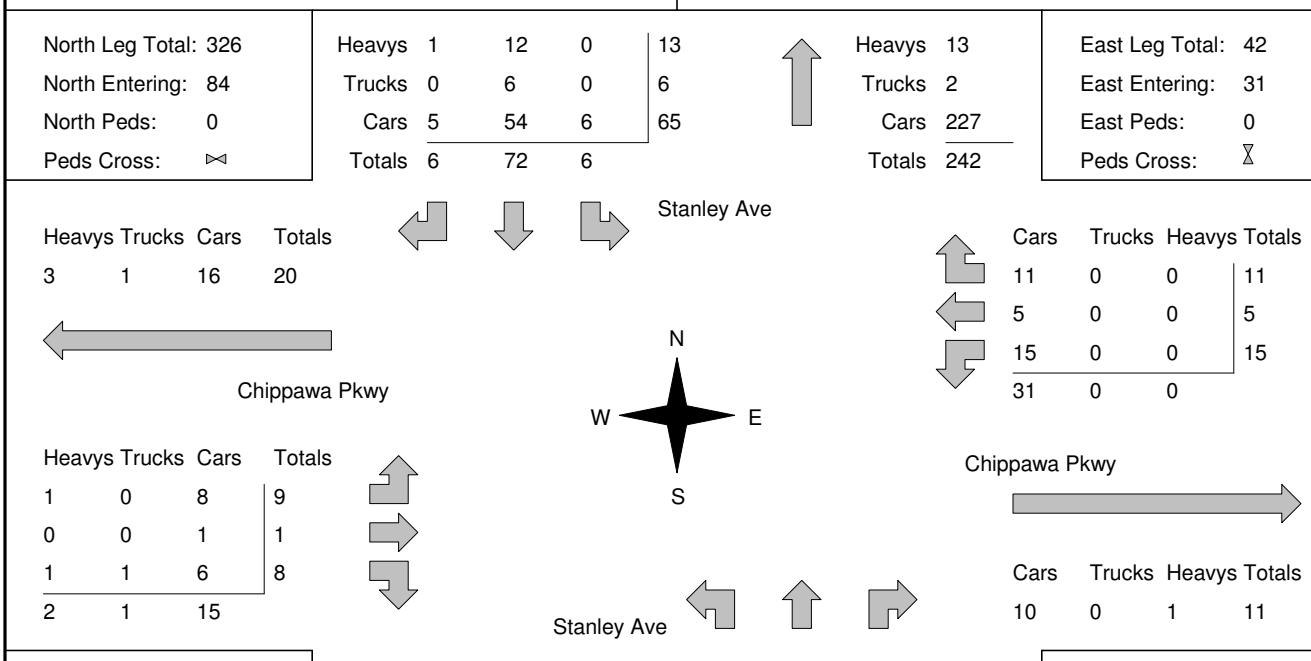
Municipality: Niagara Falls
Site #: 0000000006
Intersection: Stanley Ave & Chippawa Pkwy
TFR File #: 6
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Stanley Ave runs N/S



Comments

Stanley Ave @ Chippawa Pkwy

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

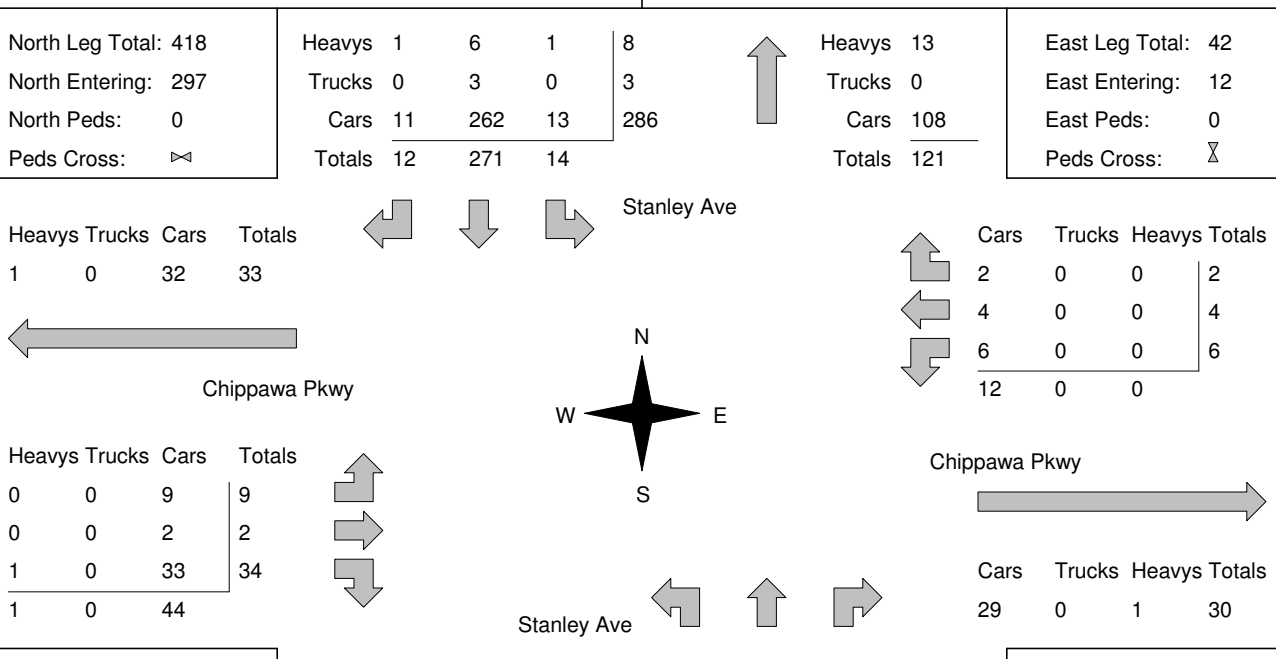
Municipality: Niagara Falls
Site #: 0000000006
Intersection: Stanley Ave & Chippawa Pkwy
TFR File #: 6
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Stanley Ave runs N/S



Comments

Stanley Ave @ Lyons Creek Rd

Morning Peak Diagram

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

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

Municipality: Niagara Falls
Site #: 0000000007
Intersection: Lyons Creek Rd & Stanley Ave
TFR File #: 7
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Lyons Creek Rd runs W/E

North Leg Total:	328		
North Entering:	95		
North Peds:	0		
Peds Cross:	⋈		
Heavys	10	1	11
Trucks	5	5	10
Cars	61	13	74
Totals	76	19	
Heavys	16		
Trucks	2		
Cars	215		
Totals	233		
East Leg Total:	399		
East Entering:	273		
East Peds:	0		
Peds Cross:	⧖		

Stanley Ave

Heavys	Trucks	Cars	Totals
16	7	278	301

	Cars	Trucks	Heavys	Totals
	42	1	5	48
	217	2	6	225
	259	3	11	

Lyons Creek Rd

N
W E
S

Heavys	Trucks	Cars	Totals
11	1	173	185
10	2	95	107
21	3	268	

Lyons Creek Rd

Cars	Trucks	Heavys	Totals
108	7	11	126

Peds Cross:	⧖
West Peds:	0
West Entering:	292
West Leg Total:	593

Comments

Stanley Ave @ Lyons Creek Rd

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Niagara Falls
Site #: 0000000007
Intersection: Lyons Creek Rd & Stanley Ave
TFR File #: 7
Count date: 22-Mar-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Lyons Creek Rd runs W/E

North Leg Total: 450
North Entering: 310
North Peds: 0
Peds Cross: ⋈

Heavys	7	1	8
Trucks	0	3	3
Cars	233	66	299
Totals	240	70	

Heavys	14
Trucks	1
Cars	125
Totals	140

East Leg Total: 545
East Entering: 204
East Peds: 0
Peds Cross: ⧖

Stanley Ave

Heavys	Trucks	Cars	Totals
10	2	398	410

	Cars	Trucks	Heavys	Totals
	33	1	0	34
	165	2	3	170
	198	3	3	

Lyons Creek Rd

N
W E
S

Heavys	Trucks	Cars	Totals
14	0	92	106
2	3	266	271
16	3	358	

Lyons Creek Rd

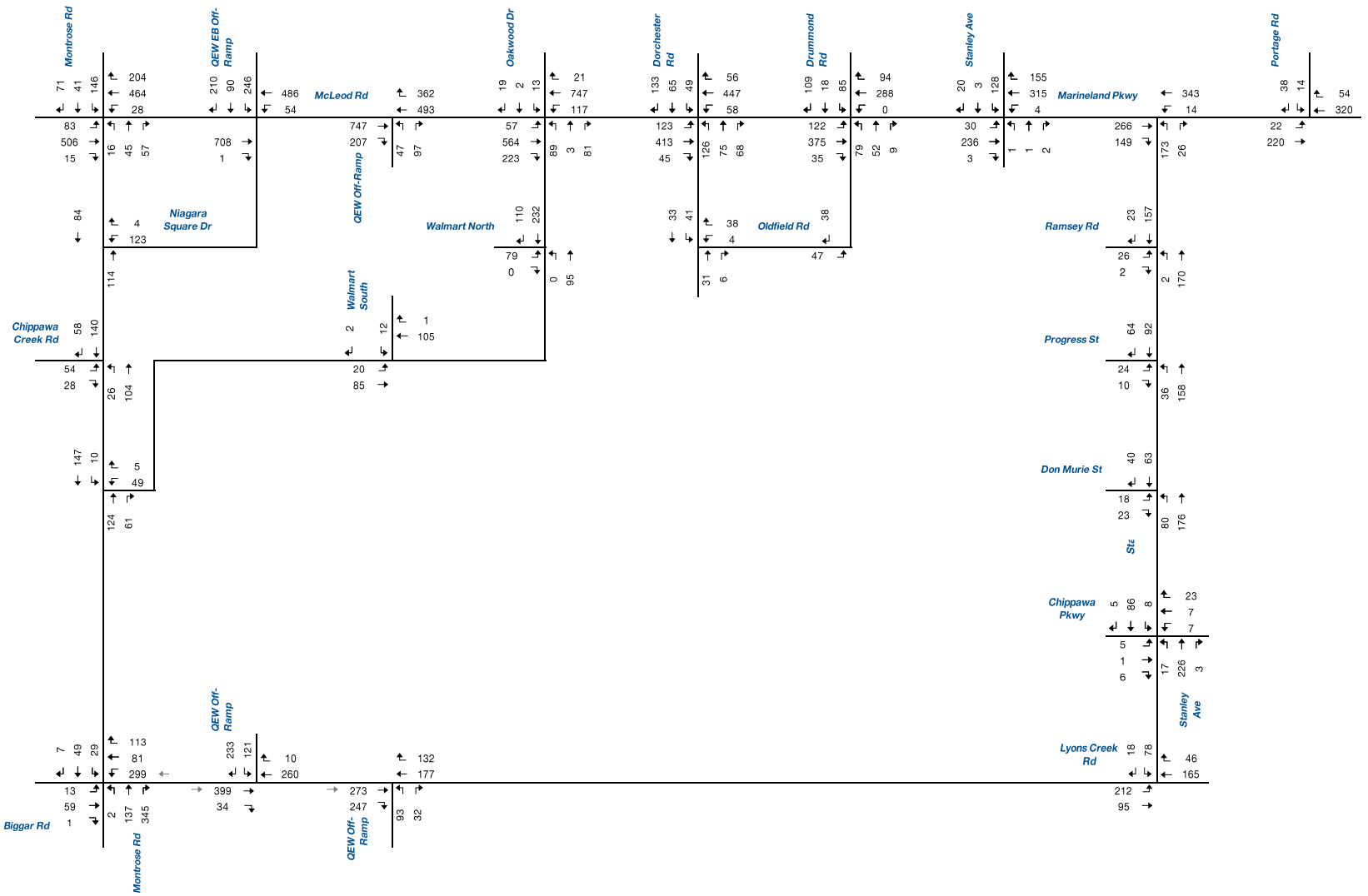
Cars	Trucks	Heavys	Totals
332	6	3	341

Peds Cross: ⧖
West Peds: 0
West Entering: 377
West Leg Total: 787

Comments

TABLE 2.1: TRAFFIC COUNT DATES

Intersection	Summer Weekday		Summer Weekend
	AM	PM	
McLeod Road & Montrose Road	2-Sep-15	2-Sep-15	5-Sep-15
McLeod Road & QEW Off-Ramp / Niagara Square Drive	2-Sep-15	2-Sep-15	29-Aug-15
McLeod Road & QEW Off-Ramp	2-Sep-15	2-Sep-15	29-Aug-15
McLeod Road & Oakwood Drive	Camera Malfunction	2-Sep-15	5-Sep-15
McLeod Road & Dorchester Road	27-Jul-15	27-Jul-15	5-Sep-15
McLeod Road & Drummond Road	29-Jul-15	29-Jul-15	5-Sep-15
Marineland Parkway & Stanley Avenue / Thundering Waters Boulevard	2-Sep-15	2-Sep-15	5-Sep-15
Marineland Parkway & Stanley Avenue	9-Sep-15	9-Sep-15	5-Sep-15
Marineland Parkway & Portage Road	2-Sep-15	2-Sep-15	5-Sep-15
Montrose Road & Niagara Square Drive	3-Sep-15	3-Sep-15	Not Counted
Montrose Road & Chippawa Creek Road	3-Sep-15	3-Sep-15	5-Sep-15
Montrose Road & Oakwood Drive	3-Sep-15	3-Sep-15	5-Sep-15
Montrose Road & Lyons Creek Road / Biggar Road	26-Aug-15	26-Aug-15	5-Sep-15
Lyons Creek Road & QEW Off-Ramp	2-Sep-15	2-Sep-15	29-Aug-15
Lyons Creek Road & QEW Off-Ramp	2-Sep-15	2-Sep-15	29-Aug-15
Lyons Creek Road & Stanley Avenue (North Leg)	3-Sep-15	3-Sep-15	5-Sep-15
Stanley Avenue & Ramsey Road	2-Sep-15	2-Sep-15	5-Sep-15
Stanley Avenue & Progress Street	2-Sep-15	2-Sep-15	5-Sep-15
Stanley Avenue & Don Murie Street	2-Sep-15	2-Sep-15	5-Sep-15
Stanley Avenue & Dorchester Road / Chippawa Parkway	3-Sep-15	3-Sep-15	5-Sep-15
Oakwood Drive & Walmart North Driveway	2-Sep-15	2-Sep-15	5-Sep-15
Oakwood Drive & Walmart South Driveway	2-Sep-15	2-Sep-15	5-Sep-15

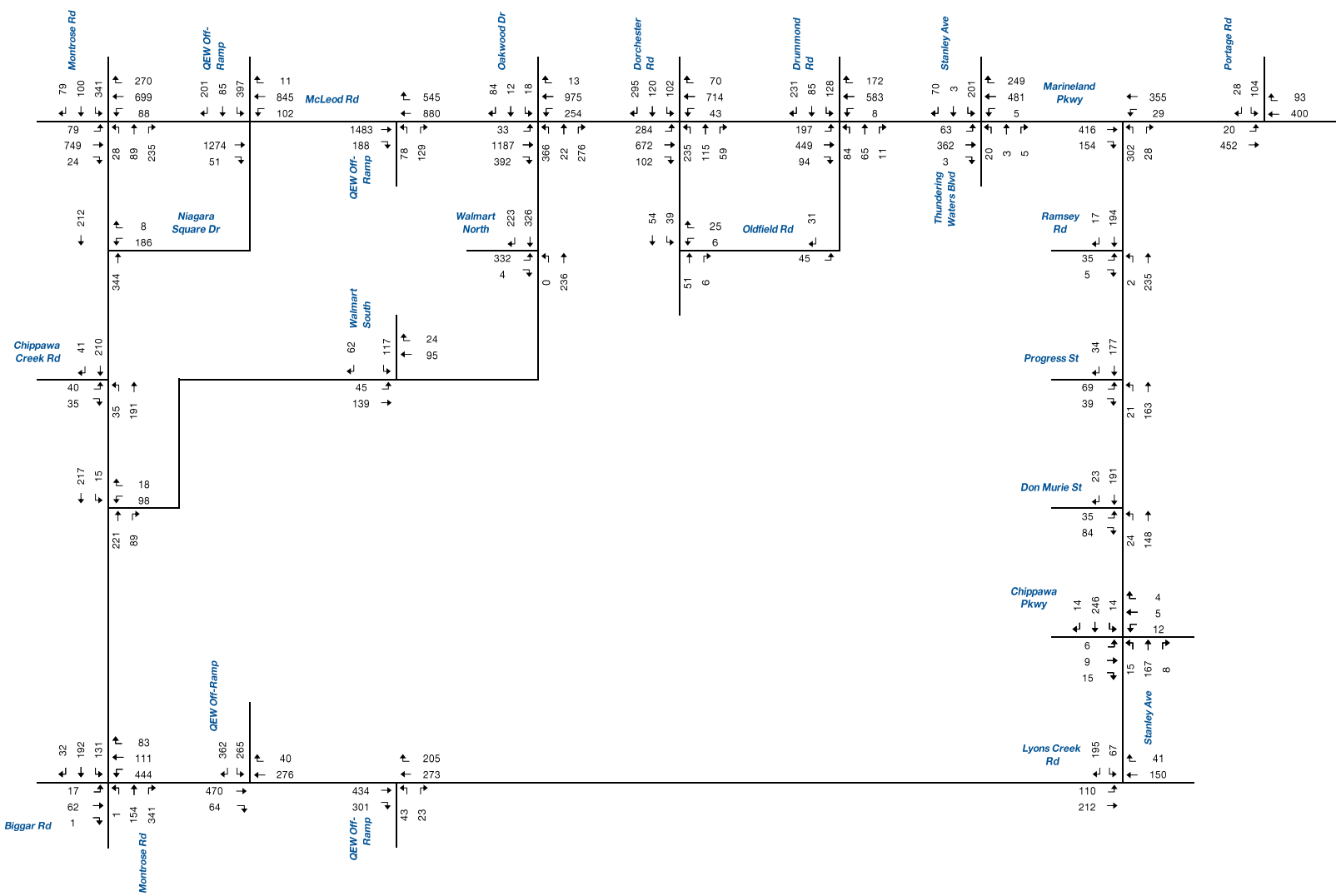


Existing Traffic Volumes (2017)

AM Peak Hour

Riverfront Community Transportation Assessment
151385

Figure 2.2



Existing Traffic Volumes (2017)

PM Peak Hour

Riverfront Community Transportation Assessment
151385

Figure 2.3

Signal Code: 049DRM						
Intersection: RR49 (McLEOD RD.) & DRUMMOND RD.						
Municipality: niagarafalls						
Owner: region						
Last Modified: 12/8/2016 8:55:24 AM						
Timing Parameters	**EBD ADV. McLEOD**	**EBD & WBD McLEOD**	**NBD & SBD DRUMMOND**	**n/a**	**n/a**	**n/a**
Min Green	**6**	**8**	**8**	**0**	**0**	**0**
Walk	**0**	**8**	**10**	**0**	**0**	**0**
Ped Clearance	**0**	**13**	**17**	**0**	**0**	**0**
Vehicle Ext.	**2.5**	**2.5**	**2.5**	**0**	**0**	**0**
Max Green	**14**	**40**	**35**	**0**	**0**	**0**
Yellow	**3**	**4.1**	**4.1**	**0**	**0**	**0**
All Red	**0**	**2**	**2**	**0**	**0**	**0**

		Offset
Minimum Cycle	**28.2**	**0**
Pedestrian Cycle	**60.2**	
Maximum Cycle	**104.2**	**0**
Operation	**FA**	

Installed On:
10/14/2011
Count Date:
7/17/2008

FA = Fully Actuated **SA = Semi Actuated** **FT = Fixed Time**

***Note: you need to change the paper orientation from Portriat to Landscape**

Signal Code: 49E102						
Intersection: RR49(Marineland Pkwy) & RR102(Stanley Ave. E.)						
Municipality: niagarafalls						
Owner: Region						
Last Modified: 5/15/2018 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:
10/19/2010
Count Date:
9/9/2015

FA = Fully Actuated **SA = Semi Actuated** **FT = Fixed Time**

***Note: you need to change the paper orientation from Portriat to Landscape**

Signal Code: 49W102						
Intersection: RR49 (Marineland Pkwy) & RR102 (Stanley Ave. W.)						
Municipality: niagarafalls						
Owner: Region						
Last Modified: 12/10/2013 9:45:41 AM						
Timing Parameters	**EBD ADVANCE MARINELAND PKWY**	**EBD & WBD THRU MARINELAND PKWY**	**NBD THRU THUNDERING WATERS ENT.**	**SBD THRU STANLEY AVE.**	**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**	**2**	**2**	**2**	**0**	**0**

		Offset
Minimum Cycle	28.2	0
Pedestrian Cycle	74.2	
Maximum Cycle	118.3	0
Operation	FA	

Installed On:
8/6/2009
Count Date:
7/24/2013

FA = Fully Actuated **SA = Semi Actuated** **FT = Fixed Time**

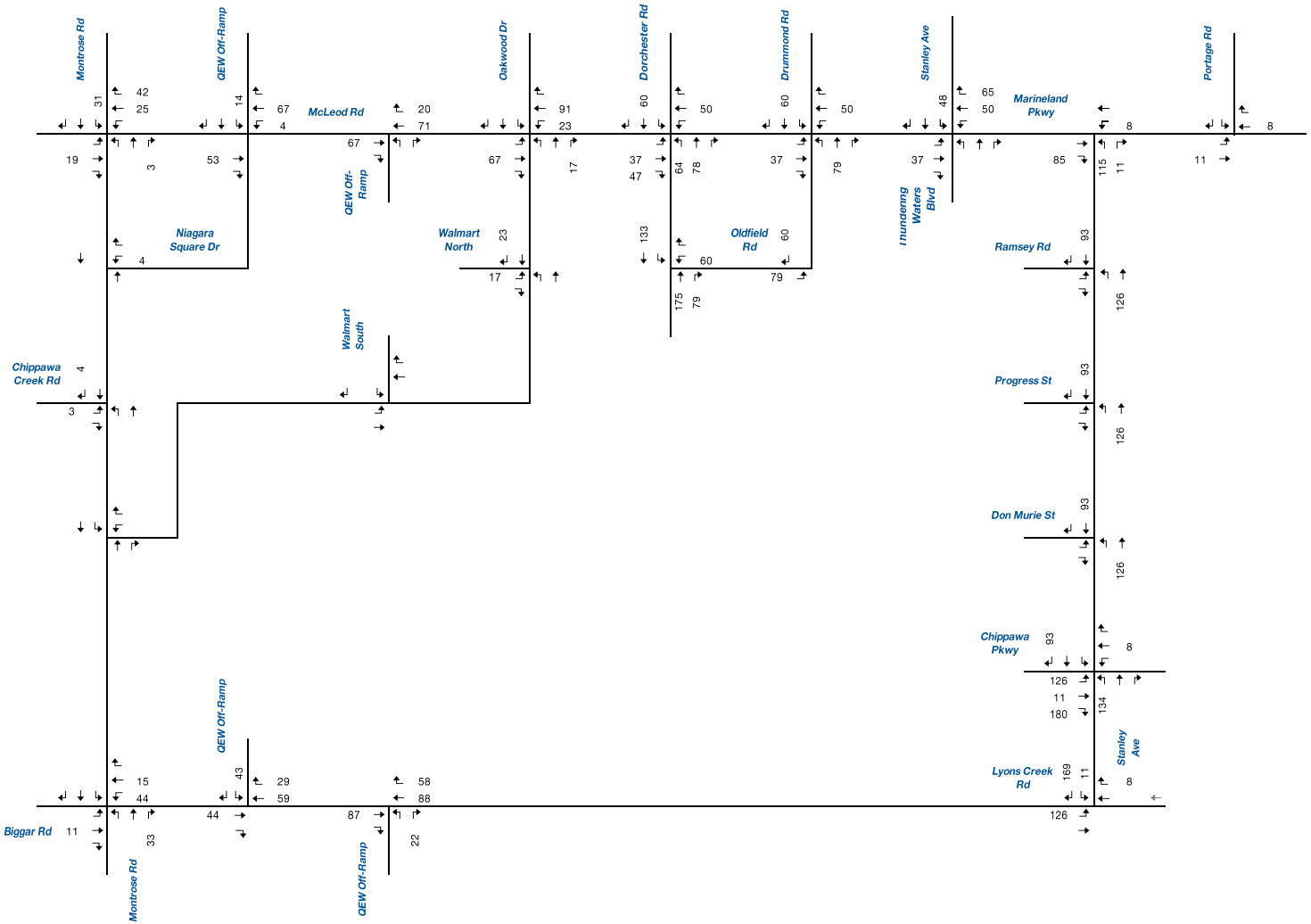
***Note: you need to change the paper orientation from Portriat to Landscape**

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix E

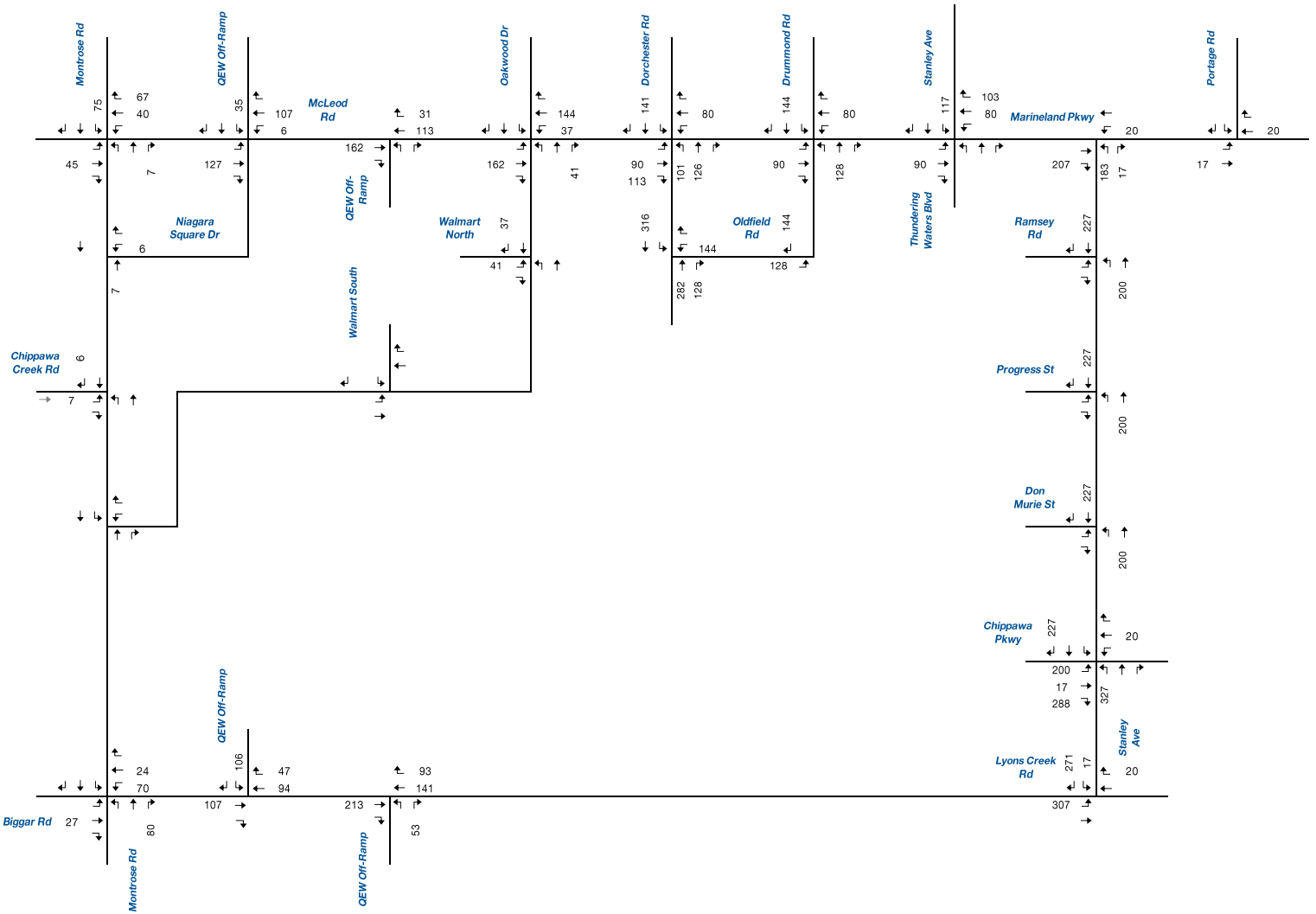
Background Development Site Traffic



Development Generated Traffic Volumes

AM Peak Hour

Figure 3.11

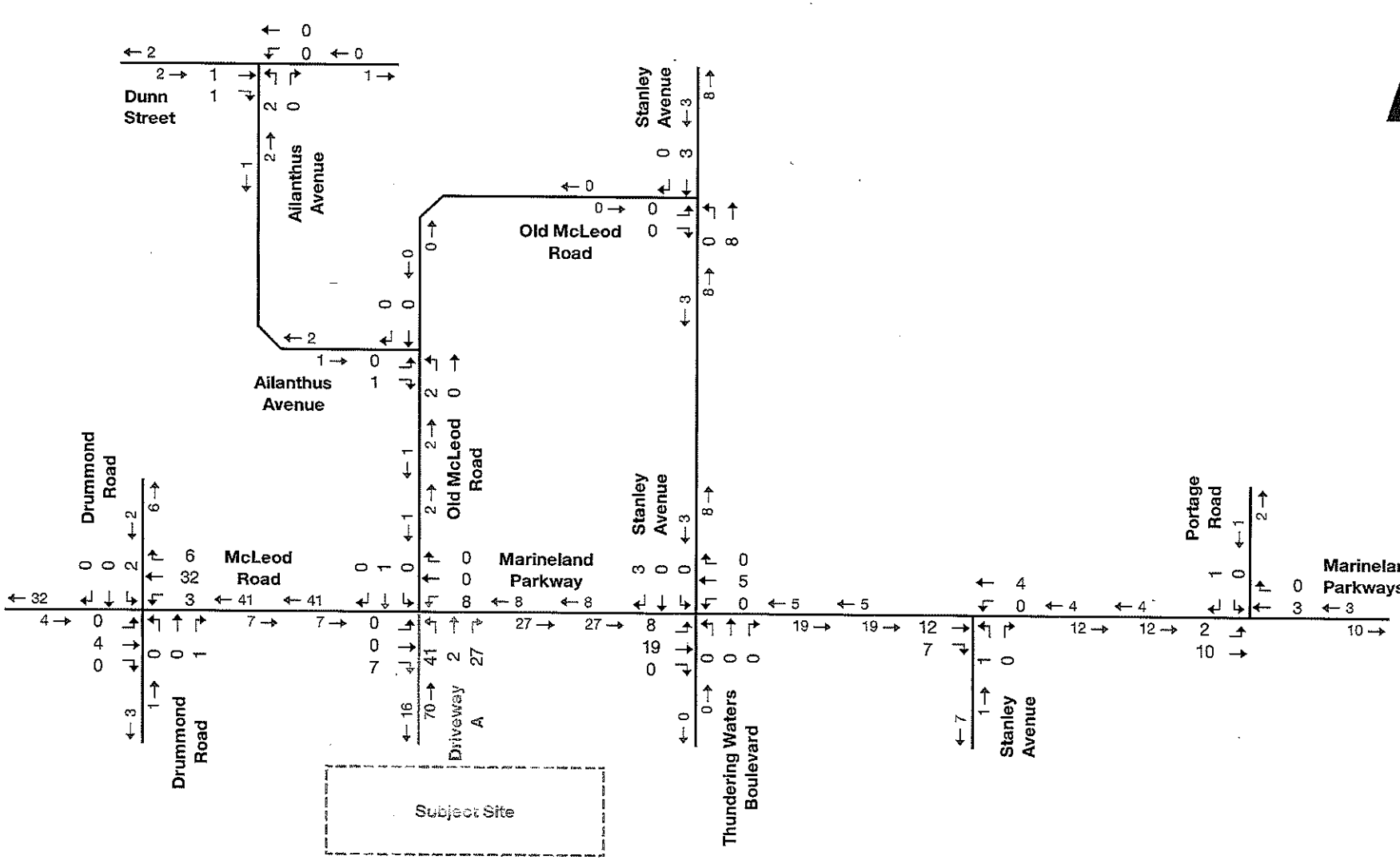


Development Generated Traffic Volumes

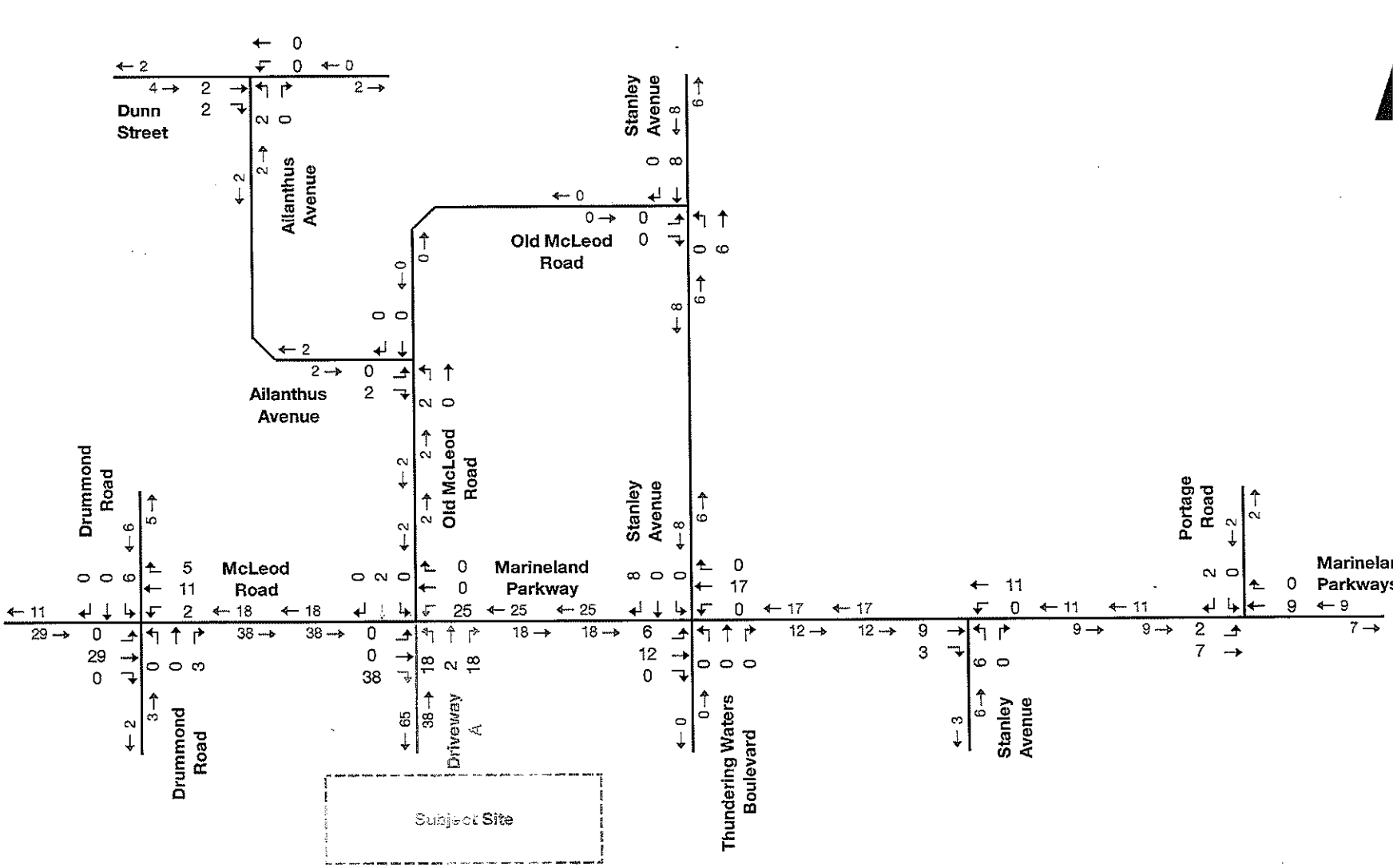
PM Peak Hour

Riverfront Community Transportation Assessment
151385

Figure 3.12



Site Generated AM Peak Hour Traffic Volumes

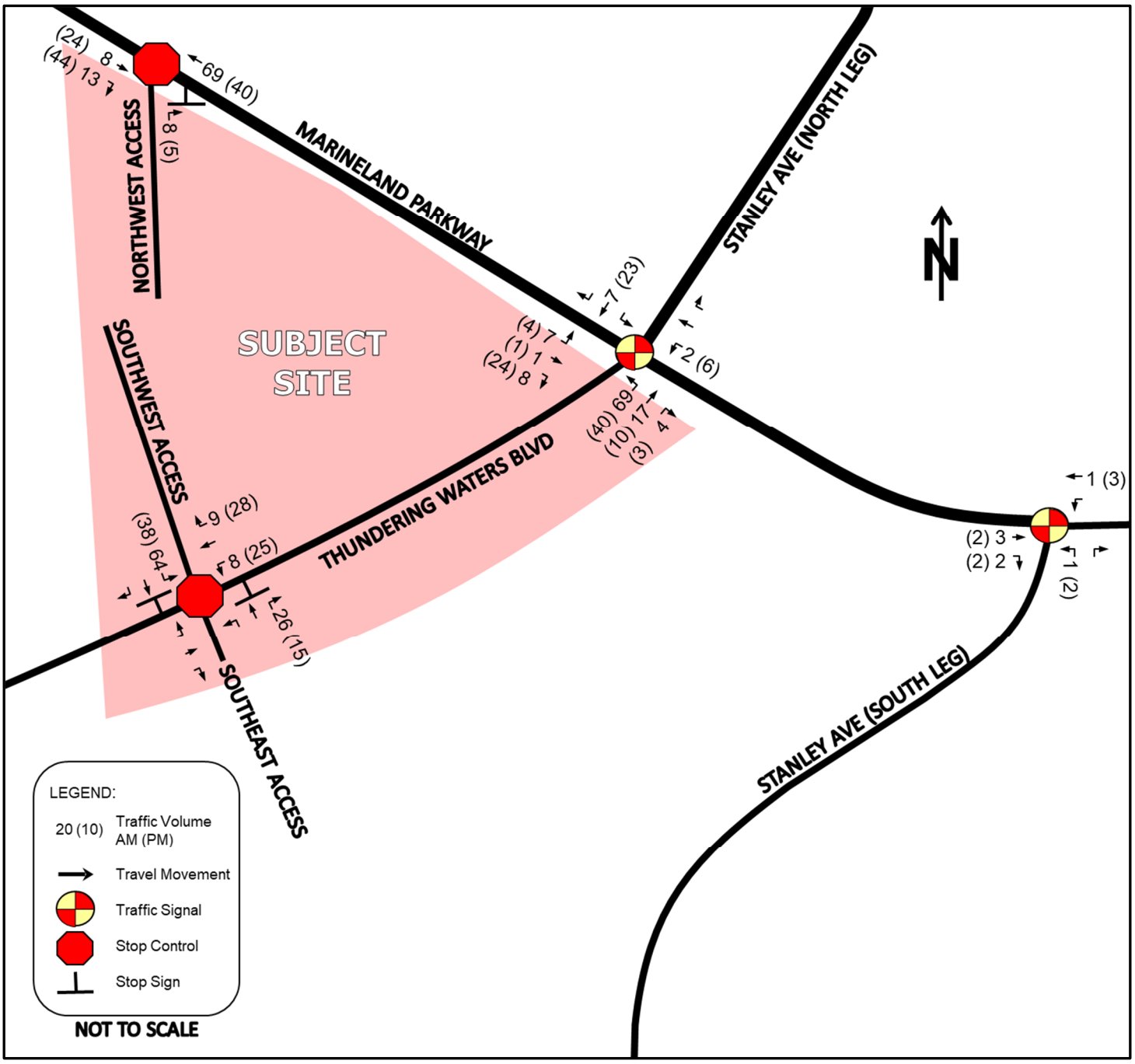


Site Generated PM Peak Hour Traffic Volumes

Nina's Court on Marineland, Niagara Falls Transportation Impact Study
162630

Figure 3.2B

Figure 14 – Proposed Development Traffic Assignment



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix F

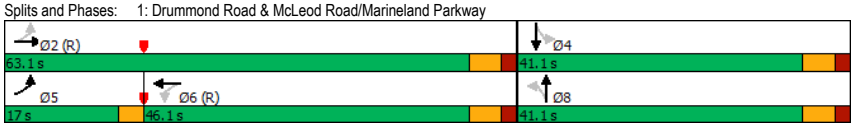
Existing Traffic Operations

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	154	300	10	293	88	84	83	59
Future Volume (vph)	154	300	10	293	88	84	83	59
Lane Group Flow (vph)	0	550	0	467	0	202	91	234
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1
Total Split (s)	17.0	63.1	46.1	46.1	41.1	41.1	41.1	41.1
Total Split (%)	16.3%	60.6%	44.2%	44.2%	39.4%	39.4%	39.4%	39.4%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)		6.1		6.1		6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max
v/c Ratio		0.44		0.28		0.48	0.24	0.37
Control Delay		15.0		11.1		31.7	27.2	12.8
Queue Delay		0.0		0.0		0.0	0.0	0.0
Total Delay		15.0		11.1		31.7	27.2	12.8
Queue Length 50th (m)		32.1		21.1		31.5	13.2	14.1
Queue Length 95th (m)		45.0		30.3		53.3	25.8	33.1
Internal Link Dist (m)		299.5		1002.2		718.1		408.3
Turn Bay Length (m)							20.0	
Base Capacity (vph)		1251		1697		417	380	639
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		0.44		0.28		0.48	0.24	0.37

Intersection Summary

Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	300	46	10	293	122	88	84	12	83	59	154
Future Volume (vph)	154	300	46	10	293	122	88	84	12	83	59	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1			6.1			6.1		6.1	6.1	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frpb, 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		0.98			1.00			0.98		0.95	1.00	
Satd. Flow (prot)		3298			3238			1820		1743	1636	
Flt Permitted		0.68			0.94			0.66		0.62	1.00	
Satd. Flow (perm)		2275			3046			1235		1132	1636	
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)	169	330	51	11	322	134	97	92	13	91	65	169
RTOR Reduction (vph)	0	7	0	0	30	0	0	3	0	0	90	0
Lane Group Flow (vph)	0	543	0	0	437	0	0	199	0	91	144	0
Confl. Peds. (#/hr)	8		2	2		8	3		9	9		3
Heavy Vehicles (%)	8%	6%	9%	40%	6%	5%	2%	1%	8%	4%	5%	3%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		57.0			57.0			35.0		35.0	35.0	
Effective Green, g (s)		57.0			57.0			35.0		35.0	35.0	
Actuated g/C Ratio		0.55			0.55			0.34		0.34	0.34	
Clearance Time (s)		6.1			6.1			6.1		6.1	6.1	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1244			1666			414		380	549	
v/s Ratio Prot											0.09	
v/s Ratio Perm		c0.24			0.14			c0.16		0.08		
v/c Ratio		0.44			0.26			0.48		0.24	0.26	
Uniform Delay, d1		14.0			12.5			27.4		25.0	25.2	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.4			4.0		1.5	1.2	
Delay (s)		14.3			12.9			31.4		26.5	26.4	
Level of Service		B			B			C		C	C	
Approach Delay (s)		14.3			12.9			31.4			26.4	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	100.3%	ICU Level of Service	G
Analysis Period (min)	15		

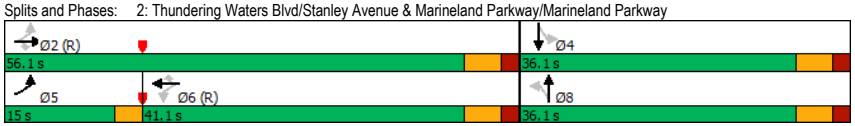
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	29	286	10	3	299	188	5	15	141	19
Future Volume (vph)	29	286	10	3	299	188	5	15	141	19
Lane Group Flow (vph)	33	325	11	3	340	214	6	24	160	53
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	15.0	56.1	56.1	41.1	41.1	41.1	36.1	36.1	36.1	36.1
Total Split (%)	16.3%	60.8%	60.8%	44.6%	44.6%	44.6%	39.2%	39.2%	39.2%	39.2%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.06	0.17	0.01	0.01	0.21	0.26	0.01	0.04	0.39	0.10
Control Delay	8.8	10.9	0.2	15.0	15.3	3.3	21.4	17.1	27.6	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	10.9	0.2	15.0	15.3	3.3	21.4	17.1	27.6	12.3
Queue Length 50th (m)	2.4	14.4	0.0	0.3	19.1	0.0	0.7	2.0	21.7	2.7
Queue Length 95th (m)	6.0	20.6	0.3	1.8	28.1	11.3	3.3	7.1	37.9	10.3
Internal Link Dist (m)		1002.2			127.7			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	590	1940	902	509	1615	809	451	600	409	545
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	0.06	0.17	0.01	0.01	0.21	0.26	0.01	0.04	0.39	0.10

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	286	10	3	299	188	5	15	6	141	19	27
Future Volume (vph)	29	286	10	3	299	188	5	15	6	141	19	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1598	3579	1633	1825	3380	1460	1825	1830		1614	1613	
Flt Permitted	0.51	1.00	1.00	0.56	1.00	1.00	0.72	1.00		0.74	1.00	
Satd. Flow (perm)	860	3579	1633	1067	3380	1460	1388	1830		1260	1613	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	33	325	11	3	340	214	6	17	7	160	22	31
RTOR Reduction (vph)	0	0	5	0	0	114	0	5	0	0	21	0
Lane Group Flow (vph)	33	325	6	3	340	100	6	19	0	160	32	0
Confl. Peds. (#/hr)	4					4			1	1		
Heavy Vehicles (%)	14%	2%	0%	0%	8%	9%	0%	0%	0%	13%	11%	7%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	50.0	50.0	50.0	42.9	42.9	42.9	30.0	30.0		30.0	30.0	
Effective Green, g (s)	50.0	50.0	50.0	42.9	42.9	42.9	30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.47	0.47	0.47	0.33	0.33		0.33	0.33	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	499	1940	885	496	1572	679	451	595		409	524	
v/s Ratio Prot	0.00	c0.09			c0.10			0.01			0.02	
v/s Ratio Perm	0.03		0.00	0.00		0.07	0.00			c0.13		
v/c Ratio	0.07	0.17	0.01	0.01	0.22	0.15	0.01	0.03		0.39	0.06	
Uniform Delay, d1	9.9	10.6	9.7	13.2	14.7	14.1	21.1	21.2		24.0	21.4	
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	0.1	0.2	0.0	0.0	0.3	0.5	0.1	0.1		0.6	0.0	
Delay (s)	10.0	10.8	9.7	13.2	15.0	14.6	21.1	21.3		24.7	21.5	
Level of Service	A	B	A	B	B	B	C	C		C	C	
Approach Delay (s)		10.7			14.8			21.3			23.9	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	15.2	
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			

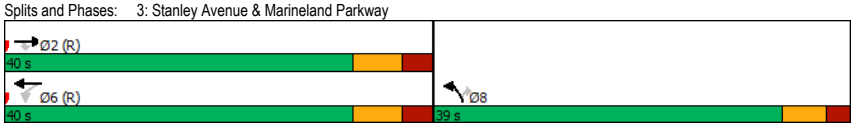
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	236	193	23	336	155	30
Future Volume (vph)	236	193	23	336	155	30
Lane Group Flow (vph)	265	217	26	378	174	34
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
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)	40.0	40.0	40.0	40.0	39.0	39.0
Total Split (%)	50.6%	50.6%	50.6%	50.6%	49.4%	49.4%
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)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.19	0.29	0.06	0.26	0.14	0.05
Control Delay	15.3	3.4	14.6	16.0	14.9	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	3.4	14.6	16.0	14.9	5.5
Queue Length 50th (m)	12.9	0.0	2.3	19.1	8.1	0.0
Queue Length 95th (m)	20.2	11.3	6.8	28.0	13.8	4.8
Internal Link Dist (m)	100.3			324.3	152.7	
Turn Bay Length (m)		33.0	29.0		140.0	32.0
Base Capacity (vph)	1416	761	446	1430	1244	664
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	0.19	0.29	0.06	0.26	0.14	0.05

Intersection Summary

Cycle Length: 79
Actuated Cycle Length: 79
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: Stanley Avenue & Marineland Parkway

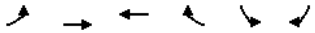


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	236	193	23	336	155	30
Future Volume (vph)	236	193	23	336	155	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	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
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)	3444	1541	1755	3476	3026	1566
Flt Permitted	1.00	1.00	0.59	1.00	0.95	1.00
Satd. Flow (perm)	3444	1541	1087	3476	3026	1566
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	265	217	26	378	174	34
RTOR Reduction (vph)	0	128	0	0	0	20
Lane Group Flow (vph)	265	89	26	378	174	14
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	6%	6%	4%	5%	17%	3%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	32.5	32.5	32.5	32.5	32.5	32.5
Effective Green, g (s)	32.5	32.5	32.5	32.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1416	633	447	1430	1244	644
v/s Ratio Prot	0.08			c0.11	c0.06	
v/s Ratio Perm		0.06	0.02			0.01
v/c Ratio	0.19	0.14	0.06	0.26	0.14	0.02
Uniform Delay, d1	14.8	14.5	14.0	15.4	14.5	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.5	0.2	0.5	0.2	0.1
Delay (s)	15.1	15.0	14.3	15.8	14.8	13.9
Level of Service	B	B	B	B	B	B
Approach Delay (s)	15.1			15.7	14.6	
Approach LOS	B			B	B	

Intersection Summary

HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	225	328	59	14	39
Future Volume (Veh/h)	22	225	328	59	14	39
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)	24	245	357	64	15	42
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		348				
pX, platoon unblocked						
vC, conflicting volume	357				528	178
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	357				528	178
tC, single (s)	4.4				6.9	7.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.4
p0 queue free %	98				97	95
cM capacity (veh/h)	1117				463	797

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	106	163	178	178	64	15	42
Volume Left	24	0	0	0	0	15	0
Volume Right	0	0	0	0	64	0	42
cSH	1117	1700	1700	1700	1700	463	797
Volume to Capacity	0.02	0.10	0.10	0.10	0.04	0.03	0.05
Queue Length 95th (m)	0.5	0.0	0.0	0.0	0.0	0.8	1.3
Control Delay (s)	2.0	0.0	0.0	0.0	0.0	13.0	9.8
Lane LOS	A					B	A
Approach Delay (s)	0.8		0.0			10.6	
Approach LOS						B	

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	29.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	1	1	177	148	10
Future Volume (Veh/h)	16	1	1	177	148	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	22	1	1	242	203	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	454	210	217			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	454	210	217			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	96	100	100			
cM capacity (veh/h)	544	835	1365			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	243	217
Volume Left	22	1	0
Volume Right	1	0	14
cSH	552	1365	1700
Volume to Capacity	0.04	0.00	0.13
Queue Length 95th (m)	1.0	0.0	0.0
Control Delay (s)	11.8	0.0	0.0
Lane LOS	B	A	
Approach Delay (s)	11.8	0.0	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	20.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	15	32	162	90	57
Future Volume (Veh/h)	32	15	32	162	90	57
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	41	19	41	208	115	73
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	442	152	188			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	442	152	188			
tC, single (s)	6.7	6.6	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.7	2.3			
p0 queue free %	92	98	97			
cM capacity (veh/h)	515	804	1362			

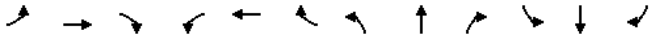
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	60	249	188
Volume Left	41	41	0
Volume Right	19	0	73
cSH	581	1362	1700
Volume to Capacity	0.10	0.03	0.11
Queue Length 95th (m)	2.6	0.7	0.0
Control Delay (s)	11.9	1.5	0.0
Lane LOS	B	A	
Approach Delay (s)	11.9	1.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		2.2	
Intersection Capacity Utilization		31.8%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	29	68	191	55	41
Future Volume (Veh/h)	10	29	68	191	55	41
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	14	41	97	273	79	59
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	576	108	138			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	576	108	138			
tC, single (s)	6.5	6.5	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.6	2.3			
p0 queue free %	97	95	93			
cM capacity (veh/h)	434	870	1421			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	55	370	138
Volume Left	14	97	0
Volume Right	41	0	59
cSH	693	1421	1700
Volume to Capacity	0.08	0.07	0.08
Queue Length 95th (m)	2.0	1.7	0.0
Control Delay (s)	10.6	2.5	0.0
Lane LOS	B	A	
Approach Delay (s)	10.6	2.5	0.0
Approach LOS	B		

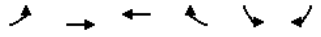
Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization		30.5%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1	8	15	5	11	9	229	4	6	74	6
Future Volume (Veh/h)	9	1	8	15	5	11	9	229	4	6	74	6
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)	11	1	10	18	6	13	11	273	5	7	88	7
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	419	406	92	414	406	276	95			278		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	419	406	92	414	406	276	95			278		
tC, single (s)	7.2	6.5	6.5	7.1	6.5	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.5	3.5	4.0	3.3	2.5			2.2		
p0 queue free %	98	100	99	97	99	98	99			99		
cM capacity (veh/h)	510	530	906	540	530	768	1325			1296		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	37	289	102
Volume Left	11	18	11	7
Volume Right	10	13	5	7
cSH	638	601	1325	1296
Volume to Capacity	0.03	0.06	0.01	0.01
Queue Length 95th (m)	0.8	1.5	0.2	0.1
Control Delay (s)	10.8	11.4	0.4	0.6
Lane LOS	B	B	A	A
Approach Delay (s)	10.8	11.4	0.4	0.6
Approach LOS	B	B		

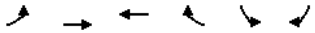
Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	24.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	191	110	232	49	20	78
Future Volume (Veh/h)	191	110	232	49	20	78
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	205	118	249	53	22	84
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	302				804	276
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	302				804	276
tC, single (s)	4.2				6.7	6.4
tC, 2 stage (s)						
tF (s)	2.3				3.8	3.5
p0 queue free %	83				92	88
cM capacity (veh/h)	1237				262	722

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	205	118	302	22	84
Volume Left	205	0	0	22	0
Volume Right	0	0	53	0	84
cSH	1237	1700	1700	262	722
Volume to Capacity	0.17	0.07	0.18	0.08	0.12
Queue Length 95th (m)	4.5	0.0	0.0	2.1	3.0
Control Delay (s)	8.5	0.0	0.0	20.0	10.6
Lane LOS	A			C	B
Approach Delay (s)	5.4		0.0	12.6	
Approach LOS				B	

Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	39.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	0	0	13	4	38
Future Volume (Veh/h)	47	0	0	13	4	38
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	0	0	14	4	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	42	28	49	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	42	28	49	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	95	100	100	99	100	
cM capacity (veh/h)	946	862	840	1085	1623	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	51	14	45
Volume Left	51	0	4
Volume Right	0	14	41
cSH	946	1085	1623
Volume to Capacity	0.05	0.01	0.00
Queue Length 95th (m)	1.3	0.3	0.1
Control Delay (s)	9.0	8.4	0.7
Lane LOS	A	A	A
Approach Delay (s)	9.0	8.4	0.7
Approach LOS	A	A	

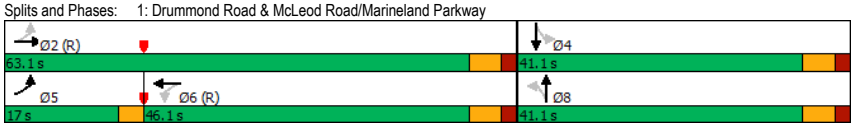
Intersection Summary				
Average Delay	5.5			
Intersection Capacity Utilization	19.3%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	232	339	10	450	68	78	117	90
Future Volume (vph)	232	339	10	450	68	78	117	90
Lane Group Flow (vph)	0	694	0	606	0	176	124	347
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1
Total Split (s)	17.0	63.1	46.1	46.1	41.1	41.1	41.1	41.1
Total Split (%)	16.3%	60.6%	44.2%	44.2%	39.4%	39.4%	39.4%	39.4%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)		6.1		6.1		6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max
v/c Ratio		0.59		0.34		0.48	0.31	0.54
Control Delay		17.8		13.0		31.6	28.3	20.0
Queue Delay		0.0		0.0		0.0	0.0	0.0
Total Delay		17.8		13.0		31.6	28.3	20.0
Queue Length 50th (m)		45.3		32.1		26.8	18.4	33.4
Queue Length 95th (m)		63.3		43.2		47.7	33.8	60.7
Internal Link Dist (m)		299.5		1002.2		715.1		408.3
Turn Bay Length (m)							20.0	
Base Capacity (vph)		1171		1792		366	403	648
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		0.59		0.34		0.48	0.31	0.54

Intersection Summary

Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	339	81	10	450	109	68	78	20	117	90	236
Future Volume (vph)	232	339	81	10	450	109	68	78	20	117	90	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1			6.1			6.1		6.1	6.1	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frpb, ped/bikes		0.99			0.99			1.00		1.00	0.98	
Flpb, ped/bikes		1.00			1.00			1.00		0.99	1.00	
Frt		0.98			0.97			0.98		1.00	0.89	
Flt Protected		0.98			1.00			0.98		0.95	1.00	
Satd. Flow (prot)		3401			3455			1812		1801	1663	
Flt Permitted		0.61			0.94			0.58		0.63	1.00	
Satd. Flow (perm)		2121			3250			1079		1202	1663	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	247	361	86	11	479	116	72	83	21	124	96	251
RTOR Reduction (vph)	0	11	0	0	14	0	0	5	0	0	90	0
Lane Group Flow (vph)	0	683	0	0	592	0	0	171	0	124	257	0
Confl. Peds. (#/hr)	11		9	9		11	8		16	16		8
Heavy Vehicles (%)	1%	4%	1%	0%	2%	0%	0%	1%	10%	0%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		57.0			57.0			35.0		35.0	35.0	
Effective Green, g (s)		57.0			57.0			35.0		35.0	35.0	
Actuated g/C Ratio		0.55			0.55			0.34		0.34	0.34	
Clearance Time (s)		6.1			6.1			6.1		6.1	6.1	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1160			1777			362		403	558	
v/s Ratio Prot											0.15	
v/s Ratio Perm		c0.32			0.18			c0.16		0.10		
v/c Ratio		0.59			0.33			0.47		0.31	0.46	
Uniform Delay, d1		15.8			13.1			27.3		25.6	27.2	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.8			0.5			4.4		2.0	2.7	
Delay (s)		16.5			13.6			31.7		27.6	29.9	
Level of Service		B			B			C		C	C	
Approach Delay (s)		16.5			13.6			31.7			29.3	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	101.6%	ICU Level of Service	G
Analysis Period (min)	15		

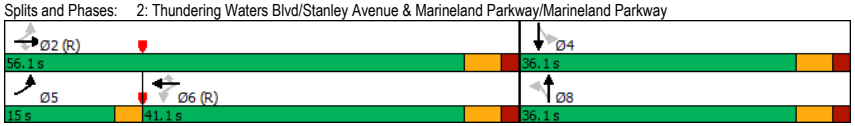
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	43	310	8	7	441	186	15	11	227	16
Future Volume (vph)	43	310	8	7	441	186	15	11	227	16
Lane Group Flow (vph)	51	369	10	8	525	221	18	17	270	83
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	15.0	56.1	56.1	41.1	41.1	41.1	36.1	36.1	36.1	36.1
Total Split (%)	16.3%	60.8%	60.8%	44.6%	44.6%	44.6%	39.2%	39.2%	39.2%	39.2%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.10	0.19	0.01	0.02	0.31	0.26	0.04	0.03	0.63	0.14
Control Delay	9.0	11.1	0.0	15.4	16.4	3.2	21.7	18.3	34.0	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	11.1	0.0	15.4	16.4	3.2	21.7	18.3	34.0	9.0
Queue Length 50th (m)	3.7	16.5	0.0	0.8	31.3	0.0	2.2	1.6	40.2	2.3
Queue Length 95th (m)	7.7	22.1	0.0	3.2	40.7	9.9	6.4	5.6	60.7	10.6
Internal Link Dist (m)		1002.2			87.3			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	579	1903	902	486	1703	855	438	605	431	573
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	0.19	0.01	0.02	0.31	0.26	0.04	0.03	0.63	0.14

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	310	8	7	441	186	15	11	3	227	16	54
Future Volume (vph)	43	310	8	7	441	186	15	11	3	227	16	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	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	0.85	1.00	0.96		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3510	1633	1825	3579	1555	1821	1853		1690	1629	
Flt Permitted	0.40	1.00	1.00	0.53	1.00	1.00	0.70	1.00		0.75	1.00	
Satd. Flow (perm)	766	3510	1633	1022	3579	1555	1347	1853		1328	1629	
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)	51	369	10	8	525	221	18	13	4	270	19	64
RTOR Reduction (vph)	0	0	5	0	0	119	0	3	0	0	43	0
Lane Group Flow (vph)	51	369	5	8	525	102	18	14	0	270	40	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	4%	0%	0%	2%	5%	0%	0%	0%	8%	0%	4%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	50.0	50.0	50.0	42.7	42.7	42.7	30.0	30.0		30.0	30.0	
Effective Green, g (s)	50.0	50.0	50.0	42.7	42.7	42.7	30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.46	0.46	0.46	0.33	0.33		0.33	0.33	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	464	1903	885	473	1657	720	438	602		432	530	
v/s Ratio Prot	0.01	c0.11			c0.15			0.01			0.02	
v/s Ratio Perm	0.05		0.00	0.01		0.07	0.01			c0.20		
v/c Ratio	0.11	0.19	0.01	0.02	0.32	0.14	0.04	0.02		0.62	0.08	
Uniform Delay, d1	10.1	10.8	9.7	13.4	15.6	14.2	21.3	21.1		26.3	21.5	
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	0.1	0.2	0.0	0.1	0.5	0.4	0.2	0.1		2.8	0.1	
Delay (s)	10.2	11.0	9.7	13.5	16.1	14.6	21.4	21.2		29.2	21.6	
Level of Service	B	B	A	B	B	B	C	C		C	C	
Approach Delay (s)		10.9			15.6			21.3			27.4	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	15.2	
Intersection Capacity Utilization	49.6%	ICU Level of Service	A	
Analysis Period (min)	15			

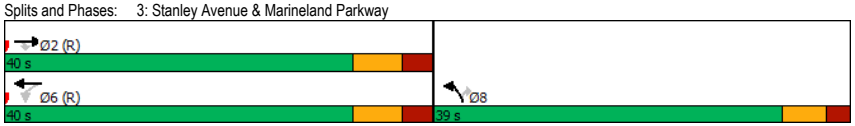
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	360	149	20	374	243	16
Future Volume (vph)	360	149	20	374	243	16
Lane Group Flow (vph)	444	184	25	462	300	20
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	38.5	38.5
Total Split (s)	40.0	40.0	40.0	40.0	39.0	39.0
Total Split (%)	50.6%	50.6%	50.6%	50.6%	49.4%	49.4%
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)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.30	0.26	0.07	0.32	0.21	0.03
Control Delay	16.3	3.6	14.8	16.5	15.5	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	3.6	14.8	16.5	15.5	6.5
Queue Length 50th (m)	22.8	0.0	2.2	23.8	14.4	0.0
Queue Length 95th (m)	29.2	7.9	6.1	30.4	19.8	3.3
Internal Link Dist (m)	155.5			318.1	148.8	
Turn Bay Length (m)		33.0	29.0		140.0	32.0
Base Capacity (vph)	1472	697	372	1457	1427	673
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	0.26	0.07	0.32	0.21	0.03

Intersection Summary

Cycle Length: 79
Actuated Cycle Length: 79
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: Stanley Avenue & Marineland Parkway

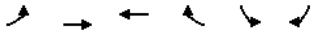


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	360	149	20	374	243	16
Future Volume (vph)	360	149	20	374	243	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	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
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)	3579	1432	1738	3544	3471	1609
Flt Permitted	1.00	1.00	0.49	1.00	0.95	1.00
Satd. Flow (perm)	3579	1432	905	3544	3471	1609
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	444	184	25	462	300	20
RTOR Reduction (vph)	0	108	0	0	0	12
Lane Group Flow (vph)	444	76	25	462	300	8
Confl. Peds. (#/hr)						4
Heavy Vehicles (%)	2%	14%	5%	3%	2%	0%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	32.5	32.5	32.5	32.5	32.5	32.5
Effective Green, g (s)	32.5	32.5	32.5	32.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1472	589	372	1457	1427	661
v/s Ratio Prot	0.12			c0.13	c0.09	
v/s Ratio Perm		0.05	0.03			0.01
v/c Ratio	0.30	0.13	0.07	0.32	0.21	0.01
Uniform Delay, d1	15.6	14.4	14.1	15.7	15.0	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.5	0.3	0.6	0.3	0.0
Delay (s)	16.2	14.9	14.4	16.3	15.3	13.8
Level of Service	B	B	B	B	B	B
Approach Delay (s)	15.8			16.2	15.2	
Approach LOS	B			B	B	

Intersection Summary

HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	464	410	95	107	28
Future Volume (Veh/h)	20	464	410	95	107	28
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)	22	504	446	103	116	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		342				
pX, platoon unblocked					0.98	
vC, conflicting volume	446				742	223
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	446				689	223
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				68	96
cM capacity (veh/h)	1111				364	780

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	190	336	223	223	103	116	30
Volume Left	22	0	0	0	0	116	0
Volume Right	0	0	0	0	103	0	30
cSH	1111	1700	1700	1700	1700	364	780
Volume to Capacity	0.02	0.20	0.13	0.13	0.06	0.32	0.04
Queue Length 95th (m)	0.5	0.0	0.0	0.0	0.0	10.2	0.9
Control Delay (s)	1.1	0.0	0.0	0.0	0.0	19.5	9.8
Lane LOS	A					C	A
Approach Delay (s)	0.4		0.0			17.5	
Approach LOS						C	

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	40.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	3	2	197	184	23
Future Volume (Veh/h)	20	3	2	197	184	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	25	4	3	249	233	29
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	502	248	262			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	502	248	262			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	99	100			
cM capacity (veh/h)	531	796	1314			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	29	252	262
Volume Left	25	3	0
Volume Right	4	0	29
cSH	557	1314	1700
Volume to Capacity	0.05	0.00	0.15
Queue Length 95th (m)	1.3	0.1	0.0
Control Delay (s)	11.8	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	11.8	0.1	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	22.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	61	40	4	131	171	20
Future Volume (Veh/h)	61	40	4	131	171	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	80	53	5	172	225	26
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	420	238	251			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	420	238	251			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	86	93	100			
cM capacity (veh/h)	587	806	1191			

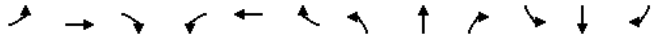
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	133	177	251
Volume Left	80	5	0
Volume Right	53	0	26
cSH	659	1191	1700
Volume to Capacity	0.20	0.00	0.15
Queue Length 95th (m)	5.7	0.1	0.0
Control Delay (s)	11.8	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	11.8	0.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		22.7%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	99	33	93	207	5
Future Volume (Veh/h)	39	99	33	93	207	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	53	134	45	126	280	7
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	502	284	287			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	502	284	287			
tC, single (s)	6.4	6.2	4.5			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.6			
p0 queue free %	89	82	96			
cM capacity (veh/h)	504	751	1069			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	187	171	287
Volume Left	53	45	0
Volume Right	134	0	7
cSH	659	1069	1700
Volume to Capacity	0.28	0.04	0.17
Queue Length 95th (m)	8.9	1.0	0.0
Control Delay (s)	12.6	2.5	0.0
Lane LOS	B	A	
Approach Delay (s)	12.6	2.5	0.0
Approach LOS	B		

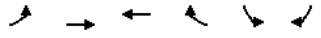
Intersection Summary			
Average Delay		4.3	
Intersection Capacity Utilization		36.2%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	2	35	6	4	2	18	113	14	14	279	12
Future Volume (Veh/h)	9	2	35	6	4	2	18	113	14	14	279	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	12	3	45	8	5	3	23	145	18	18	358	15
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	607	610	366	648	609	154	373			163		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	607	610	366	648	609	154	373			163		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	97	99	93	98	99	100	98			99		
cM capacity (veh/h)	396	398	677	350	399	897	1197			1386		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	60	16	186	391
Volume Left	12	8	23	18
Volume Right	45	3	18	15
cSH	576	413	1197	1386
Volume to Capacity	0.10	0.04	0.02	0.01
Queue Length 95th (m)	2.6	0.9	0.4	0.3
Control Delay (s)	12.0	14.1	1.1	0.5
Lane LOS	B	B	A	A
Approach Delay (s)	12.0	14.1	1.1	0.5
Approach LOS	B	B		

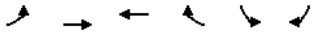
Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	27.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	109	279	175	35	72	247
Future Volume (Veh/h)	109	279	175	35	72	247
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	130	332	208	42	86	294
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	250				821	229
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	250				821	229
tC, single (s)	4.2				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.3
p0 queue free %	90				72	64
cM capacity (veh/h)	1254				304	808

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	130	332	250	86	294
Volume Left	130	0	0	86	0
Volume Right	0	0	42	0	294
cSH	1254	1700	1700	304	808
Volume to Capacity	0.10	0.20	0.15	0.28	0.36
Queue Length 95th (m)	2.6	0.0	0.0	8.6	12.7
Control Delay (s)	8.2	0.0	0.0	21.5	12.0
Lane LOS	A			C	B
Approach Delay (s)	2.3		0.0	14.1	
Approach LOS				B	

Intersection Summary				
Average Delay	5.9			
Intersection Capacity Utilization	33.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	0	0	7	12	31
Future Volume (Veh/h)	45	0	0	7	12	31
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	0	0	8	13	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	51	43	60	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	51	43	60	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	95	100	100	99	99	
cM capacity (veh/h)	936	842	824	1085	1623	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	49	8	47
Volume Left	49	0	13
Volume Right	0	8	34
cSH	936	1085	1623
Volume to Capacity	0.05	0.01	0.01
Queue Length 95th (m)	1.3	0.2	0.2
Control Delay (s)	9.1	8.3	2.0
Lane LOS	A	A	A
Approach Delay (s)	9.1	8.3	2.0
Approach LOS	A	A	

Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	19.2%	ICU Level of Service		A
Analysis Period (min)	15			

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix G

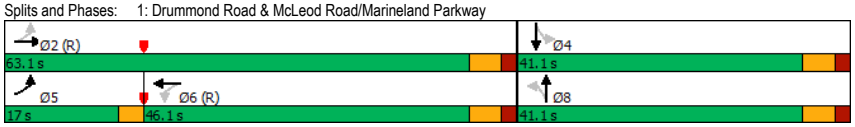
Background 2027 Traffic Operations

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	159	372	13	453	91	166	88	121
Future Volume (vph)	159	372	13	453	91	166	88	121
Lane Group Flow (vph)	0	636	0	657	0	297	97	308
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1
Total Split (s)	17.0	63.1	46.1	46.1	41.1	41.1	41.1	41.1
Total Split (%)	16.3%	60.6%	44.2%	44.2%	39.4%	39.4%	39.4%	39.4%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)		6.1		6.1		6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max
v/c Ratio		0.55		0.39		0.78	0.30	0.51
Control Delay		17.2		13.4		47.2	28.9	24.6
Queue Delay		0.0		0.0		0.0	0.0	0.0
Total Delay		17.2		13.4		47.2	28.9	24.6
Queue Length 50th (m)		40.7		35.6		53.3	14.4	38.2
Queue Length 95th (m)		57.1		47.9		#96.4	28.2	63.7
Internal Link Dist (m)		299.5		1002.2		718.1		408.3
Turn Bay Length (m)							20.0	
Base Capacity (vph)		1152		1701		379	320	608
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		0.55		0.39		0.78	0.30	0.51

Intersection Summary

Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	372	47	13	453	132	91	166	14	88	121	159
Future Volume (vph)	159	372	47	13	453	132	91	166	14	88	121	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1			6.1			6.1		6.1	6.1	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frpb, 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)		3317			3281			1842		1745	1677	
Flt Permitted		0.62			0.94			0.60		0.52	1.00	
Satd. Flow (perm)		2096			3076			1125		956	1677	
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)	175	409	52	14	498	145	100	182	15	97	133	175
RTOR Reduction (vph)	0	6	0	0	18	0	0	2	0	0	45	0
Lane Group Flow (vph)	0	630	0	0	639	0	0	295	0	97	263	0
Confl. Peds. (#/hr)	8		2	2		8	3		9	9		3
Heavy Vehicles (%)	8%	6%	9%	40%	6%	5%	2%	1%	8%	4%	5%	3%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		57.0			57.0			35.0		35.0	35.0	
Effective Green, g (s)		57.0			57.0			35.0		35.0	35.0	
Actuated g/C Ratio		0.55			0.55			0.34		0.34	0.34	
Clearance Time (s)		6.1			6.1			6.1		6.1	6.1	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1146			1682			377		321	563	
v/s Ratio Prot											0.16	
v/s Ratio Perm		c0.30			0.21			c0.26		0.10		
v/c Ratio		0.55			0.38			0.78		0.30	0.47	
Uniform Delay, d1		15.3			13.5			31.2		25.6	27.3	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.5			0.7			14.9		2.4	2.8	
Delay (s)		15.8			14.1			46.1		28.0	30.0	
Level of Service		B			B			D		C	C	
Approach Delay (s)		15.8			14.1			46.1			29.5	
Approach LOS		B			B			D			C	

Intersection Summary

HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	100.3%	ICU Level of Service	G
Analysis Period (min)	15		

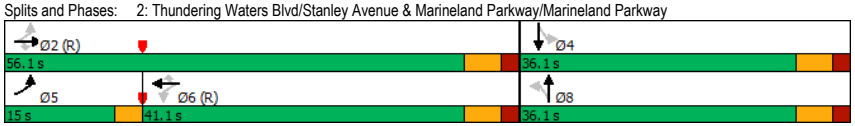
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	45	352	18	5	363	259	74	32	194	26
Future Volume (vph)	45	352	18	5	363	259	74	32	194	26
Lane Group Flow (vph)	51	400	20	6	413	294	84	47	220	65
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	15.0	56.1	56.1	41.1	41.1	41.1	36.1	36.1	36.1	36.1
Total Split (%)	16.3%	60.8%	60.8%	44.6%	44.6%	44.6%	39.2%	39.2%	39.2%	39.2%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.10	0.21	0.02	0.01	0.26	0.35	0.19	0.08	0.55	0.12
Control Delay	9.1	11.2	1.7	15.6	16.0	3.4	23.8	18.1	31.8	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	11.2	1.7	15.6	16.0	3.4	23.8	18.1	31.8	12.9
Queue Length 50th (m)	3.7	18.1	0.0	0.6	24.0	0.0	10.6	4.4	31.8	3.6
Queue Length 95th (m)	8.2	25.2	1.6	2.8	34.4	13.1	21.0	11.5	52.8	12.0
Internal Link Dist (m)		1002.2			127.7			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	558	1940	902	470	1603	847	447	608	401	551
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	0.21	0.02	0.01	0.26	0.35	0.19	0.08	0.55	0.12

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	352	18	5	363	259	74	32	10	194	26	31
Future Volume (vph)	45	352	18	5	363	259	74	32	10	194	26	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	3579	1633	1825	3380	1460	1825	1848		1614	1622	
Flt Permitted	0.47	1.00	1.00	0.52	1.00	1.00	0.71	1.00		0.73	1.00	
Satd. Flow (perm)	788	3579	1633	992	3380	1460	1373	1848		1234	1622	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	51	400	20	6	412	294	84	36	11	220	30	35
RTOR Reduction (vph)	0	0	9	0	0	158	0	7	0	0	24	0
Lane Group Flow (vph)	51	400	11	6	413	136	84	40	0	220	41	0
Confl. Peds. (#/hr)	4					4			1	1		
Heavy Vehicles (%)	14%	2%	0%	0%	8%	9%	0%	0%	0%	13%	11%	7%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	50.0	50.0	50.0	42.5	42.5	42.5	30.0	30.0		30.0	30.0	
Effective Green, g (s)	50.0	50.0	50.0	42.5	42.5	42.5	30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.46	0.46	0.46	0.33	0.33		0.33	0.33	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	466	1940	885	457	1558	672	446	601		401	527	
v/s Ratio Prot	0.01	c0.11			c0.12			0.02			0.03	
v/s Ratio Perm	0.05		0.01	0.01		0.09	0.06			c0.18		
v/c Ratio	0.11	0.21	0.01	0.01	0.27	0.20	0.19	0.07		0.55	0.08	
Uniform Delay, d1	10.1	10.9	9.7	13.5	15.3	14.8	22.4	21.4		25.5	21.5	
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	0.1	0.2	0.0	0.1	0.4	0.7	0.9	0.2		1.5	0.1	
Delay (s)	10.2	11.1	9.7	13.5	15.7	15.4	23.3	21.7		27.1	21.6	
Level of Service	B	B	A	B	B	B	C	C		C	C	
Approach Delay (s)		11.0			15.6			22.7			25.8	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	15.2	
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			

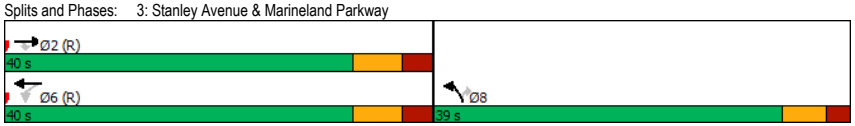
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	259	293	32	352	276	42
Future Volume (vph)	259	293	32	352	276	42
Lane Group Flow (vph)	291	329	36	396	310	47
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
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)	40.0	40.0	40.0	40.0	39.0	39.0
Total Split (%)	50.6%	50.6%	50.6%	50.6%	49.4%	49.4%
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)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.21	0.40	0.08	0.28	0.25	0.07
Control Delay	15.4	3.5	14.9	16.1	15.9	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	3.5	14.9	16.1	15.9	5.0
Queue Length 50th (m)	14.3	0.0	3.2	20.1	15.2	0.0
Queue Length 95th (m)	21.9	13.5	8.6	29.3	23.3	5.5
Internal Link Dist (m)	100.3			324.3	152.7	
Turn Bay Length (m)		33.0	29.0		140.0	32.0
Base Capacity (vph)	1416	827	436	1430	1244	671
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	0.40	0.08	0.28	0.25	0.07

Intersection Summary

Cycle Length: 79
Actuated Cycle Length: 79
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: Stanley Avenue & Marineland Parkway

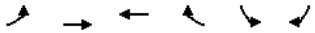


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	259	293	32	352	276	42
Future Volume (vph)	259	293	32	352	276	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	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
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)	3444	1541	1755	3476	3026	1566
Flt Permitted	1.00	1.00	0.57	1.00	0.95	1.00
Satd. Flow (perm)	3444	1541	1060	3476	3026	1566
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	291	329	36	396	310	47
RTOR Reduction (vph)	0	194	0	0	0	28
Lane Group Flow (vph)	291	135	36	396	310	19
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	6%	6%	4%	5%	17%	3%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	32.5	32.5	32.5	32.5	32.5	32.5
Effective Green, g (s)	32.5	32.5	32.5	32.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1416	633	436	1430	1244	644
v/s Ratio Prot	0.08			c0.11	c0.10	
v/s Ratio Perm		0.09	0.03			0.01
v/c Ratio	0.21	0.21	0.08	0.28	0.25	0.03
Uniform Delay, d1	14.9	15.0	14.2	15.4	15.2	13.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.8	0.4	0.5	0.5	0.1
Delay (s)	15.3	15.8	14.5	15.9	15.7	13.9
Level of Service	B	B	B	B	B	B
Approach Delay (s)	15.5			15.8	15.5	
Approach LOS	B			B	B	

Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	256	350	61	15	41
Future Volume (Veh/h)	25	256	350	61	15	41
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)	27	278	380	66	16	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		348				
pX, platoon unblocked						
vC, conflicting volume	380				573	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	380				573	190
tC, single (s)	4.4				6.9	7.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.4
p0 queue free %	98				96	94
cM capacity (veh/h)	1094				432	783

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	120	185	190	190	66	16	45
Volume Left	27	0	0	0	0	16	0
Volume Right	0	0	0	0	66	0	45
cSH	1094	1700	1700	1700	1700	432	783
Volume to Capacity	0.02	0.11	0.11	0.11	0.04	0.04	0.06
Queue Length 95th (m)	0.6	0.0	0.0	0.0	0.0	0.9	1.4
Control Delay (s)	2.1	0.0	0.0	0.0	0.0	13.7	9.9
Lane LOS	A					B	A
Approach Delay (s)	0.8		0.0			10.9	
Approach LOS						B	

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	30.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	1	1	316	259	11
Future Volume (Veh/h)	17	1	1	316	259	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	23	1	1	433	355	15
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	798	362	370			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	798	362	370			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	93	100	100			
cM capacity (veh/h)	340	687	1200			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	24	434	370
Volume Left	23	1	0
Volume Right	1	0	15
cSH	348	1200	1700
Volume to Capacity	0.07	0.00	0.22
Queue Length 95th (m)	1.7	0.0	0.0
Control Delay (s)	16.1	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	16.1	0.0	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	27.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	16	34	299	195	60
Future Volume (Veh/h)	34	16	34	299	195	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	44	21	44	383	250	77
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	760	288	327			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	760	288	327			
tC, single (s)	6.7	6.6	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.7	2.3			
p0 queue free %	87	97	96			
cM capacity (veh/h)	329	669	1210			

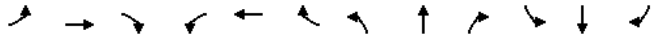
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	65	427	327
Volume Left	44	44	0
Volume Right	21	0	77
cSH	394	1210	1700
Volume to Capacity	0.16	0.04	0.19
Queue Length 95th (m)	4.4	0.9	0.0
Control Delay (s)	15.9	1.2	0.0
Lane LOS	C	A	
Approach Delay (s)	15.9	1.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	31	72	329	158	44
Future Volume (Veh/h)	11	31	72	329	158	44
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	16	44	103	470	226	63
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	934	258	289			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	934	258	289			
tC, single (s)	6.5	6.5	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.6	2.3			
p0 queue free %	94	94	92			
cM capacity (veh/h)	262	714	1250			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	60	573	289
Volume Left	16	103	0
Volume Right	44	0	63
cSH	489	1250	1700
Volume to Capacity	0.12	0.08	0.17
Queue Length 95th (m)	3.2	2.0	0.0
Control Delay (s)	13.4	2.2	0.0
Lane LOS	B	A	
Approach Delay (s)	13.4	2.2	0.0
Approach LOS	B		

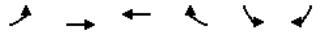
Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	12	189	16	13	12	144	244	4	7	86	100
Future Volume (Veh/h)	136	12	189	16	13	12	144	244	4	7	86	100
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)	162	14	225	19	15	14	171	290	5	8	102	119
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	834	814	162	1044	872	292	221			295		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	834	814	162	1044	872	292	221			295		
tC, single (s)	7.2	6.5	6.5	7.1	6.5	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.5	3.5	4.0	3.3	2.5			2.2		
p0 queue free %	30	95	73	85	94	98	86			99		
cM capacity (veh/h)	230	267	827	129	248	752	1185			1278		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	401	48	466	229
Volume Left	162	19	171	8
Volume Right	225	14	5	119
cSH	390	212	1185	1278
Volume to Capacity	1.03	0.23	0.14	0.01
Queue Length 95th (m)	98.5	6.4	3.8	0.1
Control Delay (s)	86.1	26.8	4.1	0.3
Lane LOS	F	D	A	A
Approach Delay (s)	86.1	26.8	4.1	0.3
Approach LOS	F	D		

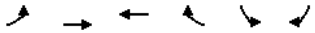
Intersection Summary				
Average Delay	33.0			
Intersection Capacity Utilization	68.0%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	329	117	246	60	33	258
Future Volume (Veh/h)	329	117	246	60	33	258
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	354	126	265	65	35	277
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	330				1132	298
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	330				1132	298
tC, single (s)	4.2				6.7	6.4
tC, 2 stage (s)						
tF (s)	2.3				3.8	3.5
p0 queue free %	71				75	61
cM capacity (veh/h)	1207				139	701

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	354	126	330	35	277
Volume Left	354	0	0	35	0
Volume Right	0	0	65	0	277
cSH	1207	1700	1700	139	701
Volume to Capacity	0.29	0.07	0.19	0.25	0.39
Queue Length 95th (m)	9.4	0.0	0.0	7.2	14.4
Control Delay (s)	9.2	0.0	0.0	39.4	13.4
Lane LOS	A			E	B
Approach Delay (s)	6.8		0.0	16.4	
Approach LOS				C	

Intersection Summary				
Average Delay	7.5			
Intersection Capacity Utilization	48.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	126	0	0	13	4	98
Future Volume (Veh/h)	126	0	0	13	4	98
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	137	0	0	14	4	107
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	76	62	115	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	76	62	115	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	85	100	100	99	100	
cM capacity (veh/h)	901	827	773	1085	1623	

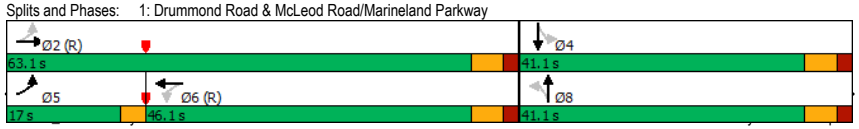
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	137	14	111
Volume Left	137	0	4
Volume Right	0	14	107
cSH	901	1085	1623
Volume to Capacity	0.15	0.01	0.00
Queue Length 95th (m)	4.1	0.3	0.1
Control Delay (s)	9.7	8.4	0.3
Lane LOS	A	A	A
Approach Delay (s)	9.7	8.4	0.3
Approach LOS	A	A	

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	26.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	240	536	12	594	70	209	126	237
Future Volume (vph)	240	536	12	594	70	209	126	237
Lane Group Flow (vph)	0	914	0	769	0	322	134	511
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1
Total Split (s)	17.0	63.1	46.1	46.1	41.1	41.1	41.1	41.1
Total Split (%)	16.3%	60.6%	44.2%	44.2%	39.4%	39.4%	39.4%	39.4%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)		6.1		6.1		6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max
v/c Ratio		0.81		0.43		1.35	0.44	0.83
Control Delay		26.2		14.4		214.2	32.6	41.3
Queue Delay		0.0		0.0		0.0	0.0	0.0
Total Delay		26.2		14.4		214.2	32.6	41.3
Queue Length 50th (m)		74.2		44.4		~85.8	21.0	85.6
Queue Length 95th (m)		104.0		58.1		#139.3	38.9	#139.6
Internal Link Dist (m)		299.5		1002.2		715.1		408.3
Turn Bay Length (m)							20.0	
Base Capacity (vph)		1124		1786		238	305	619
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		0.81		0.43		1.35	0.44	0.83

Intersection Summary
Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
~ 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.

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	536	84	12	594	117	70	209	24	126	237	243
Future Volume (vph)	240	536	84	12	594	117	70	209	24	126	237	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1			6.1			6.1		6.1	6.1	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frpb, 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			0.98			0.99		1.00	0.92	
Flt Protected		0.99			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		3427			3475			1845		1808	1738	
Flt Permitted		0.59			0.93			0.37		0.48	1.00	
Satd. Flow (perm)		2044			3246			699		909	1738	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	255	570	89	13	632	124	74	222	26	134	252	259
RTOR Reduction (vph)	0	8	0	0	11	0	0	3	0	0	35	0
Lane Group Flow (vph)	0	906	0	0	758	0	0	319	0	134	476	0
Confl. Peds. (#/hr)	11		9	9		11	8		16	16		8
Heavy Vehicles (%)	1%	4%	1%	0%	2%	0%	0%	1%	10%	0%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		57.0			57.0			35.0		35.0	35.0	
Effective Green, g (s)		57.0			57.0			35.0		35.0	35.0	
Actuated g/C Ratio		0.55			0.55			0.34		0.34	0.34	
Clearance Time (s)		6.1			6.1			6.1		6.1	6.1	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1118			1775			234		305	583	
v/s Ratio Prot											0.27	
v/s Ratio Perm		c0.44			0.23			c0.46		0.15		
v/c Ratio		0.81			0.43			1.36		0.44	0.82	
Uniform Delay, d1		19.2			13.9			34.6		27.0	31.7	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		4.6			0.8			187.9		4.5	12.0	
Delay (s)		23.8			14.7			222.5		31.5	43.6	
Level of Service		C			B			F		C	D	
Approach Delay (s)		23.8			14.7			222.5			41.1	
Approach LOS		C			B			F			D	

Intersection Summary			
HCM 2000 Control Delay	49.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	115.8%	ICU Level of Service	H
Analysis Period (min)	15		

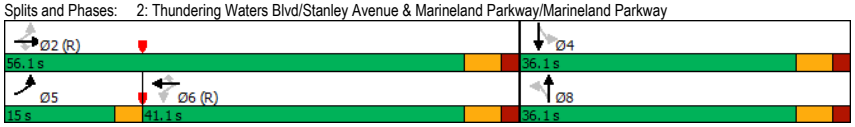
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	55	422	32	13	552	294	55	21	351	39
Future Volume (vph)	55	422	32	13	552	294	55	21	351	39
Lane Group Flow (vph)	65	502	38	15	657	350	65	32	418	121
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	15.0	56.1	56.1	41.1	41.1	41.1	36.1	36.1	36.1	36.1
Total Split (%)	16.3%	60.8%	60.8%	44.6%	44.6%	44.6%	39.2%	39.2%	39.2%	39.2%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.15	0.26	0.04	0.04	0.41	0.39	0.15	0.05	0.98	0.20
Control Delay	9.4	11.7	3.5	16.0	18.5	3.4	23.4	18.2	72.7	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	11.7	3.5	16.0	18.5	3.4	23.4	18.2	72.7	10.8
Queue Length 50th (m)	4.7	23.5	0.0	1.5	41.2	0.0	8.1	3.0	72.9	5.6
Queue Length 95th (m)	9.3	30.0	3.7	4.9	52.1	11.3	16.3	8.5	#117.4	15.6
Internal Link Dist (m)		1002.2			87.3			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	511	1903	902	407	1621	896	423	609	425	598
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	0.26	0.04	0.04	0.41	0.39	0.15	0.05	0.98	0.20

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	422	32	13	552	294	55	21	6	351	39	63
Future Volume (vph)	55	422	32	13	552	294	55	21	6	351	39	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	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	0.85	1.00	0.97		1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3510	1633	1825	3579	1555	1821	1858		1690	1685	
Flt Permitted	0.32	1.00	1.00	0.47	1.00	1.00	0.68	1.00		0.74	1.00	
Satd. Flow (perm)	615	3510	1633	899	3579	1555	1302	1858		1310	1685	
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)	65	502	38	15	657	350	65	25	7	418	46	75
RTOR Reduction (vph)	0	0	17	0	0	194	0	5	0	0	51	0
Lane Group Flow (vph)	65	502	21	15	657	156	65	27	0	418	70	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	4%	0%	0%	2%	5%	0%	0%	0%	8%	0%	4%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	50.0	50.0	50.0	41.2	41.2	41.2	30.0	30.0		30.0	30.0	
Effective Green, g (s)	50.0	50.0	50.0	41.2	41.2	41.2	30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.45	0.45	0.45	0.33	0.33		0.33	0.33	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	409	1903	885	401	1599	694	423	604		426	548	
v/s Ratio Prot	0.01	c0.14			c0.18			0.01			0.04	
v/s Ratio Perm	0.08		0.01	0.02		0.10	0.05			c0.32		
v/c Ratio	0.16	0.26	0.02	0.04	0.41	0.23	0.15	0.05		0.98	0.13	
Uniform Delay, d1	10.5	11.3	9.8	14.3	17.3	15.7	22.1	21.3		30.8	21.9	
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	0.2	0.3	0.0	0.2	0.8	0.8	0.8	0.1		38.5	0.1	
Delay (s)	10.7	11.6	9.8	14.5	18.1	16.4	22.9	21.4		69.3	22.0	
Level of Service	B	B	A	B	B	B	C	C		E	C	
Approach Delay (s)		11.4			17.5			22.4			58.7	
Approach LOS		B			B			C			E	

Intersection Summary

HCM 2000 Control Delay	25.9	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.62				
Actuated Cycle Length (s)	92.2	Sum of lost time (s)		15.2	
Intersection Capacity Utilization	59.0%	ICU Level of Service		B	
Analysis Period (min)	15				

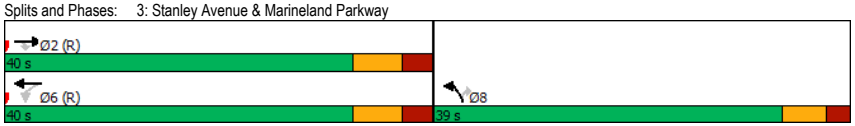
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	381	366	41	399	442	34
Future Volume (vph)	381	366	41	399	442	34
Lane Group Flow (vph)	470	452	51	493	546	42
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	38.5	38.5
Total Split (s)	40.0	40.0	40.0	40.0	39.0	39.0
Total Split (%)	50.6%	50.6%	50.6%	50.6%	49.4%	49.4%
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)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.32	0.53	0.14	0.34	0.38	0.06
Control Delay	16.5	4.2	15.9	16.7	17.2	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	4.2	15.9	16.7	17.2	5.1
Queue Length 50th (m)	24.3	0.0	4.6	25.7	28.5	0.0
Queue Length 95th (m)	30.9	9.7	10.2	32.4	35.3	4.4
Internal Link Dist (m)	155.5			318.1	148.8	
Turn Bay Length (m)		33.0	29.0		140.0	32.0
Base Capacity (vph)	1472	855	363	1457	1427	686
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	0.53	0.14	0.34	0.38	0.06

Intersection Summary

Cycle Length: 79
Actuated Cycle Length: 79
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: Stanley Avenue & Marineland Parkway

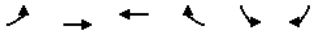


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	381	366	41	399	442	34
Future Volume (vph)	381	366	41	399	442	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	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
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)	3579	1432	1738	3544	3471	1609
Flt Permitted	1.00	1.00	0.48	1.00	0.95	1.00
Satd. Flow (perm)	3579	1432	883	3544	3471	1609
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	470	452	51	493	546	42
RTOR Reduction (vph)	0	266	0	0	0	25
Lane Group Flow (vph)	470	186	51	493	546	17
Confl. Peds. (#/hr)						4
Heavy Vehicles (%)	2%	14%	5%	3%	2%	0%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	32.5	32.5	32.5	32.5	32.5	32.5
Effective Green, g (s)	32.5	32.5	32.5	32.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1472	589	363	1457	1427	661
v/s Ratio Prot	0.13			c0.14	c0.16	
v/s Ratio Perm		0.13	0.06			0.01
v/c Ratio	0.32	0.32	0.14	0.34	0.38	0.03
Uniform Delay, d1	15.8	15.7	14.5	15.9	16.2	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	1.4	0.8	0.6	0.8	0.1
Delay (s)	16.3	17.1	15.3	16.5	17.0	13.9
Level of Service	B	B	B	B	B	B
Approach Delay (s)	16.7			16.4	16.8	
Approach LOS	B			B	B	

Intersection Summary

HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	504	455	98	110	31
Future Volume (Veh/h)	23	504	455	98	110	31
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)	25	548	495	107	120	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		342				
pX, platoon unblocked					0.97	
vC, conflicting volume	495				819	248
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	495				744	248
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				64	95
cM capacity (veh/h)	1065				330	753

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	208	365	248	248	107	120	34
Volume Left	25	0	0	0	0	120	0
Volume Right	0	0	0	0	107	0	34
cSH	1065	1700	1700	1700	1700	330	753
Volume to Capacity	0.02	0.21	0.15	0.15	0.06	0.36	0.05
Queue Length 95th (m)	0.5	0.0	0.0	0.0	0.0	12.2	1.1
Control Delay (s)	1.2	0.0	0.0	0.0	0.0	22.0	10.0
Lane LOS	A					C	B
Approach Delay (s)	0.4		0.0			19.3	
Approach LOS						C	

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	43.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	3	2	417	428	24
Future Volume (Veh/h)	21	3	2	417	428	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	27	4	3	528	542	30
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	1091	557	572			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1091	557	572			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	99	100			
cM capacity (veh/h)	239	534	1011			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	31	531	572
Volume Left	27	3	0
Volume Right	4	0	30
cSH	258	1011	1700
Volume to Capacity	0.12	0.00	0.34
Queue Length 95th (m)	3.1	0.1	0.0
Control Delay (s)	20.9	0.1	0.0
Lane LOS	C	A	
Approach Delay (s)	20.9	0.1	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	34.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	43	4	345	412	21
Future Volume (Veh/h)	65	43	4	345	412	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	86	57	5	454	542	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	1020	556	570			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1020	556	570			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	67	89	99			
cM capacity (veh/h)	261	534	898			

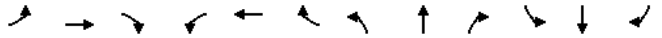
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	143	459	570
Volume Left	86	5	0
Volume Right	57	0	28
cSH	328	898	1700
Volume to Capacity	0.44	0.01	0.34
Queue Length 95th (m)	16.2	0.1	0.0
Control Delay (s)	24.2	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	24.2	0.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	105	35	304	450	5
Future Volume (Veh/h)	42	105	35	304	450	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	57	142	47	411	608	7
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1118	612	615			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1118	612	615			
tC, single (s)	6.4	6.2	4.5			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.6			
p0 queue free %	73	71	94			
cM capacity (veh/h)	214	490	791			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	199	458	615
Volume Left	57	47	0
Volume Right	142	0	7
cSH	358	791	1700
Volume to Capacity	0.56	0.06	0.36
Queue Length 95th (m)	24.6	1.4	0.0
Control Delay (s)	27.0	1.7	0.0
Lane LOS	D	A	
Approach Delay (s)	27.0	1.7	0.0
Approach LOS	D		

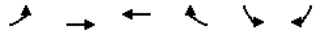
Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	210	19	325	7	12	2	346	126	15	15	299	240
Future Volume (Veh/h)	210	19	325	7	12	2	346	126	15	15	299	240
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	269	24	417	9	15	3	444	162	19	19	383	308
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	1645	1644	537	2064	1788	172	691			181		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1645	1644	537	2064	1788	172	691			181		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	0	53	23	0	64	100	51			99		
cM capacity (veh/h)	36	51	542	4	42	877	913			1365		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	710	27	625	710
Volume Left	269	9	444	19
Volume Right	417	3	19	308
cSH	82	10	913	1365
Volume to Capacity	8.63	2.74	0.49	0.01
Queue Length 95th (m)	Err	33.7	20.6	0.3
Control Delay (s)	Err	1540.0	10.9	0.4
Lane LOS	F	F	B	A
Approach Delay (s)	Err	1540.0	10.9	0.4
Approach LOS	F	F		

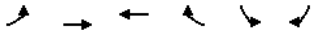
Intersection Summary				
Average Delay	3449.8			
Intersection Capacity Utilization	107.2%	ICU Level of Service	G	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	423	296	186	63	97	533
Future Volume (Veh/h)	423	296	186	63	97	533
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	504	352	221	75	115	635
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	296				1618	258
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	296				1618	258
tC, single (s)	4.2				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.3
p0 queue free %	58				0	18
cM capacity (veh/h)	1205				65	778

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	504	352	296	115	635
Volume Left	504	0	0	115	0
Volume Right	0	0	75	0	635
cSH	1205	1700	1700	65	778
Volume to Capacity	0.42	0.21	0.17	1.78	0.82
Queue Length 95th (m)	16.0	0.0	0.0	79.2	67.7
Control Delay (s)	10.1	0.0	0.0	509.9	26.7
Lane LOS	B			F	D
Approach Delay (s)	6.0		0.0	100.8	
Approach LOS				F	

Intersection Summary				
Average Delay	42.4			
Intersection Capacity Utilization	53.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	176	0	0	7	12	177
Future Volume (Veh/h)	176	0	0	7	12	177
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	191	0	0	8	13	192
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	130	122	218	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130	122	218	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	77	100	100	99	99	
cM capacity (veh/h)	831	762	675	1085	1623	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	191	8	205
Volume Left	191	0	13
Volume Right	0	8	192
cSH	831	1085	1623
Volume to Capacity	0.23	0.01	0.01
Queue Length 95th (m)	6.7	0.2	0.2
Control Delay (s)	10.6	8.3	0.5
Lane LOS	B	A	A
Approach Delay (s)	10.6	8.3	0.5
Approach LOS	B	A	

Intersection Summary				
Average Delay	5.4			
Intersection Capacity Utilization	34.7%	ICU Level of Service		A
Analysis Period (min)	15			

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix H

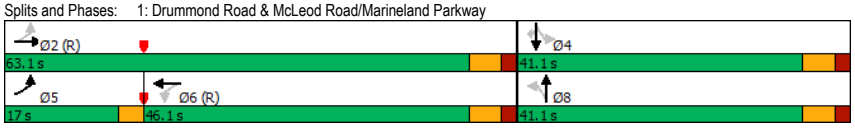
Background 2032 Traffic Operations

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	163	379	14	461	93	168	90	122	163
Future Volume (vph)	163	379	14	461	93	168	90	122	163
Lane Group Flow (vph)	179	469	15	655	102	200	99	134	179
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	6	6	8	8	4	4	4
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)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1	33.1
Total Split (s)	17.0	63.1	46.1	46.1	41.1	41.1	41.1	41.1	41.1
Total Split (%)	16.3%	60.6%	44.2%	44.2%	39.4%	39.4%	39.4%	39.4%	39.4%
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max
v/c Ratio	0.42	0.25	0.05	0.47	0.24	0.32	0.28	0.22	0.28
Control Delay	13.6	12.2	20.4	22.4	26.9	26.9	27.9	26.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	12.2	20.4	22.4	26.9	26.9	27.9	26.0	5.0
Queue Length 50th (m)	16.1	23.6	1.8	46.2	14.8	29.2	14.6	19.3	0.0
Queue Length 95th (m)	26.6	32.7	6.2	65.7	28.0	47.6	28.1	33.6	14.0
Internal Link Dist (m)		299.5		1002.2		718.1		408.3	
Turn Bay Length (m)	95.0		25.0		25.0		15.0		50.0
Base Capacity (vph)	465	1850	274	1395	423	630	360	614	643
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	0.38	0.25	0.05	0.47	0.24	0.32	0.28	0.22	0.28

Intersection Summary

Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	379	48	14	461	135	93	168	14	90	122	163
Future Volume (vph)	163	379	48	14	461	135	93	168	14	90	122	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	1.00
Frt	1.00	0.98		1.00	0.97		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)	1687	3365		1300	3304		1784	1868		1742	1830	1561
Flt Permitted	0.30	1.00		0.48	1.00		0.67	1.00		0.59	1.00	1.00
Satd. Flow (perm)	540	3365		661	3304		1261	1868		1075	1830	1561
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)	179	416	53	15	507	148	102	185	15	99	134	179
RTOR Reduction (vph)	0	10	0	0	25	0	0	3	0	0	0	119
Lane Group Flow (vph)	179	459	0	15	630	0	102	197	0	99	134	60
Confl. Peds. (#/hr)	8		2	2		8	3		9	9		3
Heavy Vehicles (%)	8%	6%	9%	40%	6%	5%	2%	1%	8%	4%	5%	3%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	57.0	57.0		43.2	43.2		35.0	35.0		35.0	35.0	35.0
Effective Green, g (s)	57.0	57.0		43.2	43.2		35.0	35.0		35.0	35.0	35.0
Actuated g/C Ratio	0.55	0.55		0.41	0.41		0.34	0.34		0.34	0.34	0.34
Clearance Time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	414	1840		274	1369		423	627		361	614	524
v/s Ratio Prot	c0.04	0.14			c0.19			c0.11			0.07	
v/s Ratio Perm	0.19			0.02			0.08			0.09		0.04
v/c Ratio	0.43	0.25		0.05	0.46		0.24	0.31		0.27	0.22	0.11
Uniform Delay, d1	12.8	12.4		18.3	22.1		25.0	25.7		25.3	24.8	23.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.3		0.4	1.1		1.3	1.3		1.9	0.8	0.4
Delay (s)	13.5	12.7		18.6	23.2		26.4	27.0		27.2	25.6	24.3
Level of Service	B	B		B	C		C	C		C	C	C
Approach Delay (s)		12.9			23.1			26.8			25.4	
Approach LOS		B			C			C			C	

Intersection Summary

HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2	
Intersection Capacity Utilization	72.8%	ICU Level of Service	C	
Analysis Period (min)	15			

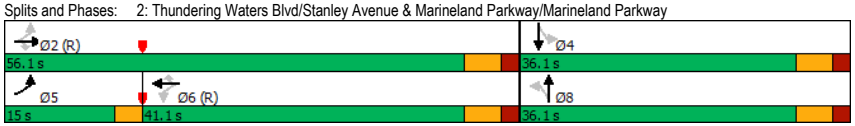
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	46	359	18	5	371	263	74	32	197	26
Future Volume (vph)	46	359	18	5	371	263	74	32	197	26
Lane Group Flow (vph)	52	408	20	6	422	299	84	47	224	66
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	15.0	56.1	56.1	41.1	41.1	41.1	36.1	36.1	36.1	36.1
Total Split (%)	16.3%	60.8%	60.8%	44.6%	44.6%	44.6%	39.2%	39.2%	39.2%	39.2%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.10	0.21	0.02	0.01	0.26	0.35	0.19	0.08	0.56	0.12
Control Delay	9.1	11.3	1.7	15.6	16.1	3.4	23.8	18.1	32.1	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	11.3	1.7	15.6	16.1	3.4	23.8	18.1	32.1	12.8
Queue Length 50th (m)	3.8	18.5	0.0	0.6	24.6	0.0	10.6	4.4	32.5	3.6
Queue Length 95th (m)	8.4	25.6	1.6	2.8	35.2	13.3	21.0	11.5	54.2	12.1
Internal Link Dist (m)		1002.2			127.7			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	554	1940	902	466	1601	849	446	608	401	551
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	0.21	0.02	0.01	0.26	0.35	0.19	0.08	0.56	0.12

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	359	18	5	371	263	74	32	10	197	26	32
Future Volume (vph)	46	359	18	5	371	263	74	32	10	197	26	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	3579	1633	1825	3380	1460	1825	1848		1614	1621	
Flt Permitted	0.46	1.00	1.00	0.51	1.00	1.00	0.71	1.00		0.73	1.00	
Satd. Flow (perm)	778	3579	1633	984	3380	1460	1372	1848		1234	1621	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	52	408	20	6	422	299	84	36	11	224	30	36
RTOR Reduction (vph)	0	0	9	0	0	161	0	7	0	0	24	0
Lane Group Flow (vph)	52	408	11	6	422	138	84	40	0	224	42	0
Confl. Peds. (#/hr)	4					4			1	1		
Heavy Vehicles (%)	14%	2%	0%	0%	8%	9%	0%	0%	0%	13%	11%	7%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	50.0	50.0	50.0	42.5	42.5	42.5	30.0	30.0		30.0	30.0	
Effective Green, g (s)	50.0	50.0	50.0	42.5	42.5	42.5	30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.46	0.46	0.46	0.33	0.33		0.33	0.33	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	461	1940	885	453	1558	672	446	601		401	527	
v/s Ratio Prot	0.01	c0.11			c0.12			0.02			0.03	
v/s Ratio Perm	0.06		0.01	0.01		0.09	0.06			c0.18		
v/c Ratio	0.11	0.21	0.01	0.01	0.27	0.21	0.19	0.07		0.56	0.08	
Uniform Delay, d1	10.1	10.9	9.7	13.5	15.3	14.8	22.4	21.4		25.6	21.5	
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	0.1	0.2	0.0	0.1	0.4	0.7	0.9	0.2		1.7	0.1	
Delay (s)	10.2	11.1	9.7	13.5	15.7	15.5	23.3	21.7		27.3	21.6	
Level of Service	B	B	A	B	B	B	C	C		C	C	
Approach Delay (s)		11.0			15.6			22.7			26.0	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	15.2	
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			

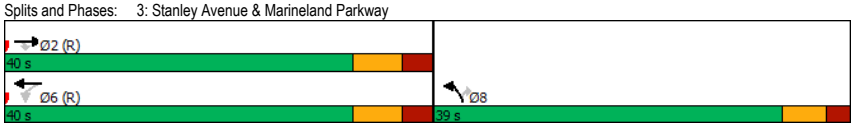
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	265	298	33	360	280	43
Future Volume (vph)	265	298	33	360	280	43
Lane Group Flow (vph)	298	335	37	404	315	48
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
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)	40.0	40.0	40.0	40.0	39.0	39.0
Total Split (%)	50.6%	50.6%	50.6%	50.6%	49.4%	49.4%
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)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.21	0.40	0.09	0.28	0.25	0.07
Control Delay	15.5	3.5	15.0	16.2	16.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.5	3.5	15.0	16.2	16.0	5.0
Queue Length 50th (m)	14.6	0.0	3.3	20.5	15.5	0.0
Queue Length 95th (m)	22.4	13.6	8.7	29.8	23.6	5.6
Internal Link Dist (m)	100.3			324.3	152.7	
Turn Bay Length (m)		33.0	29.0		140.0	32.0
Base Capacity (vph)	1416	831	433	1430	1244	672
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	0.40	0.09	0.28	0.25	0.07

Intersection Summary

Cycle Length: 79
Actuated Cycle Length: 79
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: Stanley Avenue & Marineland Parkway

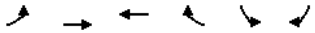


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	265	298	33	360	280	43
Future Volume (vph)	265	298	33	360	280	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	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
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)	3444	1541	1755	3476	3026	1566
Flt Permitted	1.00	1.00	0.57	1.00	0.95	1.00
Satd. Flow (perm)	3444	1541	1053	3476	3026	1566
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	298	335	37	404	315	48
RTOR Reduction (vph)	0	197	0	0	0	28
Lane Group Flow (vph)	298	138	37	404	315	20
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	6%	6%	4%	5%	17%	3%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	32.5	32.5	32.5	32.5	32.5	32.5
Effective Green, g (s)	32.5	32.5	32.5	32.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1416	633	433	1430	1244	644
v/s Ratio Prot	0.09			c0.12	c0.10	
v/s Ratio Perm		0.09	0.04			0.01
v/c Ratio	0.21	0.22	0.09	0.28	0.25	0.03
Uniform Delay, d1	15.0	15.0	14.2	15.5	15.3	13.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.8	0.4	0.5	0.5	0.1
Delay (s)	15.3	15.8	14.6	16.0	15.8	13.9
Level of Service	B	B	B	B	B	B
Approach Delay (s)	15.6			15.9	15.5	
Approach LOS	B			B	B	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	262	358	62	15	42
Future Volume (Veh/h)	26	262	358	62	15	42
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)	28	285	389	67	16	46
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		348				
pX, platoon unblocked						
vC, conflicting volume	389				588	194
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	389				588	194
tC, single (s)	4.4				6.9	7.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.4
p0 queue free %	97				96	94
cM capacity (veh/h)	1085				422	778

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	28	142	142	194	194	67	16	46
Volume Left	28	0	0	0	0	0	16	0
Volume Right	0	0	0	0	0	67	0	46
cSH	1085	1700	1700	1700	1700	1700	422	778
Volume to Capacity	0.03	0.08	0.08	0.11	0.11	0.04	0.04	0.06
Queue Length 95th (m)	0.6	0.0	0.0	0.0	0.0	0.0	0.9	1.4
Control Delay (s)	8.4	0.0	0.0	0.0	0.0	0.0	13.9	9.9
Lane LOS	A						B	A
Approach Delay (s)	0.8			0.0			10.9	
Approach LOS							B	

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	26.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	1	1	326	268	11
Future Volume (Veh/h)	18	1	1	326	268	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	25	1	1	447	367	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	824	374	382			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	824	374	382			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	92	100	100			
cM capacity (veh/h)	328	676	1188			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	26	448	382
Volume Left	25	1	0
Volume Right	1	0	15
cSH	335	1188	1700
Volume to Capacity	0.08	0.00	0.22
Queue Length 95th (m)	1.9	0.0	0.0
Control Delay (s)	16.7	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	16.7	0.0	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	28.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	36	17	36	307	200	63
Future Volume (Veh/h)	36	17	36	307	200	63
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	46	22	46	394	256	81
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	782	296	337			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	782	296	337			
tC, single (s)	6.7	6.6	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.7	2.3			
p0 queue free %	86	97	96			
cM capacity (veh/h)	318	662	1200			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	68	440	337
Volume Left	46	46	0
Volume Right	22	0	81
cSH	383	1200	1700
Volume to Capacity	0.18	0.04	0.20
Queue Length 95th (m)	4.9	0.9	0.0
Control Delay (s)	16.4	1.2	0.0
Lane LOS	C	A	
Approach Delay (s)	16.4	1.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	32	76	340	161	46
Future Volume (Veh/h)	11	32	76	340	161	46
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	16	46	109	486	230	66
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				346		
pX, platoon unblocked	0.93					
vC, conflicting volume	967	263	296			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	930	263	296			
tC, single (s)	6.5	6.5	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.6	2.3			
p0 queue free %	93	94	91			
cM capacity (veh/h)	245	708	1243			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	62	595	296
Volume Left	16	109	0
Volume Right	46	0	66
cSH	476	1243	1700
Volume to Capacity	0.13	0.09	0.17
Queue Length 95th (m)	3.4	2.2	0.0
Control Delay (s)	13.7	2.3	0.0
Lane LOS	B	A	
Approach Delay (s)	13.7	2.3	0.0
Approach LOS	B		

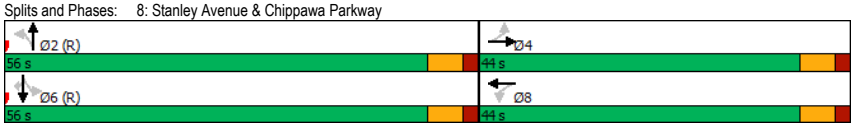
Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	136	12	17	14	144	256	7	90	100
Future Volume (vph)	136	12	17	14	144	256	7	90	100
Lane Group Flow (vph)	162	239	20	32	171	311	8	107	119
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	2	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)	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
Total Split (s)	44.0	44.0	44.0	44.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	44.0%	44.0%	44.0%	44.0%	56.0%	56.0%	56.0%	56.0%	56.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.70	0.56	0.14	0.09	0.25	0.25	0.01	0.10	0.12
Control Delay	52.7	10.7	33.4	20.1	3.5	3.1	6.7	6.5	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	10.7	33.4	20.1	3.5	3.1	6.7	6.5	1.7
Queue Length 50th (m)	29.7	2.3	3.3	2.7	3.6	6.5	0.4	5.9	0.0
Queue Length 95th (m)	42.4	16.0	8.3	8.7	5.8	9.4	2.2	13.9	5.3
Internal Link Dist (m)		207.0		145.4		1041.9		321.5	
Turn Bay Length (m)	30.0		30.0		30.0		30.0		30.0
Base Capacity (vph)	482	646	289	686	690	1251	758	1067	1005
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	0.34	0.37	0.07	0.05	0.25	0.25	0.01	0.10	0.12

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 8: Stanley Avenue & Chippawa Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	12	189	17	14	13	144	256	5	7	90	100
Future Volume (vph)	136	12	189	17	14	13	144	256	5	7	90	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.93		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)	1644	1336		1825	1786		1372	1801		1825	1537	1396
Flt Permitted	0.74	1.00		0.40	1.00		0.69	1.00		0.57	1.00	1.00
Satd. Flow (perm)	1274	1336		765	1786		994	1801		1093	1537	1396
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)	162	14	225	20	17	15	171	305	6	8	107	119
RTOR Reduction (vph)	0	184	0	0	12	0	0	0	0	0	0	36
Lane Group Flow (vph)	162	55	0	20	20	0	171	311	0	8	107	83
Heavy Vehicles (%)	11%	0%	25%	0%	0%	0%	33%	6%	25%	0%	25%	17%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	18.4	18.4		18.4	18.4		69.4	69.4		69.4	69.4	69.4
Effective Green, g (s)	18.4	18.4		18.4	18.4		69.4	69.4		69.4	69.4	69.4
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.69	0.69		0.69	0.69	0.69
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	234	245		140	328		689	1249		758	1066	968
v/s Ratio Prot		0.04			0.01			c0.17			0.07	
v/s Ratio Perm	c0.13			0.03			0.17			0.01		0.06
v/c Ratio	0.69	0.23		0.14	0.06		0.25	0.25		0.01	0.10	0.09
Uniform Delay, d1	38.2	34.7		34.2	33.7		5.7	5.7		4.7	5.0	5.0
Progression Factor	1.00	1.00		1.00	1.00		0.39	0.40		1.00	1.00	1.00
Incremental Delay, d2	8.5	0.5		0.5	0.1		0.7	0.4		0.0	0.2	0.2
Delay (s)	46.7	35.2		34.7	33.7		3.0	2.7		4.7	5.2	5.1
Level of Service	D	D		C	C		A	A		A	A	A
Approach Delay (s)		39.8			34.1			2.8			5.2	
Approach LOS		D			C			A			A	

Intersection Summary

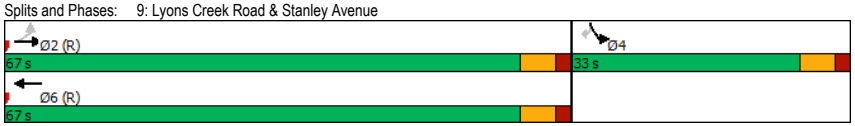
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.2	
Intersection Capacity Utilization	39.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	340	123	259	34	262
Future Volume (vph)	340	123	259	34	262
Lane Group Flow (vph)	366	132	346	37	282
Turn Type	Perm	NA	NA	Prot	Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1
Total Split (s)	67.0	67.0	67.0	33.0	33.0
Total Split (%)	67.0%	67.0%	67.0%	33.0%	33.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.63	0.13	0.32	0.10	0.49
Control Delay	18.6	8.7	9.7	28.1	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	8.7	9.7	28.1	7.7
Queue Length 50th (m)	41.7	10.0	27.7	5.2	0.0
Queue Length 95th (m)	73.8	17.7	43.1	12.1	13.5
Internal Link Dist (m)		337.8	364.0	1041.9	
Turn Bay Length (m)	44.0			25.0	
Base Capacity (vph)	578	1054	1085	372	572
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	0.63	0.13	0.32	0.10	0.49

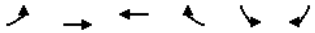
Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 33 (33%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: Lyons Creek Road & Stanley Avenue



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	340	123	259	63	34	262
Future Volume (vph)	340	123	259	63	34	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1		6.1	6.1
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1722	1731	1768		1383	1361
Flt Permitted	0.52	1.00	1.00		0.95	1.00
Satd. Flow (perm)	950	1731	1768		1383	1361
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	366	132	278	68	37	282
RTOR Reduction (vph)	0	0	9	0	0	206
Lane Group Flow (vph)	366	132	337	0	37	76
Heavy Vehicles (%)	6%	11%	4%	13%	32%	20%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	60.9	60.9	60.9		26.9	26.9
Effective Green, g (s)	60.9	60.9	60.9		26.9	26.9
Actuated g/C Ratio	0.61	0.61	0.61		0.27	0.27
Clearance Time (s)	6.1	6.1	6.1		6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	578	1054	1076		372	366
v/s Ratio Prot		0.08	0.19		0.03	
v/s Ratio Perm	c0.39					c0.06
v/c Ratio	0.63	0.13	0.31		0.10	0.21
Uniform Delay, d1	12.4	8.3	9.4		27.5	28.3
Progression Factor	1.00	1.00	1.00		0.99	1.23
Incremental Delay, d2	5.2	0.2	0.8		0.5	1.3
Delay (s)	17.7	8.5	10.2		27.7	36.2
Level of Service	B	A	B		C	D
Approach Delay (s)		15.2	10.2		35.2	
Approach LOS		B	B		D	

Intersection Summary				
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.2	
Intersection Capacity Utilization	55.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	126	0	0	13	4	98
Future Volume (Veh/h)	126	0	0	13	4	98
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	137	0	0	14	4	107
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	76	62	115	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	76	62	115	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	85	100	100	99	100	
cM capacity (veh/h)	901	827	773	1085	1623	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	137	14	111
Volume Left	137	0	4
Volume Right	0	14	107
cSH	901	1085	1623
Volume to Capacity	0.15	0.01	0.00
Queue Length 95th (m)	4.1	0.3	0.1
Control Delay (s)	9.7	8.4	0.3
Lane LOS	A	A	A
Approach Delay (s)	9.7	8.4	0.3
Approach LOS	A	A	

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	26.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Timings BG 2032 PM Peak Hour

1: Drummond Road & McLeod Road/Marineland Parkway

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	246	545	13	606	72	211	129	239	249
Future Volume (vph)	246	545	13	606	72	211	129	239	249
Lane Group Flow (vph)	262	671	14	773	77	250	137	254	265
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	6	6	8	8	4	4	4
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)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1	33.1
Total Split (s)	9.6	57.6	48.0	48.0	46.6	46.6	46.6	46.6	46.6
Total Split (%)	9.2%	55.3%	46.1%	46.1%	44.7%	44.7%	44.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max
v/c Ratio	0.82	0.39	0.05	0.55	0.19	0.35	0.34	0.34	0.35
Control Delay	38.0	16.7	19.7	24.8	22.8	23.5	25.6	24.1	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	16.7	19.7	24.8	22.8	23.5	25.6	24.1	4.5
Queue Length 50th (m)	28.2	41.5	1.7	59.8	10.1	34.1	19.3	35.7	1.4
Queue Length 95th (m)	#57.5	54.8	5.7	77.7	20.7	53.8	35.1	55.3	16.7
Internal Link Dist (m)		299.5		1002.2		715.1		408.3	
Turn Bay Length (m)	95.0		25.0		25.0		15.0		50.0
Base Capacity (vph)	321	1708	303	1412	398	722	399	746	764
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	0.82	0.39	0.05	0.55	0.19	0.35	0.34	0.34	0.35

Intersection Summary

Cycle Length: 104.2

Actuated Cycle Length: 104.2

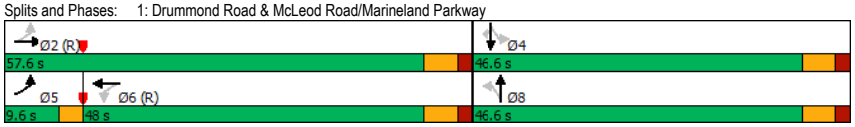
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

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

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



HCM Signalized Intersection Capacity Analysis BG 2032 PM Peak Hour

1: Drummond Road & McLeod Road/Marineland Parkway

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	545	86	13	606	120	72	211	24	129	239	249
Future Volume (vph)	246	545	86	13	606	120	72	211	24	129	239	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.99	1.00		0.99	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3432		1809	3474		1814	1849		1803	1921	1567
Flt Permitted	0.24	1.00		0.40	1.00		0.54	1.00		0.54	1.00	1.00
Satd. Flow (perm)	452	3432		755	3474		1025	1849		1028	1921	1567
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	262	580	91	14	645	128	77	224	26	137	254	265
RTOR Reduction (vph)	0	12	0	0	16	0	0	4	0	0	0	155
Lane Group Flow (vph)	262	659	0	14	757	0	77	246	0	137	254	110
Confl. Peds. (#/hr)	11		9	9		11	8		16	16		8
Heavy Vehicles (%)	1%	4%	1%	0%	2%	0%	0%	1%	10%	0%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	51.5	51.5		41.9	41.9		40.5	40.5		40.5	40.5	40.5
Effective Green, g (s)	51.5	51.5		41.9	41.9		40.5	40.5		40.5	40.5	40.5
Actuated g/C Ratio	0.49	0.49		0.40	0.40		0.39	0.39		0.39	0.39	0.39
Clearance Time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	309	1696		303	1396		398	718		399	746	609
v/s Ratio Prot	c0.05	0.19			0.22			0.13			0.13	
v/s Ratio Perm	c0.36			0.02			0.08			c0.13		0.07
v/c Ratio	0.85	0.39		0.05	0.54		0.19	0.34		0.34	0.34	0.18
Uniform Delay, d1	21.0	16.5		19.0	23.8		21.1	22.5		22.5	22.4	20.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.9	0.7		0.3	1.5		1.1	1.3		2.3	1.2	0.6
Delay (s)	40.0	17.2		19.3	25.3		22.1	23.8		24.8	23.7	21.6
Level of Service	D	B		B	C		C	C		C	C	C
Approach Delay (s)		23.6			25.2			23.4			23.1	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

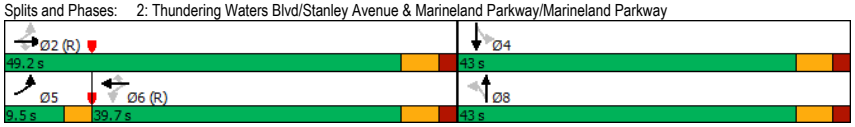
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	56	431	32	13	563	299	55	21	357	39
Future Volume (vph)	56	431	32	13	563	299	55	21	357	39
Lane Group Flow (vph)	67	513	38	15	670	356	65	32	425	123
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	9.5	49.2	49.2	39.7	39.7	39.7	43.0	43.0	43.0	43.0
Total Split (%)	10.3%	53.4%	53.4%	43.1%	43.1%	43.1%	46.6%	46.6%	46.6%	46.6%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.19	0.31	0.05	0.04	0.49	0.44	0.13	0.04	0.81	0.17
Control Delay	13.2	16.0	4.7	19.6	23.5	4.2	18.4	14.4	39.1	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	16.0	4.7	19.6	23.5	4.2	18.4	14.4	39.1	8.4
Queue Length 50th (m)	5.9	28.8	0.0	1.7	48.1	0.0	7.1	2.6	65.5	4.9
Queue Length 95th (m)	11.6	36.5	4.4	5.4	58.8	12.6	14.3	7.5	#97.6	13.7
Internal Link Dist (m)		1002.2			87.3			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	362	1640	783	341	1378	817	519	747	523	719
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.31	0.05	0.04	0.49	0.44	0.13	0.04	0.81	0.17

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	431	32	13	563	299	55	21	6	357	39	65
Future Volume (vph)	56	431	32	13	563	299	55	21	6	357	39	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	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	0.85	1.00	0.97		1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3510	1633	1825	3579	1555	1821	1858		1690	1683	
Flt Permitted	0.28	1.00	1.00	0.46	1.00	1.00	0.68	1.00		0.74	1.00	
Satd. Flow (perm)	544	3510	1633	889	3579	1555	1300	1858		1310	1683	
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)	67	513	38	15	670	356	65	25	7	425	46	77
RTOR Reduction (vph)	0	0	20	0	0	221	0	4	0	0	46	0
Lane Group Flow (vph)	67	513	18	15	670	135	65	28	0	425	77	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	4%	0%	0%	2%	5%	0%	0%	0%	8%	0%	4%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	43.1	43.1	43.1	34.9	34.9	34.9	36.9	36.9		36.9	36.9	
Effective Green, g (s)	43.1	43.1	43.1	34.9	34.9	34.9	36.9	36.9		36.9	36.9	
Actuated g/C Ratio	0.47	0.47	0.47	0.38	0.38	0.38	0.40	0.40		0.40	0.40	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	326	1640	763	336	1354	588	520	743		524	673	
v/s Ratio Prot	0.01	c0.15			c0.19			0.01			0.05	
v/s Ratio Perm	0.08		0.01	0.02		0.09	0.05			c0.32		
v/c Ratio	0.21	0.31	0.02	0.04	0.49	0.23	0.12	0.04		0.81	0.11	
Uniform Delay, d1	14.3	15.3	13.2	18.1	21.9	19.5	17.5	16.8		24.6	17.4	
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	0.3	0.5	0.1	0.3	1.3	0.9	0.5	0.1		9.3	0.1	
Delay (s)	14.6	15.8	13.3	18.4	23.2	20.4	18.0	16.9		33.8	17.5	
Level of Service	B	B	B	B	C	C	B	B		C	B	
Approach Delay (s)		15.5			22.2			17.6			30.1	
Approach LOS		B			C			B			C	

Intersection Summary

HCM 2000 Control Delay	22.1	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.64				
Actuated Cycle Length (s)	92.2	Sum of lost time (s)		15.2	
Intersection Capacity Utilization	59.7%	ICU Level of Service		B	
Analysis Period (min)	15				

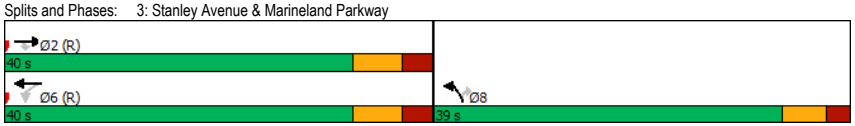
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	391	370	41	409	448	34
Future Volume (vph)	391	370	41	409	448	34
Lane Group Flow (vph)	483	457	51	505	553	42
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	38.5	38.5
Total Split (s)	40.0	40.0	40.0	40.0	39.0	39.0
Total Split (%)	50.6%	50.6%	50.6%	50.6%	49.4%	49.4%
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)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.33	0.53	0.14	0.35	0.39	0.06
Control Delay	16.6	4.2	16.0	16.8	17.3	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	4.2	16.0	16.8	17.3	5.1
Queue Length 50th (m)	25.1	0.0	4.6	26.5	29.0	0.0
Queue Length 95th (m)	31.6	9.7	10.2	33.3	35.8	4.4
Internal Link Dist (m)	155.5			318.1	148.8	
Turn Bay Length (m)		33.0	29.0		140.0	32.0
Base Capacity (vph)	1472	858	356	1457	1427	686
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	0.53	0.14	0.35	0.39	0.06

Intersection Summary

Cycle Length: 79
Actuated Cycle Length: 79
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: Stanley Avenue & Marineland Parkway

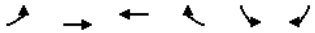


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	391	370	41	409	448	34
Future Volume (vph)	391	370	41	409	448	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	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
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)	3579	1432	1738	3544	3471	1609
Flt Permitted	1.00	1.00	0.47	1.00	0.95	1.00
Satd. Flow (perm)	3579	1432	868	3544	3471	1609
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	483	457	51	505	553	42
RTOR Reduction (vph)	0	269	0	0	0	25
Lane Group Flow (vph)	483	188	51	505	553	17
Confl. Peds. (#/hr)						4
Heavy Vehicles (%)	2%	14%	5%	3%	2%	0%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	32.5	32.5	32.5	32.5	32.5	32.5
Effective Green, g (s)	32.5	32.5	32.5	32.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1472	589	357	1457	1427	661
v/s Ratio Prot	0.13			c0.14	c0.16	
v/s Ratio Perm		0.13	0.06			0.01
v/c Ratio	0.33	0.32	0.14	0.35	0.39	0.03
Uniform Delay, d1	15.8	15.8	14.5	16.0	16.3	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	1.4	0.8	0.7	0.8	0.1
Delay (s)	16.4	17.2	15.4	16.6	17.1	13.9
Level of Service	B	B	B	B	B	B
Approach Delay (s)	16.8			16.5	16.9	
Approach LOS	B			B	B	

Intersection Summary

HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.37			
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	63.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	516	465	101	113	32
Future Volume (Veh/h)	23	516	465	101	113	32
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)	25	561	505	110	123	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		342				
pX, platoon unblocked					0.97	
vC, conflicting volume	505				836	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	505				773	252
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				61	95
cM capacity (veh/h)	1056				318	747

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	25	280	280	252	252	110	123	35
Volume Left	25	0	0	0	0	0	123	0
Volume Right	0	0	0	0	0	110	0	35
cSH	1056	1700	1700	1700	1700	1700	318	747
Volume to Capacity	0.02	0.17	0.17	0.15	0.15	0.06	0.39	0.05
Queue Length 95th (m)	0.6	0.0	0.0	0.0	0.0	0.0	13.4	1.1
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	0.0	23.3	10.1
Lane LOS	A						C	B
Approach Delay (s)	0.4			0.0			20.3	
Approach LOS							C	

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	32.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	3	2	428	438	25
Future Volume (Veh/h)	22	3	2	428	438	25
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	28	4	3	542	554	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	1118	570	586			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1118	570	586			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	99	100			
cM capacity (veh/h)	230	525	999			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	32	545	586
Volume Left	28	3	0
Volume Right	4	0	32
cSH	248	999	1700
Volume to Capacity	0.13	0.00	0.34
Queue Length 95th (m)	3.3	0.1	0.0
Control Delay (s)	21.7	0.1	0.0
Lane LOS	C	A	
Approach Delay (s)	21.7	0.1	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	34.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	68	45	5	352	421	22
Future Volume (Veh/h)	68	45	5	352	421	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	89	59	7	463	554	29
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	568	583			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1046	568	583			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	65	89	99			
cM capacity (veh/h)	251	526	887			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	148	470	583
Volume Left	89	7	0
Volume Right	59	0	29
cSH	317	887	1700
Volume to Capacity	0.47	0.01	0.34
Queue Length 95th (m)	17.9	0.2	0.0
Control Delay (s)	25.9	0.2	0.0
Lane LOS	D	A	
Approach Delay (s)	25.9	0.2	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	110	37	309	461	6
Future Volume (Veh/h)	44	110	37	309	461	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	59	149	50	418	623	8
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				346		
pX, platoon unblocked	0.88					
vC, conflicting volume	1147	627	631			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1100	627	631			
tC, single (s)	6.4	6.2	4.5			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.6			
p0 queue free %	69	69	94			
cM capacity (veh/h)	193	480	779			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	208	468	631
Volume Left	59	50	0
Volume Right	149	0	8
cSH	337	779	1700
Volume to Capacity	0.62	0.06	0.37
Queue Length 95th (m)	29.6	1.6	0.0
Control Delay (s)	31.4	1.8	0.0
Lane LOS	D	A	
Approach Delay (s)	31.4	1.8	0.0
Approach LOS	D		

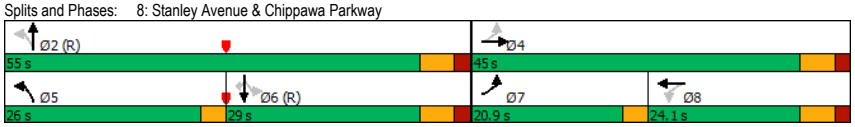
Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	210	19	7	13	347	132	16	315	241
Future Volume (vph)	210	19	7	13	347	132	16	315	241
Lane Group Flow (vph)	269	443	9	20	445	190	21	404	309
Turn Type	pm+pt	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases	7	4		8	5	2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	7	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)	9.5	24.1	24.1	24.1	9.5	24.1	24.1	24.1	24.1
Total Split (s)	20.9	45.0	24.1	24.1	26.0	55.0	29.0	29.0	29.0
Total Split (%)	20.9%	45.0%	24.1%	24.1%	26.0%	55.0%	29.0%	29.0%	29.0%
Yellow Time (s)	3.0	4.1	4.1	4.1	3.0	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	3.0	6.1	6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag	Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.69	0.65	0.08	0.16	0.63	0.17	0.05	0.54	0.43
Control Delay	41.1	8.7	44.3	41.4	12.1	8.1	27.2	31.7	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	8.7	44.3	41.4	12.1	8.1	27.2	31.7	14.6
Queue Length 50th (m)	42.4	3.4	1.7	3.2	37.8	14.4	2.8	66.5	18.6
Queue Length 95th (m)	53.3	12.8	5.5	8.7	48.7	21.7	8.0	#104.0	36.8
Internal Link Dist (m)		207.0		145.4		1041.9		321.5	
Turn Bay Length (m)	30.0		30.0		30.0		30.0		30.0
Base Capacity (vph)	409	879	307	340	750	1126	459	749	713
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	0.66	0.50	0.03	0.06	0.59	0.17	0.05	0.54	0.43

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Stanley Avenue & Chippawa Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	19	327	7	13	2	347	132	16	16	315	241
Future Volume (vph)	210	19	327	7	13	2	347	132	16	16	315	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1		6.1	6.1		3.0	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1825	1603		1825	1878		1825	1707		1706	1865	1512
Flt Permitted	0.53	1.00		0.89	1.00		0.33	1.00		0.64	1.00	1.00
Satd. Flow (perm)	1025	1603		1708	1878		638	1707		1145	1865	1512
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	269	24	419	9	17	3	445	169	21	21	404	309
RTOR Reduction (vph)	0	317	0	0	3	0	0	3	0	0	0	110
Lane Group Flow (vph)	269	126	0	9	17	0	445	187	0	21	404	199
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	0%	12%	0%	7%	3%	8%
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	24.4	24.4		4.5	4.5		63.4	63.4		37.7	37.7	37.7
Effective Green, g (s)	24.4	24.4		4.5	4.5		63.4	63.4		37.7	37.7	37.7
Actuated g/C Ratio	0.24	0.24		0.04	0.04		0.63	0.63		0.38	0.38	0.38
Clearance Time (s)	3.0	6.1		6.1	6.1		3.0	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	385	391		76	84		673	1082		431	703	570
v/s Ratio Prot	c0.12	0.08			0.01		c0.15	0.11			0.22	
v/s Ratio Perm	c0.05			0.01			c0.27			0.02		0.13
v/c Ratio	0.70	0.32		0.12	0.20		0.66	0.17		0.05	0.57	0.35
Uniform Delay, d1	33.6	31.0		45.8	46.0		10.9	7.5		19.8	24.8	22.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.5	0.5		0.7	1.2		2.4	0.3		0.2	3.4	1.7
Delay (s)	39.0	31.5		46.5	47.2		13.3	7.9		20.0	28.2	24.0
Level of Service	D	C		D	D		B	A		B	C	C
Approach Delay (s)		34.3			47.0			11.7			26.2	
Approach LOS		C			D			B			C	

Intersection Summary

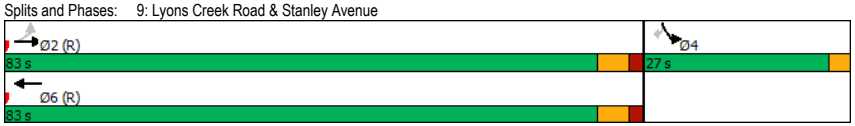
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	429	312	195	100	547
Future Volume (vph)	429	312	195	100	547
Lane Group Flow (vph)	511	371	309	119	651
Turn Type	Perm	NA	NA	Prot	Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.1	24.1	24.1	22.5	22.5
Total Split (s)	83.0	83.0	83.0	27.0	27.0
Total Split (%)	75.5%	75.5%	75.5%	24.5%	24.5%
Yellow Time (s)	4.1	4.1	4.1	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.76	0.28	0.24	0.32	0.76
Control Delay	19.9	6.9	5.8	38.9	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	6.9	5.8	38.9	9.7
Queue Length 50th (m)	62.3	26.4	18.4	21.6	0.0
Queue Length 95th (m)	94.3	35.3	26.0	35.3	17.5
Internal Link Dist (m)		337.8	364.0	1041.9	
Turn Bay Length (m)	44.0			25.0	
Base Capacity (vph)	673	1316	1270	375	854
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	0.76	0.28	0.24	0.32	0.76

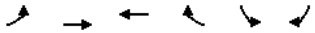
Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 34 (31%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 9: Lyons Creek Road & Stanley Avenue



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	429	312	195	65	100	547
Future Volume (vph)	429	312	195	65	100	547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1		3.0	3.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1615	1883	1802		1722	1585
Flt Permitted	0.57	1.00	1.00		0.95	1.00
Satd. Flow (perm)	963	1883	1802		1722	1585
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	511	371	232	77	119	651
RTOR Reduction (vph)	0	0	11	0	0	509
Lane Group Flow (vph)	511	371	298	0	119	142
Heavy Vehicles (%)	13%	2%	3%	3%	6%	3%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	76.9	76.9	76.9		24.0	24.0
Effective Green, g (s)	76.9	76.9	76.9		24.0	24.0
Actuated g/C Ratio	0.70	0.70	0.70		0.22	0.22
Clearance Time (s)	6.1	6.1	6.1		3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	673	1316	1259		375	345
v/s Ratio Prot		0.20	0.17		0.07	
v/s Ratio Perm	c0.53					c0.09
v/c Ratio	0.76	0.28	0.24		0.32	0.41
Uniform Delay, d1	10.6	6.2	6.0		36.1	36.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	7.9	0.5	0.4		2.2	3.6
Delay (s)	18.5	6.7	6.4		38.3	40.5
Level of Service	B	A	A		D	D
Approach Delay (s)		13.5	6.4		40.2	
Approach LOS		B	A		D	

Intersection Summary				
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.1
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	176	0	0	7	12	177
Future Volume (Veh/h)	176	0	0	7	12	177
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	191	0	0	8	13	192
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	130	122	218	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130	122	218	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	77	100	100	99	99	
cM capacity (veh/h)	831	762	675	1085	1623	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	191	8	205
Volume Left	191	0	13
Volume Right	0	8	192
cSH	831	1085	1623
Volume to Capacity	0.23	0.01	0.01
Queue Length 95th (m)	6.7	0.2	0.2
Control Delay (s)	10.6	8.3	0.5
Lane LOS	B	A	A
Approach Delay (s)	10.6	8.3	0.5
Approach LOS	B	A	

Intersection Summary				
Average Delay	5.4			
Intersection Capacity Utilization	34.7%	ICU Level of Service		A
Analysis Period (min)	15			

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix I

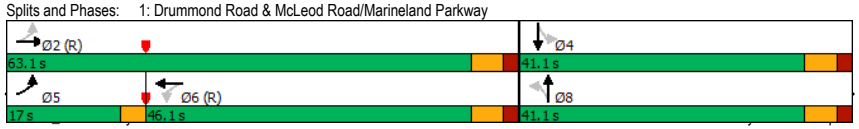
Total 2027 Traffic Operations

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	159	372	56	453	270	232	88	144
Future Volume (vph)	159	372	56	453	270	232	88	144
Lane Group Flow (vph)	0	703	0	705	0	708	97	333
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1
Total Split (s)	17.0	63.1	46.1	46.1	41.1	41.1	41.1	41.1
Total Split (%)	16.3%	60.6%	44.2%	44.2%	39.4%	39.4%	39.4%	39.4%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)		6.1		6.1		6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max
v/c Ratio		0.62		0.48		2.19	0.38	0.55
Control Delay		18.2		15.1		568.2	31.7	27.1
Queue Delay		0.0		0.0		0.0	0.0	0.0
Total Delay		18.2		15.1		568.2	31.7	27.1
Queue Length 50th (m)		46.2		41.4		~232.2	14.8	44.9
Queue Length 95th (m)		65.2		56.2		#301.7	29.9	72.3
Internal Link Dist (m)		299.5		1002.2		718.1		408.3
Turn Bay Length (m)							20.0	
Base Capacity (vph)		1134		1455		323	256	605
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		0.48		2.19	0.38	0.55

Intersection Summary

Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
~ 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.

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	372	108	56	453	132	270	232	142	88	144	159
Future Volume (vph)	159	372	108	56	453	132	270	232	142	88	144	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1			6.1			6.1		6.1	6.1	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frpb, ped/bikes		1.00			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	0.92	
Flt Protected		0.99			1.00			0.98		0.95	1.00	
Satd. Flow (prot)		3265			3211			1763		1751	1689	
Flt Permitted		0.62			0.82			0.52		0.41	1.00	
Satd. Flow (perm)		2044			2631			935		763	1689	
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)	175	409	119	62	498	145	297	255	156	97	158	175
RTOR Reduction (vph)	0	16	0	0	16	0	0	10	0	0	39	0
Lane Group Flow (vph)	0	687	0	0	689	0	0	698	0	97	294	0
Confl. Peds. (#/hr)	8		2	2		8	3		9	9		3
Heavy Vehicles (%)	8%	6%	9%	40%	6%	5%	2%	1%	8%	4%	5%	3%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		57.0			57.0			35.0		35.0	35.0	
Effective Green, g (s)		57.0			57.0			35.0		35.0	35.0	
Actuated g/C Ratio		0.55			0.55			0.34		0.34	0.34	
Clearance Time (s)		6.1			6.1			6.1		6.1	6.1	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		1118			1439			314		256	567	
v/s Ratio Prot											0.17	
v/s Ratio Perm		c0.34			0.26			c0.75		0.13		
v/c Ratio		0.61			0.48			2.22		0.38	0.52	
Uniform Delay, d1		16.1			14.5			34.6		26.3	27.8	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		1.0			1.1			560.6		4.2	3.4	
Delay (s)		17.1			15.6			595.2		30.6	31.2	
Level of Service		B			B			F		C	C	
Approach Delay (s)		17.1			15.6			595.2			31.1	
Approach LOS		B			B			F			C	

Intersection Summary

HCM 2000 Control Delay	179.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	115.8%	ICU Level of Service	H
Analysis Period (min)	15		

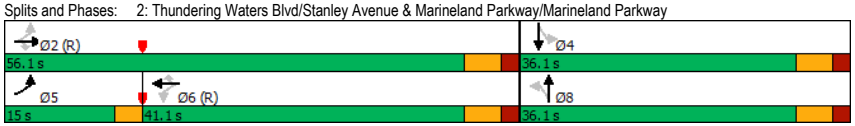
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	115	410	18	5	383	259	74	32	194	26
Future Volume (vph)	115	410	18	5	383	259	74	32	194	26
Lane Group Flow (vph)	131	466	20	6	435	294	84	47	220	91
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	15.0	56.1	56.1	41.1	41.1	41.1	36.1	36.1	36.1	36.1
Total Split (%)	16.3%	60.8%	60.8%	44.6%	44.6%	44.6%	39.2%	39.2%	39.2%	39.2%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.26	0.24	0.02	0.02	0.31	0.38	0.19	0.08	0.55	0.16
Control Delay	10.4	11.5	1.7	17.6	19.5	3.9	23.9	18.1	31.8	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	11.5	1.7	17.6	19.5	3.9	23.9	18.1	31.8	10.2
Queue Length 50th (m)	10.0	21.5	0.0	0.6	26.6	0.0	10.6	4.4	31.8	3.6
Queue Length 95th (m)	17.7	29.2	1.6	3.0	38.9	14.1	21.1	11.5	52.8	13.3
Internal Link Dist (m)		1002.2			127.7			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	538	1940	902	383	1392	774	436	608	401	559
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	0.24	0.24	0.02	0.02	0.31	0.38	0.19	0.08	0.55	0.16

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	410	18	5	383	259	74	32	10	194	26	54
Future Volume (vph)	115	410	18	5	383	259	74	32	10	194	26	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	3579	1633	1825	3380	1460	1825	1848		1614	1595	
Flt Permitted	0.44	1.00	1.00	0.48	1.00	1.00	0.70	1.00		0.73	1.00	
Satd. Flow (perm)	742	3579	1633	931	3380	1460	1341	1848		1234	1595	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	131	466	20	6	435	294	84	36	11	220	30	61
RTOR Reduction (vph)	0	0	9	0	0	173	0	7	0	0	41	0
Lane Group Flow (vph)	131	466	11	6	435	121	84	40	0	220	50	0
Confl. Peds. (#/hr)	4					4			1	1		
Heavy Vehicles (%)	14%	2%	0%	0%	8%	9%	0%	0%	0%	13%	11%	7%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	50.0	50.0	50.0	38.0	38.0	38.0	30.0	30.0		30.0	30.0	
Effective Green, g (s)	50.0	50.0	50.0	38.0	38.0	38.0	30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.41	0.41	0.41	0.33	0.33		0.33	0.33	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	486	1940	885	383	1393	601	436	601		401	518	
v/s Ratio Prot	c0.03	0.13			c0.13			0.02			0.03	
v/s Ratio Perm	0.12		0.01	0.01		0.08	0.06			c0.18		
v/c Ratio	0.27	0.24	0.01	0.02	0.31	0.20	0.19	0.07		0.55	0.10	
Uniform Delay, d1	10.7	11.1	9.7	16.0	18.3	17.4	22.4	21.4		25.5	21.7	
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	0.3	0.3	0.0	0.1	0.6	0.8	1.0	0.2		1.5	0.1	
Delay (s)	11.0	11.4	9.7	16.1	18.9	18.1	23.4	21.7		27.1	21.7	
Level of Service	B	B	A	B	B	B	C	C		C	C	
Approach Delay (s)		11.3			18.6			22.8			25.5	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	15.2	
Intersection Capacity Utilization	71.5%	ICU Level of Service	C	
Analysis Period (min)	15			

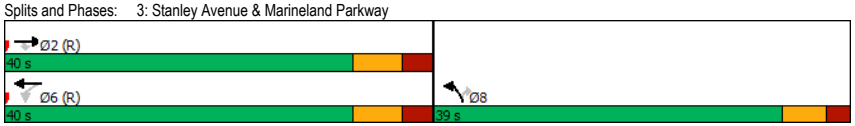
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	317	293	32	372	276	42
Future Volume (vph)	317	293	32	372	276	42
Lane Group Flow (vph)	356	329	36	418	310	47
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
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)	40.0	40.0	40.0	40.0	39.0	39.0
Total Split (%)	50.6%	50.6%	50.6%	50.6%	49.4%	49.4%
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)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.25	0.40	0.09	0.29	0.25	0.07
Control Delay	15.9	3.5	15.1	16.3	15.9	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	3.5	15.1	16.3	15.9	5.0
Queue Length 50th (m)	17.8	0.0	3.2	21.3	15.2	0.0
Queue Length 95th (m)	26.5	13.5	8.7	30.8	23.3	5.5
Internal Link Dist (m)	100.3			324.3	152.7	
Turn Bay Length (m)		33.0	29.0		140.0	32.0
Base Capacity (vph)	1416	827	409	1430	1244	671
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	0.25	0.40	0.09	0.29	0.25	0.07

Intersection Summary

Cycle Length: 79
Actuated Cycle Length: 79
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: Stanley Avenue & Marineland Parkway

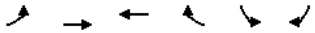


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	317	293	32	372	276	42
Future Volume (vph)	317	293	32	372	276	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	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
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)	3444	1541	1755	3476	3026	1566
Flt Permitted	1.00	1.00	0.54	1.00	0.95	1.00
Satd. Flow (perm)	3444	1541	995	3476	3026	1566
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	356	329	36	418	310	47
RTOR Reduction (vph)	0	194	0	0	0	28
Lane Group Flow (vph)	356	135	36	418	310	19
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	6%	6%	4%	5%	17%	3%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	32.5	32.5	32.5	32.5	32.5	32.5
Effective Green, g (s)	32.5	32.5	32.5	32.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1416	633	409	1430	1244	644
v/s Ratio Prot	0.10			c0.12	c0.10	
v/s Ratio Perm		0.09	0.04			0.01
v/c Ratio	0.25	0.21	0.09	0.29	0.25	0.03
Uniform Delay, d1	15.3	15.0	14.2	15.6	15.2	13.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.8	0.4	0.5	0.5	0.1
Delay (s)	15.7	15.8	14.6	16.1	15.7	13.9
Level of Service	B	B	B	B	B	B
Approach Delay (s)	15.7			16.0	15.5	
Approach LOS	B			B	B	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	300	365	61	15	46
Future Volume (Veh/h)	39	300	365	61	15	46
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)	42	326	397	66	16	50
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		348				
pX, platoon unblocked						
vC, conflicting volume	397				644	198
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	397				644	198
tC, single (s)	4.4				6.9	7.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.4
p0 queue free %	96				96	94
cM capacity (veh/h)	1077				383	773

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	151	217	198	198	66	16	50
Volume Left	42	0	0	0	0	16	0
Volume Right	0	0	0	0	66	0	50
cSH	1077	1700	1700	1700	1700	383	773
Volume to Capacity	0.04	0.13	0.12	0.12	0.04	0.04	0.06
Queue Length 95th (m)	0.9	0.0	0.0	0.0	0.0	1.0	1.6
Control Delay (s)	2.6	0.0	0.0	0.0	0.0	14.8	10.0
Lane LOS	A					B	A
Approach Delay (s)	1.1		0.0			11.1	
Approach LOS						B	

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	32.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	67	24	316	259	11
Future Volume (Veh/h)	17	67	24	316	259	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	23	92	33	433	355	15
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	862	362	370			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	862	362	370			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	92	87	97			
cM capacity (veh/h)	303	687	1200			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	115	466	370
Volume Left	23	33	0
Volume Right	92	0	15
cSH	548	1200	1700
Volume to Capacity	0.21	0.03	0.22
Queue Length 95th (m)	6.0	0.6	0.0
Control Delay (s)	13.3	0.8	0.0
Lane LOS	B	A	
Approach Delay (s)	13.3	0.8	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	47.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	16	34	322	261	60
Future Volume (Veh/h)	34	16	34	322	261	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	44	21	44	413	335	77
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	874	374	412			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	874	374	412			
tC, single (s)	6.7	6.6	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.7	2.3			
p0 queue free %	84	96	96			
cM capacity (veh/h)	279	596	1126			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	65	457	412
Volume Left	44	44	0
Volume Right	21	0	77
cSH	337	1126	1700
Volume to Capacity	0.19	0.04	0.24
Queue Length 95th (m)	5.3	0.9	0.0
Control Delay (s)	18.2	1.2	0.0
Lane LOS	C	A	
Approach Delay (s)	18.2	1.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	31	72	352	224	44
Future Volume (Veh/h)	11	31	72	352	224	44
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	16	44	103	503	320	63
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				346		
pX, platoon unblocked	0.93					
vC, conflicting volume	1060	352	383			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1027	352	383			
tC, single (s)	6.5	6.5	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.6	2.3			
p0 queue free %	92	93	91			
cM capacity (veh/h)	212	629	1154			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	60	606	383
Volume Left	16	103	0
Volume Right	44	0	63
cSH	413	1154	1700
Volume to Capacity	0.15	0.09	0.23
Queue Length 95th (m)	3.8	2.2	0.0
Control Delay (s)	15.2	2.3	0.0
Lane LOS	C	A	
Approach Delay (s)	15.2	2.3	0.0
Approach LOS	C		

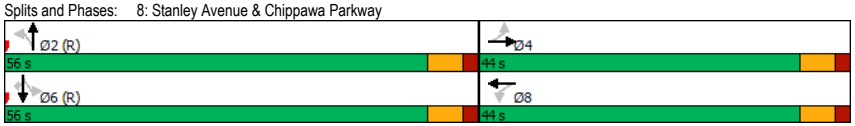
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	136	12	16	13	144	267	7	152	100
Future Volume (vph)	136	12	16	13	144	267	7	152	100
Lane Group Flow (vph)	162	239	19	29	171	323	8	181	119
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	2	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)	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
Total Split (s)	44.0	44.0	44.0	44.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	44.0%	44.0%	44.0%	44.0%	56.0%	56.0%	56.0%	56.0%	56.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.69	0.56	0.14	0.09	0.27	0.26	0.01	0.17	0.12
Control Delay	52.5	10.7	33.1	20.0	3.7	3.1	6.7	6.8	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	10.7	33.1	20.0	3.7	3.1	6.7	6.8	1.7
Queue Length 50th (m)	29.7	2.3	3.1	2.4	3.7	6.8	0.4	10.6	0.0
Queue Length 95th (m)	42.4	16.0	7.9	8.1	5.9	9.7	2.2	22.2	5.3
Internal Link Dist (m)		207.0		145.4		1041.9		321.5	
Turn Bay Length (m)	30.0		30.0		30.0		30.0		30.0
Base Capacity (vph)	483	646	289	684	645	1252	747	1067	1005
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	0.34	0.37	0.07	0.04	0.27	0.26	0.01	0.17	0.12

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 8: Stanley Avenue & Chippawa Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	12	189	16	13	12	144	267	4	7	152	100
Future Volume (vph)	136	12	189	16	13	12	144	267	4	7	152	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.93		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)	1644	1336		1825	1782		1372	1803		1825	1537	1396
Flt Permitted	0.74	1.00		0.40	1.00		0.64	1.00		0.56	1.00	1.00
Satd. Flow (perm)	1278	1336		765	1782		929	1803		1076	1537	1396
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)	162	14	225	19	15	14	171	318	5	8	181	119
RTOR Reduction (vph)	0	184	0	0	11	0	0	0	0	0	0	36
Lane Group Flow (vph)	162	55	0	19	18	0	171	323	0	8	181	83
Heavy Vehicles (%)	11%	0%	25%	0%	0%	0%	33%	6%	25%	0%	25%	17%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	18.4	18.4		18.4	18.4		69.4	69.4		69.4	69.4	69.4
Effective Green, g (s)	18.4	18.4		18.4	18.4		69.4	69.4		69.4	69.4	69.4
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.69	0.69		0.69	0.69	0.69
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	235	245		140	327		644	1251		746	1066	968
v/s Ratio Prot		0.04			0.01			0.18			0.12	
v/s Ratio Perm	c0.13			0.02			c0.18			0.01		0.06
v/c Ratio	0.69	0.23		0.14	0.05		0.27	0.26		0.01	0.17	0.09
Uniform Delay, d1	38.1	34.7		34.1	33.6		5.7	5.7		4.7	5.3	5.0
Progression Factor	1.00	1.00		1.00	1.00		0.39	0.40		1.00	1.00	1.00
Incremental Delay, d2	8.2	0.5		0.4	0.1		0.9	0.4		0.0	0.3	0.2
Delay (s)	46.3	35.2		34.6	33.7		3.1	2.7		4.7	5.7	5.1
Level of Service	D	D		C	C		A	A		A	A	A
Approach Delay (s)		39.7			34.0			2.8			5.4	
Approach LOS		D			C			A			A	

Intersection Summary

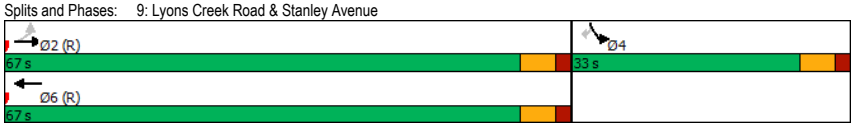
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.2	
Intersection Capacity Utilization	47.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	347	117	246	46	311
Future Volume (vph)	347	117	246	46	311
Lane Group Flow (vph)	373	126	335	49	334
Turn Type	Perm	NA	NA	Prot	Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1
Total Split (s)	67.0	67.0	67.0	33.0	33.0
Total Split (%)	67.0%	67.0%	67.0%	33.0%	33.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.63	0.12	0.31	0.13	0.55
Control Delay	18.6	8.6	9.6	29.1	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	8.6	9.6	29.1	9.4
Queue Length 50th (m)	42.5	9.5	26.5	7.4	0.0
Queue Length 95th (m)	74.9	17.0	41.4	15.5	18.4
Internal Link Dist (m)		337.8	364.0	1041.9	
Turn Bay Length (m)	44.0			25.0	
Base Capacity (vph)	588	1054	1083	372	610
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	0.63	0.12	0.31	0.13	0.55

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 33 (33%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: Lyons Creek Road & Stanley Avenue



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	347	117	246	65	46	311
Future Volume (vph)	347	117	246	65	46	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1		6.1	6.1
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1722	1731	1763		1383	1361
Flt Permitted	0.53	1.00	1.00		0.95	1.00
Satd. Flow (perm)	966	1731	1763		1383	1361
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	373	126	265	70	49	334
RTOR Reduction (vph)	0	0	9	0	0	244
Lane Group Flow (vph)	373	126	326	0	49	90
Heavy Vehicles (%)	6%	11%	4%	13%	32%	20%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	60.9	60.9	60.9		26.9	26.9
Effective Green, g (s)	60.9	60.9	60.9		26.9	26.9
Actuated g/C Ratio	0.61	0.61	0.61		0.27	0.27
Clearance Time (s)	6.1	6.1	6.1		6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	588	1054	1073		372	366
v/s Ratio Prot		0.07	0.18		0.04	
v/s Ratio Perm	c0.39					c0.07
v/c Ratio	0.63	0.12	0.30		0.13	0.25
Uniform Delay, d1	12.5	8.2	9.4		27.7	28.6
Progression Factor	1.00	1.00	1.00		1.00	1.67
Incremental Delay, d2	5.1	0.2	0.7		0.7	1.6
Delay (s)	17.6	8.5	10.1		28.5	49.3
Level of Service	B	A	B		C	D
Approach Delay (s)		15.3	10.1		46.7	
Approach LOS		B	B		D	

Intersection Summary				
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis — Tot 2027 AM Peak Hour
10: Drummond Extension/Drummond Road & Oldfield Road/Eaglewood Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	0	0	0	0	17	0	363	0	6	123	98
Future Volume (Veh/h)	126	0	0	0	0	17	0	363	0	6	123	98
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)	137	0	0	0	0	18	0	395	0	7	134	107
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	614	596	188	596	650	395	241			395		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	614	596	188	596	650	395	241			395		
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 %	65	100	100	100	100	97	100			99		
cM capacity (veh/h)	391	414	855	413	386	654	1326			1164		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	137	18	395	248
Volume Left	137	0	0	7
Volume Right	0	18	0	107
cSH	391	654	1326	1164
Volume to Capacity	0.35	0.03	0.00	0.01
Queue Length 95th (m)	11.7	0.6	0.0	0.1
Control Delay (s)	19.1	10.7	0.0	0.3
Lane LOS	C	B		A
Approach Delay (s)	19.1	10.7	0.0	0.3
Approach LOS	C	B		

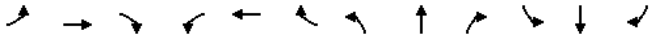
Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	39.4%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis — Tot 2027 AM Peak Hour
11: Drummond Extension & Street K

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	181	182	0	60	63
Future Volume (Veh/h)	2	181	182	0	60	63
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	197	198	0	65	68
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	396	198			198	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	396	198			198	
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	77			95	
cM capacity (veh/h)	580	843			1375	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	199	198	133
Volume Left	2	0	65
Volume Right	197	0	0
cSH	839	1700	1375
Volume to Capacity	0.24	0.12	0.05
Queue Length 95th (m)	7.0	0.0	1.1
Control Delay (s)	10.6	0.0	4.0
Lane LOS	B		A
Approach Delay (s)	10.6	0.0	4.0
Approach LOS	B		

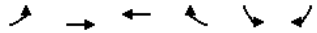
Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	37.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	0	17	5	0	66	6	1	1	22	7	32
Future Volume (Veh/h)	97	0	17	5	0	66	6	1	1	22	7	32
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)	105	0	18	5	0	72	7	1	1	24	8	35
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	161	90	26	107	106	2	43			2		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	161	90	26	107	106	2	43			2		
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 %	86	100	98	99	100	93	100			99		
cM capacity (veh/h)	740	785	1050	845	769	1083	1566			1620		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	123	77	9	67
Volume Left	105	5	7	24
Volume Right	18	72	1	35
cSH	773	1063	1566	1620
Volume to Capacity	0.16	0.07	0.00	0.01
Queue Length 95th (m)	4.3	1.8	0.1	0.3
Control Delay (s)	10.5	8.6	5.7	2.7
Lane LOS	B	A	A	A
Approach Delay (s)	10.5	8.6	5.7	2.7
Approach LOS	B	A		

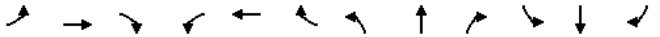
Intersection Summary				
Average Delay	7.9			
Intersection Capacity Utilization	23.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	47	20	15	37	0
Future Volume (Veh/h)	0	47	20	15	37	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)	0	51	22	16	40	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	38				81	30
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	38				81	30
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				96	100
cM capacity (veh/h)	1572				921	1044

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	51	38	40
Volume Left	0	0	40
Volume Right	0	16	0
cSH	1572	1700	921
Volume to Capacity	0.00	0.02	0.04
Queue Length 95th (m)	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	9.1
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.1
Approach LOS			A

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	176	0	0	0	0	8	0	238	0	15	383	177
Future Volume (vph)	176	0	0	0	0	8	0	238	0	15	383	177
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)	191	0	0	0	0	9	0	259	0	16	416	192

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	191	9	259	624
Volume Left (vph)	191	0	0	16
Volume Right (vph)	0	9	0	192
Hadj (s)	0.23	-0.57	0.03	-0.15
Departure Headway (s)	6.3	6.0	5.4	4.8
Degree Utilization, x	0.33	0.02	0.39	0.83
Capacity (veh/h)	537	521	630	738
Control Delay (s)	12.4	9.1	11.8	26.9
Approach Delay (s)	12.4	9.1	11.8	26.9
Approach LOS	B	A	B	D

Intersection Summary				
Delay			20.6	
Level of Service			C	
Intersection Capacity Utilization			66.6%	ICU Level of Service
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	118	120	0	186	197
Future Volume (Veh/h)	1	118	120	0	186	197
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	128	130	0	202	214
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	748	130			130	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	748	130			130	
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	86			86	
cM capacity (veh/h)	327	920			1455	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	129	130	416
Volume Left	1	0	202
Volume Right	128	0	0
cSH	907	1700	1455
Volume to Capacity	0.14	0.08	0.14
Queue Length 95th (m)	3.8	0.0	3.7
Control Delay (s)	9.6	0.0	4.5
Lane LOS	A		A
Approach Delay (s)	9.6	0.0	4.5
Approach LOS	A		

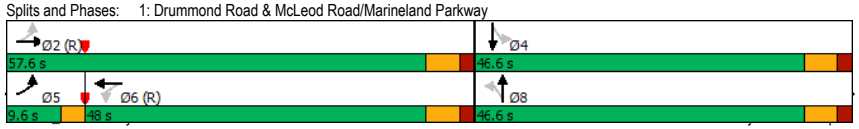
Intersection Summary				
Average Delay		4.6		
Intersection Capacity Utilization		41.4%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	240	536	148	594	185	252	126	307
Future Volume (vph)	240	536	148	594	185	252	126	307
Lane Group Flow (vph)	0	1112	0	913	0	580	134	586
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1
Total Split (s)	9.6	57.6	48.0	48.0	46.6	46.6	46.6	46.6
Total Split (%)	9.2%	55.3%	46.1%	46.1%	44.7%	44.7%	44.7%	44.7%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)		6.1		6.1		6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max
v/c Ratio		1.15		0.98		3.05	0.45	0.82
Control Delay		106.6		52.7		953.9	29.8	37.7
Queue Delay		0.0		0.0		0.0	0.0	0.0
Total Delay		106.6		52.7		953.9	29.8	37.7
Queue Length 50th (m)		~137.1		91.0		~170.3	19.8	97.9
Queue Length 95th (m)		#177.7		#137.8		#235.9	38.0	#155.8
Internal Link Dist (m)		299.5		1002.2		715.1		408.3
Turn Bay Length (m)							20.0	
Base Capacity (vph)		964		927		190	296	712
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		1.15		0.98		3.05	0.45	0.82

Intersection Summary

Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
~ 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.

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	536	270	148	594	117	185	252	108	126	307	243
Future Volume (vph)	240	536	270	148	594	117	185	252	108	126	307	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1			6.1			6.1		6.1	6.1	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frpb, ped/bikes		0.99			0.99			0.99		1.00	0.99	
Flpb, ped/bikes		1.00			1.00			1.00		0.99	1.00	
Frt		0.96			0.98			0.97		1.00	0.93	
Flt Protected		0.99			0.99			0.98		0.95	1.00	
Satd. Flow (prot)		3343			3473			1783		1815	1761	
Flt Permitted		0.56			0.53			0.26		0.40	1.00	
Satd. Flow (perm)		1884			1856			470		763	1761	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	255	570	287	157	632	124	197	268	115	134	327	259
RTOR Reduction (vph)	0	33	0	0	10	0	0	9	0	0	28	0
Lane Group Flow (vph)	0	1079	0	0	903	0	0	571	0	134	558	0
Confl. Peds. (#/hr)	11		9	9		11	8		16	16		8
Heavy Vehicles (%)	1%	4%	1%	0%	2%	0%	0%	1%	10%	0%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		51.5			51.5			40.5		40.5	40.5	
Effective Green, g (s)		51.5			51.5			40.5		40.5	40.5	
Actuated g/C Ratio		0.49			0.49			0.39		0.39	0.39	
Clearance Time (s)		6.1			6.1			6.1		6.1	6.1	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		931			917			182		296	684	
v/s Ratio Prot											0.32	
v/s Ratio Perm		c0.57			0.49			c1.22		0.18		
v/c Ratio		1.16			0.98			3.14		0.45	0.82	
Uniform Delay, d1		26.4			26.0			31.9		23.6	28.5	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		83.4			26.2			977.2		4.9	10.4	
Delay (s)		109.8			52.2			1009.1		28.6	38.9	
Level of Service		F			D			F		C	D	
Approach Delay (s)		109.8			52.2			1009.1			37.0	
Approach LOS		F			D			F			D	

Intersection Summary

HCM 2000 Control Delay	235.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.09		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	137.4%	ICU Level of Service	H
Analysis Period (min)	15		

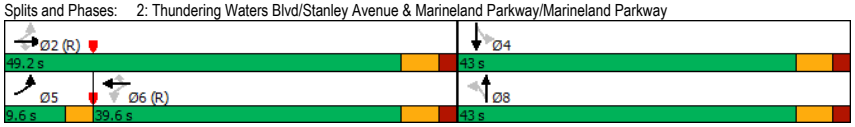
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	100	461	32	13	613	294	55	21	351	39
Future Volume (vph)	100	461	32	13	613	294	55	21	351	39
Lane Group Flow (vph)	119	549	38	15	730	350	65	32	418	210
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	9.6	49.2	49.2	39.6	39.6	39.6	43.0	43.0	43.0	43.0
Total Split (%)	10.4%	53.4%	53.4%	43.0%	43.0%	43.0%	46.6%	46.6%	46.6%	46.6%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.36	0.33	0.05	0.05	0.56	0.44	0.14	0.04	0.80	0.28
Control Delay	15.5	16.2	4.7	19.8	25.5	4.3	18.7	14.4	38.0	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.5	16.2	4.7	19.8	25.5	4.3	18.7	14.4	38.0	6.1
Queue Length 50th (m)	10.8	31.2	0.0	1.7	53.7	0.0	7.2	2.6	63.9	4.9
Queue Length 95th (m)	18.3	39.2	4.4	5.4	65.0	12.5	14.5	7.5	#93.4	15.7
Internal Link Dist (m)		1002.2			87.3			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	331	1640	783	312	1302	788	465	747	523	749
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	0.33	0.05	0.05	0.56	0.44	0.14	0.04	0.80	0.28

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	461	32	13	613	294	55	21	6	351	39	138
Future Volume (vph)	100	461	32	13	613	294	55	21	6	351	39	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	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	0.85	1.00	0.97		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3510	1633	1825	3579	1555	1821	1858		1690	1626	
Flt Permitted	0.24	1.00	1.00	0.45	1.00	1.00	0.61	1.00		0.74	1.00	
Satd. Flow (perm)	468	3510	1633	858	3579	1555	1162	1858		1310	1626	
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)	119	549	38	15	730	350	65	25	7	418	46	164
RTOR Reduction (vph)	0	0	20	0	0	222	0	4	0	0	98	0
Lane Group Flow (vph)	119	549	18	15	730	128	65	28	0	418	112	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	4%	0%	0%	2%	5%	0%	0%	0%	8%	0%	4%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	43.1	43.1	43.1	33.6	33.6	33.6	36.9	36.9		36.9	36.9	
Effective Green, g (s)	43.1	43.1	43.1	33.6	33.6	33.6	36.9	36.9		36.9	36.9	
Actuated g/C Ratio	0.47	0.47	0.47	0.36	0.36	0.36	0.40	0.40		0.40	0.40	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	314	1640	763	312	1304	566	465	743		524	650	
v/s Ratio Prot	c0.03	0.16			c0.20			0.01			0.07	
v/s Ratio Perm	0.15		0.01	0.02		0.08	0.06			c0.32		
v/c Ratio	0.38	0.33	0.02	0.05	0.56	0.23	0.14	0.04		0.80	0.17	
Uniform Delay, d1	15.1	15.5	13.2	19.0	23.4	20.3	17.6	16.8		24.4	17.8	
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	0.8	0.6	0.1	0.3	1.7	0.9	0.6	0.1		8.3	0.1	
Delay (s)	15.8	16.1	13.3	19.2	25.1	21.2	18.2	16.9		32.6	17.9	
Level of Service	B	B	B	B	C	C	B	B		C	B	
Approach Delay (s)		15.9			23.8			17.8			27.7	
Approach LOS		B			C			B			C	

Intersection Summary

HCM 2000 Control Delay	22.3	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.66				
Actuated Cycle Length (s)	92.2	Sum of lost time (s)		15.2	
Intersection Capacity Utilization	64.7%	ICU Level of Service		C	
Analysis Period (min)	15				

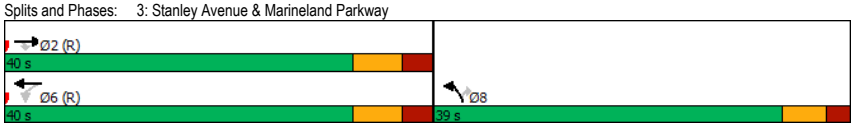
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	420	366	41	460	442	34
Future Volume (vph)	420	366	41	460	442	34
Lane Group Flow (vph)	519	452	51	568	546	42
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	38.5	38.5
Total Split (s)	40.0	40.0	40.0	40.0	39.0	39.0
Total Split (%)	50.6%	50.6%	50.6%	50.6%	49.4%	49.4%
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)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.35	0.53	0.15	0.39	0.38	0.06
Control Delay	16.9	4.2	16.2	17.3	17.2	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.9	4.2	16.2	17.3	17.2	5.1
Queue Length 50th (m)	27.3	0.0	4.7	30.4	28.5	0.0
Queue Length 95th (m)	34.0	9.7	10.3	37.5	35.3	4.4
Internal Link Dist (m)	155.5			318.1	148.8	
Turn Bay Length (m)		33.0	29.0		140.0	32.0
Base Capacity (vph)	1472	855	337	1457	1427	686
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	0.35	0.53	0.15	0.39	0.38	0.06

Intersection Summary

Cycle Length: 79
Actuated Cycle Length: 79
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: Stanley Avenue & Marineland Parkway

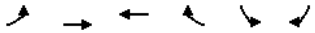


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	420	366	41	460	442	34
Future Volume (vph)	420	366	41	460	442	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	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
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)	3579	1432	1738	3544	3471	1609
Flt Permitted	1.00	1.00	0.45	1.00	0.95	1.00
Satd. Flow (perm)	3579	1432	821	3544	3471	1609
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	519	452	51	568	546	42
RTOR Reduction (vph)	0	266	0	0	0	25
Lane Group Flow (vph)	519	186	51	568	546	17
Confl. Peds. (#/hr)						4
Heavy Vehicles (%)	2%	14%	5%	3%	2%	0%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	32.5	32.5	32.5	32.5	32.5	32.5
Effective Green, g (s)	32.5	32.5	32.5	32.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1472	589	337	1457	1427	661
v/s Ratio Prot	0.15			c0.16	c0.16	
v/s Ratio Perm		0.13	0.06			0.01
v/c Ratio	0.35	0.32	0.15	0.39	0.38	0.03
Uniform Delay, d1	16.0	15.7	14.6	16.3	16.2	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	1.4	1.0	0.8	0.8	0.1
Delay (s)	16.7	17.1	15.5	17.1	17.0	13.9
Level of Service	B	B	B	B	B	B
Approach Delay (s)	16.9			17.0	16.8	
Approach LOS	B			B	B	

Intersection Summary

HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	33	533	502	98	110	45
Future Volume (Veh/h)	33	533	502	98	110	45
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)	36	579	546	107	120	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		342				
pX, platoon unblocked					0.95	
vC, conflicting volume	546				908	273
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	546				794	273
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				60	93
cM capacity (veh/h)	1019				298	725

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	229	386	273	273	107	120	49
Volume Left	36	0	0	0	0	120	0
Volume Right	0	0	0	0	107	0	49
cSH	1019	1700	1700	1700	1700	298	725
Volume to Capacity	0.04	0.23	0.16	0.16	0.06	0.40	0.07
Queue Length 95th (m)	0.8	0.0	0.0	0.0	0.0	14.2	1.6
Control Delay (s)	1.7	0.0	0.0	0.0	0.0	25.0	10.3
Lane LOS	A					D	B
Approach Delay (s)	0.6		0.0			20.8	
Approach LOS						C	

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	45.7%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	45	72	417	428	24
Future Volume (Veh/h)	21	45	72	417	428	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	27	57	91	528	542	30
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	1267	557	572			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1267	557	572			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	89	91			
cM capacity (veh/h)	171	534	1011			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	84	619	572
Volume Left	27	91	0
Volume Right	57	0	30
cSH	318	1011	1700
Volume to Capacity	0.26	0.09	0.34
Queue Length 95th (m)	7.9	2.2	0.0
Control Delay (s)	20.4	2.3	0.0
Lane LOS	C	A	
Approach Delay (s)	20.4	2.3	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	63.8%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	43	4	415	454	21
Future Volume (Veh/h)	65	43	4	415	454	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	86	57	5	546	597	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	1167	611	625			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1167	611	625			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	60	89	99			
cM capacity (veh/h)	213	497	855			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	143	551	625
Volume Left	86	5	0
Volume Right	57	0	28
cSH	276	855	1700
Volume to Capacity	0.52	0.01	0.37
Queue Length 95th (m)	21.1	0.1	0.0
Control Delay (s)	31.3	0.2	0.0
Lane LOS	D	A	
Approach Delay (s)	31.3	0.2	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	105	35	374	492	5
Future Volume (Veh/h)	42	105	35	374	492	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	57	142	47	505	665	7
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				346		
pX, platoon unblocked	0.87					
vC, conflicting volume	1270	668	672			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1236	668	672			
tC, single (s)	6.4	6.2	4.5			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.6			
p0 queue free %	64	69	94			
cM capacity (veh/h)	158	454	750			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	199	552	672
Volume Left	57	47	0
Volume Right	142	0	7
cSH	296	750	1700
Volume to Capacity	0.67	0.06	0.40
Queue Length 95th (m)	34.2	1.5	0.0
Control Delay (s)	39.0	1.7	0.0
Lane LOS	E	A	
Approach Delay (s)	39.0	1.7	0.0
Approach LOS	E		

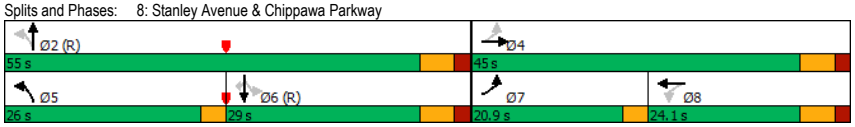
Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	210	19	7	12	346	196	15	341	240
Future Volume (vph)	210	19	7	12	346	196	15	341	240
Lane Group Flow (vph)	269	441	9	18	444	270	19	437	308
Turn Type	pm+pt	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases	7	4		8	5	2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	7	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)	9.5	24.1	24.1	24.1	9.5	24.1	24.1	24.1	24.1
Total Split (s)	20.9	45.0	24.1	24.1	26.0	55.0	29.0	29.0	29.0
Total Split (%)	20.9%	45.0%	24.1%	24.1%	26.0%	55.0%	29.0%	29.0%	29.0%
Yellow Time (s)	3.0	4.1	4.1	4.1	3.0	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	3.0	6.1	6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag	Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.69	0.65	0.08	0.14	0.65	0.24	0.04	0.58	0.44
Control Delay	41.1	8.8	44.3	40.7	13.0	8.8	27.5	32.6	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	8.8	44.3	40.7	13.0	8.8	27.5	32.6	15.7
Queue Length 50th (m)	42.5	3.5	1.7	2.8	37.6	22.1	2.5	73.3	20.8
Queue Length 95th (m)	53.3	12.7	5.5	8.1	48.7	31.2	7.6	#117.0	39.6
Internal Link Dist (m)		207.0		145.4		1041.9		321.5	
Turn Bay Length (m)	30.0		30.0		30.0		30.0		30.0
Base Capacity (vph)	410	878	314	339	723	1128	428	751	706
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	0.66	0.50	0.03	0.05	0.61	0.24	0.04	0.58	0.44

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Stanley Avenue & Chippawa Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	19	325	7	12	2	346	196	15	15	341	240
Future Volume (vph)	210	19	325	7	12	2	346	196	15	15	341	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1		6.1	6.1		3.0	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.97		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)	1825	1603		1825	1873		1825	1710		1706	1865	1512
Flt Permitted	0.54	1.00		0.91	1.00		0.30	1.00		0.59	1.00	1.00
Satd. Flow (perm)	1038	1603		1746	1873		576	1710		1065	1865	1512
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	269	24	417	9	15	3	444	251	19	19	437	308
RTOR Reduction (vph)	0	316	0	0	3	0	0	2	0	0	0	101
Lane Group Flow (vph)	269	125	0	9	15	0	444	268	0	19	437	207
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	0%	12%	0%	7%	3%	8%
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	24.3	24.3		4.4	4.4		63.5	63.5		37.9	37.9	37.9
Effective Green, g (s)	24.3	24.3		4.4	4.4		63.5	63.5		37.9	37.9	37.9
Actuated g/C Ratio	0.24	0.24		0.04	0.04		0.64	0.64		0.38	0.38	0.38
Clearance Time (s)	3.0	6.1		6.1	6.1		3.0	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	385	389		76	82		648	1085		403	706	573
v/s Ratio Prot	c0.12	0.08			0.01		c0.15	0.16			0.23	
v/s Ratio Perm	c0.05			0.01			c0.28			0.02		0.14
v/c Ratio	0.70	0.32		0.12	0.18		0.69	0.25		0.05	0.62	0.36
Uniform Delay, d1	33.7	31.1		45.9	46.1		11.4	7.9		19.6	25.2	22.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.5	0.5		0.7	1.1		3.0	0.5		0.2	4.0	1.8
Delay (s)	39.1	31.6		46.6	47.2		14.4	8.4		19.9	29.2	24.1
Level of Service	D	C		D	D		B	A		B	C	C
Approach Delay (s)		34.4			47.0			12.1			26.9	
Approach LOS		C			D			B			C	

Intersection Summary

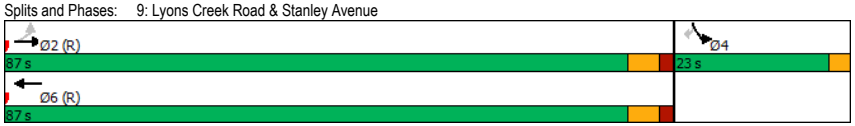
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.2	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	479	296	186	104	568
Future Volume (vph)	479	296	186	104	568
Lane Group Flow (vph)	570	352	313	124	676
Turn Type	Perm	NA	NA	Prot	Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.1	24.1	24.1	22.5	22.5
Total Split (s)	87.0	87.0	87.0	23.0	23.0
Total Split (%)	79.1%	79.1%	79.1%	20.9%	20.9%
Yellow Time (s)	4.1	4.1	4.1	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.80	0.25	0.24	0.40	0.80
Control Delay	20.2	5.3	4.3	44.1	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	5.3	4.3	44.1	11.6
Queue Length 50th (m)	67.6	21.1	15.0	23.7	0.0
Queue Length 95th (m)	105.0	28.4	21.3	38.3	18.5
Internal Link Dist (m)		337.8	364.0	1041.9	
Turn Bay Length (m)	44.0			25.0	
Base Capacity (vph)	712	1384	1330	313	841
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	0.80	0.25	0.24	0.40	0.80

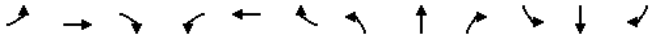
Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 34 (31%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 9: Lyons Creek Road & Stanley Avenue



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	479	296	186	77	104	568
Future Volume (vph)	479	296	186	77	104	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1		3.0	3.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1615	1883	1791		1722	1585
Flt Permitted	0.57	1.00	1.00		0.95	1.00
Satd. Flow (perm)	969	1883	1791		1722	1585
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	570	352	221	92	124	676
RTOR Reduction (vph)	0	0	13	0	0	553
Lane Group Flow (vph)	570	352	300	0	124	123
Heavy Vehicles (%)	13%	2%	3%	3%	6%	3%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	80.9	80.9	80.9		20.0	20.0
Effective Green, g (s)	80.9	80.9	80.9		20.0	20.0
Actuated g/C Ratio	0.74	0.74	0.74		0.18	0.18
Clearance Time (s)	6.1	6.1	6.1		3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	712	1384	1317		313	288
v/s Ratio Prot		0.19	0.17		0.07	
v/s Ratio Perm	c0.59					c0.08
v/c Ratio	0.80	0.25	0.23		0.40	0.43
Uniform Delay, d1	9.4	4.7	4.6		39.7	39.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	9.2	0.4	0.4		3.7	4.6
Delay (s)	18.6	5.2	5.0		43.4	44.5
Level of Service	B	A	A		D	D
Approach Delay (s)		13.5	5.0		44.3	
Approach LOS		B	A		D	

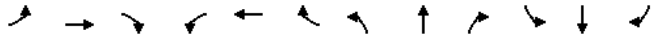
Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.1
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	0	0	0	0	8	0	238	0	15	383	177
Future Volume (Veh/h)	176	0	0	0	0	8	0	238	0	15	383	177
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)	191	0	0	0	0	9	0	259	0	16	416	192
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	812	803	512	803	899	259	608			259		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	812	803	512	803	899	259	608			259		
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 %	34	100	100	100	100	99	100			99		
cM capacity (veh/h)	291	313	562	299	275	780	970			1306		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	191	9	259	624
Volume Left	191	0	0	16
Volume Right	0	9	0	192
cSH	291	780	970	1306
Volume to Capacity	0.66	0.01	0.00	0.01
Queue Length 95th (m)	32.4	0.3	0.0	0.3
Control Delay (s)	38.1	9.7	0.0	0.3
Lane LOS	E	A		A
Approach Delay (s)	38.1	9.7	0.0	0.3
Approach LOS	E	A		

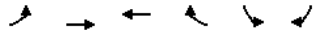
Intersection Summary				
Average Delay		7.0		
Intersection Capacity Utilization		66.6%	ICU Level of Service	C
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	0	11	3	0	44	19	5	4	69	4	104
Future Volume (Veh/h)	63	0	11	3	0	44	19	5	4	69	4	104
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)	68	0	12	3	0	48	21	5	4	75	4	113
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	308	262	60	272	316	7	117			9		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	308	262	60	272	316	7	117			9		
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 %	88	100	99	100	100	96	99			95		
cM capacity (veh/h)	588	605	1005	642	564	1075	1471			1611		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	80	51	30	192
Volume Left	68	3	21	75
Volume Right	12	48	4	113
cSH	627	1034	1471	1611
Volume to Capacity	0.13	0.05	0.01	0.05
Queue Length 95th (m)	3.3	1.2	0.3	1.1
Control Delay (s)	11.6	8.7	5.3	3.1
Lane LOS	B	A	A	A
Approach Delay (s)	11.6	8.7	5.3	3.1
Approach LOS	B	A		

Intersection Summary				
Average Delay			6.0	
Intersection Capacity Utilization			28.1%	ICU Level of Service
Analysis Period (min)			15	



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	42	54	42	24	0
Future Volume (Veh/h)	0	42	54	42	24	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)	0	46	59	46	26	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	105				128	82
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	105				128	82
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				97	100
cM capacity (veh/h)	1486				866	978

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	46	105	26
Volume Left	0	0	26
Volume Right	0	46	0
cSH	1486	1700	866
Volume to Capacity	0.00	0.06	0.03
Queue Length 95th (m)	0.0	0.0	0.7
Control Delay (s)	0.0	0.0	9.3
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.3
Approach LOS			A

Intersection Summary				
Average Delay			1.4	
Intersection Capacity Utilization			15.4%	ICU Level of Service
Analysis Period (min)			15	

BURNSIDE

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Appendix J

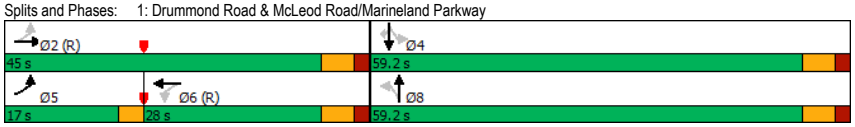
Total 2032 Traffic Operations

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	163	379	57	461	272	234	90	145	163
Future Volume (vph)	163	379	57	461	272	234	90	145	163
Lane Group Flow (vph)	179	536	63	655	299	413	99	159	179
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	6	6	8	8	4	4	4
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)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1	33.1
Total Split (s)	17.0	45.0	28.0	28.0	59.2	59.2	59.2	59.2	59.2
Total Split (%)	16.3%	43.2%	26.9%	26.9%	56.8%	56.8%	56.8%	56.8%	56.8%
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max
v/c Ratio	0.64	0.43	0.44	0.84	0.48	0.46	0.25	0.17	0.20
Control Delay	32.1	23.6	47.3	48.0	19.8	16.4	16.4	14.3	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.1	23.6	47.3	48.0	19.8	16.4	16.4	14.3	2.6
Queue Length 50th (m)	23.7	38.6	11.1	64.4	37.6	45.5	10.8	16.6	0.0
Queue Length 95th (m)	39.3	53.2	25.5	#98.0	60.6	69.6	21.5	28.0	10.0
Internal Link Dist (m)		299.5		1002.2		718.1		408.3	
Turn Bay Length (m)	95.0		25.0		25.0		15.0		50.0
Base Capacity (vph)	304	1252	142	781	627	904	403	932	883
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	0.59	0.43	0.44	0.84	0.48	0.46	0.25	0.17	0.20

Intersection Summary

Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	379	109	57	461	135	272	234	142	90	145	163
Future Volume (vph)	163	379	109	57	461	135	272	234	142	90	145	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	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	0.94		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)	1689	3289		1301	3304		1784	1734		1746	1830	1561
Flt Permitted	0.16	1.00		0.45	1.00		0.66	1.00		0.43	1.00	1.00
Satd. Flow (perm)	290	3289		619	3304		1233	1734		792	1830	1561
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)	179	416	120	63	507	148	299	257	156	99	159	179
RTOR Reduction (vph)	0	26	0	0	25	0	0	21	0	0	0	88
Lane Group Flow (vph)	179	510	0	63	630	0	299	392	0	99	159	91
Confl. Peds. (#/hr)	8		2	2		8	3		9	9		3
Heavy Vehicles (%)	8%	6%	9%	40%	6%	5%	2%	1%	8%	4%	5%	3%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	38.9	38.9		23.8	23.8		53.1	53.1		53.1	53.1	53.1
Effective Green, g (s)	38.9	38.9		23.8	23.8		53.1	53.1		53.1	53.1	53.1
Actuated g/C Ratio	0.37	0.37		0.23	0.23		0.51	0.51		0.51	0.51	0.51
Clearance Time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	270	1227		141	754		628	883		403	932	795
v/s Ratio Prot	c0.08	0.16			c0.19			0.23			0.09	
v/s Ratio Perm	0.17			0.10			c0.24			0.12		0.06
v/c Ratio	0.66	0.42		0.45	0.83		0.48	0.44		0.25	0.17	0.11
Uniform Delay, d1	24.5	24.2		34.5	38.3		16.5	16.2		14.3	13.7	13.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.0	1.0		9.9	10.6		2.6	1.6		1.4	0.4	0.3
Delay (s)	30.5	25.3		44.5	48.9		19.1	17.8		15.8	14.1	13.6
Level of Service	C	C		D	D		B	B		B	B	B
Approach Delay (s)		26.6			48.5			18.4			14.3	
Approach LOS		C			D			B			B	

Intersection Summary

HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			

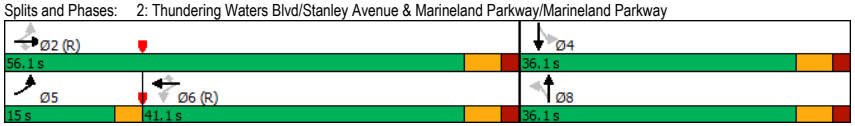
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	116	417	18	5	391	263	74	32	197	26
Future Volume (vph)	116	417	18	5	391	263	74	32	197	26
Lane Group Flow (vph)	132	474	20	6	444	299	84	47	224	93
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	15.0	56.1	56.1	41.1	41.1	41.1	36.1	36.1	36.1	36.1
Total Split (%)	16.3%	60.8%	60.8%	44.6%	44.6%	44.6%	39.2%	39.2%	39.2%	39.2%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.26	0.24	0.02	0.02	0.32	0.39	0.19	0.08	0.56	0.17
Control Delay	10.5	11.5	1.7	17.6	19.6	4.0	23.9	18.1	32.1	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	11.5	1.7	17.6	19.6	4.0	23.9	18.1	32.1	10.1
Queue Length 50th (m)	10.1	22.0	0.0	0.6	27.3	0.0	10.6	4.4	32.5	3.6
Queue Length 95th (m)	17.9	29.8	1.6	3.0	39.8	14.2	21.1	11.5	54.2	13.5
Internal Link Dist (m)		1002.2			127.7			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	533	1940	902	379	1390	776	435	608	401	560
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	0.25	0.24	0.02	0.02	0.32	0.39	0.19	0.08	0.56	0.17

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	417	18	5	391	263	74	32	10	197	26	55
Future Volume (vph)	116	417	18	5	391	263	74	32	10	197	26	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	3579	1633	1825	3380	1460	1825	1848		1614	1594	
Flt Permitted	0.43	1.00	1.00	0.48	1.00	1.00	0.70	1.00		0.73	1.00	
Satd. Flow (perm)	731	3579	1633	923	3380	1460	1339	1848		1234	1594	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	132	474	20	6	444	299	84	36	11	224	30	62
RTOR Reduction (vph)	0	0	9	0	0	176	0	7	0	0	43	0
Lane Group Flow (vph)	132	474	11	6	444	123	84	40	0	224	50	0
Confl. Peds. (#/hr)	4					4			1	1		
Heavy Vehicles (%)	14%	2%	0%	0%	8%	9%	0%	0%	0%	13%	11%	7%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	50.0	50.0	50.0	37.9	37.9	37.9	30.0	30.0		30.0	30.0	
Effective Green, g (s)	50.0	50.0	50.0	37.9	37.9	37.9	30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.54	0.54	0.54	0.41	0.41	0.41	0.33	0.33		0.33	0.33	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	482	1940	885	379	1389	600	435	601		401	518	
v/s Ratio Prot	c0.03	0.13			c0.13			0.02			0.03	
v/s Ratio Perm	0.12		0.01	0.01		0.08	0.06			c0.18		
v/c Ratio	0.27	0.24	0.01	0.02	0.32	0.20	0.19	0.07		0.56	0.10	
Uniform Delay, d1	10.7	11.1	9.7	16.1	18.4	17.5	22.4	21.4		25.6	21.7	
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	0.3	0.3	0.0	0.1	0.6	0.8	1.0	0.2		1.7	0.1	
Delay (s)	11.0	11.4	9.7	16.2	19.0	18.2	23.4	21.7		27.3	21.8	
Level of Service	B	B	A	B	B	B	C	C		C	C	
Approach Delay (s)		11.3			18.7			22.8			25.7	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	15.2	
Intersection Capacity Utilization	71.6%	ICU Level of Service	C	
Analysis Period (min)	15			

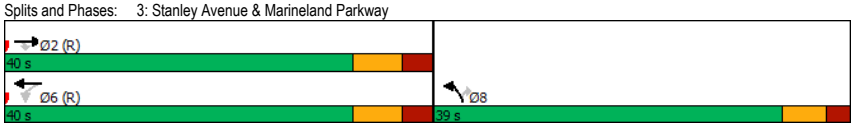
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	323	298	33	380	280	43
Future Volume (vph)	323	298	33	380	280	43
Lane Group Flow (vph)	363	335	37	427	315	48
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
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)	40.0	40.0	40.0	40.0	39.0	39.0
Total Split (%)	50.6%	50.6%	50.6%	50.6%	49.4%	49.4%
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)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.26	0.40	0.09	0.30	0.25	0.07
Control Delay	15.9	3.5	15.1	16.3	16.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	3.5	15.1	16.3	16.0	5.0
Queue Length 50th (m)	18.2	0.0	3.3	21.9	15.5	0.0
Queue Length 95th (m)	27.1	13.6	8.8	31.5	23.6	5.6
Internal Link Dist (m)	100.3			324.3	152.7	
Turn Bay Length (m)		33.0	29.0		140.0	32.0
Base Capacity (vph)	1416	831	406	1430	1244	672
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	0.26	0.40	0.09	0.30	0.25	0.07

Intersection Summary

Cycle Length: 79
Actuated Cycle Length: 79
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: Stanley Avenue & Marineland Parkway

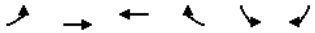


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	323	298	33	380	280	43
Future Volume (vph)	323	298	33	380	280	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	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
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)	3444	1541	1755	3476	3026	1566
Flt Permitted	1.00	1.00	0.54	1.00	0.95	1.00
Satd. Flow (perm)	3444	1541	989	3476	3026	1566
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	363	335	37	427	315	48
RTOR Reduction (vph)	0	197	0	0	0	28
Lane Group Flow (vph)	363	138	37	427	315	20
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	6%	6%	4%	5%	17%	3%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	32.5	32.5	32.5	32.5	32.5	32.5
Effective Green, g (s)	32.5	32.5	32.5	32.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1416	633	406	1430	1244	644
v/s Ratio Prot	0.11			c0.12	c0.10	
v/s Ratio Perm		0.09	0.04			0.01
v/c Ratio	0.26	0.22	0.09	0.30	0.25	0.03
Uniform Delay, d1	15.3	15.0	14.2	15.6	15.3	13.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.8	0.4	0.5	0.5	0.1
Delay (s)	15.7	15.8	14.7	16.1	15.8	13.9
Level of Service	B	B	B	B	B	B
Approach Delay (s)	15.8			16.0	15.5	
Approach LOS	B			B	B	

Intersection Summary

HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	306	373	62	15	47
Future Volume (Veh/h)	40	306	373	62	15	47
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)	43	333	405	67	16	51
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		348				
pX, platoon unblocked						
vC, conflicting volume	405				658	202
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	405				658	202
tC, single (s)	4.4				6.9	7.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.4
p0 queue free %	96				96	93
cM capacity (veh/h)	1069				375	769

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	43	166	166	202	202	67	16	51
Volume Left	43	0	0	0	0	0	16	0
Volume Right	0	0	0	0	0	67	0	51
cSH	1069	1700	1700	1700	1700	1700	375	769
Volume to Capacity	0.04	0.10	0.10	0.12	0.12	0.04	0.04	0.07
Queue Length 95th (m)	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.6
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	0.0	15.0	10.0
Lane LOS	A						C	B
Approach Delay (s)	1.0			0.0			11.2	
Approach LOS							B	

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	27.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	67	24	326	268	11
Future Volume (Veh/h)	18	67	24	326	268	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	25	92	33	447	367	15
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	888	374	382			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	888	374	382			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	91	86	97			
cM capacity (veh/h)	292	676	1188			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	117	480	382
Volume Left	25	33	0
Volume Right	92	0	15
cSH	528	1188	1700
Volume to Capacity	0.22	0.03	0.22
Queue Length 95th (m)	6.4	0.7	0.0
Control Delay (s)	13.7	0.8	0.0
Lane LOS	B	A	
Approach Delay (s)	13.7	0.8	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	48.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	36	17	36	330	266	63
Future Volume (Veh/h)	36	17	36	330	266	63
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	46	22	46	423	341	81
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	896	382	422			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	896	382	422			
tC, single (s)	6.7	6.6	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.7	2.3			
p0 queue free %	83	96	96			
cM capacity (veh/h)	270	590	1116			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	46	22	469	422
Volume Left	46	0	46	0
Volume Right	0	22	0	81
cSH	270	590	1116	1700
Volume to Capacity	0.17	0.04	0.04	0.25
Queue Length 95th (m)	4.6	0.9	1.0	0.0
Control Delay (s)	21.0	11.3	1.2	0.0
Lane LOS	C	B	A	
Approach Delay (s)	17.9		1.2	0.0
Approach LOS	C			

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	50.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	32	76	363	227	46
Future Volume (Veh/h)	11	32	76	363	227	46
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	16	46	109	519	324	66
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				346		
pX, platoon unblocked	0.92					
vC, conflicting volume	1094	357	390			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1060	357	390			
tC, single (s)	6.5	6.5	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.6	2.3			
p0 queue free %	92	93	90			
cM capacity (veh/h)	200	625	1147			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	16	46	628	390
Volume Left	16	0	109	0
Volume Right	0	46	0	66
cSH	200	625	1147	1700
Volume to Capacity	0.08	0.07	0.10	0.23
Queue Length 95th (m)	2.0	1.8	2.4	0.0
Control Delay (s)	24.6	11.2	2.4	0.0
Lane LOS	C	B	A	
Approach Delay (s)	14.7		2.4	0.0
Approach LOS	B			

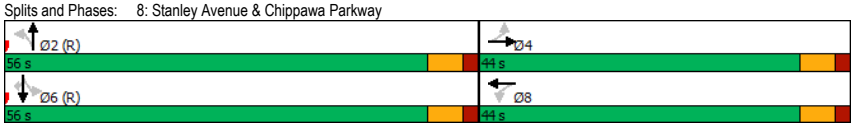
Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	51.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	136	12	17	14	144	279	7	156	100
Future Volume (vph)	136	12	17	14	144	279	7	156	100
Lane Group Flow (vph)	162	239	20	32	171	338	8	186	119
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	2	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)	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
Total Split (s)	44.0	44.0	44.0	44.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	44.0%	44.0%	44.0%	44.0%	56.0%	56.0%	56.0%	56.0%	56.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.70	0.56	0.14	0.09	0.27	0.27	0.01	0.17	0.12
Control Delay	52.7	10.7	33.4	20.1	3.6	3.1	6.7	6.8	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	10.7	33.4	20.1	3.6	3.1	6.7	6.8	1.7
Queue Length 50th (m)	29.7	2.3	3.3	2.7	3.6	7.1	0.4	10.9	0.0
Queue Length 95th (m)	42.4	16.0	8.3	8.7	5.9	10.1	2.2	22.8	5.3
Internal Link Dist (m)		207.0		145.4		1041.9		321.5	
Turn Bay Length (m)	30.0		30.0		30.0		30.0		30.0
Base Capacity (vph)	482	646	289	686	641	1251	732	1067	1005
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	0.34	0.37	0.07	0.05	0.27	0.27	0.01	0.17	0.12

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 8: Stanley Avenue & Chippawa Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	12	189	17	14	13	144	279	5	7	156	100
Future Volume (vph)	136	12	189	17	14	13	144	279	5	7	156	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.93		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)	1644	1336		1825	1786		1372	1802		1825	1537	1396
Flt Permitted	0.74	1.00		0.40	1.00		0.64	1.00		0.55	1.00	1.00
Satd. Flow (perm)	1274	1336		765	1786		925	1802		1056	1537	1396
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)	162	14	225	20	17	15	171	332	6	8	186	119
RTOR Reduction (vph)	0	184	0	0	12	0	0	0	0	0	0	36
Lane Group Flow (vph)	162	55	0	20	20	0	171	338	0	8	186	83
Heavy Vehicles (%)	11%	0%	25%	0%	0%	0%	33%	6%	25%	0%	25%	17%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	18.4	18.4		18.4	18.4		69.4	69.4		69.4	69.4	69.4
Effective Green, g (s)	18.4	18.4		18.4	18.4		69.4	69.4		69.4	69.4	69.4
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.69	0.69		0.69	0.69	0.69
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	234	245		140	328		641	1250		732	1066	968
v/s Ratio Prot		0.04			0.01			c0.19			0.12	
v/s Ratio Perm	c0.13			0.03			0.18			0.01		0.06
v/c Ratio	0.69	0.23		0.14	0.06		0.27	0.27		0.01	0.17	0.09
Uniform Delay, d1	38.2	34.7		34.2	33.7		5.7	5.8		4.7	5.3	5.0
Progression Factor	1.00	1.00		1.00	1.00		0.38	0.40		1.00	1.00	1.00
Incremental Delay, d2	8.5	0.5		0.5	0.1		0.9	0.4		0.0	0.4	0.2
Delay (s)	46.7	35.2		34.7	33.7		3.1	2.7		4.7	5.7	5.1
Level of Service	D	D		C	C		A	A		A	A	A
Approach Delay (s)		39.8			34.1			2.8			5.5	
Approach LOS		D			C			A			A	

Intersection Summary

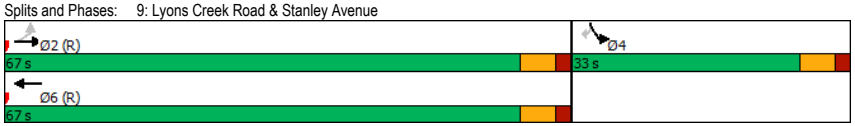
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.2	
Intersection Capacity Utilization	48.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	358	123	259	47	315
Future Volume (vph)	358	123	259	47	315
Lane Group Flow (vph)	385	132	351	51	339
Turn Type	Perm	NA	NA	Prot	Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1
Total Split (s)	67.0	67.0	67.0	33.0	33.0
Total Split (%)	67.0%	67.0%	67.0%	33.0%	33.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.67	0.13	0.32	0.14	0.55
Control Delay	20.3	8.7	9.8	29.1	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	8.7	9.8	29.1	9.5
Queue Length 50th (m)	45.6	10.0	28.1	7.6	0.0
Queue Length 95th (m)	81.5	17.7	43.7	16.1	19.0
Internal Link Dist (m)		337.8	364.0	1041.9	
Turn Bay Length (m)	44.0			25.0	
Base Capacity (vph)	573	1054	1083	372	613
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	0.67	0.13	0.32	0.14	0.55

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 33 (33%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: Lyons Creek Road & Stanley Avenue



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	358	123	259	68	47	315
Future Volume (vph)	358	123	259	68	47	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1		6.1	6.1
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1722	1731	1764		1383	1361
Flt Permitted	0.52	1.00	1.00		0.95	1.00
Satd. Flow (perm)	943	1731	1764		1383	1361
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	385	132	278	73	51	339
RTOR Reduction (vph)	0	0	9	0	0	248
Lane Group Flow (vph)	385	132	342	0	51	91
Heavy Vehicles (%)	6%	11%	4%	13%	32%	20%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	60.9	60.9	60.9		26.9	26.9
Effective Green, g (s)	60.9	60.9	60.9		26.9	26.9
Actuated g/C Ratio	0.61	0.61	0.61		0.27	0.27
Clearance Time (s)	6.1	6.1	6.1		6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	574	1054	1074		372	366
v/s Ratio Prot		0.08	0.19		0.04	
v/s Ratio Perm	c0.41					c0.07
v/c Ratio	0.67	0.13	0.32		0.14	0.25
Uniform Delay, d1	12.9	8.3	9.5		27.7	28.6
Progression Factor	1.00	1.00	1.00		1.00	1.69
Incremental Delay, d2	6.1	0.2	0.8		0.7	1.6
Delay (s)	19.1	8.5	10.3		28.6	50.1
Level of Service	B	A	B		C	D
Approach Delay (s)		16.4	10.3		47.3	
Approach LOS		B	B		D	

Intersection Summary				
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

10: Drummond Extension/Drummond Road & Oldfield Road/Eaglewood Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	0	0	0	0	17	0	363	0	6	123	98
Future Volume (Veh/h)	126	0	0	0	0	17	0	363	0	6	123	98
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)	137	0	0	0	0	18	0	395	0	7	134	107
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	614	596	188	596	650	395	241			395		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	614	596	188	596	650	395	241			395		
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 %	65	100	100	100	100	97	100			99		
cM capacity (veh/h)	391	414	855	413	386	654	1326			1164		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	137	18	395	248
Volume Left	137	0	0	7
Volume Right	0	18	0	107
cSH	391	654	1326	1164
Volume to Capacity	0.35	0.03	0.00	0.01
Queue Length 95th (m)	11.7	0.6	0.0	0.1
Control Delay (s)	19.1	10.7	0.0	0.3
Lane LOS	C	B		A
Approach Delay (s)	19.1	10.7	0.0	0.3
Approach LOS	C	B		

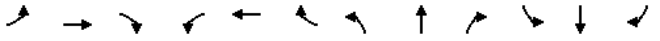
Intersection Summary				
Average Delay		3.6		
Intersection Capacity Utilization		39.4%	ICU Level of Service	A
Analysis Period (min)		15		

11: Drummond Extension & Street K

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	181	182	0	60	63
Future Volume (Veh/h)	2	181	182	0	60	63
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	197	198	0	65	68
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	396	198			198	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	396	198			198	
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	77			95	
cM capacity (veh/h)	580	843			1375	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	199	198	133
Volume Left	2	0	65
Volume Right	197	0	0
cSH	839	1700	1375
Volume to Capacity	0.24	0.12	0.05
Queue Length 95th (m)	7.0	0.0	1.1
Control Delay (s)	10.6	0.0	4.0
Lane LOS	B		A
Approach Delay (s)	10.6	0.0	4.0
Approach LOS	B		

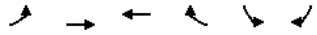
Intersection Summary				
Average Delay		5.0		
Intersection Capacity Utilization		37.5%	ICU Level of Service	A
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	0	17	5	0	66	6	1	1	22	7	32
Future Volume (Veh/h)	97	0	17	5	0	66	6	1	1	22	7	32
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)	105	0	18	5	0	72	7	1	1	24	8	35
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	161	90	26	107	106	2	43			2		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	161	90	26	107	106	2	43			2		
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 %	86	100	98	99	100	93	100			99		
cM capacity (veh/h)	740	785	1050	845	769	1083	1566			1620		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	123	77	9	67
Volume Left	105	5	7	24
Volume Right	18	72	1	35
cSH	773	1063	1566	1620
Volume to Capacity	0.16	0.07	0.00	0.01
Queue Length 95th (m)	4.3	1.8	0.1	0.3
Control Delay (s)	10.5	8.6	5.7	2.7
Lane LOS	B	A	A	A
Approach Delay (s)	10.5	8.6	5.7	2.7
Approach LOS	B	A		

Intersection Summary				
Average Delay	7.9			
Intersection Capacity Utilization	23.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	48	20	15	37	0
Future Volume (Veh/h)	0	48	20	15	37	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)	0	52	22	16	40	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	38				82	30
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	38				82	30
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				96	100
cM capacity (veh/h)	1572				920	1044

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	52	38	40
Volume Left	0	0	40
Volume Right	0	16	0
cSH	1572	1700	920
Volume to Capacity	0.00	0.02	0.04
Queue Length 95th (m)	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	9.1
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.1
Approach LOS			A

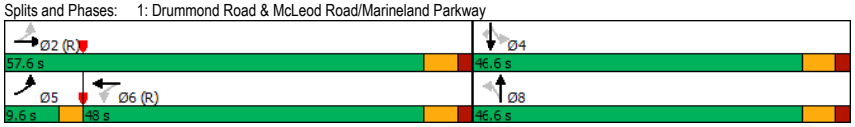
Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	246	545	149	606	187	254	129	309	249
Future Volume (vph)	246	545	149	606	187	254	129	309	249
Lane Group Flow (vph)	262	869	159	773	199	385	137	329	265
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	5	2		6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	6	6	8	8	4	4	4
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)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1	33.1
Total Split (s)	9.6	57.6	48.0	48.0	46.6	46.6	46.6	46.6	46.6
Total Split (%)	9.2%	55.3%	46.1%	46.1%	44.7%	44.7%	44.7%	44.7%	44.7%
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max
v/c Ratio	0.82	0.51	0.67	0.55	0.60	0.55	0.48	0.44	0.35
Control Delay	38.0	16.4	42.0	24.8	34.4	26.8	31.0	25.8	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	16.4	42.0	24.8	34.4	26.8	31.0	25.8	4.5
Queue Length 50th (m)	28.2	51.7	25.9	59.8	31.6	56.0	20.5	48.4	1.4
Queue Length 95th (m)	#57.5	68.4	#56.9	77.7	56.8	85.0	39.5	72.5	16.7
Internal Link Dist (m)		299.5		1002.2		715.1		408.3	
Turn Bay Length (m)	95.0		25.0		25.0		15.0		50.0
Base Capacity (vph)	321	1700	237	1412	333	696	285	746	764
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	0.82	0.51	0.67	0.55	0.60	0.55	0.48	0.44	0.35

Intersection Summary

Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	545	272	149	606	120	187	254	108	129	309	249
Future Volume (vph)	246	545	272	149	606	120	187	254	108	129	309	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		0.99	1.00	1.00
Frt	1.00	0.95		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3320		1814	3474		1816	1754		1809	1921	1567
Flt Permitted	0.24	1.00		0.31	1.00		0.45	1.00		0.39	1.00	1.00
Satd. Flow (perm)	452	3320		590	3474		858	1754		735	1921	1567
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	262	580	289	159	645	128	199	270	115	137	329	265
RTOR Reduction (vph)	0	60	0	0	16	0	0	15	0	0	0	155
Lane Group Flow (vph)	262	809	0	159	757	0	199	370	0	137	329	110
Confl. Peds. (#/hr)	11		9	9		11	8		16	16		8
Heavy Vehicles (%)	1%	4%	1%	0%	2%	0%	0%	1%	10%	0%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	51.5	51.5		41.9	41.9		40.5	40.5		40.5	40.5	40.5
Effective Green, g (s)	51.5	51.5		41.9	41.9		40.5	40.5		40.5	40.5	40.5
Actuated g/C Ratio	0.49	0.49		0.40	0.40		0.39	0.39		0.39	0.39	0.39
Clearance Time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	309	1640		237	1396		333	681		285	746	609
v/s Ratio Prot	c0.05	0.24			0.22			0.21			0.17	
v/s Ratio Perm	c0.36			0.27			c0.23			0.19		0.07
v/c Ratio	0.85	0.49		0.67	0.54		0.60	0.54		0.48	0.44	0.18
Uniform Delay, d1	21.0	17.6		25.5	23.8		25.4	24.7		23.9	23.5	20.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.9	1.1		14.1	1.5		7.7	3.1		5.7	1.9	0.6
Delay (s)	40.0	18.7		39.6	25.3		33.1	27.8		29.7	25.4	21.6
Level of Service	D	B		D	C		C	C		C	C	C
Approach Delay (s)		23.6			27.8			29.6			24.8	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2	
Intersection Capacity Utilization	85.8%	ICU Level of Service	E	
Analysis Period (min)	15			

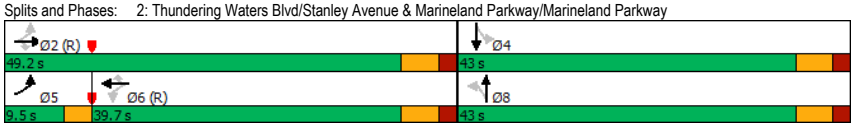
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	101	470	32	13	624	299	55	21	357	39
Future Volume (vph)	101	470	32	13	624	299	55	21	357	39
Lane Group Flow (vph)	120	560	38	15	743	356	65	32	425	213
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	9.5	49.2	49.2	39.7	39.7	39.7	43.0	43.0	43.0	43.0
Total Split (%)	10.3%	53.4%	53.4%	43.1%	43.1%	43.1%	46.6%	46.6%	46.6%	46.6%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.37	0.34	0.05	0.05	0.57	0.45	0.14	0.04	0.81	0.28
Control Delay	15.8	16.3	4.7	19.7	25.6	4.3	18.7	14.4	39.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	16.3	4.7	19.7	25.6	4.3	18.7	14.4	39.1	6.1
Queue Length 50th (m)	10.9	31.9	0.0	1.7	54.7	0.0	7.2	2.6	65.5	4.9
Queue Length 95th (m)	18.6	40.0	4.4	5.4	66.1	12.6	14.5	7.5	#97.6	15.7
Internal Link Dist (m)		1002.2			87.3			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	324	1640	783	309	1306	793	461	747	523	750
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	0.37	0.34	0.05	0.05	0.57	0.45	0.14	0.04	0.81	0.28

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	470	32	13	624	299	55	21	6	357	39	140
Future Volume (vph)	101	470	32	13	624	299	55	21	6	357	39	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	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	0.85	1.00	0.97		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3510	1633	1825	3579	1555	1821	1858		1690	1625	
Flt Permitted	0.24	1.00	1.00	0.44	1.00	1.00	0.60	1.00		0.74	1.00	
Satd. Flow (perm)	455	3510	1633	849	3579	1555	1155	1858		1310	1625	
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)	120	560	38	15	743	356	65	25	7	425	46	167
RTOR Reduction (vph)	0	0	20	0	0	226	0	4	0	0	100	0
Lane Group Flow (vph)	120	560	18	15	743	130	65	28	0	425	113	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	4%	0%	0%	2%	5%	0%	0%	0%	8%	0%	4%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	43.1	43.1	43.1	33.6	33.6	33.6	36.9	36.9		36.9	36.9	
Effective Green, g (s)	43.1	43.1	43.1	33.6	33.6	33.6	36.9	36.9		36.9	36.9	
Actuated g/C Ratio	0.47	0.47	0.47	0.36	0.36	0.36	0.40	0.40		0.40	0.40	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	309	1640	763	309	1304	566	462	743		524	650	
v/s Ratio Prot	c0.03	0.16			c0.21			0.01			0.07	
v/s Ratio Perm	0.15		0.01	0.02		0.08	0.06			c0.32		
v/c Ratio	0.39	0.34	0.02	0.05	0.57	0.23	0.14	0.04		0.81	0.17	
Uniform Delay, d1	15.1	15.6	13.2	19.0	23.5	20.3	17.6	16.8		24.6	17.8	
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	0.8	0.6	0.1	0.3	1.8	0.9	0.6	0.1		9.3	0.1	
Delay (s)	15.9	16.1	13.3	19.3	25.3	21.3	18.2	16.9		33.8	18.0	
Level of Service	B	B	B	B	C	C	B	B		C	B	
Approach Delay (s)		15.9			23.9			17.8			28.5	
Approach LOS		B			C			B			C	

Intersection Summary

HCM 2000 Control Delay	22.6	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.67				
Actuated Cycle Length (s)	92.2	Sum of lost time (s)		15.2	
Intersection Capacity Utilization	65.4%	ICU Level of Service		C	
Analysis Period (min)	15				

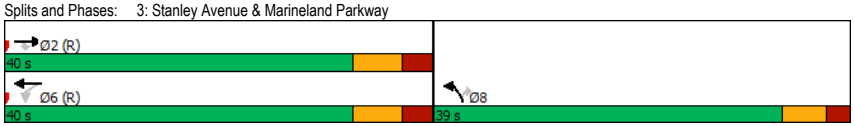
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	430	370	41	470	448	34
Future Volume (vph)	430	370	41	470	448	34
Lane Group Flow (vph)	531	457	51	580	553	42
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	38.5	38.5
Total Split (s)	40.0	40.0	40.0	40.0	39.0	39.0
Total Split (%)	50.6%	50.6%	50.6%	50.6%	49.4%	49.4%
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)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.36	0.53	0.15	0.40	0.39	0.06
Control Delay	17.0	4.2	16.2	17.4	17.3	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	4.2	16.2	17.4	17.3	5.1
Queue Length 50th (m)	28.1	0.0	4.7	31.2	29.0	0.0
Queue Length 95th (m)	34.8	9.7	10.3	38.3	35.8	4.4
Internal Link Dist (m)	155.5			318.1	148.8	
Turn Bay Length (m)		33.0	29.0		140.0	32.0
Base Capacity (vph)	1472	858	331	1457	1427	686
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	0.36	0.53	0.15	0.40	0.39	0.06

Intersection Summary

Cycle Length: 79
Actuated Cycle Length: 79
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: Stanley Avenue & Marineland Parkway

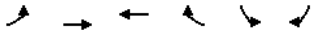


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	430	370	41	470	448	34
Future Volume (vph)	430	370	41	470	448	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	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
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)	3579	1432	1738	3544	3471	1609
Flt Permitted	1.00	1.00	0.44	1.00	0.95	1.00
Satd. Flow (perm)	3579	1432	805	3544	3471	1609
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	531	457	51	580	553	42
RTOR Reduction (vph)	0	269	0	0	0	25
Lane Group Flow (vph)	531	188	51	580	553	17
Confl. Peds. (#/hr)						4
Heavy Vehicles (%)	2%	14%	5%	3%	2%	0%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Actuated Green, G (s)	32.5	32.5	32.5	32.5	32.5	32.5
Effective Green, g (s)	32.5	32.5	32.5	32.5	32.5	32.5
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1472	589	331	1457	1427	661
v/s Ratio Prot	0.15			c0.16	c0.16	
v/s Ratio Perm		0.13	0.06			0.01
v/c Ratio	0.36	0.32	0.15	0.40	0.39	0.03
Uniform Delay, d1	16.1	15.8	14.6	16.4	16.3	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	1.4	1.0	0.8	0.8	0.1
Delay (s)	16.8	17.2	15.6	17.2	17.1	13.9
Level of Service	B	B	B	B	B	B
Approach Delay (s)	17.0			17.1	16.9	
Approach LOS	B			B	B	

Intersection Summary

HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	33	545	512	101	113	46
Future Volume (Veh/h)	33	545	512	101	113	46
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)	36	592	557	110	123	50
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		342				
pX, platoon unblocked					0.96	
vC, conflicting volume	557				925	278
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	557				834	278
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				57	93
cM capacity (veh/h)	1010				283	719

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	36	296	296	278	278	110	123	50
Volume Left	36	0	0	0	0	0	123	0
Volume Right	0	0	0	0	0	110	0	50
cSH	1010	1700	1700	1700	1700	1700	283	719
Volume to Capacity	0.04	0.17	0.17	0.16	0.16	0.06	0.43	0.07
Queue Length 95th (m)	0.8	0.0	0.0	0.0	0.0	0.0	15.8	1.7
Control Delay (s)	8.7	0.0	0.0	0.0	0.0	0.0	27.1	10.4
Lane LOS	A						D	B
Approach Delay (s)	0.5			0.0			22.3	
Approach LOS							C	

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	33.7%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	45	72	428	438	25
Future Volume (Veh/h)	22	45	72	428	438	25
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	28	57	91	542	554	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	1294	570	586			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1294	570	586			
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	89	91			
cM capacity (veh/h)	165	525	999			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	85	633	586
Volume Left	28	91	0
Volume Right	57	0	32
cSH	305	999	1700
Volume to Capacity	0.28	0.09	0.34
Queue Length 95th (m)	8.5	2.3	0.0
Control Delay (s)	21.3	2.3	0.0
Lane LOS	C	A	
Approach Delay (s)	21.3	2.3	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	65.1%	ICU Level of Service		C
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	68	45	5	422	463	22
Future Volume (Veh/h)	68	45	5	422	463	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	89	59	7	555	609	29
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	1192	624	638			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1192	624	638			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	57	88	99			
cM capacity (veh/h)	205	489	845			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	89	59	562	638
Volume Left	89	0	7	0
Volume Right	0	59	0	29
cSH	205	489	845	1700
Volume to Capacity	0.43	0.12	0.01	0.38
Queue Length 95th (m)	15.4	3.1	0.2	0.0
Control Delay (s)	35.4	13.4	0.2	0.0
Lane LOS	E	B	A	
Approach Delay (s)	26.6		0.2	0.0
Approach LOS	D			

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	36.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	110	37	379	503	6
Future Volume (Veh/h)	44	110	37	379	503	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	59	149	50	512	680	8
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				346		
pX, platoon unblocked	0.87					
vC, conflicting volume	1298	684	688			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1268	684	688			
tC, single (s)	6.4	6.2	4.5			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.6			
p0 queue free %	61	67	93			
cM capacity (veh/h)	150	445	739			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	59	149	562	688
Volume Left	59	0	50	0
Volume Right	0	149	0	8
cSH	150	445	739	1700
Volume to Capacity	0.39	0.33	0.07	0.40
Queue Length 95th (m)	12.9	11.0	1.7	0.0
Control Delay (s)	43.8	17.1	1.8	0.0
Lane LOS	E	C	A	
Approach Delay (s)	24.7		1.8	0.0
Approach LOS	C			

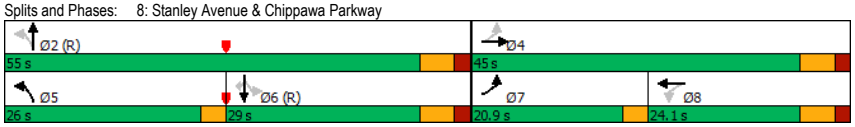
Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	60.7%	ICU Level of Service	B	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	210	19	7	13	347	202	16	357	241
Future Volume (vph)	210	19	7	13	347	202	16	357	241
Lane Group Flow (vph)	269	443	9	20	445	280	21	458	309
Turn Type	pm+pt	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases	7	4		8	5	2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	7	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)	9.5	24.1	24.1	24.1	9.5	24.1	24.1	24.1	24.1
Total Split (s)	20.9	45.0	24.1	24.1	26.0	55.0	29.0	29.0	29.0
Total Split (%)	20.9%	45.0%	24.1%	24.1%	26.0%	55.0%	29.0%	29.0%	29.0%
Yellow Time (s)	3.0	4.1	4.1	4.1	3.0	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	3.0	6.1	6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag	Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.69	0.65	0.08	0.16	0.68	0.25	0.05	0.61	0.44
Control Delay	41.1	8.7	44.3	41.4	14.1	8.9	27.4	33.5	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	8.7	44.3	41.4	14.1	8.9	27.4	33.5	16.4
Queue Length 50th (m)	42.4	3.4	1.7	3.2	37.8	23.1	2.8	78.3	22.3
Queue Length 95th (m)	53.3	12.8	5.5	8.7	48.7	32.3	8.1	#125.1	41.3
Internal Link Dist (m)		207.0		145.4		1041.9		321.5	
Turn Bay Length (m)	30.0		30.0		30.0		30.0		30.0
Base Capacity (vph)	409	879	307	340	704	1128	424	749	700
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	0.66	0.50	0.03	0.06	0.63	0.25	0.05	0.61	0.44

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Stanley Avenue & Chippawa Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	19	327	7	13	2	347	202	16	16	357	241
Future Volume (vph)	210	19	327	7	13	2	347	202	16	16	357	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1		6.1	6.1		3.0	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		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)	1825	1603		1825	1878		1825	1710		1706	1865	1512
Flt Permitted	0.53	1.00		0.89	1.00		0.28	1.00		0.59	1.00	1.00
Satd. Flow (perm)	1025	1603		1708	1878		531	1710		1055	1865	1512
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	269	24	419	9	17	3	445	259	21	21	458	309
RTOR Reduction (vph)	0	317	0	0	3	0	0	2	0	0	0	97
Lane Group Flow (vph)	269	126	0	9	17	0	445	278	0	21	458	212
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	0%	12%	0%	7%	3%	8%
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	24.4	24.4		4.5	4.5		63.4	63.4		37.7	37.7	37.7
Effective Green, g (s)	24.4	24.4		4.5	4.5		63.4	63.4		37.7	37.7	37.7
Actuated g/C Ratio	0.24	0.24		0.04	0.04		0.63	0.63		0.38	0.38	0.38
Clearance Time (s)	3.0	6.1		6.1	6.1		3.0	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	385	391		76	84		630	1084		397	703	570
v/s Ratio Prot	c0.12	0.08			0.01		c0.16	0.16			0.25	
v/s Ratio Perm	c0.05			0.01			c0.29			0.02		0.14
v/c Ratio	0.70	0.32		0.12	0.20		0.71	0.26		0.05	0.65	0.37
Uniform Delay, d1	33.6	31.0		45.8	46.0		11.9	8.0		19.8	25.7	22.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.5	0.5		0.7	1.2		3.6	0.6		0.3	4.6	1.9
Delay (s)	39.0	31.5		46.5	47.2		15.5	8.6		20.1	30.4	24.4
Level of Service	D	C		D	D		B	A		C	C	C
Approach Delay (s)		34.3			47.0			12.9			27.8	
Approach LOS		C			D			B			C	

Intersection Summary

HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.2	
Intersection Capacity Utilization	72.7%	ICU Level of Service	C	
Analysis Period (min)	15			

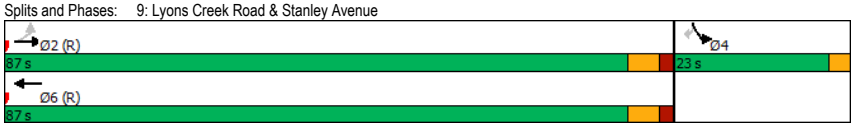
c Critical Lane Group

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	485	312	195	107	582
Future Volume (vph)	485	312	195	107	582
Lane Group Flow (vph)	577	371	326	127	693
Turn Type	Perm	NA	NA	Prot	Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.1	24.1	24.1	22.5	22.5
Total Split (s)	87.0	87.0	87.0	23.0	23.0
Total Split (%)	79.1%	79.1%	79.1%	20.9%	20.9%
Yellow Time (s)	4.1	4.1	4.1	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.82	0.27	0.24	0.41	0.81
Control Delay	22.2	5.4	4.4	44.3	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	5.4	4.4	44.3	11.8
Queue Length 50th (m)	71.3	22.5	15.9	24.3	0.0
Queue Length 95th (m)	112.7	30.1	22.5	39.2	18.3
Internal Link Dist (m)		337.8	364.0	1041.9	
Turn Bay Length (m)	44.0			25.0	
Base Capacity (vph)	701	1384	1331	313	855
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	0.82	0.27	0.24	0.41	0.81

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 34 (31%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 9: Lyons Creek Road & Stanley Avenue

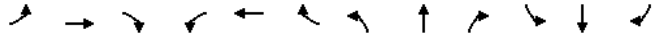


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	485	312	195	79	107	582
Future Volume (vph)	485	312	195	79	107	582
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1		3.0	3.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1615	1883	1793		1722	1585
Flt Permitted	0.56	1.00	1.00		0.95	1.00
Satd. Flow (perm)	954	1883	1793		1722	1585
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	577	371	232	94	127	693
RTOR Reduction (vph)	0	0	13	0	0	567
Lane Group Flow (vph)	577	371	313	0	127	126
Heavy Vehicles (%)	13%	2%	3%	3%	6%	3%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	80.9	80.9	80.9		20.0	20.0
Effective Green, g (s)	80.9	80.9	80.9		20.0	20.0
Actuated g/C Ratio	0.74	0.74	0.74		0.18	0.18
Clearance Time (s)	6.1	6.1	6.1		3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	701	1384	1318		313	288
v/s Ratio Prot		0.20	0.17		0.07	
v/s Ratio Perm	c0.60					c0.08
v/c Ratio	0.82	0.27	0.24		0.41	0.44
Uniform Delay, d1	9.8	4.8	4.7		39.8	40.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	10.6	0.5	0.4		3.9	4.8
Delay (s)	20.3	5.3	5.1		43.6	44.8
Level of Service	C	A	A		D	D
Approach Delay (s)		14.4	5.1		44.6	
Approach LOS		B	A		D	

Intersection Summary

HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.1
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	0	0	0	0	8	0	238	0	15	383	177
Future Volume (Veh/h)	176	0	0	0	0	8	0	238	0	15	383	177
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)	191	0	0	0	0	9	0	259	0	16	416	192
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	812	803	512	803	899	259	608			259		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	812	803	512	803	899	259	608			259		
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 %	34	100	100	100	100	99	100			99		
cM capacity (veh/h)	291	313	562	299	275	780	970			1306		

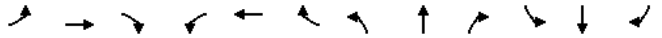
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	191	9	259	624
Volume Left	191	0	0	16
Volume Right	0	9	0	192
cSH	291	780	970	1306
Volume to Capacity	0.66	0.01	0.00	0.01
Queue Length 95th (m)	32.4	0.3	0.0	0.3
Control Delay (s)	38.1	9.7	0.0	0.3
Lane LOS	E	A		A
Approach Delay (s)	38.1	9.7	0.0	0.3
Approach LOS	E	A		

Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	66.6%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	118	120	0	186	197
Future Volume (Veh/h)	1	118	120	0	186	197
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	128	130	0	202	214
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	748	130			130	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	748	130			130	
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	86			86	
cM capacity (veh/h)	327	920			1455	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	129	130	416
Volume Left	1	0	202
Volume Right	128	0	0
cSH	907	1700	1455
Volume to Capacity	0.14	0.08	0.14
Queue Length 95th (m)	3.8	0.0	3.7
Control Delay (s)	9.6	0.0	4.5
Lane LOS	A		A
Approach Delay (s)	9.6	0.0	4.5
Approach LOS	A		

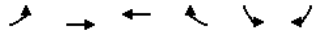
Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	41.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	0	11	3	0	44	19	5	4	69	4	104
Future Volume (Veh/h)	63	0	11	3	0	44	19	5	4	69	4	104
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)	68	0	12	3	0	48	21	5	4	75	4	113
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	308	262	60	272	316	7	117			9		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	308	262	60	272	316	7	117			9		
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 %	88	100	99	100	100	96	99			95		
cM capacity (veh/h)	588	605	1005	642	564	1075	1471			1611		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	80	51	30	192
Volume Left	68	3	21	75
Volume Right	12	48	4	113
cSH	627	1034	1471	1611
Volume to Capacity	0.13	0.05	0.01	0.05
Queue Length 95th (m)	3.3	1.2	0.3	1.1
Control Delay (s)	11.6	8.7	5.3	3.1
Lane LOS	B	A	A	A
Approach Delay (s)	11.6	8.7	5.3	3.1
Approach LOS	B	A		

Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	28.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	43	55	42	24	0
Future Volume (Veh/h)	0	43	55	42	24	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)	0	47	60	46	26	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	106				130	83
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	106				130	83
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				97	100
cM capacity (veh/h)	1485				864	976

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	47	106	26
Volume Left	0	0	26
Volume Right	0	46	0
cSH	1485	1700	864
Volume to Capacity	0.00	0.06	0.03
Queue Length 95th (m)	0.0	0.0	0.7
Control Delay (s)	0.0	0.0	9.3
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	15.5%	ICU Level of Service	A
Analysis Period (min)	15		

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix K

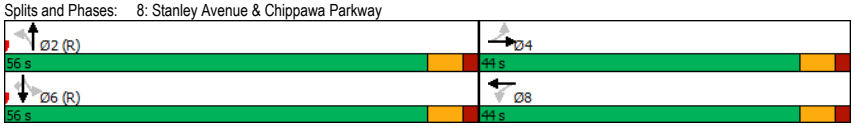
Background Traffic Operations with Improvements

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	136	12	16	13	144	244	7	86	100
Future Volume (vph)	136	12	16	13	144	244	7	86	100
Lane Group Flow (vph)	162	239	19	29	171	295	8	102	119
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		4		8		2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	2	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)	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
Total Split (s)	44.0	44.0	44.0	44.0	56.0	56.0	56.0	56.0	56.0
Total Split (%)	44.0%	44.0%	44.0%	44.0%	56.0%	56.0%	56.0%	56.0%	56.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.69	0.56	0.14	0.09	0.25	0.24	0.01	0.10	0.12
Control Delay	52.5	10.7	33.1	20.0	3.5	3.1	6.7	6.5	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	10.7	33.1	20.0	3.5	3.1	6.7	6.5	1.7
Queue Length 50th (m)	29.7	2.3	3.1	2.4	3.6	6.2	0.4	5.6	0.0
Queue Length 95th (m)	42.4	16.0	7.9	8.1	5.8	9.0	2.2	13.3	5.3
Internal Link Dist (m)		207.0		145.4		1041.9		321.5	
Turn Bay Length (m)	30.0		30.0		30.0		30.0		30.0
Base Capacity (vph)	483	646	289	684	692	1251	773	1067	1005
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	0.34	0.37	0.07	0.04	0.25	0.24	0.01	0.10	0.12

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 8: Stanley Avenue & Chippawa Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	12	189	16	13	12	144	244	4	7	86	100
Future Volume (vph)	136	12	189	16	13	12	144	244	4	7	86	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.93		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)	1644	1336		1825	1782		1372	1802		1825	1537	1396
Flt Permitted	0.74	1.00		0.40	1.00		0.69	1.00		0.58	1.00	1.00
Satd. Flow (perm)	1278	1336		765	1782		998	1802		1114	1537	1396
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)	162	14	225	19	15	14	171	290	5	8	102	119
RTOR Reduction (vph)	0	184	0	0	11	0	0	0	0	0	0	36
Lane Group Flow (vph)	162	55	0	19	18	0	171	295	0	8	102	83
Heavy Vehicles (%)	11%	0%	25%	0%	0%	0%	33%	6%	25%	0%	25%	17%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	18.4	18.4		18.4	18.4		69.4	69.4		69.4	69.4	69.4
Effective Green, g (s)	18.4	18.4		18.4	18.4		69.4	69.4		69.4	69.4	69.4
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.69	0.69		0.69	0.69	0.69
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	235	245		140	327		692	1250		773	1066	968
v/s Ratio Prot		0.04			0.01			0.16			0.07	
v/s Ratio Perm	c0.13			0.02			c0.17			0.01		0.06
v/c Ratio	0.69	0.23		0.14	0.05		0.25	0.24		0.01	0.10	0.09
Uniform Delay, d1	38.1	34.7		34.1	33.6		5.7	5.6		4.7	5.0	5.0
Progression Factor	1.00	1.00		1.00	1.00		0.39	0.41		1.00	1.00	1.00
Incremental Delay, d2	8.2	0.5		0.4	0.1		0.8	0.4		0.0	0.2	0.2
Delay (s)	46.3	35.2		34.6	33.7		3.0	2.7		4.7	5.2	5.1
Level of Service	D	D		C	C		A	A		A	A	A
Approach Delay (s)		39.7			34.0			2.8			5.2	
Approach LOS		D			C			A			A	

Intersection Summary

HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.2	
Intersection Capacity Utilization	39.0%	ICU Level of Service	A	
Analysis Period (min)	15			

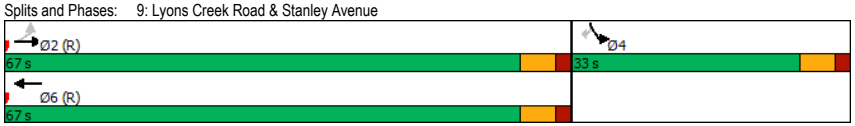
c Critical Lane Group

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	329	117	246	33	258
Future Volume (vph)	329	117	246	33	258
Lane Group Flow (vph)	354	126	330	35	277
Turn Type	Perm	NA	NA	Prot	Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1
Total Split (s)	67.0	67.0	67.0	33.0	33.0
Total Split (%)	67.0%	67.0%	67.0%	33.0%	33.0%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.60	0.12	0.30	0.09	0.49
Control Delay	17.3	8.6	9.6	27.9	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	8.6	9.6	27.9	7.6
Queue Length 50th (m)	38.9	9.5	26.0	5.0	0.0
Queue Length 95th (m)	67.9	17.0	40.6	11.7	13.1
Internal Link Dist (m)		337.8	364.0	1041.9	
Turn Bay Length (m)	44.0			25.0	
Base Capacity (vph)	592	1054	1085	372	568
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	0.60	0.12	0.30	0.09	0.49

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 33 (33%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: Lyons Creek Road & Stanley Avenue



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	329	117	246	60	33	258
Future Volume (vph)	329	117	246	60	33	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1		6.1	6.1
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1722	1731	1768		1383	1361
Flt Permitted	0.54	1.00	1.00		0.95	1.00
Satd. Flow (perm)	973	1731	1768		1383	1361
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	354	126	265	65	35	277
RTOR Reduction (vph)	0	0	9	0	0	202
Lane Group Flow (vph)	354	126	321	0	35	75
Heavy Vehicles (%)	6%	11%	4%	13%	32%	20%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	60.9	60.9	60.9		26.9	26.9
Effective Green, g (s)	60.9	60.9	60.9		26.9	26.9
Actuated g/C Ratio	0.61	0.61	0.61		0.27	0.27
Clearance Time (s)	6.1	6.1	6.1		6.1	6.1
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	592	1054	1076		372	366
v/s Ratio Prot		0.07	0.18		0.03	
v/s Ratio Perm	c0.36					c0.05
v/c Ratio	0.60	0.12	0.30		0.09	0.20
Uniform Delay, d1	12.0	8.2	9.3		27.4	28.3
Progression Factor	1.00	1.00	1.00		0.98	1.21
Incremental Delay, d2	4.4	0.2	0.7		0.5	1.2
Delay (s)	16.4	8.5	10.1		27.4	35.4
Level of Service	B	A	B		C	D
Approach Delay (s)		14.3	10.1		34.5	
Approach LOS		B	B		C	

Intersection Summary

HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

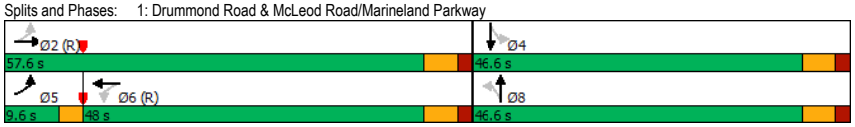
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	240	536	12	594	70	209	126	237
Future Volume (vph)	240	536	12	594	70	209	126	237
Lane Group Flow (vph)	0	914	0	769	0	322	134	511
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1
Total Split (s)	9.6	57.6	48.0	48.0	46.6	46.6	46.6	46.6
Total Split (%)	9.2%	55.3%	46.1%	46.1%	44.7%	44.7%	44.7%	44.7%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0
Total Lost Time (s)		6.1		6.1		6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max
v/c Ratio		0.91		0.48		0.88	0.36	0.72
Control Delay		38.6		18.0		54.9	26.2	30.6
Queue Delay		0.0		0.0		0.0	0.0	0.0
Total Delay		38.6		18.0		54.9	26.2	30.6
Queue Length 50th (m)		85.0		50.4		58.7	19.0	77.1
Queue Length 95th (m)		#129.3		65.8		#110.9	35.0	116.1
Internal Link Dist (m)		299.5		1002.2		715.1		408.3
Turn Bay Length (m)							20.0	
Base Capacity (vph)		1003		1616		368	372	711
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		0.91		0.48		0.88	0.36	0.72

Intersection Summary

Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	536	84	12	594	117	70	209	24	126	237	243
Future Volume (vph)	240	536	84	12	594	117	70	209	24	126	237	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1			6.1			6.1		6.1	6.1	
Lane Util. Factor		0.95			0.95			1.00		1.00	1.00	
Frpb, 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			0.98			0.99		1.00	0.92	
Flt Protected		0.99			1.00			0.99		0.95	1.00	
Satd. Flow (prot)		3427			3475			1845		1807	1738	
Flt Permitted		0.58			0.93			0.50		0.50	1.00	
Satd. Flow (perm)		2016			3244			939		959	1738	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	255	570	89	13	632	124	74	222	26	134	252	259
RTOR Reduction (vph)	0	8	0	0	13	0	0	3	0	0	35	0
Lane Group Flow (vph)	0	906	0	0	756	0	0	319	0	134	476	0
Confl. Peds. (#/hr)	11		9	9		11	8		16	16		8
Heavy Vehicles (%)	1%	4%	1%	0%	2%	0%	0%	1%	10%	0%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		51.5			51.5			40.5		40.5	40.5	
Effective Green, g (s)		51.5			51.5			40.5		40.5	40.5	
Actuated g/C Ratio		0.49			0.49			0.39		0.39	0.39	
Clearance Time (s)		6.1			6.1			6.1		6.1	6.1	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		996			1603			364		372	675	
v/s Ratio Prot											0.27	
v/s Ratio Perm		c0.45			0.23			c0.34		0.14		
v/c Ratio		0.91			0.47			0.88		0.36	0.70	
Uniform Delay, d1		24.2			17.4			29.5		22.6	26.8	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		11.8			1.0			24.4		2.7	6.1	
Delay (s)		36.0			18.4			53.9		25.3	32.9	
Level of Service		D			B			D		C	C	
Approach Delay (s)		36.0			18.4			53.9			31.3	
Approach LOS		D			B			D			C	

Intersection Summary

HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	115.8%	ICU Level of Service	H
Analysis Period (min)	15		

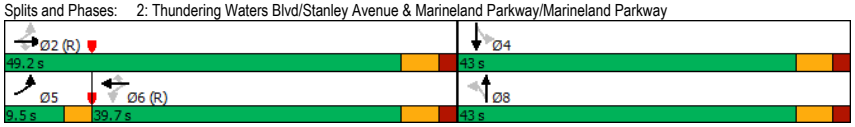
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	55	422	32	13	552	294	55	21	351	39
Future Volume (vph)	55	422	32	13	552	294	55	21	351	39
Lane Group Flow (vph)	65	502	38	15	657	350	65	32	418	121
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	9.5	49.2	49.2	39.7	39.7	39.7	43.0	43.0	43.0	43.0
Total Split (%)	10.3%	53.4%	53.4%	43.1%	43.1%	43.1%	46.6%	46.6%	46.6%	46.6%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.18	0.31	0.05	0.04	0.48	0.43	0.12	0.04	0.80	0.17
Control Delay	13.2	15.9	4.7	19.5	23.4	4.2	18.4	14.4	38.0	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	15.9	4.7	19.5	23.4	4.2	18.4	14.4	38.0	8.5
Queue Length 50th (m)	5.7	28.0	0.0	1.7	47.0	0.0	7.1	2.6	63.9	4.9
Queue Length 95th (m)	11.3	35.7	4.4	5.4	57.6	12.5	14.3	7.5	#93.4	13.7
Internal Link Dist (m)		1002.2			87.3			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	368	1640	783	346	1378	814	520	747	523	719
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	0.18	0.31	0.05	0.04	0.48	0.43	0.13	0.04	0.80	0.17

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	422	32	13	552	294	55	21	6	351	39	63
Future Volume (vph)	55	422	32	13	552	294	55	21	6	351	39	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	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	0.85	1.00	0.97		1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3510	1633	1825	3579	1555	1821	1858		1690	1685	
Flt Permitted	0.29	1.00	1.00	0.47	1.00	1.00	0.68	1.00		0.74	1.00	
Satd. Flow (perm)	558	3510	1633	899	3579	1555	1302	1858		1310	1685	
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)	65	502	38	15	657	350	65	25	7	418	46	75
RTOR Reduction (vph)	0	0	20	0	0	218	0	4	0	0	45	0
Lane Group Flow (vph)	65	502	18	15	657	132	65	28	0	418	76	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	4%	0%	0%	2%	5%	0%	0%	0%	8%	0%	4%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	43.1	43.1	43.1	34.9	34.9	34.9	36.9	36.9		36.9	36.9	
Effective Green, g (s)	43.1	43.1	43.1	34.9	34.9	34.9	36.9	36.9		36.9	36.9	
Actuated g/C Ratio	0.47	0.47	0.47	0.38	0.38	0.38	0.40	0.40		0.40	0.40	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	332	1640	763	340	1354	588	521	743		524	674	
v/s Ratio Prot	0.01	c0.14			c0.18			0.01			0.05	
v/s Ratio Perm	0.08		0.01	0.02		0.09	0.05			c0.32		
v/c Ratio	0.20	0.31	0.02	0.04	0.49	0.23	0.12	0.04		0.80	0.11	
Uniform Delay, d1	14.2	15.3	13.2	18.1	21.8	19.5	17.5	16.8		24.4	17.4	
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	0.3	0.5	0.1	0.2	1.2	0.9	0.5	0.1		8.3	0.1	
Delay (s)	14.5	15.7	13.3	18.4	23.1	20.4	17.9	16.9		32.6	17.4	
Level of Service	B	B	B	B	C	C	B	B		C	B	
Approach Delay (s)		15.5			22.1			17.6			29.2	
Approach LOS		B			C			B			C	

Intersection Summary

HCM 2000 Control Delay	21.8	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.62				
Actuated Cycle Length (s)	92.2	Sum of lost time (s)		15.2	
Intersection Capacity Utilization	59.0%	ICU Level of Service		B	
Analysis Period (min)	15				

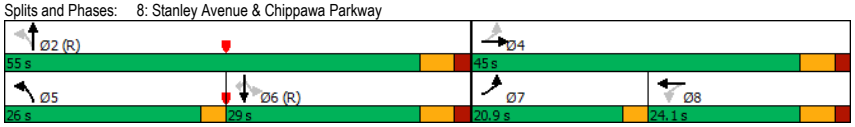
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	210	19	7	12	346	126	15	299	240
Future Volume (vph)	210	19	7	12	346	126	15	299	240
Lane Group Flow (vph)	269	441	9	18	444	181	19	383	308
Turn Type	pm+pt	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases	7	4		8	5	2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	7	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)	9.5	24.1	24.1	24.1	9.5	24.1	24.1	24.1	24.1
Total Split (s)	20.9	45.0	24.1	24.1	26.0	55.0	29.0	29.0	29.0
Total Split (%)	20.9%	45.0%	24.1%	24.1%	26.0%	55.0%	29.0%	29.0%	29.0%
Yellow Time (s)	3.0	4.1	4.1	4.1	3.0	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	3.0	6.1	6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag	Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio	0.69	0.65	0.08	0.14	0.61	0.16	0.04	0.50	0.42
Control Delay	41.1	8.8	44.3	40.7	11.7	8.1	26.9	30.1	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	8.8	44.3	40.7	11.7	8.1	26.9	30.1	13.5
Queue Length 50th (m)	42.5	3.5	1.7	2.8	37.6	13.6	2.4	60.8	16.7
Queue Length 95th (m)	53.3	12.7	5.5	8.1	48.7	20.8	7.5	#94.0	34.4
Internal Link Dist (m)		207.0		145.4		1041.9		321.5	
Turn Bay Length (m)	30.0		30.0		30.0		30.0		30.0
Base Capacity (vph)	410	878	314	339	769	1128	474	766	730
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	0.66	0.50	0.03	0.05	0.58	0.16	0.04	0.50	0.42

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Stanley Avenue & Chippawa Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	19	325	7	12	2	346	126	15	15	299	240
Future Volume (vph)	210	19	325	7	12	2	346	126	15	15	299	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1		6.1	6.1		3.0	6.1		6.1	6.1	6.1
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.97		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1825	1603		1825	1873		1825	1707		1706	1865	1512
Flt Permitted	0.54	1.00		0.91	1.00		0.36	1.00		0.64	1.00	1.00
Satd. Flow (perm)	1038	1603		1746	1873		696	1707		1155	1865	1512
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	269	24	417	9	15	3	444	162	19	19	383	308
RTOR Reduction (vph)	0	316	0	0	3	0	0	3	0	0	0	114
Lane Group Flow (vph)	269	125	0	9	15	0	444	178	0	19	383	194
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	0%	12%	0%	7%	3%	8%
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	7	4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	24.3	24.3		4.4	4.4		63.5	63.5		38.7	38.7	38.7
Effective Green, g (s)	24.3	24.3		4.4	4.4		63.5	63.5		38.7	38.7	38.7
Actuated g/C Ratio	0.24	0.24		0.04	0.04		0.64	0.64		0.39	0.39	0.39
Clearance Time (s)	3.0	6.1		6.1	6.1		3.0	6.1		6.1	6.1	6.1
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	385	389		76	82		688	1083		446	721	585
v/s Ratio Prot	c0.12	0.08			0.01		c0.14	0.10			0.21	
v/s Ratio Perm	c0.05			0.01			c0.27			0.02		0.13
v/c Ratio	0.70	0.32		0.12	0.18		0.65	0.16		0.04	0.53	0.33
Uniform Delay, d1	33.7	31.1		45.9	46.1		10.4	7.4		19.1	23.7	21.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.5	0.5		0.7	1.1		2.1	0.3		0.2	2.8	1.5
Delay (s)	39.1	31.6		46.6	47.2		12.5	7.8		19.3	26.4	23.1
Level of Service	D	C		D	D		B	A		B	C	C
Approach Delay (s)		34.4			47.0			11.1			24.8	
Approach LOS		C			D			B			C	

Intersection Summary

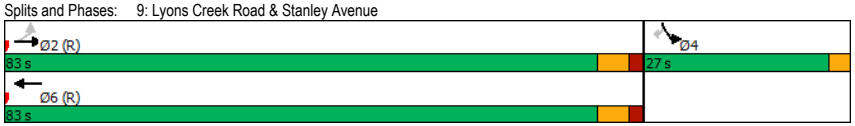
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.2	
Intersection Capacity Utilization	69.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	423	296	186	97	533
Future Volume (vph)	423	296	186	97	533
Lane Group Flow (vph)	504	352	296	115	635
Turn Type	Perm	NA	NA	Prot	Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.1	24.1	24.1	22.5	22.5
Total Split (s)	83.0	83.0	83.0	27.0	27.0
Total Split (%)	75.5%	75.5%	75.5%	24.5%	24.5%
Yellow Time (s)	4.1	4.1	4.1	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	Max	Max
v/c Ratio	0.74	0.27	0.23	0.31	0.75
Control Delay	18.5	6.7	5.6	38.7	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	6.7	5.6	38.7	9.5
Queue Length 50th (m)	59.5	24.8	17.3	20.8	0.0
Queue Length 95th (m)	89.3	33.3	24.8	34.2	17.5
Internal Link Dist (m)		337.8	364.0	1041.9	
Turn Bay Length (m)	44.0			25.0	
Base Capacity (vph)	684	1316	1270	375	842
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	0.74	0.27	0.23	0.31	0.75

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 34 (31%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 9: Lyons Creek Road & Stanley Avenue



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	423	296	186	63	97	533
Future Volume (vph)	423	296	186	63	97	533
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	6.1		3.0	3.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1615	1883	1801		1722	1585
Flt Permitted	0.58	1.00	1.00		0.95	1.00
Satd. Flow (perm)	979	1883	1801		1722	1585
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	504	352	221	75	115	635
RTOR Reduction (vph)	0	0	11	0	0	496
Lane Group Flow (vph)	504	352	285	0	115	139
Heavy Vehicles (%)	13%	2%	3%	3%	6%	3%
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	76.9	76.9	76.9		24.0	24.0
Effective Green, g (s)	76.9	76.9	76.9		24.0	24.0
Actuated g/C Ratio	0.70	0.70	0.70		0.22	0.22
Clearance Time (s)	6.1	6.1	6.1		3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	684	1316	1259		375	345
v/s Ratio Prot		0.19	0.16		0.07	
v/s Ratio Perm	c0.51					c0.09
v/c Ratio	0.74	0.27	0.23		0.31	0.40
Uniform Delay, d1	10.3	6.1	5.9		36.0	36.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	7.0	0.5	0.4		2.1	3.5
Delay (s)	17.2	6.6	6.3		38.1	40.3
Level of Service	B	A	A		D	D
Approach Delay (s)		12.9	6.3		40.0	
Approach LOS		B	A		D	

Intersection Summary				
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.1
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	36	17	36	307	200	63
Future Volume (Veh/h)	36	17	36	307	200	63
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	46	22	46	394	256	81
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	782	296	337			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	782	296	337			
tC, single (s)	6.7	6.6	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.7	2.3			
p0 queue free %	86	97	96			
cM capacity (veh/h)	318	662	1200			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	46	22	440	337
Volume Left	46	0	46	0
Volume Right	0	22	0	81
cSH	318	662	1200	1700
Volume to Capacity	0.14	0.03	0.04	0.20
Queue Length 95th (m)	3.8	0.8	0.9	0.0
Control Delay (s)	18.2	10.6	1.2	0.0
Lane LOS	C	B	A	
Approach Delay (s)	15.8		1.2	0.0
Approach LOS	C			

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	45.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	32	76	340	161	46
Future Volume (Veh/h)	11	32	76	340	161	46
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	16	46	109	486	230	66
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				346		
pX, platoon unblocked	0.93					
vC, conflicting volume	967	263	296			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	930	263	296			
tC, single (s)	6.5	6.5	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.6	2.3			
p0 queue free %	93	94	91			
cM capacity (veh/h)	245	708	1243			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	16	46	595	296
Volume Left	16	0	109	0
Volume Right	0	46	0	66
cSH	245	708	1243	1700
Volume to Capacity	0.07	0.06	0.09	0.17
Queue Length 95th (m)	1.6	1.6	2.2	0.0
Control Delay (s)	20.7	10.4	2.3	0.0
Lane LOS	C	B	A	
Approach Delay (s)	13.1		2.3	0.0
Approach LOS	B			

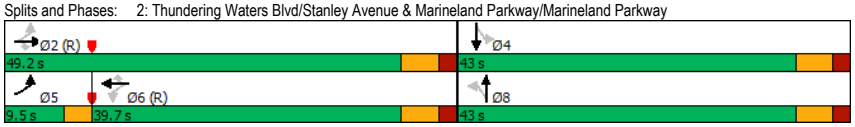
Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	46.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	56	431	32	13	563	299	55	21	357	39
Future Volume (vph)	56	431	32	13	563	299	55	21	357	39
Lane Group Flow (vph)	67	513	38	15	670	356	65	32	425	123
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2			6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	6	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.1	38.1	38.1	38.1	38.1	36.1	36.1	36.1	36.1
Total Split (s)	9.5	49.2	49.2	39.7	39.7	39.7	43.0	43.0	43.0	43.0
Total Split (%)	10.3%	53.4%	53.4%	43.1%	43.1%	43.1%	46.6%	46.6%	46.6%	46.6%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead			Lag	Lag	Lag				
Lead-Lag Optimize?	Yes			Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	None	None
v/c Ratio	0.19	0.31	0.05	0.04	0.49	0.44	0.13	0.04	0.81	0.17
Control Delay	13.2	16.0	4.7	19.6	23.5	4.2	18.4	14.4	39.1	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	16.0	4.7	19.6	23.5	4.2	18.4	14.4	39.1	8.4
Queue Length 50th (m)	5.9	28.8	0.0	1.7	48.1	0.0	7.1	2.6	65.5	4.9
Queue Length 95th (m)	11.6	36.5	4.4	5.4	58.8	12.6	14.3	7.5	#97.6	13.7
Internal Link Dist (m)		1002.2			87.3			119.7		189.9
Turn Bay Length (m)	56.0		30.0	23.0		50.0	17.0			
Base Capacity (vph)	362	1640	783	341	1378	817	519	747	523	719
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.31	0.05	0.04	0.49	0.44	0.13	0.04	0.81	0.17

Intersection Summary

Cycle Length: 92.2
Actuated Cycle Length: 92.2
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Thundering Waters Blvd/Stanley Avenue & Marineland Parkway/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	431	32	13	563	299	55	21	6	357	39	65
Future Volume (vph)	56	431	32	13	563	299	55	21	6	357	39	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	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	0.85	1.00	0.97		1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1825	3510	1633	1825	3579	1555	1821	1858		1690	1683	
Flt Permitted	0.28	1.00	1.00	0.46	1.00	1.00	0.68	1.00		0.74	1.00	
Satd. Flow (perm)	544	3510	1633	889	3579	1555	1300	1858		1310	1683	
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)	67	513	38	15	670	356	65	25	7	425	46	77
RTOR Reduction (vph)	0	0	20	0	0	221	0	4	0	0	46	0
Lane Group Flow (vph)	67	513	18	15	670	135	65	28	0	425	77	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	4%	0%	0%	2%	5%	0%	0%	0%	8%	0%	4%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	43.1	43.1	43.1	34.9	34.9	34.9	36.9	36.9		36.9	36.9	
Effective Green, g (s)	43.1	43.1	43.1	34.9	34.9	34.9	36.9	36.9		36.9	36.9	
Actuated g/C Ratio	0.47	0.47	0.47	0.38	0.38	0.38	0.40	0.40		0.40	0.40	
Clearance Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	326	1640	763	336	1354	588	520	743		524	673	
v/s Ratio Prot	0.01	c0.15			c0.19			0.01			0.05	
v/s Ratio Perm	0.08		0.01	0.02		0.09	0.05			c0.32		
v/c Ratio	0.21	0.31	0.02	0.04	0.49	0.23	0.12	0.04		0.81	0.11	
Uniform Delay, d1	14.3	15.3	13.2	18.1	21.9	19.5	17.5	16.8		24.6	17.4	
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	0.3	0.5	0.1	0.3	1.3	0.9	0.5	0.1		9.3	0.1	
Delay (s)	14.6	15.8	13.3	18.4	23.2	20.4	18.0	16.9		33.8	17.5	
Level of Service	B	B	B	B	C	C	B	B		C	B	
Approach Delay (s)		15.5			22.2			17.6			30.1	
Approach LOS		B			C			B			C	

Intersection Summary

HCM 2000 Control Delay	22.1	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.64				
Actuated Cycle Length (s)	92.2	Sum of lost time (s)		15.2	
Intersection Capacity Utilization	59.7%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	68	45	5	352	421	22
Future Volume (Veh/h)	68	45	5	352	421	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	89	59	7	463	554	29
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	568	583			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1046	568	583			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	65	89	99			
cM capacity (veh/h)	251	526	887			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	89	59	470	583
Volume Left	89	0	7	0
Volume Right	0	59	0	29
cSH	251	526	887	1700
Volume to Capacity	0.35	0.11	0.01	0.34
Queue Length 95th (m)	11.6	2.9	0.2	0.0
Control Delay (s)	27.0	12.7	0.2	0.0
Lane LOS	D	B	A	
Approach Delay (s)	21.3		0.2	0.0
Approach LOS	C			

Intersection Summary				
Average Delay			2.7	
Intersection Capacity Utilization			33.9%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	110	37	309	461	6
Future Volume (Veh/h)	44	110	37	309	461	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	59	149	50	418	623	8
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				346		
pX, platoon unblocked	0.88					
vC, conflicting volume	1147	627	631			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1100	627	631			
tC, single (s)	6.4	6.2	4.5			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.6			
p0 queue free %	69	69	94			
cM capacity (veh/h)	193	480	779			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	59	149	468	631
Volume Left	59	0	50	0
Volume Right	0	149	0	8
cSH	193	480	779	1700
Volume to Capacity	0.31	0.31	0.06	0.37
Queue Length 95th (m)	9.4	10.0	1.6	0.0
Control Delay (s)	31.7	15.8	1.8	0.0
Lane LOS	D	C	A	
Approach Delay (s)	20.3		1.8	0.0
Approach LOS	C			

Intersection Summary				
Average Delay			3.9	
Intersection Capacity Utilization			56.3%	ICU Level of Service
Analysis Period (min)			15	

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix L

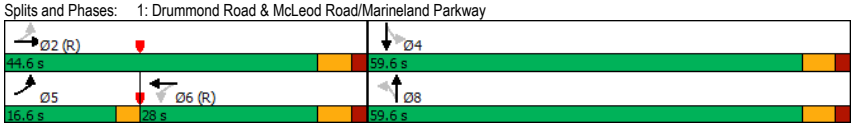
Total Traffic Operations with Improvements

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	159	372	56	453	270	232	88	144
Future Volume (vph)	159	372	56	453	270	232	88	144
Lane Group Flow (vph)	175	528	62	643	297	411	97	333
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1
Total Split (s)	16.6	44.6	28.0	28.0	59.6	59.6	59.6	59.6
Total Split (%)	15.9%	42.8%	26.9%	26.9%	57.2%	57.2%	57.2%	57.2%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max
v/c Ratio	0.63	0.43	0.44	0.83	0.61	0.45	0.24	0.37
Control Delay	31.8	23.8	47.0	47.3	24.8	16.1	16.0	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	23.8	47.0	47.3	24.8	16.1	16.0	12.7
Queue Length 50th (m)	23.3	38.1	11.0	63.2	40.9	44.9	10.4	28.6
Queue Length 95th (m)	38.9	52.6	24.9	#95.1	70.7	68.5	20.9	47.8
Internal Link Dist (m)		299.5		1002.2		718.1		408.3
Turn Bay Length (m)	95.0		25.0		25.0		15.0	
Base Capacity (vph)	301	1240	141	776	485	910	409	905
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	0.58	0.43	0.44	0.83	0.61	0.45	0.24	0.37

Intersection Summary

Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	372	108	56	453	132	270	232	142	88	144	159
Future Volume (vph)	159	372	108	56	453	132	270	232	142	88	144	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	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	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1689	3287		1301	3304		1786	1733		1746	1689	
Flt Permitted	0.17	1.00		0.46	1.00		0.50	1.00		0.43	1.00	
Satd. Flow (perm)	303	3287		624	3304		946	1733		799	1689	
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)	175	409	119	62	498	145	297	255	156	97	158	175
RTOR Reduction (vph)	0	26	0	0	25	0	0	21	0	0	38	0
Lane Group Flow (vph)	175	502	0	62	618	0	297	390	0	97	295	0
Confl. Peds. (#/hr)	8		2	2		8	3		9	9		3
Heavy Vehicles (%)	8%	6%	9%	40%	6%	5%	2%	1%	8%	4%	5%	3%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	38.5	38.5		23.7	23.7		53.5	53.5		53.5	53.5	
Effective Green, g (s)	38.5	38.5		23.7	23.7		53.5	53.5		53.5	53.5	
Actuated g/C Ratio	0.37	0.37		0.23	0.23		0.51	0.51		0.51	0.51	
Clearance Time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	268	1214		141	751		485	889		410	867	
v/s Ratio Prot	c0.07	0.15			c0.19			0.23			0.17	
v/s Ratio Perm	0.17			0.10			c0.31			0.12		
v/c Ratio	0.65	0.41		0.44	0.82		0.61	0.44		0.24	0.34	
Uniform Delay, d1	24.6	24.4		34.6	38.2		18.0	15.9		14.0	14.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.6	1.0		9.6	9.9		5.7	1.6		1.4	1.1	
Delay (s)	30.2	25.5		44.2	48.1		23.7	17.5		15.4	16.0	
Level of Service	C	C		D	D		C	B		B	B	
Approach Delay (s)		26.7			47.8			20.1			15.9	
Approach LOS		C			D			C			B	

Intersection Summary

HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2	
Intersection Capacity Utilization	82.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	16	34	322	261	60
Future Volume (Veh/h)	34	16	34	322	261	60
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	44	21	44	413	335	77
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	874	374	412			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	874	374	412			
tC, single (s)	6.7	6.6	4.2			
tC, 2 stage (s)						
tF (s)	3.7	3.7	2.3			
p0 queue free %	84	96	96			
cM capacity (veh/h)	279	596	1126			

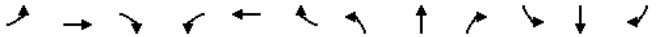
Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	44	21	457	412
Volume Left	44	0	44	0
Volume Right	0	21	0	77
cSH	279	596	1126	1700
Volume to Capacity	0.16	0.04	0.04	0.24
Queue Length 95th (m)	4.2	0.8	0.9	0.0
Control Delay (s)	20.3	11.3	1.2	0.0
Lane LOS	C	B	A	
Approach Delay (s)	17.4		1.2	0.0
Approach LOS	C			

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	49.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	31	72	352	224	44
Future Volume (Veh/h)	11	31	72	352	224	44
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	16	44	103	503	320	63
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				346		
pX, platoon unblocked	0.93					
vC, conflicting volume	1060	352	383			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1027	352	383			
tC, single (s)	6.5	6.5	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.6	2.3			
p0 queue free %	92	93	91			
cM capacity (veh/h)	212	629	1154			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	16	44	606	383
Volume Left	16	0	103	0
Volume Right	0	44	0	63
cSH	212	629	1154	1700
Volume to Capacity	0.08	0.07	0.09	0.23
Queue Length 95th (m)	1.8	1.7	2.2	0.0
Control Delay (s)	23.3	11.2	2.3	0.0
Lane LOS	C	B	A	
Approach Delay (s)	14.4		2.3	0.0
Approach LOS	B			

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	50.3%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	126	0	0	0	0	17	0	363	0	6	123	98
Future Volume (vph)	126	0	0	0	0	17	0	363	0	6	123	98
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)	137	0	0	0	0	18	0	395	0	7	134	107

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	137	18	395	248
Volume Left (vph)	137	0	0	7
Volume Right (vph)	0	18	0	107
Hadj (s)	0.23	-0.57	0.03	-0.22
Departure Headway (s)	5.7	5.1	4.7	4.6
Degree Utilization, x	0.22	0.03	0.52	0.32
Capacity (veh/h)	574	591	745	741
Control Delay (s)	10.2	8.3	12.6	9.8
Approach Delay (s)	10.2	8.3	12.6	9.8
Approach LOS	B	A	B	A

Intersection Summary				
Delay	11.2			
Level of Service	B			
Intersection Capacity Utilization	39.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	181	182	0	60	63
Future Volume (Veh/h)	2	181	182	0	60	63
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	197	198	0	65	68
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	396	198			198	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	396	198			198	
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	77			95	
cM capacity (veh/h)	580	843			1375	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	199	198	133
Volume Left	2	0	65
Volume Right	197	0	0
cSH	839	1700	1375
Volume to Capacity	0.24	0.12	0.05
Queue Length 95th (m)	7.0	0.0	1.1
Control Delay (s)	10.6	0.0	4.0
Lane LOS	B		A
Approach Delay (s)	10.6	0.0	4.0
Approach LOS	B		

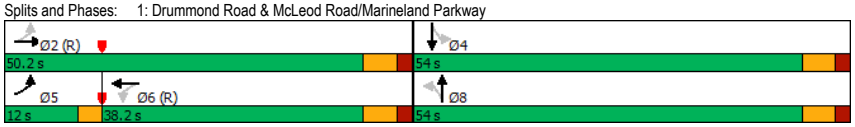
Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	37.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	240	536	148	594	185	252	126	307
Future Volume (vph)	240	536	148	594	185	252	126	307
Lane Group Flow (vph)	255	857	157	756	197	383	134	586
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	5	2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	27.1	27.1	27.1	33.1	33.1	33.1	33.1
Total Split (s)	12.0	50.2	38.2	38.2	54.0	54.0	54.0	54.0
Total Split (%)	11.5%	48.2%	36.7%	36.7%	51.8%	51.8%	51.8%	51.8%
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	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max
v/c Ratio	0.90	0.58	0.86	0.70	0.90	0.47	0.35	0.70
Control Delay	55.6	21.9	75.1	34.8	69.6	20.2	21.6	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.6	21.9	75.1	34.8	69.6	20.2	21.6	25.8
Queue Length 50th (m)	32.0	60.0	29.9	68.5	35.8	47.9	17.0	84.2
Queue Length 95th (m)	#70.7	79.2	#67.2	89.4	#80.8	72.8	32.1	124.4
Internal Link Dist (m)		299.5		1002.2		715.1		408.3
Turn Bay Length (m)	95.0		25.0		25.0		15.0	
Base Capacity (vph)	283	1465	182	1085	218	820	378	837
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	0.58	0.86	0.70	0.90	0.47	0.35	0.70

Intersection Summary

Cycle Length: 104.2
Actuated Cycle Length: 104.2
Offset: 58.1 (56%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Drummond Road & McLeod Road/Marineland Parkway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	536	270	148	594	117	185	252	108	126	307	243
Future Volume (vph)	240	536	270	148	594	117	185	252	108	126	307	243
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.95		1.00	0.98		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)	1806	3319		1813	3475		1820	1753		1809	1761	
Flt Permitted	0.18	1.00		0.31	1.00		0.25	1.00		0.43	1.00	
Satd. Flow (perm)	350	3319		591	3475		476	1753		824	1761	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	255	570	287	157	632	124	197	268	115	134	327	259
RTOR Reduction (vph)	0	61	0	0	16	0	0	15	0	0	28	0
Lane Group Flow (vph)	255	796	0	157	740	0	197	368	0	134	558	0
Confl. Peds. (#/hr)	11		9	9		11	8		16	16		8
Heavy Vehicles (%)	1%	4%	1%	0%	2%	0%	0%	1%	10%	0%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	44.1	44.1		32.1	32.1		47.9	47.9		47.9	47.9	
Effective Green, g (s)	44.1	44.1		32.1	32.1		47.9	47.9		47.9	47.9	
Actuated g/C Ratio	0.42	0.42		0.31	0.31		0.46	0.46		0.46	0.46	
Clearance Time (s)	3.0	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	273	1404		182	1070		218	805		378	809	
v/s Ratio Prot	c0.08	0.24			0.21			0.21			0.32	
v/s Ratio Perm	c0.31			0.27			c0.41			0.16		
v/c Ratio	0.93	0.57		0.86	0.69		0.90	0.46		0.35	0.69	
Uniform Delay, d1	23.9	22.8		34.0	31.7		26.0	19.3		18.2	22.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.9	1.7		38.3	3.7		40.2	1.9		2.6	4.8	
Delay (s)	60.9	24.5		72.3	35.4		66.2	21.1		20.8	27.1	
Level of Service	E	C		E	D		E	C		C	C	
Approach Delay (s)		32.8			41.7			36.4			25.9	
Approach LOS		C			D			D			C	

Intersection Summary

HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	15.2	
Intersection Capacity Utilization	93.9%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	43	4	415	454	21
Future Volume (Veh/h)	65	43	4	415	454	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	86	57	5	546	597	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	1167	611	625			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1167	611	625			
tC, single (s)	6.4	6.2	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	60	89	99			
cM capacity (veh/h)	213	497	855			

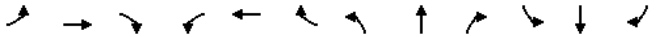
Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	86	57	551	625
Volume Left	86	0	5	0
Volume Right	0	57	0	28
cSH	213	497	855	1700
Volume to Capacity	0.40	0.11	0.01	0.37
Queue Length 95th (m)	13.9	2.9	0.1	0.0
Control Delay (s)	32.9	13.2	0.2	0.0
Lane LOS	D	B	A	
Approach Delay (s)	25.1		0.2	0.0
Approach LOS	D			

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	35.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	105	35	374	492	5
Future Volume (Veh/h)	42	105	35	374	492	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	57	142	47	505	665	7
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				346		
pX, platoon unblocked	0.87					
vC, conflicting volume	1270	668	672			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1236	668	672			
tC, single (s)	6.4	6.2	4.5			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.6			
p0 queue free %	64	69	94			
cM capacity (veh/h)	158	454	750			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	57	142	552	672
Volume Left	57	0	47	0
Volume Right	0	142	0	7
cSH	158	454	750	1700
Volume to Capacity	0.36	0.31	0.06	0.40
Queue Length 95th (m)	11.5	10.0	1.5	0.0
Control Delay (s)	40.1	16.5	1.7	0.0
Lane LOS	E	C	A	
Approach Delay (s)	23.2		1.7	0.0
Approach LOS	C			

Intersection Summary				
Average Delay	3.9			
Intersection Capacity Utilization	58.7%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	176	0	0	0	0	8	0	238	0	15	383	177
Future Volume (vph)	176	0	0	0	0	8	0	238	0	15	383	177
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)	191	0	0	0	0	9	0	259	0	16	416	192

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	191	9	259	624
Volume Left (vph)	191	0	0	16
Volume Right (vph)	0	9	0	192
Hadj (s)	0.23	-0.57	0.03	-0.15
Departure Headway (s)	6.3	6.0	5.4	4.8
Degree Utilization, x	0.33	0.02	0.39	0.83
Capacity (veh/h)	537	521	630	738
Control Delay (s)	12.4	9.1	11.8	26.9
Approach Delay (s)	12.4	9.1	11.8	26.9
Approach LOS	B	A	B	D

Intersection Summary				
Delay			20.6	
Level of Service			C	
Intersection Capacity Utilization			66.6%	ICU Level of Service
Analysis Period (min)			15	

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	118	120	0	186	197
Future Volume (Veh/h)	1	118	120	0	186	197
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	128	130	0	202	214
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	748	130			130	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	748	130			130	
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	86			86	
cM capacity (veh/h)	327	920			1455	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	129	130	416
Volume Left	1	0	202
Volume Right	128	0	0
cSH	907	1700	1455
Volume to Capacity	0.14	0.08	0.14
Queue Length 95th (m)	3.8	0.0	3.7
Control Delay (s)	9.6	0.0	4.5
Lane LOS	A		A
Approach Delay (s)	9.6	0.0	4.5
Approach LOS	A		

Intersection Summary				
Average Delay		4.6		
Intersection Capacity Utilization		41.4%	ICU Level of Service	A
Analysis Period (min)		15		

BURNSIDE

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Appendix M

Signal Warrant Analysis

Input Sheet

Main Road	Stanley Avenue
Minor Road	Chippawa Parkway
Direction of Main Road	North / South
Date:	Background 2027 T
No. of Lanes on Main	1
T-Intersection	No
Operating Environment	Urban
Scenario	Forecasted Traffic Volumes (Existing Intersection)

Analysis Sheet

Justification 1: Minimum Vehicle Volumes

Justification	Guidance Approach Lanes				Total	Section Percent
	1 Lanes		2 or More Lanes			
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW		
1A (All Approach Lanes)	480	720	600	900		
		x				
	COMPLIANCE %				645	90%
1B (Minor Street Both Approaches)	120	170	120	170		
		x				
	COMPLIANCE %				238	140%
Signal Justification 1:						

Justification 2: Delay to Cross Traffic

Justification	Guidance Approach Lanes				Total	Section Percent
	1 lanes		2 or More lanes			
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW		
2A (Major Street Both Approaches)	480	720	600	900		
		x				
	COMPLIANCE %				407	57%
2B (Traffic Crossing Major Street)	50	75	50	75		
		x				
	COMPLIANCE %				100	133%
Signal Justification 2:						

Justification 3: Combination (Justification 1 and 2)

Justification Satisfied 80% or More	
Justification 1	Minimun Vehicular Volume
Justification 2	Delay Cross Traffic

Results Sheet

Justification		Compliance	Minimum Target	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A. Total Volume	90%	120%		NO
	B. Crossing Volume	140%			
2. Delay to Cross Traffic	A. Main Road	57%	120%		NO
	B. Crossing Road	133%			
3. Combination	A. Justificaton 1	90%	120%		NO
	B. Justification 2	57%			

BURNSIDE
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Input Sheet

Main Road	Stanley Avenue
Minor Road	Lyons Creek Road
Direction of Main Road	East / West
Date:	Background 2027 T
No. of Lanes on Main	1
T-Intersection	No
Operating Environment	Urban
Scenario	Forecasted Traffic Volumes (Existing Intersection)

Analysis Sheet

Justification 1: Minimum Vehicle Volumes

Justification	Guidance Approach Lanes				Total	Section Percent
	1 Lanes		2 or More Lanes			
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW		
1A (All Approach Lanes)	480	720	600	900		
		x				
	COMPLIANCE %				660	92%
1B (Minor Street Both Approaches)	120	170	120	170		
		x				
	COMPLIANCE %				230	135%
Signal Justification 1:						

Justification 2: Delay to Cross Traffic

Justification	Guidance Approach Lanes				Total	Section Percent
	1 lanes		2 or More lanes			
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW		
2A (Major Street Both Approaches)	480	720	600	900		
		x				
	COMPLIANCE %				430	60%
2B (Traffic Crossing Major Street)	50	75	50	75		
		x				
	COMPLIANCE %				33	44%
Signal Justification 2:						

Justification 3: Combination (Justification 1 and 2)

Justification Satisfied 80% or More	
Justification 1	Minimun Vehicular Volume
Justification 2	Delay Cross Traffic

Results Sheet

Justification		Compliance	Minimum Target	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A. Total Volume	92%	120%		NO
	B. Crossing Volume	135%			
2. Delay to Cross Traffic	A. Main Road	60%	120%		NO
	B. Crossing Road	44%			
3. Combination	A. Justificaton 1	92%	120%		NO
	B. Justification 2	44%			

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

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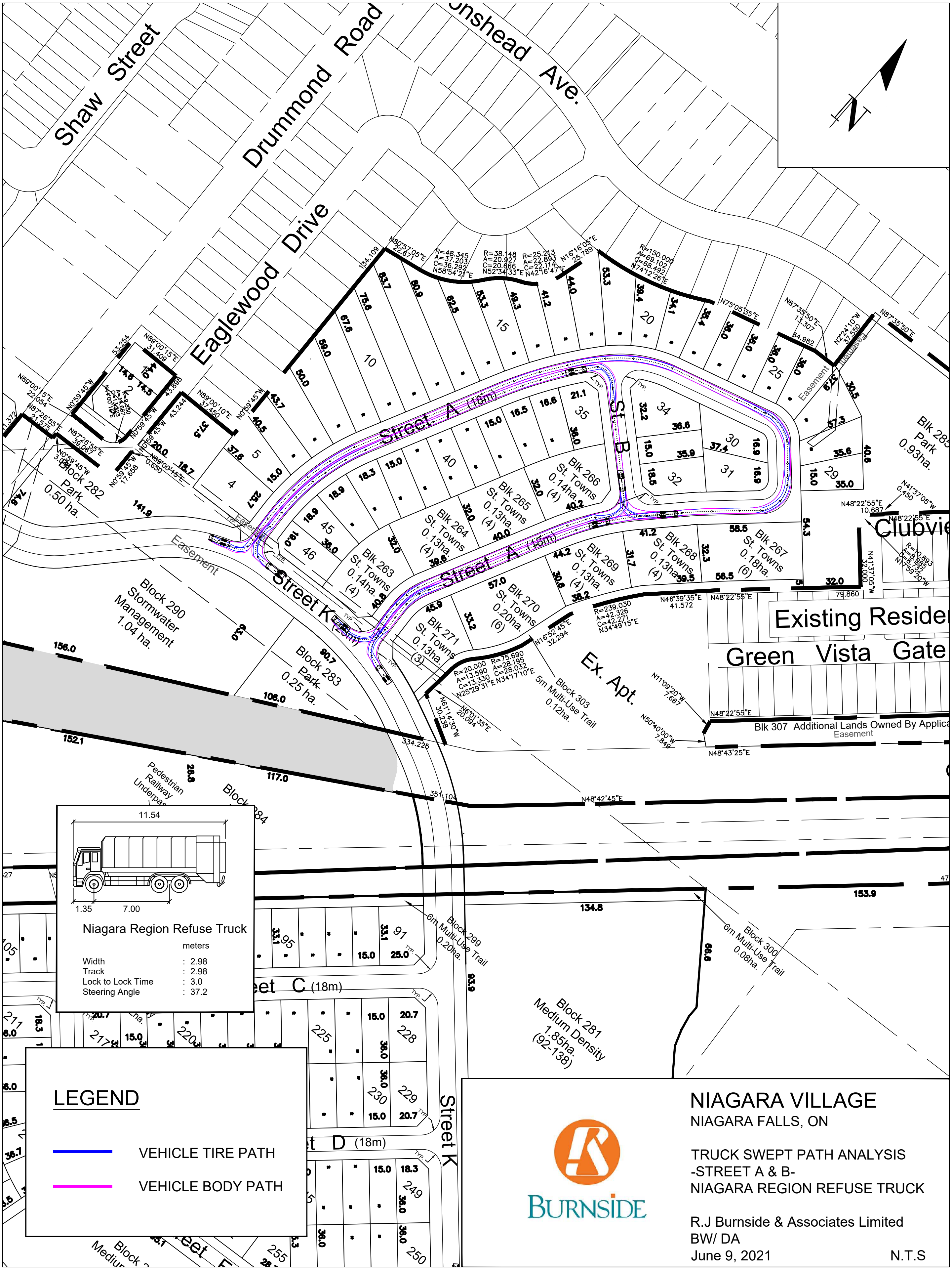
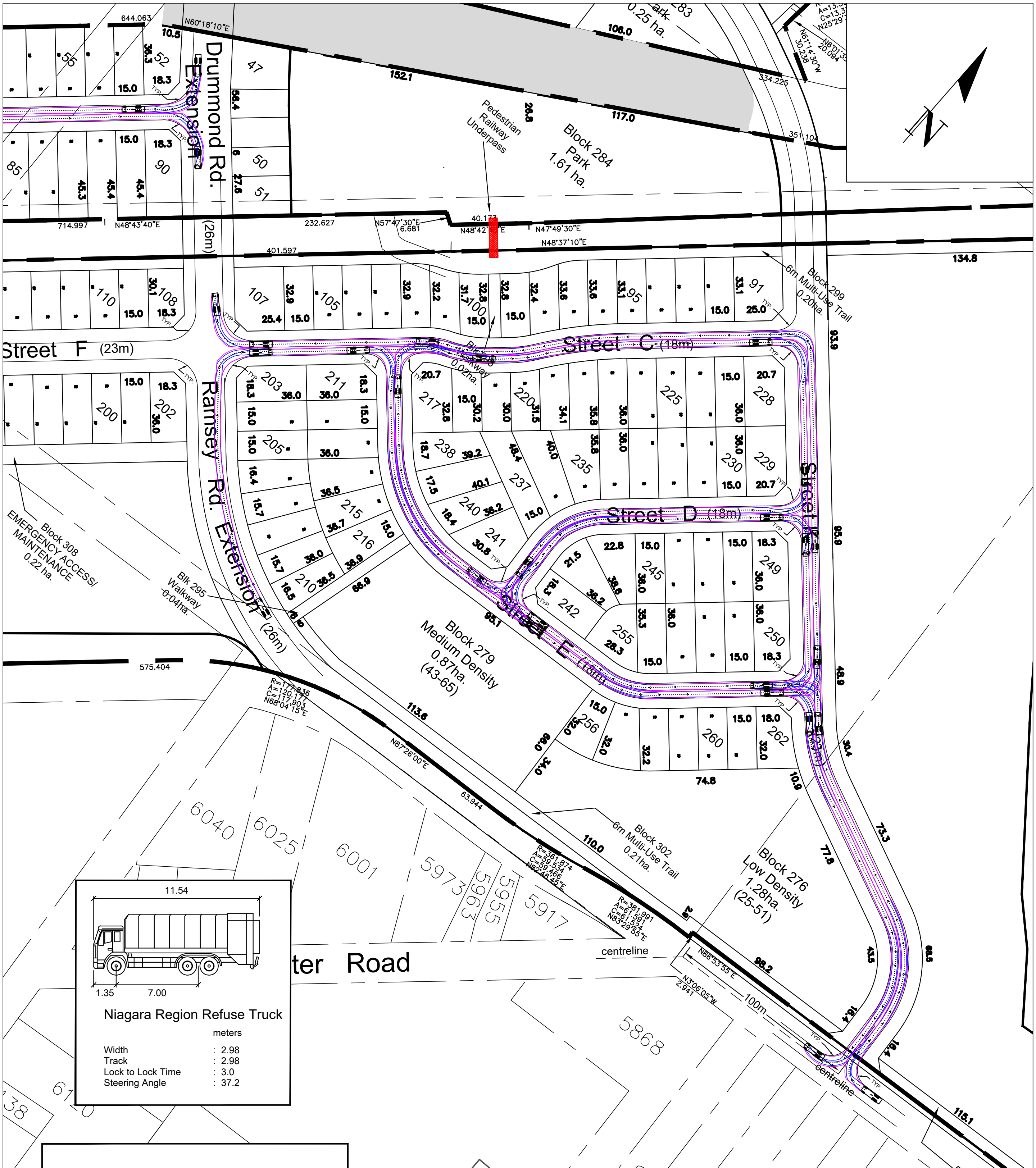
Appendix N

Refuse Truck Maneuvering Analyses


Shaw Street
Drummond Road
Eaglewood Drive
Street A (18m)
St. B
Street K (26m)
Street C (18m)
Street K
Existing Residential
Green Vista Gate
Ex. Apt.
Block 282 Park 0.50 ha.
Block 290 Stormwater Management 1.04 ha.
Block 283 Park 0.25 ha.
Blk 285 Park 0.93ha.
Blk 263 St. Towns 0.14ha. (4)
Blk 264 St. Towns 0.13ha. (4)
Blk 265 St. Towns 0.13ha. (4)
Blk 266 St. Towns 0.14ha. (4)
Blk 267 St. Towns 0.18ha. (6)
Blk 268 St. Towns 0.13ha. (4)
Blk 269 St. Towns 0.13ha. (4)
Blk 270 St. Towns 0.20ha. (6)
Blk 271 St. Towns 0.13ha. (3)
Block 303 5m Multi-Use Trail 0.12ha.
Blk 307 Additional Lands Owned By Applicant
Block 299 6m Multi-Use Trail 0.20ha.
Block 300 6m Multi-Use Trail 0.08ha.
Block 281 Medium Density 1.85ha. (92-138)
Pedestrian Railway Underpass
Easement
11.54
1.35
7.00
Niagara Region Refuse Truck
meters
Width : 2.98
Track : 2.98
Lock to Lock Time : 3.0
Steering Angle : 37.2
LEGEND
VEHICLE TIRE PATH
VEHICLE BODY PATH
NIAGARA VILLAGE
NIAGARA FALLS, ON
TRUCK SWEPT PATH ANALYSIS
-STREET A & B-
NIAGARA REGION REFUSE TRUCK
R.J Burnside & Associates Limited
BW/ DA
June 9, 2021
N.T.S



LEGEND

VEHICLE TIRE PATH

VEHICLE BODY PATH

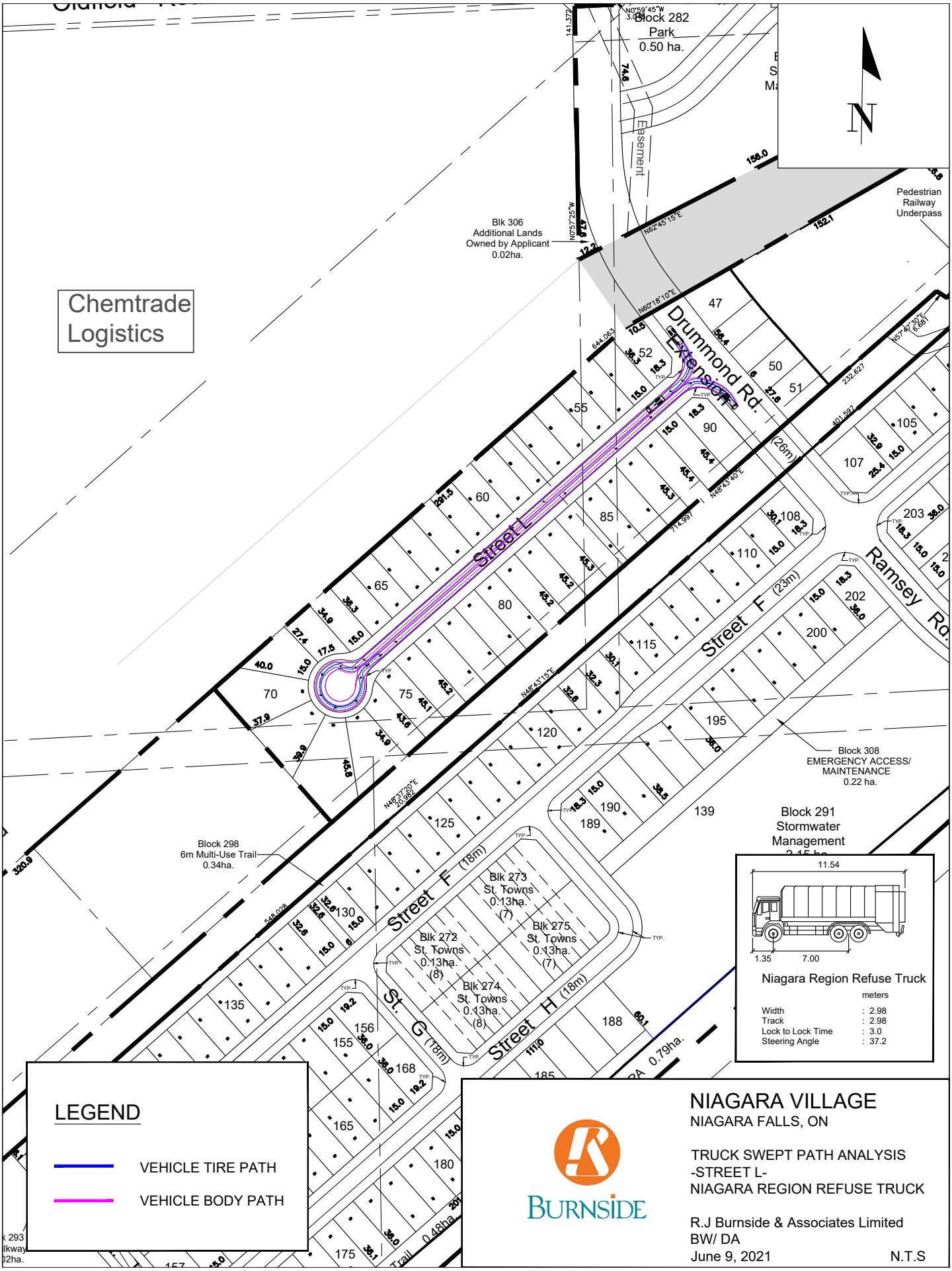
NIAGARA VILLAGE

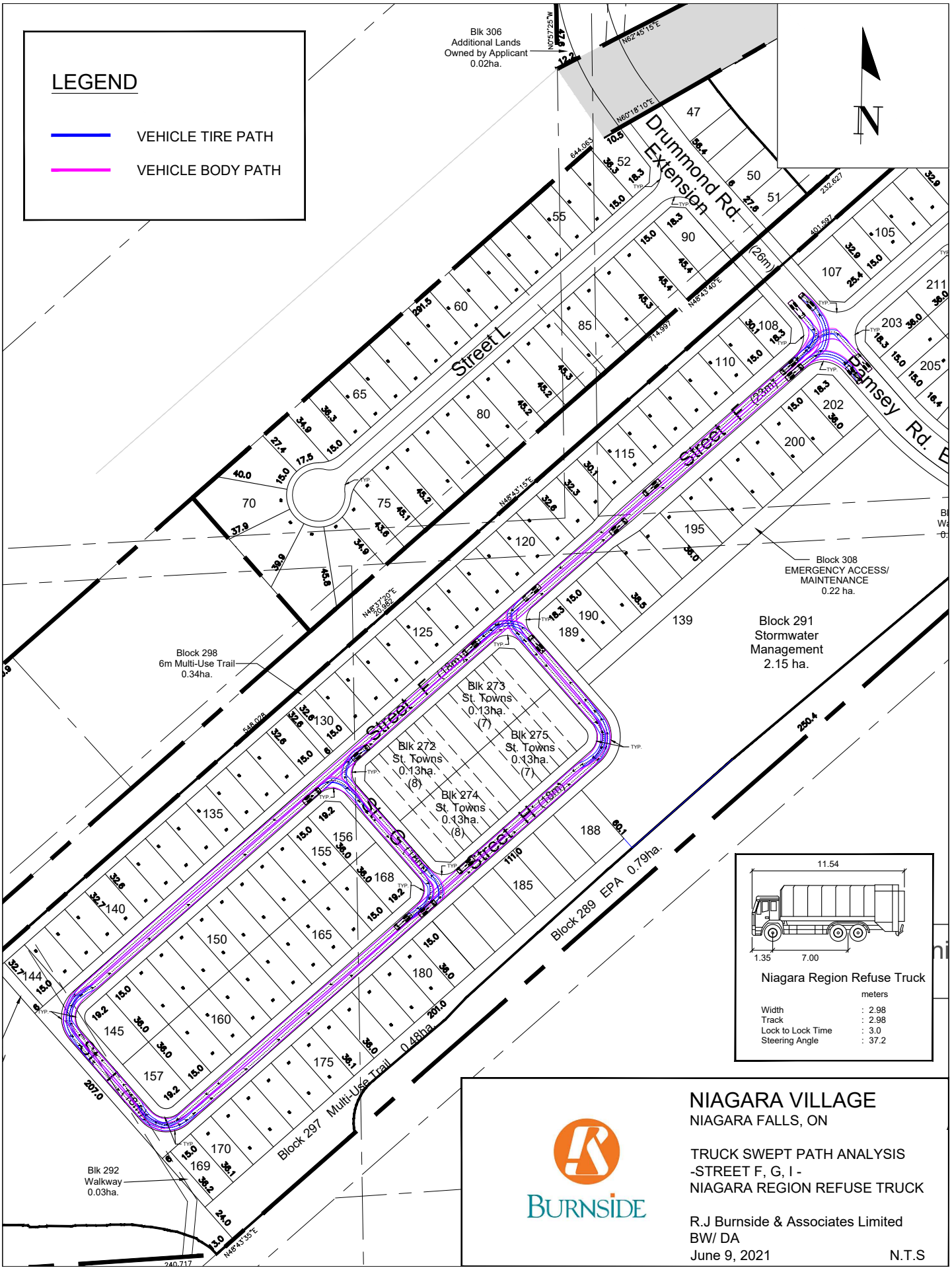
NIAGARA FALLS, ON

TRUCK SWEPT PATH ANALYSIS
-RAMSEY ROAD + STREET C, D, E-
NIAGARA REGION REFUSE TRUCK

BURNSIDE

R.J Burnside & Associates Limited
BW/ DA
June 9, 2021 N.T.S


Chemtrade Logistics
Block 282 Park 0.50 ha.
Blk 306 Additional Lands Owned by Applicant 0.02ha.
Pedestrian Railway Underpass
Drummond Rd. Extension
Street L
Street F (23m)
Street F (18m)
St. G (18m)
Street H (18m)
Ramsey Rd.
Block 298 6m Multi-Use Trail 0.34ha.
Block 308 EMERGENCY ACCESS/ MAINTENANCE 0.22 ha.
Block 291 Stormwater Management
Blk 272 St. Towns 0.13ha. (8)
Blk 273 St. Towns 0.13ha. (7)
Blk 274 St. Towns 0.13ha. (8)
Blk 275 St. Towns 0.13ha. (7)
0.79ha.
0.48ha.
N
LEGEND
VEHICLE TIRE PATH
VEHICLE BODY PATH
11.54
1.35
7.00
Niagara Region Refuse Truck
meters
Width : 2.98
Track : 2.98
Lock to Lock Time : 3.0
Steering Angle : 37.2
NIAGARA VILLAGE
NIAGARA FALLS, ON
TRUCK SWEPT PATH ANALYSIS
-STREET L-
NIAGARA REGION REFUSE TRUCK
R.J Burnside & Associates Limited
BW/ DA
June 9, 2021
N.T.S


LEGEND
VEHICLE TIRE PATH
VEHICLE BODY PATH
N
Blk 306
Additional Lands
Owned by Applicant
0.02ha.
Drummond Rd. Extension
Street L
Street F
Street G
Street I
Ramsey Rd. E
Block 308
EMERGENCY ACCESS/
MAINTENANCE
0.22 ha.
Block 291
Stormwater
Management
2.15 ha.
Block 298
6m Multi-Use Trail
0.34ha.
Blk 273
St. Towns
0.13ha.
(7)
Blk 272
St. Towns
0.13ha.
(8)
Blk 275
St. Towns
0.13ha.
(7)
Blk 274
St. Towns
0.13ha.
(8)
Block 289 EPA 0.79ha.
Block 297 Multi-Use Trail 0.48ha
Blk 292
Walkway
0.03ha.
11.54
1.35
7.00
Niagara Region Refuse Truck
meters
Width : 2.98
Track : 2.98
Lock to Lock Time : 3.0
Steering Angle : 37.2
NIAGARA VILLAGE
NIAGARA FALLS, ON
TRUCK SWEPT PATH ANALYSIS
-STREET F, G, I -
NIAGARA REGION REFUSE TRUCK
R.J Burnside & Associates Limited
BW/ DA
June 9, 2021
N.T.S

R.J. Burnside & Associates Limited