



**166 South Service Road East,  
Oakville  
Transportation Impact Study  
& Parking Study**

Paradigm Transportation Solutions Limited  
BA Consulting Group Ltd

June 2022  
210590



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### Client

**c/o 166 South Service Inc.**  
1-90 Wingold Avenue  
Toronto, ON M6B 1P5

### Client Contact

Clarence Qian, MArch  
Director of Development

### Consultant Project Team

Stew Elkins, B.E.S  
Adam Makarewicz, CET, MITE  
Greg Lue, M.A.Sc., P.Eng.  
Erica Bayley, P.Eng.

### BA Project Team

Timothy J. Arnott, MCIP, RPP  
Kyle Cory Jon, B.A.Sc.

### Paradigm Transportation Solutions Limited

5A-150 Pinebush Road  
Cambridge ON N1R 8J8  
p: 519.896.3163  
905.381.2229  
416.479.9684

[www.ptsl.com](http://www.ptsl.com)

## 166 South Service Road East, Oakville Transportation Impact Study & Parking Study



Erica Bayley, P.Eng.

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# Executive Summary

## Content

Paradigm Transportation Solutions Limited (Paradigm) was retained in collaboration with BA Consulting Group Ltd. to conduct this Transportation Impact Study (TIS) and Parking Study (PS) for a mixed-use development located at 166 South Service Road East in the Town of Oakville, Ontario.

The study aims to assess current traffic and the additional traffic generated by the proposed development, analyze the traffic impact on the adjacent roadway network, and provide the municipality and owner with improvements required to mitigate the identified effects of the site-generated traffic.

The development proposal for the site envisions a large-scale development of three towers with proposed heights of 50, 58, and 44 storeys, with Towers 2 and 3 on top of a mutual podium. The development proposes approximately 2,014 m<sup>2</sup> (21,676 sq.ft.) of rentable retail space, 3,891 m<sup>2</sup> (41,882 sq.ft.) office space, and 1,606 residential units with 1,191 parking spaces and 1,613 bicycle parking spaces. Vehicle access will be provided through two driveway connections: South Service Road East (North Access) and a new north-south local road (East Access) connecting South Service Road East to Cross Avenue.

It is assumed that the site will be developed in two phases:

- ▶ Phase 1 will open in 2027 and will include Tower 1, while
- ▶ Phase 2 will open in 2032 and consist of Towers 2 and 3.

It is also assumed that the North Access will be only accessed until 2037 when the new north-south local road is in place.

## Conclusions

### Development Concept Review

A review of the proposed Development Concept plans was undertaken with the following conclusions reached:

- ▶ Pedestrian, bicycle, and vehicular access to the Site provides appropriate mobility opportunities for all modes.
- ▶ The proposed Development Concept is consistent and compatible with short-term (prior to the development of



adjacent properties) and long-term (with the fulfillment of the Mid-Town Oakville streets and blocks plan) Mid-Town Oakville conditions.

## Parking Supply

- ▶ Adoption of reduced minimum resident and non-residential parking supply standards is appropriate based on the following considerations:
- ▶ The proposed parking reduction is consistent with Provincial, Regional & Local Mobility and Parking Policy;
- ▶ The parking supply strategy is in conformance with Ontario's current vision for transit nodes;
- ▶ The area transportation context and proposed TDM framework supports multi-modal travel;
- ▶ The provision of an enhanced TDM plan was determined as a proactive method of reducing the proposed resident parking supply; and,
- ▶ The parking supply reduction significantly reduces the cost of construction of the project, which can improve the initial proposed housing along with ongoing life-cycle maintenance and property tax costs, further enhancing the affordability of the project for the residents in the long-term and,
- ▶ The proposed reduction in parking supply has regard to matters of Provincial interest; they are consistent with the Provincial Policy Statement. They conform with the Growth Plan, the Region of Halton Official Plan, and the Livable Oakville Plan Mid-Town Oakville provisions.
- ▶ While a reduction to the minimum resident and commercial parking requirements under Zoning By-Law 2014-014 is proposed, the resulting vehicular parking supply will meet the development's needs regarding the existing /planned transit infrastructure in the immediate area, including higher-order transit.
- ▶ A reduced resident parking supply ratio of 0.50 parking spaces per residential unit and office and retail parking rates of 1.08 parking spaces per 100 m<sup>2</sup> is considered appropriate.
- ▶ The proposed development incorporates a total of six (6) loading spaces. The proposed loading arrangements are functionally and operationally appropriate and will facilitate the loading/unloading, moving, delivery and refuse collection needs of the proposed development
- ▶ The proposed bicycle parking supply of 1,613 bicycle parking spaces is considered appropriate and will accommodate the bicycle parking demands of the proposed development.



## Transportation Impact Study

The proposed development will generate approximately 447 new vehicle trips during the weekday AM peak hour and 433 new vehicle trips during the weekday PM peak hour.

Detailed traffic analysis was conducted for each study area intersections under Base conditions, Opening (2027), 5-Year (2032) and 10-Year (2037), Background and Total conditions.

To avoid situations where drivers at a stop-controlled minor approach experience significant delays, the intersection of South Service Road and Argus Road is recommended to be restricted to right-in/out operations.

It is acknowledged that deficiencies currently exist at specific locations, primarily along the Trafalgar Road corridor within the study area. They can be expected to persist in the future with anticipated growth in traffic, independent of the development.

For clarification, delays at the study area intersection have been documented as a foreseeable issue without the proposed development in the Midtown Oakville EA. The EA identified several roadway improvements to address traffic growth's existing and long-term impacts. The construction of new direct off-ramps for the QEW at Trafalgar Road, a revised local road network for Midtown Oakville, an extension of Cross Avenue and a variety of intersection improvements are proposed. It is understood that these improvements will provide some relief to operational issues. However, vehicle capacity constraints will persist for the overall transportation network.

As the EA recognized capacity constraints, further remedial measures to improve intersection capacity are not likely to be implemented. Instead, future improvements to the transportation network are expected to primarily focus on sustainable forms of transportation, including an improved transit network by adding BRT along Trafalgar Road.

By shifting commuter travel to public transit, intersection operations could be expected to maintain the status quo (at capacity condition during peak hours) or improve if fewer vehicles transverse the intersections during the peak hours of a typical weekday. The Town of Oakville's Urban Mobility & Transportation Strategy<sup>1</sup> echoes this sentiment:

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<sup>1</sup> Oakville Urban Mobility & Transportation Strategy, Steer, November 2021



*"The Town of Oakville and Halton Region must accept a crucial point: they will never solve congestion. There will always be someone new who fills up space on the road, regardless of whether that space was created by paving a new lane or having some drivers switch to buses. It is well established that the expansion of congested roadways does not reduce congestion – it just increases the number of people on those roadways. This is called induced demand."*

*"Due to the principle of induced demand, vehicular congestion can never be solved completely, and Oakville should not fall into the trap of trying to prove otherwise. Oakville's current methodology for assessing traffic (and the impacts to traffic from new developments) fails to capture this fact, biases suburban developments over urban ones, and does not assess other modes such as walking, cycling and transit."*

## **Transportation Demand Management**

The proposed development proposes active mitigation of site traffic impacts by implementing several Transportation Demand Management (TDM) measures. To complement and build upon the location and accessibility of the development and enhance the non-auto-dependent mobility of prospective residents, the development will consider adopting TDM measures to reduce the dependency on vehicular travel. These measures include a shared parking strategy, active uses at grade along street frontages, provision of bicycle spaces exceeding Zoning requirements, the building owner will charge parking as a separate cost to occupants as well as welcome packets

Research conducted focused on whether a relationship exists between the provision of off-street parking and the choice to drive among individuals travelling to or from the site. Following data collection and an empirical review of the data, this research found that reductions in off-street vehicular parking for office, residential, and retail developments reduce the overall automobile mode share associated with those developments relative to projects with the same land uses in similar contexts that provide more off-street vehicular parking. However, a limited parking supply is one of the essential TDM measures.

The role of parking management is a crucial element in helping Oakville meet its trip reduction goals. If free and unregulated parking is provided, there is little incentive for many residents and visitors to use alternative modes of transportation. The Town of Oakville's Urban Mobility & Transportation Strategy echoes this sentiment:



*"The provision of free parking is a subsidy to drivers, and its removal or reduction can serve as an encouragement to switch to other modes of transport."*

## Recommendations

Based on the findings of this study, the following recommendations are identified:

- ▶ South Service Road and Argus Road be restricted to right-in/right-out only
- ▶ On-site pedestrian sidewalks are recommended to be well-lit and conform to the Town of Oakville's design standards and the Accessibility for Ontarians with Disabilities Act (AODA) design standards.
- ▶ Implement reduced vehicular parking rates to serve as a critical TDM measure to reduce vehicular travel to and from the Project and provide support for reduced environmental and project cost impacts on the delivery of residential, retail, and office land uses within the Mid-Town Oakville context.
- ▶ Applicant implements unbundling resident parking where parking spaces are provided as a separate cost to residents.
- ▶ Provide a comprehensive TDM plan to maximize alternative mobility opportunities for residents, visitors, and employees of the Project.



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# 1 Introduction

## 1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Study (TIS) for the mixed-use development located at 166 South Service Road in the Town of Oakville, Ontario. **Figure 1.1** details the location of the subject development.

The study aims to assess current traffic and the additional traffic generated by the proposed development, analyze the traffic impact on the adjacent roadway network, and provide the municipality and owner with improvements required to mitigate the identified effects of the site-generated traffic.

More specifically, the scope of this study is to:

- ▶ Forecast traffic from the proposed development;
- ▶ Assign the projected volumes to the surrounding road network based on the existing traffic patterns at the driveway connection;
- ▶ Assess total future traffic within the study area. The following horizons have been considered: Opening Year (2027), five years from Opening Year (2032), and ten years from Opening Year (2037);
- ▶ Identify operational concerns and any mitigation measures that may be required to improve operations;
- ▶ Review and identify potential Transportation Demand Management (TDM) measures that can be implemented for the proposed development; and
- ▶ Review the proposed parking supply, and determine its adequacy compared to estimated parking demands

This report adheres to the terms of reference developed by Paradigm and agreed upon by the Town of Oakville, Region of Halton, and the Ministry of Transportation, Ontario (MTO). The correspondence is provided in **Appendix A**.

## 1.2 Study Area

The study area intersections assessed in this study include:

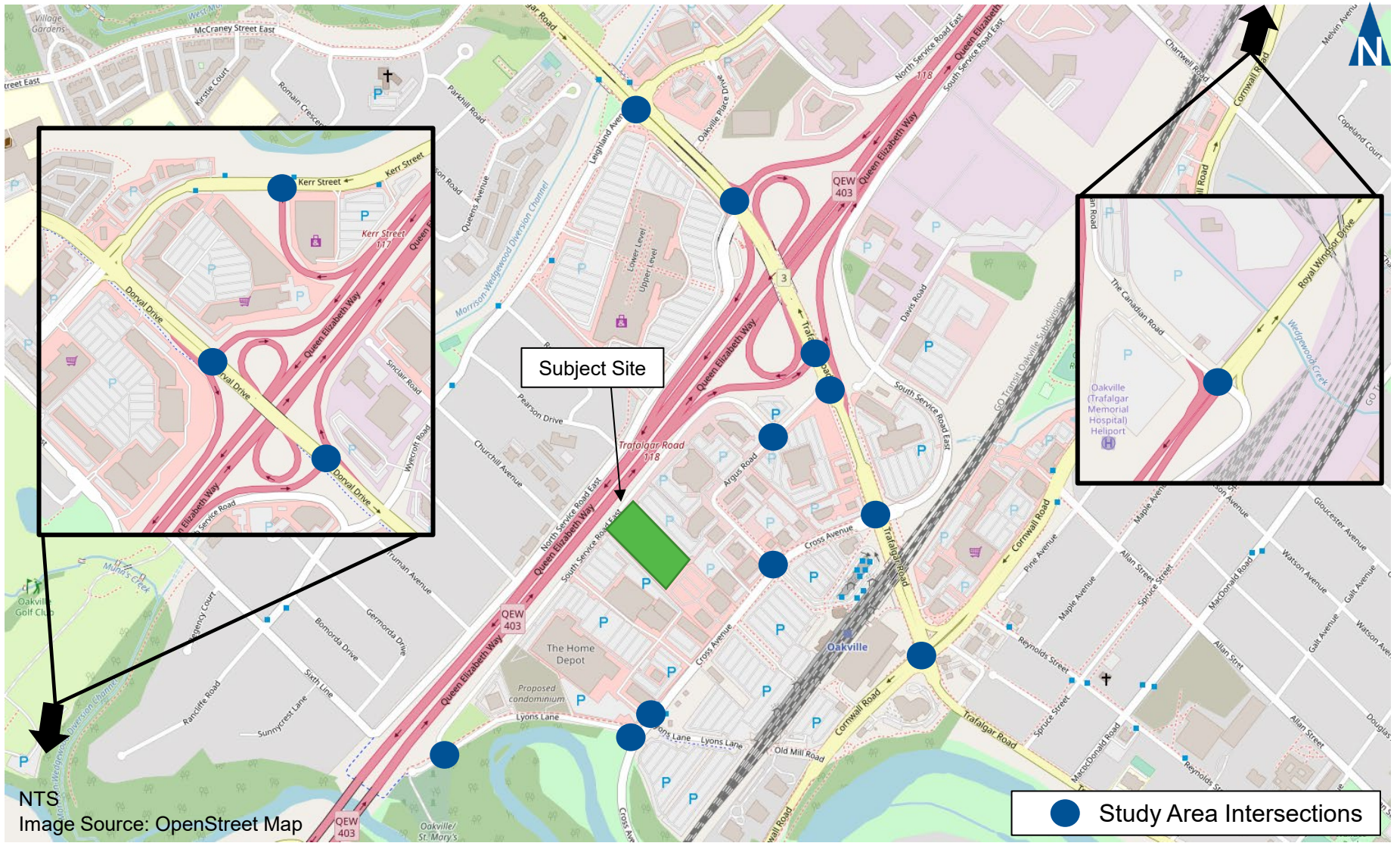
- ▶ Trafalgar Road and QEW Westbound Off-Ramp / North Service Road (Signalized);



- ▶ Trafalgar Road and QEW Eastbound Off-Ramp (Signalized);
- ▶ Trafalgar Road and Argus Road (Unsignalized);
- ▶ Trafalgar Road and Leighland Avenue / Iroquois Shore Road (signalized)
- ▶ Trafalgar Road and Cross Avenue / South Service Road (Signalized);
- ▶ Trafalgar Road and Cornwall Road (Signalized);
- ▶ Cross Avenue and Argus Road / GO Station Driveway (Signalized);
- ▶ Argus Road and South Service Road;
- ▶ Cross Avenue and Lyons Lane West;
- ▶ Dorval Road and QEW Westbound Off-Ramp (signalized);
- ▶ Dorval Road and QEW Eastbound Off-Ramp (signalized);
- ▶ Kerr Street and QEW Westbound Off-Ramp (signalized);
- ▶ Canadian Road / South Service Road and Royal Windsor Drive / QEW Eastbound Off-Ramp;
- ▶ Future local Road and South Service Road East; and
- ▶ Two site driveways.

**Figure 1.1** illustrates the study area intersections.





## 2 Existing Conditions

### 2.1 Roadway Characteristics

The roadways of interest within the study area include:

- ▶ **Trafalgar Road** (Halton Region Road 3) is an urban major arterial road from Cornwall Road northwards and an urban minor arterial road southward from Cornwall Road. The roadway consists of a six-lane cross-section from Cornwall Road northwards and tapers down to a two-lane cross-section southward. The posted speed limit along Trafalgar Road is 50 kilometres per hour. Pedestrian facilities are provided along both sides of the road in the study area.
- ▶ **Cross Avenue** is an urban minor arterial road from Trafalgar Road to Cornwall Road. It provides access to the Oakville GO Station and the station's commercial businesses. East of Trafalgar Road, Cross Avenue continues as South Service Road, eastwards towards Royal Windsor Drive. The assumed speed limit of Cross Avenue is 50 kilometres per hour. Pedestrian facilities are provided along both sides of the road in the study area.
- ▶ **Lyons Lane** is a two-lane local road north of Cross Avenue. Lyons Lane terminates as a cul-de-sac west of its intersection with South Service Road. There is a sidewalk on the east side of Lyons Lane. The assumed speed limit of Lyons Lane is 50 kilometres per hour.
- ▶ **South Service Road East** is a two-lane local road that fronts the QEW and provides additional access to the existing built lands. From its west end of Lyons Lane, it runs east parallel to the QEW, turning south to intersect with Argus Road. The assumed speed limit of South Service Road is 50 kilometres per hour. There are no pedestrian facilities along South Service Road.
- ▶ **Argus Road** is a two-lane local road that connects Trafalgar Road to Cross Avenue. The assumed speed limit of Argus Road is 50 kilometres per hour. There is a sidewalk on the south and east side of the roadway.
- ▶ **Leighland Avenue / Iroquois Shore Road** is an east-west minor arterial road with a four-lane cross-section west of Trafalgar Road. East of Trafalgar is a multi-purpose arterial road with a two-lane cross-section. There is a sidewalk on both sides of the roadway. The posted speed limit is 50 kilometres per hour.

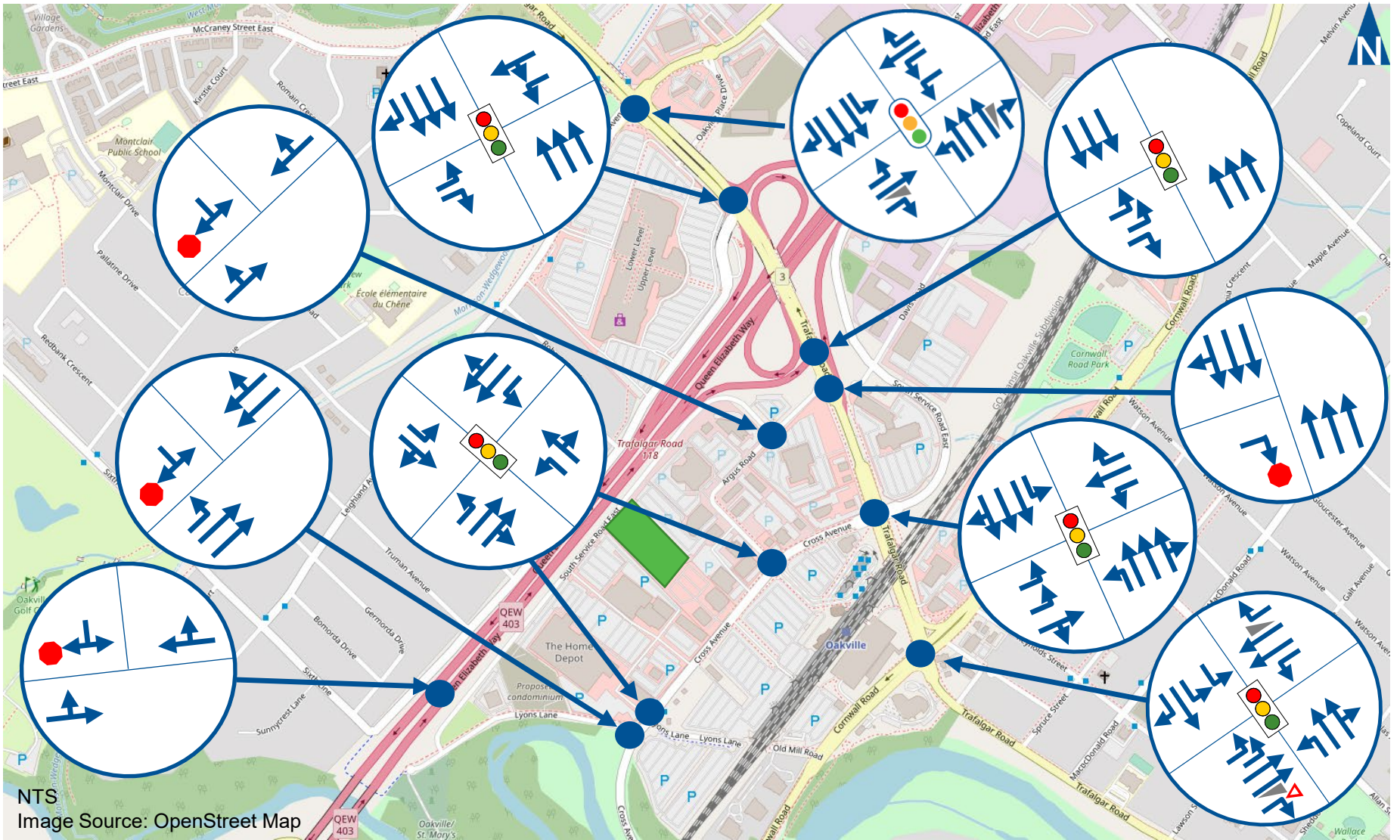




- ▶ **Dorval Road** is a north-south four-lane major arterial road. The posted speed limit is 60 kilometres per hour. There is a sidewalk on both sides of the roadway.
- ▶ **Kerr Street / North Service Road W** is an east-west four-lane minor arterial road. The posted speed limit is 60 kilometres per hour. There is a sidewalk on the south side of the roadway.
- ▶ **Royal Windsor Drive** is an east-west four-lane multi-purpose arterial road. The posted speed limit is 60 kilometres per hour. There is a sidewalk on the north side of the roadway.
- ▶ **Canadian Road** is a north-south two-lane local road. The posted speed limit is 40 kilometres per hour. There are no sidewalks along the roadway.

**Figure 2.1** illustrates the study area's existing land configuration and traffic control.



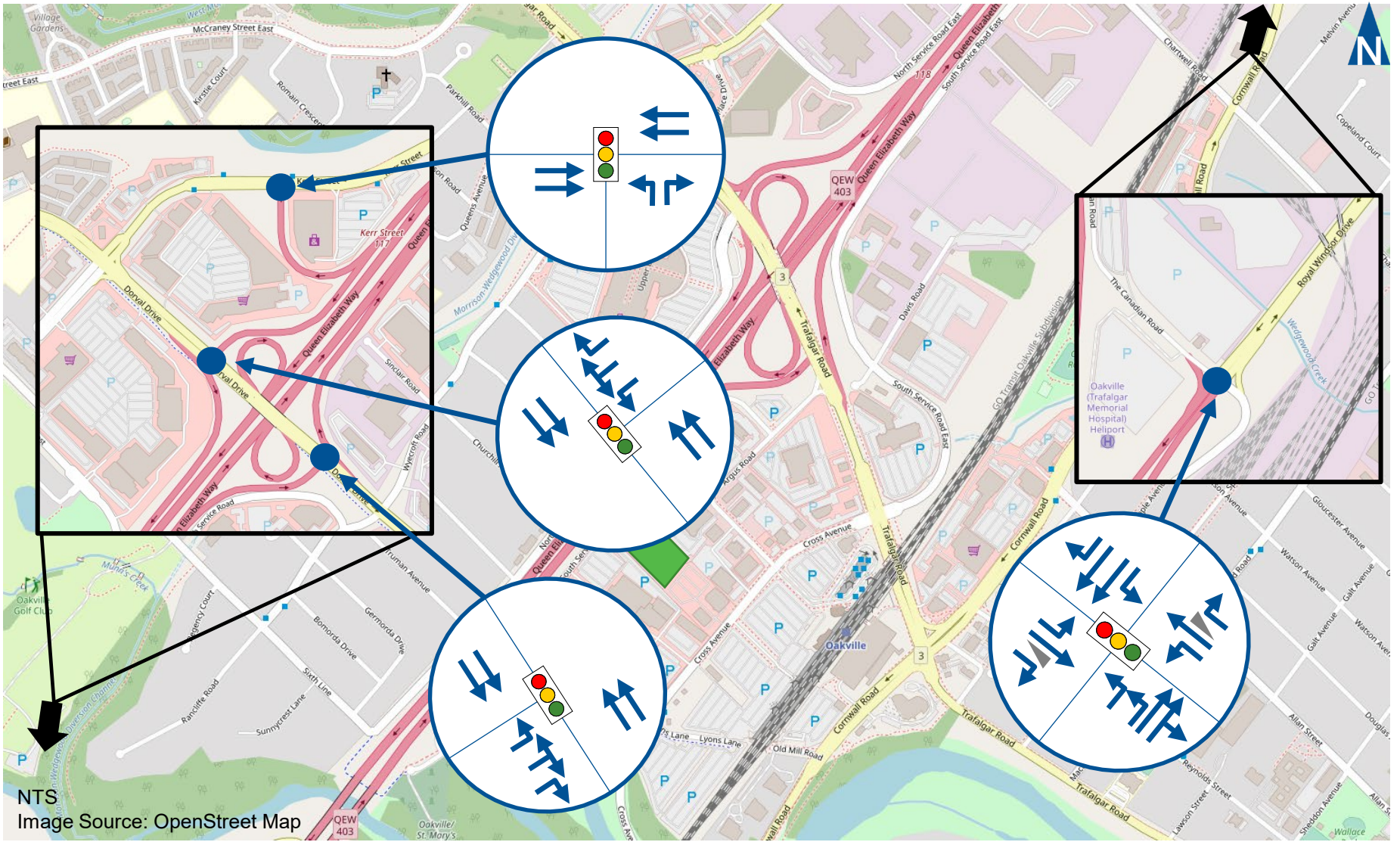


## Existing Lane Configuration & Traffic Control (1/2)

166 South Service Road East, Oakville  
210590



Figure 2.1A



## Existing Lane Configuration & Traffic Control (2/2)

166 South Service Road East, Oakville  
210590



Figure 2.1B

## 2.2 Existing Transit Service

### 2.2.1 Oakville Transit

Oakville Transit owns and operates the public transit system in Oakville. The subject site is located within the Midtown Oakville Urban Growth Area, one of the most transit-accessible locations within the Town. The subject site is approximately 650 metres (8-minute walk) from the Oakville GO Station, currently serviced by 16 out of 22 Oakville Transit Routes. Most of the transit routes which provide access to all of the Town of Oakville operate seven days a week from early morning to late evening, with headways generally between 10 and 30 minutes depending on the day of week and time of day.

**Figure 2.2** illustrates the existing Oakville Transit network

### 2.2.2 GO Inter-Regional Transit

The proposed development is approximately 650 metres (8-minute walk) from the Oakville GO Station. This station is located along the Lakeshore West Line, which currently operates a two-way all-day train service seven days a week and GO Bus connections to Hamilton and Sheridan College and York University via Highway 407.

**Figure 2.3** illustrates the GO Network's relation to the site.





## Existing Oakville Transit Network

166 South Service Road East, Oakville  
210590



Figure 2.2



## Existing GO Transit Network

166 South Service Road East, Oakville  
210590



Figure 2.3

## 2.3 Active Transportation

### 2.3.1 Pedestrians

The site is within walking distance of several retail opportunities providing a range of destinations for prospective residents of the proposed Development that can be readily accessed without using a vehicle.

Pedestrian sidewalks are provided on at least one side of streets through most study areas. Crosswalks, pedestrian pushbuttons, and indicators are provided for all approaches at the signalized intersections within the study area.

The site's proximity to such a range of amenities and destinations within walking distance reduces the need for residents to travel regularly using a car and own a vehicle.

### 2.3.2 Cycling

On-road cycling lanes are not currently provided on the streets in the study area. However, the Town of Oakville's Active Transportation Master Plan identifies that Trafalgar Road and Cross Avenue are proposed to be reconstructed with on-street cycle lanes, as indicated in **Figure 2.4**.

In addition, as cyclists are permitted to ride on most roads except controlled-access highways, the lack of separate bicycle lanes on all other local and collector roadways will not prohibit this type of travel.

### 2.3.3 Travel Characteristics

A review of existing modes of transportation by area residents has been completed. Data on primary modes of transportation for all trips within Ward 3 was extracted from the 2016 Transportation Tomorrow Survey (TTS)<sup>2</sup>. The TTS data indicates that during the AM peak hour, the automobile accounts for 71 percent of trips made by residents, while transit accounts for 13 percent (one percent for local transit and 12 percent for GO Train). Walking and cycling (8 percent) and other modes (8 percent) account for the remaining percentages.

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<sup>2</sup> Transportation Tomorrow Survey 2016, Regional Municipality of Halton Summary by Ward, March 2018, Malatest





NTS  
Image Source: Oakville ATMP 2009



## Proposed Cycle & Trail Network

166 South Service Road East, Oakville  
210590



Figure 2.4



## 2.4 Traffic Volumes

Turning movement counts are used to quantify the movement of vehicles through the area to assess intersection operation. Existing traffic data at an intersection or road section forms the foundation for analysis. The counts are usually taken during peak periods at an intersection to complete the level of service analysis. **Appendix B** contains the traffic data utilized in this report.

The Region's Traffic Impact Study Guidelines indicate the requirement for collecting new data for three or more counts. Acknowledging this requirement and the current situation related to COVID-19, the ability to conduct up-to-date data collection is impacted. The Region acknowledges this impact and has accepted using 2017 count data for this study<sup>3</sup>.

Historic TMC data has been used and adjusted to provide reasonable traffic volumes for the baseline horizon (2022), using a growth rate of 2% per annum as outlined by the Region.

### 2.4.1 Traffic Data

Existing historical traffic counts were obtained from the Region of Halton, MTO, and collected by Paradigm. **Table 2.1** provides a summary of traffic count locations and sources.

**TABLE 2.1: TRAFFIC COUNT SUMMARY**

	Intersection	Date
Trafalgar Road	Leighland Avenue/Iroquois Shore Road	March 3, 2017
	QEW Westbound Off-Ramp/North Service Road	June 1, 2017
	QEW Eastbound Off-Ramp	June 1, 2017
	Argus Road	June 1, 2017
	Cross Avenue/South Service Road	June 1, 2017
	Cornwall Road	June 1, 2017
Cross Avenue	Argus Road/GO Station Driveway	January 10, 2019
	Lyons Lane / Commercial Driveway	January 10, 2019
	Lyons Lane	January 10, 2019
South Service Road	Argus Road	January 10, 2019
	Lyons Lane	January 10, 2019
	Royal Windsor Drive/QEW Ramp	February 15, 2022
Dorval Drive	QEW Westbound Off-Ramp	August 14, 2018
	QEW Eastbound Off-Ramp	August 14, 2018
Kerr Street	QEW Westbound Off-Ramp	August 14, 2018

### 2.4.2 Volume Balancing

Volume balancing along Trafalgar Road has also been applied to ensure that the corridor maintains reasonable upstream and

<sup>3</sup> Appendix A – Terms of Reference



downstream flow. No balancing occurred on Cross Avenue west of Argus Road to account for the GO Station and commercial driveways.

**Figures 2.5A** and **2.5B** illustrate the adjusted base year traffic volumes during the weekday AM and PM peak hours.







## 3 Development Proposal Review

### 3.1 Proposed Development Programme Elements

The following provides an overview of the programme elements for the Proposed Development. Reduced scale architectural plans of the Proposed Development are provided in **Appendix C. Figure 3.1** illustrates the proposed concept.

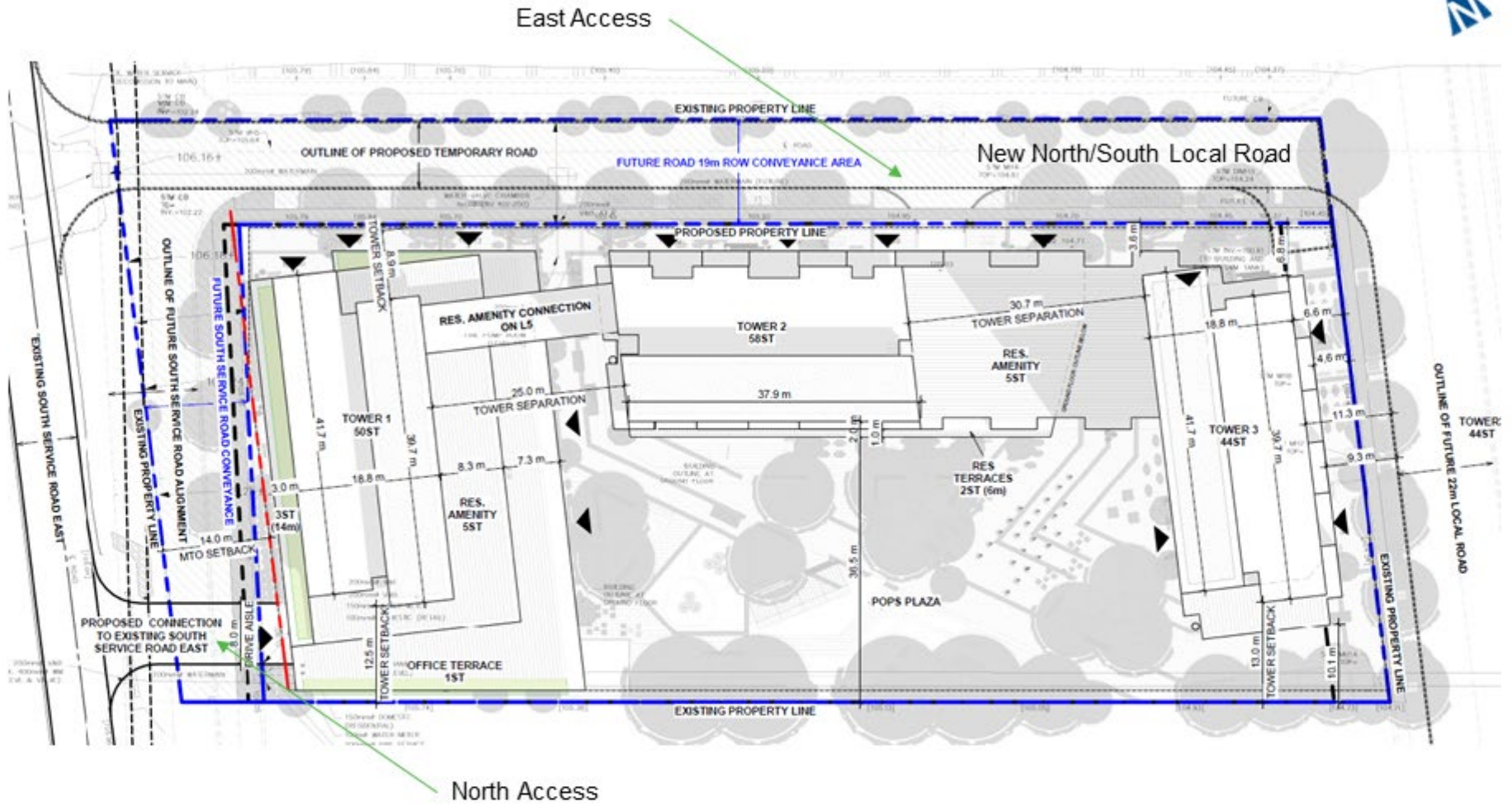
The Proposed Development includes a mixed-use programme composed of 1,606 residential units, approximately 2,014 square metres (21,677 square feet) of retail Net Floor Area (NFA), and about 3,891 square metres (41,887 square feet) of office NFA. A summary of the development programme is provided in **Table 3.1**.

The development programme is configured within three buildings across the development block; Tower 1 (the north tower), Tower 2 (the central tower) and Tower 3 (the south tower). Towers 1 and 2 are linked at the sixth level, and Towers 2 and 3 are linked from the second to the sixth level. A POPS area (Private Open Publicly accessible Space) is situated within the central portion of the development.

**TABLE 3.1: DEVELOPMENT PROGRAMME**

Land Use		Unit / GFA
Residential Uses	< 75 m / unit	1,534 units
	> 75 m / unit	72 units
	Total Res. Units	1,606 units
Non-Residential Uses	Retail	2,014 sq. metres NFA
	Office	3,891 sq. metres NFA
Transportation Services	Parking Supply	1,191 parking spaces (including 805 residential sps, 322 residential vis. sps, 22 commercial sps, & 42 office sps)
	Loading Supply	5 loading spaces (incl. 2 Refuse Collection / General Loading spaces & 3 underground Loading Areas for Moving/Res. Delivery purposes)
	Bicycle Parking Supply	1,609 Bike parking spaces (including 1,208 long-term sps & 401 short-term sps)





NTS



## Site Concept Plan

166 South Service Road East, Oakville  
210590

Figure 3.1

## 3.2 Site Access Description

### 3.2.1 Pedestrian Access

The Proposed Development occupies the majority of an entire block within the Mid-Town area of the Town of Oakville. It is currently bounded by the South Service Road on the north side, the Trafalgar Village retail centre on the west side, and existing commercial properties on the east and south sides. In the future, the west side of the Site would be bounded by future development within the Mid-Town area. New future Local public streets will form the site's east limit and the site's southern boundary.

In the interim condition, before the development of the adjacent properties to the east and south, the Site would be accessed via the South Service Road (either in its current alignment or future alignment, given its planned realignment in the Mid-Town area) and from an interim 13.6-metre version of a future 19 m Local public street right-of-way (ROW) which will form the east boundary of the Site, extending south from the South Service Road. Under the Interim condition, the interim version of the Local public street on the east side of the Site will be partially constructed to permit vehicular (including emergency vehicles) and pedestrian and cycling access to the Site in general and specifically to the ramp leading to the below-grade parking facilities on the east side of the Site.

The interim private version of the street will include 13.6 metres of the future Public ROW, including the full west boulevard dimension, an 8.0 m private street, plus an interim east curb line offset from the existing east property line of the Site. This interim version of the Local public street would terminate at the southerly limit of the Site and act as a private driveway until the property to the east of the Site is redeveloped, enabling the balance (5.4 metres) of the Local street ROW to be constructed while still providing the necessary width to accommodate all functional and required (emergency vehicle) access to the Site. When the lands to the south (and east and/or west) of the Site are redeveloped, the southern boundary 22 m ROW Local public street could be constructed, completing the Local public street network surrounding the Site.

This context is illustrated in several of the reduced-scale architectural drawings in **Appendix C** (including Drawings AZ001, AZ011, AZ 010 and AZ100).



Pedestrian access will be well served with pedestrian sidewalks within the municipal ROW's that will meet the Town's minimum standards for Local public streets. Given the layout of the proposed buildings on the Site, the proposed Development will have direct access to the adjacent public streets to the front doors of all buildings.

Furthermore, given the POPS configuration within the central area of the Site, access will also be afforded to residents, visitors and employees/customers of the non-residential floor space within the development. Access to the buildings from the central POPS area is integrated into the podiums on-site. Circulation "through" the Site will also be afforded to all of the aforementioned users without any vehicular conflicts, given all vehicular access is direct from the adjacent public streets to at-grade loading areas and below-grade passenger vehicle parking.

The context of the Proposed Development and its relationship to the surrounding public streets is illustrated in the drawings mentioned above in **Appendix C**.





### 3.2.2 Bicycle Access

Bicycle parking is provided below and above grade to facilitate centralized storage rooms and secure, weather-protected bike parking. Bike parking is generally situated on the mezzanine level and the P1 level below grade and accessed via elevators adjacent to the bike storage rooms, a short distance from the elevator access, or via stairs equipped with bike rails. Cyclists could also ride down the vehicular ramps to access the underground garage bicycle parking.

### 3.2.3 Vehicular Access

Access to the at-grade and below-grade loading areas is provided solely from the north side of the development from South Service Road East. The site's east side ramp does not offer sufficient height clearances for loading vehicles accessing the underground garage. Signage will be proposed to inform loading vehicles of the height clearance deficiency. Access to the below-grade parking garage will occur from the north and east sides of the Project, from the east-west portion of South Service Road East and the future Local public street, respectively.

These access driveways are configured to minimize the width of the driveways across the public boulevards and the sidewalks to reduce the exposure of pedestrians to crossing vehicular traffic. Sidewalks would be extended through the driveways to emphasize the pedestrian realm further and remind pedestrians and motorists that pedestrians have the right-of-way when crossing the driveways. Once on-site, loading vehicles from the north will immediately either enter the enclosed loading area or continue down to the underground garage. Passenger vehicles accessing the underground parking garage would utilize the ramps on the north or east side of the site down to the P1 parking level. Since the below-grade garage is a continuous plate across the entire Site, motorists can enter and exit the garage at either driveway. This allows motorists to select the most convenient route relative to their origin or destination routings and minimize the amount of unnecessary routing across the public street network.

As noted above, during an interim condition, before the redevelopment of adjacent properties to the east of the Site, the east side of the development will be accessed via what will be an interim, private version of what will become a public street extending south from the existing South Service Road East ROW and terminating at the southern limit of the Site property. **Appendix C** illustrates this condition in Drawing AZ100 (hatched area). In due course, as land from the adjacent property to the east is acquired by the Town of Oakville, the future Local public street on the site's east side will be fully



implemented. Furthermore, as lands to the south of the Site are acquired by the Town of Oakville, the southern future 22-metre ROW Public Street boundary road could be constructed as well as the extension of the 19 m Local Public Street to Cross Avenue, providing access to Argus Road and Cross Avenue, respectively, as well as other future Public streets within the Mid-town area of Oakville.

A description of the operating conditions associated with the vehicular project driveways and on-site vehicular circulation, both Interim and ultimate, is provided in more detail in **Section 4.4.3**.

### 3.2.4 Future South Service Road East Alignment

The Mid-Town Oakville Environmental Assessment (Mid-Town EA) envisions several transportation network improvements to support the proposed intensification within the area. One of those improvements is a newly configured E-NS off-ramp from the QEW/Hwy. 403 to Trafalgar Road will also permit direct connections to the future alignment of Cross Avenue under Trafalgar Road. As part of this design, the existing South Service Road East alignment will 'shift' to the south where the above-noted ramp's added width, and modified alignment occurs. This will result in a future realignment of South Service Road East and a corresponding impact on the subject Site.

At this time, definitive plans for the aforementioned QEW/Hwy. 403 ramp realignment is not available. The approximate future alignment of the realigned South Service Road East ROW has been indicated on the architectural plans (See Drawing AZ100 in **Appendix C**). The corresponding Ministry of Transportation, Ontario (MTO) 14.0-metre setback from their facilities and its relationship to the new South Service Road East alignment have not been reflected in the architectural plans to date. This impact will be reflected in subsequent submissions when more definitive/precise information is available to establish the resulting development envelope associated with the Site.

For the current development submission, the architectural plans respect the existing 14.0 m setback from the existing South Service Road East alignment to provide a basis for preparing development plans for the Zoning Bylaw Amendment process.



### 3.3 Vehicle Parking Provisions

Parking for the Project will be provided entirely below grade within the Site's footprint.

A 6-level underground parking garage (partial sixth floor) is provided to adequately accommodate all of the vehicular parking estimated to serve the project's needs. Justification for the proposed vehicular parking supply is set out in **Chapter 4** of this report separately.

A total of 805 parking spaces are provided for the residents of the Project. These are situated on levels 3 through 6 of the below-grade garage. An overhead door system is proposed to provide a physical separation between the resident parking and the non-resident (visitor, commercial, and office use) parking spaces. Access to the resident portion of the garage would be accomplished via a proximity card system within the residents' vehicles.

A total of 386 non-resident parking spaces are provided on levels P1 to P3 of the underground parking garage. This accommodates the resident visitor parking (322 spaces), commercial-use parking (22 spaces), and office-use parking (42 spaces) allocations. It is planned that the commercial and office use parking spaces would be allocated only to the respective uses themselves, i.e., sold to the purchasers of the commercial and office floor area for their customers and employees. The residential visitor parking would be allocated to the residential uses for their visitor parking demands. The nature of the residential visitor parking (i.e., time of use patterns) would make these spaces functionally available to accommodate other users during the daytime periods, with the approval of the residential condominium boards. This shared parking condition would efficiently use the non-resident parking spaces within the overall garage.

As noted in the Transportation Demand Management (TDM) section of this report (**Chapter 5**), a fee is recommended for the use of the non-resident parking spaces to encourage visitors and others who travel to the Site to consider alternative modes of travel.

The applicable Zoning Bylaw requires a total of 23 barrier free parking spaces to meet the needs of the Project.

It is proposed to supply 28 barrier-free parking spaces within the proposed parking garage, which meets/exceeds the requirement. Ten barrier-free spaces are proposed to be allocated to the non-residential portion of the garage, and the remaining 18 barrier-free spaces are distributed in the residential portion of the garage. It should be noted that typically an even number of Type A (the wider Accessible Parking



space) and Type B (the smaller Accessible parking space) are provided. Where an odd number of Accessible Parking spaces may be required, the additional Accessible Parking spaces should be configured as a Type B Accessible Parking space.

### 3.4 Loading Facilities Provided

A total of five formal loading spaces are proposed on the ground floor level and within the underground garage of the three Towers that make up the Project.

The Tower 1 building will contain two at-grade loading spaces configured as follows:

- ▶ Refuse Collection loading space capable of accommodating an overhead front loading refuse collection vehicle or a large Single Unit delivery vehicle for the non-residential floor space; and,
- ▶ A second full-sized loading space capable of accommodating a large single-unit delivery vehicle
- ▶ That can accommodate full-sized delivery vehicles or household moving vehicles.

The combination of these two loading spaces would adequately serve the entire development's residential waste pick-up and non-residential requirements.

The loading area will serve as the consolidated garbage pick-up location for all three Towers and has the requisite internal manoeuvring area and refuse bin staging area. The entry into the loading area would be equipped with a signalling and signage system to ensure that when loading vehicles are manoeuvring into or out of the loading area, vehicles entering or exiting the parking garage and using the driveway in the vicinity of the loading area would be aware of the potential for truck manoeuvring occurring.

The underground parking garage will contain three loading spaces configured as follows:

- ▶ Small delivery vehicles that can accommodate small commercial deliveries or household moving vehicles.

These loading spaces would mainly serve the three Tower's residential moving in and moving out operations, deliveries to residential units or small deliveries to some of the retail uses within the podiums of Towers 2 and 3. Access to these loading spaces would occur solely from the north driveway off of South Service Road East. The P1 level



of the underground garage would have a height clearance of 4.0 metres minimum to accommodate these vehicles.

The proposed loading facilities and bin staging areas collectively facilitate residential garbage and recycling collection by the Region of Halton, residential moving activities, retail waste collection, and delivery activities associated with the proposed office, retail, and commercial uses.

Manoeuvring characteristics associated with the loading facilities are reviewed in **Section 4.4** herein.

### **3.5 Bicycle Parking Provisions**

A bicycle strategy has been developed and is proposed as part of the site to enable and encourage bicycle usage by residents, employees and visitors to the site.

A total of 1,613 bicycle parking spaces are proposed across the Project on the mezzanine and P1 levels. Again, access to the project's bicycle parking facilities is via elevator access adjacent to the bike storage rooms, a short distance from the elevator access, or via stair wells equipped with bike rails. Cyclists could also ride down the vehicular ramps to access the underground bicycle parking spaces.



## 4 Vehicular Parking Supply Review

BA Group has undertaken a review of the vehicular parking aspects of the proposed development recognizing the area transportation context, the nature of the proposed mixed-use building, prevailing Zoning Bylaw requirements, a review of broad mobility policy at various levels of government and demands seen in comparable environments in the Greater Toronto Area (GTA) and the Transportation Demand Management (TDM) context of the Project.

### 4.1 Zoning Bylaw Requirements (2014-014)

The site is currently subject to the “Mixed Use Zones” parking standards under the Town of Oakville Zoning By-law 2014-014. The minimum parking supply standards that apply to the site are summarized in **Table 4.1**.

**TABLE 4.1: ZONING BY-LAW PARKING REQUIREMENTS**

Use	Units / Floor Area	Rate (Minimum)	Requirement (Minimum)
<b>Resident</b>			
1- Bedroom <sup>3</sup>	1,128 units	0.80 spaces / unit <sup>4</sup>	903 spaces
2-Bedroom <sup>3</sup>	406 units	0.80 spaces / unit <sup>4</sup>	325 spaces
3-Bedroom	72 units	1.05 spaces / unit <sup>4</sup>	76 spaces
<b>SUBTOTAL</b>	<b>1,606 units</b>	<b>0.81 spaces / unit</b>	<b>1,304 spaces</b>
<b>Non-Resident</b>			
Residential Visitors	1,606 units	0.2 spaces / unit	321 spaces
Retail	2,014 m <sup>2</sup>	1.0 spaces / 18 m <sup>2</sup> GFA	112 spaces
Office	3,891 m <sup>2</sup>	1.0 spaces / 35 m <sup>2</sup> GFA	111 spaces
<b>SUBTOTAL</b>			<b>544 spaces</b>
<b>TOTAL<sup>2</sup></b>			<b>1,848 spaces</b>

Notes:

- 1 Based upon site statistics provided by Sweeney Architects May 30, 2022.
- 2 In accordance with Zoning By-law 2014-014, if the calculation of a parking requirement results in a fraction less than 0.25, it shall be rounded down to the nearest whole number.
- 3 1-Bedroom and 2-Bedroom units have a net floor area less than 75 m<sup>2</sup>.
- 4 Residential rates incorporate a 0.20 visitor ratio



Applying the supply requirements of Zoning-By-law 2014-014 to the proposed development would require the provision of a minimum of 1,848 parking spaces, including 1,304 resident spaces (effective rate of 0.81), 321 resident visitor spaces, 112 retail parking spaces, and 111 Office parking spaces.

## 4.2 Proposed Parking Supply

It is our opinion that the above-noted parking standards summarized in **Table 4.1** overstate the site's parking demands by some margin, given the excellent existing and future transit and pedestrian/cycling nature of the proposed development and future Mid-Town Oakville environs.

It is proposed to provide a total of 1,191 total parking spaces to meet the needs of the Project. This includes 805 resident parking spaces (effective parking supply of 0.5 parking spaces per unit), 322 residential visitor parking spaces (effectively ratio of 0.2 parking spaces per unit), and 64 commercial parking spaces (for the retail and office uses).

It is also important to note that the total supply of non-resident parking – residential visitor and commercial land uses – could potentially be shared during certain times of the day, given the favourable (compatible) temporal patterns exhibited by the office/residential visitor parking demands.

Although the current plan is to sell the retail and office parking spaces to those who would be purchasing the floor area, the residential visitor parking will not be fully utilized during the daytime hours throughout the week (likely between 20% and 50% utilization or equivalent to approximately 161 to 258 vacant resident visitor vehicle parking spaces during those times of the day).

There would be an opportunity, assuming an agreement between the residential condominiums and the commercial floor space purchasers, to share on a paid parking basis the residential visitor parking supply during daytime hours when office and retail parking demands are highest – yet even when combined, their estimated parking demand of approximately 50 to 100 (conservatively high) vehicles would total less than the available resident visitor supply during the daytime periods. This would create an efficient urban parking condition. This approach would be pursued further through the detailed Site Plan stages of development and the leasing and sales process of the overall Project.



## 4.3 Appropriateness of the Proposed Resident Parking Standards

Adoption of reduced parking minimum standards is considered appropriate based upon the following considerations:

- ▶ Provincial and local policy/plan that direct municipalities to reduce or eliminate minimum parking requirements;
- ▶ High-level justification for Intensification within Mid-Town Oakville;
- ▶ Zoning By-laws from other areas of the Town of Oakville recognize a variation in parking requirements for differing conditions across the Town, including lower minimum parking requirements and accommodation of context-specific parking requirements;
- ▶ The Site's proximity to current and future transit services, cycling networks, and on-Site transportation incentives;
- ▶ A review of standards applicable to comparable uses and contexts in adjacent Ontario municipalities and industry standards; and,
- ▶ The TDM measures for the Site will influence parking demand on-Site and in the wider area.

The following provides an overview of the contextual factors influencing parking demand at residential developments in the Mid-Town Oakville area and the appropriateness of the proposed reduced parking supply in this instance.

### 4.3.1 Provincial, Regional & Local Policy

Many provincial plans and local policies provide a framework to guide development in Ontario municipalities. These plans and policies often contain direction regarding development along transit corridors, commenting on parking standards and the future regulations of parking minimums. Below is an overview of the provincial and local plans and policies that support a reduced parking minimum and multi-modal lifestyle.





### 4.3.2 Ontario's Five Year Climate Change Action Plan

Ontario's Five-Year Climate Change Action Plan was announced in June 2016 (herein referred to as "the Plan"). The Plan emphasizes the importance of addressing climate change at the municipal level. Some of the critical transportation and land-use planning actions outlined in the Plan are as follows:

- ▶ **Support cycling and walking:** Commuter cycling networks will be established across Ontario, targeting routes with high-commuting volumes, such as between residential communities, major transit stations and employment areas. There will be more cycling facilities in urban areas, including grade-separated routes and cycling signals. More bicycle parking will be at transit stations and provincially owned, publicly accessible facilities. Ontario will revise provincial road and highway standards to require commuter cycling infrastructure to be considered for all road and highway construction projects where it is safe and feasible. Ontario will do the same for major transit corridors.
- ▶ **Reduce single-passenger vehicle trips:** Ontario will provide grants to municipalities and large private employers to implement Transportation Demand Management (TDM) Plans. The plans will help increase walking, cycling, carpooling, telecommuting and flex-work schedules, reducing fossil fuel consumption, traffic congestion and transportation emissions.
- ▶ **Eliminate minimum parking requirements:** Minimum parking requirements will be eliminated over the next five years for municipal zoning by-laws, especially in transit corridors and other high-density, highly walkable communities. Minimum parking requirements are a barrier to creating complete, compact, mixed-use communities. Instead, by-laws will encourage bike lanes, larger sidewalks, and enhanced tree canopies.

Eliminating minimum parking requirements in transit-accessible areas is not new in North America. Residential developments with lower parking requirements are being promoted, approved, and developed in Vaughan, Toronto, Calgary, Vancouver and other cities. This shift away from providing excess residential parking highlights a changing perspective. A reduced minimum parking supply requirement for the subject site would conform with Ontario's current vision for transit corridors.



### 4.3.3 Planning Act

The Planning Act directs municipalities to have regard to matters of provincial interest set out in Section 2 of the Planning Act, including:

- (q) the promotion of development that is designed to be sustainable, to support public transit and to be oriented to pedestrians;
- (s) the mitigation of greenhouse gas emissions and adaptation to a changing climate.

The proposed parking supply will promote sustainable, transit-supportive development and mitigate greenhouse gas emissions. The proposed reduction in the parking supply will support and encourage the use of existing higher-order public transit by discouraging automobile ownership and demand for single-occupant vehicle trips. The proposed reduction to resident parking supply has regard to the matters of Provincial interest.

### 4.3.4 Provincial Policy Statement (2020)

The Provincial Policy Statement (2020) (the “PPS”) contains several policies which promote efficient development and the optimization of land and infrastructure.

Specifically, policy 1.1.1 e) states that healthy, liveable and safe communities are sustained by:

“e) promoting the integration of land use planning, growth management, transit-supportive development, intensification and infrastructure planning to achieve cost-effective development patterns, optimization of transit investments, and standards to minimize land consumption and servicing costs;”

Policy 1.1.3.2 states, “Land use patterns within settlement areas shall be based on densities, and a mix of land uses which:

- a) efficiently use land and resources;
- b) are appropriate for, and efficiently use, the infrastructure and public service facilities which are planned or available, and avoid the need for their unjustified and/or uneconomical expansion;
- c) minimize negative impacts to air quality and climate change, and promote energy efficiency;
- d) prepare for the impacts of a changing climate;



e) support active transportation;

f) are transit-supportive, where transit is planned, exists or may be developed;

Policy 1.1.3.4. states, “Appropriate development standards should be promoted which facilitate intensification, redevelopment and compact form, while avoiding or mitigating risks to public health and safety.”

Policy 1.6.7.2 states, “Efficient use should be made of existing and planned infrastructure, including through the use of transportation demand management strategies, where feasible.”

The proposed reduction in residential parking rates associated with the development is an appropriate development standard to facilitate intensification and transit-supportive development as planned for the area. The proposed parking supply is part of the overall transportation demand management strategy for the Proposed Development to support the use of transit infrastructure.

The proposed reduction to resident parking supply is consistent with the PPS.

#### 4.3.5 Ontario’s Growth Plan

Ontario’s most recent *A Place to Grow – Growth Plan for the Greater Golden Horseshoe* (the ‘Growth Plan’) was published in May 2019, outlining requirements for accommodating growth to 2041. The plan covers many areas and topics, many of which apply to this development.

- ▶ **Transportation and Moving People** – Public transit will prioritize significant transportation investment. Transit growth will focus on increasing the capacity of existing transit systems while also expanding transit services to connect nearby neighbourhoods with urban growth centres and major transit station areas. These goals should increase the modal share of transit and reduce greenhouse gas emissions.
- ▶ **Active Transportation** – To reduce single-occupant vehicle trips and address climate change, municipalities should encourage and include the growth plan guidelines for active transportation networks. These networks provide sidewalks, bicycle lanes, and easy access to surrounding major transit station areas.
- ▶ **Reduce single-passenger vehicle trips** – The Growth Plan calls for municipalities to develop and implement local TDM policies and active transportation strategies to reduce single-



occupant automobile trips. This will aid in shifting trip demand from the automobile to the strengthened multi-modal networks also proposed in the plan to reduce the need for individual automobile ownership.

The policies in the Growth Plan support the Proposed Development intention to reduce reliance on automobiles by encouraging transit use and active transportation through the proposed TDM measures, including a reduced vehicle parking supply.

#### 4.3.6 Halton Region Official Plan

The 2021 Halton Region Official Plan sets the framework for growth and development in the region, including the Town of Oakville. The plan emphasizes the need for sustainable communities and proper intensification in growth areas as the region grows. The plan includes policies and objectives outlined below that encourage safe, convenient, accessible, affordable and efficient transportation systems and support TDM and parking management to achieve these goals.

*Policy 172. (2) states the OP Objective....” To develop a balanced transportation system that:*

- a) reduces dependency on automobile use;*
- b) includes a safe, convenient, accessible, affordable and efficient public transit system that is competitive with the private automobile; and*
- c) promotes active transportation.*

*Policy 172. (4) states the OP objective....” To improve transportation network efficiency through both travel demand management and transportation supply management strategies.”*

*Policy 172. (10) states the OP objective....” To promote land use patterns and densities that foster strong live-work relationships and can be easily and effectively served by public transit and active transportation.”*

The proposed (reduced) parking supply is encouraged by the Official Plan, as it is a TDM measure aimed at lowering single-occupancy automobile use, and the reduced supply acknowledges the walking distance to transit (in this case, the proximity to the Oakville GO Rail Hub within the MTSA) and complementary uses.



### 4.3.7 Livable Oakville – Growth Areas – Mid-Town Oakville

The Mid-Town Oakville District is envisioned as a higher density, transit-supportive, mixed-use area and a strategic location to accommodate population and employment growth. This district will include gateway features, an urban park with pedestrian midblock connections and establish a mix of commercial and residential uses.

Livable Oakville describes the Mid-Town and its attributes as follows...

*" The Oakville GO/VIA Station is the Town's primary hub for current and planned transit and is a major transit station. Rail and bus connections currently service the area and major improvements to the local and inter-regional transit network are planned. In addition to improvements to the local bus network, there will be express commuter rail service and bus rapid transit corridors along Trafalgar Road and Highway 403. The bus rapid transit systems will originate in Midtown Oakville and connect with the broader Greater Toronto and Hamilton Area transportation network."*

Within Livable Oakville, Part E – Growth Areas, Mid-Town Oakville, several relevant policies support the Mid-Town area's intensification and speak directly to the mobility needs and requirements, supporting land-use policies (internalization of trip making) and phasing necessary to fulfill those goals and objectives. These characteristics are consistent with reducing the reliance on the private automobile to support that intensification.

Policy 20.1 states that:

**Goal**

*Midtown Oakville will be a vibrant, transit-supportive, mixed-use urban community and employment area.*

Policy 20.2.1 state that:

**Objectives**

*To create transit-supportive development by:*

*a) ensuring the entire area is developed as a pedestrian-oriented environment focused on access to, and from, transit;*



*b) improving internal road circulation and connections to, and through, Midtown Oakville for public transit, pedestrians, cyclists and vehicles; and,*

*c) promoting a compact urban form with higher density and higher intensity land uses.*

Policy 20.4.1 states that:

**Transportation**

*e) Development shall promote safe, convenient and attractive pedestrian access to transit stops or stations. Barriers, such as boundary fences, shall be discouraged.*

#### **4.3.8 Town of Oakville Zoning Bylaws**

It is worth noting that the Town of Oakville's Zoning Bylaws that govern the provision of vehicular parking recognize, in some instances, various requirements to describe how parking must be provided for land use similar to those proposed within the Proposed Development.

Residential "Apartment – More than four storeys" as set out in the North Oakville Zoning Bylaw 2009-189 Section 5 has a "maximum" parking rate expressed but no minimum parking rate. Similarly, in Zoning Bylaw 2014—014, within Section 5.2.2 Minimum Number of Parking Spaces in Mixed-Use Zones, non-residential uses within the Downtown Oakville area have no minimum requirement.

These Zoning standards recognize that contextual differences across the Town should be incorporated into the development and intensification of lands.

The Mid-Town Oakville area is an excellent example of where parking requirements should support the area's goal and objectives, as the Livable Oakville document is consistent with Provincial and Regional policy. As noted in the TDM section to follow, reduced parking standards are one of the most effective ways to reduce the reliance upon the private automobile and encourage alternative forms of mobility.



### 4.3.9 Urban Mobility and Transportation Strategy Report

The Town of Oakville recently commissioned, received, and endorsed the above-noted transportation strategy. The supporting technical documentation and recommendations noted a series of key “takeaways” throughout the report. As those takeaways relate to the issue of vehicles parking and goals associated with improved alternative mobility choices, the following was noted:

#### **End of Section 2.4 (Existing Planning Guidance)**

“Auto-oriented tall buildings will create the same problems that single-family subdivisions have to date. Oakville must therefore ensure controls on new developments so that their strategic aims are met while still ensuring that livable, walkable communities are being produced.”

#### **Section 3.4 (Goals)**

“To get people out of their cars, Oakville needs to create environments that are pleasant to traverse without one. While this does require improved transportation infrastructure for walking, cycling and transit, the more important element is an improved link between the transportation network and the Town of Oakville’s land use policies, because no matter how wide the sidewalks, few people will choose to walk to or between strip malls and office parks surrounded by a sea of parking.”

#### **End of Section 5.2.5 (Parking)**

“Parking is one of the greatest obstacles to Oakville’s strategic aims. Excessive parking results in spread out urban landscapes where the only practical way to get around is by car. Suburban municipalities often struggle to separate themselves from parking. However, nobody goes to a city because it has great parking. The parking is just a means to an end. By reallocating space away from parking, Oakville can create spaces people actually want to travel to and spend time in, where other modes such as walking, cycling and transit are actually viable. Therefore, Oakville should abolish all parking minimums. If developers believe they can sell properties without parking, they should be allowed to. Frankly, Oakville should want them to, as it forwards the Town’s own strategic aims for modal shift. To that end, parking maximums should be considered. Cars will always be a part of Oakville’s story, and so parking will be too. However, Oakville can utilize new technologies to “right size” their parking and manage demand through other means beyond supply. The parking that does exist should be out of sight, and out of mind.”



The message within the recommended strategy is clear that providing vehicular parking in a “business as usual” way is counter-productive towards achieving the objectives of the Province’s, Region’s and the Town’s Official Plan policies and the functional operating conditions required to support future mobility within Oakville.

#### 4.3.10 Mid-Town Oakville Transportation Context

Mid-Town Oakville is at the nexus of multi-modal transportation within the Town. When combined with the growth potential for the Town, the existing and planned transportation context within and around Mid-Town is highly supportive of and complimentary to reduced parking supply standards.

Substantial Municipal/Regional/Provincial mobility infrastructure investment within Mid-Town is planned. This includes:

- ▶ The Mid-Town EA public street network improvements – substantially improved multi-modal connectivity within and beyond Mid-Town;
- ▶ Regional investments along Trafalgar and Dundas involve BRT corridors establishing foundational network elements of higher-order transit systems. Trafalgar Road is identified as Transit Priority Corridor – from Mid-Town Oakville to Georgetown;
- ▶ At the Provincial scale, Metrolinx has planned investment in Mid-Town, referred to as an Anchor Hub or Mobility Hub. This involves improvements to Regional Express Rail (RER) service / Regional Rail service (All-day 15 minutes two-way service or better), GO Bus service and Integration with Local Oakville Transit and recognizing that Mid-Town is the busiest Transit Hub in the Town of Oakville.

In addition to the investments being made in the Mid-Town area at various levels of government, the proximity of Mid-Town to existing and planned multi-modal infrastructure makes it an exceptional framework to enshrine lower parking standards. The reasons include:

- ▶ Mid-Town’s compact area and supporting (existing and proposed) public street network provides a dense, urban street grid suited for pedestrian and cycling travel modes.
- ▶ This proposed street grid will facilitate intra-Mid-Town mobility and will prioritize non-auto travel within the area;
- ▶ The mixed-use “complete community” within Mid-Town is an excellent basis for intensification, serving the day-to-day needs of residents, employees, visitors, and commuters; and,





- ▶ Internalization /efficiency of trip making is maximized.

Lastly, intensifying the residential population of Mid-Town will increase and encourage non-auto trip making for commuters and internalized O-D trips. Reducing parking supply standards within Mid-Town reinforces the multi-modal nature of Mid-Town. It promotes the mobility outcomes needed to support the Official Plan objectives and functional outcomes associated with intensification. Furthermore:

- ▶ The level of transit service serving trips destined **TO** Mid-Town from elsewhere in the Town of Oakville serves as an excellent “built-in” contra-flow transit capacity for trips **FROM** Mid-Town to other areas of the Town. No additional transit capacity is required to deliver this contra-flow capacity.
- ▶ Existing ‘On-demand’ transit services could be further enhanced given the concentrated “origins” within Mid-Town when paired with “popular destinations” in the Town of Oakville; and,
- ▶ Micro-mobility provides an excellent option to exploit short-travel distances within Mid-Town Oakville.

#### 4.3.11 Review of Recent Municipal Zoning Bylaw Updates

The City of Toronto and Vaughan completed two notable municipal parking review processes (within the past year).

Both cities have refined their policies related to parking provision across their municipalities.

The City of Toronto took the most aggressive step and eliminated vehicle parking for most land uses in most areas of the entire City. A set of “maximums” were instituted, which used to be the minimums” across the various areas of the City. The City of Toronto cited many reasons for their policy shift, many of which had been underlying reasons for urban intensification but had never been institutionalized into the Zoning regime of the City. Environmental, economic, functional, urban design, housing affordability, encouraging transit, walking and cycling were important reasons the parking standards were modified.

Admittedly, the City of Toronto has significantly more transit, cycling and other mobility options; however, the reasons for and rationale behind the parking supply rate reduction within their Zoning Bylaw point to a need to better accommodate developments that can be successfully marketed with the support from a robust set of TDM measures and underlying municipal/regional/provincial non-auto infrastructure.



The other City is the City of Vaughan. Recently, City-wide, Vaughan reduced its parking supply rates and recognized that there are supporting reasons why that was both necessary and desirable.

In the Vaughan Metropolitan Centre (VMC), where the TTC's recent expansion of the Yonge/University/Spadina Subway line now terminates, the area's parking rates were reduced significantly relative to previous standards. Although the new Comprehensive Zoning Bylaw's parking rates for the VMC now reflect 0.4 spaces per residential unit, parking rates below that value are regularly approved by City Transportation staff. The VMC and the surrounding area are being intensified significantly. The nature of the area is planned as a mixed-use centre that is intended to benefit from a "15 minute City" type of built environment, like other urban centres in downtown Toronto. The need to own a private vehicle is not essential from a day-to-day activity perspective. Supporting TDM measures compliment the transit availability and make owning a vehicle in that area non-essential.

The Mid-Town of Oakville has similar designs and visions of providing a mixed-use environment. A key ingredient to the success of that plan is multi-modal mobility support. Initially, that will be augmented through TDM measures offered by the individual developments but will gradually be extended to the critical mass of population and employment, creating origins and destinations that support the array of mobility options required to support the reduced parking requirements. The mobility options are sufficient to support day-to-day activity without owning a private automobile.



#### 4.3.12 Maintain Sales/Leasing Viability with Proposed Parking Rates

Reducing parking rates is an essential measure in trying to reduce the reliance upon the private automobile and to reduce the unnecessary infrastructure that the development must:

- ▶ Build upfront and reflect in both the cost to purchasers and the impact on the environment (the initial carbon footprint of an extensive development is substantial), and,
- ▶ Maintain on an ongoing basis for the life cycle of the building (which includes maintenance, repair, and high municipal taxes) as well as the lasting environmental impacts of a larger parking garage.

It is also important to ensure that the parking supply provided is supportable from a residential sales perspective (that there is a market for the units sold without parking over the long term) and from a commercial leasing/business operations perspective. A parking rate contributing to a poor leasing/sales outcome does not produce a viable development for the long-term condition.

The rates proposed herein have been vetted by the applicant's leasing and sales advisors, and from a business perspective, the proposed parking supply is considered viable. The non-residential rates proposed are in-line with parking rate ranges contemplated within the applicable Zoning Bylaw (2014-014) for the range of Mixed-Use Zones within the Town of Oakville (i.e., greater than "No Minimum" and less than 1.00 space per 35 to 40 square metres of NFA). The proposed non-residential parking rates also consider the scale of the proposed non-residential NFA. A substantial element of the "market" is anticipated to be derived from the Project and future intensification surrounding the Project.



### 4.3.13 Transportation Demand Management Measures

Several TDM measures are being contemplated as part of the development proposal to support a reduced parking supply. While a reduced parking supply is a direct incentive to reduce automobile use and ownership, additional TDM measures are proposed to complement and work with the reduced parking supply. These include:

- ▶ Facilitation of Reduced Car Ownership and Usage;
- ▶ Vehicular Parking Supply and Management;
- ▶ Encourage Transit Use;
- ▶ Encourage and Facilitate Bicycle Use;
- ▶ Enhance Pedestrian Access and Walkability;
- ▶ Land Use and Building Infrastructure; and
- ▶ Coordination, Communication, and Promotion.

Finding the right balance needed to support the Towns' goals is critical, mainly because parking is an expensive resource. Sufficient automobile parking is necessary for the development to be successful. However, too much parking can encourage traffic congestion, limit the ability to meet trip reduction goals, increase project costs, and impact site design and aesthetics.

Research conducted focused on whether or not a relationship exists between the provision of off-street parking and the choice to drive among individuals travelling to or from the site:

- ▶ A New York City study of three boroughs showed a clear relationship between guaranteed vehicular parking at home and a greater tendency to use the automobile for trips to and from work, even when both work and home are well served by transit. The study infers that driving to other non-work activities is also likely higher for households with guaranteed vehicular parking<sup>4</sup>.
- ▶ A study of households within a two-mile radius of ten rail stations in New Jersey was completed. The study concluded that if development near transit stations is developed with a high parking supply, those developments will not reduce automobile use compared to developments located further

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<sup>4</sup> Rachel Weinberger, Death by a thousand curb-cuts: Evidence on the effect of minimum parking requirements on the choice to drive. Transport Policy, 20, March 2012.



away from transit stations. The parking supply can undermine the incentive to use transit that proximity to transit provides<sup>5</sup>.

- ▶ A study of nine cities across the United States examined whether citywide changes in vehicular parking cause automobile use to increase or whether minimum parking requirements are an appropriate response to the already rising automobile use. The study concluded that: “parking provision in cities is a likely cause of increased driving among residents and employees in those places.”<sup>6</sup>

Based on recent research, a reduced Parking Supply is one of the most effective TDM measures available to minimize vehicle travel<sup>7</sup>. This research found that reductions in off-street vehicular parking for office, residential, and retail developments reduce the overall automobile mode share associated with those developments relative to projects with the same land uses in similar contexts that provide more off-street vehicular parking. In other words, more off-street vehicular parking is linked to more driving, and people without dedicated parking spaces are less likely to drive.

If free and unregulated parking is provided, there is little incentive for many residents and visitors to use alternative modes of transportation. Free and abundant parking encourages people to drive alone rather than car or vanpool, drop off or pick up, walk, cycle, or take transit. Excessive free parking for the user places a significant disadvantage on sustainable modes.

As the development promotes using other modes of transportation through limited on-site parking to meet the projected demand, the development plays a significant role in setting an example for residents and visitors to consider non-automotive travel.

These TDM measures are more detailed in **Chapter 5.0**, Transportation Demand Management (TDM).

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<sup>5</sup> Daniel Chatman, Does Transit-Oriented Development Need the Transit? Access, Fall 2015.

<sup>6</sup> Chris McCahill, et al., Effects of Parking Provision on Automobile Use in Cities: Inferring Causality, Transportation Research Board, November 13, 2015.

<sup>7</sup> Transportation Demand Management Technical Justification, City and County of San Francisco, June 2018.



### 4.3.14 Overall Vehicular Parking Supply Conclusions

Adoption of reduced minimum resident and non-residential parking supply standards is appropriate based on the following considerations:

- ▶ The proposed parking reduction is consistent with Provincial, Regional & Local Mobility and Parking Policy;
- ▶ The parking supply strategy is in conformance with Ontario's current vision for transit nodes;
- ▶ The area transportation context and proposed TDM framework supports multi-modal travel;
  - The provision of an enhanced TDM plan was determined as a proactive method of reducing the proposed resident parking supply; and,
- ▶ The parking supply reduction significantly reduces the cost of construction of the project, which can improve the initial proposed housing along with ongoing life-cycle maintenance and property tax costs, further enhancing the affordability of the project for the residents in the long-term and,

The proposed reduction in parking supply has regard to matters of Provincial interest; they are consistent with the Provincial Policy Statement. They conform with the Growth Plan, the Region of Halton Official Plan, and the Livable Oakville Plan Mid-Town Oakville provisions.

While a reduction to the minimum resident and commercial parking requirements under Zoning By-Law 2014-014 is proposed, the resulting vehicular parking supply will meet the development's needs regarding the existing /planned transit infrastructure in the immediate area, including higher-order transit.

A resident parking supply ratio of 0.50 parking spaces per residential unit and office and retail and daycare parking rates of 1.08 parking spaces per 100 m<sup>2</sup> is considered appropriate.

## 4.4 Loading Supply Review

### 4.4.1 Loading Supply / Facilities Requirements

The prevailing (Zoning By-law-2014-014) loading standard for the proposed development does not require loading spaces. However, given the proposed uses for the site, it is suggested to provide six (6) loading spaces, and one (1) refuse compactor across the three buildings within the Project.



#### 4.4.2 Loading Supply / Servicing Arrangements

The Tower 1 building will contain two at-grade loading spaces configured as follows:

- ▶ Refuse Collection loading space capable of accommodating an overhead front loading refuse collection vehicle or a large Single Unit delivery vehicle for the non-residential floor space;
- ▶ A second full-sized loading space can accommodate a large single-unit delivery vehicle that can accommodate full-sized commercial delivery vehicles or household moving vehicles.

The combination of these two loading spaces would adequately serve the entire development's residential waste pick-up and non-residential requirements.

The loading area will serve as the consolidated garbage pick-up location for all three Towers and has the requisite internal manoeuvring area and refuse bin staging area. The entry into the loading area would be equipped with a signalling and signage system to ensure that when loading vehicles are manoeuvring into or out of the loading area, vehicles entering or exiting the parking garage and using the driveway in the vicinity of the loading area would be aware of the potential for truck manoeuvring occurring.

The underground parking garage will contain three loading spaces configured as follows:

- ▶ Small delivery vehicles that can accommodate small commercial deliveries or household moving vehicles.

These loading spaces would mainly serve all three towers' moving in and out operations and deliveries to the residential units. Access to these loading spaces would occur solely from the north driveway off of South Service Road East.

#### 4.4.3 Operations and Manoeuvring

The proposed access and driveway configuration associated with the three Towers within the Project, combined with the loading area layouts, can appropriately accommodate forward in and forward out manoeuvring for each loading area.

Vehicular manoeuvring diagrams (VMD's) have been developed, which demonstrate the ability of service and delivery vehicles to manoeuvre within the site when entering/exiting the loading area. The design vehicles used in assessing the configuration of the proposed loading



space are the Halton Region front-loading overhead refuse collection vehicle, single unit truck (TAC SU), and a heavy single unit truck (TAC HSU). Each vehicle enters and leaves the site via the site driveways in a forward motion.

Functional Drawings (illustrating the below-grade and at-grade functional design characteristics) are shown in drawings SPR-01 through SPR-06 and contained in **Appendix D**. Vehicular Manoeuvring Diagrams (VMD's) illustrating the service vehicle manoeuvring characteristics across the various loading areas are illustrated in drawings VMD-01 through VMD-08 and are found in **Appendix D**. These vehicular manoeuvring diagrams confirm that the proposed loading arrangements are appropriate and will facilitate the manoeuvring requirements of the vehicles that are expected to access the site.

It should be noted that during the interim Project conditions (i.e., prior to the adjacent property to the east of the Site), the Site will be accessed via an interim version of the future Public Street on the east side of the Site. This interim private version of the street extends south from the existing South Service Road East ROW and terminates at the southern limit of the Site property. In due course, as land from adjacent properties are acquired by the Town of Oakville, the future Local public street on the east side of the Site will be implemented, and Local public roads will provide access from multiple directions to the Site. VMD-08 illustrates that a small delivery vehicle can manoeuvre at the south end of the interim private street and make a U-Turn to exit back to South Service Road East.

#### 4.4.4 Height Clearances

A minimum height clearance of 4.5 metres is maintained throughout the entire loading area, and 6.1 metres for the loading space satisfying the minimum practical height clearance requirements associated with front-loading overhead refuse collection vehicles.

A minimum height clearance of 4.0 metres is maintained throughout the P1 level of the underground garage to accommodate smaller loading vehicles that will serve to move in / moving out operations.

#### 4.4.5 Loading Summary

The proposed development incorporates a total of 5 loading spaces. The proposed loading arrangements are functionally and operationally appropriate and will facilitate the loading/unloading, moving, delivery and refuse collection needs of the proposed development under interim and ultimate area conditions.





## 4.6 Bicycle Parking Supply Review

### 4.6.1 Zoning Bylaw Bicycle Requirements

Applying the bicycle parking standards outlined in the underlying Town of Oakville Zoning By-law 2014-014 requires a minimum of 1,613 bicycle parking spaces (1,211 long-term and 402 short-term bicycle parking spaces). A detailed summary of these requirements is provided in **Table 4.2**.

**TABLE 4.2: ZONING BY-LAW BICYCLE PARKING REQUIREMENTS**

Use		Units/IFA	Minimum Parking Rate <sup>1</sup>	Minimum Parking Required <sup>2</sup>
Residential	Long-term	1,606 units	0.75 sps / unit	1,205 spaces
	Short-Term		0.25 sps / unit	402 spaces
	<b>Sub-Total</b>	<b>1,606 units</b>	<b>-</b>	<b>1,607 spaces</b>
Non-Residential	Retail Long-term	2,014 m <sup>2</sup>	Greater of 2 or 1 sps / 1000 m <sup>2</sup>	2 spaces
	Office Long Term	3,891 m <sup>2</sup>	Greater of 2 or 1 sps / 1000 m <sup>2</sup>	4 spaces
	<b>Sub-Total</b>	<b>-</b>	<b>--</b>	<b>6 spaces</b>
<b>Long-Term</b>				<b>1,211 spaces</b>
<b>Short-Term</b>				<b>402 spaces</b>
<b>Total</b>				<b>1,613 spaces</b>

Notes:

<sup>1</sup> Based upon site statistics provided by Sweeney Architects dated May 30, 2022.

<sup>2</sup> Bicycle Parking Rates based upon Zoning By-law 2014-014 which also specifies that if the calculation of the number of required bicycle parking spaces results in a number with a fraction greater than 0.25, the number is rounded up to the nearest whole number



#### **4.6.2 Bicycle Parking Supply and Facilities**

A total of 1,613 bicycle parking spaces are proposed across the Project on the mezzanine and P1 levels. This includes 1,205 resident long-term bike parking spaces, 402 residential visitor short-term bike parking spaces and six long-term bike parking spaces for the retail and office components of the development. This meets the zoning bylaw requirements of the Site. Again, access to the project's bicycle parking facilities is via elevator access adjacent to the bike storage rooms, a short distance from the elevator access, or via stairwells equipped with bike rails. Cyclists could also ride down the vehicular ramps to access the underground bicycle parking spaces.

#### **4.6.3 Bicycle Parking Summary**

The proposed bicycle parking supply of 1,613 bicycle parking spaces is considered appropriate and will accommodate the bicycle parking demands of the proposed development.



## 5 Transportation Demand Management

The Town of Oakville is actively engaging the development community to integrate Travel Demand Management (TDM) in all current and future development applications. A TDM Study aims to outline a straightforward process for selecting and implementing TDM measures.

### 5.1 Area Opportunities

#### 5.1.1 Pedestrians

This area in the Town of Oakville is primarily commercial and in proximity to the Oakville GO Station; therefore, pedestrian facilities are limited to the sidewalk network along the east side of Lyons Lane. Directly to the west of the subject property, a pedestrian path leads under the Queen Elizabeth Way/Highway 403 to enable pedestrians to safely cross the highway to the residential area to the north. There are no pedestrian facilities along South Service Road.

The site is within walking distance of numerous significant retail and transportation opportunities providing a range of destinations for prospective residents of the proposed building that can be readily accessed without using a car.

Existing pedestrian sidewalks are provided on a least one side of streets throughout most of the study area. Crosswalks, pedestrian pushbuttons, and indicators are provided for all approaches at the signalized intersections within the study area. These facilities will help foster and promote walking trips to/from the development.

Furthermore, MOEA identified additional future links for pedestrians and cyclists are recommended by two grade-separated, active transportation crossings of the QEW. The crossing proposed on the west side of Trafalgar Road is located approximately 200 metres from the proposed development. This crossing will encourage the development and general area residents to explore active transportation mode choices and improve access to transit, area retail, and employment opportunities.

#### 5.1.2 Cycling

On-road cycling lanes are not currently provided on the streets in the study area. However, as cyclists are permitted to ride on most roads except controlled-access highways, the lack of a separate bicycle lane will not prohibit this type of travel, particularly for this development.



Reviewing the Town of Oakville's Active Transportation Master Plan (ATPM) document for cycling network plans and existing facilities within the proposed development indicates that there are currently no cycling facilities. However, within the ATMP, on-street bike lanes are proposed along Lyons Lane and are proposed to be completed in the Long-Term Phase (11-20+ years), and Cross Avenue to be completed in 2020.

### **5.1.3 Oakville Transit**

Oakville Transit owns and operates the public transit system in Oakville. The subject site is located within the Midtown Oakville Urban Growth Area, the most transit-accessible location within the Town. The subject site is approximately 150 metres from the Oakville GO Station, currently serviced by 16 out of 22 Oakville Transit Routes. Most of the transit routes which provide access to all of the Town of Oakville operate seven days a week from early morning to late evening, with headways generally between 10 and 30 minutes depending on the day of week and time of day.

The Trafalgar Road Class EA recommended that the curb lane of Trafalgar Road be converted to a high occupancy vehicle (HOV) or bus rapid transit (BRT) lane. With a BRT line along Trafalgar Road, ridership in the service area typically increases by 50%. This future transit line provides a further incentive for residents of the development to choose transit as a primary commuting option.

### **5.1.4 GO Inter-Regional Transit**

The proposed development is located approximately 150 metres from the Oakville GO Station. This station is located along the Lakeshore West Line, which currently operates a two-way all-day train service seven days a week plus GO Bus connections to Hamilton, Sheridan College and York University via Highway 407.

Future GO Rail service along the Lakeshore West corridor will be improved to two-way, All-day service with 15-minute service or better. This level of service will facilitate increased flexibility and reliability relative to the GO Transit network of services and destinations throughout the Lakeshore West (and East) service corridors.

### **5.1.5 Ride-Hailing & Car Services**

Ride-hailing car services in the Town of Oakville include Oakville Taxi, Oakville United Taxi, A1 Oakville Taxi, Halton Taxi Svc, Blue Line Taxi, Oakville Para-transit and Uber/Lyft. These services offer on-demand private car services. Their increasing share of the mobility markets offers added flexibility and reliability to residents, visitors, and



employees and supports travel opportunities other than the private automobile.

## 5.2 Mobility Choice Travel Plan

The Mobility Choice Travel Plan is proposed to guide the provision of viable alternative personal transportation options beyond the single-occupant, private automobile. This plan intends to support the development plan by outlining TDM measures and the suite of strategies to promote more active and sustainable transportation modes, respond to the mobility needs of residents, employees, and patrons to the site, and reduce dependence on the private automobile.

Four (4) specific objectives define the policy framework for the Mobility Choice Travel Plan:

- ▶ Encourage the use of alternate travel modes (transit, cycling, walking);
- ▶ Increase vehicle occupancy;
- ▶ Shift travel to off-peak periods; and
- ▶ Reduce vehicle kilometres travelled.

A comprehensive framework has been developed that will serve as a guideline for implementing effective TDM strategies during the site design stage and its operations following the complete redevelopment of the property.

## 5.3 Organizational Framework

The four (4) broader objectives can be organized within the following categories:

- ▶ Facilitation of Reduced Car Ownership and Usage;
- ▶ Vehicular Parking Supply and Management;
- ▶ Encourage Transit Use;
- ▶ Encourage and Facilitate Bicycle Use;
- ▶ Enhance Pedestrian Access and Walkability;
- ▶ Land Use and Building Infrastructure; and
- ▶ Coordination, Communication, and Promotion

Within each of the seven (7) categories, interventions considered for application may be further organized by the buildings of their implementation as the development progresses:



- ▶ **Infrastructure** (external links and facilities): Measures to improve the active transportation realm along the site's boundaries and to facilitate the integration of pedestrian, cycling and transit infrastructure Facilities and features of the site plan and design. Physical aspects of the internal layout of the development, including its buildings, open spaces and circulation routings to promote alternative transportation modes
- ▶ **Building operations/property management:** User-focused programs & policies enacted once the site is operational to encourage alternative transportation modes
- ▶ **Monitoring:** Post-occupancy data collection programs are used to assess travel patterns and gauge the effectiveness of TDM strategies and the Mobility Choice Travel Plan.

## 5.4 Mobility Plan Strategies

While substantial opportunities exist in the area's infrastructure to accommodate sustainable transportation practices, the ability to fully leverage these opportunities ensures the success of the Mobility Plan strategies. To this end, Mobility Plan strategies are presented with targeted "intents" (i.e. what it is trying to achieve and for whom), accompanied by implementation methods. Potential strategies or measures are framed in the development context, and the most appropriate approach for application is proposed.

A summary of the mobility travel plan (MTP) strategy is outlined in **Tables 5.1 – 5.3**. These TDM strategies will be refined throughout the future Site Plan Approval application process.



**TABLE 5.1: POTENTIAL MTP – REDUCE SINGLE-OCCUPANT VEHICLES**



Vehicle parking supply & management	Intent	Possible Measures	Development Plan Measures
	<p>Reduce the attractiveness of private vehicle use for residents, employees and visitors</p> <p>Reduce car ownership needs</p> <p>Encourage higher vehicle occupancy</p> <p>Encourage the use of other travel modes</p>	<p><b>Building, Planning &amp; Design</b></p> <p>Establish appropriate minimum parking supply standards for the proposed land uses and buildings that may be reduced to compare to the existing Zoning By-law</p> <p>Provide reduced retail, office and day care parking to maximize the efficient use of the supply</p> <p>Ensure that leasing opportunities associated with the parking supply are not compromised.</p> <p><b>Operational / Management</b></p> <p>Operate the majority of the site parking supply as paid parking for non-residents</p> <p>Offer parking to building residents “unbundled” from unit purchase</p> <p>Adjust parking fee structure, operations and parking allocations to support non-automobile usage goals and to accommodate changing parking needs</p> <p>To the extent possible, adopt a shared parking operations management that make most efficient use of on-site parking supply and temporal parking patterns.</p>	<p>The proposed parking supply for the site is provided at a reduced rate of 0.5 parking spaces / residential unit unbundled from the purchase of a residential unit.</p> <p>The visitor parking supply - 0.20 spaces per unit and</p> <p>Office and Retail parking - 1.08 parking spaces / 100 m2 of NFA.</p> <p>Ensure leasing is not compromised</p> <p>Explore ways to “share” resident visitor parking with Day Care/office /retail parking demands.</p>
Facilitation of reduced car ownership & usage	<p>Reduce the need for residents and employees to own a car for occasional travel</p> <p>Reduce the likelihood of privately-owned car use for general travel, particularly during peak periods</p>	<p><b>Operational / Management</b></p> <p>Operate a car-share program on-Site that members can access “on demand”</p> <p>Consider membership in the local SmartCommute transportation management association to facilitate economical delivery and area wide TDM measures such as a carpool / ride-matching and guaranteed ride home programme for residents and employees.</p> <p>Coordination with building employers to offer flexible work hours and compressed work week opportunities for staff</p> <p>Provide information and communication items that outline the availability of the on-Site services as well as broader taxi and ridesharing services</p> <p>Provide incentive programs design to encourage the use of on-Site services including corporate or private membership to car-share / car-pool services</p> <p><b>Monitoring</b></p> <p>Monitor car-share program membership and usage, and adjust car deployment to respond to demands</p> <p>Monitor carpool and ride-matching programs, and adjust to suit needs of residents, employees and visitors</p>	<p>Explore membership in the local SmartCommute transportation management association to deliver efficient TDM programme elements.</p> <p>Explore the provisions of between 5 to 10 car share vehicles on-site through a Car-Share provider.</p> <p>Consider offering Car-Share Memberships to all new unit purchasers for a 2 year period.</p> <p>Provide an “information package” to be distributed to new unit purchasers and resale purchasers on mobility options in the area.</p>



**TABLE 5.2: POTENTIAL MTP – TRANSIT, CYCLING AND WALKING**



	Intent	Possible Measures	Development Plan Measures
Encourage transit use	<p>Increase awareness and viability of transit travel options for commuter and recreational travel purposes</p> <p>Capitalize on the improving transit context</p> <p>Support the use of transit</p> <p>Capitalize on the improving transit context</p> <p>Support the use of transit</p>	<p><b>Building, Planning &amp; Design</b></p> <p>Provide accessible and high-quality pedestrian connections towards transit from the site</p> <p>Provide facilities that support transit passenger travel including weather protection and amenities along key travel paths within the site</p> <p>Provide facilities that support transit passenger travel including weather protection and amenities along key travel paths within the site</p> <p>Facilitation of accessible transit services</p> <p><b>Operational / Management</b></p> <p>Provide transit service information for Site users</p> <p>Offer transit promotion programmes</p> <p>Consider involving On-Demand transit service to link the Mid-Town or other key destinations / origins in the Town.</p>	<p>Short walk (350m+/-) to existing Oakville GO Rail Transit Hub.</p> <p>Provide enhanced pedestrian connections to the abutting public streets;</p> <p>Provide transit service information on-site</p> <p>Site design measures that enhance pedestrian comfort.</p>
Encourage bicycle use	<p>Provide physical and operational infrastructure on-Site</p> <p>Cooperate with the Town to enhance bicycle connectivity within the area to the broader network</p>	<p><b>External Infrastructure</b></p> <p>Work with the Town to improve existing facilities and provide new connections in the site area</p> <p><b>Building, Planning &amp; Design</b></p> <p>Provide secure long-term bicycle parking in convenient and accessible locations</p> <p>Provide short-term bicycle parking distributed across the site in accessible locations</p> <p>Meet or exceed the minimum requirements of the Town of Oakville</p> <p>Provide shower and change facilities within office buildings for staff and visitor use</p> <p><b>Operational / Management</b></p> <p>Consider private bike share stations within the site at convenient locations or work with the Town to facilitate public stations</p> <p>Encourage an on-Site bicycle repair / maintenance centre</p>	<p>Proposed bicycle parking supply meets the Town standards</p> <p>Consider providing two private bike share stations supporting 25 bicycles total for residents</p> <p>Providing a bike repair station and cleaning station on-site to support bicycle use.</p>
Enhance access & walkability	<p>Enhance the walkability of the site at-grade and create a pedestrian-scaled neighbourhood</p> <p>Assist in creating high-quality, safe pedestrian linkages to the site and wider network</p> <p>Improve the quality of the public realm and accessibility of the area</p> <p>Enhance ability to travel to transit focal points without a vehicle</p>	<p><b>External Infrastructure</b></p> <p>Work with the Town towards realizing improvements to area pedestrian infrastructure quality of the public realm and the convenience of pedestrian linkages / road crossings along the site boundaries and in the site area</p> <p><b>Building, Planning &amp; Design</b></p> <p>Provide high-quality, safe pedestrian-scale connections from the site property to the surrounding public street network</p> <p>Facilitate convenient building access and connectivity</p> <p>Provide accessible and universal connectivity throughout the site, meeting appropriate accessibility codes and guidelines</p> <p><b>Operational / Management</b></p> <p>Maintain on-Site pedestrian facilities to enable year-round pedestrian access and usage</p>	<p>Pedestrian access to the new residential, office and retail uses are provided along the existing and future public streets surrounding the Site</p> <p>Loading and parking operations will be conducted within the site so as not to conflict with pedestrian movement</p>





**TABLE 5.3: POTENTIAL MTP – LAND USE & COMMUNICATION**



	Intent	Possible Measures	Development Plan Measures
<b>Land use &amp; building infrastructure</b>	<p>Offer a variety of residential and non-residential uses on-Site</p> <p>Reduce the need for residents, employees and visitors to travel off-Site to address daily needs</p> <p>Shorten travel distances</p> <p>Support residents that work from home</p>	<p><b>Building, Planning &amp; Design</b></p> <p>Provide for a range of employment, retail and residential uses within the proposed buildings</p> <p>Provide for support services and amenities within the site</p> <p>Provide technology and communications support infrastructure and facilities within the residential buildings that support telecommuting and other work from home practices</p>	<p>The proposed development offers a variety of uses that allow people to live and work on the site, reducing the number of vehicles trips generated from the site</p>
<b>Coordination, communication &amp; promotion</b>	<p>Inform and raise awareness of non-automobile travel options for the site</p> <p>Actively promote non-automobile travel options and services</p> <p>Introduce, develop and coordinate TDM programs / initiatives with the employment tenants within the context of the broader strategies in place</p> <p>Ability to adapt the strategy based on changing demand and special circumstances as they may arise</p>	<p><b>Operational / Management</b></p> <p>Consider membership in the local SmartCommute organization to play the role of a TDM Coordinator Office that supports activities and advances TDM strategies, programs and implementation protocols for the site</p> <p>Establish a consultative framework to liaise and empower building tenants, businesses and residents to engage in dialogue with the Town, transit providers, and other service providers to advance the needs of the development and surrounding area</p> <p>Use of wayfinding and multi-modal navigation tools to augment the TDM services provided on-Site</p> <p>The active marketing, branding and promotion of non-automobile travel options (i.e. fairs, events and other incentive programs)</p> <p><b>Monitoring</b></p> <p>Monitor the success of programming by the TDM Coordinator Office</p> <p>Measure the site's modal split over time to examine the effectiveness of TDM interventions</p> <p>Refine programming on an ongoing and coordinated basis</p>	<p>Consider membership in the local SmartCommute organization</p> <p>Scheduled days to promote the existing transit services and active transportation facilities on-Site and in proximity to the site will be completed to inform residents and retail workers.</p> <p>The use of sustainable transportation modes will be supported and promoted by building management and operations</p> <p>Yearly evaluations of the TDM provisions</p>



## **5.5 Site Specific Monitoring**

### **5.5.1 Walking Infrastructure Monitoring**

It is recommended that the site operator monitor the long-term desired lines created by the erosion caused by pedestrians crossing the site's landscaped areas. Should desire lines form, there may be an opportunity to adjust the site's landscaping to encourage the use of the designated on-site pedestrian sidewalks.

### **5.5.2 Cycling Infrastructure Monitoring**

It is recommended that the site operator monitor the on-site bicycle storage usage and the need for parking spaces to ensure demand matches supply. An indicator to suggest that the site's bicycle parking demand exceeds supply is observing bicycles locked to the street furniture on-site or immediately adjacent to the subject site.

Should the site's bicycle parking demand regularly exceed the supply, consideration should be given to expanding the amount of on-site bicycle parking.



## 6 Development Concept Travel Forecasts

The development proposal for the site envisions a large-scale development of three towers with proposed heights of 50, 58, and 44 storeys, with Towers 2 and 3 on top of a mutual podium. The development proposes approximately 2,014 m<sup>2</sup> (21,676 sq.ft.) of rentable retail space, 3,891 m<sup>2</sup> (41,882 sq.ft.) office space, and 1,606 residential units with 1,191 parking spaces and 1,613 bicycle parking spaces. Vehicle access will be provided through two driveway connections: South Service Road East (North Access) and a new north-south local road (East Access) connecting South Service Road East to Cross Avenue.

It is assumed that the site will be developed in two phases:

- ▶ Phase 1 will open in 2027 and will include Tower 1, while
- ▶ Phase 2 will open in 2032 and consist of Towers 2 and 3.

It is also assumed the North Access will be the only access until 2037, when the new north-south local road is assumed to be constructed.

**Table 6.1** summarizes the development land uses for each tower.

**TABLE 6.1: DEVELOPMENT LAND USES**

Tower	Units	Office (m <sup>2</sup> )	Retail (m <sup>2</sup> )
1	484	3,891	602
2 + 3	1,122	--	1,412
<b>Total</b>	<b>1,606</b>	<b>3,891</b>	<b>2,014</b>



## 6.1 Development Trip Generation

The following land use codes from the Institute of Transportation Engineers (ITE) Trip Generation 11<sup>th</sup> Edition<sup>8</sup> were used to estimate the weekday AM and PM peak hour traffic volumes that the Development will generate:

- ▶ Multifamily Housing (High-Rise) (LUC 222);
- ▶ General Office (LUC 710); and
- ▶ Shopping Centre (LUC 822).

Data for the peak hour of adjacent street traffic were used to estimate trip generation. The resulting summation is the "raw" trip generation – unadjusted for modal split credits. The effects of these other factors on the actual net new trip generation on the local roadway system are discussed in detail in the following sections.

The trip generation rates used for the Multifamily Housing trips are for urban, multi-use developments nearby rail transit. The trip generation rates consider lower auto mode shares typically seen in these high-density, multi-modal areas. Additionally, through previous development applications within the study area, the MTO has previously advised that mode share should not be considered to provide a conservative approach. As such, no mode share reductions were applied to the trip generation.

### 6.1.1 Internal Capture

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

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

The ITE Trip Generation Handbook has been utilized to account for the development's internal trips. By way of example, some portion of the traffic destined to and from the retail uses located within site will likely

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<sup>8</sup> Trip Generation Manual 10th Edition + Supplement Institute of Transportation Engineers Washington DC 2020



originate from the on-site residential units, requiring only a walking trip. The detailed calculations are provided in **Appendix E**.

ITE data suggests an internal capture rate of 4% - 16% for the respective peak hours.

### **6.1.2 Net Trip Generations Estimates**

**Tables 6.2 and 6.3** summarize the projected trip generation associated with the build-out of the development. As noted earlier, these estimates were based on the standardized ITE rates with internal credits.

The estimated trip generation for the Development indicates that 448 new trips are forecasted to be generated during the AM peak hour and 433 new trips during the PM peak hour.



**TABLE 6.2: TRIP GENERATION – PHASE 1**

ITE Land Use Code / Number of Units	Trips	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Sum	Rate	In	Out	Sum
222 - Multifamily Housing (High-Rise) 484 Units	Total	0.22	12	95	<b>107</b>	0.19	63	29	<b>92</b>
	Internal	2%	0	2	<b>2</b>	10%	6	3	<b>9</b>
	New	<b>98%</b>	<b>12</b>	<b>93</b>	<b>105</b>	<b>90%</b>	<b>57</b>	<b>26</b>	<b>83</b>
710 - General Office 41,883 sq.ft	Total	1.52	56	8	<b>64</b>	1.44	10	50	<b>60</b>
	Internal	9%	4	2	<b>6</b>	20%	5	7	<b>12</b>
	New	<b>91%</b>	<b>52</b>	<b>6</b>	<b>58</b>	<b>80%</b>	<b>5</b>	<b>43</b>	<b>48</b>
822 - Shopping Centre 6,484 sq.ft	Total	2.36	9	6	<b>15</b>	6.59	22	22	<b>44</b>
	Internal	13%	1	1	<b>2</b>	23%	4	6	<b>10</b>
	New	--	<b>8</b>	<b>5</b>	<b>13</b>	--	<b>18</b>	<b>16</b>	<b>34</b>
<b>Total</b>	<b>Total</b>	--	<b>77</b>	<b>109</b>	<b>186</b>	--	<b>95</b>	<b>101</b>	<b>196</b>
	<b>Internal</b>	5%	<b>5</b>	<b>5</b>	<b>10</b>	16%	<b>15</b>	<b>16</b>	<b>31</b>
	<b>New</b>	--	<b>72</b>	<b>104</b>	<b>176</b>	--	<b>80</b>	<b>85</b>	<b>165</b>

**Equations**

LUC 222 Rate per Unit AM: 0.22 | PM: 0.19

LUC 710 Rate per 1,000 sq.ft. AM: 1.52 | PM: 1.44

LUC 822 Rate per 1,000 sq.ft GFA AM: 2.36 | PM: 6.59

**TABLE 6.3 TRIP GENERATION – FULL BUILD-OUT**

ITE Land Use Code / Number of Units	Trips	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Sum	Rate	In	Out	Sum
222 - Multifamily Housing (High-Rise) 1,606 Units	Total	0.22	39	314	<b>353</b>	0.19	210	95	<b>305</b>
	Internal	2%	1	5	<b>6</b>	10%	20	11	<b>31</b>
	New	<b>98%</b>	<b>38</b>	<b>309</b>	<b>347</b>	<b>90%</b>	<b>190</b>	<b>84</b>	<b>274</b>
710 - General Office 41,883 sq.ft	Total	1.52	56	8	<b>64</b>	1.44	10	50	<b>60</b>
	Internal	9%	4	2	<b>6</b>	20%	5	7	<b>12</b>
	New	<b>91%</b>	<b>52</b>	<b>6</b>	<b>58</b>	<b>80%</b>	<b>5</b>	<b>43</b>	<b>48</b>
822 - Shopping Centre 21,616 sq.ft	Total	2.36	31	20	<b>51</b>	6.59	72	72	<b>144</b>
	Internal	16%	5	3	<b>8</b>	23%	13	20	<b>33</b>
	New	--	<b>26</b>	<b>17</b>	<b>43</b>	--	<b>59</b>	<b>52</b>	<b>111</b>
<b>Total</b>	<b>Total</b>	--	<b>126</b>	<b>342</b>	<b>468</b>	--	<b>292</b>	<b>217</b>	<b>509</b>
	<b>Internal</b>	4%	<b>10</b>	<b>10</b>	<b>20</b>	15%	<b>38</b>	<b>38</b>	<b>76</b>
	<b>New</b>	--	<b>116</b>	<b>332</b>	<b>448</b>	--	<b>254</b>	<b>179</b>	<b>433</b>

**Equations**

LUC 222 Rate per Unit AM: 0.22 | PM: 0.19

LUC 710 Rate per 1,000 sq.ft. AM: 1.52 | PM: 1.44

LUC 822 Rate per 1,000 sq.ft GFA AM: 2.36 | PM: 6.59



### 6.1.3 Trip Distribution and Assignment

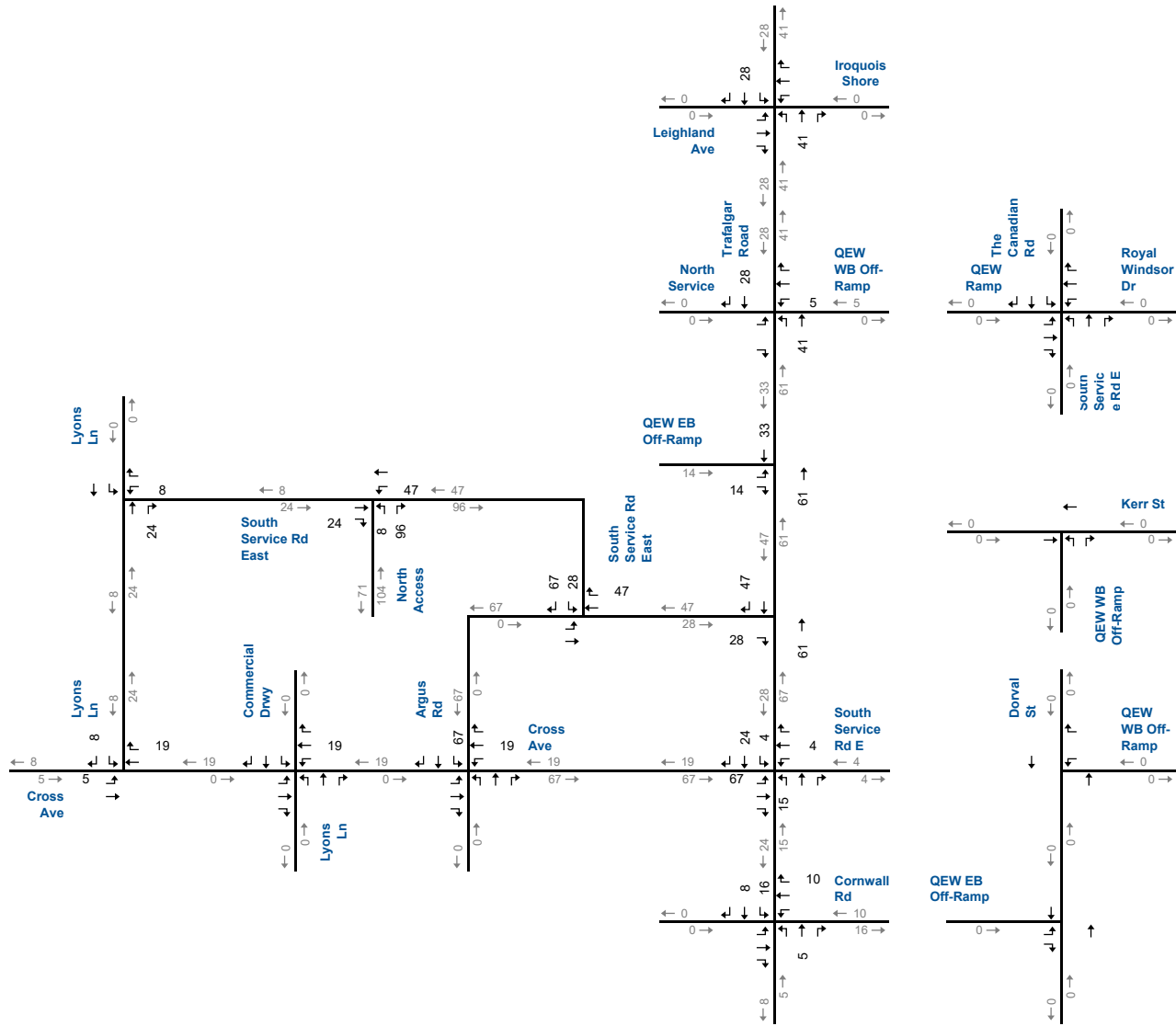
The area lends itself to commuter travel patterns, similar to what the development would exhibit. The site-generated trips were assigned to the road network based on the existing distribution of traffic at the study area intersections. The distribution is summarized in **Table 6.4**.

**Figures 6.1 and 6.2** display the resulting Phase 1 and Full Build-Out AM and PM peak hour total trip assignments.

**TABLE 6.4: TRIP DISTRIBUTION**

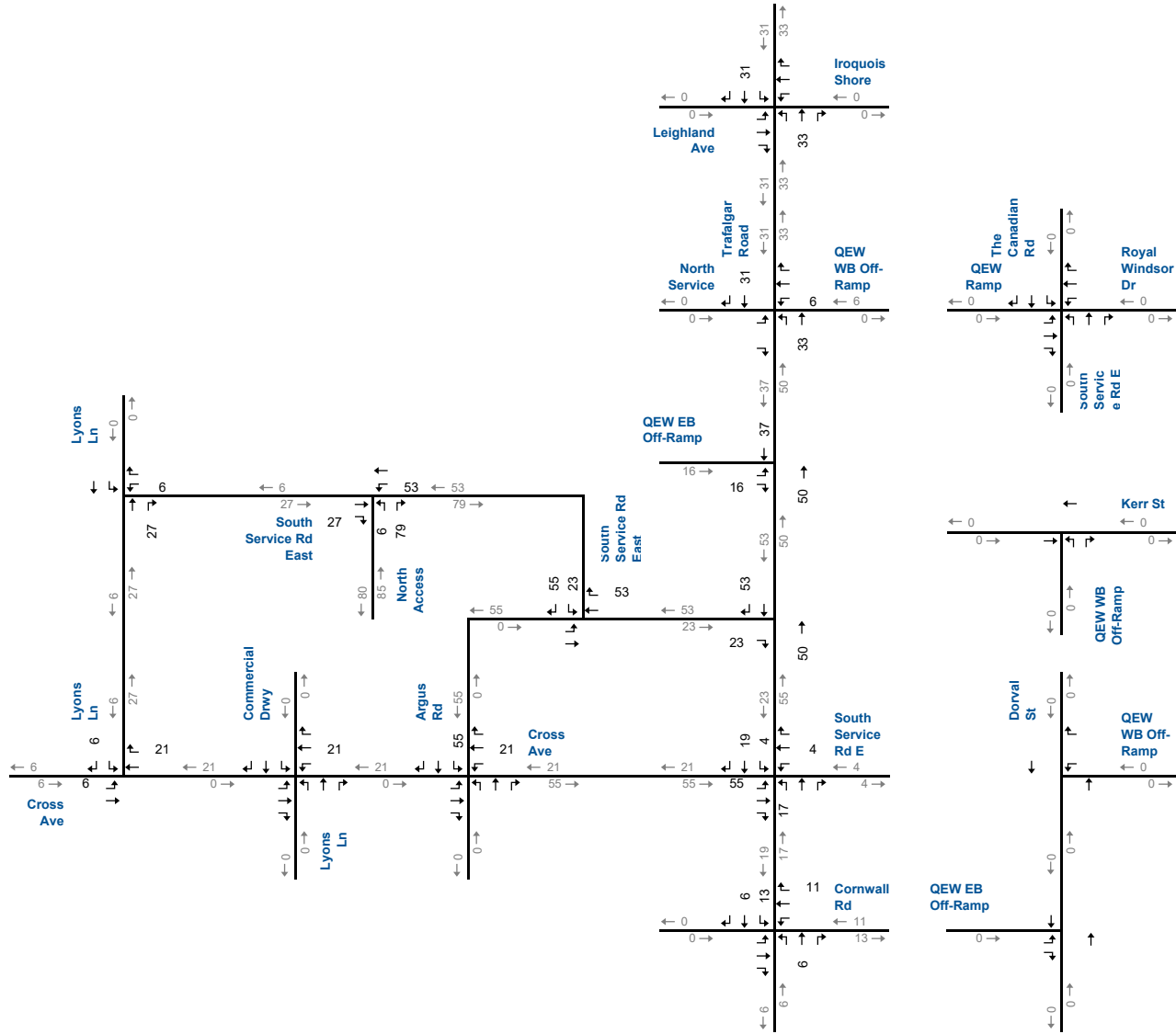
Direction	Route	AM Peak Hour	PM Peak Hour
North	Trafalgar Road	39%	38%
South	Trafalgar Road	22%	24%
East	QEW	8%	9%
	South Service Road	5%	5%
West	QEW	23%	19%
	Cross Avenue	4%	5%
<b>Total</b>		<b>100%</b>	<b>100%</b>





## Site Generated Traffic Volumes Phase 1 - AM Peak Hour



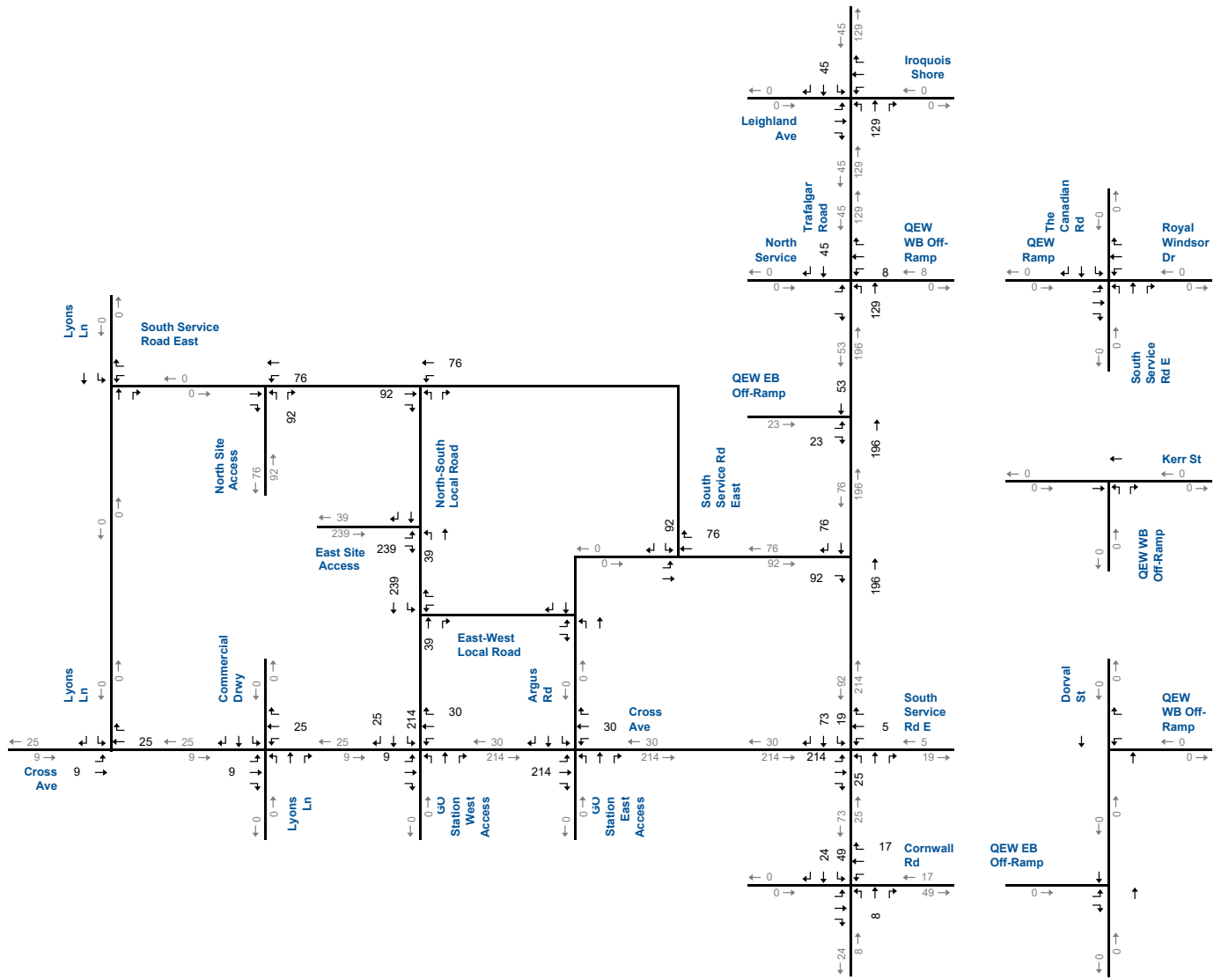


## Site Generated Traffic Volumes Phase 1 - PM Peak Hour

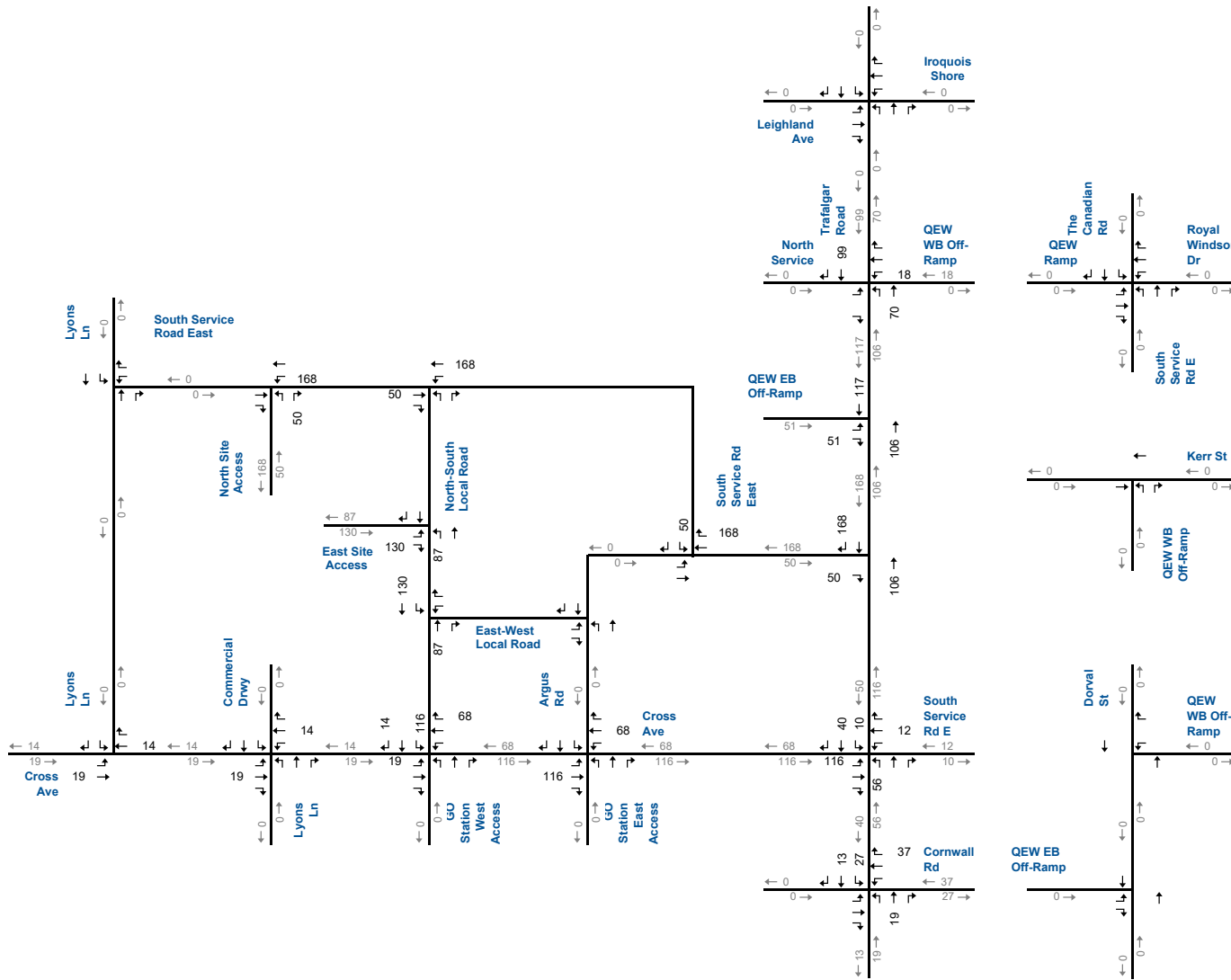
166 South Service Road East, Oakville  
210590



Figure 6.1B



## Site Generated Traffic Volumes Full Build-Out - AM Peak Hour



## Site Generated Traffic Volumes Full Build-Out - PM Peak Hour

166 South Service Road East, Oakville  
210590



Figure 6.2B

## 7 Future Conditions

To remain consistent with MTO and Region traffic impact study guidelines, horizon years of 2027 (Opening Date), 2032 (5 years from Opening) and 2037 (10 years from Opening) have been utilized for analysis of future traffic conditions.

### 7.1 Trafalgar EA

The Trafalgar Road (Regional Road 3)<sup>9</sup> Improvements Class Environmental Assessment Study from Cornwall Road to Highway 407 was completed in May 2015. It was recommended that Trafalgar Road be widened from four (4) to six (6) lanes and potentially converted the curb lanes to high occupancy vehicle (HOV) or bus rapid transit (BRT) lanes after completion of the road widening by 2032.

For the 2032 and 2037 future horizons, it is assumed the Trafalgar corridor will operate as a six-lane corridor with HOV curb lanes. Trafalgar Road is a six-lane cross-section plus exclusive left-turn lanes within the study area. The only modification to the road network for future analyses is removing the eastbound channelized right turn at Trafalgar Road and Cornwall Road to be consistent with the preferred design. It is estimated that 20% of lane capacity is assigned to HOV usage. The lane utilization factor in Synchro has been adjusted to 0.80 for the through lanes to reflect a 20% HOV usage

### 7.2 Midtown Oakville EA

The Town of Oakville completed a Class Environmental Assessment (EA) for Midtown Oakville (MOEA)<sup>10</sup> to guide the development of the transportation and municipal stormwater network needed to accommodate the planned growth in Midtown Oakville. The MOEA identified critical changes to the existing and planned road network that would be required to support intentional growth.

In addition, other master plans have been updated and technical studies completed, including the Halton Region Transportation Master Plan<sup>11</sup>, the Town of Oakville Transportation Master Plan – Switching

<sup>9</sup> Trafalgar Road Improvements Class Environmental Assessment Study From Cornwall Road to Highway 407, Town of Oakville, AECOM, April 2015.

<sup>10</sup> Midtown Oakville Transportation and Stormwater Municipal Class Environmental Assessment, Cole Engineering, June 2015.

<sup>11</sup> The Road to Change – Halton Region Transportation Master Plan, Dillion Consulting/GHD, October 2011



Gears<sup>12</sup>, the Midtown Parking Strategy<sup>13</sup>, and Designing Midtown Oakville<sup>14</sup>. As a result, the Town has proposed an Official Plan Amendment (OPA) that would incorporate the results of these studies into the Official Plan and bring the policies and Schedules into alignment with the most current source documents.

The changes to the Midtown-related transportation network include modifications designed to the broader area network and changes to the local road network within Midtown Oakville. To accommodate traffic to and from Midtown Oakville and to provide an alternative to Trafalgar Road, several improvements are provided, including direct off-ramps from eastbound QEW at Trafalgar Road and new ramps to/from the QEW at Royal Windsor Drive;

- ▶ A direct route from eastbound QEW to Midtown Oakville is provided via a new off-ramp that crosses under Trafalgar Road. This reduces the impacts of future traffic demand on the existing constrained intersections along Trafalgar Road at the off-ramp and Cross Avenue. The underpass of Trafalgar Road also provides the opportunity for improved active transportation connections into Midtown Oakville.
- ▶ A direct route from eastbound QEW to Midtown Oakville is provided via a new off-ramp to Cross Avenue at the Royal Windsor Drive interchange. A direct route from Midtown Oakville to eastbound QEW is provided via a new on-ramp at Royal Windsor Drive opposite Cross Avenue. A new westbound QEW off-ramp at Royal Windsor Drive will offer an alternative route to Midtown Oakville and surrounding areas.
- ▶ Cross Avenue is extended from Trafalgar Road to Royal Windsor Drive, connecting with the enhanced QEW interchange. Cross Avenue will provide accessible facilities for pedestrians and cyclists to travel safely, on-street parking where appropriate and four vehicular travel lanes.
- ▶ For access and circulation within Midtown Oakville, a revised local road network for Midtown Oakville is designed to support and align with the broader transportation network determined through the MOEA. As part of the revised road network, Lyons Lane at Cross Avenue is proposed to be realigned to form a four-way signalized intersection. Other local road network changes include a north-south local road connecting South Service Road East and Cross Avenue and a new east-west road connecting Argus Road. For this study, the east-west local road is only assumed to extend between Argus Road and the

<sup>12</sup> Town of Oakville Transportation Master Plan – Switching Gears, WSP + GLP, March 2018.

<sup>13</sup> Midtown Oakville Parking Strategy, BA Group, May 2014.

<sup>14</sup> Designing Midtown Oakville, Town of Oakville, September 2013.



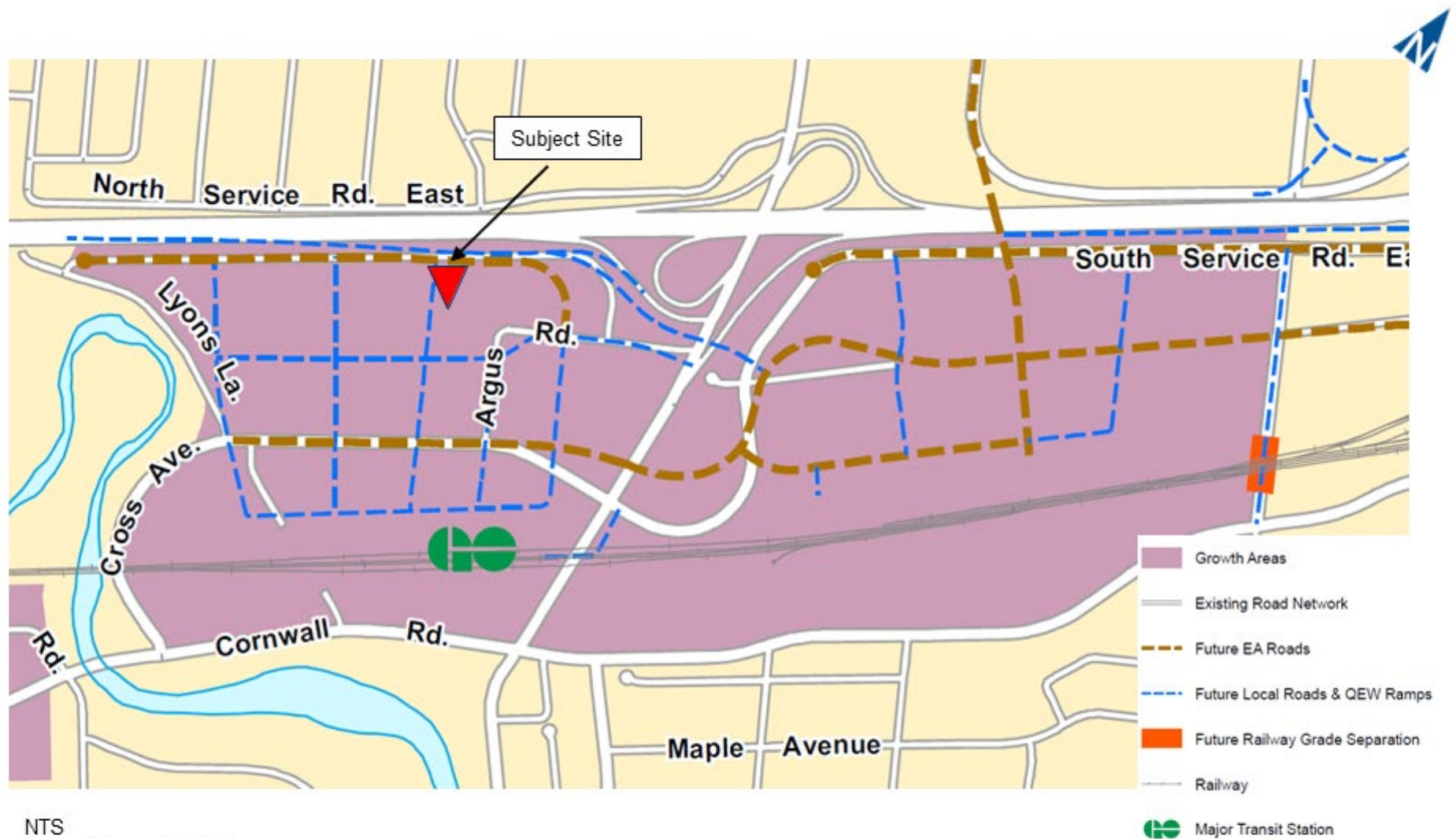
new north-south local road. It is also assumed the realignment of Argus Road does not occur.

The proposed improvements are not expected to significantly impact the QEW mainline operations with the refinements to the design to accommodate weaving and merging better. The new ramps at Royal Windsor Drive and Trafalgar Road will accommodate the additional travel demand from Midtown Oakville's planned intensification, relieving the existing Trafalgar Road interchange.

Ramp network improvements are assumed to be in place for the Opening (2027), 5-Year (2032) and 10-Year (2037) horizons, while the new local roads are assumed only in the 10-Year (2037) horizon to assess the long-term impacts for the area. **Figure 7.1** illustrate the proposed transportation network for Midtown Oakville.

**The MOEA recognized that the roadway improvements identified herein would provide some relief to operational issues; however, capacity constraints will persist for the overall vehicle transportation network.**





NTS  
Image Source: OPA 14

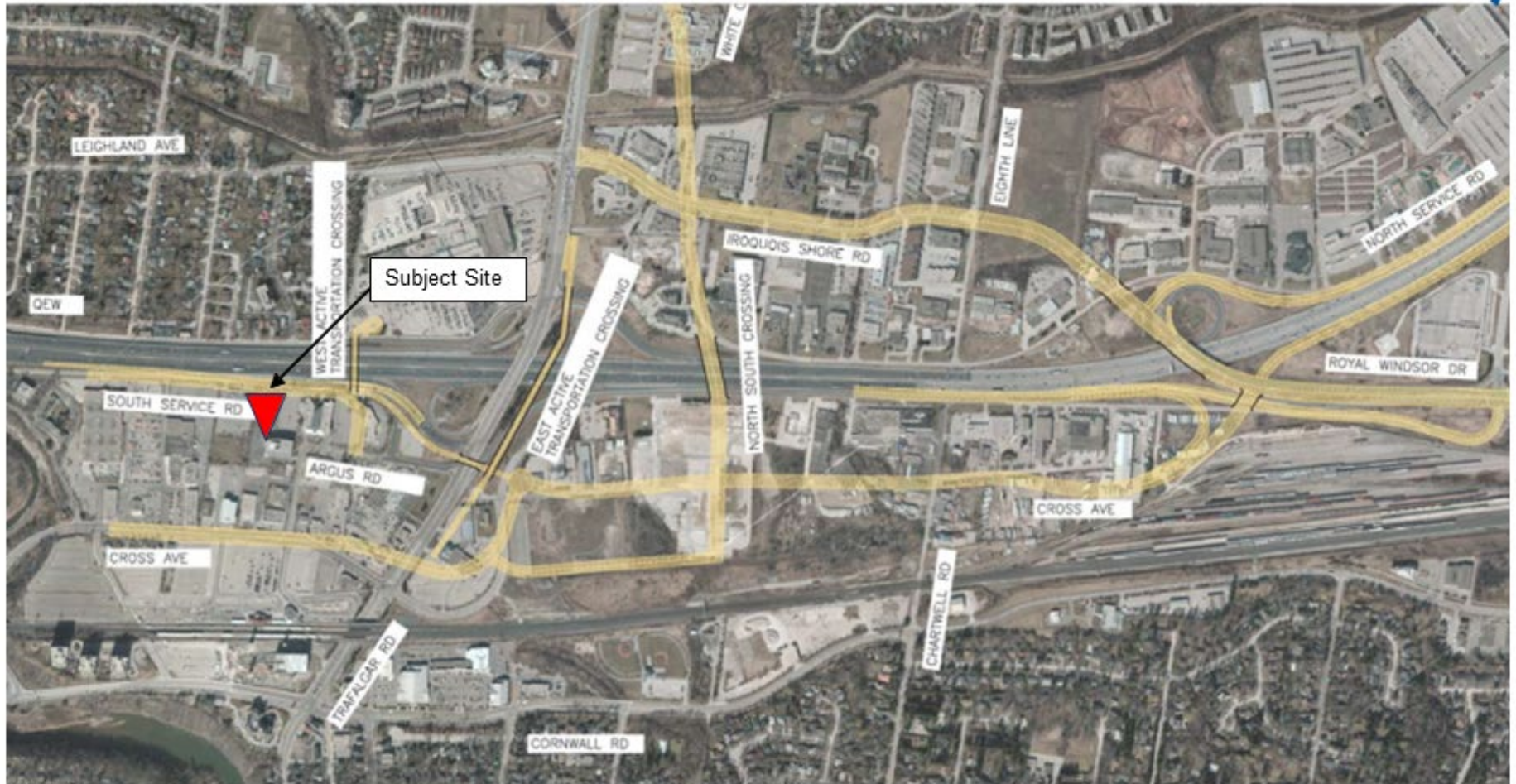


## Midtown Oakville Proposed Road Network

166 South Service Road East, Oakville  
210590



Figure 7.1A



NTS

Image Source: Midtown Oakville Class EA



## Midtown Oakville Broader Area Improvements

166 South Service Road East, Oakville  
210590



Figure 7.1B



### 7.3 Future Forecasts

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

Based on discussions with Region of Halton staff, a growth rate of 2.0% was applied to the area roadways to account for population and employment growth.

In addition to the general traffic growth, it is assumed that a portion of Midtown Oakville's redevelopment will occur in the 2032 and 2037 horizons. The MOEA<sup>15</sup> provides the best source for the development context and traffic growth expectations for the immediate study area. This report provides a traffic forecast for a 17-year horizon with a development assumption of 5,960 residential units, 370,000 square feet of retail uses, and 1.4 million square feet of office spaces with supporting institutional and recreational uses. This report assumes 20% to 40% build-out for the 2032 and 2037 horizons.

Given that the MOEA most closely models the overall redevelopment plans, traffic projections within the MOEA were the primary source for developing background development projections. Adjustments were made to the traffic forecasts extracted from this study to account solely for site-specific growth. Specifically, as a 2% per annum growth rate was most likely utilized in the MOEA forecast, this growth has been factored out of the projections. **Appendix F** provides traffic projections related to site-specific growth.

In the 2037 horizon year, the new local road network will cause a portion of the Argus Road traffic to the new east-west local road to access the GO Station. Based on existing volumes along Cross Avenue, it is assumed that approximately 70% of westbound vehicles in the AM peak hour (30% in the PM peak hour) are going to the GO Station. It is assumed that an equal portion of the vehicles along Argus Road are going to the GO station and would take the new local road network.

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<sup>15</sup> Midtown Oakville Transportation and Stormwater Municipal Class Environmental Assessment, Cole Engineering, June 2015.



### 7.3.1 Background Developments

The following background developments are planned within the study horizon and are included in the background traffic:

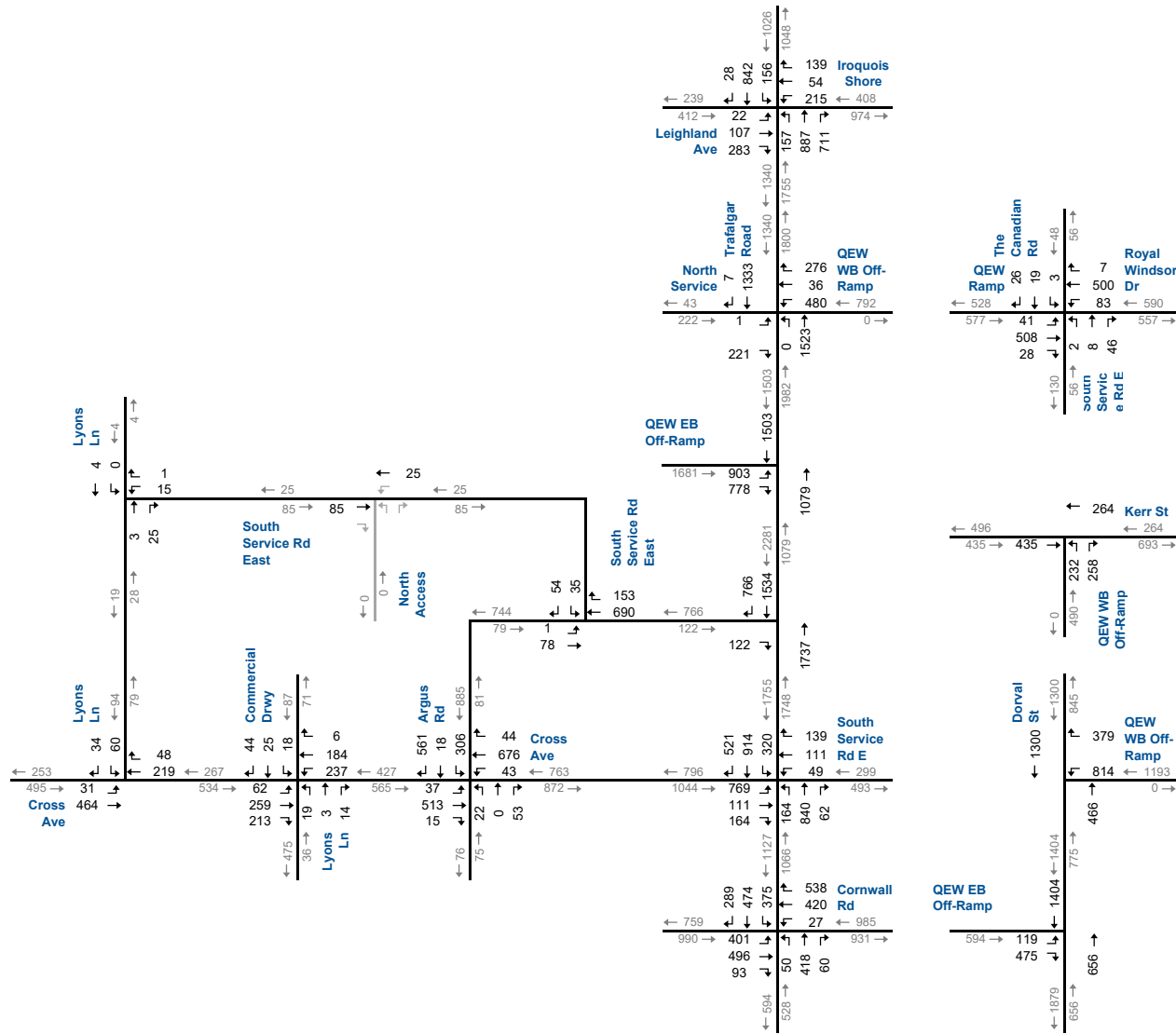
- ▶ 157 Cross Avenue – Located west of the Oakville GO Station Parking Access, the proposed Development is a mixed-use development with residential, office, and commercial units.
- ▶ 271 Cornwall Road – Located east of Trafalgar Road at Cornwall Road, the proposed Development is two-mixed use towers with residential, office, and commercial uses
- ▶ 571 Argus Road – Located north of Argus Road at Cross Avenue, the proposed Development is two-mixed use towers with residential and commercial uses and a daycare and supermarket.
- ▶ 599 Lyons Lane – Located north of Lyons Lane at Cross Avenue, the proposed Development is a residential high-rise.
- ▶ 627 Lyons Lane – Located east of South Service Road East at Lyons Lane, the proposed Development is a residential high-rise.

The Background traffic volumes for Opening (2027), 5-Year (2032) and 10-Year (2037) are illustrated in **Figures 7.2 to 7.4**.

### 7.3.2 Total Projections

The projected site-generated traffic volumes were added to the Background projections to develop the Total traffic volumes. The Total traffic volumes vary due to rounding of site traffic volumes but provide a conservative trip generation estimate. The weekday AM and PM peak hours Total traffic volumes for Opening (2027), 5-Year (2032) and 10-Year (2037) are illustrated in **Figures 7.5 to 7.7**.





# Background Traffic Volumes Opening Year - AM Peak Hour

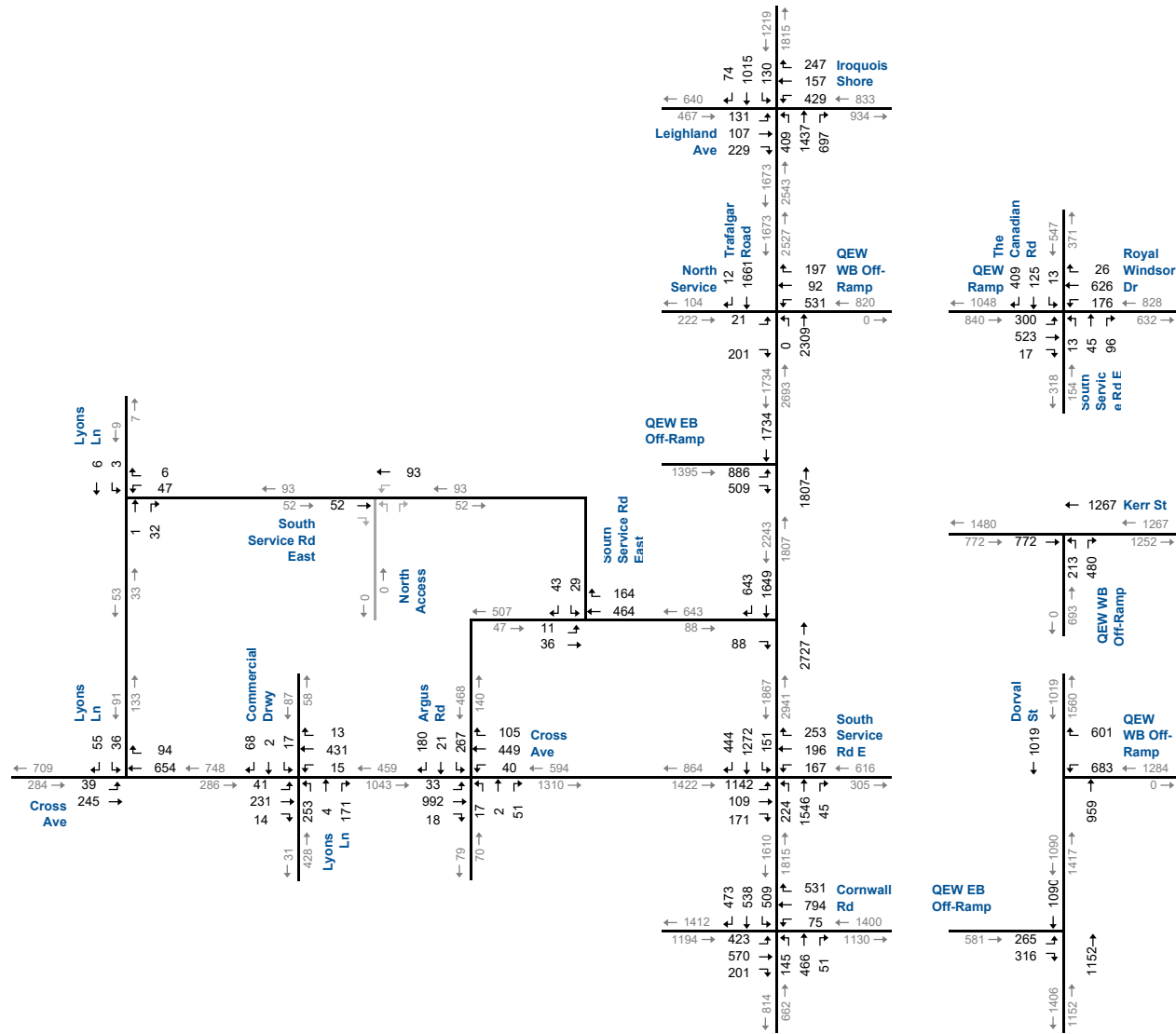
166 South Service Road East, Oakville  
210590



Figure 7.2A



# Background Traffic Volumes Opening Year - PM Peak Hour

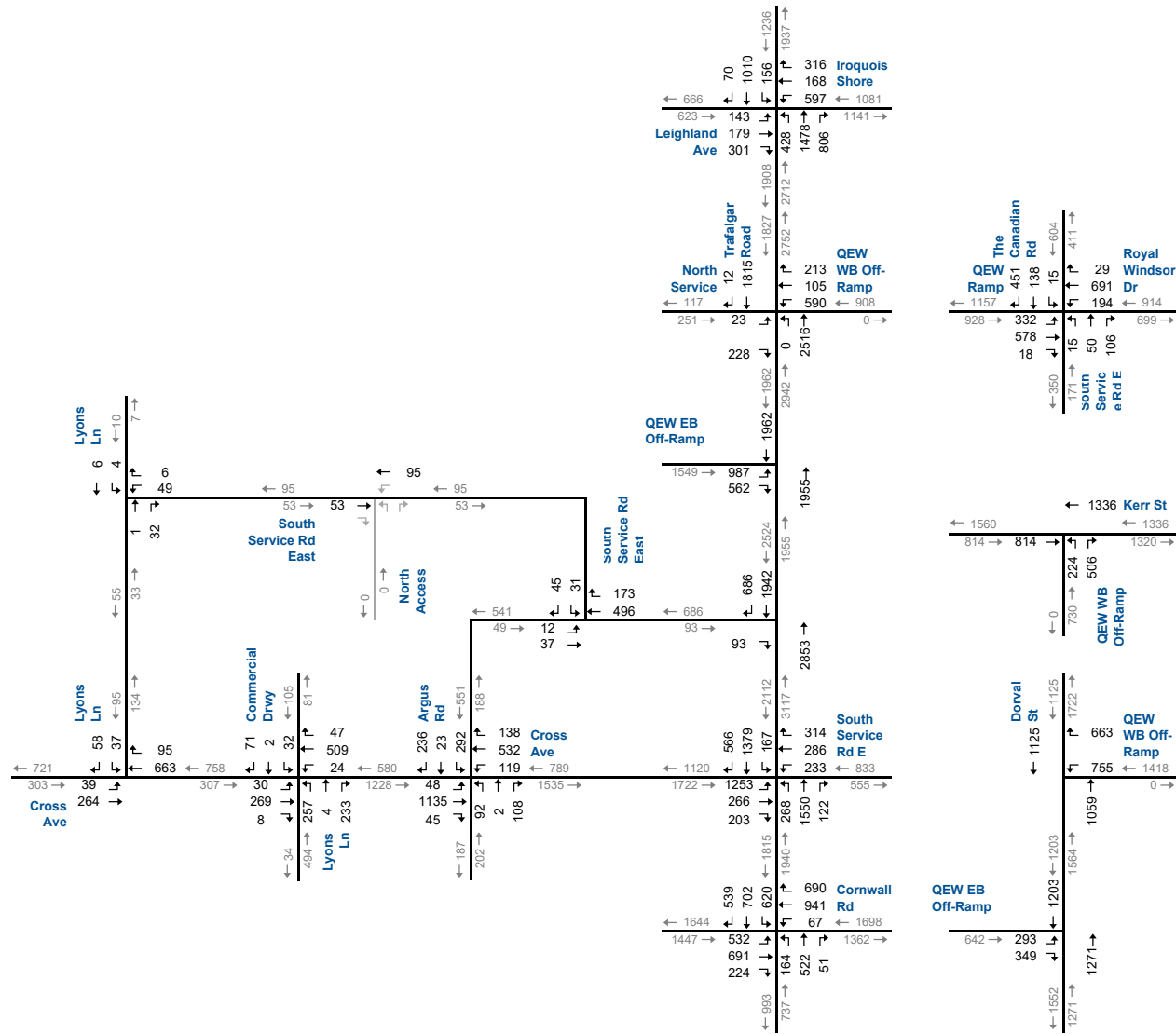


166 South Service Road East, Oakville  
210590



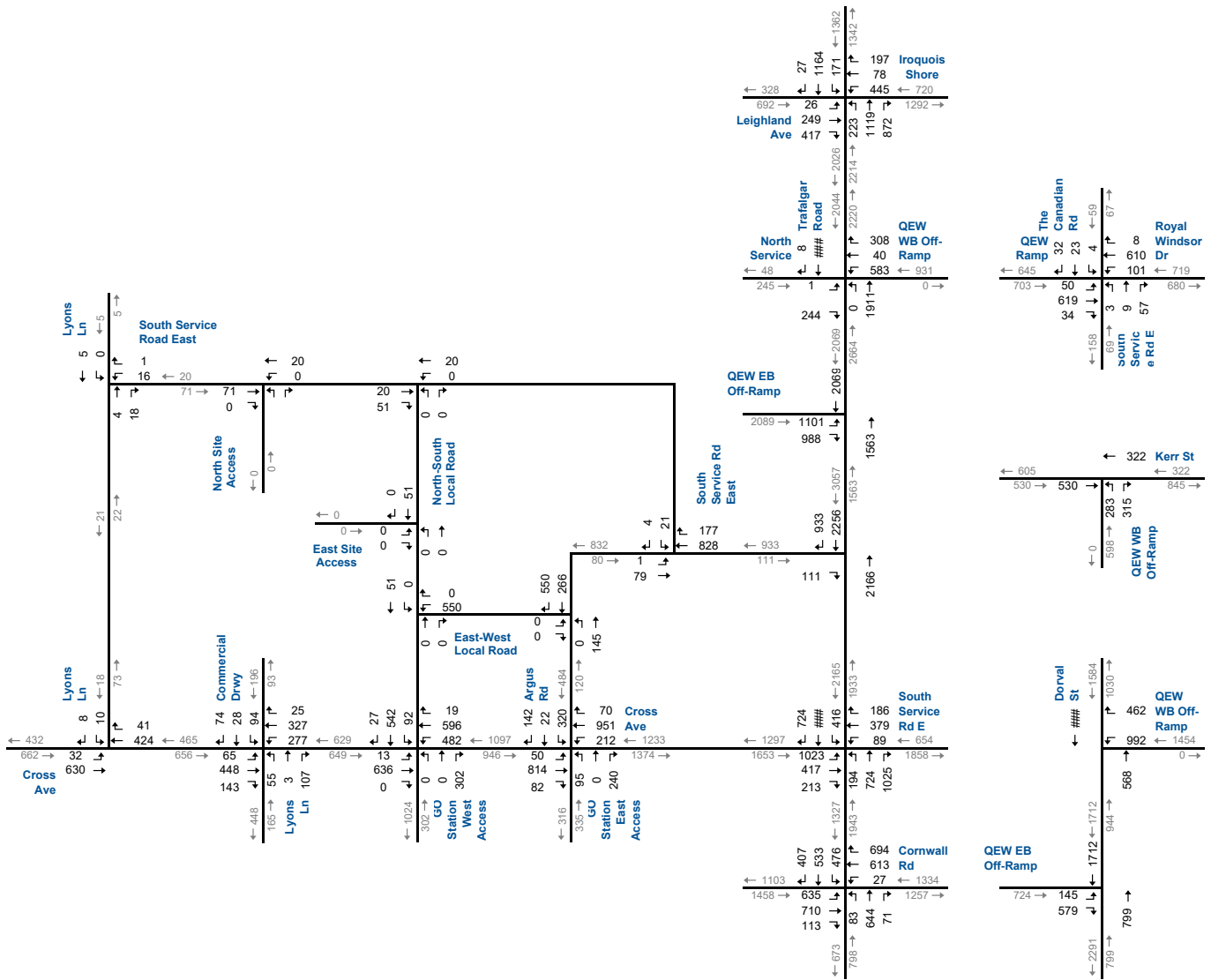
Figure 7.2B





## Background Traffic Volumes 5-Year - PM Peak Hour

Figure 7.3B

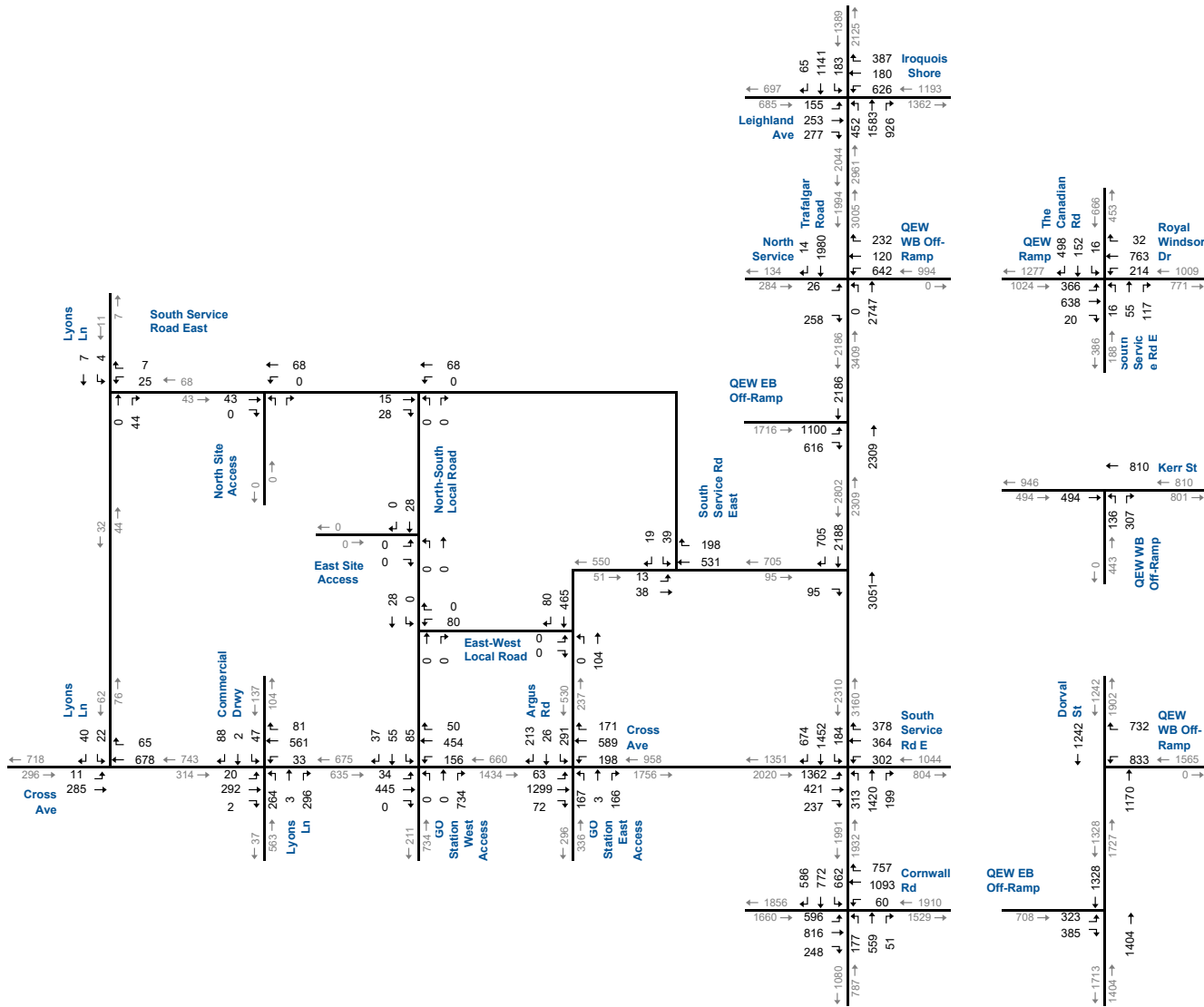


# Background Traffic Volumes 10-Year - AM Peak Hour

166 South Service Road East, Oakville  
210590



Figure 7.4A



## Background Traffic Volumes 10-Year - PM Peak Hour

166 South Service Road East, Oakville  
210590



Figure 7.4B





166 South Service Road East, Oakville  
210590



# Total Traffic Volumes Opening Year - AM Peak Hour

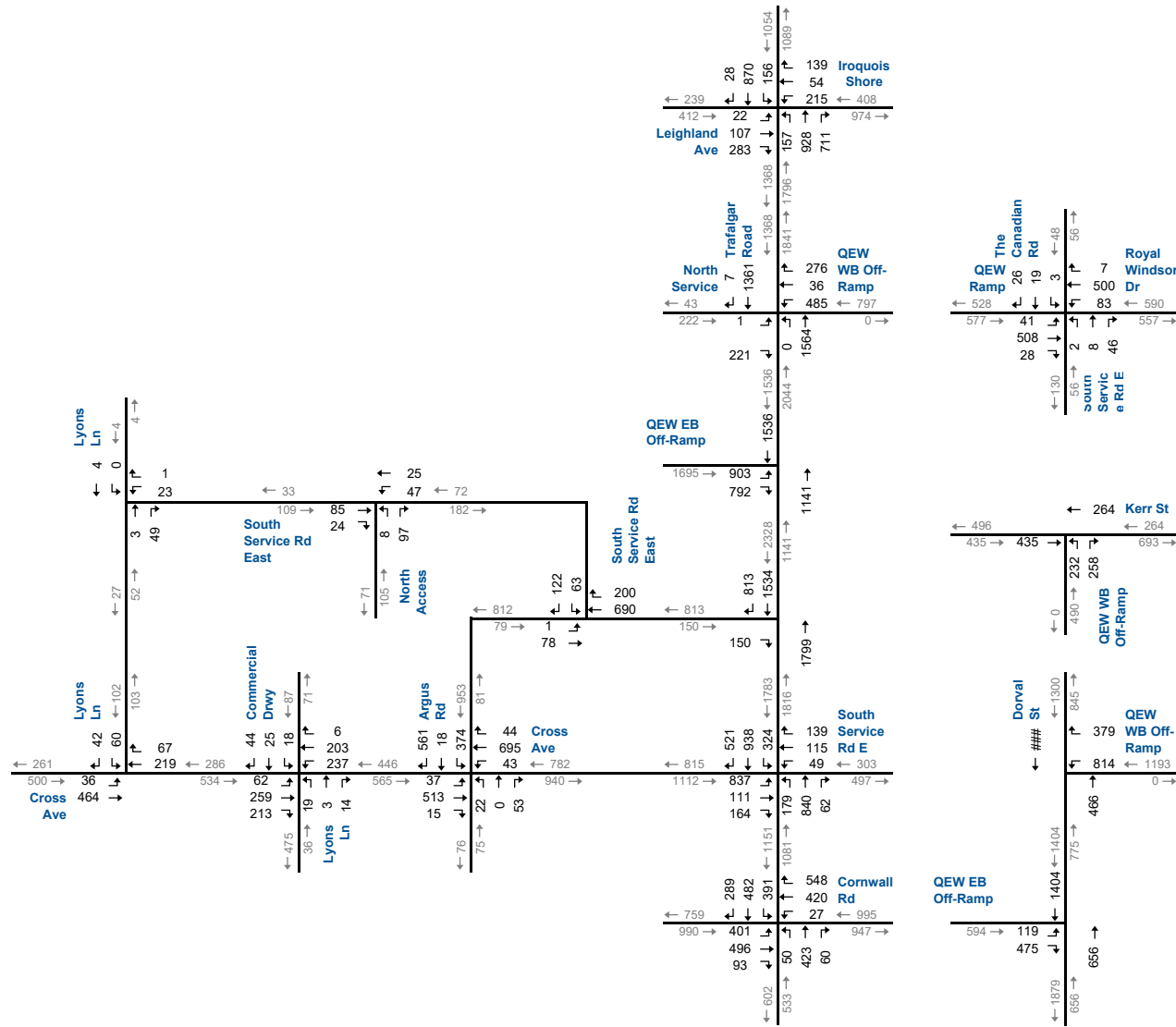
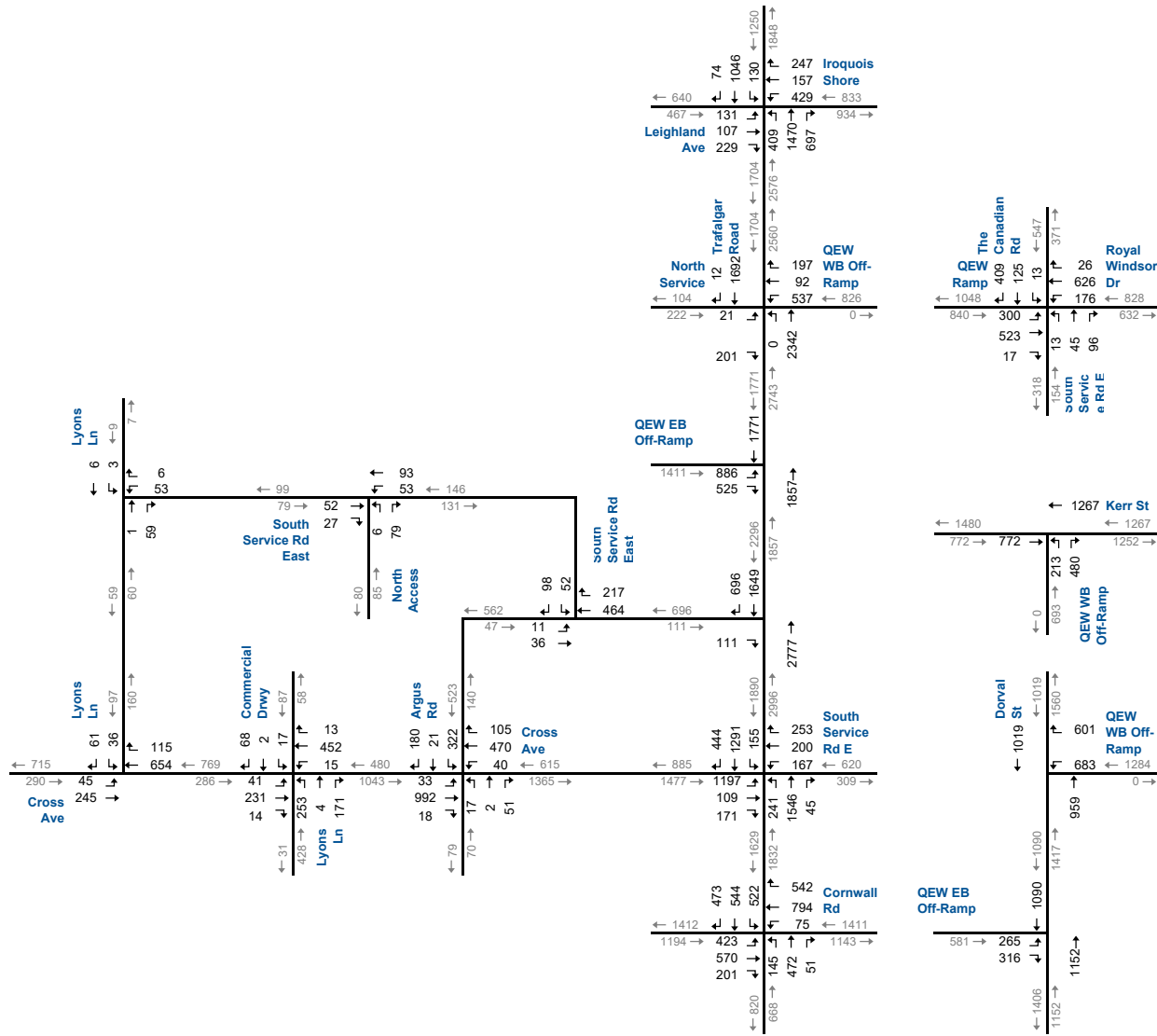


Figure 7.5A

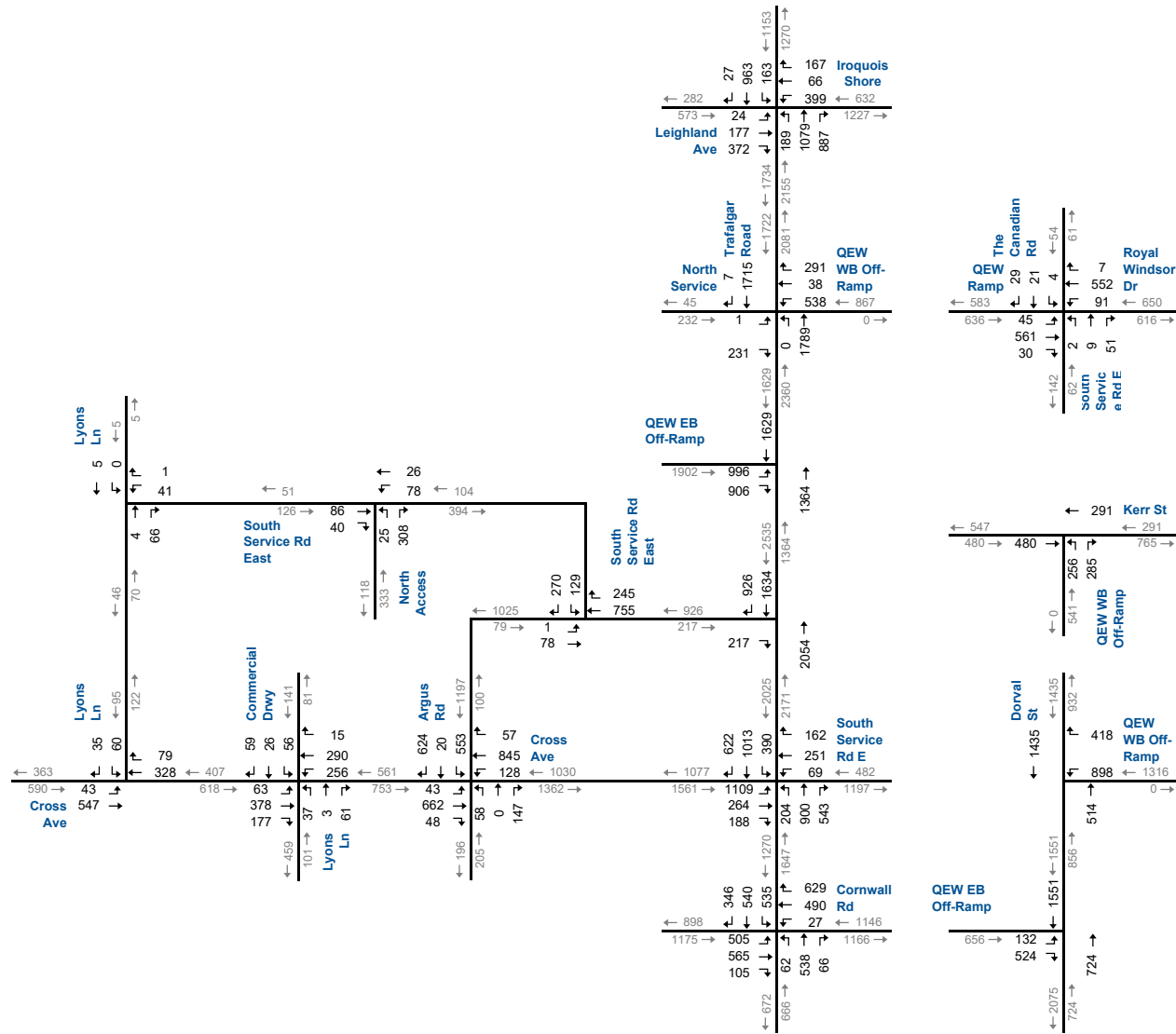


# Total Traffic Volumes Opening Year - PM Peak Hour

166 South Service Road East, Oakville  
210590

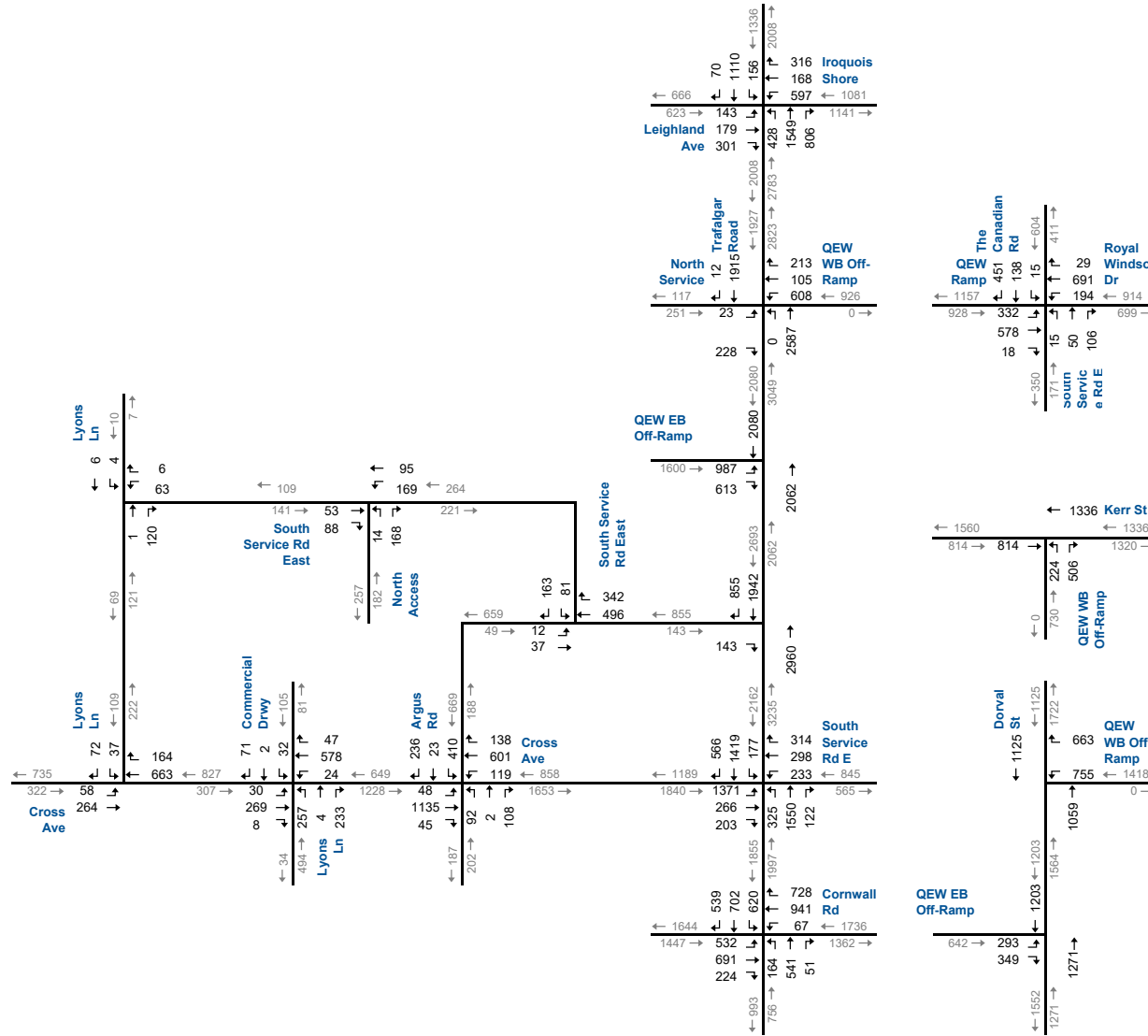


Figure 7.5B



## Total Traffic Volumes 5-Year - AM Peak Hour

Figure 7.6A

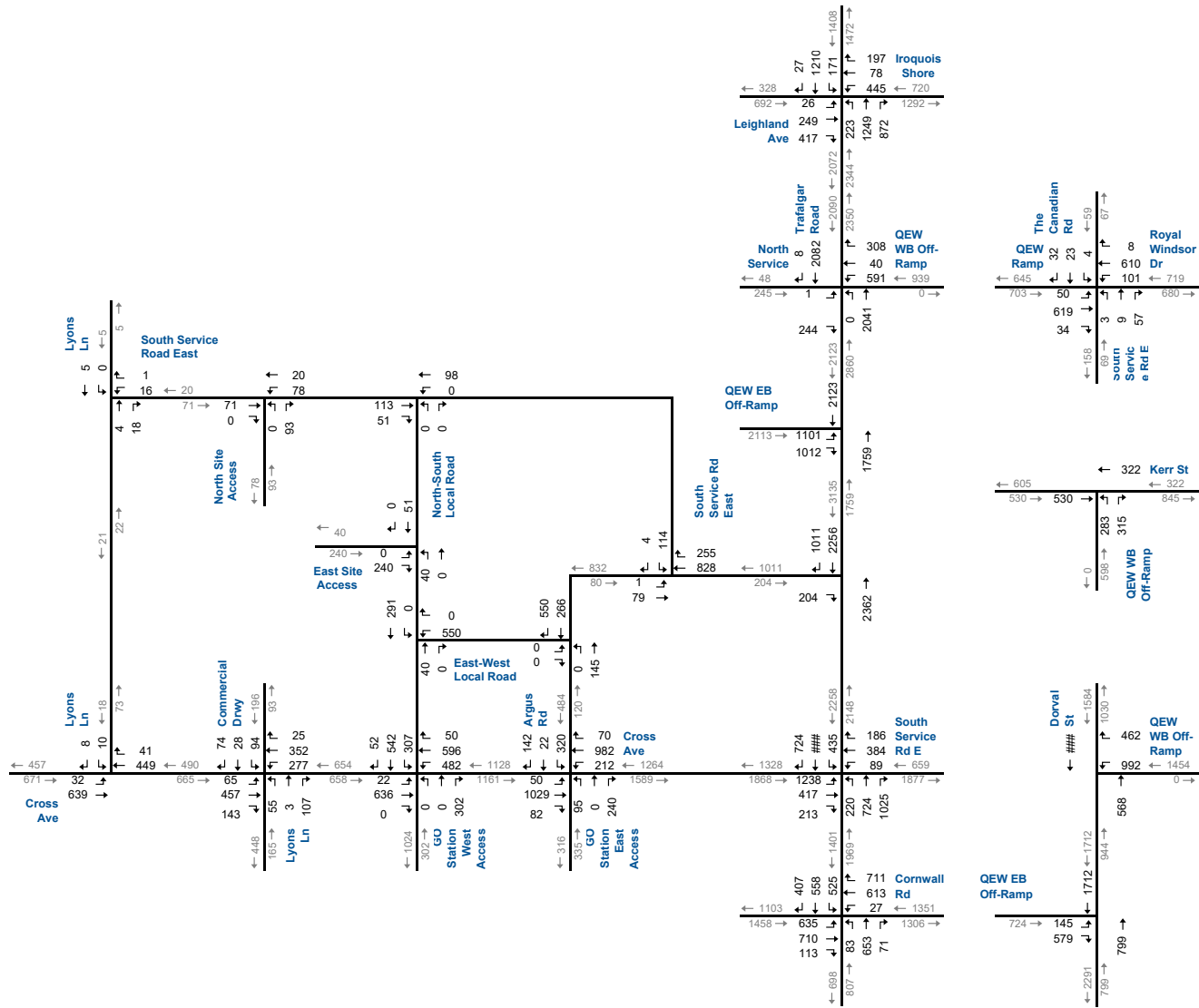


## Total Traffic Volumes 5-Year - PM Peak Hour

Figure 7.6B

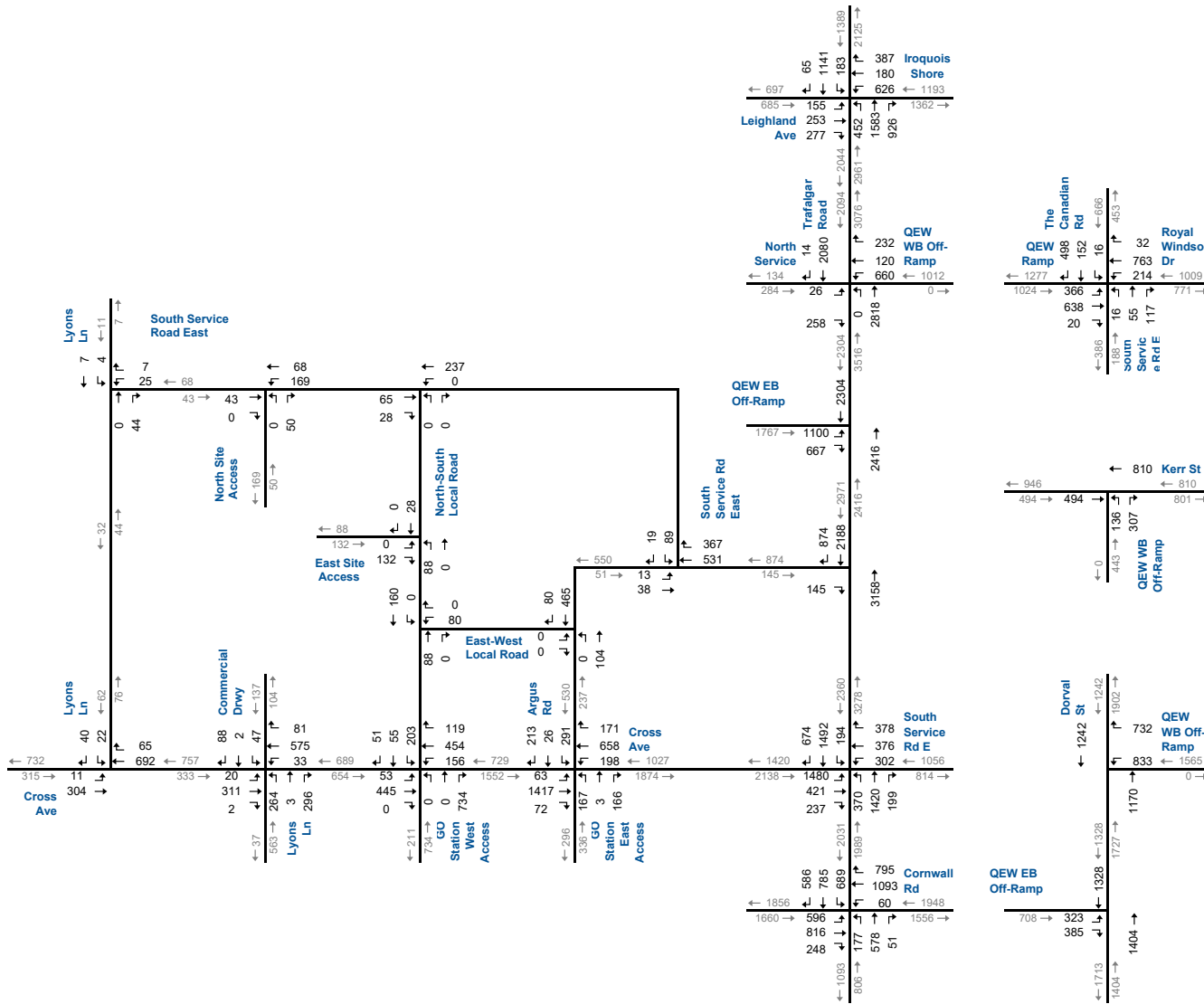


166 South Service Road East, Oakville  
210590



## Total Traffic Volumes 10-Year - AM Peak Hour

Figure 7.7A



# Total Traffic Volumes 10-Year - PM Peak Hour

166 South Service Road East, Oakville  
210590



Figure 7.7B

## 8 Operational Assessment

### 8.1 Level of Service Criteria

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

For signalized intersections, the analysis considered the operation of each lane or lane group entering the intersection and the level of service for the overall conditions at the intersection.

For unsignalized intersections, the analysis assumes that traffic on the mainline is not affected by the traffic on the side streets. The level of service is only determined for left turns from the main street and all movements from the minor street.

The evaluation criteria used to analyze intersections are based on the 2000 Highway Capacity Manual (HCM)<sup>16</sup>.

### 8.2 Intersection Capacity Analysis

Intersection capacity analyses were conducted at all intersections in the study area. Analyses were conducted for the Base Conditions as well as the Opening (2027), 5-Year (2032) and 10-Year (2037) Background and Total Conditions.

**Tables 8.1 through 8.12** summarize the capacity analyses for the study area intersections for all horizon years. The capacity analysis results are included in **Appendix G**. The following sub-sections outline the operations of the study area intersections.

#### 8.2.1 Trafalgar Road at QEW Westbound Ramp

At the intersection of Trafalgar Road and QEW Westbound Ramp, the southbound through movement along Trafalgar Road presently operates at LOS F, while several overall movements are noted to be operating at LOS D during the weekday peak hours.

Under the Opening and 5-Year Background conditions, southbound conditions are forecast to improve with the addition of direct off-ramps

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<sup>16</sup> Transportation Research Board, Highway Capacity Manual, Washing, D.C. 2003.



from eastbound QEW at Trafalgar Road and new ramps to/from the QEW at Royal Windsor Drive.

Under the 10-Year Background conditions, the southbound through movement is projected to degrade to LOS F or better during the weekday peak hours. The westbound approach will operate at LOS E during peak weekday PM.

In terms of development traffic implications, similar levels of operation are expected under the Total conditions with only minor increases in delay resulting from site-generated traffic volumes.

### **8.2.2 Trafalgar Road at QEW Eastbound Ramp**

At the intersection of Trafalgar Road at QEW Eastbound Ramp, the eastbound right turn movement presently operates at LOS E-F during the weekday AM and PM peak hours.

Under the Opening and 5-Year Background conditions, eastbound conditions are forecast to improve with the addition of direct off-ramps from eastbound QEW at Trafalgar Road and new ramps to/from the QEW at Royal Windsor Drive. In the 10-Year background horizon, operations are forecast to degrade to LOS F.

The southbound through movement currently operates at LOS B during the weekday AM peak hour and is expected to degrade to LOS F under the 5-Year and 10-Year Background conditions. The southbound movement currently operates at LOS A; however, it is likely to degrade to the LOS F range under the 10-Year Background conditions.

Under the Total conditions, the additional traffic generated by the site is forecasted to be relatively minor. However, with background operations, specific movements will operate in the LOS E-F range and v/c ratios above 1.00. The additional site traffic is forecast to result in moderate increases in delay.

### **8.2.3 Trafalgar Road at Leighland Avenue / Iroquois Shore Road**

At the intersection of Trafalgar Road at Leighland Avenue / Iroquois Shore Road, the overall intersection operations are at LOS F during the weekday peak hours.

Under the Opening and 5-Year Background conditions, operations are expected to improve with the Midtown Oakville road improvements. However, by the 10-Year background horizon, operations are forecast to degrade to the LOS E-F range for the northbound and southbound approaches in the PM peak hour





Under the Total conditions, the additional traffic generated by the site is forecasted to be relatively minor. However, with background operations, specific movements will operate in the LOS E-F range and v/c ratios above 1.00. The additional site traffic is forecast to result in moderate increases in delay.

#### **8.2.4 Trafalgar Road at Argus Road**

Individual movements at the unsignalized intersection of Trafalgar Road and Argus Road presently operate at LOS B or better during the weekday peak hours. Similar levels of operation are expected under future Background and Total traffic conditions with only a minor increase in delay resulting from site-generated traffic volumes.

#### **8.2.5 Trafalgar Road at Cross Avenue/South Service Road**

The intersection of Trafalgar Road and Cross Avenue/South Service Road presently operates at a LOS F overall during the weekday PM peak hour. Several movements operate at LOS E during the weekday AM peak hour and LOS E and F during the PM peak hour.

Under Opening Year Background traffic conditions, a significant number of movements are projected to continue to operate with high levels of delay, with overall intersection operations forecasted at LOS F during the weekday peak hours.

Under the 5-Year and 10-Year horizons, increased congestion and delay are projected for several movements degrading to LOS E and F during the weekday peak hours.

Regarding development traffic implications, similar levels of operation are expected under the Total conditions with site-generated traffic volumes. However, due to the highly congested forecasted operations, additional traffic significantly increases delay.

#### **8.2.6 Trafalgar Road at Cornwall Road**

The intersection of Trafalgar Road and Cornwall Road presently operates at a LOS F overall during the weekday peak hours. Several movements operate at LOS E and F during the weekday peak hours.

Under Opening, 5-Year and 10-Year Background traffic conditions, a significant number of movements are projected to continue to operate with high levels of delay during the weekday peak hours.

Regarding development traffic implications, similar levels of operation are expected under the Total conditions with site-generated traffic volumes.



### **8.2.7 Cross Avenue at Argus Road/GO Station Driveway**

Individual movements at Cross Avenue and Argus Road/GO Station Driveway's signalized intersection presently operate at LOS D or better during the weekday peak hours. The exception is the northbound left-turn movement which operates at a LOS F in the weekday AM peak hour.

Under Opening Year, 5-Year, and 10-Year Background conditions, the southbound approach is projected to degrade to LOS F. The westbound left-turn movement is forecast to degrade to LOS E-F range during the weekday peak hours. Significant delays are forecast for the southbound left-turn.

In terms of development traffic implications, similar levels of operation are expected under the Total conditions with only minor increases in delay resulting from site-generated traffic volumes. The exception is the southbound left-turn movement which is forecast to be over capacity under background conditions and further exasperated by site traffic in the total scenarios.

### **8.2.8 Cross Avenue at Lyons Lane/Commercial Driveway (Four Leg)**

Individual movements at the signalized intersection of Cross Avenue and Lyons Lane presently operate at LOS D or better during the weekday peak hours. Similar levels of operation are expected under future Background and Total traffic conditions with only a minor increase in delay resulting from site-generated traffic volumes.

### **8.2.9 Cross Avenue at Lyons Lane (Three Leg)**

Individual movements at the unsignalized intersection of Cross Avenue and Lyons Lane presently operate at LOS B or better during the weekday peak hours. Similar levels of operation are expected under future Background and Total traffic conditions with only a minor increase in delay resulting from site-generated traffic volumes.

### **8.2.10 South Service Road at Lyons Lane**

Individual movements presently operate at LOS A during the weekday peak hours with similar levels of operation are expected under future Background and Total traffic conditions.

### **8.2.11 Argus Road at South Service Road East**

Individual movements at the unsignalized intersection of Argus Road and South Service Road East presently operate at LOS C or better during the weekday peak hours.



Under the Opening, 5-Year, and 10-Year Background conditions, the southbound approach is forecast to operate at LOS F with Synchro outputting delay and queue measurement error values due to extensive congestion. This is due to high volumes of east-west traffic along Argus Road, leaving few gaps for southbound stop-controlled movements.

Operations improve in the 10-Year scenarios by opening the local road network within Midtown Oakville due to additional connectivity between South Service Road East and Cross Avenue.

Regarding development traffic implications, the southbound approach is extremely sensitive to the addition of any traffic due to the high volumes of east-west traffic along Argus Road. As a result, the addition of site traffic results in significant delays in the AM peak hour.

#### **8.2.12 Dorval Drive/Kerr Street at QEW Ramps**

Individual movements at the signalized Dorval Drive / Kerr Street QEW off-ramps presently operate at LOS D or better during the weekday peak hours. Similar levels of operation are expected under future Background and Total traffic conditions with only a minor increase in delay resulting from site-generated traffic volumes.

A negligible volume of site traffic is expected to utilize Dorval Drive off-ramps to access the site due to the distance and diversion such a route would impose.

#### **8.2.13 Royal Windsor Drive at QEW Eastbound Ramp**

Individual movements at the signalized Canadian Road / South Service Road at Royal Windsor Drive / QEW ramps presently operate at LOS D or better during the weekday peak hours. Similar levels of operation are expected under future Background and Total traffic conditions with only a minor increase in delay resulting from site-generated traffic volumes.

A negligible volume of site traffic is expected to utilize Royal Windsor Drive QEW ramps to access the site due to the distance and diversion such a route would impose.

#### **8.2.14 Future Local Road Network**

In the 10-Year horizon Background scenario, the new north-south and east-west local roads are forecast to operate at LOS B or better during weekday peak hours.



In the 10-Year Background scenario, the intersection of the local north-south road and Cross Avenue / GO Station West Access is forecast to operate at a LOS E in the AM peak hour. The westbound approach is forecast to operate at LOS F due to the high volume of traffic travelling to the GO Station.

The addition of site traffic is expected to add minor delays to the local road network, with delays forecast at less than 35 seconds.

### **8.2.15 Development Access**

Under the future traffic conditions, the north and east accesses are expected to operate at LOS B or better during the weekday peak hours under the Total conditions.



**TABLE 8.1: AM PEAK HOUR OPERATIONS – 2022-2037 (1/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach													Overall			
					Eastbound				Westbound				Northbound				Southbound				
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left		Through	Right	Approach
AM Peak Hour	Trafalgar Road & QEW Westbound Off-Ramp / North Service Road	Base Year	TCS	LOS Delay V/C Q	E 63 0.04 1	D 38 0.43 61	F 38	E 56 0.73 92	E 56 0.73 92	D 48 0.54 36	D 53	C 20	C 20	F 191 1.36 587	F 191	F 120 1.14					
		Background Opening Year	TCS	LOS Delay V/C Q	E 63 0.04 1	C 34 0.44 64	C 35	D 55 0.76 106	D 54 0.75 75	D 45 0.54 35	D 51	C 25	C 25	B 19 0.56 131	B 19	C 29 0.67					
		Total Opening Year	TCS	LOS Delay V/C Q	E 63 0.04 1	C 34 0.44 64	C 35	D 55 0.77 107	D 53 0.75 75	D 44 0.53 35	D 50	C 27	C 27	B 20 0.58 136	B 20	C 30 0.68					
		Background 5 Year	TCS	LOS Delay V/C Q	E 63 0.04 1	C 32 0.44 63	C 33	D 53 0.76 111	D 53 0.77 80	D 44 0.57 40	D 49	C 28	C 28	C 25 0.73 197	C 25	C 32 0.73					
		Total 5 Year	TCS	LOS Delay V/C Q	E 63 0.04 1	C 32 0.44 65	C 33	D 53 0.77 116	D 53 0.78 83	D 44 0.58 43	D 50	C 30	C 30	C 26 0.76 200	C 26	C 33 0.76					
		Background 10 Year	TCS	LOS Delay V/C Q	E 63 0.04 1	C 30 0.44 74	C 31	D 51 0.78 134	D 51 0.78 95	D 43 0.62 55	D 48	D 43	D 43	E 73 1.07 345	E 72	E 55 0.93					
		Total 10 Year	TCS	LOS Delay V/C Q	E 63 0.04 1	C 31 0.44 77	C 31	D 53 0.80 142	D 52 0.79 99	D 44 0.64 60	D 49	E 57 1.05 169	E 57	E 79 1.08 347	E 79	E 63 0.95					
AM Peak Hour	Trafalgar Road & QEW Eastbound Off-Ramp	Base Year	TCS	LOS Delay V/C Q	D 44 0.82 153	F 201 1.32 351	F 113					B 11	B 11	B 19 1.00 37	B 19	D 45 1.13					
		Background Opening Year	TCS	LOS Delay V/C Q	B 20 1 104	E 77 1 351	D 47					D 36	D 36	E 58 1 215	E 58	D 48 1.02					
		Total Opening Year	TCS	LOS Delay V/C Q	B 20 0.55 104	F 84 1.07 360	D 51					D 38	D 38	E 62 1.00 224	E 62	D 52 1.04					
		Background 5 Year	TCS	LOS Delay V/C Q	B 20 0.59 115	F 117 1.16 415	E 67					D 48	D 48	E 79 1.07 235	E 79	E 66 1.13					
		Total 5 Year	TCS	LOS Delay V/C Q	B 20 0.59 115	F 130 1.20 432	E 74					D 55	D 55	E 92 1.11 250	E 92	E 75 1.16					
		Background 10 Year	TCS	LOS Delay V/C Q	C 25 0.70 146	F 216 1.39 499	F 118					F 106	F 106	F 243 1.46 365	F 243	F 161 1.42					
		Total 10 Year	TCS	LOS Delay V/C Q	C 28 0.73 154	F 259 1.48 525	F 142					F 141	F 141	F 225 1.42 362	F 225	F 172 1.45					
AM Peak Hour	Trafalgar Road & Leighland Avenue/ Iroquois Shore Road	Base Year	TCS	LOS Delay V/C Q	C 30 0.06 8	C 33 0.21 35	F 315 1.58 313	F 275	F 96 1.10 184	C 25 0.09 19	C 25 0.10 14	F 85	F 121 1.06 70	C 32 0.66 99	D 53 0.89 183	D 47	F 46 0.81 219	F 78	F 96 1.26		
		Background Opening Year	TCS	LOS Delay V/C Q	D 42 0.11 11	D 46 0.41 42	D 46 0.37 38	D 46	D 43 0.56 33	D 41 0.18 24	D 40 0.11 17	D 42	B 11 0.50 27	B 15 0.38 69	C 22 0.62 69	B 18	B 12 0.48 27	B 15 0.36 66	B 15	C 23 0.6	
		Total Opening Year	TCS	LOS Delay V/C Q	D 43 0.11 11	D 47 0.42 43	D 45 0.26 30	D 45	D 44 0.58 34	D 41 0.18 24	D 41 0.11 18	D 42	B 11 0.51 26	B 16 0.40 70	C 22 0.62 66	B 18	B 12 0.49 25	B 15 0.37 66	B 15	C 23 0.60	
		Background 5 Year	TCS	LOS Delay V/C Q	D 38 0.10 10	D 45 0.54 63	D 41 0.28 27	D 42	D 37 0.74 51	C 31 0.14 24	C 31 0.13 16	C 35	C 23 0.67 46	C 24 0.51 82	F 95 1.09 270	E 55	C 23 0.62 54	C 28 0.53 99	C 27	D 43 0.93	
		Total 5 Year	TCS	LOS Delay V/C Q	D 38 0.10 10	D 44 0.54 62	D 43 0.42 43	D 43	D 44 0.80 52	C 33 0.15 24	C 33 0.13 17	D 40	C 22 0.68 47	C 25 0.57 93	F 108 1.08 270	D 52	C 24 0.66 64	C 27 0.54 102	C 26	D 43 0.95	
		Background 10 Year	TCS	LOS Delay V/C Q	C 35 0.09 10	D 45 0.65 88	D 45 0.64 78	D 44	D 50 0.89 63	C 29 0.16 28	C 29 0.16 17	D 42	E 65 0.90 90	C 142 0.72 118	F 270 1.20 290	E 78	E 67 0.92 89	D 43 0.87 165	D 46	E 59 1.06	
		Total 10 Year	TCS	LOS Delay V/C Q	C 34 0.09 10	D 43 0.62 88	D 55 0.80 118	D 49	D 44 0.85 61	C 28 0.15 28	C 28 0.16 17	D 38	F 76 0.94 103	C 142 0.80 138	F 290 1.20 290	E 78	F 118 1.08 91	D 47 0.91 150	E 55	E 62 1.05	



**TABLE 8.2: AM PEAK HOUR OPERATIONS – 2022-2037 (2/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach																
					Eastbound				Westbound				Northbound				Southbound				Overall
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Trafalgar Road & Argus Road	Base Year	TWSC	LOS Delay V/C Q		B 13	B 13							A 0	A 0	A 0	A 0				
		Background Opening Year	TWSC	LOS Delay V/C Q		B 13	B 13							A 0	A 0	A 0	A 0				
		Total Opening Year	TWSC	LOS Delay V/C Q		B 14	B 14							A 0	A 0	A 0	A 0				
		Background 5 Year	TWSC	LOS Delay V/C Q		B 13	B 13							A 0	A 0	A 0	A 0				
		Total 5 Year	TWSC	LOS Delay V/C Q		C 18	C 18							A 0	A 0	A 0	A 0				
		Background 10 Year	TWSC	LOS Delay V/C Q		B 13	B 13							A 0	A 0	A 0	A 0				
		Total 10 Year	TWSC	LOS Delay V/C Q		C 19	C 19							A 0	A 0	A 0	A 0				
AM Peak Hour	Trafalgar Road & Cross Avenue / South Service Road	Base Year	TCS	LOS Delay V/C Q	E 64	E 57	>	E 61	D 48	E 61	D 54	E 55	D 43	D 49	>	D 49	E 60	F 80	>	E 77	E 65
		Background Opening Year	TCS	LOS Delay V/C Q	F 127	D 50	>	F 103	D 47	E 65	D 53	E 57	F 82	E 73	>	E 75	F 91	F 106	>	F 104	F 93
		Total Opening Year	TCS	LOS Delay V/C Q	F 154	D 48	>	F 123	D 47	E 66	D 53	E 57	F 113	E 79	>	F 85	F 93	F 125	>	F 119	F 107
		Background 5 Year	TCS	LOS Delay V/C Q	F 293	F 199	>	F 257	D 47	F 169	D 50	F 111	F 194	F 184	>	F 185	F 334	F 101	>	F 146	F 183
		Total 5 Year	TCS	LOS Delay V/C Q	F 407	F 184	>	F 333	D 48	F 200	D 51	F 128	F 281	F 184	>	F 197	F 402	F 134	>	F 185	F 224
		Background 10 Year	TCS	LOS Delay V/C Q	F 467	F 375	>	F 428	D 50	F 298	D 49	F 193	F 290	F 429	>	F 415	F 520	F 250	>	F 302	F 357
		Total 10 Year	TCS	LOS Delay V/C Q	F 613	F 375	>	F 522	D 50	F 331	D 49	F 214	F 381	F 411	>	F 407	F 608	F 277	>	F 341	F 397
AM Peak Hour	Trafalgar Road & Cornwall Road	Base Year	TCS	LOS Delay V/C Q	F 119	D 46	>	F 73	E 71	F 242	F 238	F 136	D 48	>	E 62	F 84	C 28	>	D 50	F 106	
		Background Opening Year	TCS	LOS Delay V/C Q	F 93	C 33	>	F 56	E 79	F 84	F 83	F 142	D 52	>	E 63	F 101	C 33	>	D 49	E 62	
		Total Opening Year	TCS	LOS Delay V/C Q	F 93	C 33	>	F 56	E 79	F 86	F 86	F 142	D 54	>	E 65	F 92	C 29	>	D 45	E 62	
		Background 5 Year	TCS	LOS Delay V/C Q	F 174	D 36	>	F 92	E 79	F 164	F 162	F 167	E 58	>	E 72	F 197	D 49	>	F 96	F 108	
		Total 5 Year	TCS	LOS Delay V/C Q	F 201	D 37	>	F 103	E 79	F 172	F 169	F 215	E 59	>	E 79	F 226	D 50	>	F 110	F 118	
		Background 10 Year	TCS	LOS Delay V/C Q	F 307	D 37	>	F 149	E 79	F 238	F 234	F 234	F 140	>	F 153	F 309	F 225	>	F 195	F 185	
		Total 10 Year	TCS	LOS Delay V/C Q	F 380	D 42	>	F 182	E 79	F 275	F 270	F 234	F 100	>	F 119	F 378	F 197	>	F 211	F 203	



**TABLE 8.3: AM PEAK HOUR OPERATIONS – 2022-2037 (3/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach																Overall				
					Eastbound				Westbound				Northbound				Southbound								
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach					
AM Peak Hour	Cross Avenue & Argus Road / GO Station Driveway	Base Year	TCS	LOS Delay V/C Q	B 18 0.27 8	B 18 0.42 35	>	>	B 18	B 10 0.22 7	B 10 0.41 38	>	>	B 10	F 81 0.79 10	B 15 0.09 0	>	>	D 38	B 15 0.17 13	C 30 0.80 31	>	>	C 28	B 19 0.61
		Background Opening Year	TCS	LOS Delay V/C Q	C 20 0.35 10	C 21 0.56 50	>	>	C 20	B 12 0.29 8	B 12 0.50 50	>	>	B 12	F 132 0.93 14	B 15 0.10 0	>	>	E 57	D 45 0.91 96	E 69 1.02 65	>	>	E 60	C 35 0.77
		Total Opening Year	TCS	LOS Delay V/C Q	C 20 0.36 10	C 21 0.56 50	>	>	C 20	B 12 0.29 8	B 12 0.51 52	>	>	B 12	F 132 0.93 14	B 15 0.10 0	>	>	E 57	F 101 1.11 126	E 72 1.04 67	>	>	F 84	D 45 0.81
		Background 5 Year	TCS	LOS Delay V/C Q	C 21 0.43 11	C 22 0.69 73	>	>	C 22	F 81 0.98 40	B 12 0.56 64	>	>	C 21	F 838 2.66 37	C 21 0.29 0	>	>	F 300	F 230 1.41 140	F 200 1.35 121	>	>	F 211	F 109 1.65
		Total 5 Year	TCS	LOS Delay V/C Q	C 21 0.44 11	C 22 0.69 73	>	>	C 22	F 81 0.98 40	B 12 0.58 67	>	>	C 21	F 838 2.66 37	C 21 0.29 0	>	>	F 300	F 627 2.31 240	F 207 1.37 124	>	>	F 413	F 191 1.65
		Background 10 Year	TCS	LOS Delay V/C Q	C 23 0.55 13	C 26 0.82 103	>	>	C 25	F 424 1.84 98	B 12 0.61 78	>	>	F 85	F 189 1.25 38	E 69 0.92 0	>	>	F 110	F 677 2.40 153	C 24 0.32 15	>	>	F 467	F 132 2.05
		Total 10 Year	TCS	LOS Delay V/C Q	C 24 0.56 13	D 40 0.96 158	>	>	D 39	F 555 2.12 105	B 12 0.62 82	>	>	F 106	F 204 1.29 38	F 103 1.04 0	>	>	F 138	F 738 2.53 154	C 25 0.34 16	>	>	F 509	F 148 2.26
AM Peak Hour	Cross Avenue & Lyons Lane / Commercial Driveway	Base Year	TCS	LOS Delay V/C Q	A 9 0.13 10	A 9 0.24 12	>	>	A 9	A 6 0.56 15	A 3 0.08 4	>	>	A 5	C 25 0.10 7	C 24 0.03 5	>	>	C 24	C 25 0.13 6	C 25 0.13 14	>	>	C 25	A 9 0.48
		Background Opening Year	TCS	LOS Delay V/C Q	A 10 0.16 13	B 11 0.33 21	>	>	B 11	A 8 0.66 17	A 3 0.12 7	>	>	A 6	C 26 0.12 9	C 25 0.03 6	>	>	C 26	C 26 0.15 8	C 26 0.14 15	>	>	C 26	B 10 0.57
		Total Opening Year	TCS	LOS Delay V/C Q	A 10 0.16 13	B 11 0.33 21	>	>	B 11	A 8 0.66 17	A 3 0.14 7	>	>	A 6	C 26 0.12 9	C 25 0.03 6	>	>	C 26	C 26 0.15 8	C 26 0.14 15	>	>	C 26	B 10 0.57
		Background 5 Year	TCS	LOS Delay V/C Q	B 12 0.20 16	B 15 0.47 48	>	>	B 14	B 15 0.77 28	A 4 0.19 14	>	>	A 10	C 27 0.20 14	C 26 0.08 8	>	>	C 26	C 30 0.43 18	C 26 0.14 16	>	>	C 28	B 15 0.70
		Total 5 Year	TCS	LOS Delay V/C Q	B 13 0.21 16	B 15 0.47 48	>	>	B 14	B 15 0.77 28	A 4 0.21 15	>	>	A 9	C 27 0.20 14	C 26 0.08 8	>	>	C 26	C 30 0.43 18	C 26 0.14 16	>	>	C 28	B 15 0.70
		Background 10 Year	TCS	LOS Delay V/C Q	B 16 0.25 18	B 19 0.57 59	>	>	B 19	C 31 0.89 36	A 6 0.26 19	>	>	B 18	C 27 0.26 19	C 26 0.14 9	>	>	C 26	D 46 0.75 29	C 26 0.14 17	>	>	D 37	C 22 0.86
		Total 10 Year	TCS	LOS Delay V/C Q	B 17 0.26 18	B 20 0.58 60	>	>	B 19	C 32 0.90 37	A 6 0.27 21	>	>	B 18	C 27 0.26 19	C 26 0.14 9	>	>	C 26	D 46 0.76 29	C 26 0.14 17	>	>	D 37	C 22 0.87
AM Peak Hour	Cross Avenue & Lyons Lane	Base Year	TWSC	LOS Delay V/C Q	A 8 0.02 1	A 0 0.20 0	>	>	A 0	A 0 0.08 0	A 0 0 0	>	>	A 0						B 12 0.03 1	>	>	B 12		
		Background Opening Year	TWSC	LOS Delay V/C Q	A 8 0.04 1	A 0 0.24 0	>	>	A 0	A 0 0.11 0	A 0 0 0	>	>	A 0						C 19 0.39 15	>	>	C 19		
		Total Opening Year	TWSC	LOS Delay V/C Q	A 8 0.04 1	A 0 0.24 0	>	>	A 1	A 0 0.13 0	A 0 0 0	>	>	A 0						C 20 0.43 17	>	>	C 20		
		Background 5 Year	TWSC	LOS Delay V/C Q	A 8 0.04 1	A 0 0.28 0	>	>	A 0	A 0 0.15 0	A 0 0 0	>	>	A 0						D 26 0.49 21	>	>	D 26		
		Total 5 Year	TWSC	LOS Delay V/C Q	A 9 0.06 2	A 0 0.28 0	>	>	A 1	A 0 0.17 0	A 0 0 0	>	>	A 0						D 29 0.53 24	>	>	D 29		
		Background 10 Year	TWSC	LOS Delay V/C Q	A 9 0.04 1	A 0 0.32 0	>	>	A 0	A 0 0.19 0	A 0 0 0	>	>	A 0						C 18 0.10 3	>	>	C 18		
		Total 10 Year	TWSC	LOS Delay V/C Q	A 9 0.04 1	A 0 0.32 0	>	>	A 0	A 0 0.20 0	A 0 0 0	>	>	A 0						C 18 0.11 3	>	>	C 18		



**TABLE 8.4: AM PEAK HOUR OPERATIONS – 2022-2037 (4/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach												Overall				
					Eastbound				Westbound				Northbound					Southbound			
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		Left	Through	Right	Approach
AM Peak Hour	Lyons Lane & South Service Road	Base Year	TWSC	LOS Delay V/C Q	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 9	
		Background Opening Year	TWSC	LOS Delay V/C Q	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 9	
		Total Opening Year	TWSC	LOS Delay V/C Q	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 9	
		Background 5 Year	TWSC	LOS Delay V/C Q	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 9	
		Total 5 Year	TWSC	LOS Delay V/C Q	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 10	
		Background 10 Year	TWSC	LOS Delay V/C Q	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 9	
		Total 10 Year	TWSC	LOS Delay V/C Q	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 9	
AM Peak Hour	Argus Road & South Service Road	Base Year	TWSC	LOS Delay V/C Q	< 3	A 3	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	C 15	
		Background Opening Year	TWSC	LOS Delay V/C Q	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	F 176	
		Total Opening Year	TWSC	LOS Delay V/C Q	< 1	A 1	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	F 787	
		Background 5 Year	TWSC	LOS Delay V/C Q	< 1	A 1	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	F 256	
		Total 5 Year	TWSC	LOS Delay V/C Q	< 1	A 1	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	F Err	
		Background 10 Year	TWSC	LOS Delay V/C Q	< 1	A 1	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	E 44	
		Total 10 Year	TWSC	LOS Delay V/C Q	< 1	A 1	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	A 0	< 0	A 0	> 0	F 871	
AM Peak Hour	Dorval Road & QEW Westbound Off-Ramp	Base Year	TCS	LOS Delay V/C Q				D 38	C 29	D 36	B 11	B 11	B 15	B 15	B 15	B 15	B 15	B 15	C 23		
		Background Opening Year	TCS	LOS Delay V/C Q				0.75	0.23	0.34	0.21	0.21	0.60	0.60	0.60	0.60	0.60	0.60	0.60	C 24	
		Total Opening Year	TCS	LOS Delay V/C Q				115	23	34	36	36	43	43	43	43	43	43	43	C 24	
		Background 5 Year	TCS	LOS Delay V/C Q				0.76	0.30	0.42	0.25	0.25	0.69	0.69	0.69	0.69	0.69	0.69	0.69	C 27	
		Total 5 Year	TCS	LOS Delay V/C Q				124	32	34	36	36	43	43	43	43	43	43	43	C 27	
		Background 10 Year	TCS	LOS Delay V/C Q				0.81	0.42	0.54	0.28	0.28	0.78	0.78	0.78	0.78	0.78	0.78	0.78	C 31	
		Total 10 Year	TCS	LOS Delay V/C Q				142	56	40	48	48	53	53	53	53	53	53	53	C 31	





**TABLE 8.5: AM PEAK HOUR OPERATIONS – 2022-2037 (5/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach																
					Eastbound				Westbound				Northbound				Southbound				Overall
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Dorval Road & QEW Eastbound Off-Ramp	Base Year	TCS	LOS Delay V/C Q	C 35 41	D 40 67	D 37								A 6	A 6	A 8	A 8	B 14 0.57		
		Background Opening Year	TCS	LOS Delay V/C Q	D 37 0 49	D 45 1 81	D 40								A 7 0 50	A 7 0 50	A 10 1 144	A 10 1 144	B 16 0.63		
		Total Opening Year	TCS	LOS Delay V/C Q	D 37 49	D 45 81	D 40								A 7 50	A 7 50	A 10 144	A 10 144	B 16 0.63		
		Background 5 Year	TCS	LOS Delay V/C Q	D 37 56	D 46 73 95	D 41								A 8 0.33 57	A 8 0.33 57	B 13 0.70 172	B 13 0.70 172	B 18 0.71		
		Total 5 Year	TCS	LOS Delay V/C Q	D 37 56	D 46 73 95	D 41								A 8 0.33 57	A 8 0.33 57	B 13 0.70 172	B 13 0.70 172	B 18 0.71		
		Background 10 Year	TCS	LOS Delay V/C Q	D 37 64	D 50 110	D 42								A 9 0.37 64	A 9 0.37 64	B 16 0.79 210	B 16 0.79 210	C 20 0.79		
		Total 10 Year	TCS	LOS Delay V/C Q	D 37 64	D 50 110	D 42								A 9 0.37 64	A 9 0.37 64	B 16 0.79 210	B 16 0.79 210	C 20 0.79		
AM Peak Hour	Kerr Street & QEW Westbound Off-Ramp	Base Year	TCS	LOS Delay V/C Q	A 10 0.30 20	A 10	A 9 0.18 13	A 9	B 11 0.32 25	A 10									A 10 0.31		
		Background Opening Year	TCS	LOS Delay V/C Q	A 10 0.33 22	A 10	A 9 0.20 14	A 9	B 11 0.36 27	A 10									A 10 0.35		
		Total Opening Year	TCS	LOS Delay V/C Q	A 10 0.33 22	A 10	A 9 0.20 14	A 9	B 11 0.36 27	A 10									A 10 0.35		
		Background 5 Year	TCS	LOS Delay V/C Q	B 10 0.37 24	B 10	A 9 0.22 15	A 9	B 11 0.39 30	B 11									B 10 0.38		
		Total 5 Year	TCS	LOS Delay V/C Q	B 10 0.37 24	B 10	A 9 0.22 15	A 9	B 11 0.39 30	B 11									B 10 0.38		
		Background 10 Year	TCS	LOS Delay V/C Q	B 11 0.41 27	B 11	A 9 0.25 17	A 9	B 12 0.44 33	B 12									B 11 0.42		
		Total 10 Year	TCS	LOS Delay V/C Q	B 11 0.41 27	B 11	A 9 0.25 17	A 9	B 12 0.44 33	B 12									B 11 0.42		
AM Peak Hour	Canadian Road / South Service Road & Royal Windsor Drive / QEW Eastbound Off-Ramp	Base Year	TCS	LOS Delay V/C Q	A 4 0.03 2	A 6 0.24 30	> > >	A 6	A 3 0.12 6	A 5 0.23 29	A 4 0.01 0	A 5	D 38 0.05 6	D 38 0.03 0	D 38 0.02 3	D 39 0.11 10	D 38 0.02 0	D 38 0.02 0	A 8 0.21		
		Background Opening Year	TCS	LOS Delay V/C Q	A 4 0.04 2	A 6 0.26 33	> > >	A 6	A 3 0.14 7	A 5 0.25 32	A 4 0.01 0	A 6	D 39 0.05 6	D 39 0.03 2	D 39 0.02 3	D 40 0.10 11	D 39 0.02 0	D 39 0.02 0	A 9 0.23		
		Total Opening Year	TCS	LOS Delay V/C Q	A 4 0.04 2	A 6 0.26 33	> > >	A 6	A 3 0.14 7	A 5 0.25 32	A 4 0.01 0	A 6	D 39 0.05 6	D 39 0.03 2	D 39 0.02 3	D 40 0.10 11	D 39 0.02 0	D 39 0.02 0	A 9 0.23		
		Background 5 Year	TCS	LOS Delay V/C Q	A 4 0.04 2	A 7 0.29 37	> > >	A 7	A 3 0.16 7	A 5 0.28 35	A 4 0.01 0	A 6	D 41 0.05 7	D 41 0.04 3	D 41 0.02 4	D 41 0.11 12	D 41 0.02 0	D 41 0.02 0	A 9 0.25		
		Total 5 Year	TCS	LOS Delay V/C Q	A 4 0.04 2	A 7 0.29 37	> > >	A 7	A 3 0.16 7	A 5 0.28 35	A 4 0.01 0	A 6	D 41 0.05 7	D 41 0.04 3	D 41 0.02 4	D 41 0.11 12	D 41 0.02 0	D 41 0.02 0	A 9 0.25		
		Background 10 Year	TCS	LOS Delay V/C Q	A 4 0.05 2	A 8 0.33 42	> > >	A 7	A 4 0.19 8	A 5 0.31 40	A 4 0.01 0	A 6	D 40 0.05 7	D 40 0.04 5	D 40 0.02 4	D 40 0.12 12	D 40 0.02 0	D 40 0.02 0	A 10 0.28		
		Total 10 Year	TCS	LOS Delay V/C Q	A 4 0.05 2	A 8 0.33 42	> > >	A 7	A 4 0.19 8	A 5 0.31 40	A 4 0.01 0	A 6	D 40 0.05 7	D 40 0.04 5	D 40 0.02 4	D 40 0.12 12	D 40 0.02 0	D 40 0.02 0	A 10 0.28		



**TABLE 8.6: AM PEAK HOUR OPERATIONS – 2022-2037 (6/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach																Overall					
					Eastbound				Westbound				Northbound				Southbound									
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach						
AM Peak Hour	North-South Local Road & South Service Road E	Background 10 Year	TWSC	LOS Delay V/C Q	A	>	A	0	<	A	>	A	0	A	>	A	0									
		Total 10 Year	TWSC	LOS Delay V/C Q	A	>	A	0	<	A	>	A	0	A	>	A	0									
AM Peak Hour	Argus Road & East-West Local Road	Background 10 Year	TWSC	LOS Delay V/C Q	A	>	A	0					<	A	>	A	0	A	>	A	0					
		Total 10 Year	TWSC	LOS Delay V/C Q	A	>	A	0					<	A	>	A	0	A	>	A	0					
AM Peak Hour	North-South Local Road & East-West Local Road	Background 10 Year	TWSC	LOS Delay V/C Q					B	>	B	15	A	>	A	0	<	A	>	A	0					
		Total 10 Year	TWSC	LOS Delay V/C Q					E	>	E	47	A	>	A	0	<	A	>	A	0					
AM Peak Hour	GO Station West Access/North-South Local Road & Cross Avenue	Background 10 Year	TCS	LOS Delay V/C Q	<	B	>	B	10	<	F	>	F	173	A	B	>	B	12	B	C	>	C	22	E	79
		Total 10 Year	TCS	LOS Delay V/C Q	<	B	>	B	11	<	F	>	F	190	A	B	>	B	12	D	C	>	C	33	F	85
AM Peak Hour	North Access & South Service Road	Total Opening Year	TWSC	LOS Delay V/C Q	A	>	A	0	<	A	>	A	5	A	>	A	9									
		Total 5 Year	TWSC	LOS Delay V/C Q	A	>	A	0	<	A	>	A	6	B	>	B	12									
		Total 10 Year	TWSC	LOS Delay V/C Q	A	>	A	0	<	A	>	A	6	A	>	A	9									
AM Peak Hour	East Access & North-South Local Road	Total Opening Year	TWSC	LOS Delay V/C Q	A	>	A	0					<	A	>	A	0	A	>	A	0					
		Total 5 Year	TWSC	LOS Delay V/C Q	A	>	A	0					<	A	>	A	0	A	>	A	0					
		Total 10 Year	TWSC	LOS Delay V/C Q	A	>	A	7					<	A	>	A	0	A	>	A	10					

MOE - Measure of Effectiveness  
 LOS - Level of Service  
 Delay - Average Delay per Vehicle in Seconds  
 Q - 95th Percentile Queue Length (m)  
 TCS - Traffic Control Signal  
 TWSC - Two-Way Stop Control  
 < - Shared Left-Turn  
 > - Shared Right-Turn



**TABLE 8.7: PM PEAK HOUR OPERATIONS – 2022-2037 (1/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach																
					Eastbound				Westbound				Northbound				Southbound				Overall
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	Trafalgar Road & QEW Westbound Off-Ramp / North Service Road	Base Year	TCS	LOS Delay V/C Q	E 64 0.29 13	C 30 0.41 73	C 34	D 54 0.79 141	D 51 0.76 107	D 52 0.77 106	D 52	F 99 1.15 370	F 99	F 164 1.28 380	F 163	F 113 1.06					
		Background Opening Year	TCS	LOS Delay V/C Q	E 64 0.31 14	C 28 0.33 57	C 33	E 56 0.82 152	D 52 0.78 112	D 37 0.30 34	D 50	D 49 1.02 302	D 49	C 34 0.86 180	C 34	D 43 0.90					
		Total Opening Year	TCS	LOS Delay V/C Q	E 64 0.31 14	C 28 0.33 57	C 33	E 57 0.83 155	D 52 0.79 114	D 37 0.30 34	D 50	D 53 1.03 309	D 53	C 35 0.88 186	C 35	D 46 0.91					
		Background 5 Year	TCS	LOS Delay V/C Q	E 64 0.34 15	C 28 0.37 65	C 33	E 65 0.90 178	D 59 0.86 127	D 37 0.35 41	E 56	F 90 1.12 354	F 90	D 44 0.96 230	D 44	E 66 0.99					
		Total 5 Year	TCS	LOS Delay V/C Q	E 64 0.34 15	C 28 0.37 65	C 33	E 70 0.93 187	D 62 0.88 131	D 37 0.35 41	E 59	F 105 1.15 370	F 105	E 56 1.01 253	E 56	E 77 1.02					
		Background 10 Year	TCS	LOS Delay V/C Q	E 64 0.37 17	C 29 0.42 75	C 34	F 90 1.00 209	E 75 0.95 144	D 38 0.42 52	E 72	F 213 1.39 395	F 213	F 123 1.19 335	F 122	F 149 1.18					
		Total 10 Year	TCS	LOS Delay V/C Q	E 64 0.37 17	C 28 0.41 74	C 33	F 87 0.99 210	E 77 0.96 153	D 37 0.41 50	E 71	F 239 1.45 419	F 239	F 157 1.26 363	F 156	F 171 1.21					
PM Peak Hour	Trafalgar Road & QEW Eastbound Off-Ramp	Base Year	TCS	LOS Delay V/C Q	E 71 1.00 206	E 67 0.94 209	E 70					C 25 0.86 86	C 25	A 9 0.67 40	A 9	C 33 0.92					
		Background Opening Year	TCS	LOS Delay V/C Q	D 35 1 137	D 50 1 194	D 40					C 29 1 96	C 29	C 22 1 173	C 22	C 30 0.84					
		Total Opening Year	TCS	LOS Delay V/C Q	C 34 0.75 137	D 51 0.90 215	D 40					C 32 0.85 103	C 32	C 23 0.83 182	C 23	C 31 0.87					
		Background 5 Year	TCS	LOS Delay V/C Q	D 38 0.83 166	E 62 0.95 246	D 46					D 36 0.89 87	D 36	C 28 0.93 210	C 28	D 36 0.94					
		Total 5 Year	TCS	LOS Delay V/C Q	D 37 0.81 166	F 81 1.03 282	D 53					C 39 0.96 88	C 39	D 37 1.00 229	D 37	D 42 1.01					
		Background 10 Year	TCS	LOS Delay V/C Q	D 44 0.91 197	F 83 1.03 284	E 57					F 142 1.22 132	F 142	F 114 1.19 284	F 114	F 108 1.13					
		Total 10 Year	TCS	LOS Delay V/C Q	E 62 0.99 223	F 152 1.21 335	F 94					F 121 1.19 73	F 121	F 99 1.17 250	F 99	F 106 1.20					
PM Peak Hour	Trafalgar Road & Leighland Avenue/ Iroquois Shore Road	Base Year	TCS	LOS Delay V/C Q	D 38 0.41 32	D 42 0.29 35	D 51 0.65 65	D 46	F 214 1.37 185	D 38 0.34 45	D 36 0.20 22	F 164	F 207 1.33 204	C 31 0.81 187	E 76 1.03 259	C 33 0.69 45	C 33 0.73 119	C 32	E 77 1.35		
		Background Opening Year	TCS	LOS Delay V/C Q	D 49 0.62 41	D 48 0.42 41	D 45 0.17 22	D 47	E 59 0.89 60	D 46 0.51 55	D 43 0.31 33	D 52	D 37 0.80 122	C 23 0.63 134	C 25 0.57 58	C 26 0.56 31	C 38 0.70 119	D 36	C 34 0.82		
		Total Opening Year	TCS	LOS Delay V/C Q	D 49 0.62 41	D 48 0.42 41	D 45 0.17 22	D 47	E 59 0.89 60	D 46 0.51 55	D 43 0.32 33	D 52	D 39 0.81 126	C 23 0.64 138	C 25 0.57 58	C 26 0.56 32	C 38 0.73 125	D 37	C 34 0.83		
		Background 5 Year	TCS	LOS Delay V/C Q	D 42 0.54 39	D 47 0.56 63	D 42 0.22 25	D 43	E 61 0.96 82	D 36 0.37 52	D 37 0.44 49	D 50	D 53 0.90 168	C 32 0.77 144	D 50 0.90 201	D 48 0.79 67	D 54 0.90 122	D 52	D 45 0.95		
		Total 5 Year	TCS	LOS Delay V/C Q	D 42 0.54 39	D 47 0.56 63	D 42 0.22 25	D 43	E 61 0.96 82	D 36 0.37 52	D 37 0.44 49	D 50	D 53 0.90 171	C 32 0.81 154	D 50 0.89 201	D 48 0.79 66	D 54 0.99 138	D 64	D 48 0.96		
		Background 10 Year	TCS	LOS Delay V/C Q	D 39 0.53 42	D 50 0.69 89	D 39 0.20 23	D 43	F 92 1.08 96	C 33 0.36 56	C 60 0.39 78	E 66	D 83 1.02 182	F 59 1.00 213	F 159 1.24 297	F 94	F 75 0.92 84	F 142 1.19 183	F 128	F 90 1.16	
		Total 10 Year	TCS	LOS Delay V/C Q	D 41 0.56 42	D 55 0.75 92	D 40 0.20 24	D 46	E 67 1.00 99	C 32 0.35 56	D 41 0.68 95	D 54	F 149 1.20 196	F 45 0.95 202	F 117 1.14 278	F 83	F 197 1.26 95	F 85 1.05 169	F 98	E 77 1.13	



**TABLE 8.8: PM PEAK HOUR OPERATIONS – 2022-2037 (2/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach																			
					Eastbound				Westbound				Northbound				Southbound				Overall			
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach				
PM Peak Hour	Trafalgar Road & Argus Road	Base Year	TWSC	LOS Delay V/C Q	B	10									A	0			A	0				
		Background Opening Year	TWSC	LOS Delay V/C Q	B	12									A	0			A	0				
		Total Opening Year	TWSC	LOS Delay V/C Q	B	12									A	0			A	0				
		Background 5 Year	TWSC	LOS Delay V/C Q	B	13									A	0			A	0				
		Total 5 Year	TWSC	LOS Delay V/C Q	C	16									A	0			A	0				
		Background 10 Year	TWSC	LOS Delay V/C Q	B	14									A	0			A	0				
		Total 10 Year	TWSC	LOS Delay V/C Q	C	18									A	0			A	0				
PM Peak Hour	Trafalgar Road & Cross Avenue / South Service Road	Base Year	TCS	LOS Delay V/C Q	F	366	F	344	E	68	E	62	F	138	D	44	D	46	D	46	F	133		
		Background Opening Year	TCS	LOS Delay V/C Q	F	280	F	290	E	68	E	72	F	130	F	110	F	198	F	176	F	178		
		Total Opening Year	TCS	LOS Delay V/C Q	F	311	F	290	E	70	E	63	F	126	F	114	F	205	F	197	F	197		
		Background 5 Year	TCS	LOS Delay V/C Q	F	415	F	475	E	72	E	69	F	183	F	184	F	249	F	289	F	286		
		Total 5 Year	TCS	LOS Delay V/C Q	F	466	F	475	E	79	E	61	F	181	F	222	F	282	F	338	F	333		
		Background 10 Year	TCS	LOS Delay V/C Q	F	467	F	3249	F	137	F	124	F	1028	F	283	F	292	F	459	F	445		
		Total 10 Year	TCS	LOS Delay V/C Q	F	736	F	2648	E	61	E	56	F	795	F	384	F	326	F	537	F	520		
PM Peak Hour	Trafalgar Road & Cornwall Road	Base Year	TCS	LOS Delay V/C Q	F	355	E	56	F	257	F	247	F	89	F	89	F	133	D	70	F	193		
		Background Opening Year	TCS	LOS Delay V/C Q	F	113	F	85	F	219	F	212	F	87	F	87	F	286	F	84	F	144		
		Total Opening Year	TCS	LOS Delay V/C Q	F	111	F	94	F	210	F	204	F	89	F	89	F	302	F	101	F	158		
		Background 5 Year	TCS	LOS Delay V/C Q	F	175	F	96	F	360	F	350	F	114	F	114	F	510	F	214	F	282		
		Total 5 Year	TCS	LOS Delay V/C Q	F	193	F	96	F	360	F	349	F	113	F	113	F	512	F	211	F	284		
		Background 10 Year	TCS	LOS Delay V/C Q	F	226	F	88	F	469	F	457	F	139	F	139	F	567	F	448	F	402		
		Total 10 Year	TCS	LOS Delay V/C Q	F	274	F	116	F	504	F	492	F	144	F	144	F	725	F	383	F	428		



**TABLE 8.9: PM PEAK HOUR OPERATIONS – 2022-2037 (3/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach																Overall
					Eastbound				Westbound				Northbound				Southbound				
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	Cross Avenue & Argus Road / GO Station Driveway	Base Year	TCS	LOS	B	B	>	B	A	A	>	A	C	C	>	C	C	C	>	C	B
				Delay	11	17	>	17	9	6	>	6	24	23	>	23	28	23	>	25	16
		V/C	0.05	0.69	>		0.25	0.20	>		0.19	0.14	>		0.58	0.21	>		0.6		
		Q	4	80	>		6	20	>		7	0	>		44	12	>				
		Background Opening Year	TCS	LOS	B	C	>	C	B	A	>	A	C	C	>	C	D	C	>	D	C
		Delay	14	26	>	26	15	9	>	9	24	22	>	23	52	23	>	39	24		
		V/C	0.16	0.85	>		0.38	0.31	>		0.21	0.14	>		0.89	0.25	>		0.81		
Q	9	111	>		10	32	>		8	0	>		95	12	>						
Total Opening Year	TCS	LOS	B	C	>	C	B	A	>	A	C	C	>	C	F	C	>	E	C		
Delay	15	27	>	27	16	9	>	10	23	22	>	23	90	23	>	63	31				
V/C	0.16	0.86	>		0.39	0.32	>		0.20	0.14	>		1.04	0.25	>		0.88				
Q	9	111	>		10	34	>		8	0	>		122	12	>						
Background 5 Year	TCS	LOS	B	D	>	D	F	A	>	C	F	C	>	F	F	C	>	E	E		
Delay	16	54	>	52	151	10	>	31	280	25	>	137	124	24	>	75	58				
V/C	0.26	1.02	>		1.13	0.37	>		1.44	0.33	>		1.13	0.31	>		1.25				
Q	12	159	>		56	41	>		50	0	>		118	12	>						
Total 5 Year	TCS	LOS	B	D	>	D	F	A	>	C	F	C	>	F	F	C	>	F	F		
Delay	16	54	>	52	151	10	>	29	280	25	>	137	312	25	>	194	85				
V/C	0.28	1.02	>		1.13	0.41	>		1.44	0.33	>		1.59	0.37	>		1.30				
Q	12	159	>		56	47	>		50	0	>		174	18	>						
Background 10 Year	TCS	LOS	B	F	>	F	F	A	>	F	F	D	>	F	F	C	>	F	F		
Delay	18	125	>	119	456	10	>	100	686	44	>	351	256	24	>	146	147				
V/C	0.37	1.21	>		1.88	0.43	>		2.39	0.77	>		1.45	0.30	>		2.07				
Q	16	206	>		97	47	>		88	0	>		129	13	>						
Total 10 Year	TCS	LOS	B	F	>	F	F	A	>	F	F	D	>	F	F	C	>	F	F		
Delay	18	153	>	146	456	10	>	94	768	49	>	394	294	26	>	166	165				
V/C	0.39	1.27	>		1.88	0.46	>		2.57	0.80	>		1.54	0.36	>		2.12				
Q	16	229	>		97	52	>		89	0	>		132	18	>						
PM Peak Hour	Cross Avenue & Lyons Lane / Commercial Driveway	Base Year	TCS	LOS	B	B	>	B	A	A	>	A	D	C	>	C	B	B	>	B	C
				Delay	15	15	>	15	9	9	>	9	41	20	>	33	20	20	>	20	21
		V/C	0.17	0.15	>		0.05	0.19	>		0.83	0.16	>		0.07	0.08	>		0.45		
		Q	10	16	>		3	22	>		61	0	>		6	1	>				
		Background Opening Year	TCS	LOS	B	B	>	B	A	B	>	B	D	C	>	D	B	B	>	B	C
		Delay	17	16	>	16	10	10	>	10	46	20	>	36	19	19	>	19	22		
		V/C	0.22	0.23	>		0.05	0.27	>		0.87	0.17	>		0.08	0.09	>		0.53		
Q	11	24	>		4	31	>		69	0	>		6	0	>						
Total Opening Year	TCS	LOS	B	B	>	B	A	B	>	B	D	C	>	D	B	B	>	B	C		
Delay	17	16	>	16	10	10	>	10	46	20	>	36	19	19	>	19	22				
V/C	0.22	0.23	>		0.05	0.29	>		0.87	0.17	>		0.08	0.09	>		0.54				
Q	11	24	>		4	33	>		69	0	>		6	0	>						
Background 5 Year	TCS	LOS	B	B	>	B	A	B	>	B	D	C	>	D	C	B	>	B	C		
Delay	17	17	>	17	10	11	>	11	49	21	>	36	20	19	>	20	22				
V/C	0.19	0.27	>		0.09	0.36	>		0.89	0.23	>		0.19	0.09	>		0.59				
Q	9	27	>		5	41	>		71	0	>		11	0	>						
Total 5 Year	TCS	LOS	B	B	>	B	A	B	>	B	D	C	>	D	C	B	>	B	C		
Delay	17	17	>	17	10	11	>	11	49	21	>	36	20	19	>	20	21				
V/C	0.20	0.27	>		0.09	0.40	>		0.89	0.23	>		0.19	0.09	>		0.62				
Q	9	27	>		5	47	>		71	0	>		11	0	>						
Background 10 Year	TCS	LOS	B	B	>	B	B	B	>	B	E	C	>	D	C	B	>	C	C		
Delay	17	18	>	18	11	12	>	12	61	21	>	40	22	19	>	20	24				
V/C	0.14	0.29	>		0.13	0.43	>		0.95	0.28	>		0.33	0.11	>		0.67				
Q	6	29	>		6	49	>		84	0	>		15	0	>						
Total 10 Year	TCS	LOS	B	B	>	B	B	B	>	B	E	C	>	D	C	B	>	C	C		
Delay	17	18	>	18	11	12	>	12	61	21	>	40	22	19	>	20	23				
V/C	0.14	0.31	>		0.13	0.44	>		0.95	0.28	>		0.33	0.11	>		0.67				
Q	6	31	>		6	50	>		84	0	>		15	0	>						
PM Peak Hour	Cross Avenue & Lyons Lane	Base Year	TWSC	LOS	A	A	>	A	A	A	>	A			>		B	B	>	B	
				Delay	9	0	>	1	0	0	>	0			>		14		>	14	
		V/C	0.01	0.06	>		0.27		>				>		0.20		>				
		Q	0	0	>		0		>				>		6		>				
		Background Opening Year	TWSC	LOS	B	A	>	A	A	A	>	A			>		D		>	D	
		Delay	11	0	>	3	0	0	>	0			>		31		>	31			
		V/C	0.11	0.08	>		0.31		>				>		0.63		>				
Q	3	0	>		0		>				>		32		>						
Total Opening Year	TWSC	LOS	B	A	>	A	A	A	>	A			>		E		>	E			
Delay	11	0	>	3	0	0	>	0			>		36		>	36					
V/C	0.14	0.08	>		0.31		>				>		0.69		>						
Q	4	0	>		0		>				>		39		>						
Background 5 Year	TWSC	LOS	B	A	>	A	A	A	>	A			>		D		>	D			
Delay	11	0	>	2	0	0	>	0			>		30		>	30					
V/C	0.11	0.08	>		0.31		>				>		0.62		>						
Q	3	0	>		0		>				>		32		>						
Total 5 Year	TWSC	LOS	B	A	>	A	A	A	>	A			>		F		>	F			
Delay	12	0	>	3	0	0	>	0			>		50		>	50					
V/C	0.18	0.08	>		0.32		>				>		0.81		>						
Q	5	0	>		0		>				>		54		>						
Background 10 Year	TWSC	LOS	B	A	>	A	A	A	>	A			>		C		>	C			
Delay	10	0	>	1	0	0	>	0			>		17		>	17					
V/C	0.03	0.09	>		0.32		>				>		0.34		>						
Q	1	0	>		0		>				>		12		>						
Total 10 Year	TWSC	LOS	B	A	>	A	A	A	>	A			>		C		>	C			
Delay	10	0	>	1	0	0	>	0			>		17		>	17					
V/C	0.03	0.10	>		0.32		>				>		0.34		>						
Q	1	0	>		0		>				>		12		>						



**TABLE 8.10: PM PEAK HOUR OPERATIONS – 2022-2037 (4/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach												Overall				
					Eastbound				Westbound				Northbound					Southbound			
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		Left	Through	Right	Approach
PM Peak Hour	Lyons Lane & South Service Road	Base Year	TWSC	LOS Delay V/C Q	< 4	< 0.00	< 0	A 4	> 0	> 0.01	> 0	A 0	> 0	> 0.04	> 1	A 9	B 9				
		Background Opening Year	TWSC	LOS Delay V/C Q	< 3	< 0.01	< 0	A 3	> 0	> 0.03	> 0	A 0	> 0	> 0.11	> 3	A 9	B 9				
		Total Opening Year	TWSC	LOS Delay V/C Q	< 3	< 0.01	< 0	A 3	> 0	> 0.06	> 0	A 0	> 0	> 0.13	> 4	A 10	B 10				
		Background 5 Year	TWSC	LOS Delay V/C Q	< 4	< 0.01	< 0	A 4	> 0	> 0.03	> 0	A 0	> 0	> 0.12	> 3	A 9	B 9				
		Total 5 Year	TWSC	LOS Delay V/C Q	< 4	< 0.01	< 0	A 4	> 0	> 0.12	> 0	A 0	> 0	> 0.16	> 5	A 10	B 10				
		Background 10 Year	TWSC	LOS Delay V/C Q	< 4	< 0.01	< 0	A 4	> 0	> 0.04	> 0	A 0	> 0	> 0.07	> 2	A 9	B 9				
		Total 10 Year	TWSC	LOS Delay V/C Q	< 4	< 0.01	< 0	A 4	> 0	> 0.04	> 0	A 0	> 0	> 0.07	> 2	A 9	B 9				
PM Peak Hour	Argus Road & South Service Road	Base Year	TWSC	LOS Delay V/C Q	< 5	< 0.02	< 1	A 5	> 0	> 0.26	> 0	A 0	> 0	> 0.06	> 2	B 11	C 11				
		Background Opening Year	TWSC	LOS Delay V/C Q	< 3	< 0.03	< 1	A 3	> 0	> 0.46	> 0	A 0	> 0	> 0.25	> 8	C 16	D 16				
		Total Opening Year	TWSC	LOS Delay V/C Q	< 3	< 0.03	< 1	A 3	> 0	> 0.50	> 0	A 0	> 0	> 0.54	> 25	C 24	D 24				
		Background 5 Year	TWSC	LOS Delay V/C Q	< 3	< 0.03	< 1	A 3	> 0	> 0.48	> 0	A 0	> 0	> 0.28	> 9	C 18	D 18				
		Total 5 Year	TWSC	LOS Delay V/C Q	< 3	< 0.04	< 1	A 3	> 0	> 0.63	> 0	A 0	> 0	> 1.06	> 103	F 100	G 100				
		Background 10 Year	TWSC	LOS Delay V/C Q	< 3	< 0.04	< 1	A 3	> 0	> 0.53	> 0	A 0	> 0	> 0.24	> 8	C 19	D 19				
		Total 10 Year	TWSC	LOS Delay V/C Q	< 4	< 0.05	< 1	A 4	> 0	> 0.68	> 0	A 0	> 0	> 0.56	> 25	D 34	E 34				
PM Peak Hour	Dorval Road & QEW Westbound Off-Ramp	Base Year	TCS	LOS Delay V/C Q				C 35	C 35	0.72	0.64	109	102	0.46	90	B 14	C 22				
		Background Opening Year	TCS	LOS Delay V/C Q				C 30	C 30	0.70	0.70	108	118	0.55	120	B 18	C 23				
		Total Opening Year	TCS	LOS Delay V/C Q				C 30	C 30	0.70	0.70	108	118	0.55	120	B 18	C 23				
		Background 5 Year	TCS	LOS Delay V/C Q				C 31	C 31	0.74	0.75	124	141	0.63	138	C 22	C 26				
		Total 5 Year	TCS	LOS Delay V/C Q				C 31	C 31	0.74	0.75	124	141	0.63	138	C 22	C 26				
		Background 10 Year	TCS	LOS Delay V/C Q				C 33	D 33	0.78	0.81	145	169	0.72	160	C 26	C 28				
		Total 10 Year	TCS	LOS Delay V/C Q				C 33	D 33	0.78	0.81	145	169	0.72	160	C 26	C 28				



**TABLE 8.11: PM PEAK HOUR OPERATIONS – 2022-2037 (5/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach																
					Eastbound				Westbound				Northbound				Southbound				Overall
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	Dorval Road & QEW Eastbound Off-Ramp	Base Year	TCS	LOS Delay V/C Q	D 37 0.53 43	D 36 0.39 39	D 36				A 6 0.44 61	A 6			A 5 0.42 57	A 5	B 12 0.46				
		Background Opening Year	TCS	LOS Delay V/C Q	D 41 1 54	D 40 0 47	D 41				A 7 7 82	A 7			A 6 6 76	A 6	B 14 0.15				
		Total Opening Year	TCS	LOS Delay V/C Q	D 41 0.59 54	D 40 0.43 47	D 41				A 7 0.48 82	A 7			A 6 0.46 76	A 6	B 14 0.50				
		Background 5 Year	TCS	LOS Delay V/C Q	D 42 0.62 60	D 41 0.54 60	D 42				A 8 0.54 105	A 8			A 8 0.52 97	A 8	B 15 0.56				
		Total 5 Year	TCS	LOS Delay V/C Q	D 42 0.62 60	D 41 0.54 60	D 42				A 8 0.54 105	A 8			A 8 0.52 97	A 8	B 15 0.56				
		Background 10 Year	TCS	LOS Delay V/C Q	D 42 0.65 69	D 43 0.61 73	D 42				A 10 0.61 133	A 10			A 9 0.58 122	A 9	B 16 0.62				
		Total 10 Year	TCS	LOS Delay V/C Q	D 41 0.64 69	D 42 0.61 73	D 42				A 10 0.62 136	A 10			A 10 0.59 125	A 10	B 16 0.62				
PM Peak Hour	Kerr Street & QEW Westbound Off-Ramp	Base Year	TCS	LOS Delay V/C Q	A 10 0.28 19	A 10	B 11 0.46 31	B 11	A 9 0.15 13	A 9							B 10 0.31				
		Background Opening Year	TCS	LOS Delay V/C Q	B 12 0.59 41	B 12	C 30 0.96 98	C 30	B 11 0.32 25	B 17							C 22 0.86				
		Total Opening Year	TCS	LOS Delay V/C Q	B 12 0.59 41	B 12	C 30 0.96 98	C 30	B 11 0.32 25	B 17							C 22 0.86				
		Background 5 Year	TCS	LOS Delay V/C Q	B 13 0.62 44	B 13	D 41 1.02 105	D 41	B 11 0.34 26	B 19							C 28 0.91				
		Total 5 Year	TCS	LOS Delay V/C Q	B 13 0.62 44	B 13	D 41 1.02 105	D 41	B 11 0.34 26	B 19							C 28 0.91				
		Background 10 Year	TCS	LOS Delay V/C Q	B 10 0.38 25	B 10	B 13 0.62 44	B 13	A 10 0.20 16	B 10							B 12 0.48				
		Total 10 Year	TCS	LOS Delay V/C Q	B 10 0.38 25	B 10	B 13 0.62 44	B 13	A 10 0.20 16	B 10							B 12 0.48				
PM Peak Hour	Canadian Road / South Service Road & Royal Windsor Drive / QEW Eastbound Off-Ramp	Base Year	TCS	LOS Delay V/C Q	A 5 0.26 14	A 10 0.27 44	A 8	A 6 0.28 19	A 10	A 11 0.31 53	A 10	D 19 0.15 19	D 36 0.06 8	D 38 0.40 42	D 38 0.26 24	D 38	B 18 0.32				
		Background Opening Year	TCS	LOS Delay V/C Q	A 8 0.34 22	B 14 0.35 64	B 12	A 8 0.36 29	B 13	B 11 0.39 72	B 13	C 29 0.12 17	C 29 0.07 12	C 34 0.33 7	C 34 0.58 55	C 34	B 18 0.44				
		Total Opening Year	TCS	LOS Delay V/C Q	A 8 0.34 22	B 14 0.35 64	B 12	A 8 0.36 29	B 13	B 11 0.39 72	B 13	C 29 0.12 17	C 29 0.07 12	C 34 0.33 7	C 34 0.58 55	C 34	B 18 0.44				
		Background 5 Year	TCS	LOS Delay V/C Q	B 10 0.41 29	B 17 0.41 83	B 15	B 10 0.43 37	B 16	B 13 0.46 92	B 16	C 18 0.12 8	C 28 0.07 12	C 34 0.32 8	C 34 0.65 69	C 34	C 20 0.51				
		Total 5 Year	TCS	LOS Delay V/C Q	B 10 0.41 29	B 17 0.41 83	B 15	B 10 0.43 37	B 16	B 13 0.46 92	B 16	C 18 0.12 8	C 28 0.07 12	C 34 0.32 8	C 34 0.65 69	C 34	C 20 0.51				
		Background 10 Year	TCS	LOS Delay V/C Q	B 14 0.52 37	C 21 0.49 105	B 19	B 13 0.53 49	B 20	C 15 0.54 116	B 20	C 19 0.11 12	C 27 0.08 12	C 36 0.31 8	C 36 0.73 89	D 36	C 23 0.61				
		Total 10 Year	TCS	LOS Delay V/C Q	B 14 0.53 37	C 22 0.49 105	B 19	B 14 0.54 49	B 20	C 15 0.53 115	B 20	C 19 0.11 12	C 27 0.08 12	C 37 0.31 8	C 37 0.74 93	D 37	C 24 0.61				



**TABLE 8.12: PM PEAK HOUR OPERATIONS – 2022-2037 (6/6)**

Analysis Period	Intersection	Horizon	Control Type	MOE	Direction / Movement / Approach																Overall
					Eastbound				Westbound				Northbound				Southbound				
					Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	North-South Local Road & South Service Road E	Background 10 Year	TWSC	LOS Delay V/C Q	A 0	> 0	> 0.03	A 0	< A 0	> 0	> 0.00	A 0	A 0	> 0	> 0.00	A 0					
		Total 10 Year	TWSC	LOS Delay V/C Q	A 0	> 0	> 0.06	A 0	< A 0	> 0	> 0.00	A 0	A 0	> 0	> 0.00	A 0					
PM Peak Hour	Argus Road & East-West Local Road	Background 10 Year	TWSC	LOS Delay V/C Q	A 0	> 0	> 0.00	A 0					< A 0	> 0	> 0.00	A 0	A 0	> 0	> 0.35	A 0	
		Total 10 Year	TWSC	LOS Delay V/C Q	A 0	> 0	> 0.00	A 0					< A 0	> 0	> 0.00	A 0	A 0	> 0	> 0.35	A 0	
PM Peak Hour	North-South Local Road & East-West Local Road	Background 10 Year	TWSC	LOS Delay V/C Q					A 9	> 0	> 0.09	A 9	A 0	> 0	> 0.00	A 0	< A 0	> 0	> 0.00	A 0	
		Total 10 Year	TWSC	LOS Delay V/C Q					B 11	> 0	> 0.12	B 11	A 0	> 0	> 0.06	A 0	< A 0	> 0	> 0.00	A 0	
PM Peak Hour	GO Station West Access/ North-South Local Road & Cross Avenue	Background 10 Year	TCS	LOS Delay V/C Q	< B 11	> 11	> 0.44	B 11	< B 16	> 16	> 0.74	B 16	A 0	D 35	> 35	D 35	C 26	A 8	> 10	B 16	C 22
		Total 10 Year	TCS	LOS Delay V/C Q	< B 11	> 11	> 0.48	B 11	< B 17	> 17	> 0.79	B 17	A 0	D 38	> 38	D 38	F 238	A 8	> 10	F 160	D 42
PM Peak Hour	North Access & South Service Road	Total Opening Year	TWSC	LOS Delay V/C Q	A 0	> 0	> 0.05	A 0	< A 3	> 3	> 0.04	A 3	A 9	> 9	> 0.10	A 9					
		Total 5 Year	TWSC	LOS Delay V/C Q	A 0	> 0	> 0.09	A 0	< A 6	> 6	> 0.13	A 6	B 10	> 10	> 0.23	B 10					
		Total 10 Year	TWSC	LOS Delay V/C Q	A 0	> 0	> 0.03	A 0	< A 6	> 6	> 0.12	A 6	A 9	> 9	> 0.05	A 9					
PM Peak Hour	East Access & North-South Local Road	Total Opening Year	TWSC	LOS Delay V/C Q	A 0	> 0	> 0.00	A 0					< A 0	> 0	> 0.00	A 0	A 0	> 0	> 0.00	A 0	
		Total 5 Year	TWSC	LOS Delay V/C Q	A 0	> 0	> 0.00	A 0					< A 0	> 0	> 0.00	A 0	A 0	> 0	> 0.00	A 0	
		Total 10 Year	TWSC	LOS Delay V/C Q	A 9	> 7	> 0.14	A 7					< A 7	> 0	> 0.06	A 0	A 0	> 0	> 0.02	A 9	

MOE - Measure of Effectiveness  
 LOS - Level of Service  
 Delay - Average Delay per Vehicle in Seconds  
 Q - 95th Percentile Queue Length (m)  
 TCS - Traffic Control Signal  
 TWSC - Two-Way Stop Control  
 < - Shared Left-Turn  
 > - Shared Right-Turn





## 9 Mitigation

As summarized in the analysis tables in the previous chapter, several study area locations either currently experience or are projected to experience operational deficiencies independent of the Development. **The analysis also identified that the development would have minimal impact on the study area's traffic conditions.**

### 9.1 Midtown Oakville Improvements

Mitigation measures at several study area intersections have been identified through the Midtown Oakville Environmental Assessment. The critical transportation network improvements include the following:

- ▶ The extension of Cross Avenue eastward to Royal Windsor Drive and the QEW. This extension will likely divert eastbound left-turns at Cross Avenue and Trafalgar Road to the QEW and Royal Windsor Drive interchange. In addition to the extension, Cross Avenue will be widened from Trafalgar Road to Lyons Lane.
- ▶ A new north-south crossing of the QEW east of Trafalgar Road. This north-south road will connect the Cross Avenue extension with Iroquois Shore Road and Trafalgar Road at McCraney Street. This new street will have pedestrian and cycling infrastructure, dedicated transit, and general-purpose lanes. The purpose of the new roadway is to divert north/south traffic on Trafalgar Road;
- ▶ Realignment of the Trafalgar Road and QEW Eastbound Off-Ramp Terminal. A new eastbound QEW direct off-ramp will be constructed under Trafalgar Road and connect with the Cross Avenue extension. This new off-ramp will divert eastbound right-turns that will generally turn onto Trafalgar Road. The realignment of South Service Road and Argus Road to the west of its current location will be needed to accommodate this new off-ramp;
- ▶ Two new active transportation crossings of the QEW are west and east of Trafalgar Road. The west crossing will connect Oakville Place to the realigned Argus Road. The east crossing will be separate and east of Trafalgar Road;
- ▶ Improvements to the QEW and Royal Windsor Drive interchange will include a new westbound off-ramp, eastbound on-ramp, eastbound direct off-ramp to Cross Avenue extension, and widening and extension of Royal Windsor Drive to Iroquois Shore Road at Eighth Line. The improvements to this interchange will likely divert traffic to/from the Trafalgar Road interchanges; and



- ▶ Midtown Oakville's new local road network gives access to new developments and provides additional connectivity between South Service Road East, Cross Avenue, and Argus Road.

Because the GO Oakville Station is located centrally within the study area, the Trafalgar Road corridor experiences many trips during the weekday peak hours. In most circumstances, widening existing roads or building new ones will infringe on private property, impact mature trees and green space, or compromise the public realm (e.g. sidewalks, boulevards).

The Midtown Oakville and Trafalgar Road EA recognize this and identify roadway improvements that will provide some relief to operational issues; however, vehicle capacity constraints will persist for the overall transportation network. Instead, the strategy is to further focus on providing a sustainable transportation strategy to move more people per kilometre by walking, cycling and transit or in combination with high occupancy vehicles.

## 9.2 Transportation Network Overview

The vehicle traffic analyses of intersection performance conducted overall conditions are expected to experience congestion during the weekday peak hours. This area surrounds one of the busiest GO Transit stations within the province<sup>17</sup>; the area is expected to experience vehicle capacity constraints two to four hours a day on a typical weekday. The other 20 hours of the weekday, weekends and holidays would be expected to exhibit better vehicle traffic conditions.

Widening arterial roads to accommodate vehicular traffic volumes is not recommended in the study area. This would be counter-intuitive to the vision of a people-centric, pedestrian-friendly environment that expects people to use more sustainable modes to travel. Any potential road widening would accommodate dedicated bus lanes to improve transit capacity and efficiency.

Conditions for pedestrians, cyclists and transit users would be expected to be significantly improved from existing conditions in the study area. The smaller block size and wide sidewalks on both sides of any new roads will aid in pedestrian connectivity through pedestrian pathways. Wider sidewalks and multi-use pathways are anticipated in areas of the highest pedestrian demand.

<sup>17</sup> Ridership Performance Year-to-Date, Metrolinx, 2019  
<https://blog.metrolinx.com/wp-content/uploads/2020/02/click-here-to-see-the-above-ridership-map-in-detail.pdf>



Cycling infrastructure presently is limited in the study area. The cycling network is expected to expand through redevelopment, and gaps in the network are expected to be filled.

Increased frequency of GO trains and buses and Oakville Transit buses are expected to make transit more convenient. Transit priority measures are recommended to be explored further by the Town to help make transit schedules more reliable and make transit more attractive.

There is forecast to be more vehicle traffic congestion, longer delays and long queues at full build-out of the study area. At the same time, with the people-centric approach to Midtown Oakville, there are expected to be more amenities, better connectivity for pedestrians and cyclists, and more frequent, reliable, and convenient service for transit passengers. The finer grain road network is proposed to provide enhanced multi-modal connectivity and access.

### **9.3 Right-in/Right-Out Conditions**

#### **9.3.1 Argus Road & South Service Road East**

Future southbound left-turn movements from South Service Road East are forecast to operate at LOS F due to high east-west volumes along Argus Road by-passing the Trafalgar Road / Cross Avenue intersection.

A limited local road network was assumed to provide a conservative estimate of study area roads for this study. However, the Midtown Oakville proposed local road network will provide excellent connections between Cross Avenue, Argus Road, and South Service Road. Once the local road network is in place, it is likely that traffic will no longer be concentrated at Argus Road and South Service Road East but will be dispersed through the local road network.

However, to avoid situations where southbound drivers are experiencing significant delays, the southbound Leg of the South Service Road may be limited to right-in/right-out movements. This change will impact site traffic south along Trafalgar Road via Argus Road. With the existing network, site traffic will use the signalized intersection of Cross Avenue to access Trafalgar Road. With the new local road network, traffic will likely divert to the north-south road to access Trafalgar Road via Cross Avenue.



# 10 Conclusions and Recommendations

## 10.1 Conclusions

### Development Concept Review

A review of the proposed Development Concept plans was undertaken with the following conclusions reached:

- ▶ Pedestrian, bicycle, and vehicular access to the Site provides appropriate mobility opportunities for all modes.
- ▶ The proposed Development Concept is consistent and compatible with short-term (prior to the development of adjacent properties) and long-term (with the fulfillment of the Mid-Town Oakville streets and blocks plan) Mid-Town Oakville conditions.

### Parking Supply

- ▶ Adoption of reduced minimum resident and non-residential parking supply standards is appropriate based on the following considerations:
  - ▶ The proposed parking reduction is consistent with Provincial, Regional & Local Mobility and Parking Policy;
  - ▶ The parking supply strategy is in conformance with Ontario's current vision for transit nodes;
  - ▶ The area transportation context and proposed TDM framework supports multi-modal travel;
  - ▶ The provision of an enhanced TDM plan was determined as a proactive method of reducing the proposed resident parking supply; and,
  - ▶ The parking supply reduction significantly reduces the cost of construction of the project, which can improve the initial proposed housing along with ongoing life-cycle maintenance and property tax costs, further enhancing the affordability of the project for the residents in the long-term and,
- ▶ The proposed reduction in parking supply has regard to matters of Provincial interest; they are consistent with the Provincial Policy Statement. They conform with the Growth Plan, the Region of Halton Official Plan, and the Livable Oakville Plan Mid-Town Oakville provisions.
- ▶ While a reduction to the minimum resident and commercial parking requirements under Zoning By-Law 2014-014 is proposed, the resulting vehicular parking supply will meet the development's needs regarding the existing /planned transit



infrastructure in the immediate area, including higher-order transit.

- ▶ A reduced resident parking supply ratio of 0.50 parking spaces per residential unit and office and retail parking rates of 1.08 parking spaces per 100 m<sup>2</sup> is considered appropriate.
- ▶ The proposed development incorporates a total of six (6) loading spaces. The proposed loading arrangements are functionally and operationally appropriate and will facilitate the loading/unloading, moving, delivery and refuse collection needs of the proposed development

The proposed bicycle parking supply of 1,613 bicycle parking spaces is considered appropriate and will accommodate the bicycle parking demands of the proposed development.

### **Transportation Impact Study**

The proposed development will generate approximately 447 new vehicle trips during the weekday AM peak hour and 433 new vehicle trips during the weekday PM peak hour.

Detailed traffic analysis was conducted for each study area intersections under Base conditions, Opening (2027), 5-Year (2032) and 10-Year (2037), Background and Total conditions.

To avoid situations where drivers at a stop-controlled minor approach experience significant delays, the intersection of South Service Road and Argus Road is recommended to be restricted to right-in/out operations.

It is acknowledged that deficiencies currently exist at specific locations, primarily along the Trafalgar Road corridor within the study area. They can be expected to persist in the future with anticipated growth in traffic, independent of the development.

For clarification, delays at the study area intersection have been documented as a foreseeable issue without the proposed development in the Midtown Oakville EA. The EA identified several roadway improvements to address traffic growth's existing and long-term impacts. The construction of new direct off-ramps for the QEW at Trafalgar Road, a revised local road network for Midtown Oakville, an extension of Cross Avenue and a variety of intersection improvements are proposed. It is understood that these improvements will provide some relief to operational issues. However, vehicle capacity constraints will persist for the overall transportation network.



As the EA recognized capacity constraints, further remedial measures to improve intersection capacity are not likely to be implemented. Instead, future improvements to the transportation network are expected to primarily focus on sustainable forms of transportation, including an improved transit network by adding BRT along Trafalgar Road.

By shifting commuter travel to public transit, intersection operations could be expected to maintain the status quo (at capacity condition during peak hours) or improve if fewer vehicles transverse the intersections during the peak hours of a typical weekday. The Town of Oakville's Urban Mobility & Transportation Strategy<sup>18</sup> echoes this sentiment:

*"The Town of Oakville and Halton Region must accept a crucial point: they will never solve congestion. There will always be someone new who fills up space on the road, regardless of whether that space was created by paving a new lane or having some drivers switch to buses. It is well established that the expansion of congested roadways does not reduce congestion – it just increases the number of people on those roadways. This is called induced demand."*

*"Due to the principle of induced demand, vehicular congestion can never be solved completely, and Oakville should not fall into the trap of trying to prove otherwise. Oakville's current methodology for assessing traffic (and the impacts to traffic from new developments) fails to capture this fact, biases suburban developments over urban ones, and does not assess other modes such as walking, cycling and transit."*

### **Transportation Demand Management**

The proposed development proposes active mitigation of site traffic impacts by implementing several Transportation Demand Management (TDM) measures. To complement and build upon the location and accessibility of the development and enhance the non-auto-dependent mobility of prospective residents, the development will consider adopting TDM measures to reduce the dependency on vehicular travel. These measures include a shared parking strategy, active uses at grade along street frontages, provision of bicycle spaces exceeding Zoning requirements, the building owner will charge parking as a separate cost to occupants as well as welcome packets

<sup>18</sup> Oakville Urban Mobility & Transportation Strategy, Steer, November 2021



However, a limited parking supply is one of the essential TDM measures. The research focused on whether a relationship exists between the provision of off-street parking and the choice to drive among individuals travelling to or from the site. Following data collection and an empirical review of the data, this research found that reductions in off-street vehicular parking for office, residential, and retail developments reduce the overall automobile mode share associated with those developments relative to projects with the same land uses in similar contexts that provide more off-street vehicular parking.

The role of parking management is a crucial element in helping Oakville meet its trip reduction goals. If free and unregulated parking is provided, there is little incentive for many residents and visitors to use alternative modes of transportation. The Town of Oakville's Urban Mobility & Transportation Strategy echoes this sentiment:

*"The provision of free parking is a subsidy to drivers, and its removal or reduction can serve as an encouragement to switch to other modes of transport."*

## 10.2 Recommendations

Based on the findings of this study, the following recommendations are identified:

- ▶ South Service Road and Argus Road be restricted to right-in/right-out only
- ▶ On-site pedestrian sidewalks are recommended to be well-lit and conform to the Town of Oakville's design standards and the Accessibility for Ontarians with Disabilities Act (AODA) design standards.
- ▶ Implement reduced vehicular parking rates to serve as a critical TDM measure to reduce vehicular travel to and from the Project and provide support for reduced environmental and project cost impacts on the delivery of residential, retail and office land uses within the Mid-Town Oakville context.
- ▶ Applicant implements unbundling resident parking where parking spaces are provided as a separate cost to residents.
- ▶ Provide a comprehensive TDM plan to maximize alternative mobility opportunities for residents, visitors and employees of the Project.



# Appendix A

## Terms of Reference





## Greg Lue

---

**From:** Aquisha Khan <aquisha.khan@oakville.ca>  
**Sent:** January 7, 2022 11:20 AM  
**To:** Adam Makarewicz; Greg Lue  
**Cc:** Steiger, Bernie; White, Mark J. (MTO); 'Krusto, Matt'; Tricia Collingwood  
**Subject:** RE: 210590 - 166 South Service Road Oakville Traffic and Parking Study - Terms of Reference

Good Morning Mr. Makarewicz;

Thank you for confirming that there are no historical counts for the Trafalgar Village Plaza intersections.

- Trafalgar Plaza Village & South Service Road
- Trafalgar Plaza Village & Cross Avenue

At this time due to unforeseen circumstances, it is acknowledged that the turning movement counts would not be conducted.

The Town is in support of negating the analysis of these intersections at this time and will accept a supplemental addendum for these intersections analysis at a later date.

Regards;

**Aquisha Khan, P. Eng.**

Transportation Engineer,  
Transportation and Engineering Department,  
Town of Oakville | P: 905-845-6601 | [www.oakville.ca](http://www.oakville.ca)

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**From:** Adam Makarewicz <amakarewicz@ptsl.com>  
**Sent:** January 7, 2022 9:54 AM  
**To:** Aquisha Khan <aquisha.khan@oakville.ca>; Greg Lue <glue@ptsl.com>  
**Cc:** Steiger, Bernie <Bernie.Steiger@halton.ca>; White, Mark J. (MTO) <Mark.J.White@ontario.ca>; 'Krusto, Matt' <Matt.Krusto@halton.ca>  
**Subject:** RE: 210590 - 166 South Service Road Oakville Traffic and Parking Study - Terms of Reference

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Hi Aquisha,

Unfortunately, there are no historical counts at the Trafalgar Village Plaza driveways.

As a result, will you consider removing these two intersections from the operational analysis for the current report? Once the situation has improved, we can re-analyze these intersections through a supplemental addendum.

All the best,

**Adam J. Makarewicz**

*Senior Project Manager*



**Paradigm Transportation Solutions Limited**

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

p: 905.381.2229 x303

e: [amakarewicz@ptsl.com](mailto:amakarewicz@ptsl.com)

w: [www.ptsl.com](http://www.ptsl.com)

---

**From:** Adam Makarewicz

**Sent:** 6-Jan-22 1:53 PM

**To:** Aquisha Khan <[aquisha.khan@oakville.ca](mailto:aquisha.khan@oakville.ca)>; Greg Lue <[glue@ptsl.com](mailto:glue@ptsl.com)>

**Cc:** Steiger, Bernie <[Bernie.Steiger@halton.ca](mailto:Bernie.Steiger@halton.ca)>; White, Mark J. (MTO) <[Mark.J.White@ontario.ca](mailto:Mark.J.White@ontario.ca)>; 'Krusto, Matt' <[Matt.Krusto@halton.ca](mailto:Matt.Krusto@halton.ca)>

**Subject:** RE: 210590 - 166 South Service Road Oakville Traffic and Parking Study - Terms of Reference

Hi Aquisha,

We have reached out to Service Oakville to check on historical counts. We will follow up once we know the historic data situation.

All the best,

**Adam J. Makarewicz**

*Senior Project Manager*



**Paradigm Transportation Solutions Limited**

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

p: 905.381.2229 x303

e: [amakarewicz@ptsl.com](mailto:amakarewicz@ptsl.com)

w: [www.ptsl.com](http://www.ptsl.com)

---

**From:** Aquisha Khan <[aquisha.khan@oakville.ca](mailto:aquisha.khan@oakville.ca)>

**Sent:** 6-Jan-22 11:55 AM

**To:** Adam Makarewicz <[amakarewicz@ptsl.com](mailto:amakarewicz@ptsl.com)>; Greg Lue <[glue@ptsl.com](mailto:glue@ptsl.com)>

**Cc:** Steiger, Bernie <[Bernie.Steiger@halton.ca](mailto:Bernie.Steiger@halton.ca)>; White, Mark J. (MTO) <[Mark.J.White@ontario.ca](mailto:Mark.J.White@ontario.ca)>; 'Krusto, Matt' <[Matt.Krusto@halton.ca](mailto:Matt.Krusto@halton.ca)>

**Subject:** RE: 210590 - 166 South Service Road Oakville Traffic and Parking Study - Terms of Reference

Hi Adam;

Please send a request to [serviceoakville@oakville.ca](mailto:serviceoakville@oakville.ca) to request for or confirm if there are any historical traffic counts at the intersections.

Thank you.

Regards;

**Aquisha Khan, P. Eng.**

Transportation Engineer,

Transportation and Engineering Department,

Town of Oakville | P: 905-845-6601 | [www.oakville.ca](http://www.oakville.ca)

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**From:** Adam Makarewicz <[amakarewicz@ptsl.com](mailto:amakarewicz@ptsl.com)>

**Sent:** January 6, 2022 9:53 AM

**To:** Aquisha Khan <[aquisha.khan@oakville.ca](mailto:aquisha.khan@oakville.ca)>; Greg Lue <[glue@ptsl.com](mailto:glue@ptsl.com)>

**Cc:** Pasquini-Smith, Alexandria <[Alex.Pasquini-Smith@halton.ca](mailto:Alex.Pasquini-Smith@halton.ca)>; Steiger, Bernie <[Bernie.Steiger@halton.ca](mailto:Bernie.Steiger@halton.ca)>; White, Mark J. (MTO) <[Mark.J.White@ontario.ca](mailto:Mark.J.White@ontario.ca)>; 'Krusto, Matt' <[Matt.Krusto@halton.ca](mailto:Matt.Krusto@halton.ca)>

**Subject:** RE: 210590 - 166 South Service Road Oakville Traffic and Parking Study - Terms of Reference

SECURITY CAUTION: This email originated from outside of The Town of Oakville. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Morning and Happy New Year Aquisha,

We were planning to have the intersections of Trafalgar Village Plaza with South Service Road, and Cross Avenue counted next week. However, given the current lockdown with schools closed and retail stores having reduced capacity, completing traffic counts would be underrepresented in terms of volumes.

Does the Town have any historical traffic data for these two intersections? If not, would you consider removing these two intersections from the operational analysis?

We can consider re-analyzing these intersections once the situation has improved and actual counts can be completed through a supplemental addendum.

All the best,

**Adam J. Makarewicz**

*Senior Project Manager*



## Paradigm Transportation Solutions Limited

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

p: 905.381.2229 x303

e: [amakarewicz@ptsl.com](mailto:amakarewicz@ptsl.com)

w: [www.ptsl.com](http://www.ptsl.com)

---

**From:** Aquisha Khan <[aquisha.khan@oakville.ca](mailto:aquisha.khan@oakville.ca)>

**Sent:** 30-Nov-21 4:25 PM

**To:** Greg Lue <[glue@ptsl.com](mailto:glue@ptsl.com)>

**Cc:** Pasquini-Smith, Alexandria <[Alex.Pasquini-Smith@halton.ca](mailto:Alex.Pasquini-Smith@halton.ca)>; Steiger, Bernie <[Bernie.Steiger@halton.ca](mailto:Bernie.Steiger@halton.ca)>; White, Mark J. (MTO) <[Mark.J.White@ontario.ca](mailto:Mark.J.White@ontario.ca)>; Adam Makarewicz <[amakarewicz@ptsl.com](mailto:amakarewicz@ptsl.com)>; 'Krusto, Matt' <[Matt.Krusto@halton.ca](mailto:Matt.Krusto@halton.ca)>

**Subject:** RE: 210590 - 166 South Service Road Oakville Traffic and Parking Study - Terms of Reference

Hello Greg;

Thank you for providing your Terms of Reference for our review. Please see the Town of Oakville comments in green:

### Study Intersections:

The study intersections identified for this study will include the following:

#### Proposed

- Trafalgar Road at QEW WB Ramp (signalized);
- Trafalgar Road at QEW EB Ramp (signalized);
- Trafalgar Road at Cross Avenue/South Service Road (signalized);
- Trafalgar Road at Cornwall Road (signalized);
- Cross Avenue and Argus Road/GO Station Driveway (signalized);
- Trafalgar Road at Argus Road (unsignalized);
- Argus Road and South Service Road (unsignalized); and
- One site driveway – (Site access at Future Local Road).

#### Additional intersections

- Trafalgar Road at Leighland/Iroquois Shore
- Cross Avenue at Lyons Lane West
- Future Local Road at South Service Road East
- Trafalgar Village Plaza Access at South Service Road East
- Trafalgar Village at Cross Avenue

#### Existing Data

- For all Town of Oakville Intersections, please contact [serviceoakville@oakville.ca](mailto:serviceoakville@oakville.ca) to request the most recent traffic data and signal timing plan where applicable.

#### Background Traffic

- Background developments to include in study are as follows:
  - 418 – 450 Iroquois Shore Road
  - 157 Cross Avenue
  - 217-227 Cross Avenue
  - 130 Cornwall Road
  - 271 Cornwall Road

- 571 Argus Road
- 599 Lyons Lane
- 627 Lyons Lane
- Midtown Oakville EA Study

Transit Modal Split to be incorporated as per Halton Region guidelines.

TIA to confirm the ownership of South Service Road and the ROW requirements as per MTO restrictions.  
TIA to include lane configuration plans of the existing and future lane configurations with traffic control devices.

If there are any other questions, please feel free to contact me.

Regards;

**Aquisha Khan, P. Eng.**

Transportation Engineer,  
Transportation Services,  
Town of Oakville | 905-845-6601 x3236, | [www.oakville.ca](http://www.oakville.ca)

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**Aquisha Khan, P. Eng.**

Transportation Engineer  
Transportation and Engineering  
Town of Oakville | 905-845-6601, | [www.oakville.ca](http://www.oakville.ca)

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**From:** Krusto, Matt <[Matt.Krusto@halton.ca](mailto:Matt.Krusto@halton.ca)>

**Sent:** November 30, 2021 1:59 PM

**To:** 'glue@ptsl.com' <[glue@ptsl.com](mailto:glue@ptsl.com)>

**Cc:** Pasquini-Smith, Aleksandria <[Alex.Pasquini-Smith@halton.ca](mailto:Alex.Pasquini-Smith@halton.ca)>; Steiger, Bernie <[Bernie.Steiger@halton.ca](mailto:Bernie.Steiger@halton.ca)>; White, Mark J. (MTO) <[Mark.J.White@ontario.ca](mailto:Mark.J.White@ontario.ca)>; Aquisha Khan <[aquisha.khan@oakville.ca](mailto:aquisha.khan@oakville.ca)>; [amakarewicz@ptsl.com](mailto:amakarewicz@ptsl.com)

**Subject:** RE: 210590 - 166 South Service Road Oakville Traffic and Parking Study - Terms of Reference

SECURITY CAUTION: This email originated from outside of The Town of Oakville. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Greg,

Thank you for providing the terms of reference. I have reviewed the terms of reference and have the following comments:

As noted in the terms of reference, the study area intersections will be:

- Trafalgar Road at QEW WB Ramp (signalized);
- Trafalgar Road at QEW EB Ramp (signalized);
- Trafalgar Road at Cross Avenue/South Service Road (signalized);
- Trafalgar Road at Cornwall Road (signalized);
- Cross Avenue and Argus Road/GO Station Driveway (signalized);
- Trafalgar Road at Argus Road (unsignalized);
- Argus Road and South Service Road (unsignalized); and
- One site driveway.

Please add the intersection of Trafalgar Road at Leighland/Iroquois Shore.

It is stated in the terms of reference *“Existing TMC data in the study area from 2017 and 2019 will be utilized for a 2021 base year”*. It must be first checked with Halton Region if there are any existing 2018 or 2019 counts available, before proceeding with the use of a 2017 count with a growth rate. Requests for traffic data and traffic signal timings can be made to [trafficdatarequests@halton.ca](mailto:trafficdatarequests@halton.ca)

It is stated in the terms of reference *“Historic traffic growth trends at Trafalgar Rd & QEW ramps showed a decrease in traffic of 3-4% between 2015 and 2017. Thus, we would assume no growth from TMC year to Base year”*. This cannot be supported for the following reasons:

- It should be noted, in a 2017 memo by Town staff on another area development file, it was stated: *“Please note the former hospital site was closed on December 13, 2015 and the bridge work along Trafalgar Road has yet to be completed. MTO is completing the bridge work in phases and although was expected to be completed in December 2016, will now be completed by the summer of 2017. Currently all six (6) lanes of traffic are open, however, please confirm with MTO that the lanes will remain open at the time of any traffic counts.”* Therefore, the decrease in traffic counts when comparing 2015 to 2017 was, in all likelihood, due to the MTO bridge works during the 2016-2017 time period. The 3-4% decrease is explainable and, not applying growth rates to the 2017 and 2019 count data is unacceptable. Further, Town of Oakville comments from the previous area development (which recommending the same decrease) also did not support a decrease in traffic volumes to be used in the study. Additionally, on this same area development, MTO did not support this decrease as well (MTO data previously showed the volume was not decreasing).
- Halton’s transportation model predicts growth rates averaging two percent per annum, to the year 2031, on various sections of Trafalgar Road and the crossings streets.

For the traffic volume counts and traffic signal timing (from Halton Region), information can be requested from our Road Operations group at [trafficdatarequests@halton.ca](mailto:trafficdatarequests@halton.ca).

The Background Developments must be confirmed and approved by the Town of Oakville. Town staff will also provide, if available, any Midtown Oakville traffic assumptions.

#### Transit Mode Splits:

Halton’s Transportation Master Plan 2011 utilizes a transit mode split of 10% for 2021, 15% for 2026 and 20% for 2031. Assumption of travel via other modes (active transportation i.e.: walk, cycle) should utilize a 5% mode split for 2031. Transportation Demand Management (TDM) assumptions of 3% for 2031 would also be acceptable. **Transit mode splits will need to be adjusted from the 2011 TMP assumptions to reasonable percentages based on current**

**year (2021), 2026 and 2031 planned and proposed mode splits (based on existing facilities and service in the area to date (planned &/or proposed). Reasonable assumptions and rationale must be clearly outlined in the Study.**

The Study must document all mitigation measures required based on the approved Study & analysis, either based on the development traffic impacts or based on the overall analysis (unrelated to the development traffic impacts).

Other general Study comments include:

*The TIS report will include:*

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

Let me know if there are any questions.

Matt

## **Matt Krusto**

**Supervisor, Transportation Development Review**

Infrastructure Planning & Policy

Public Works

**Halton Region**

905-825-6000, ext. 7225 | 1-866-442-5866

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## Greg Lue

---

**From:** White, Mark J. (MTO) <Mark.J.White@ontario.ca>  
**Sent:** December 8, 2021 8:55 AM  
**To:** Greg Lue  
**Subject:** FW: 210590 - 166 South Service Road Oakville Traffic and Parking Study - Terms of Reference

Good morning Greg,

Please see comments from our Traffic office:

- TIS should Include TO/FROM trips/traffic to all accesses from site to QEW EB/WB at 3 ICs: Dorval Dr., Trafalgar Road and Royal Windsor Dr.
- It is expected that the proposed TIS would take into account the finalized ramps at the RWD IC that are included in the Oakville Midtown Plan.
- The TIS should consider both QEW existing ramps and the future ramps.
- It is already December so base year can be 2022.

Our project delivery office had comments to provide when a full site plan is submitted:

- Please show EA-approved locations of relocated roads and highways as well as new roads on the site plan.
- 14m setback from the new South Service Road location is required.

Regards,

Mark White

Corridor Management Planner  
Ministry of Transportation | Central Region  
159 Sir William Hearst Ave. 7<sup>th</sup> Floor,  
Toronto, ON M3M 0B7  
[Mark.j.white@ontario.ca](mailto:Mark.j.white@ontario.ca)

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**From:** Krusto, Matt <Matt.Krusto@halton.ca>  
**Sent:** November 30, 2021 1:59 PM  
**To:** 'glue@ptsl.com' <glue@ptsl.com>  
**Cc:** Pasquini-Smith, Alexandria <Alex.Pasquini-Smith@halton.ca>; Steiger, Bernie <Bernie.Steiger@halton.ca>; White, Mark J. (MTO) <Mark.J.White@ontario.ca>; Aquisha Khan <aquisha.khan@oakville.ca>; amakarewicz@ptsl.com  
**Subject:** RE: 210590 - 166 South Service Road Oakville Traffic and Parking Study - Terms of Reference

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Hi Greg,

Thank you for providing the terms of reference. I have reviewed the terms of reference and have the following comments:

As noted in the terms of reference, the study area intersections will be:

- Trafalgar Road at QEW WB Ramp (signalized);
- Trafalgar Road at QEW EB Ramp (signalized);
- Trafalgar Road at Cross Avenue/South Service Road (signalized);

- Trafalgar Road at Cornwall Road (signalized);
- Cross Avenue and Argus Road/GO Station Driveway (signalized);
- Trafalgar Road at Argus Road (unsignalized);
- Argus Road and South Service Road (unsignalized); and
- One site driveway.

Please add the intersection of Trafalgar Road at Leighland/Iroquois Shore.

It is stated in the terms of reference “Existing TMC data in the study area from 2017 and 2019 will be utilized for a 2021 base year”. It must be first checked with Halton Region if there are any existing 2018 or 2019 counts available, before proceeding with the use of a 2017 count with a growth rate. Requests for traffic data and traffic signal timings can be made to [trafficdatarequests@halton.ca](mailto:trafficdatarequests@halton.ca)

It is stated in the terms of reference “Historic traffic growth trends at Trafalgar Rd & QEW ramps showed a decrease in traffic of 3-4% between 2015 and 2017. Thus, we would assume no growth from TMC year to Base year”. This cannot be supported for the following reasons:

- It should be noted, in a 2017 memo by Town staff on another area development file, it was stated: “Please note the former hospital site was closed on December 13, 2015 and the bridge work along Trafalgar Road has yet to be completed. MTO is completing the bridge work in phases and although was expected to be completed in December 2016, will now be completed by the summer of 2017. Currently all six (6) lanes of traffic are open, however, please confirm with MTO that the lanes will remain open at the time of any traffic counts.” Therefore, the decrease in traffic counts when comparing 2015 to 2017 was, in all likelihood, due to the MTO bridge works during the 2016-2017 time period. The 3-4% decrease is explainable and, not applying growth rates to the 2017 and 2019 count data is unacceptable. Further, Town of Oakville comments from the previous area development (which recommending the same decrease) also did not support a decrease in traffic volumes to be used in the study. Additionally, on this same area development, MTO did not support this decrease as well (MTO data previously showed the volume was not decreasing).
- Halton’s transportation model predicts growth rates averaging two percent per annum, to the year 2031, on various sections of Trafalgar Road and the crossings streets.

For the traffic volume counts and traffic signal timing (from Halton Region), information can be requested from our Road Operations group at [trafficdatarequests@halton.ca](mailto:trafficdatarequests@halton.ca).

The Background Developments must be confirmed and approved by the Town of Oakville. Town staff will also provide, if available, any Midtown Oakville traffic assumptions.

#### Transit Mode Splits:

Halton’s Transportation Master Plan 2011 utilizes a transit mode split of 10% for 2021, 15% for 2026 and 20% for 2031. Assumption of travel via other modes (active transportation i.e.: walk, cycle) should utilize a 5% mode split for 2031. Transportation Demand Management (TDM) assumptions of 3% for 2031 would also be acceptable. **Transit mode splits will need to be adjusted from the 2011 TMP assumptions to reasonable percentages based on current year (2021), 2026 and 2031 planned and proposed mode splits (based on existing facilities and service in the area to date (planned &/or proposed)). Reasonable assumptions and rationale must be clearly outlined in the Study.**

The Study must document all mitigation measures required based on the approved Study & analysis, either based on the development traffic impacts or based on the overall analysis (unrelated to the development traffic impacts).

Other general Study comments include:

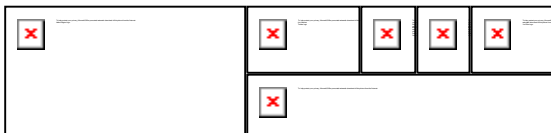
*The TIS report will include:*

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

Let me know if there are any questions.

Matt

**Matt Krusto**  
**Supervisor, Transportation Development Review**  
 Infrastructure Planning & Policy  
 Public Works  
**Halton Region**  
 905-825-6000, ext. 7225 | 1-866-442-5866



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**From:** Greg Lue <[glue@ptsl.com](mailto:glue@ptsl.com)>  
**Sent:** November 24, 2021 4:29 PM  
**To:** Krusto, Matt <[Matt.Krusto@halton.ca](mailto:Matt.Krusto@halton.ca)>; [Mark.J.White@ontario.ca](mailto:Mark.J.White@ontario.ca); Aquisha Khan <[aquisha.khan@oakville.ca](mailto:aquisha.khan@oakville.ca)>  
**Cc:** Adam Makarewicz <[amakarewicz@ptsl.com](mailto:amakarewicz@ptsl.com)>  
**Subject:** 210590 - 166 South Service Road Oakville Traffic and Parking Study - Terms of Reference

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Hi all,

Paradigm Transportations Solutions Limited has been retained to conduct a Transportation Impact Analysis and Parking Study for a proposed development located 166 South Service Road in the Town of Oakville. The preliminary site plan envisions a large-scale mixed-use residential development of three towers with proposed heights of 58, 50, and 44 storeys on top of a podium (preliminary site plan attached). The development would include approximately 1,720 units with a parking ratio of 0.49 spaces per unit. Vehicle access will be provided through a driveway connection to South Service Road.

Road network changes outlined in the Oakville Midtown EA will be included in the future road network. Specifically, the horizontal alignment of the existing South Service Road will be modified to accommodate the new Queen Elizabeth Way (QEW) eastbound off ramp to Cross Avenue at the Trafalgar Road interchange. The alignment of South Service Road will be shifted to the south and will form a new intersection with Argus Road. Impacts to the local roadway include a cul-de-sac proposed along the South Service Road at Lyons Lane, extension of the South Service to Cross Avenue and realignment of Lyons Lane at Cross Avenue. Trafalgar Road will also be assumed to operate as a six-lane corridor with HOV curb lanes with the eastbound channelized right turn at Trafalgar Road and Cornwall Road assumed to be removed.

### Proposed Terms of Reference

#### Study Area Intersections

- Trafalgar Road at QEW WB Ramp (signalized);
- Trafalgar Road at QEW EB Ramp (signalized);
- Trafalgar Road at Cross Avenue/South Service Road (signalized);
- Trafalgar Road at Cornwall Road (signalized);
- Cross Avenue and Argus Road/GO Station Driveway (signalized);
- Trafalgar Road at Argus Road (unsignalized);
- Argus Road and South Service Road (unsignalized); and
- One site driveway.

#### Existing Data

- Existing TMC data in the study area from 2017 and 2019 will be utilized for a 2021 base year
- Historic traffic growth trends at Trafalgar Rd & QEW ramps showed a decrease in traffic of 3-4% between 2015 and 2017. Thus, we would assume no growth from TMC year to Base year.

#### Horizon Years

- 2021 Base Year
- Opening Date
- 5 and 10-years from opening date

#### Analysis Periods

- Weekday AM peak hour
- Weekday PM peak hour

#### Analysis

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

#### Background Traffic

- Generalized growth rate 2% per annum
- Redevelopment of Midtown Oakville traffic will be included based on forecasts from the Midtown Oakville Transportation and Stormwater Municipal Class EA 2015
- Can you comment on this and provide any other relevant studies or inputs to estimate the traffic for the site(s)?

#### Site Traffic Estimates

- ITE Trip Generation Data 10<sup>th</sup> Edition
- Modal split reductions will be considered for horizon years based on planned/proposed transit service and network improvements. Mode split reductions will be confirmed with Town of Oakville staff.

#### Site Traffic Distribution

- Existing travel patterns/TTS 2016 data

#### Access and Circulation Review

- Front End Garbage Truck
- Fire Truck
- Other vehicles TBD based on Clients input/needs

#### Transportation Demand Management

- Discuss TDM measures and how they would be incorporated

#### Parking Study

- Parking generation for the site will be calculated using parking rates obtained from ITE Parking Generation Manual, Zoning By-Law comparisons, and other sources.
- A parking rate will be recommended that is deemed applicable to the subject site taking into account the development's location. The recommended rate will then be used to estimate the number of parking spaces needed to meet the projected parking demand. The estimated parking supply needed will be compared to the By-law required supply to assess the feasibility of providing less than the By-law supply requirements. In the event that the parking review determines that a parking reduction cannot be justified, the report will speak to this point.

#### Report

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



Please let us know your comments on the study. Thanks !

**Greg Lue, M.A.Sc., P.Eng.**  
*Transportation Engineer*



**Paradigm Transportation Solutions Limited**

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

p: 905.381.2229 x307

m: 905.981.7479

e: [glue@ptsl.com](mailto:glue@ptsl.com)

w: [www.ptsl.com](http://www.ptsl.com)

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# Appendix B

## Existing Traffic Data



Count Name: Trafalgar Road & Leighland Avenue/Iroquois Shore Road  
 Start Date: 03/21/2017

Paradigm Transportation Solutions Limited  
 22 King Street South, Suite 300  
 Waterloo, Ontario, Canada N2J 1N8

Start Time	Leighland			Iroquois Shore			Trafalgar			Trafalgar			15	60
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
7:00 AM	4	7	86	105	6	19	20	123	87	22	265	1	745	
7:15 AM	5	8	117	135	2	11	20	151	120	27	304	4	904	
7:30 AM	5	17	117	161	9	34	24	218	152	30	331	4	1102	
7:45 AM	5	21	141	163	10	34	33	211	170	48	367	5	1208	3959
8:00 AM	3	24	130	178	12	23	27	240	162	22	296	10	1127	4341
8:15 AM	5	26	126	163	13	23	29	182	171	28	297	9	1072	4509
8:30 AM	2	26	87	172	6	22	22	186	194	53	245	4	1019	4426
8:45 AM	9	23	93	163	8	22	21	255	188	66	250	12	1110	4328
9:00 AM	6	22	58	129	8	21	40	181	184	47	252	12	960	4161
9:15 AM	7	15	62	124	9	27	39	187	155	29	250	10	914	4003
9:30 AM	5	16	66	116	6	25	35	164	140	24	206	10	813	3797
9:45 AM	4	11	61	105	18	24	31	200	135	29	266	26	910	3597
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
	18	88	514	665	44	114	113	851	655	128	1291	28		
3:00 PM	29	28	61	203	24	49	49	320	149	35	280	33	1260	
3:15 PM	29	23	77	188	18	42	47	327	143	29	237	29	1189	
3:30 PM	38	19	65	172	22	48	51	306	148	20	263	25	1177	
3:45 PM	22	15	60	180	29	57	54	287	174	25	235	21	1159	4785
4:00 PM	33	17	66	207	36	57	64	312	197	23	268	27	1307	4832
4:15 PM	27	26	60	206	33	51	68	260	140	40	189	29	1129	4772
4:30 PM	29	23	75	179	30	61	64	378	199	30	246	20	1334	4929
4:45 PM	18	20	70	185	28	57	73	303	157	26	224	25	1186	4956
5:00 PM	23	22	61	213	37	45	73	376	233	29	276	28	1416	5065
5:15 PM	33	15	61	164	36	65	85	376	150	32	230	35	1282	5218
5:30 PM	29	26	64	185	27	51	91	389	276	23	234	15	1410	5294
5:45 PM	23	25	69	142	29	42	86	385	241	23	232	24	1321	5429
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
	108	88	255	704	129	203	335	1526	900	107	972	102		



Date: 3-8-2016

Intersection: Leighland Avenue/Iroquois Shore Road & Trafalgar

8 Phase Basic Timing Sheet												
	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	x	x	x	x	x	x	x	x	x	x	x	x
Direction	SEL	NWT	NEL	SWT	NWL	SET	SWL	NET				
Min Green	6	15	6	10	6	15	6	10				
Veh Ext.	3.0		3.0	3.0	3.0		3.0	3.0				
Yellow	3	4	3	4	3	4	3	4				
Red	1	3	1	3	1	3	2	3				
Walk	-	7	-	7	-	7	-	-				
Don't Walk	-	20	-	29	-	20	-	-				
Max 1	15	40	15	40	20	40	15	35				
Max 2												
Max 3												
Veh Recall												
Ped Recall												
<b>Notes:</b>												

<p><b>Pattern 1</b>  <b>Time:</b> 6:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 28%</p> <table border="0"> <tr><td colspan="5"> </td></tr> <tr><td><b>Direction</b></td><td></td><td></td><td></td><td></td></tr> <tr><td><b>Phase</b></td><td><b>1</b></td><td><b>2</b></td><td><b>3</b></td><td><b>4</b></td></tr> <tr><td><b>%</b></td><td>10%</td><td>44%</td><td>10%</td><td>36%</td></tr> <tr><td><b>Direction</b></td><td></td><td></td><td></td><td></td></tr> <tr><td><b>Phase</b></td><td><b>5</b></td><td><b>6</b></td><td><b>7</b></td><td><b>8</b></td></tr> <tr><td><b>%</b></td><td>10%</td><td>44%</td><td>31%</td><td>15%</td></tr> </table>						<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	10%	44%	10%	36%	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	10%	44%	31%	15%	<p><b>Pattern 2</b>  <b>Time:</b> 10:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 98%</p> <table border="0"> <tr><td colspan="5"> </td></tr> <tr><td><b>Direction</b></td><td></td><td></td><td></td><td></td></tr> <tr><td><b>Phase</b></td><td><b>1</b></td><td><b>2</b></td><td><b>3</b></td><td><b>4</b></td></tr> <tr><td><b>%</b></td><td>13%</td><td>41%</td><td>10%</td><td>36%</td></tr> <tr><td><b>Direction</b></td><td></td><td></td><td></td><td></td></tr> <tr><td><b>Phase</b></td><td><b>5</b></td><td><b>6</b></td><td><b>7</b></td><td><b>8</b></td></tr> <tr><td><b>%</b></td><td>16%</td><td>38%</td><td>31%</td><td>15%</td></tr> </table>						<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	13%	41%	10%	36%	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	16%	38%	31%	15%
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<p><b>Pattern 5</b>  <b>Time:</b> Weekend  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 98%</p> <table border="0"> <tr><td colspan="5"> </td></tr> <tr><td><b>Direction</b></td><td></td><td></td><td></td><td></td></tr> <tr><td><b>Phase</b></td><td><b>1</b></td><td><b>2</b></td><td><b>3</b></td><td><b>4</b></td></tr> <tr><td><b>%</b></td><td>13%</td><td>41%</td><td>10%</td><td>36%</td></tr> <tr><td><b>Direction</b></td><td></td><td></td><td></td><td></td></tr> <tr><td><b>Phase</b></td><td><b>5</b></td><td><b>6</b></td><td><b>7</b></td><td><b>8</b></td></tr> <tr><td><b>%</b></td><td>16%</td><td>38%</td><td>31%</td><td>15%</td></tr> </table>						<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	13%	41%	10%	36%	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	16%	38%	31%	15%	<p><b>Pattern 6</b>  <b>Time:</b>  <b>Cycle Length:</b> Local  <b>Offset (%):</b></p> <table border="0"> <tr><td colspan="5"> </td></tr> <tr><td><b>Direction</b></td><td></td><td></td><td></td><td></td></tr> <tr><td><b>Phase</b></td><td><b>1</b></td><td><b>2</b></td><td><b>3</b></td><td><b>4</b></td></tr> <tr><td><b>%</b></td><td>x</td><td>x</td><td>x</td><td>x</td></tr> <tr><td><b>Direction</b></td><td></td><td></td><td></td><td></td></tr> <tr><td><b>Phase</b></td><td><b>5</b></td><td><b>6</b></td><td><b>7</b></td><td><b>8</b></td></tr> <tr><td><b>%</b></td><td>x</td><td>x</td><td>x</td><td>x</td></tr> </table>						<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	x	x	x	x	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	x	x	x	x
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<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>																																																																			
<b>%</b>	x	x	x	x																																																																			

# Trafalgar Rd @ North Service Rd E

## 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:** Halton Region  
**Site #:** 0000003015  
**Intersection:** Trafalgar Rd & North Service Rd E  
**TFR File #:** 7  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 4937  
 North Entering: 3090  
 North Peds: 0  
 Peds Cross:  $\times$

Heavys	0	77	0	77
Trucks	0	18	0	18
Cars	5	2990	0	2995
Totals	5	3085	0	



Heavys	59
Trucks	30
Cars	1758
Totals	1847

East Leg Total: 896  
 East Entering: 620  
 East Peds: 5  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
3	4	28	35

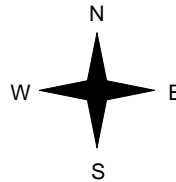


Trafalgar Rd

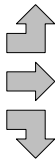
Cars	Trucks	Heavys	Totals
213	7	6	226
23	4	3	30
344	12	8	364
580	23	17	



North Service Rd E



Heavys	Trucks	Cars	Totals
0	0	1	1
0	0	0	0
3	2	176	181
3	2	177	



QEW WB On/Off Ramp



Cars	Trucks	Heavys	Totals
261	3	12	276

Peds Cross:  $\times$   
 West Peds: 8  
 West Entering: 182  
 West Leg Total: 217

Cars	3510
Trucks	32
Heavys	88
Totals	3630



Cars	0	1544	261	1805
Trucks	0	23	3	26
Heavys	0	53	12	65
Totals	0	1620	276	

Peds Cross:  $\times$   
 South Peds: 0  
 South Entering: 1896  
 South Leg Total: 5526

## Comments

# Trafalgar Rd @ North Service Rd E

## Mid-day Peak Diagram

### Specified Period

**From:** 11:00:00

**To:** 14:00:00

### One Hour Peak

**From:** 12:00:00

**To:** 13:00:00

**Municipality:** Halton Region  
**Site #:** 0000003015  
**Intersection:** Trafalgar Rd & North Service Rd E  
**TFR File #:** 7  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 3903  
 North Entering: 1954  
 North Peds: 3  
 Peds Cross:  $\bowtie$

Heavys	0	62	0	62
Trucks	0	27	0	27
Cars	10	1855	0	1865
<b>Totals</b>	<b>10</b>	<b>1944</b>	<b>0</b>	



Heavys	64
Trucks	63
Cars	1822
<b>Totals</b>	<b>1949</b>

East Leg Total: 1092  
 East Entering: 742  
 East Peds: 9  
 Peds Cross:  $\bowtie$

Heavys	0
Trucks	2
Cars	81
<b>Totals</b>	<b>83</b>

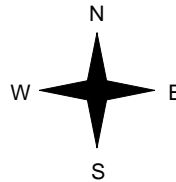


Trafalgar Rd

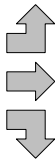
Cars	230	Trucks	16	Heavys	18	<b>Totals</b>	<b>264</b>
	71		2		0		73
	387		13		5		405
<b>Totals</b>	<b>688</b>	<b>31</b>	<b>23</b>				



North Service Rd E



Heavys	1	Trucks	1	Cars	24	<b>Totals</b>	<b>26</b>
	0		0		0		0
	4		3		214		221
<b>Totals</b>	<b>5</b>	<b>4</b>	<b>238</b>				



QEW WB On/Off Ramp



Cars	331	Trucks	11	Heavys	8	<b>Totals</b>	<b>350</b>
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Trafalgar Rd



Peds Cross:  $\bowtie$   
 West Peds: 15  
 West Entering: 247  
 West Leg Total: 330

Cars	2456
Trucks	43
Heavys	71
<b>Totals</b>	<b>2570</b>



Cars	0	1568	331	1899
Trucks	0	46	11	57
Heavys	0	45	8	53
<b>Totals</b>	<b>0</b>	<b>1659</b>	<b>350</b>	

Peds Cross:  $\bowtie$   
 South Peds: 3  
 South Entering: 2009  
 South Leg Total: 4579

## Comments

# Trafalgar Rd @ North Service Rd E

## Afternoon Peak Diagram

### Specified Period

**From:** 15:00:00

**To:** 18:00:00

### One Hour Peak

**From:** 17:00:00

**To:** 18:00:00

**Municipality:** Halton Region  
**Site #:** 0000003015  
**Intersection:** Trafalgar Rd & North Service Rd E  
**TFR File #:** 7  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 5024  
 North Entering: 2280  
 North Peds: 2  
 Peds Cross:  $\times$

Heavys	0	37	0	37
Trucks	0	13	0	13
Cars	10	2220	0	2230
Totals	10	2270	0	



Heavys	35
Trucks	10
Cars	2699
Totals	2744

East Leg Total: 1173  
 East Entering: 857  
 East Peds: 14  
 Peds Cross:  $\times$

Heavys	0
Trucks	1
Cars	126
Totals	127

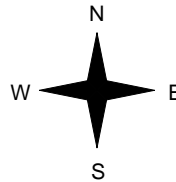


Trafalgar Rd

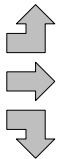
Cars	321	Trucks	2	Heavys	3	Totals	326
Cars	116	Trucks	1	Heavys	0	Totals	117
Cars	407	Trucks	2	Heavys	5	Totals	414
Cars	844	Trucks	5	Heavys	8	Totals	



North Service Rd E



Heavys	0
Trucks	0
Cars	17
Totals	17
Heavys	0
Trucks	0
Cars	0
Totals	0
Heavys	1
Trucks	0
Cars	223
Totals	224
Heavys	1
Trucks	0
Cars	240
Totals	240



QEW WB On/Off Ramp



Cars	313	Trucks	1	Heavys	2	Totals	316
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Trafalgar Rd



Peds Cross:  $\times$   
 West Peds: 14  
 West Entering: 241  
 West Leg Total: 368

Cars	2850
Trucks	15
Heavys	43
Totals	2908



Cars	0	2361	313	2674
Trucks	0	8	1	9
Heavys	0	32	2	34
Totals	0	2401	316	

Peds Cross:  $\times$   
 South Peds: 0  
 South Entering: 2717  
 South Leg Total: 5625

## Comments

# Trafalgar Rd @ North Service Rd E

## Total Count Diagram

**Municipality:** Halton Region  
**Site #:** 0000003015  
**Intersection:** Trafalgar Rd & North Service Rd E  
**TFR File #:** 7  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 33764  
 North Entering: 17883  
 North Peds: 9  
 Peds Cross:  $\times$

Heavys	1	476	0	477
Trucks	0	166	0	166
Cars	63	17177	0	17240
<b>Totals</b>	<b>64</b>	<b>17819</b>	<b>0</b>	



Heavys	458
Trucks	232
Cars	15191
<b>Totals</b>	<b>15881</b>

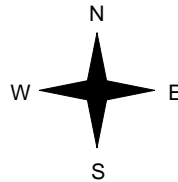
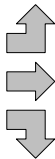
East Leg Total: 8515  
 East Entering: 5956  
 East Peds: 67  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
9	11	557	577



North Service Rd E

Heavys	Trucks	Cars	Totals
1	2	129	132
0	0	0	0
20	22	1547	1589
<b>21</b>	<b>24</b>	<b>1676</b>	



Trafalgar Rd



Cars	Trucks	Heavys	Totals
2172	61	101	2334
494	11	8	513
3005	62	42	3109
<b>5671</b>	<b>134</b>	<b>151</b>	

QEW WB On/Off Ramp



Cars	Trucks	Heavys	Totals
2456	46	57	2559

Peds Cross:  $\times$   
 West Peds: 82  
 West Entering: 1721  
 West Leg Total: 2298

Cars	21729	Cars	0	12890	2456	15346
Trucks	250	Trucks	0	169	46	215
Heavys	538	Heavys	0	356	57	413
<b>Totals</b>	<b>22517</b>	<b>Totals</b>	<b>0</b>	<b>13415</b>	<b>2559</b>	



Peds Cross:  $\times$   
 South Peds: 4  
 South Entering: 15974  
 South Leg Total: 38491

### Comments

# Trafalgar Rd @ QEW EB Off Ramp

## 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:** Halton Region  
**Site #:** 0000003014  
**Intersection:** Trafalgar Rd & QEW EB Off Ramp  
**TFR File #:** 6  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

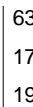
North Leg Total: 3931

North Entering: 2046

North Peds: 0

Peds Cross:  $\nabla$

Heavys	0	63	63
Trucks	0	17	17
Cars	0	1966	1966
Totals	0	2046	



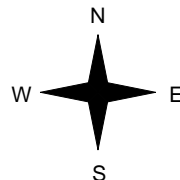
Heavys	68
Trucks	21
Cars	1796
Totals	1885

Heavys	Trucks	Cars	Totals
0	0	0	0



QEW EB Off Ramp

Heavys	Trucks	Cars	Totals
12	11	799	822
6	2	591	599
18	13	1390	



Trafalgar Rd

Peds Cross:  $\nabla$   
 West Peds: 6  
 West Entering: 1421  
 West Leg Total: 1421

Cars	2557
Trucks	19
Heavys	69
Totals	2645



Cars	0	997	997
Trucks	0	10	10
Heavys	0	56	56
Totals	0	1063	

Peds Cross:  $\nabla$   
 South Peds: 0  
 South Entering: 1063  
 South Leg Total: 3708

## Comments

# Trafalgar Rd @ QEW EB Off Ramp

## Mid-day Peak Diagram

### Specified Period

**From:** 11:00:00

**To:** 14:00:00

### One Hour Peak

**From:** 11:30:00

**To:** 12:30:00

**Municipality:** Halton Region  
**Site #:** 0000003014  
**Intersection:** Trafalgar Rd & QEW EB Off Ramp  
**TFR File #:** 6  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 3410  
 North Entering: 1392  
 North Peds: 0  
 Peds Cross:  $\nabla$

Heavys	0	32	32
Trucks	0	13	13
Cars	0	1347	1347
Totals	0	1392	



Heavys	56
Trucks	25
Cars	1937
Totals	2018

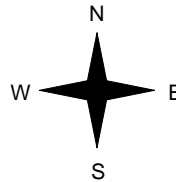
Heavys	Trucks	Cars	Totals
0	0	0	0



Trafalgar Rd



QEW EB Off Ramp



Heavys	Trucks	Cars	Totals
21	8	644	673
6	9	421	436
27	17	1065	



Trafalgar Rd



Peds Cross:  $\nabla$   
 West Peds: 11  
 West Entering: 1109  
 West Leg Total: 1109

Cars	1768
Trucks	22
Heavys	38
Totals	1828



Cars	0	1293	1293
Trucks	0	17	17
Heavys	0	35	35
Totals	0	1345	

Peds Cross:  $\nabla$   
 South Peds: 2  
 South Entering: 1345  
 South Leg Total: 3173

## Comments



# Trafalgar Rd @ QEW EB Off Ramp

## Afternoon Peak Diagram

### Specified Period

**From:** 15:00:00

**To:** 18:00:00

### One Hour Peak

**From:** 17:00:00

**To:** 18:00:00

**Municipality:** Halton Region  
**Site #:** 0000003014  
**Intersection:** Trafalgar Rd & QEW EB Off Ramp  
**TFR File #:** 6  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 4360  
 North Entering: 1485  
 North Peds: 0  
 Peds Cross:  $\nabla$

Heavys	0	26	26
Trucks	0	5	5
Cars	0	1454	1454
Totals	0	1485	



Heavys	34
Trucks	6
Cars	2835
Totals	2875

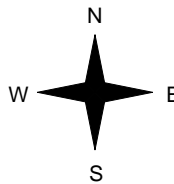
Heavys	Trucks	Cars	Totals
0	0	0	0



Trafalgar Rd



QEW EB Off Ramp



Heavys	Trucks	Cars	Totals
1	2	888	891
5	0	414	419
6	2	1302	



Trafalgar Rd



Peds Cross:  $\nabla$   
 West Peds: 17  
 West Entering: 1310  
 West Leg Total: 1310

Cars	1868
Trucks	5
Heavys	31
Totals	1904



Cars	0	1947	1947
Trucks	0	4	4
Heavys	0	33	33
Totals	0	1984	

Peds Cross:  $\nabla$   
 South Peds: 2  
 South Entering: 1984  
 South Leg Total: 3888

## Comments

# Trafalgar Rd @ QEW EB Off Ramp

## Total Count Diagram

**Municipality:** Halton Region  
**Site #:** 0000003014  
**Intersection:** Trafalgar Rd & QEW EB Off Ramp  
**TFR File #:** 6  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 28637  
 North Entering: 12310  
 North Peds: 0  
 Peds Cross:  $\nabla$

Heavys	0	296
Trucks	0	118
Cars	0	11896
Totals	0	12310

296  
118  
11896



Heavys	411
Trucks	143
Cars	15773
Totals	16327

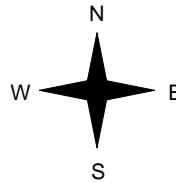
Heavys	Trucks	Cars	Totals
0	0	0	0



Trafalgar Rd



QEW EB Off Ramp



Heavys	Trucks	Cars	Totals
114	48	5398	5560
59	36	3438	3533
173	84	8836	



Trafalgar Rd



Peds Cross:  $\nabla$   
 West Peds: 87  
 West Entering: 9093  
 West Leg Total: 9093

Cars	15334
Trucks	154
Heavys	355
Totals	15843



Cars	0	10375	10375
Trucks	0	95	95
Heavys	0	297	297
Totals	0	10767	

Peds Cross:  $\nabla$   
 South Peds: 7  
 South Entering: 10767  
 South Leg Total: 26610

### Comments

# Trafalgar Rd @ Argus Rd

## 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:** Halton Region  
**Site #:** 0000003013  
**Intersection:** Trafalgar Rd & Argus Rd  
**TFR File #:** 2  
**Count date:** 15-May-2017

**Weather conditions:**  
Sunny/Dry  
**Person(s) who counted:**  
Bronek  
Radek

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

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 3496  
 North Entering: 2579  
 North Peds: 0  
 Peds Cross:  $\nabla$

Heavys	10	39	49
Trucks	3	46	49
Cars	633	1848	2481
<b>Totals</b>	<b>646</b>	<b>1933</b>	



Heavys	42
Trucks	26
Cars	849
<b>Totals</b>	<b>917</b>

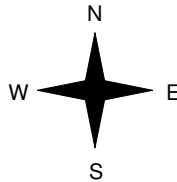
Heavys	Trucks	Cars	Totals
10	3	633	646



Trafalgar Rd



Argus Rd



Heavys	Trucks	Cars	Totals
0	0	0	0
0	1	14	15
0	1	14	



Trafalgar Rd



Peds Cross:  $\nabla$   
 West Peds: 11  
 West Entering: 15  
 West Leg Total: 661

Cars	1862
Trucks	47
Heavys	39
<b>Totals</b>	<b>1948</b>



Cars	0	849	849
Trucks	0	26	26
Heavys	0	42	42
<b>Totals</b>	<b>0</b>	<b>917</b>	

Peds Cross:  $\nabla$   
 South Peds: 0  
 South Entering: 917  
 South Leg Total: 2865

## Comments

# Trafalgar Rd @ Argus Rd

## Mid-day Peak Diagram

### Specified Period

**From:** 11:00:00

**To:** 14:00:00

### One Hour Peak

**From:** 12:15:00

**To:** 13:15:00

**Municipality:** Halton Region  
**Site #:** 0000003013  
**Intersection:** Trafalgar Rd & Argus Rd  
**TFR File #:** 2  
**Count date:** 15-May-2017

**Weather conditions:**  
Sunny/Dry  
**Person(s) who counted:**  
Bronek  
Radek

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

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 2892  
 North Entering: 1647  
 North Peds: 0  
 Peds Cross:  $\times$

Heavys	11	30	41
Trucks	5	32	37
Cars	279	1290	1569
<b>Totals</b>	<b>295</b>	<b>1352</b>	



Heavys	29
Trucks	22
Cars	1194
<b>Totals</b>	<b>1245</b>

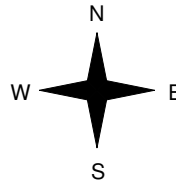
Heavys	Trucks	Cars	Totals
11	5	279	295



Trafalgar Rd



Argus Rd



Heavys	Trucks	Cars	Totals
0	0	0	0
1	2	35	38
1	2	35	



Trafalgar Rd



Peds Cross:  $\times$   
 West Peds: 9  
 West Entering: 38  
 West Leg Total: 333

Cars	1325
Trucks	34
Heavys	31
<b>Totals</b>	<b>1390</b>



Cars	0	1194	1194
Trucks	0	22	22
Heavys	0	29	29
<b>Totals</b>	<b>0</b>	<b>1245</b>	

Peds Cross:  $\times$   
 South Peds: 0  
 South Entering: 1245  
 South Leg Total: 2635

## Comments

# Trafalgar Rd @ Argus Rd

## Afternoon Peak Diagram

### Specified Period

**From:** 15:00:00

**To:** 18:00:00

### One Hour Peak

**From:** 17:00:00

**To:** 18:00:00

**Municipality:** Halton Region  
**Site #:** 0000003013  
**Intersection:** Trafalgar Rd & Argus Rd  
**TFR File #:** 2  
**Count date:** 15-May-2017

**Weather conditions:**  
Sunny/Dry  
**Person(s) who counted:**  
Bronek  
Radek

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

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 3579  
 North Entering: 1674  
 North Peds: 0  
 Peds Cross:  $\nabla$

Heavys	9	21	30
Trucks	1	8	9
Cars	330	1305	1635
<b>Totals</b>	<b>340</b>	<b>1334</b>	



Heavys	29
Trucks	8
Cars	1868
<b>Totals</b>	<b>1905</b>

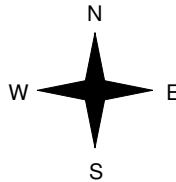
Heavys	Trucks	Cars	Totals
9	1	330	340



Trafalgar Rd



Argus Rd



Heavys	Trucks	Cars	Totals
0	0	0	0
2	1	35	38
2	1	35	



Trafalgar Rd



Peds Cross:  $\nabla$   
 West Peds: 24  
 West Entering: 38  
 West Leg Total: 378

Cars	1340
Trucks	9
Heavys	23
<b>Totals</b>	<b>1372</b>



Cars	0	1868	1868
Trucks	0	8	8
Heavys	0	29	29
<b>Totals</b>	<b>0</b>	<b>1905</b>	

Peds Cross:  $\nabla$   
 South Peds: 0  
 South Entering: 1905  
 South Leg Total: 3277

## Comments

# Trafalgar Rd @ Argus Rd

## Total Count Diagram

**Municipality:** Halton Region  
**Site #:** 0000003013  
**Intersection:** Trafalgar Rd & Argus Rd  
**TFR File #:** 2  
**Count date:** 15-May-2017

**Weather conditions:**  
 Sunny/Dry  
**Person(s) who counted:**  
 Bronek  
 Radek

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

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 24276  
 North Entering: 14428  
 North Peds: 0  
 Peds Cross:  $\nabla$

Heavys	85	240	325
Trucks	21	245	266
Cars	3022	10815	13837
<b>Totals</b>	<b>3128</b>	<b>11300</b>	



Heavys	267
Trucks	169
Cars	9412
<b>Totals</b>	<b>9848</b>

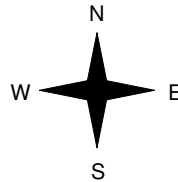
Heavys	Trucks	Cars	Totals
85	21	3022	3128



Trafalgar Rd



Argus Rd



Heavys	Trucks	Cars	Totals
0	0	0	0
6	8	215	229
6	8	215	



Trafalgar Rd



Peds Cross:  $\nabla$   
 West Peds: 99  
 West Entering: 229  
 West Leg Total: 3357

Cars	11030
Trucks	253
Heavys	246
<b>Totals</b>	<b>11529</b>



Cars	0	9412	9412
Trucks	0	169	169
Heavys	0	267	267
<b>Totals</b>	<b>0</b>	<b>9848</b>	

Peds Cross:  $\nabla$   
 South Peds: 0  
 South Entering: 9848  
 South Leg Total: 21377

### Comments

# Trafalgar Rd @ South Service 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:** Halton Region  
**Site #:** 0000003012  
**Intersection:** Trafalgar Rd & South Service Rd  
**TFR File #:** 5  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 3502  
 North Entering: 1907  
 North Peds: 1  
 Peds Cross:  $\bowtie$

Heavys	14	16	3	33
Trucks	2	21	5	28
Cars	377	1232	237	1846
<b>Totals</b>	<b>393</b>	<b>1269</b>	<b>245</b>	



Heavys	54
Trucks	15
Cars	1526
<b>Totals</b>	<b>1595</b>

East Leg Total: 607  
 East Entering: 234  
 East Peds: 52  
 Peds Cross:  $\bowtie$

Heavys	Trucks	Cars	Totals
28	5	547	580

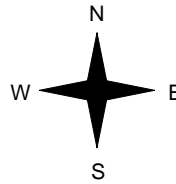


Trafalgar Rd

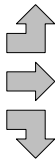
Cars	Trucks	Heavys	Totals
109	1	4	114
74	1	5	80
39	1	0	40
<b>222</b>	<b>3</b>	<b>9</b>	



Cross Ave



Heavys	Trucks	Cars	Totals
27	6	337	370
5	0	72	77
9	4	94	107
<b>41</b>	<b>10</b>	<b>503</b>	



South Service Rd



Peds Cross:  $\bowtie$   
 West Peds: 10  
 West Entering: 554  
 West Leg Total: 1134

Cars	1365	Cars	96	1080	51	1227
Trucks	26	Trucks	2	8	0	10
Heavys	25	Heavys	9	23	0	32
<b>Totals</b>	<b>1416</b>	<b>Totals</b>	<b>107</b>	<b>1111</b>	<b>51</b>	



Trafalgar Rd



Peds Cross:  $\bowtie$   
 South Peds: 4  
 South Entering: 1269  
 South Leg Total: 2685

## Comments

# Trafalgar Rd @ South Service Rd

## Mid-day Peak Diagram

### Specified Period

**From:** 11:00:00

**To:** 14:00:00

### One Hour Peak

**From:** 12:00:00

**To:** 13:00:00

**Municipality:** Halton Region  
**Site #:** 0000003012  
**Intersection:** Trafalgar Rd & South Service Rd  
**TFR File #:** 5  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 3320  
 North Entering: 1509  
 North Peds: 0  
 Peds Cross:  $\times$

Heavys	9	12	4	25
Trucks	6	21	2	29
Cars	232	1101	122	1455
<b>Totals</b>	<b>247</b>	<b>1134</b>	<b>128</b>	



Heavys	42
Trucks	25
Cars	1744
<b>Totals</b>	<b>1811</b>

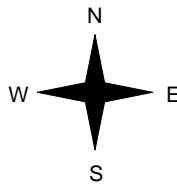
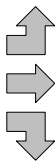
East Leg Total: 594  
 East Entering: 336  
 East Peds: 8  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
17	8	450	475



Cross Ave

Heavys	Trucks	Cars	Totals
21	2	407	430
2	2	70	74
6	0	88	94
<b>29</b>	<b>4</b>	<b>565</b>	



Trafalgar Rd



Cars	Trucks	Heavys	Totals
151	3	6	160
89	0	2	91
80	2	3	85
<b>320</b>	<b>5</b>	<b>11</b>	



South Service Rd



Cars	Trucks	Heavys	Totals
246	6	6	258

Peds Cross:  $\times$   
 West Peds: 20  
 West Entering: 598  
 West Leg Total: 1073

Cars	1269
Trucks	23
Heavys	21
<b>Totals</b>	<b>1313</b>



Cars	129	1186	54	1369
Trucks	2	20	2	24
Heavys	6	15	0	21
<b>Totals</b>	<b>137</b>	<b>1221</b>	<b>56</b>	

Peds Cross:  $\times$   
 South Peds: 28  
 South Entering: 1414  
 South Leg Total: 2727

## Comments



# Trafalgar Rd @ South Service Rd

## Afternoon Peak Diagram

### Specified Period

**From:** 15:00:00

**To:** 18:00:00

### One Hour Peak

**From:** 17:00:00

**To:** 18:00:00

**Municipality:** Halton Region  
**Site #:** 0000003012  
**Intersection:** Trafalgar Rd & South Service Rd  
**TFR File #:** 5  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 4034  
 North Entering: 1668  
 North Peds: 0  
 Peds Cross:  $\times$

Heavys	9	5	0	14
Trucks	0	4	0	4
Cars	281	1250	119	1650
<b>Totals</b>	<b>290</b>	<b>1259</b>	<b>119</b>	



Heavys	34
Trucks	9
Cars	2323
<b>Totals</b>	<b>2366</b>

East Leg Total: 749  
 East Entering: 515  
 East Peds: 70  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
20	0	516	536

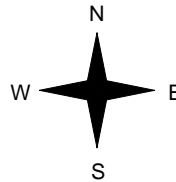


Trafalgar Rd

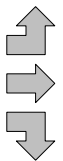
Cars	Trucks	Heavys	Totals
246	1	1	248
125	0	5	130
134	1	2	137
<b>505</b>	<b>2</b>	<b>8</b>	



Cross Ave



Heavys	Trucks	Cars	Totals
28	1	837	866
6	0	72	78
11	0	109	120
<b>45</b>	<b>1</b>	<b>1018</b>	



South Service Rd



Cars	Trucks	Heavys	Totals
228	0	6	234

Trafalgar Rd



Peds Cross:  $\times$   
 West Peds: 18  
 West Entering: 1064  
 West Leg Total: 1600

Cars	1493
Trucks	5
Heavys	18
<b>Totals</b>	<b>1516</b>



Cars	110	1240	37	1387
Trucks	0	7	0	7
Heavys	6	5	0	11
<b>Totals</b>	<b>116</b>	<b>1252</b>	<b>37</b>	

Peds Cross:  $\times$   
 South Peds: 15  
 South Entering: 1405  
 South Leg Total: 2921

## Comments

# Trafalgar Rd @ South Service Rd

## Total Count Diagram

**Municipality:** Halton Region  
**Site #:** 0000003012  
**Intersection:** Trafalgar Rd & South Service Rd  
**TFR File #:** 5  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 27051  
 North Entering: 12565  
 North Peds: 1  
 Peds Cross:  $\times$

Heavys	93	116	17	226
Trucks	14	124	15	153
Cars	2294	8870	1022	12186
<b>Totals</b>	<b>2401</b>	<b>9110</b>	<b>1054</b>	



Heavys	349
Trucks	148
Cars	13989
<b>Totals</b>	<b>14486</b>

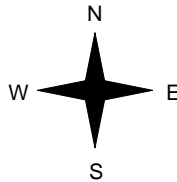
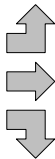
East Leg Total: 4526  
 East Entering: 2674  
 East Peds: 256  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
167	27	3820	4014



Cross Ave

Heavys	Trucks	Cars	Totals
197	24	3662	3883
21	8	474	503
59	7	728	794
<b>277</b>	<b>39</b>	<b>4864</b>	



Trafalgar Rd

Cars	Trucks	Heavys	Totals
1272	20	34	1326
736	3	18	757
569	8	14	591
<b>2577</b>	<b>31</b>	<b>66</b>	

South Service Rd



Cars	Trucks	Heavys	Totals
1776	32	44	1852

Peds Cross:  $\times$   
 West Peds: 102  
 West Entering: 5180  
 West Leg Total: 9194

Cars	10167	Cars	790	9055	280	10125
Trucks	139	Trucks	10	104	9	123
Heavys	189	Heavys	56	118	6	180
<b>Totals</b>	<b>10495</b>	<b>Totals</b>	<b>856</b>	<b>9277</b>	<b>295</b>	



Peds Cross:  $\times$   
 South Peds: 83  
 South Entering: 10428  
 South Leg Total: 20923

### Comments

# Trafalgar Rd @ Cornwall 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:** Halton Region  
**Site #:** 0000003011  
**Intersection:** Trafalgar Rd & Cornwall Rd  
**TFR File #:** 4  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 2557  
 North Entering: 1337  
 North Peds: 25  
 Peds Cross:  $\times$

Heavys	9	6	19	34
Trucks	10	6	4	20
Cars	300	471	512	1283
<b>Totals</b>	<b>319</b>	<b>483</b>	<b>535</b>	



Heavys	14
Trucks	9
Cars	1197
<b>Totals</b>	<b>1220</b>

East Leg Total: 1995  
 East Entering: 953  
 East Peds: 18  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
19	13	713	745

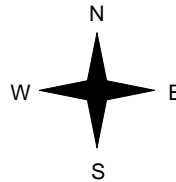


Trafalgar Rd

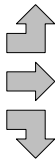
Cars	Trucks	Heavys	Totals
543	5	9	557
366	3	9	378
17	1	0	18
<b>926</b>	<b>9</b>	<b>18</b>	



Cornwall Rd



Heavys	Trucks	Cars	Totals
3	3	339	345
12	7	443	462
1	0	71	72
<b>16</b>	<b>10</b>	<b>853</b>	



Cornwall Rd



Peds Cross:  $\times$   
 West Peds: 9  
 West Entering: 879  
 West Leg Total: 1624

Cars	559	Cars	47	315	45	407
Trucks	7	Trucks	0	1	0	1
Heavys	7	Heavys	1	2	0	3
<b>Totals</b>	<b>573</b>	<b>Totals</b>	<b>48</b>	<b>318</b>	<b>45</b>	



Trafalgar Rd

Peds Cross:  $\times$   
 South Peds: 7  
 South Entering: 411  
 South Leg Total: 984

## Comments

# Trafalgar Rd @ Cornwall Rd

## Mid-day Peak Diagram

### Specified Period

**From:** 11:00:00

**To:** 14:00:00

### One Hour Peak

**From:** 12:00:00

**To:** 13:00:00

**Municipality:** Halton Region  
**Site #:** 0000003011  
**Intersection:** Trafalgar Rd & Cornwall Rd  
**TFR File #:** 4  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 2692  
 North Entering: 1309  
 North Peds: 24  
 Peds Cross:  $\times$

Heavys	8	1	12	21
Trucks	10	3	6	19
Cars	186	516	567	1269
<b>Totals</b>	<b>204</b>	<b>520</b>	<b>585</b>	



Heavys	22
Trucks	23
Cars	1338
<b>Totals</b>	<b>1383</b>

East Leg Total: 2106  
 East Entering: 1076  
 East Peds: 13  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
21	17	576	614

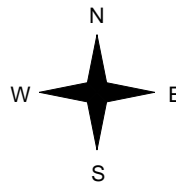


Trafalgar Rd

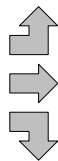
Cars	Trucks	Heavys	Totals
626	13	13	652
359	7	13	379
44	1	0	45
<b>1029</b>	<b>21</b>	<b>26</b>	



Cornwall Rd



Heavys	Trucks	Cars	Totals
5	6	324	335
6	5	368	379
0	2	37	39
<b>11</b>	<b>13</b>	<b>729</b>	



Cornwall Rd



Peds Cross:  $\times$   
 West Peds: 6  
 West Entering: 753  
 West Leg Total: 1367

Cars	597	Cars	31	388	66	485
Trucks	6	Trucks	0	4	0	4
Heavys	1	Heavys	0	4	0	4
<b>Totals</b>	<b>604</b>	<b>Totals</b>	<b>31</b>	<b>396</b>	<b>66</b>	



Trafalgar Rd



Peds Cross:  $\times$   
 South Peds: 8  
 South Entering: 493  
 South Leg Total: 1097

## Comments

# Trafalgar Rd @ Cornwall Rd

## Afternoon Peak Diagram

### Specified Period

**From:** 15:00:00

**To:** 18:00:00

### One Hour Peak

**From:** 17:00:00

**To:** 18:00:00

**Municipality:** Halton Region  
**Site #:** 0000003011  
**Intersection:** Trafalgar Rd & Cornwall Rd  
**TFR File #:** 4  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 2883  
 North Entering: 1483  
 North Peds: 21  
 Peds Cross:  $\times$

Heavys	6	0	11	17
Trucks	2	2	1	5
Cars	462	524	475	1461
<b>Totals</b>	<b>470</b>	<b>526</b>	<b>487</b>	



Heavys	8
Trucks	7
Cars	1385
<b>Totals</b>	<b>1400</b>

East Leg Total: 2246  
 East Entering: 1261  
 East Peds: 10  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
11	5	1208	1224



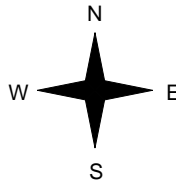
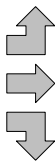
Trafalgar Rd

Cars	Trucks	Heavys	Totals
556	3	5	564
634	1	5	640
57	0	0	57
<b>1247</b>	<b>4</b>	<b>10</b>	



Cornwall Rd

Heavys	Trucks	Cars	Totals
3	2	424	429
6	6	447	459
1	0	161	162
<b>10</b>	<b>8</b>	<b>1032</b>	



Trafalgar Rd



Cars	Trucks	Heavys	Totals
961	7	17	985



Peds Cross:  $\times$   
 West Peds: 17  
 West Entering: 1050  
 West Leg Total: 2274

Cars	742	Cars	112	405	39	556
Trucks	2	Trucks	2	2	0	4
Heavys	1	Heavys	0	0	0	0
<b>Totals</b>	<b>745</b>	<b>Totals</b>	<b>114</b>	<b>407</b>	<b>39</b>	



Peds Cross:  $\times$   
 South Peds: 14  
 South Entering: 560  
 South Leg Total: 1305

## Comments

# Trafalgar Rd @ Cornwall Rd

## Total Count Diagram

**Municipality:** Halton Region  
**Site #:** 0000003011  
**Intersection:** Trafalgar Rd & Cornwall Rd  
**TFR File #:** 4  
**Count date:** 1-Jun-2017

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

**\*\* Signalized Intersection \*\***

**Major Road:** Trafalgar Rd runs N/S

North Leg Total: 20400  
 North Entering: 10198  
 North Peds: 147  
 Peds Cross:  $\times$

Heavys	58	29	112	199
Trucks	60	29	40	129
Cars	2277	3661	3932	9870
<b>Totals</b>	<b>2395</b>	<b>3719</b>	<b>4084</b>	



Heavys	146
Trucks	111
Cars	9945
<b>Totals</b>	<b>10202</b>

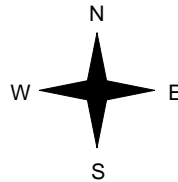
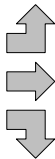
East Leg Total: 15937  
 East Entering: 8450  
 East Peds: 79  
 Peds Cross:  $\times$

Heavys	Trucks	Cars	Totals
151	98	6219	6468



Cornwall Rd

Heavys	Trucks	Cars	Totals
40	36	2602	2678
68	35	2939	3042
5	9	490	504
<b>113</b>	<b>80</b>	<b>6031</b>	



Trafalgar Rd

Cars	Trucks	Heavys	Totals
4396	51	87	4534
3495	36	87	3618
293	4	1	298
<b>8184</b>	<b>91</b>	<b>175</b>	

Cornwall Rd



Cars	Trucks	Heavys	Totals
7227	79	181	7487

Peds Cross:  $\times$   
 West Peds: 79  
 West Entering: 6224  
 West Leg Total: 12692

Cars	4444
Trucks	42
Heavys	35
<b>Totals</b>	<b>4521</b>



Cars	447	2947	356	3750
Trucks	2	24	4	30
Heavys	6	19	1	26
<b>Totals</b>	<b>455</b>	<b>2990</b>	<b>361</b>	

Peds Cross:  $\times$   
 South Peds: 68  
 South Entering: 3806  
 South Leg Total: 8327

### Comments



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Argus Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 1

### Turning Movement Data

Start Time	Cross Avenue Eastbound						Cross Avenue Westbound						GO Bus Station Northbound						Argus Road Southbound						Int. Total	
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total		
7:00 AM	2	75	5	0	1	82	12	134	0	0	1	146	7	0	14	0	0	21	5	2	85	0	1	92	341	
7:15 AM	3	82	2	0	3	87	7	154	2	0	10	163	1	0	7	0	0	8	13	2	112	0	2	127	385	
7:30 AM	2	90	5	0	1	97	9	131	5	0	8	145	6	0	14	0	1	20	11	3	103	0	0	117	379	
7:45 AM	6	87	2	0	1	95	7	157	4	0	3	168	1	0	9	0	0	10	17	6	130	0	0	153	426	
Hourly Total	13	334	14	0	6	361	35	576	11	0	22	622	15	0	44	0	1	59	46	13	430	0	3	489	1531	
8:00 AM	7	76	5	0	0	88	11	118	7	0	5	136	9	0	16	0	2	25	11	4	110	0	1	125	374	
8:15 AM	14	102	1	0	1	117	10	145	6	0	4	161	3	0	6	0	0	9	14	2	120	0	0	136	423	
8:30 AM	10	88	6	0	1	104	10	96	6	0	2	112	9	0	13	0	0	22	17	2	39	0	0	58	296	
8:45 AM	12	81	2	0	1	95	8	84	8	0	3	100	4	1	3	0	0	8	8	4	57	0	0	69	272	
Hourly Total	43	347	14	0	3	404	39	443	27	0	14	509	25	1	38	0	2	64	50	12	326	0	1	388	1365	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	6	81	4	0	1	91	6	59	7	0	3	72	6	0	8	0	1	14	20	4	22	0	0	46	223	
11:15 AM	4	73	2	0	2	79	2	66	10	0	1	78	0	0	3	0	0	3	20	0	30	0	0	50	210	
11:30 AM	7	76	7	0	1	90	7	66	7	0	3	80	7	0	11	0	1	18	21	2	33	0	2	56	244	
11:45 AM	3	94	1	0	1	98	1	67	8	1	1	77	0	0	3	0	0	3	28	2	24	0	1	54	232	
Hourly Total	20	324	14	0	5	358	16	258	32	1	8	307	13	0	25	0	2	38	89	8	109	0	3	206	909	
12:00 PM	3	77	4	0	4	84	7	73	6	0	4	86	3	0	4	0	1	7	31	3	20	0	1	54	231	
12:15 PM	7	88	1	0	0	96	2	78	4	0	1	84	4	0	7	0	0	11	23	0	37	0	1	60	251	
12:30 PM	1	97	4	0	3	102	7	76	9	0	4	92	4	0	8	0	0	12	25	3	19	0	0	47	253	
12:45 PM	7	98	1	0	2	106	3	82	7	0	1	92	1	0	3	0	0	4	26	1	21	0	3	48	250	
Hourly Total	18	360	10	0	9	388	19	309	26	0	10	354	12	0	22	0	1	34	105	7	97	0	5	209	985	
1:00 PM	7	117	4	0	2	128	8	89	10	0	1	107	9	0	9	0	1	18	18	4	19	0	2	41	294	
1:15 PM	4	99	1	0	0	104	3	76	9	0	3	88	1	0	2	0	0	3	18	0	25	0	2	43	238	
1:30 PM	3	75	6	0	2	84	8	69	4	0	1	81	7	0	8	0	1	15	22	1	23	0	0	46	226	
1:45 PM	5	84	1	0	1	90	1	82	13	0	4	96	0	0	4	0	1	4	17	1	18	0	2	36	226	
Hourly Total	19	375	12	0	5	406	20	316	36	0	9	372	17	0	23	0	3	40	75	6	85	0	6	166	984	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	4	92	4	0	4	100	8	82	10	0	10	100	7	0	10	0	6	17	24	4	24	0	0	52	269	
3:15 PM	6	108	1	0	0	115	3	83	9	0	6	95	3	0	2	0	0	5	22	4	27	0	1	53	268	
3:30 PM	7	101	4	0	5	112	9	63	14	0	8	86	5	0	10	0	1	15	11	3	25	0	10	39	252	
3:45 PM	4	84	1	0	1	89	1	87	4	0	2	92	3	0	2	0	0	5	19	3	27	0	3	49	235	
Hourly Total	21	385	10	0	10	416	21	315	37	0	26	373	18	0	24	0	7	42	76	14	103	0	14	193	1024	
4:00 PM	4	145	4	0	0	153	8	72	6	0	6	86	5	0	11	0	1	16	27	5	34	0	0	66	321	
4:15 PM	5	90	2	0	0	97	4	72	4	0	3	80	2	1	7	0	2	10	23	3	33	0	1	59	246	
4:30 PM	3	195	4	1	1	203	4	64	10	0	5	78	2	0	13	0	1	15	25	6	36	0	3	67	363	
4:45 PM	2	122	5	0	0	129	4	72	5	0	2	81	5	0	10	0	0	15	25	3	37	0	1	65	290	
Hourly Total	14	552	15	1	1	582	20	280	25	0	16	325	14	1	41	0	4	56	100	17	140	0	5	257	1220	

5:00 PM	2	212	5	0	2	219	9	83	8	0	4	100	3	0	14	0	1	17	39	6	21	0	0	66	402
5:15 PM	4	108	3	0	6	115	8	82	12	0	8	102	4	0	8	0	2	12	32	2	30	0	2	64	293
5:30 PM	2	225	5	0	2	232	8	86	8	0	3	102	2	0	16	0	0	18	24	4	31	0	4	59	411
5:45 PM	5	242	2	0	2	249	9	76	11	0	5	96	5	2	5	0	1	12	39	6	39	0	3	84	441
Hourly Total	13	787	15	0	12	815	34	327	39	0	20	400	14	2	43	0	4	59	134	18	121	0	9	273	1547
Grand Total	161	3464	104	1	51	3730	204	2824	233	1	125	3262	128	4	260	0	24	392	675	95	1411	0	46	2181	9565
Approach %	4.3	92.9	2.8	0.0	-	-	6.3	86.6	7.1	0.0	-	-	32.7	1.0	66.3	0.0	-	-	30.9	4.4	64.7	0.0	-	-	-
Total %	1.7	36.2	1.1	0.0	-	39.0	2.1	29.5	2.4	0.0	-	34.1	1.3	0.0	2.7	0.0	-	4.1	7.1	1.0	14.8	0.0	-	22.8	-
Lights	160	3426	4	1	-	3591	17	2797	228	1	-	3043	8	0	13	0	-	21	665	4	1405	0	-	2074	8729
% Lights	99.4	98.9	3.8	100.0	-	96.3	8.3	99.0	97.9	100.0	-	93.3	6.3	0.0	5.0	-	-	5.4	98.5	4.2	99.6	-	-	95.1	91.3
Mediums	1	32	100	0	-	133	187	25	5	0	-	217	120	4	247	0	-	371	8	91	6	0	-	105	826
% Mediums	0.6	0.9	96.2	0.0	-	3.6	91.7	0.9	2.1	0.0	-	6.7	93.8	100.0	95.0	-	-	94.6	1.2	95.8	0.4	-	-	4.8	8.6
Articulated Trucks	0	6	0	0	-	6	0	1	0	0	-	1	0	0	0	0	-	0	2	0	0	0	-	2	9
% Articulated Trucks	0.0	0.2	0.0	0.0	-	0.2	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.3	0.0	0.0	-	-	0.1	0.1
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	6.5	-	-
Pedestrians	-	-	-	-	51	-	-	-	-	-	125	-	-	-	-	-	24	-	-	-	-	-	43	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	93.5	-	-

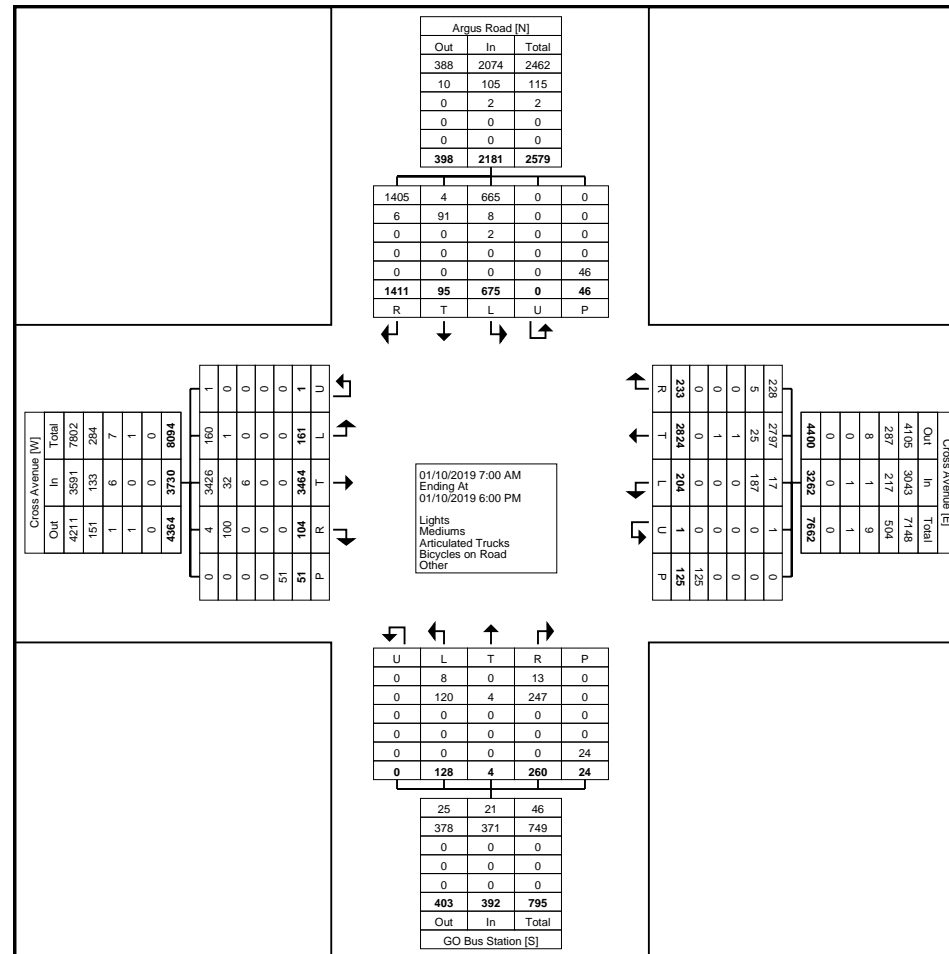




Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Argus Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Argus Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 4

### Turning Movement Peak Hour Data (7:30 AM)

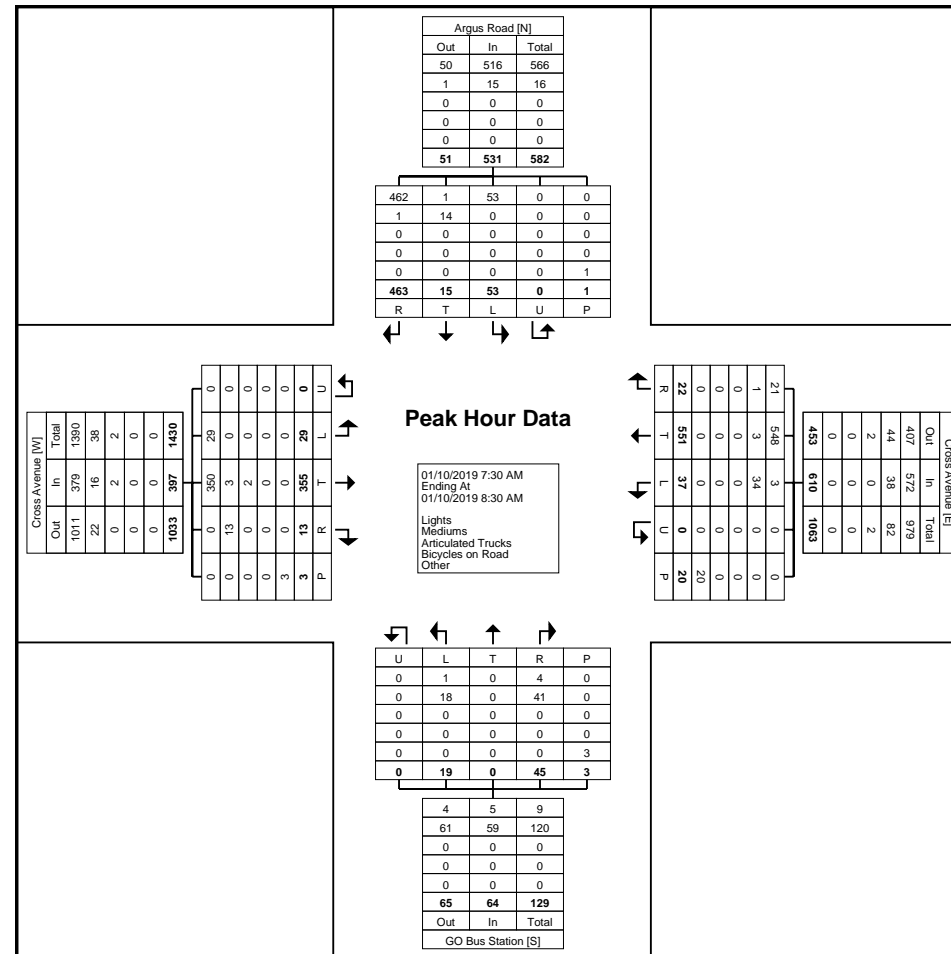
Start Time	Cross Avenue Eastbound						Cross Avenue Westbound						GO Bus Station Northbound						Argus Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:30 AM	2	90	5	0	1	97	9	131	5	0	8	145	6	0	14	0	1	20	11	3	103	0	0	117	379
7:45 AM	6	87	2	0	1	95	7	157	4	0	3	168	1	0	9	0	0	10	17	6	130	0	0	153	426
8:00 AM	7	76	5	0	0	88	11	118	7	0	5	136	9	0	16	0	2	25	11	4	110	0	1	125	374
8:15 AM	14	102	1	0	1	117	10	145	6	0	4	161	3	0	6	0	0	9	14	2	120	0	0	136	423
Total	29	355	13	0	3	397	37	551	22	0	20	610	19	0	45	0	3	64	53	15	463	0	1	531	1602
Approach %	7.3	89.4	3.3	0.0	-	-	6.1	90.3	3.6	0.0	-	-	29.7	0.0	70.3	0.0	-	-	10.0	2.8	87.2	0.0	-	-	-
Total %	1.8	22.2	0.8	0.0	-	24.8	2.3	34.4	1.4	0.0	-	38.1	1.2	0.0	2.8	0.0	-	4.0	3.3	0.9	28.9	0.0	-	33.1	-
PHF	0.518	0.870	0.650	0.000	-	0.848	0.841	0.877	0.786	0.000	-	0.908	0.528	0.000	0.703	0.000	-	0.640	0.779	0.625	0.890	0.000	-	0.868	0.940
Lights	29	350	0	0	-	379	3	548	21	0	-	572	1	0	4	0	-	5	53	1	462	0	-	516	1472
% Lights	100.0	98.6	0.0	-	-	95.5	8.1	99.5	95.5	-	-	93.8	5.3	-	8.9	-	-	7.8	100.0	6.7	99.8	-	-	97.2	91.9
Mediums	0	3	13	0	-	16	34	3	1	0	-	38	18	0	41	0	-	59	0	14	1	0	-	15	128
% Mediums	0.0	0.8	100.0	-	-	4.0	91.9	0.5	4.5	-	-	6.2	94.7	-	91.1	-	-	92.2	0.0	93.3	0.2	-	-	2.8	8.0
Articulated Trucks	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.6	0.0	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	100.0	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	20	-	-	-	-	-	3	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	0.0	-	-



Paradigm Transportation Solutions Limited  
 22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
 519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Argus Road  
 Site Code:  
 Start Date: 01/10/2019  
 Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Argus Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 6

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

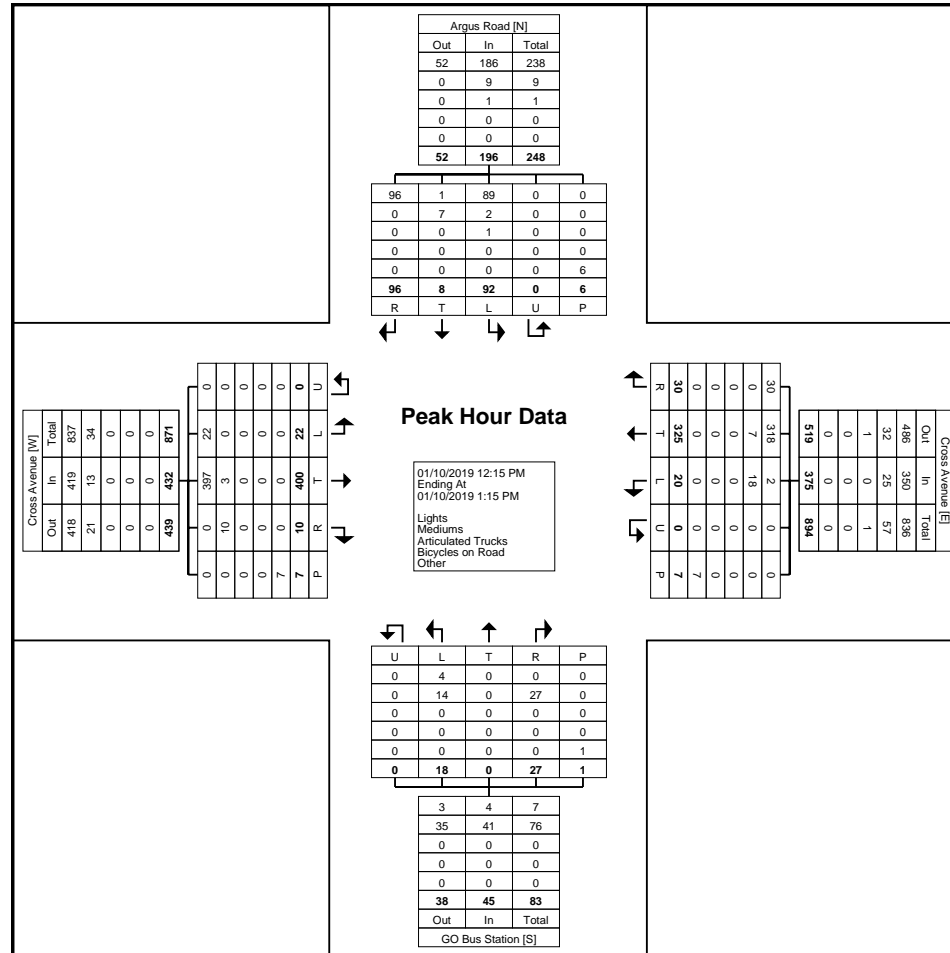
Start Time	Cross Avenue Eastbound						Cross Avenue Westbound						GO Bus Station Northbound						Argus Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:15 PM	7	88	1	0	0	96	2	78	4	0	1	84	4	0	7	0	0	11	23	0	37	0	1	60	251
12:30 PM	1	97	4	0	3	102	7	76	9	0	4	92	4	0	8	0	0	12	25	3	19	0	0	47	253
12:45 PM	7	98	1	0	2	106	3	82	7	0	1	92	1	0	3	0	0	4	26	1	21	0	3	48	250
1:00 PM	7	117	4	0	2	128	8	89	10	0	1	107	9	0	9	0	1	18	18	4	19	0	2	41	294
Total	22	400	10	0	7	432	20	325	30	0	7	375	18	0	27	0	1	45	92	8	96	0	6	196	1048
Approach %	5.1	92.6	2.3	0.0	-	-	5.3	86.7	8.0	0.0	-	-	40.0	0.0	60.0	0.0	-	-	46.9	4.1	49.0	0.0	-	-	-
Total %	2.1	38.2	1.0	0.0	-	41.2	1.9	31.0	2.9	0.0	-	35.8	1.7	0.0	2.6	0.0	-	4.3	8.8	0.8	9.2	0.0	-	18.7	-
PHF	0.786	0.855	0.625	0.000	-	0.844	0.625	0.913	0.750	0.000	-	0.876	0.500	0.000	0.750	0.000	-	0.625	0.885	0.500	0.649	0.000	-	0.817	0.891
Lights	22	397	0	0	-	419	2	318	30	0	-	350	4	0	0	0	-	4	89	1	96	0	-	186	959
% Lights	100.0	99.3	0.0	-	-	97.0	10.0	97.8	100.0	-	-	93.3	22.2	-	0.0	-	-	8.9	96.7	12.5	100.0	-	-	94.9	91.5
Mediums	0	3	10	0	-	13	18	7	0	0	-	25	14	0	27	0	-	41	2	7	0	0	-	9	88
% Mediums	0.0	0.8	100.0	-	-	3.0	90.0	2.2	0.0	-	-	6.7	77.8	-	100.0	-	-	91.1	2.2	87.5	0.0	-	-	4.6	8.4
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	1	1
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	1.1	0.0	0.0	-	-	0.5	0.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	7	-	-	-	-	-	7	-	-	-	-	-	1	-	-	-	-	-	6	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Argus Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 7



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



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Argus Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 8

### Turning Movement Peak Hour Data (5:00 PM)

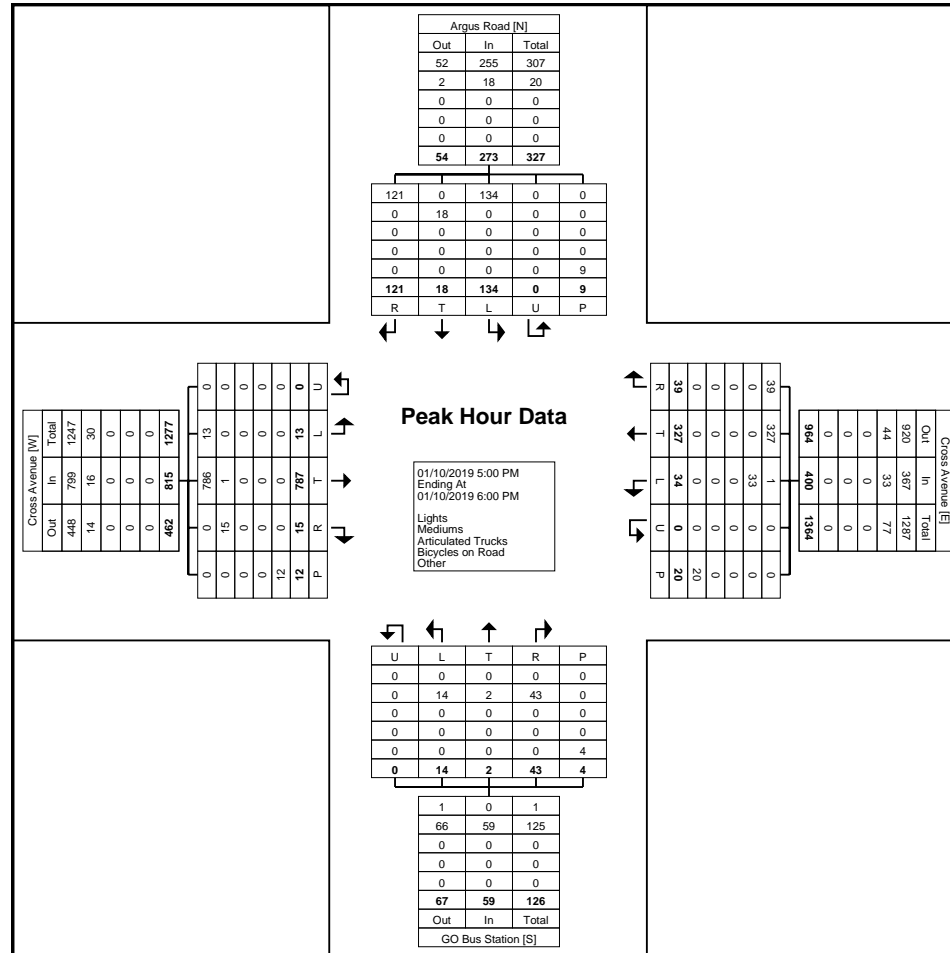
Start Time	Cross Avenue Eastbound						Cross Avenue Westbound						GO Bus Station Northbound						Argus Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
5:00 PM	2	212	5	0	2	219	9	83	8	0	4	100	3	0	14	0	1	17	39	6	21	0	0	66	402
5:15 PM	4	108	3	0	6	115	8	82	12	0	8	102	4	0	8	0	2	12	32	2	30	0	2	64	293
5:30 PM	2	225	5	0	2	232	8	86	8	0	3	102	2	0	16	0	0	18	24	4	31	0	4	59	411
5:45 PM	5	242	2	0	2	249	9	76	11	0	5	96	5	2	5	0	1	12	39	6	39	0	3	84	441
<b>Total</b>	<b>13</b>	<b>787</b>	<b>15</b>	<b>0</b>	<b>12</b>	<b>815</b>	<b>34</b>	<b>327</b>	<b>39</b>	<b>0</b>	<b>20</b>	<b>400</b>	<b>14</b>	<b>2</b>	<b>43</b>	<b>0</b>	<b>4</b>	<b>59</b>	<b>134</b>	<b>18</b>	<b>121</b>	<b>0</b>	<b>9</b>	<b>273</b>	<b>1547</b>
Approach %	1.6	96.6	1.8	0.0	-	-	8.5	81.8	9.8	0.0	-	-	23.7	3.4	72.9	0.0	-	-	49.1	6.6	44.3	0.0	-	-	-
Total %	0.8	50.9	1.0	0.0	-	52.7	2.2	21.1	2.5	0.0	-	25.9	0.9	0.1	2.8	0.0	-	3.8	8.7	1.2	7.8	0.0	-	17.6	-
PHF	0.650	0.813	0.750	0.000	-	0.818	0.944	0.951	0.813	0.000	-	0.980	0.700	0.250	0.672	0.000	-	0.819	0.859	0.750	0.776	0.000	-	0.813	0.877
Lights	13	786	0	0	-	799	1	327	39	0	-	367	0	0	0	0	-	0	134	0	121	0	-	255	1421
% Lights	100.0	99.9	0.0	-	-	98.0	2.9	100.0	100.0	-	-	91.8	0.0	0.0	0.0	-	-	0.0	100.0	0.0	100.0	-	-	93.4	91.9
Mediums	0	1	15	0	-	16	33	0	0	0	-	33	14	2	43	0	-	59	0	18	0	0	-	18	126
% Mediums	0.0	0.1	100.0	-	-	2.0	97.1	0.0	0.0	-	-	8.3	100.0	100.0	100.0	-	-	100.0	0.0	100.0	0.0	-	-	6.6	8.1
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	11.1	-	-
Pedestrians	-	-	-	-	12	-	-	-	-	-	20	-	-	-	-	-	4	-	-	-	-	-	8	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	88.9	-	-



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Argus Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 9



Turning Movement Peak Hour Data Plot (5:00 PM)



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

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519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Argus Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 10





Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Lyons  
Lane/Commercial Plaza  
Site Code:  
Start Date: 01/10/2019  
Page No: 1

### Turning Movement Data

Start Time	Cross Avenue Eastbound						Cross Avenue Westbound						Lyons Lane Northbound						Plaza Entrance Southbound						Int. Total	
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total		
7:00 AM	7	27	26	0	0	60	29	15	3	0	1	47	2	1	0	0	1	3	3	2	4	0	1	9	119	
7:15 AM	5	50	46	0	2	101	64	20	1	0	1	85	2	0	8	0	0	10	3	2	6	0	2	11	207	
7:30 AM	12	37	42	0	0	91	35	22	3	0	1	60	4	0	3	0	0	7	6	6	8	0	0	20	178	
7:45 AM	8	34	62	0	2	104	46	21	1	0	1	68	2	1	2	0	0	5	1	6	11	0	5	18	195	
Hourly Total	32	148	176	0	4	356	174	78	8	0	4	260	10	2	13	0	1	25	13	16	29	0	8	58	699	
8:00 AM	16	39	43	0	0	98	45	34	1	0	1	80	5	1	2	0	1	8	6	5	9	0	0	20	206	
8:15 AM	17	49	35	0	1	101	77	31	0	0	0	108	5	1	5	0	0	11	2	5	10	0	0	17	237	
8:30 AM	17	41	22	0	2	80	28	35	3	0	0	66	2	1	2	0	0	5	12	4	11	0	1	27	178	
8:45 AM	12	53	7	0	0	72	23	29	5	0	0	57	0	0	1	0	0	1	7	2	15	0	0	24	154	
Hourly Total	62	182	107	0	3	351	173	129	9	0	1	311	12	3	10	0	1	25	27	16	45	0	1	88	775	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	19	33	2	0	1	54	0	38	3	0	0	41	0	0	0	0	0	0	8	1	21	0	2	30	125	
11:15 AM	20	34	0	0	1	54	1	46	2	0	0	49	0	1	0	0	1	1	4	0	16	0	0	20	124	
11:30 AM	14	38	1	0	0	53	2	59	7	0	1	68	1	0	1	0	1	2	5	0	23	0	0	28	151	
11:45 AM	16	32	0	0	1	48	1	52	4	0	1	57	2	0	1	0	0	3	3	0	12	0	1	15	123	
Hourly Total	69	137	3	0	3	209	4	195	16	0	2	215	3	1	2	0	2	6	20	1	72	0	3	93	523	
12:00 PM	16	45	0	0	0	61	0	49	8	0	4	57	0	0	0	0	0	0	4	0	18	0	1	22	140	
12:15 PM	17	39	1	0	0	57	0	56	10	0	0	66	3	0	3	0	0	6	9	0	13	0	1	22	151	
12:30 PM	16	47	4	0	0	67	3	47	4	0	1	54	2	0	2	0	0	4	5	0	28	0	1	33	158	
12:45 PM	16	30	0	0	0	46	0	41	6	0	0	47	1	0	3	0	0	4	9	1	18	0	0	28	125	
Hourly Total	65	161	5	0	0	231	3	193	28	0	5	224	6	0	8	0	0	14	27	1	77	0	3	105	574	
1:00 PM	19	33	1	0	1	53	0	51	7	0	1	58	0	1	0	0	0	1	7	0	23	0	0	30	142	
1:15 PM	14	37	0	0	0	51	2	55	6	0	0	63	5	0	0	0	0	5	4	0	27	0	1	31	150	
1:30 PM	12	43	0	0	1	55	1	56	2	0	0	59	0	1	2	0	1	3	7	0	17	0	1	24	141	
1:45 PM	16	37	2	0	1	55	0	42	5	0	0	47	3	1	1	0	0	5	9	0	23	0	1	32	139	
Hourly Total	61	150	3	0	3	214	3	204	20	0	1	227	8	3	3	0	1	14	27	0	90	0	3	117	572	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	15	43	1	0	1	59	0	72	4	0	0	76	0	0	1	0	0	1	6	0	20	0	0	26	162	
3:15 PM	11	50	0	0	1	61	0	83	4	0	1	87	2	0	7	0	1	9	6	0	16	0	3	22	179	
3:30 PM	15	42	2	0	1	59	0	53	2	0	0	55	0	0	2	0	1	2	2	0	17	0	0	19	135	
3:45 PM	13	39	3	0	0	55	2	78	5	0	3	85	5	1	4	0	1	10	5	0	19	0	1	24	174	
Hourly Total	54	174	6	0	3	234	2	286	15	0	4	303	7	1	14	0	3	22	19	0	72	0	4	91	650	
4:00 PM	11	38	1	0	0	50	1	93	3	0	0	97	13	1	18	0	0	32	5	0	14	0	2	19	198	
4:15 PM	8	33	2	0	0	43	3	59	1	0	0	63	6	1	5	0	0	12	5	0	14	0	1	19	137	
4:30 PM	14	43	5	0	1	62	4	68	4	0	1	76	26	0	21	0	1	47	3	0	20	0	1	23	208	
4:45 PM	12	46	5	0	3	63	3	72	3	0	0	78	11	1	11	0	1	23	8	0	23	0	0	31	195	
Hourly Total	45	160	13	0	4	218	11	292	11	0	1	314	56	3	55	0	2	114	21	0	71	0	4	92	738	

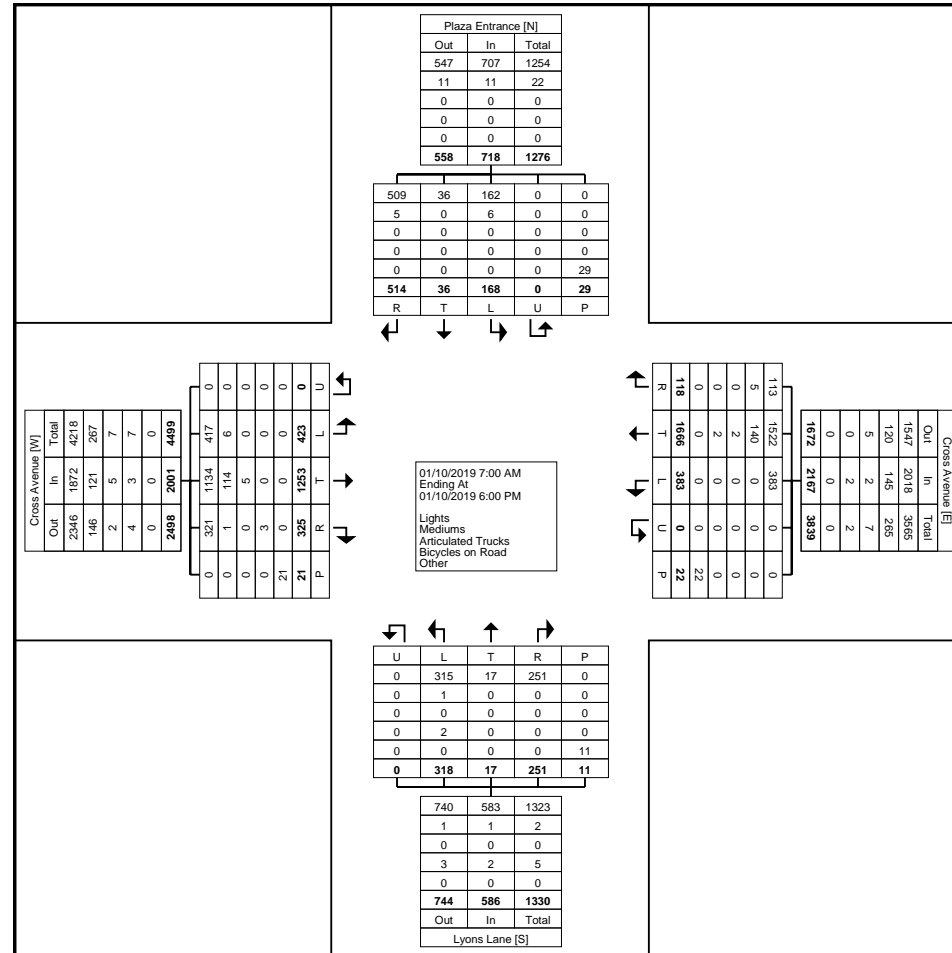
5:00 PM	9	41	0	0	0	50	1	76	2	0	0	79	73	0	32	0	1	105	5	0	24	0	0	29	263
5:15 PM	7	24	4	0	1	35	6	73	3	0	1	82	24	0	24	0	0	48	3	0	14	0	1	17	182
5:30 PM	15	42	4	0	0	61	2	66	5	0	1	73	59	1	46	0	0	106	4	1	10	0	1	15	255
5:45 PM	4	34	4	0	0	42	4	74	1	0	2	79	60	3	44	0	0	107	2	1	10	0	1	13	241
Hourly Total	35	141	12	0	1	188	13	289	11	0	4	313	216	4	146	0	1	366	14	2	58	0	3	74	941
Grand Total	423	1253	325	0	21	2001	383	1666	118	0	22	2167	318	17	251	0	11	586	168	36	514	0	29	718	5472
Approach %	21.1	62.6	16.2	0.0	-	-	17.7	76.9	5.4	0.0	-	-	54.3	2.9	42.8	0.0	-	-	23.4	5.0	71.6	0.0	-	-	-
Total %	7.7	22.9	5.9	0.0	-	36.6	7.0	30.4	2.2	0.0	-	39.6	5.8	0.3	4.6	0.0	-	10.7	3.1	0.7	9.4	0.0	-	13.1	-
Lights	417	1134	321	0	-	1872	383	1522	113	0	-	2018	315	17	251	0	-	583	162	36	509	0	-	707	5180
% Lights	98.6	90.5	98.8	-	-	93.6	100.0	91.4	95.8	-	-	93.1	99.1	100.0	100.0	-	-	99.5	96.4	100.0	99.0	-	-	98.5	94.7
Mediums	6	114	1	0	-	121	0	140	5	0	-	145	1	0	0	0	-	1	6	0	5	0	-	11	278
% Mediums	1.4	9.1	0.3	-	-	6.0	0.0	8.4	4.2	-	-	6.7	0.3	0.0	0.0	-	-	0.2	3.6	0.0	1.0	-	-	1.5	5.1
Articulated Trucks	0	5	0	0	-	5	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	7
% Articulated Trucks	0.0	0.4	0.0	-	-	0.2	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	3	0	-	3	0	2	0	0	-	2	2	0	0	0	-	2	0	0	0	0	-	0	7
% Bicycles on Road	0.0	0.0	0.9	-	-	0.1	0.0	0.1	0.0	-	-	0.1	0.6	0.0	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	10.3	-	-
Pedestrians	-	-	-	-	21	-	-	-	-	-	22	-	-	-	-	-	11	-	-	-	-	-	26	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	89.7	-	-



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Lyons  
Lane/Commercial Plaza  
Site Code:  
Start Date: 01/10/2019  
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Lyons  
Lane/Commercial Plaza  
Site Code:  
Start Date: 01/10/2019  
Page No: 4

### Turning Movement Peak Hour Data (7:30 AM)

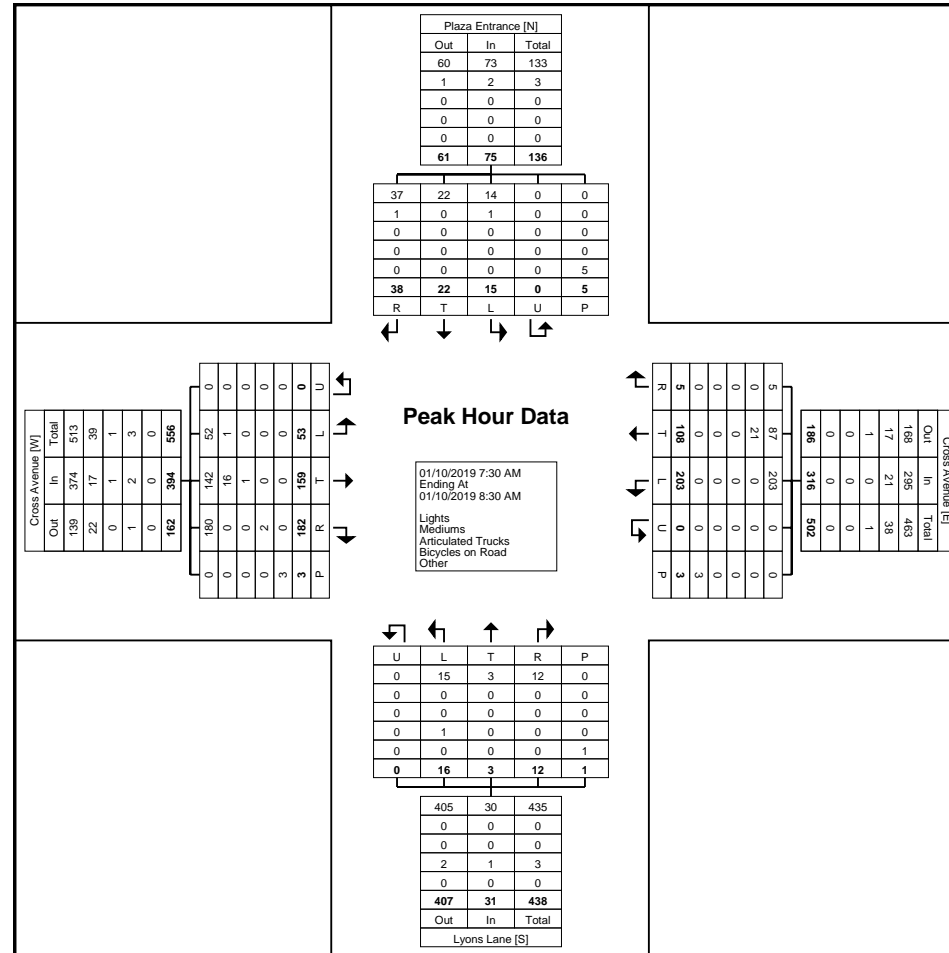
Start Time	Cross Avenue Eastbound						Cross Avenue Westbound						Lyons Lane Northbound						Plaza Entrance Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:30 AM	12	37	42	0	0	91	35	22	3	0	1	60	4	0	3	0	0	7	6	6	8	0	0	20	178
7:45 AM	8	34	62	0	2	104	46	21	1	0	1	68	2	1	2	0	0	5	1	6	11	0	5	18	195
8:00 AM	16	39	43	0	0	98	45	34	1	0	1	80	5	1	2	0	1	8	6	5	9	0	0	20	206
8:15 AM	17	49	35	0	1	101	77	31	0	0	0	108	5	1	5	0	0	11	2	5	10	0	0	17	237
<b>Total</b>	<b>53</b>	<b>159</b>	<b>182</b>	<b>0</b>	<b>3</b>	<b>394</b>	<b>203</b>	<b>108</b>	<b>5</b>	<b>0</b>	<b>3</b>	<b>316</b>	<b>16</b>	<b>3</b>	<b>12</b>	<b>0</b>	<b>1</b>	<b>31</b>	<b>15</b>	<b>22</b>	<b>38</b>	<b>0</b>	<b>5</b>	<b>75</b>	<b>816</b>
Approach %	13.5	40.4	46.2	0.0	-	-	64.2	34.2	1.6	0.0	-	-	51.6	9.7	38.7	0.0	-	-	20.0	29.3	50.7	0.0	-	-	-
Total %	6.5	19.5	22.3	0.0	-	48.3	24.9	13.2	0.6	0.0	-	38.7	2.0	0.4	1.5	0.0	-	3.8	1.8	2.7	4.7	0.0	-	9.2	-
PHF	0.779	0.811	0.734	0.000	-	0.947	0.659	0.794	0.417	0.000	-	0.731	0.800	0.750	0.600	0.000	-	0.705	0.625	0.917	0.864	0.000	-	0.938	0.861
Lights	52	142	180	0	-	374	203	87	5	0	-	295	15	3	12	0	-	30	14	22	37	0	-	73	772
% Lights	98.1	89.3	98.9	-	-	94.9	100.0	80.6	100.0	-	-	93.4	93.8	100.0	100.0	-	-	96.8	93.3	100.0	97.4	-	-	97.3	94.6
Mediums	1	16	0	0	-	17	0	21	0	0	-	21	0	0	0	0	-	0	1	0	1	0	-	2	40
% Mediums	1.9	10.1	0.0	-	-	4.3	0.0	19.4	0.0	-	-	6.6	0.0	0.0	0.0	-	-	0.0	6.7	0.0	2.6	-	-	2.7	4.9
Articulated Trucks	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.6	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	2	0	-	2	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	3
% Bicycles on Road	0.0	0.0	1.1	-	-	0.5	0.0	0.0	0.0	-	-	0.0	6.3	0.0	0.0	-	-	3.2	0.0	0.0	0.0	-	-	0.0	0.4
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	20.0	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	80.0	-	-



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Lyons  
Lane/Commercial Plaza  
Site Code:  
Start Date: 01/10/2019  
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsI.com

Count Name: Cross Avenue & Lyons  
Lane/Commercial Plaza  
Site Code:  
Start Date: 01/10/2019  
Page No: 6

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

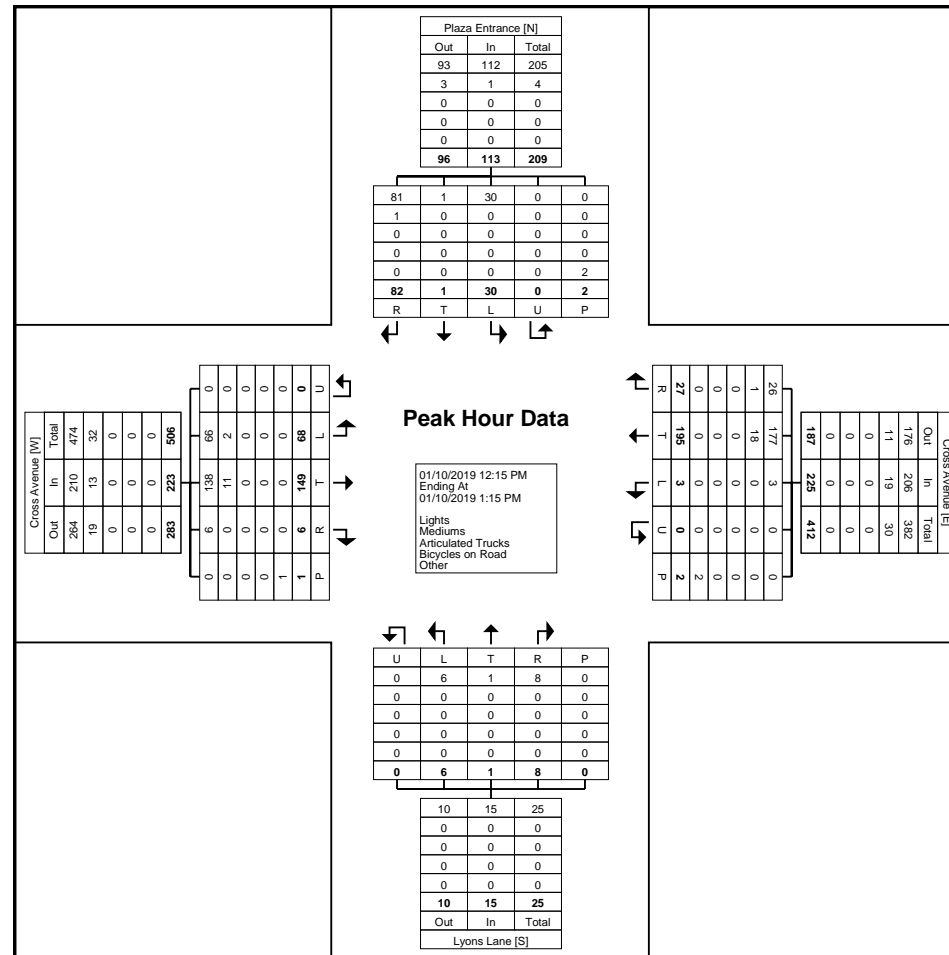
Start Time	Cross Avenue Eastbound						Cross Avenue Westbound						Lyons Lane Northbound						Plaza Entrance Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:15 PM	17	39	1	0	0	57	0	56	10	0	0	66	3	0	3	0	0	6	9	0	13	0	1	22	151
12:30 PM	16	47	4	0	0	67	3	47	4	0	1	54	2	0	2	0	0	4	5	0	28	0	1	33	158
12:45 PM	16	30	0	0	0	46	0	41	6	0	0	47	1	0	3	0	0	4	9	1	18	0	0	28	125
1:00 PM	19	33	1	0	1	53	0	51	7	0	1	58	0	1	0	0	0	1	7	0	23	0	0	30	142
<b>Total</b>	<b>68</b>	<b>149</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>223</b>	<b>3</b>	<b>195</b>	<b>27</b>	<b>0</b>	<b>2</b>	<b>225</b>	<b>6</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>30</b>	<b>1</b>	<b>82</b>	<b>0</b>	<b>2</b>	<b>113</b>	<b>576</b>
Approach %	30.5	66.8	2.7	0.0	-	-	1.3	86.7	12.0	0.0	-	-	40.0	6.7	53.3	0.0	-	-	26.5	0.9	72.6	0.0	-	-	-
Total %	11.8	25.9	1.0	0.0	-	38.7	0.5	33.9	4.7	0.0	-	39.1	1.0	0.2	1.4	0.0	-	2.6	5.2	0.2	14.2	0.0	-	19.6	-
PHF	0.895	0.793	0.375	0.000	-	0.832	0.250	0.871	0.675	0.000	-	0.852	0.500	0.250	0.667	0.000	-	0.625	0.833	0.250	0.732	0.000	-	0.856	0.911
Lights	66	138	6	0	-	210	3	177	26	0	-	206	6	1	8	0	-	15	30	1	81	0	-	112	543
% Lights	97.1	92.6	100.0	-	-	94.2	100.0	90.8	96.3	-	-	91.6	100.0	100.0	100.0	-	-	100.0	100.0	100.0	98.8	-	-	99.1	94.3
Mediums	2	11	0	0	-	13	0	18	1	0	-	19	0	0	0	0	-	0	0	0	1	0	-	1	33
% Mediums	2.9	7.4	0.0	-	-	5.8	0.0	9.2	3.7	-	-	8.4	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.2	-	-	0.9	5.7
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	2	-	-	-	-	-	-	0	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Lyons  
Lane/Commercial Plaza  
Site Code:  
Start Date: 01/10/2019  
Page No: 7



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



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

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Count Name: Cross Avenue & Lyons  
Lane/Commercial Plaza  
Site Code:  
Start Date: 01/10/2019  
Page No: 8

### Turning Movement Peak Hour Data (5:00 PM)

Start Time	Cross Avenue Eastbound						Cross Avenue Westbound						Lyons Lane Northbound						Plaza Entrance Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
5:00 PM	9	41	0	0	0	50	1	76	2	0	0	79	73	0	32	0	1	105	5	0	24	0	0	29	263
5:15 PM	7	24	4	0	1	35	6	73	3	0	1	82	24	0	24	0	0	48	3	0	14	0	1	17	182
5:30 PM	15	42	4	0	0	61	2	66	5	0	1	73	59	1	46	0	0	106	4	1	10	0	1	15	255
5:45 PM	4	34	4	0	0	42	4	74	1	0	2	79	60	3	44	0	0	107	2	1	10	0	1	13	241
<b>Total</b>	<b>35</b>	<b>141</b>	<b>12</b>	<b>0</b>	<b>1</b>	<b>188</b>	<b>13</b>	<b>289</b>	<b>11</b>	<b>0</b>	<b>4</b>	<b>313</b>	<b>216</b>	<b>4</b>	<b>146</b>	<b>0</b>	<b>1</b>	<b>366</b>	<b>14</b>	<b>2</b>	<b>58</b>	<b>0</b>	<b>3</b>	<b>74</b>	<b>941</b>
Approach %	18.6	75.0	6.4	0.0	-	-	4.2	92.3	3.5	0.0	-	-	59.0	1.1	39.9	0.0	-	-	18.9	2.7	78.4	0.0	-	-	-
Total %	3.7	15.0	1.3	0.0	-	20.0	1.4	30.7	1.2	0.0	-	33.3	23.0	0.4	15.5	0.0	-	38.9	1.5	0.2	6.2	0.0	-	7.9	-
PHF	0.583	0.839	0.750	0.000	-	0.770	0.542	0.951	0.550	0.000	-	0.954	0.740	0.333	0.793	0.000	-	0.855	0.700	0.500	0.604	0.000	-	0.638	0.894
Lights	34	126	12	0	-	172	13	274	11	0	-	298	216	4	146	0	-	366	14	2	57	0	-	73	909
% Lights	97.1	89.4	100.0	-	-	91.5	100.0	94.8	100.0	-	-	95.2	100.0	100.0	100.0	-	-	100.0	100.0	100.0	98.3	-	-	98.6	96.6
Mediums	1	15	0	0	-	16	0	14	0	0	-	14	0	0	0	0	-	0	0	0	1	0	-	1	31
% Mediums	2.9	10.6	0.0	-	-	8.5	0.0	4.8	0.0	-	-	4.5	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.7	-	-	1.4	3.3
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.3	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	33.3	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	4	-	-	-	-	-	1	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	66.7	-	-

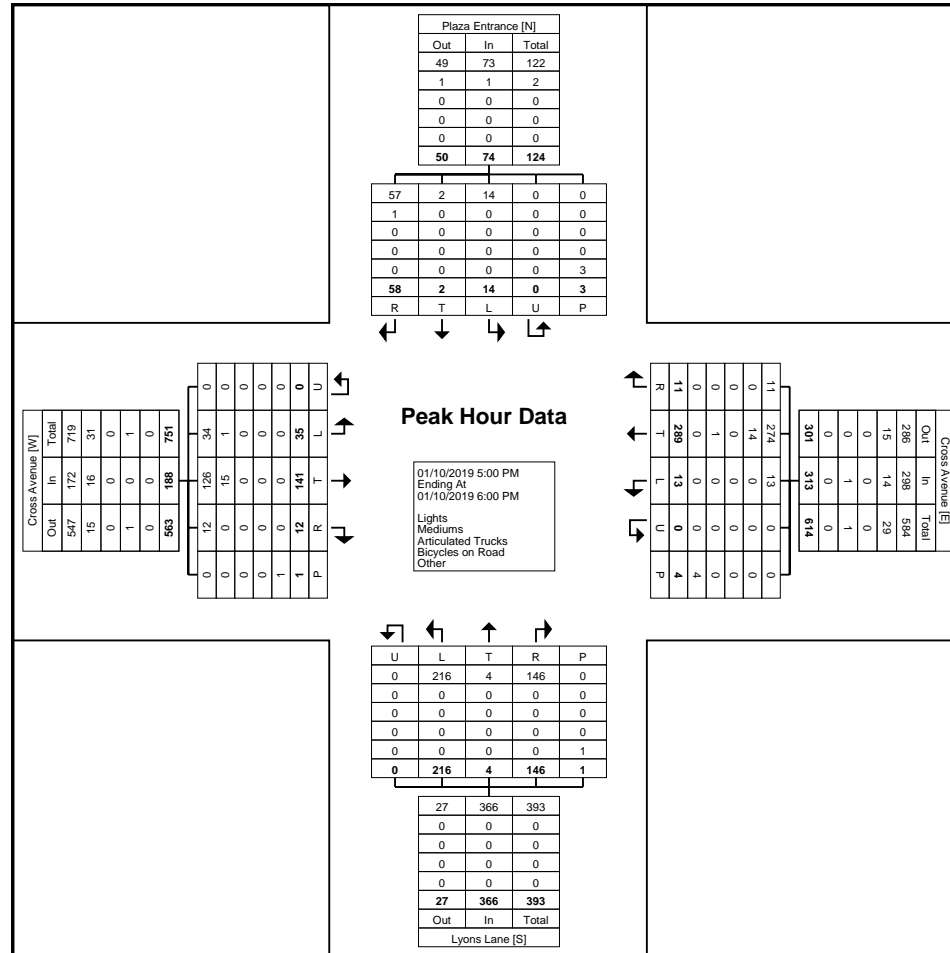




Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Lyons  
Lane/Commercial Plaza  
Site Code:  
Start Date: 01/10/2019  
Page No: 9



Turning Movement Peak Hour Data Plot (5:00 PM)



Paradigm Transportation Solutions Limited  
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Count Name: Cross Avenue & Lyons  
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Start Date: 01/10/2019  
Page No: 10



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Lyons Lane  
Site Code:  
Start Date: 01/10/2019  
Page No: 1

### Turning Movement Data

Start Time	Cross Avenue Eastbound					Cross Avenue Westbound					Lyons Lane Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	0	60	0	0	60	19	0	0	0	19	0	1	0	2	1	80
7:15 AM	4	99	0	0	103	22	3	0	1	25	2	1	0	0	3	131
7:30 AM	2	84	0	0	86	32	4	0	0	36	3	2	0	0	5	127
7:45 AM	2	111	0	0	113	36	0	0	3	36	2	2	0	2	4	153
Hourly Total	8	354	0	0	362	109	7	0	4	116	7	6	0	4	13	491
8:00 AM	8	84	0	0	92	43	3	0	1	46	2	0	0	0	2	140
8:15 AM	7	106	0	0	113	45	2	0	1	47	1	1	0	0	2	162
8:30 AM	5	80	0	0	85	49	1	0	2	50	0	1	0	2	1	136
8:45 AM	1	71	0	0	72	38	6	0	0	44	1	1	0	0	2	118
Hourly Total	21	341	0	0	362	175	12	0	4	187	4	3	0	2	7	556
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	1	54	0	0	55	61	1	0	0	62	3	8	0	2	11	128
11:15 AM	3	43	0	0	46	58	5	0	2	63	1	3	0	1	4	113
11:30 AM	4	50	0	0	54	72	3	0	0	75	7	5	0	0	12	141
11:45 AM	1	42	0	0	43	68	3	0	1	71	5	2	0	0	7	121
Hourly Total	9	189	0	0	198	259	12	0	3	271	16	18	0	3	34	503
12:00 PM	3	53	0	0	56	60	2	0	0	62	10	7	0	2	17	135
12:15 PM	0	55	0	0	55	76	3	0	0	79	0	9	0	1	9	143
12:30 PM	4	59	0	0	63	75	1	0	0	76	5	3	0	1	8	147
12:45 PM	3	47	0	0	50	55	2	0	0	57	3	2	0	0	5	112
Hourly Total	10	214	0	0	224	266	8	0	0	274	18	21	0	4	39	537
1:00 PM	5	50	0	0	55	67	5	0	1	72	4	5	0	1	9	136
1:15 PM	2	49	0	0	51	79	7	0	0	86	2	1	0	2	3	140
1:30 PM	5	53	0	0	58	72	1	0	0	73	1	4	0	2	5	136
1:45 PM	4	48	0	0	52	63	4	0	2	67	5	7	0	1	12	131
Hourly Total	16	200	0	0	216	281	17	0	3	298	12	17	0	6	29	543
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	1	58	0	0	59	84	3	0	1	87	3	4	0	0	7	153
3:15 PM	1	53	0	0	54	100	4	0	0	104	7	6	0	1	13	171
3:30 PM	1	57	0	0	58	64	2	0	2	66	4	2	0	2	6	130
3:45 PM	2	51	0	0	53	102	4	0	0	106	5	5	0	0	10	169
Hourly Total	5	219	0	0	224	350	13	0	3	363	19	17	0	3	36	623
4:00 PM	2	44	0	0	46	122	0	0	1	122	5	7	0	2	12	180
4:15 PM	3	37	0	0	40	75	1	0	0	76	2	9	0	2	11	127
4:30 PM	1	56	0	0	57	118	2	0	1	120	5	11	0	2	16	193
4:45 PM	1	66	0	0	67	102	0	0	1	102	0	15	0	1	15	184
Hourly Total	7	203	0	0	210	417	3	0	3	420	12	42	0	7	54	684
5:00 PM	3	43	0	0	46	164	2	0	1	166	4	16	0	1	20	232

5:15 PM	0	37	0	0	37	104	3	0	4	107	1	3	0	0	4	148
5:30 PM	1	46	0	0	47	140	2	0	1	142	8	4	0	0	12	201
5:45 PM	2	44	0	0	46	145	0	0	3	145	1	3	0	0	4	195
Hourly Total	6	170	0	0	176	553	7	0	9	560	14	26	0	1	40	776
Grand Total	82	1890	0	0	1972	2410	79	0	29	2489	102	150	0	30	252	4713
Approach %	4.2	95.8	0.0	-	-	96.8	3.2	0.0	-	-	40.5	59.5	0.0	-	-	-
Total %	1.7	40.1	0.0	-	41.8	51.1	1.7	0.0	-	52.8	2.2	3.2	0.0	-	5.3	-
Lights	79	1763	0	-	1842	2261	74	0	-	2335	98	147	0	-	245	4422
% Lights	96.3	93.3	-	-	93.4	93.8	93.7	-	-	93.8	96.1	98.0	-	-	97.2	93.8
Mediums	1	122	0	-	123	144	2	0	-	146	0	2	0	-	2	271
% Mediums	1.2	6.5	-	-	6.2	6.0	2.5	-	-	5.9	0.0	1.3	-	-	0.8	5.8
Articulated Trucks	0	5	0	-	5	3	0	0	-	3	0	0	0	-	0	8
% Articulated Trucks	0.0	0.3	-	-	0.3	0.1	0.0	-	-	0.1	0.0	0.0	-	-	0.0	0.2
Bicycles on Road	2	0	0	-	2	2	3	0	-	5	4	1	0	-	5	12
% Bicycles on Road	2.4	0.0	-	-	0.1	0.1	3.8	-	-	0.2	3.9	0.7	-	-	2.0	0.3
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	3	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	10.3	-	-	-	-	3.3	-	-
Pedestrians	-	-	-	0	-	-	-	-	26	-	-	-	-	29	-	-
% Pedestrians	-	-	-	-	-	-	-	-	89.7	-	-	-	-	96.7	-	-





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Count Name: Cross Avenue & Lyons Lane  
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Start Date: 01/10/2019  
Page No: 4

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

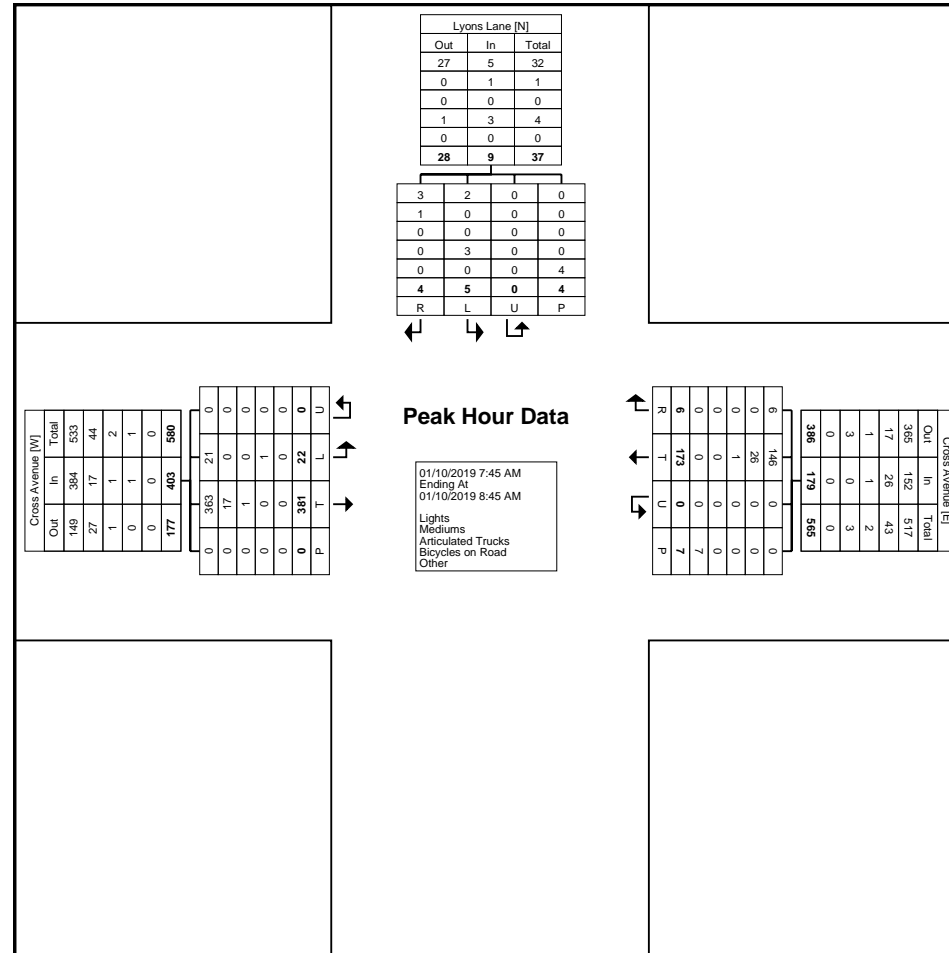
Start Time	Cross Avenue Eastbound					Cross Avenue Westbound					Lyons Lane Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:45 AM	2	111	0	0	113	36	0	0	3	36	2	2	0	2	4	153
8:00 AM	8	84	0	0	92	43	3	0	1	46	2	0	0	0	2	140
8:15 AM	7	106	0	0	113	45	2	0	1	47	1	1	0	0	2	162
8:30 AM	5	80	0	0	85	49	1	0	2	50	0	1	0	2	1	136
Total	22	381	0	0	403	173	6	0	7	179	5	4	0	4	9	591
Approach %	5.5	94.5	0.0	-	-	96.6	3.4	0.0	-	-	55.6	44.4	0.0	-	-	-
Total %	3.7	64.5	0.0	-	68.2	29.3	1.0	0.0	-	30.3	0.8	0.7	0.0	-	1.5	-
PHF	0.688	0.858	0.000	-	0.892	0.883	0.500	0.000	-	0.895	0.625	0.500	0.000	-	0.563	0.912
Lights	21	363	0	-	384	146	6	0	-	152	2	3	0	-	5	541
% Lights	95.5	95.3	-	-	95.3	84.4	100.0	-	-	84.9	40.0	75.0	-	-	55.6	91.5
Mediums	0	17	0	-	17	26	0	0	-	26	0	1	0	-	1	44
% Mediums	0.0	4.5	-	-	4.2	15.0	0.0	-	-	14.5	0.0	25.0	-	-	11.1	7.4
Articulated Trucks	0	1	0	-	1	1	0	0	-	1	0	0	0	-	0	2
% Articulated Trucks	0.0	0.3	-	-	0.2	0.6	0.0	-	-	0.6	0.0	0.0	-	-	0.0	0.3
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	3	0	0	-	3	4
% Bicycles on Road	4.5	0.0	-	-	0.2	0.0	0.0	-	-	0.0	60.0	0.0	-	-	33.3	0.7
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	7	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-



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



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Page No: 6

### Turning Movement Peak Hour Data (11:45 AM)

Start Time	Cross Avenue Eastbound					Cross Avenue Westbound					Lyons Lane Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
11:45 AM	1	42	0	0	43	68	3	0	1	71	5	2	0	0	7	121
12:00 PM	3	53	0	0	56	60	2	0	0	62	10	7	0	2	17	135
12:15 PM	0	55	0	0	55	76	3	0	0	79	0	9	0	1	9	143
12:30 PM	4	59	0	0	63	75	1	0	0	76	5	3	0	1	8	147
Total	8	209	0	0	217	279	9	0	1	288	20	21	0	4	41	546
Approach %	3.7	96.3	0.0	-	-	96.9	3.1	0.0	-	-	48.8	51.2	0.0	-	-	-
Total %	1.5	38.3	0.0	-	39.7	51.1	1.6	0.0	-	52.7	3.7	3.8	0.0	-	7.5	-
PHF	0.500	0.886	0.000	-	0.861	0.918	0.750	0.000	-	0.911	0.500	0.583	0.000	-	0.603	0.929
Lights	8	194	0	-	202	261	9	0	-	270	20	21	0	-	41	513
% Lights	100.0	92.8	-	-	93.1	93.5	100.0	-	-	93.8	100.0	100.0	-	-	100.0	94.0
Mediums	0	14	0	-	14	17	0	0	-	17	0	0	0	-	0	31
% Mediums	0.0	6.7	-	-	6.5	6.1	0.0	-	-	5.9	0.0	0.0	-	-	0.0	5.7
Articulated Trucks	0	1	0	-	1	1	0	0	-	1	0	0	0	-	0	2
% Articulated Trucks	0.0	0.5	-	-	0.5	0.4	0.0	-	-	0.3	0.0	0.0	-	-	0.0	0.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	25.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	75.0	-	-







Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsI.com

Count Name: Cross Avenue & Lyons Lane  
Site Code:  
Start Date: 01/10/2019  
Page No: 8

### Turning Movement Peak Hour Data (5:00 PM)

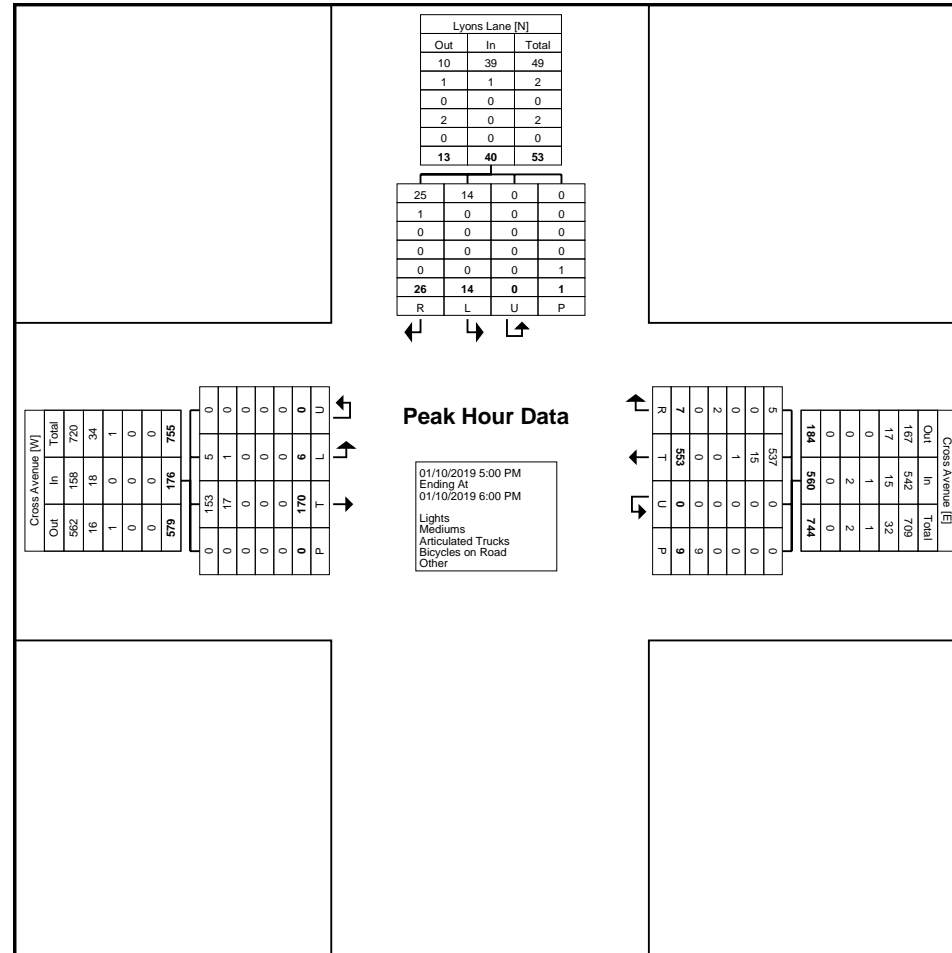
Start Time	Cross Avenue Eastbound					Cross Avenue Westbound					Lyons Lane Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
5:00 PM	3	43	0	0	46	164	2	0	1	166	4	16	0	1	20	232
5:15 PM	0	37	0	0	37	104	3	0	4	107	1	3	0	0	4	148
5:30 PM	1	46	0	0	47	140	2	0	1	142	8	4	0	0	12	201
5:45 PM	2	44	0	0	46	145	0	0	3	145	1	3	0	0	4	195
Total	6	170	0	0	176	553	7	0	9	560	14	26	0	1	40	776
Approach %	3.4	96.6	0.0	-	-	98.8	1.3	0.0	-	-	35.0	65.0	0.0	-	-	-
Total %	0.8	21.9	0.0	-	22.7	71.3	0.9	0.0	-	72.2	1.8	3.4	0.0	-	5.2	-
PHF	0.500	0.924	0.000	-	0.936	0.843	0.583	0.000	-	0.843	0.438	0.406	0.000	-	0.500	0.836
Lights	5	153	0	-	158	537	5	0	-	542	14	25	0	-	39	739
% Lights	83.3	90.0	-	-	89.8	97.1	71.4	-	-	96.8	100.0	96.2	-	-	97.5	95.2
Mediums	1	17	0	-	18	15	0	0	-	15	0	1	0	-	1	34
% Mediums	16.7	10.0	-	-	10.2	2.7	0.0	-	-	2.7	0.0	3.8	-	-	2.5	4.4
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.2	0.0	-	-	0.2	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	28.6	-	-	0.4	0.0	0.0	-	-	0.0	0.3
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	22.2	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	7	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	77.8	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Lyons Lane  
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Start Date: 01/10/2019  
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Turning Movement Peak Hour Data Plot (5:00 PM)



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Cross Avenue & Lyons Lane  
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Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Argus Road & South Service Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 1

### Turning Movement Data

Start Time	Argus Road Eastbound						Argus Road Westbound						Northbound Approach Northbound						South Service Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	1	0	0	1	1	1	102	17	0	4	120	1	0	0	0	2	1	0	0	0	1	0	122	
7:15 AM	0	0	0	0	0	0	0	128	17	0	2	145	0	0	0	0	1	0	0	0	0	0	0	145	
7:30 AM	1	1	1	0	0	3	0	127	25	0	1	152	0	0	0	0	1	0	1	0	0	0	1	156	
7:45 AM	0	0	0	0	0	0	2	157	28	0	2	187	0	1	0	0	2	1	0	0	1	0	1	189	
Hourly Total	1	2	1	0	1	4	3	514	87	0	9	604	1	1	0	0	6	2	1	0	1	0	2	612	
8:00 AM	0	1	1	0	0	2	1	130	21	0	1	152	0	0	0	0	2	0	2	2	2	1	0	7	161
8:15 AM	0	3	0	0	1	3	1	125	39	0	1	165	1	0	0	0	1	1	1	0	0	0	0	1	170
8:30 AM	2	2	0	0	0	4	0	60	27	0	0	87	1	1	0	0	1	2	0	1	2	0	0	3	96
8:45 AM	2	2	0	0	0	4	0	85	30	0	1	115	0	1	0	0	0	1	1	2	0	0	0	3	123
Hourly Total	4	8	1	0	1	13	2	400	117	0	3	519	2	2	0	0	4	4	4	5	4	1	0	14	550
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	2	5	1	1	0	9	0	30	18	0	0	48	1	3	0	0	1	4	4	3	3	1	0	11	72
11:15 AM	2	1	0	0	0	3	1	33	19	0	0	53	0	2	1	0	0	3	2	2	8	0	0	12	71
11:30 AM	4	4	0	0	0	8	1	32	25	0	3	58	0	1	0	0	2	1	2	1	3	0	0	6	73
11:45 AM	1	0	0	0	0	1	0	38	20	0	1	58	1	4	0	0	0	5	2	4	2	0	0	8	72
Hourly Total	9	10	1	1	0	21	2	133	82	0	4	217	2	10	1	0	3	13	10	10	16	1	0	37	288
12:00 PM	1	4	1	0	0	6	1	22	24	1	1	48	1	3	0	0	0	4	3	3	5	0	0	11	69
12:15 PM	0	0	0	0	0	0	1	32	15	0	1	48	0	1	0	0	0	1	2	3	3	0	0	8	57
12:30 PM	0	2	0	1	0	3	2	30	20	0	2	52	0	0	1	0	0	1	2	0	5	0	0	7	63
12:45 PM	1	6	1	0	0	8	0	37	20	0	0	57	0	1	0	0	0	1	1	0	3	0	0	4	70
Hourly Total	2	12	2	1	0	17	4	121	79	1	4	205	1	5	1	0	0	7	8	6	16	0	0	30	259
1:00 PM	1	2	0	0	0	3	0	32	24	0	2	56	0	0	0	0	3	0	0	0	5	0	0	5	64
1:15 PM	1	3	1	0	0	5	0	44	10	0	0	54	0	1	0	0	0	1	3	0	4	0	0	7	67
1:30 PM	1	2	0	1	0	4	0	30	27	0	4	57	1	0	0	0	5	1	2	1	2	0	0	5	67
1:45 PM	1	3	1	0	0	5	0	38	17	0	2	55	0	2	0	0	0	2	1	2	2	0	0	5	67
Hourly Total	4	10	2	1	0	17	0	144	78	0	8	222	1	3	0	0	8	4	6	3	13	0	0	22	265
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	5	3	0	0	1	8	0	36	16	0	4	52	1	0	0	0	5	1	3	2	5	0	0	10	71
3:15 PM	1	2	0	0	0	3	0	31	18	0	0	49	0	1	0	0	2	1	1	1	1	0	0	3	56
3:30 PM	1	7	1	0	0	9	0	31	6	0	1	37	0	2	1	0	3	3	4	2	4	0	0	10	59
3:45 PM	1	5	0	0	0	6	1	36	12	0	1	49	0	1	0	0	1	1	2	1	5	1	0	9	65
Hourly Total	8	17	1	0	1	26	1	134	52	0	6	187	1	4	1	0	11	6	10	6	15	1	0	32	251
4:00 PM	5	1	0	1	0	7	0	44	12	0	3	56	1	3	0	0	1	4	4	3	2	0	0	9	76
4:15 PM	0	3	0	0	0	3	0	46	19	0	1	65	1	0	0	0	2	1	3	0	2	0	0	5	74
4:30 PM	3	4	0	0	0	7	0	37	9	0	1	46	0	0	0	0	1	0	1	0	4	0	0	5	58
4:45 PM	1	0	0	0	0	1	0	51	12	0	0	63	1	0	0	0	1	1	4	2	5	0	0	11	76
Hourly Total	9	8	0	1	0	18	0	178	52	0	5	230	3	3	0	0	5	6	12	5	13	0	0	30	284

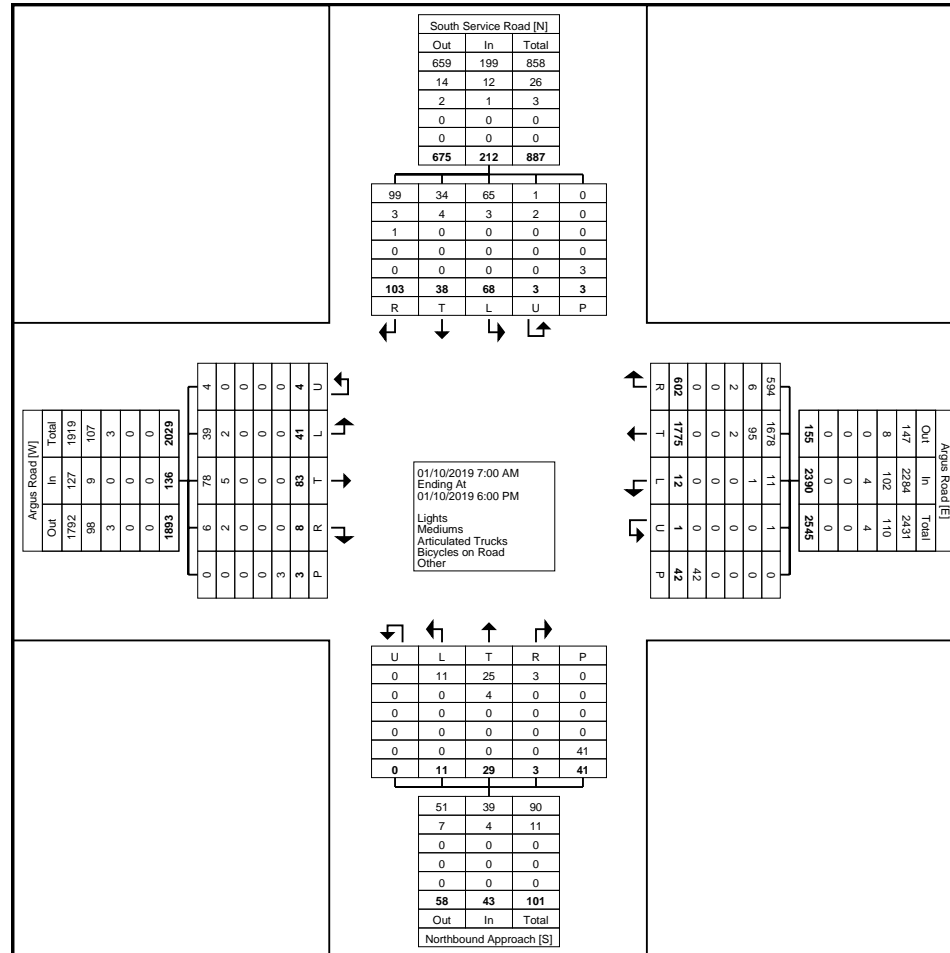
5:00 PM	2	5	0	0	0	7	0	27	16	0	0	43	0	1	0	0	0	1	10	1	13	0	1	24	75
5:15 PM	1	3	0	0	0	4	0	40	10	0	1	50	0	0	0	0	1	0	1	1	5	0	0	7	61
5:30 PM	0	4	0	0	0	4	0	36	15	0	1	51	0	0	0	0	2	0	1	1	2	0	0	4	59
5:45 PM	1	4	0	0	0	5	0	48	14	0	1	62	0	0	0	0	1	0	5	0	5	0	0	10	77
Hourly Total	4	16	0	0	0	20	0	151	55	0	3	206	0	1	0	0	4	1	17	3	25	0	1	45	272
Grand Total	41	83	8	4	3	136	12	1775	602	1	42	2390	11	29	3	0	41	43	68	38	103	3	3	212	2781
Approach %	30.1	61.0	5.9	2.9	-	-	0.5	74.3	25.2	0.0	-	-	25.6	67.4	7.0	0.0	-	-	32.1	17.9	48.6	1.4	-	-	-
Total %	1.5	3.0	0.3	0.1	-	4.9	0.4	63.8	21.6	0.0	-	85.9	0.4	1.0	0.1	0.0	-	1.5	2.4	1.4	3.7	0.1	-	7.6	-
Lights	39	78	6	4	-	127	11	1678	594	1	-	2284	11	25	3	0	-	39	65	34	99	1	-	199	2649
% Lights	95.1	94.0	75.0	100.0	-	93.4	91.7	94.5	98.7	100.0	-	95.6	100.0	86.2	100.0	-	-	90.7	95.6	89.5	96.1	33.3	-	93.9	95.3
Mediums	2	5	2	0	-	9	1	95	6	0	-	102	0	4	0	0	-	4	3	4	3	2	-	12	127
% Mediums	4.9	6.0	25.0	0.0	-	6.6	8.3	5.4	1.0	0.0	-	4.3	0.0	13.8	0.0	-	-	9.3	4.4	10.5	2.9	66.7	-	5.7	4.6
Articulated Trucks	0	0	0	0	-	0	0	2	2	0	-	4	0	0	0	0	-	0	0	0	1	0	-	1	5
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.1	0.3	0.0	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.0	0.0	-	0.5	0.2
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	42	-	-	-	-	-	41	-	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Argus Road & South Service Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsI.com

Count Name: Argus Road & South Service Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 4

### Turning Movement Peak Hour Data (7:30 AM)

Start Time	Argus Road Eastbound						Argus Road Westbound						Northbound Approach Northbound						South Service Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:30 AM	1	1	1	0	0	3	0	127	25	0	1	152	0	0	0	0	1	0	1	0	0	0	0	1	156
7:45 AM	0	0	0	0	0	0	2	157	28	0	2	187	0	1	0	0	2	1	0	0	1	0	1	1	189
8:00 AM	0	1	1	0	0	2	1	130	21	0	1	152	0	0	0	0	2	0	2	2	2	1	0	7	161
8:15 AM	0	3	0	0	1	3	1	125	39	0	1	165	1	0	0	0	1	1	1	0	0	0	0	1	170
Total	1	5	2	0	1	8	4	539	113	0	5	656	1	1	0	0	6	2	4	2	3	1	1	10	676
Approach %	12.5	62.5	25.0	0.0	-	-	0.6	82.2	17.2	0.0	-	-	50.0	50.0	0.0	0.0	-	-	40.0	20.0	30.0	10.0	-	-	-
Total %	0.1	0.7	0.3	0.0	-	1.2	0.6	79.7	16.7	0.0	-	97.0	0.1	0.1	0.0	0.0	-	0.3	0.6	0.3	0.4	0.1	-	1.5	-
PHF	0.250	0.417	0.500	0.000	-	0.667	0.500	0.858	0.724	0.000	-	0.877	0.250	0.250	0.000	0.000	-	0.500	0.500	0.250	0.375	0.250	-	0.357	0.894
Lights	0	5	2	0	-	7	4	524	113	0	-	641	1	1	0	0	-	2	4	2	3	1	-	10	660
% Lights	0.0	100.0	100.0	-	-	87.5	100.0	97.2	100.0	-	-	97.7	100.0	100.0	-	-	-	100.0	100.0	100.0	100.0	100.0	-	100.0	97.6
Mediums	1	0	0	0	-	1	0	15	0	0	-	15	0	0	0	0	-	0	0	0	0	0	-	0	16
% Mediums	100.0	0.0	0.0	-	-	12.5	0.0	2.8	0.0	-	-	2.3	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	2.4
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	5	-	-	-	-	-	6	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

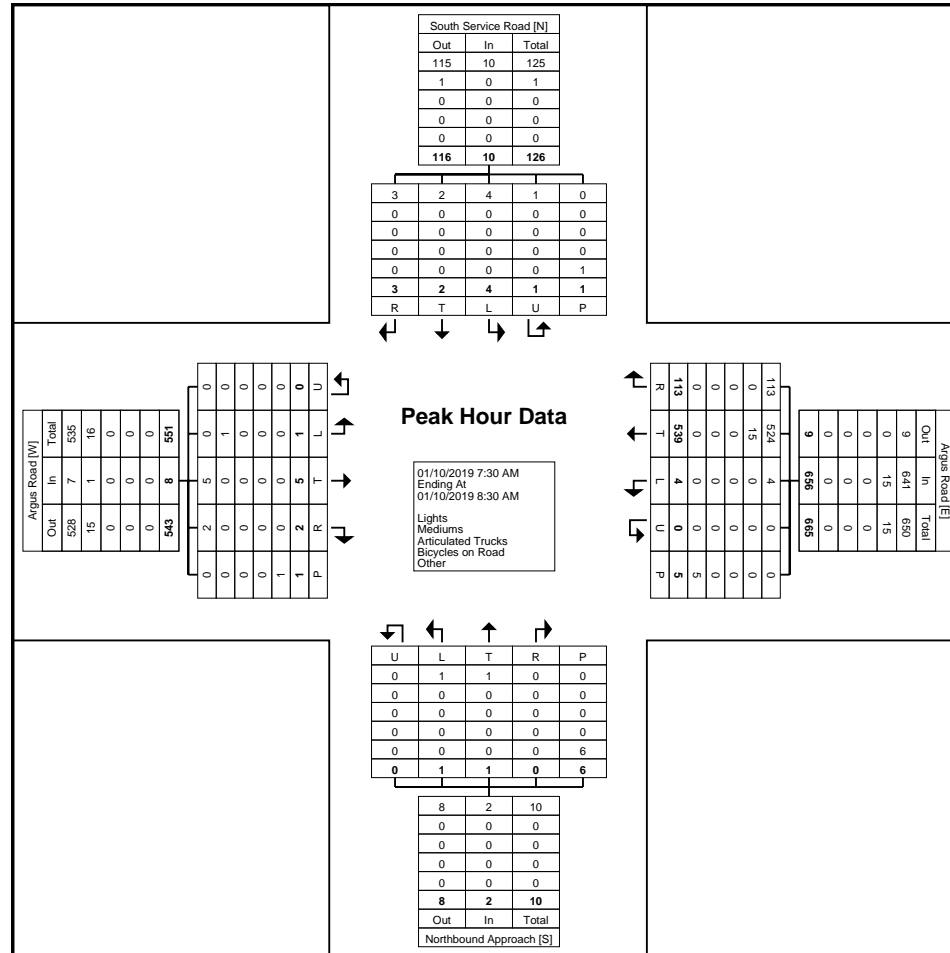




Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Argus Road & South Service Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
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Count Name: Argus Road & South Service Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 6

### Turning Movement Peak Hour Data (11:00 AM)

Start Time	Argus Road Eastbound						Argus Road Westbound						Northbound Approach Northbound						South Service Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:00 AM	2	5	1	1	0	9	0	30	18	0	0	48	1	3	0	0	1	4	4	3	3	1	0	11	72
11:15 AM	2	1	0	0	0	3	1	33	19	0	0	53	0	2	1	0	0	3	2	2	8	0	0	12	71
11:30 AM	4	4	0	0	0	8	1	32	25	0	3	58	0	1	0	0	2	1	2	1	3	0	0	6	73
11:45 AM	1	0	0	0	0	1	0	38	20	0	1	58	1	4	0	0	0	5	2	4	2	0	0	8	72
<b>Total</b>	<b>9</b>	<b>10</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>21</b>	<b>2</b>	<b>133</b>	<b>82</b>	<b>0</b>	<b>4</b>	<b>217</b>	<b>2</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>13</b>	<b>10</b>	<b>10</b>	<b>16</b>	<b>1</b>	<b>0</b>	<b>37</b>	<b>288</b>
Approach %	42.9	47.6	4.8	4.8	-	-	0.9	61.3	37.8	0.0	-	-	15.4	76.9	7.7	0.0	-	-	27.0	27.0	43.2	2.7	-	-	-
Total %	3.1	3.5	0.3	0.3	-	7.3	0.7	46.2	28.5	0.0	-	75.3	0.7	3.5	0.3	0.0	-	4.5	3.5	3.5	5.6	0.3	-	12.8	-
PHF	0.563	0.500	0.250	0.250	-	0.583	0.500	0.875	0.820	0.000	-	0.935	0.500	0.625	0.250	0.000	-	0.650	0.625	0.625	0.500	0.250	-	0.771	0.986
Lights	9	10	1	1	-	21	1	126	82	0	-	209	2	8	1	0	-	11	10	8	15	0	-	33	274
% Lights	100.0	100.0	100.0	100.0	-	100.0	50.0	94.7	100.0	-	-	96.3	100.0	80.0	100.0	-	-	84.6	100.0	80.0	93.8	0.0	-	89.2	95.1
Mediums	0	0	0	0	-	0	1	7	0	0	-	8	0	2	0	0	-	2	0	2	1	1	-	4	14
% Mediums	0.0	0.0	0.0	0.0	-	0.0	50.0	5.3	0.0	-	-	3.7	0.0	20.0	0.0	-	-	15.4	0.0	20.0	6.3	100.0	-	10.8	4.9
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	3	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-





Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsI.com

Count Name: Argus Road & South Service Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 8

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

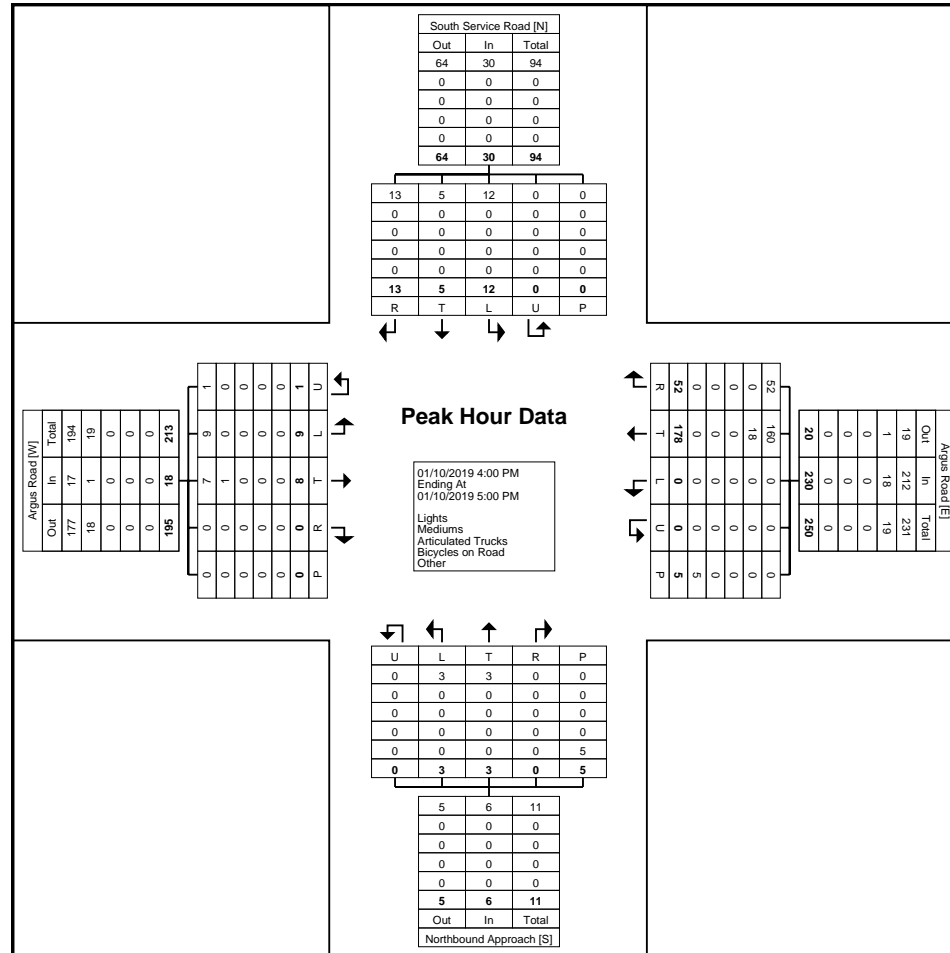
Start Time	Argus Road Eastbound						Argus Road Westbound						Northbound Approach Northbound						South Service Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:00 PM	5	1	0	1	0	7	0	44	12	0	3	56	1	3	0	0	1	4	4	3	2	0	0	9	76
4:15 PM	0	3	0	0	0	3	0	46	19	0	1	65	1	0	0	0	2	1	3	0	2	0	0	5	74
4:30 PM	3	4	0	0	0	7	0	37	9	0	1	46	0	0	0	0	1	0	1	0	4	0	0	5	58
4:45 PM	1	0	0	0	0	1	0	51	12	0	0	63	1	0	0	0	1	1	4	2	5	0	0	11	76
<b>Total</b>	<b>9</b>	<b>8</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>18</b>	<b>0</b>	<b>178</b>	<b>52</b>	<b>0</b>	<b>5</b>	<b>230</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>6</b>	<b>12</b>	<b>5</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>30</b>	<b>284</b>
Approach %	50.0	44.4	0.0	5.6	-	-	0.0	77.4	22.6	0.0	-	-	50.0	50.0	0.0	0.0	-	-	40.0	16.7	43.3	0.0	-	-	-
Total %	3.2	2.8	0.0	0.4	-	6.3	0.0	62.7	18.3	0.0	-	81.0	1.1	1.1	0.0	0.0	-	2.1	4.2	1.8	4.6	0.0	-	10.6	-
PHF	0.450	0.500	0.000	0.250	-	0.643	0.000	0.873	0.684	0.000	-	0.885	0.750	0.250	0.000	0.000	-	0.375	0.750	0.417	0.650	0.000	-	0.682	0.934
Lights	9	7	0	1	-	17	0	160	52	0	-	212	3	3	0	0	-	6	12	5	13	0	-	30	265
% Lights	100.0	87.5	-	100.0	-	94.4	-	89.9	100.0	-	-	92.2	100.0	100.0	-	-	-	100.0	100.0	100.0	100.0	-	-	100.0	93.3
Mediums	0	1	0	0	-	1	0	18	0	0	-	18	0	0	0	0	-	0	0	0	0	0	-	0	19
% Mediums	0.0	12.5	-	0.0	-	5.6	-	10.1	0.0	-	-	7.8	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	6.7
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	0.0	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	0.0	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	5	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited  
 22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
 519-896-3163 cbowness@ptsl.com

Count Name: Argus Road & South Service Road  
 Site Code:  
 Start Date: 01/10/2019  
 Page No: 9



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



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: Argus Road & South Service Road  
Site Code:  
Start Date: 01/10/2019  
Page No: 10



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: South Service Road & Lyons Lane  
Site Code:  
Start Date: 01/10/2019  
Page No: 1

### Turning Movement Data

Start Time	South Service Road Westbound					Lyons Lane Northbound					Lyons Lane Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	
7:00 AM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	1	0	0	0	1	0	1	0	0	1	0	1	0	0	1	3
7:30 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
7:45 AM	2	0	0	3	2	1	0	0	0	1	0	2	0	0	2	5
Hourly Total	4	1	0	3	5	2	1	0	0	3	0	3	0	0	3	11
8:00 AM	1	0	2	2	3	1	1	0	0	2	0	1	0	0	1	6
8:15 AM	0	0	0	1	0	1	1	0	0	2	0	1	0	0	1	3
8:30 AM	0	1	0	0	1	0	1	0	1	1	0	0	0	0	0	2
8:45 AM	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	2
Hourly Total	2	1	2	3	5	2	3	0	1	5	1	2	0	0	3	13
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	4	2	2	2	8	0	0	0	0	0	2	0	0	0	2	10
11:15 AM	1	0	2	2	3	0	1	0	0	1	0	0	0	0	0	4
11:30 AM	2	0	0	1	2	0	0	0	0	0	0	0	0	0	0	2
11:45 AM	2	1	1	0	4	0	2	0	0	2	1	1	0	0	2	8
Hourly Total	9	3	5	5	17	0	3	0	0	3	3	1	0	0	4	24
12:00 PM	3	1	1	3	5	0	2	0	0	2	1	1	0	0	2	9
12:15 PM	3	1	1	0	5	1	0	0	0	1	1	0	0	0	1	7
12:30 PM	1	0	0	0	1	3	1	0	0	4	0	0	0	0	0	5
12:45 PM	2	2	0	0	4	1	1	0	0	2	2	2	0	0	4	10
Hourly Total	9	4	2	3	15	5	4	0	0	9	4	3	0	0	7	31
1:00 PM	2	0	0	1	2	0	3	0	0	3	0	1	0	0	1	6
1:15 PM	0	0	0	3	0	0	1	0	0	1	0	0	0	2	0	1
1:30 PM	1	0	0	1	1	1	1	0	0	2	0	0	0	0	0	3
1:45 PM	3	2	0	3	5	0	0	0	0	0	1	1	0	0	2	7
Hourly Total	6	2	0	8	8	1	5	0	0	6	1	2	0	2	3	17
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	1	1	0	0	2	2	0	0	0	2	0	1	0	0	1	5
3:15 PM	2	2	0	2	4	0	1	0	0	1	1	2	0	0	3	8
3:30 PM	2	0	1	3	3	0	1	0	0	1	0	1	0	0	1	5
3:45 PM	2	0	2	2	4	1	2	0	0	3	0	1	0	0	1	8
Hourly Total	7	3	3	7	13	3	4	0	0	7	1	5	0	0	6	26
4:00 PM	6	3	0	0	9	0	1	0	0	1	2	1	0	0	3	13
4:15 PM	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
4:30 PM	4	1	0	0	5	0	0	0	0	0	0	2	0	0	2	7
4:45 PM	2	0	0	4	2	0	0	0	0	0	0	0	0	0	0	2
Hourly Total	15	4	0	4	19	0	1	0	0	1	2	3	0	0	5	25
5:00 PM	2	1	0	0	3	1	2	0	0	3	1	1	0	0	2	8

5:15 PM	1	2	0	0	3	1	0	0	0	1	2	0	0	0	2	6
5:30 PM	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	2
5:45 PM	0	0	0	3	0	1	0	0	0	1	0	0	0	0	0	1
Hourly Total	3	3	0	3	6	4	2	0	0	6	3	2	0	0	5	17
Grand Total	55	21	12	36	88	17	23	0	1	40	15	21	0	2	36	164
Approach %	62.5	23.9	13.6	-	-	42.5	57.5	0.0	-	-	41.7	58.3	0.0	-	-	-
Total %	33.5	12.8	7.3	-	53.7	10.4	14.0	0.0	-	24.4	9.1	12.8	0.0	-	22.0	-
Lights	54	21	6	-	81	7	20	0	-	27	14	11	0	-	25	133
% Lights	98.2	100.0	50.0	-	92.0	41.2	87.0	-	-	67.5	93.3	52.4	-	-	69.4	81.1
Mediums	1	0	6	-	7	1	3	0	-	4	0	1	0	-	1	12
% Mediums	1.8	0.0	50.0	-	8.0	5.9	13.0	-	-	10.0	0.0	4.8	-	-	2.8	7.3
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	9	0	0	-	9	1	9	0	-	10	19
% Bicycles on Road	0.0	0.0	0.0	-	0.0	52.9	0.0	-	-	22.5	6.7	42.9	-	-	27.8	11.6
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	36	-	-	-	-	1	-	-	-	-	2	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

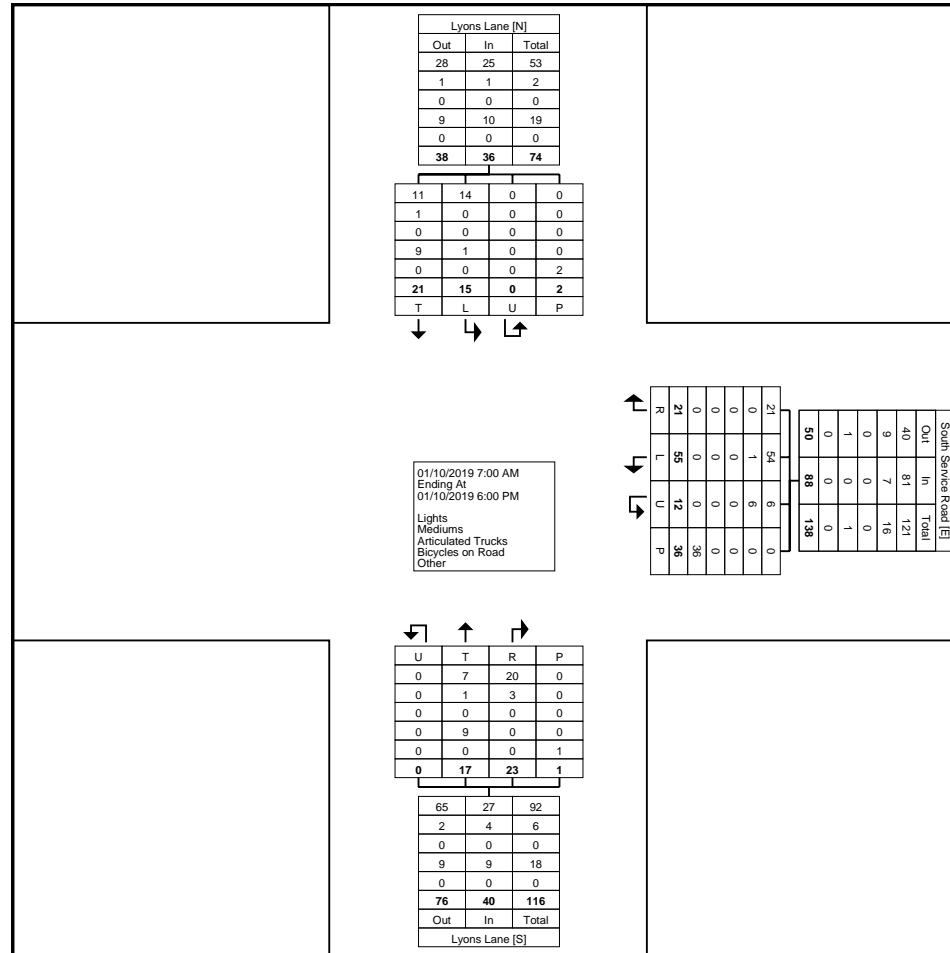




Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: South Service Road & Lyons Lane  
Site Code:  
Start Date: 01/10/2019  
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: South Service Road & Lyons Lane  
Site Code:  
Start Date: 01/10/2019  
Page No: 4

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

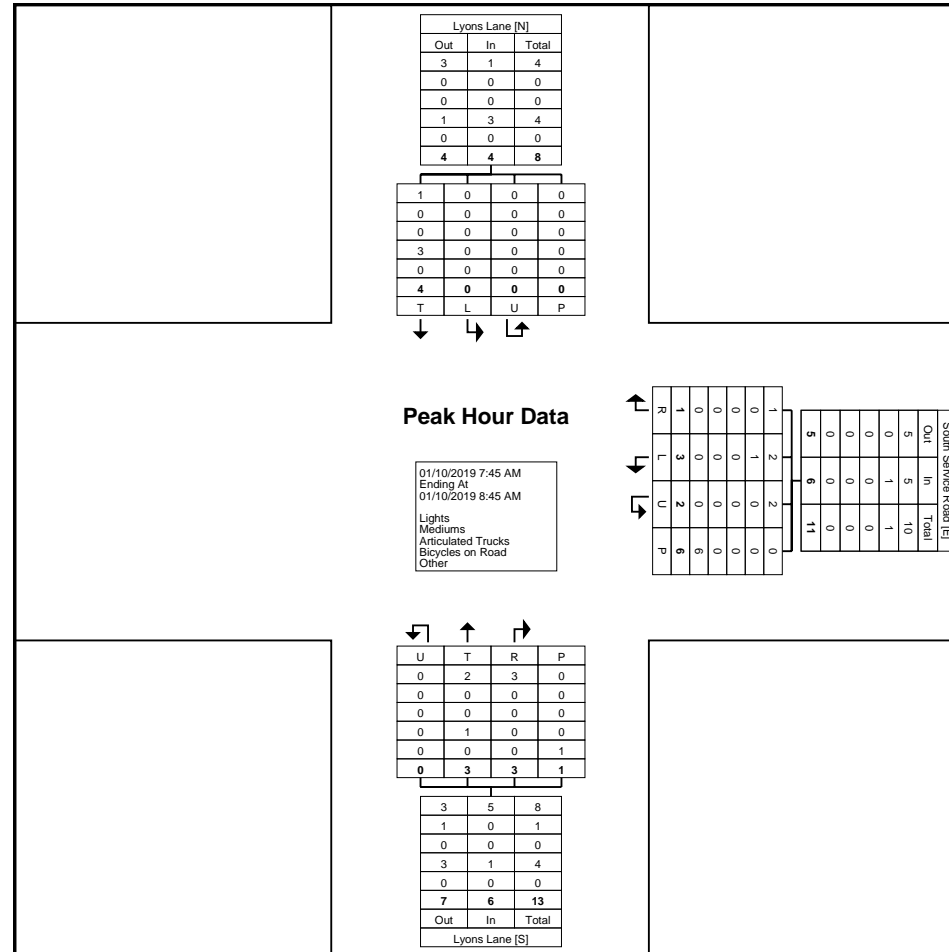
Start Time	South Service Road Westbound					Lyons Lane Northbound					Lyons Lane Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	
7:45 AM	2	0	0	3	2	1	0	0	0	1	0	2	0	0	2	5
8:00 AM	1	0	2	2	3	1	1	0	0	2	0	1	0	0	1	6
8:15 AM	0	0	0	1	0	1	1	0	0	2	0	1	0	0	1	3
8:30 AM	0	1	0	0	1	0	1	0	1	1	0	0	0	0	0	2
Total	3	1	2	6	6	3	3	0	1	6	0	4	0	0	4	16
Approach %	50.0	16.7	33.3	-	-	50.0	50.0	0.0	-	-	0.0	100.0	0.0	-	-	-
Total %	18.8	6.3	12.5	-	37.5	18.8	18.8	0.0	-	37.5	0.0	25.0	0.0	-	25.0	-
PHF	0.375	0.250	0.250	-	0.500	0.750	0.750	0.000	-	0.750	0.000	0.500	0.000	-	0.500	0.667
Lights	2	1	2	-	5	2	3	0	-	5	0	1	0	-	1	11
% Lights	66.7	100.0	100.0	-	83.3	66.7	100.0	-	-	83.3	-	25.0	-	-	25.0	68.8
Mediums	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Mediums	33.3	0.0	0.0	-	16.7	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	6.3
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	1	0	0	-	1	0	3	0	-	3	4
% Bicycles on Road	0.0	0.0	0.0	-	0.0	33.3	0.0	-	-	16.7	-	75.0	-	-	75.0	25.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	6	-	-	-	-	1	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: South Service Road & Lyons Lane  
Site Code:  
Start Date: 01/10/2019  
Page No: 5



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

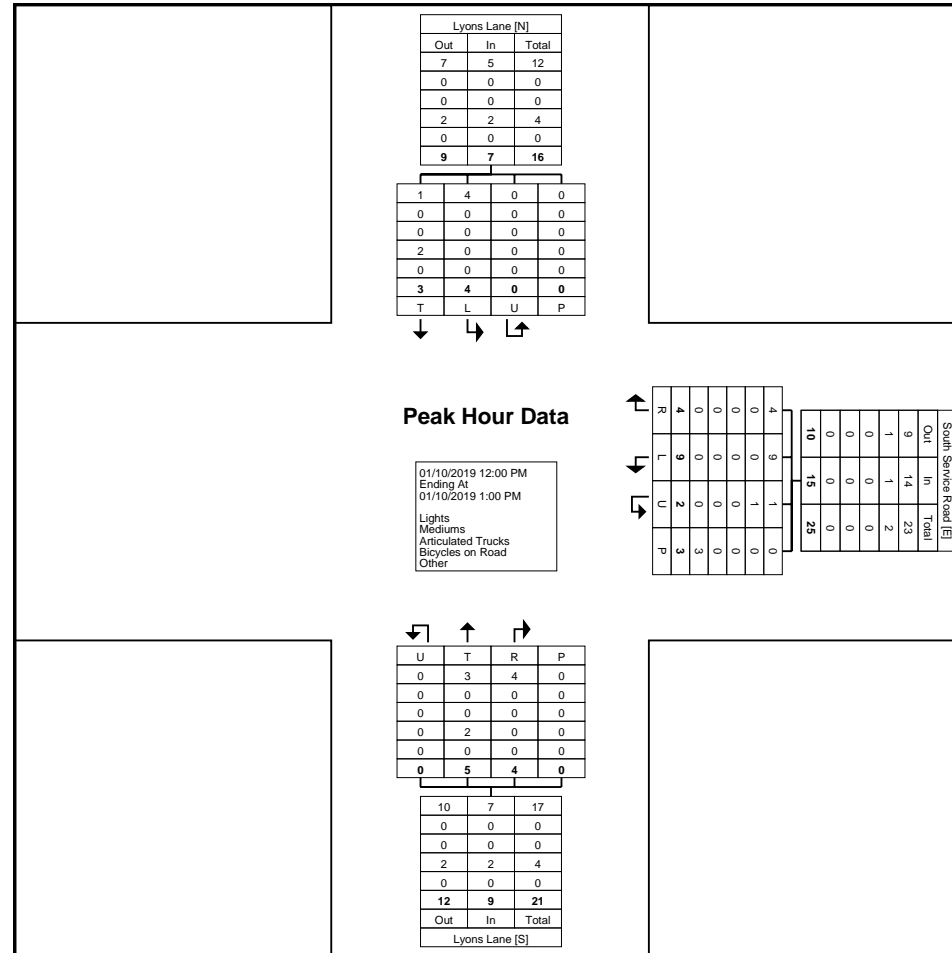




Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: South Service Road & Lyons Lane  
Site Code:  
Start Date: 01/10/2019  
Page No: 7



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

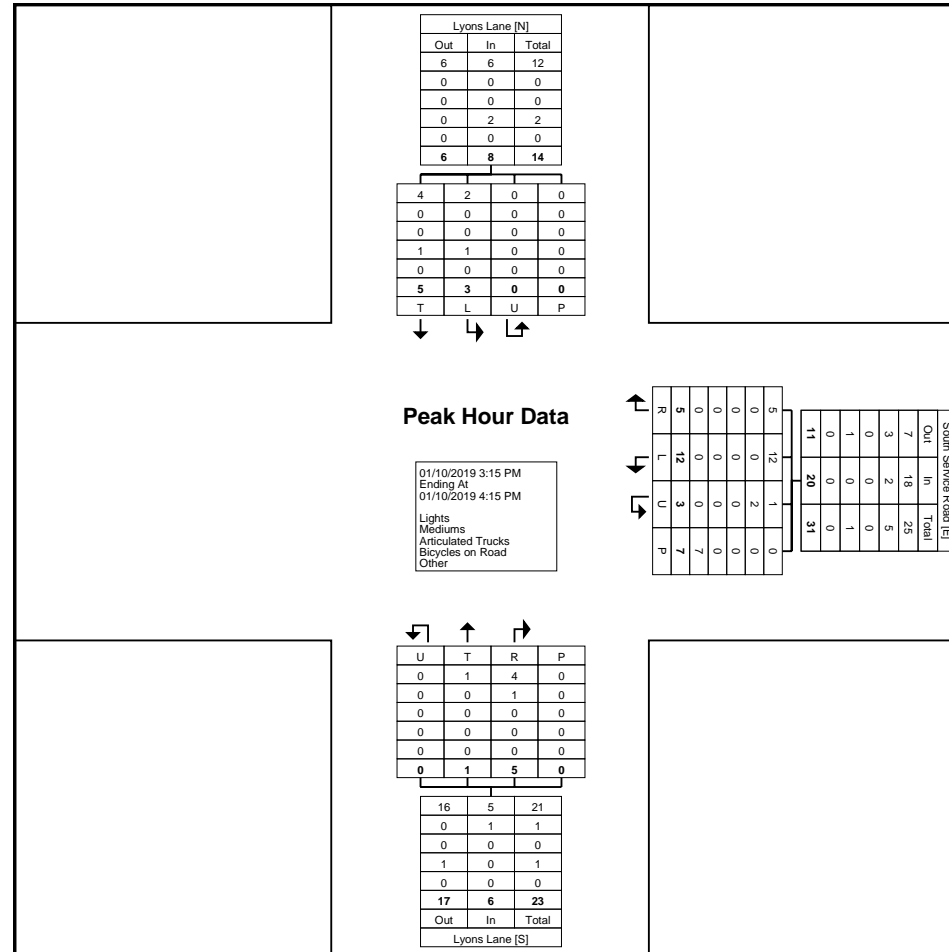




Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: South Service Road & Lyons Lane  
Site Code:  
Start Date: 01/10/2019  
Page No: 9



Turning Movement Peak Hour Data Plot (3:15 PM)



Paradigm Transportation Solutions Limited  
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8  
519-896-3163 cbowness@ptsl.com

Count Name: South Service Road & Lyons Lane  
Site Code:  
Start Date: 01/10/2019  
Page No: 10





Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: Royal Windsor Drive & Canadian Road  
Site Code: 210590  
Start Date: 02/15/2022  
Page No: 1

### Turning Movement Data

Start Time	QEW Ramp Eastbound						Royal Windsor Drive Westbound						South Service Road E Northbound						The Canadian Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	6	86	3	0	0	95	3	54	0	0	0	57	1	2	3	0	0	6	3	1	3	0	0	7	165
7:15 AM	19	146	3	0	0	168	13	69	0	0	0	82	2	1	11	0	0	14	2	3	8	0	0	13	277
7:30 AM	17	137	3	1	0	158	8	68	2	1	0	79	1	2	6	0	0	9	0	8	9	0	0	17	263
7:45 AM	13	122	4	0	0	139	13	127	1	0	0	141	0	0	14	0	0	14	0	4	3	0	0	7	301
Hourly Total	55	491	13	1	0	560	37	318	3	1	0	359	4	5	34	0	0	43	5	16	23	0	0	44	1006
8:00 AM	10	85	5	0	0	100	18	105	2	0	0	125	1	2	7	0	0	10	1	6	8	0	0	15	250
8:15 AM	7	125	6	0	0	138	19	103	1	0	0	123	1	2	12	0	0	15	1	1	6	0	0	8	284
8:30 AM	7	128	10	0	0	145	25	118	2	1	0	146	0	3	9	0	0	12	1	5	7	0	0	13	316
8:45 AM	1	130	3	0	0	134	22	96	2	0	0	120	0	0	10	0	0	10	0	3	7	0	0	10	274
Hourly Total	25	468	24	0	0	517	84	422	7	1	0	514	2	7	38	0	0	47	3	15	28	0	0	46	1124
9:00 AM	6	100	8	0	0	114	11	64	0	0	0	75	0	2	14	0	0	16	0	4	3	0	0	7	212
9:15 AM	2	92	4	0	0	98	16	80	0	2	0	98	0	1	12	0	0	13	0	2	5	0	0	7	216
9:30 AM	1	104	2	1	0	108	9	87	0	0	0	96	0	0	6	0	0	6	1	5	6	0	0	12	222
9:45 AM	1	81	7	0	0	89	14	88	0	0	0	102	0	0	9	0	0	9	1	3	3	0	0	7	207
Hourly Total	10	377	21	1	0	409	50	319	0	2	0	371	0	3	41	0	0	44	2	14	17	0	0	33	857
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	4	77	11	2	0	94	9	73	6	1	0	89	4	2	7	1	0	14	2	4	8	0	0	14	211
11:15 AM	3	83	6	0	0	92	10	95	1	0	0	106	2	1	16	0	0	19	0	2	5	0	0	7	224
11:30 AM	3	78	9	2	0	92	22	91	0	0	0	113	0	0	14	0	0	14	0	2	3	0	0	5	224
11:45 AM	6	84	6	1	0	97	15	87	1	0	0	103	3	0	21	0	0	24	0	0	3	0	0	3	227
Hourly Total	16	322	32	5	0	375	56	346	8	1	0	411	9	3	58	1	0	71	2	8	19	0	0	29	886
12:00 PM	3	84	4	0	0	91	13	74	0	1	0	88	0	4	22	0	0	26	1	5	4	0	0	10	215
12:15 PM	0	75	5	0	0	80	18	73	0	0	0	91	1	3	10	0	0	14	1	2	2	0	0	5	190
12:30 PM	0	73	2	0	0	75	12	79	2	0	0	93	0	0	12	0	0	12	0	3	6	0	0	9	189
12:45 PM	0	78	4	0	0	82	12	87	3	0	0	102	2	0	8	0	0	10	0	0	5	0	0	5	199
Hourly Total	3	310	15	0	0	328	55	313	5	1	0	374	3	7	52	0	0	62	2	10	17	0	0	29	793
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:30 PM	7	101	6	2	0	116	29	168	1	0	0	198	2	2	32	0	0	36	0	8	35	0	0	43	393
3:45 PM	11	96	3	0	0	110	22	183	0	0	0	205	2	6	25	1	0	34	0	11	75	0	0	86	435
Hourly Total	18	197	9	2	0	226	51	351	1	0	0	403	4	8	57	1	0	70	0	19	110	0	0	129	828
4:00 PM	21	97	5	0	0	123	47	169	3	0	0	219	2	5	18	0	0	25	3	31	205	0	0	239	606
4:15 PM	25	107	2	0	0	134	57	146	8	0	0	211	2	7	18	0	0	27	7	52	94	0	0	153	525
4:30 PM	86	128	2	0	0	216	30	140	3	0	0	173	3	10	23	0	0	36	1	14	45	0	0	60	485
4:45 PM	140	142	6	0	0	288	25	112	10	0	0	147	5	19	28	0	0	52	1	7	26	0	0	34	521
Hourly Total	272	474	15	0	0	761	159	567	24	0	0	750	12	41	87	0	0	140	12	104	370	0	0	486	2137

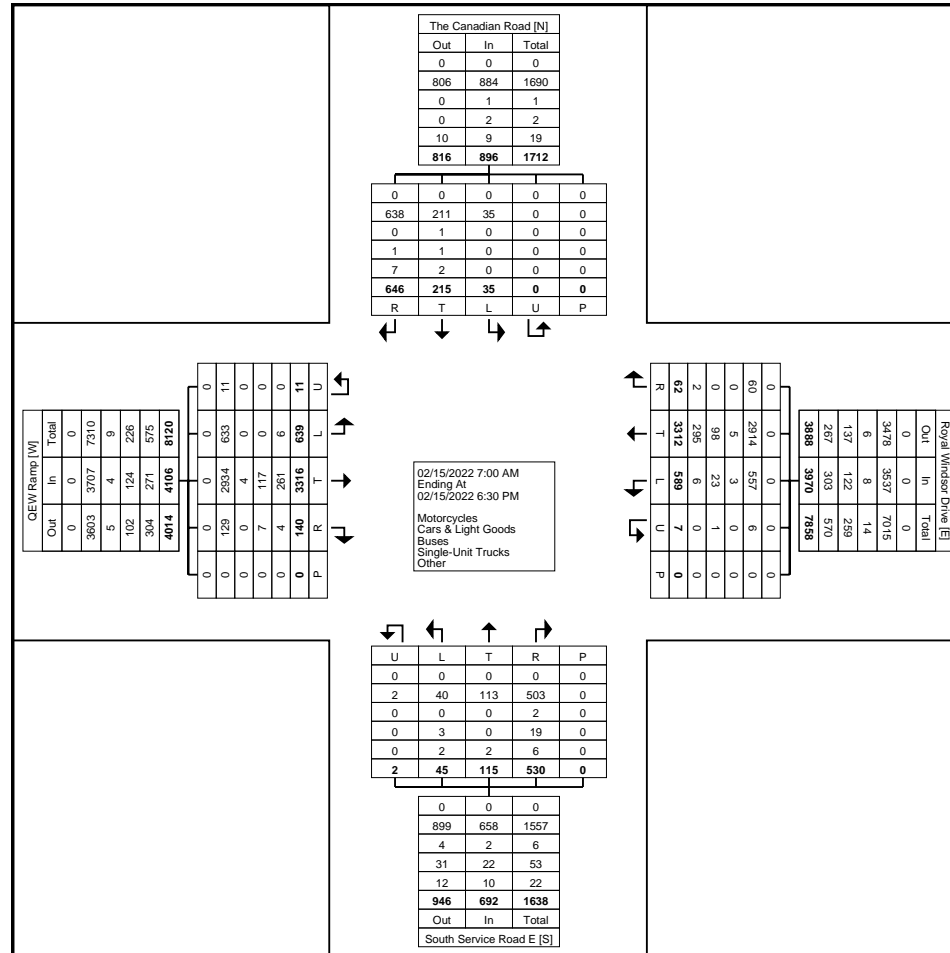




Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: Royal Windsor Drive & Canadian Road  
Site Code: 210590  
Start Date: 02/15/2022  
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: Royal Windsor Drive & Canadian Road  
Site Code: 210590  
Start Date: 02/15/2022  
Page No: 4

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

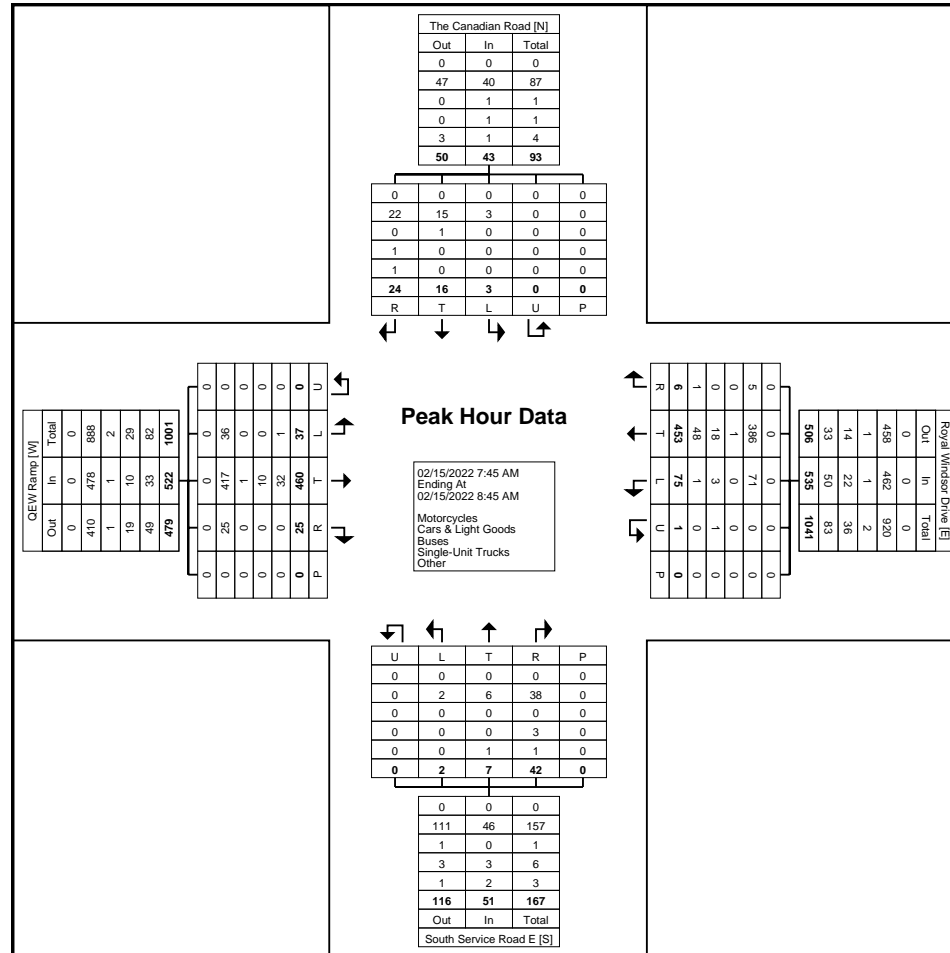
Start Time	QEW Ramp Eastbound						Royal Windsor Drive Westbound						South Service Road E Northbound						The Canadian Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:45 AM	13	122	4	0	0	139	13	127	1	0	0	141	0	0	14	0	0	14	0	4	3	0	0	7	301
8:00 AM	10	85	5	0	0	100	18	105	2	0	0	125	1	2	7	0	0	10	1	6	8	0	0	15	250
8:15 AM	7	125	6	0	0	138	19	103	1	0	0	123	1	2	12	0	0	15	1	1	6	0	0	8	284
8:30 AM	7	128	10	0	0	145	25	118	2	1	0	146	0	3	9	0	0	12	1	5	7	0	0	13	316
Total	37	460	25	0	0	522	75	453	6	1	0	535	2	7	42	0	0	51	3	16	24	0	0	43	1151
Approach %	7.1	88.1	4.8	0.0	-	-	14.0	84.7	1.1	0.2	-	-	3.9	13.7	82.4	0.0	-	-	7.0	37.2	55.8	0.0	-	-	-
Total %	3.2	40.0	2.2	0.0	-	45.4	6.5	39.4	0.5	0.1	-	46.5	0.2	0.6	3.6	0.0	-	4.4	0.3	1.4	2.1	0.0	-	3.7	-
PHF	0.712	0.898	0.625	0.000	-	0.900	0.750	0.892	0.750	0.250	-	0.916	0.500	0.583	0.750	0.000	-	0.850	0.750	0.667	0.750	0.000	-	0.717	0.911
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	36	417	25	0	-	478	71	386	5	0	-	462	2	6	38	0	-	46	3	15	22	0	-	40	1026
% Cars & Light Goods	97.3	90.7	100.0	-	-	91.6	94.7	85.2	83.3	0.0	-	86.4	100.0	85.7	90.5	-	-	90.2	100.0	93.8	91.7	-	-	93.0	89.1
Buses	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	3
% Buses	0.0	0.2	0.0	-	-	0.2	0.0	0.2	0.0	0.0	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	6.3	0.0	-	-	2.3	0.3
Single-Unit Trucks	0	10	0	0	-	10	3	18	0	1	-	22	0	0	3	0	-	3	0	0	1	0	-	1	36
% Single-Unit Trucks	0.0	2.2	0.0	-	-	1.9	4.0	4.0	0.0	100.0	-	4.1	0.0	0.0	7.1	-	-	5.9	0.0	0.0	4.2	-	-	2.3	3.1
Articulated Trucks	1	32	0	0	-	33	1	48	1	0	-	50	0	1	1	0	-	2	0	0	1	0	-	1	86
% Articulated Trucks	2.7	7.0	0.0	-	-	6.3	1.3	10.6	16.7	0.0	-	9.3	0.0	14.3	2.4	-	-	3.9	0.0	0.0	4.2	-	-	2.3	7.5
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: Royal Windsor Drive & Canadian Road  
Site Code: 210590  
Start Date: 02/15/2022  
Page No: 5



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



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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519-896-3163 cbowness@ptsI.com

Count Name: Royal Windsor Drive & Canadian Road  
Site Code: 210590  
Start Date: 02/15/2022  
Page No: 6

### Turning Movement Peak Hour Data (11:15 AM)

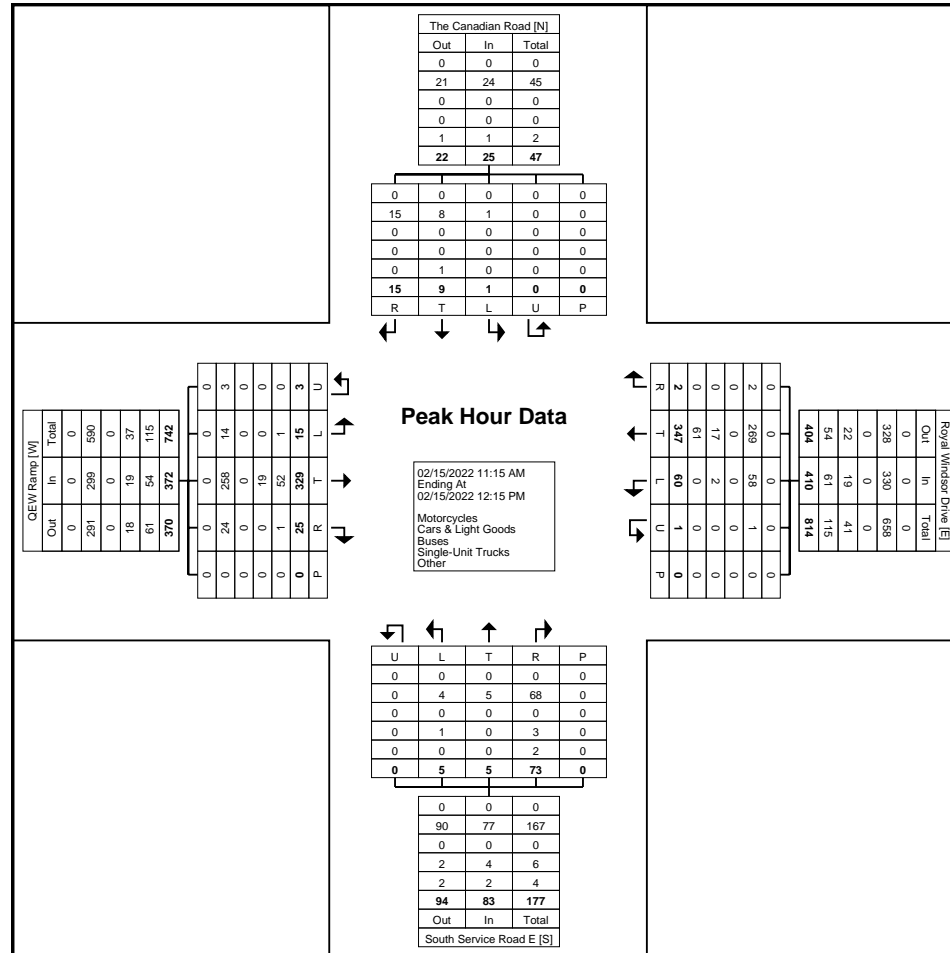
Start Time	QEW Ramp Eastbound						Royal Windsor Drive Westbound						South Service Road E Northbound						The Canadian Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:15 AM	3	83	6	0	0	92	10	95	1	0	0	106	2	1	16	0	0	19	0	2	5	0	0	7	224
11:30 AM	3	78	9	2	0	92	22	91	0	0	0	113	0	0	14	0	0	14	0	2	3	0	0	5	224
11:45 AM	6	84	6	1	0	97	15	87	1	0	0	103	3	0	21	0	0	24	0	0	3	0	0	3	227
12:00 PM	3	84	4	0	0	91	13	74	0	1	0	88	0	4	22	0	0	26	1	5	4	0	0	10	215
<b>Total</b>	15	329	25	3	0	372	60	347	2	1	0	410	5	5	73	0	0	83	1	9	15	0	0	25	890
Approach %	4.0	88.4	6.7	0.8	-	-	14.6	84.6	0.5	0.2	-	-	6.0	6.0	88.0	0.0	-	-	4.0	36.0	60.0	0.0	-	-	-
Total %	1.7	37.0	2.8	0.3	-	41.8	6.7	39.0	0.2	0.1	-	46.1	0.6	0.6	8.2	0.0	-	9.3	0.1	1.0	1.7	0.0	-	2.8	-
PHF	0.625	0.979	0.694	0.375	-	0.959	0.682	0.913	0.500	0.250	-	0.907	0.417	0.313	0.830	0.000	-	0.798	0.250	0.450	0.750	0.000	-	0.625	0.980
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	14	258	24	3	-	299	58	269	2	1	-	330	4	5	68	0	-	77	1	8	15	0	-	24	730
% Cars & Light Goods	93.3	78.4	96.0	100.0	-	80.4	96.7	77.5	100.0	100.0	-	80.5	80.0	100.0	93.2	-	-	92.8	100.0	88.9	100.0	-	-	96.0	82.0
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Buses	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	19	0	0	-	19	2	17	0	0	-	19	1	0	3	0	-	4	0	0	0	0	-	0	42
% Single-Unit Trucks	0.0	5.8	0.0	0.0	-	5.1	3.3	4.9	0.0	0.0	-	4.6	20.0	0.0	4.1	-	-	4.8	0.0	0.0	0.0	-	-	0.0	4.7
Articulated Trucks	1	52	1	0	-	54	0	61	0	0	-	61	0	0	2	0	-	2	0	1	0	0	-	1	118
% Articulated Trucks	6.7	15.8	4.0	0.0	-	14.5	0.0	17.6	0.0	0.0	-	14.9	0.0	0.0	2.7	-	-	2.4	0.0	11.1	0.0	-	-	4.0	13.3
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: Royal Windsor Drive & Canadian Road  
Site Code: 210590  
Start Date: 02/15/2022  
Page No: 7



Turning Movement Peak Hour Data Plot (11:15 AM)



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: Royal Windsor Drive & Canadian Road  
Site Code: 210590  
Start Date: 02/15/2022  
Page No: 8

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

Start Time	QEW Ramp Eastbound						Royal Windsor Drive Westbound						South Service Road E Northbound						The Canadian Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:00 PM	21	97	5	0	0	123	47	169	3	0	0	219	2	5	18	0	0	25	3	31	205	0	0	239	606
4:15 PM	25	107	2	0	0	134	57	146	8	0	0	211	2	7	18	0	0	27	7	52	94	0	0	153	525
4:30 PM	86	128	2	0	0	216	30	140	3	0	0	173	3	10	23	0	0	36	1	14	45	0	0	60	485
4:45 PM	140	142	6	0	0	288	25	112	10	0	0	147	5	19	28	0	0	52	1	7	26	0	0	34	521
Total	272	474	15	0	0	761	159	567	24	0	0	750	12	41	87	0	0	140	12	104	370	0	0	486	2137
Approach %	35.7	62.3	2.0	0.0	-	-	21.2	75.6	3.2	0.0	-	-	8.6	29.3	62.1	0.0	-	-	2.5	21.4	76.1	0.0	-	-	-
Total %	12.7	22.2	0.7	0.0	-	35.6	7.4	26.5	1.1	0.0	-	35.1	0.6	1.9	4.1	0.0	-	6.6	0.6	4.9	17.3	0.0	-	22.7	-
PHF	0.486	0.835	0.625	0.000	-	0.661	0.697	0.839	0.600	0.000	-	0.856	0.600	0.539	0.777	0.000	-	0.673	0.429	0.500	0.451	0.000	-	0.508	0.882
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	272	443	15	0	-	730	152	545	24	0	-	721	12	41	86	0	-	139	12	104	368	0	-	484	2074
% Cars & Light Goods	100.0	93.5	100.0	-	-	95.9	95.6	96.1	100.0	-	-	96.1	100.0	100.0	98.9	-	-	99.3	100.0	100.0	99.5	-	-	99.6	97.1
Buses	0	1	0	0	-	1	2	2	0	0	-	4	0	0	1	0	-	1	0	0	0	0	-	0	6
% Buses	0.0	0.2	0.0	-	-	0.1	1.3	0.4	0.0	-	-	0.5	0.0	0.0	1.1	0	-	0.7	0.0	0.0	0.0	-	-	0.0	0.3
Single-Unit Trucks	0	10	0	0	-	10	3	7	0	0	-	10	0	0	0	0	-	0	0	0	0	0	-	0	20
% Single-Unit Trucks	0.0	2.1	0.0	-	-	1.3	1.9	1.2	0.0	-	-	1.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.9
Articulated Trucks	0	20	0	0	-	20	2	13	0	0	-	15	0	0	0	0	-	0	0	0	2	0	-	2	37
% Articulated Trucks	0.0	4.2	0.0	-	-	2.6	1.3	2.3	0.0	-	-	2.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.5	-	-	0.4	1.7
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

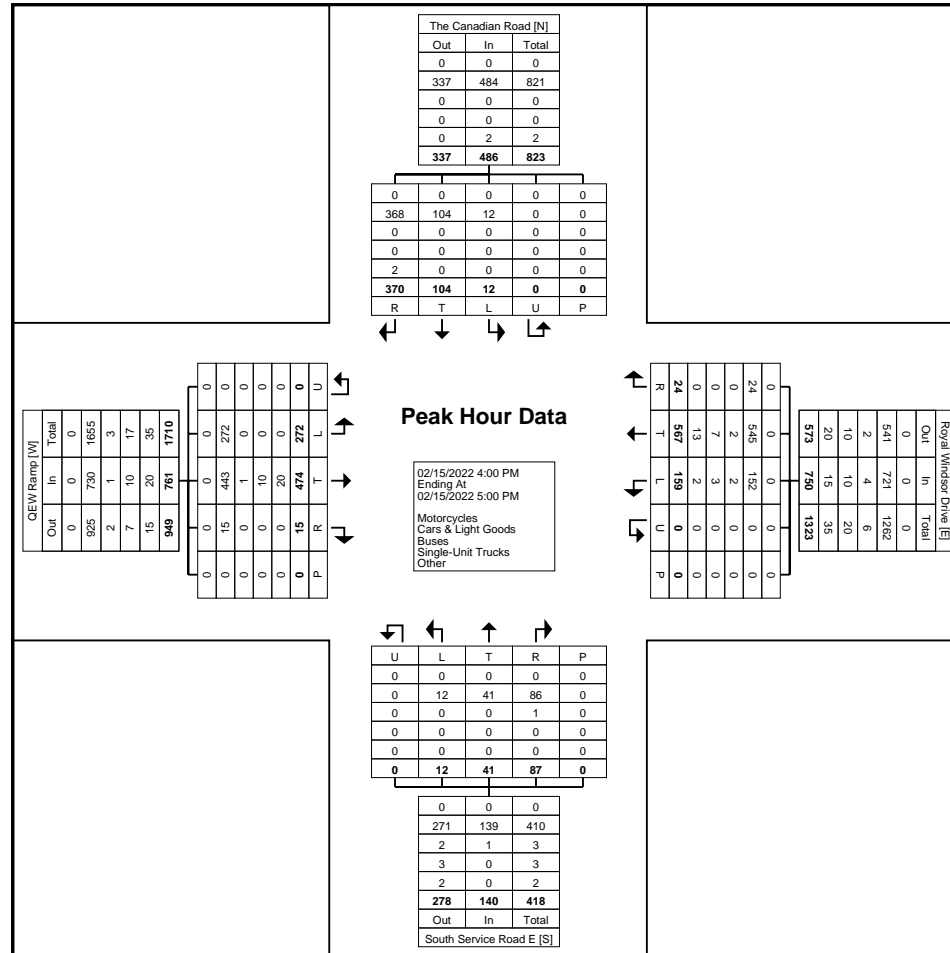




Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: Royal Windsor Drive & Canadian Road  
Site Code: 210590  
Start Date: 02/15/2022  
Page No: 9



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



Ministry of Transportation

Ministère des Transports

2018

# Intersection Layout Sheet

Version: 1.0 Feb 1, 2016

Contract # 9015-E-0009

Work Order # 027

Date: Aug 14 Day: Tue Hrs: 7-9 + 11-14 + 15-18

Location: QEW @ Dorval Dr - Kerr STIC-116 Ramps: NRT1

Reg/Mun: CR Town/City: Oakville Area: \_\_\_\_\_

File Name: 1101330000 Device: Gretch / Jamar Unit # 121 Interval 1: AM NN / PM

Observer: Renat Shuliko Weather: Clear Clear Road Condition: Dry / Dry

LHRS & O/S: 10133 0.00 Comments: \_\_\_\_\_

GPS: G-Star IV

Datum: WGS 84 QIN

Lat: 43.447395

Long: -79.701587

SIGNALIZED (Y) / N

If intersection is unsignalized;

Sign Type: Stop / Yield

Sign Size: \_\_\_\_\_ cm x \_\_\_\_\_ cm

Sign Condition: \_\_\_\_\_

NA: New / Good / Poor / Missing

SA: New / Good / Poor / Missing

WA: New / Good / Poor / Missing

EA: New / Good / Poor / Missing

Photograph all approach's

including all Signs (Y) / N

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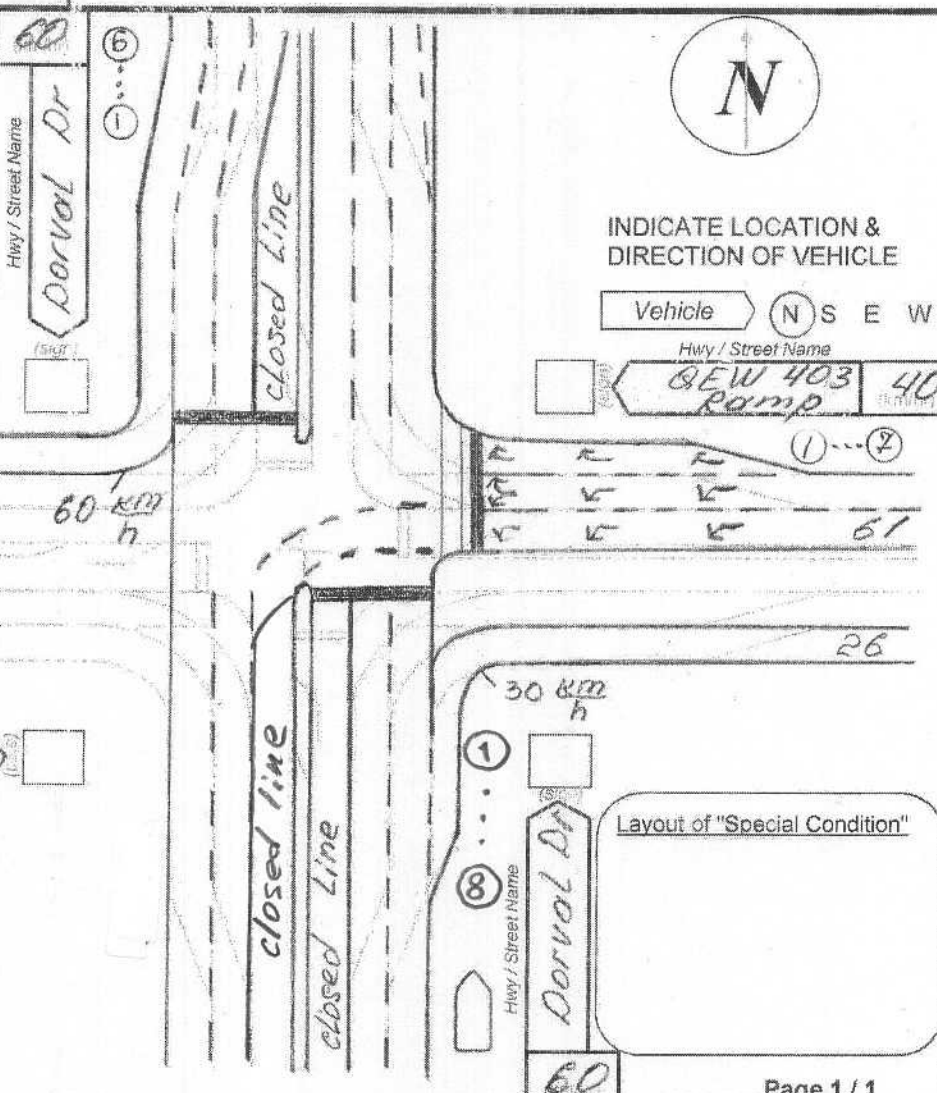
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QEW 403 Ramp

Note: Show all lanes approaching and leaving the intersection.

Show all channelization

If there are two or more through lane in one direction, indicate if these lanes are not continuous

Show pedestrian crosswalks



# TVIS II - Traffic Volume Information System

## Turning Movement Total Count and Peak Summary Report

Ministry of Transportation

Description: **Dorval Dr - Kerr St IC116 (NRT)**

Region: **CENTRAL**

Survey Type: **TM - Interchange**

Hwy: **QEW**

Start Date: **14-Aug-2018 (Tue)**

I/C Side: **N**

LHRS: **10133**

End Date: **14-Aug-2018 (Tue)**

Int. Type: **Four Leg**

Offset: **0**

Schedule Summary: **TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00**

### Total Count Number of hours: 8

Dorval Dr		Ped. 0			QEW; 61	
Ped. 19	Total Vehicles	2% (T+LT) 1417	2% (T+LT) 6942	0% (T+LT) 0	↑ 7514	
← 1417	↙	↓	↘	↑ 2855	4% (T+LT)	
0% (T+LT) 0	↗	← 0	0% (T+LT) 0	← 0	0% (T+LT)	
0% (T+LT) 0	→	↙ 4410	11% (T+LT)	↘ 4410	11% (T+LT)	
0% (T+LT) 0	↘	↖	↑	↗ 2380	→	
QEW; 36	↓ 11352	0	2% (T+LT) 4659	3% (T+LT) 2380	Total Vehicles	Ped. 17
Ped. 0	↓	0% (T+LT)	2% (T+LT)	3% (T+LT)		

### AM Peak Hour Report Start Time: 08:00

Dorval Dr		Ped. 0			QEW; 61	
Ped. 1	Total Vehicles	3% (T+LT) 194	2% (T+LT) 1087	0% (T+LT) 0	↑ 707	
← 194	↙	↓	↘	↑ 317	7% (T+LT)	
0% (T+LT) 0	↗	← 0	0% (T+LT) 0	← 0	0% (T+LT)	
0% (T+LT) 0	→	↙ 681	12% (T+LT)	↘ 681	12% (T+LT)	
0% (T+LT) 0	↘	↖	↑	↗ 258	→	
QEW; 36	↓ 1768	0	4% (T+LT) 390	3% (T+LT) 258	Total Vehicles	Ped. 4
Ped. 0	↓	0% (T+LT)	4% (T+LT)	3% (T+LT)		

### Midday Peak Hour Report Start Time: 12:00

Dorval Dr		Ped. 0			QEW; 61	
Ped. 1	Total Vehicles	1% (T+LT) 221	2% (T+LT) 917	0% (T+LT) 0	↑ 1047	
← 221	↙	↓	↘	↑ 355	4% (T+LT)	
0% (T+LT) 0	↗	← 0	0% (T+LT) 0	← 0	0% (T+LT)	
0% (T+LT) 0	→	↙ 463	19% (T+LT)	↘ 463	19% (T+LT)	
0% (T+LT) 0	↘	↖	↑	↗ 306	→	
QEW; 36	↓ 1380	0	1% (T+LT) 692	5% (T+LT) 306	Total Vehicles	Ped. 2
Ped. 0	↓	0% (T+LT)	1% (T+LT)	5% (T+LT)		

### PM Peak Hour Report Start Time: 16:30

Dorval Dr		Ped. 0			QEW; 61	
Ped. 1	Total Vehicles	3% (T+LT) 188	2% (T+LT) 853	0% (T+LT) 0	↑ 1306	
← 188	↙	↓	↘	↑ 503	1% (T+LT)	
0% (T+LT) 0	↗	← 0	0% (T+LT) 0	← 0	0% (T+LT)	
0% (T+LT) 0	→	↙ 572	3% (T+LT)	↘ 572	3% (T+LT)	
0% (T+LT) 0	↘	↖	↑	↗ 371	→	
QEW; 36	↓ 1425	0	1% (T+LT) 803	2% (T+LT) 371	Total Vehicles	Ped. 1
Ped. 0	↓	0% (T+LT)	1% (T+LT)	2% (T+LT)		



TVIS II - Traffic Volume Information System
Turning Movement 15 Minute Report

Description: Dorval Dr - Kerr St IC116 (NRT)

Region: CENTRAL

Survey Type: TM - Interchange

Hwy: QEW

Start Date: 14-Aug-2018 (Tue)

I/C Side: N

LHRS: 10133

End Date: 14-Aug-2018 (Tue)

Int. Type: Four Leg

Offset: 0

Schedule Summary: TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00

Table with columns for Major Road Approaches (North/South Dorval Dr) and Minor Road Approaches (East/West QEW). Rows include Start Time, vehicle counts for Cars, Trucks, and Long Trucks in various directions, and Total Veh. per 15-minute period.



**TVIS II - Traffic Volume Information System**  
**Turning Movement 15 Minute Report**

Description: **Dorval Dr - Kerr St IC116 (NRT)**

Region: **CENTRAL**

Survey Type: **TM – Interchange**

Hwy: **QEW**

Start Date: **14-Aug-2018 (Tue)**

I/C Side: **N**

LHRS: **10133**

End Date: **14-Aug-2018 (Tue)**

Int. Type: **Four Leg**

Offset: **0**

Schedule Summary: **TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00**

Start Time	Major Road Approaches										Minor Road Approaches										Total Veh.																				
	North Dorval Dr					South Dorval Dr					East QEW: Ramp(s): 61					West QEW																									
	Cars			Trucks		Long Trucks		Ped	Cars			Trucks		Long Trucks		Ped	Cars			Trucks		Heavy Trucks		Ped																	
←	↑	→	←	→	←	→	←		↑	→	←	↑	→	←	↑		→	←	↑	→	←	↑	→																		
15:30	0	164	35	0	4	0	0	2	1	0	0	176	89	0	0	1	0	1	2	0	133	0	79	4	0	2	5	0	0	2	0	0	0	0	0	0	0	0	0	2	698
15:45	0	229	32	0	6	0	0	2	0	0	0	187	65	0	2	2	0	3	1	0	143	0	106	12	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	794
16:00	0	202	33	0	5	0	0	3	0	0	0	200	77	0	0	0	0	0	0	0	120	0	100	3	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	1	749
16:15	0	208	38	0	0	0	0	1	0	0	0	179	88	0	2	3	0	1	3	0	155	0	112	5	0	1	5	0	3	0	0	0	0	0	0	0	0	0	0	0	804
16:30	0	191	45	0	1	1	0	2	0	0	0	184	108	0	3	0	0	1	1	0	129	0	106	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	774
16:45	0	208	51	0	2	1	0	2	1	0	0	180	62	0	0	2	0	2	1	0	151	0	127	5	0	2	3	0	1	0	0	0	0	0	0	0	0	0	0	0	801
17:00	0	222	40	0	2	0	0	1	0	0	0	238	113	0	0	2	0	2	0	0	147	0	130	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	902
17:15	0	218	47	0	3	2	0	1	0	0	0	192	81	0	0	1	0	1	0	0	127	0	134	1	0	2	3	0	0	1	0	0	0	0	0	0	0	0	0	1	813
17:30	0	182	34	0	2	0	0	2	0	0	0	190	75	0	0	0	0	1	0	0	124	0	127	5	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	744
17:45	0	197	44	0	2	1	0	1	0	0	0	140	69	0	0	2	0	1	0	0	118	0	131	1	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	708



### Intersection Layout Sheet

Contract # 9015-E-0009  
Work Order # 028

Date: Aug 14/1 Day: Tue 1 Hrs: 7-9 + 11-14 + 15-18

Location: REW @ Dorval Dr - Kerr STIC-116 Ramps: SRT1

Reg/Mun: CR Town/City: Oakville Area: \_\_\_\_\_

File Name: 2101330000 Device: Gretch / Jamar Unit #: 121 Interval 1: (AM) NN / PM

Observer: Renat Shalix Weather: Clear Clear Road Condition: Dry / Dry

LHRS & O/S: 10/33 0.00 Comments: \_\_\_\_\_

GPS: E-STAR IV

Datum: WGS 84 (N)

Lat: 43.445528

Long: -79.698691

SIGNALIZED (Y) N

If intersection is unsignalized:  
Sign Type: Stop / Yield

Sign Size: \_\_\_\_\_ cm x \_\_\_\_\_ cm

Sign Condition:

NA: New / Good / Poor / Missing

SA: New / Good / Poor / Missing

WA: New / Good / Poor / Missing

EA: New / Good / Poor / Missing

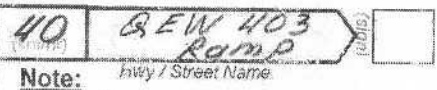
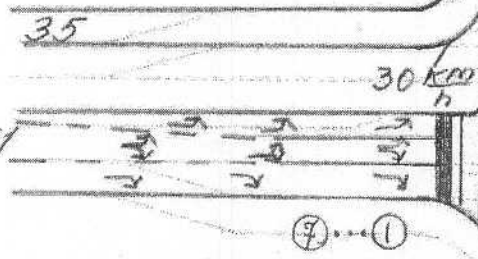
Photograph all approach's including all Signs (Y) N



INDICATE LOCATION & DIRECTION OF VEHICLE

Vehicle (N) (S) (E) (W)

Hwy / Street Name



**Note:**

Show all lanes approaching and leaving the intersection.

Show all channelization

If there are two or more through lane in one direction, indicate if these lanes are not continuous

Show pedestrian crosswalks

Layout of "Special Condition"



# TVIS II - Traffic Volume Information System

## Turning Movement Total Count and Peak Summary Report

Ministry of Transportation

Description: **Dorval Dr - Kerr St IC-116 (SRT)**

Region: **CENTRAL**

Survey Type: **TM - Interchange**

Hwy: **QEW**

Start Date: **14-Aug-2018 (Tue)**

I/C Side: **S**

LHRS: **10133**

End Date: **14-Aug-2018 (Tue)**

Int. Type: **T - W**

Offset: **0**

Schedule Summary: **TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00**

Total Count		Number of hours: 8					
Dorval Dr							
Ped. 19	Total Vehicles	2% (T+LT) 3983	8% (T+LT) 7267	0% (T+LT) 0	↑ 7064	Ped. 0	
				Not Configured			
←	3983	↙	↓	↘	↑	0	0% (T+LT)
2% (T+LT)	1363	↗	↖	←	0	0% (T+LT)	0% (T+LT)
0% (T+LT)	0	→	↘	↙	0	0% (T+LT)	0% (T+LT)
3% (T+LT)	2647	↖	↗	↖	↗	6127	→
QEW; 51	9914	0	5701	6127	Total Vehicles	Ped. 0	
Ped. 0	↓	0% (T+LT)	2% (T+LT)	10% (T+LT)			
				Dorval Dr			

AM Peak Hour Report		Start Time: 08:00					
Dorval Dr							
Ped. 2	Total Vehicles	2% (T+LT) 582	8% (T+LT) 1175	0% (T+LT) 0	↑ 649	Ped. 0	
				Not Configured			
←	582	↙	↓	↘	↑	0	0% (T+LT)
4% (T+LT)	100	↗	↖	←	0	0% (T+LT)	0% (T+LT)
0% (T+LT)	0	→	↘	↙	0	0% (T+LT)	0% (T+LT)
2% (T+LT)	397	↖	↗	↖	↗	786	→
QEW; 51	1572	0	549	786	Total Vehicles	Ped. 6	
Ped. 0	↓	0% (T+LT)	3% (T+LT)	7% (T+LT)			
				Dorval Dr			

Midday Peak Hour Report		Start Time: 12:00					
Dorval Dr							
Ped. 3	Total Vehicles	3% (T+LT) 539	11% (T+LT) 835	0% (T+LT) 0	↑ 1006	Ped. 0	
				Not Configured			
←	539	↙	↓	↘	↑	0	0% (T+LT)
1% (T+LT)	213	↗	↖	←	0	0% (T+LT)	0% (T+LT)
0% (T+LT)	0	→	↘	↙	0	0% (T+LT)	0% (T+LT)
3% (T+LT)	374	↖	↗	↖	↗	721	→
QEW; 51	1209	0	793	721	Total Vehicles	Ped. 1	
Ped. 0	↓	0% (T+LT)	3% (T+LT)	12% (T+LT)			
				Dorval Dr			

PM Peak Hour Report		Start Time: 16:15					
Dorval Dr							
Ped. 0	Total Vehicles	2% (T+LT) 526	3% (T+LT) 912	0% (T+LT) 0	↑ 1186	Ped. 0	
				Not Configured			
←	526	↙	↓	↘	↑	0	0% (T+LT)
3% (T+LT)	222	↗	↖	←	0	0% (T+LT)	0% (T+LT)
0% (T+LT)	0	→	↘	↙	0	0% (T+LT)	0% (T+LT)
2% (T+LT)	264	↖	↗	↖	↗	979	→
QEW; 51	1176	0	964	979	Total Vehicles	Ped. 0	
Ped. 0	↓	0% (T+LT)	2% (T+LT)	7% (T+LT)			
				Dorval Dr			



**TVIS II - Traffic Volume Information System**  
**Turning Movement 15 Minute Report**

Description: **Dorval Dr - Kerr St IC-116 (SRT)**

Region: **CENTRAL**

Survey Type: **TM - Interchange**

Hwy: **QEW**

Start Date: **14-Aug-2018 (Tue)**

I/C Side: **S**

LHRS: **10133**

End Date: **14-Aug-2018 (Tue)**

Int. Type: **T - W**

Offset: **0**

Schedule Summary: **TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00**

Start Time	Major Road Approaches										Minor Road Approaches										Total Veh.										
	North Dorval Dr					South Dorval Dr					West QEW: Ramp(s): 51					Not Configured															
	Cars			Trucks		Long Trucks		Ped	Cars			Trucks		Long Trucks		Ped	Cars			Trucks		Heavy Trucks		Ped							
←	↑	→	←	→	←	→	←		↑	→	←	↑	→	←	↑		→	←	↑	→	←	↑	→		←	↑	→				
Period 1																															
07:00	0	151	129	0	5	0	0	10	0	0	0	72	111	0	2	8	0	1	4	0	18	0	56	0	0	2	0	0	0	0	569
07:15	0	150	117	0	8	0	0	12	0	0	0	67	114	0	4	8	0	2	6	0	9	0	74	1	0	0	0	0	0	1	572
07:30	0	215	175	0	9	1	0	8	0	0	0	98	135	0	3	8	0	1	8	0	24	0	86	0	0	0	1	0	1	0	773
07:45	0	274	135	0	6	2	0	11	0	0	0	102	176	0	3	3	0	1	10	0	22	0	109	1	0	0	0	0	1	0	856
08:00	0	239	155	0	11	2	0	8	1	0	0	104	168	0	2	10	0	0	11	0	20	0	86	1	0	0	0	0	1	2	819
08:15	0	271	148	0	7	0	0	16	0	0	0	115	201	0	4	4	0	3	10	0	16	0	109	0	0	4	0	0	1	0	909
08:30	0	254	151	0	10	1	0	13	1	0	0	156	179	0	4	6	0	1	5	0	28	0	87	0	0	1	0	0	0	0	897
08:45	0	320	118	0	9	2	0	17	3	0	0	156	180	0	2	7	0	2	5	0	32	0	106	1	0	2	2	0	0	0	964
Period 2																															
11:00	0	179	70	0	11	5	0	13	1	0	0	133	142	0	5	14	0	2	10	0	39	0	69	0	0	2	0	0	2	1	697
11:15	0	152	107	0	11	0	0	15	2	0	0	186	143	0	6	13	0	3	17	0	40	0	79	1	0	3	0	0	1	0	779
11:30	0	168	132	0	15	2	0	14	1	0	0	175	155	0	4	10	0	2	10	0	60	0	72	1	0	2	0	0	0	0	823
11:45	0	187	111	0	12	2	0	11	0	0	0	164	149	0	4	9	0	1	9	0	37	0	87	1	0	3	0	0	1	1	788
12:00	0	171	122	0	13	1	0	10	3	0	0	242	165	0	1	10	0	1	11	0	53	0	92	1	0	1	0	0	0	1	897
12:15	0	178	156	0	12	1	0	13	0	0	0	173	158	0	5	11	0	3	13	0	53	0	76	1	0	3	0	0	2	1	858
12:30	0	175	130	0	9	4	0	12	3	0	0	183	164	0	3	11	0	3	13	0	46	0	87	0	0	1	0	0	1	0	845
12:45	0	218	116	0	9	2	0	15	1	0	0	172	147	0	2	7	0	5	11	0	59	0	109	0	0	2	0	0	0	1	875
13:00	0	214	114	0	7	4	0	6	2	0	0	202	164	0	0	7	0	2	9	0	49	0	99	0	0	1	0	0	2	1	882
13:15	0	192	132	0	13	2	0	14	0	0	0	177	171	0	2	12	0	4	12	0	50	0	86	0	0	2	1	0	0	1	870
13:30	0	207	104	0	10	2	0	5	1	0	0	185	136	0	0	13	0	1	10	0	47	0	80	2	0	1	1	0	4	3	809
13:45	0	218	88	0	16	0	0	12	0	0	0	179	154	0	0	13	0	2	15	0	31	0	89	0	0	1	0	0	4	1	822
Period 3																															
15:00	0	229	92	0	12	2	0	8	3	0	0	195	192	0	4	11	0	1	14	0	44	0	81	1	0	4	0	0	1	1	894
15:15	0	212	86	0	4	6	0	5	1	0	0	170	158	0	2	12	0	3	13	0	42	0	76	0	0	2	0	0	2	1	794





**TVIS II - Traffic Volume Information System**  
**Turning Movement 15 Minute Report**

Description: **Dorval Dr - Kerr St IC-116 (SRT)**

Region: **CENTRAL**

Survey Type: **TM – Interchange**

Hwy: **QEW**

Start Date: **14-Aug-2018 (Tue)**

I/C Side: **S**

LHRS: **10133**

End Date: **14-Aug-2018 (Tue)**

Int. Type: **T - W**

Offset: **0**

Schedule Summary: **TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00**

Start Time	Major Road Approaches													Minor Road Approaches											Total Veh.						
	North Dorval Dr						South Dorval Dr						West QEW: Ramp(s): 51						Not Configured												
	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks		Heavy Trucks		Ped			
←	↑	→	←	↑	→	←	↑	→	←		↑	→	←	↑	→	←	↑	→	←		↑	→	←	↑	→	←	↑		→	←	↑
15:30	0	229	92	0	7	2	0	4	3	0	0	217	199	0	1	9	0	3	13	0	43	0	64	0	0	2	0	0	3	1	891
15:45	0	231	102	0	10	3	0	5	1	0	0	186	161	0	2	13	0	3	14	0	54	0	98	2	0	1	1	0	0	0	887
16:00	0	210	144	0	8	4	0	6	1	0	0	216	200	0	0	7	0	0	11	0	63	0	74	0	0	0	0	0	0	1	944
16:15	0	211	104	0	4	0	0	6	0	0	0	220	221	0	2	6	0	4	13	0	51	0	68	2	0	3	0	0	0	0	915
16:30	0	219	147	0	1	0	0	2	2	0	0	247	244	0	1	7	0	2	10	0	47	0	61	2	0	1	0	0	1	0	994
16:45	0	207	117	0	4	2	0	3	1	0	0	188	205	0	3	12	0	3	12	0	53	0	56	0	0	0	0	0	1	0	867
17:00	0	248	150	0	2	2	0	5	1	0	0	292	241	0	2	5	0	0	3	0	65	0	73	1	0	0	1	0	0	0	1091
17:15	0	199	123	0	2	2	0	3	1	0	0	219	223	0	1	4	0	1	9	0	49	0	60	0	0	0	0	0	0	1	896
17:30	0	198	122	0	5	1	0	2	1	0	0	209	197	0	0	6	0	0	8	0	54	0	65	0	0	0	0	0	0	0	868
17:45	0	190	101	0	4	1	0	1	1	0	0	163	166	0	2	3	0	2	10	0	39	0	58	0	0	2	0	0	0	0	743



# Intersection Layout Sheet

Contract # 9015-E-0009

Work Order # 026

2018

Date: Aug 14/1 Day: Tue 1 Hrs: 8-9 + 11-14 + 15-18

Location: BEW @ Kerr St Ramps: NRT 1

Reg/Mun: CR Town/City: Oakville Area: \_\_\_\_\_

File Name: 0101330000 Device: Gretch / Jamar Unit # 121 Interval 1: (AM) NN / PM

Observer: Renat Shukras Weather: Clear / Clear Road Condition: Dry / Dry

LHRS & OIS: 10133 0.00 Comments: \_\_\_\_\_

GPS: G-Star IV

Datum: WGS 84 (Y) N

Lat: 43.450691

Long: -79.699845

### SIGNALIZED Y I (N)

If intersection is unsignalized;  
Sign Type: Stop / Yield

Sign Size: 60 cm x 60 cm

Sign Condition:

NA: New / Good / Poor / Missing

SA: New / (Good) / Poor / Missing

WA: New / Good / Poor / Missing

EA: New / Good / Poor / Missing

Photograph all approach's including all Signs (Y) / N

(km/hr)

Hwy / Street Name

(sign)



INDICATE LOCATION & DIRECTION OF VEHICLE

Vehicle N S E W

Hwy / Street Name

Kerr St 50

begins 50

① ② ③ ④

60 begins

60 Nort Service Rd

Note: Hwy / Street Name

Show all lanes approaching and leaving the intersection.

Show all channelization

If there are two or more through lane in one direction, indicate if these lanes are not continuous

Show pedestrian crosswalks

③ ② ①

①  
⑥

STOP

Hwy / Street Name

BEW 403  
Ramp

40

Layout of "Special Condition"



**TVIS II - Traffic Volume Information System**  
**Turning Movement Total Count and Peak Summary Report**

Ministry of Transportation

Description: **Kerr St**

Region: **CENTRAL**

Survey Type: **TM – Interchange**

Hwy: **QEW**

Start Date: **14-Aug-2018 (Tue)**

I/C Side: **E**

LHRS: **10133**

End Date: **14-Aug-2018 (Tue)**

Int. Type: **T - S**

Offset: **0**

Schedule Summary: **TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00**

**Total Count**                                      **Number of hours: 8**

Ped. 0		Total Vehicles	0% (T +LT)	0% (T +LT)	0% (T +LT)	↑	Ped. 0
Kerr St		0	0	0	0	0	Kerr St
←	3689	←	↓	↓	↓	↑	0
	0	↑	←	←	←	0%	2894
	0%	0	↑	↑	↑	2%	2837
	0	→	↓	↓	↓	0%	0
	0	→	←	←	←	0%	4287
Kerr St		0	795	0	1450	Total Vehicles	Ped. 0
	Ped. 57	↓	3%	0%	4%	↓	57

QEW; 62, 63

**AM Peak Hour Report**                              **Start Time: 08:00**

Ped. 0		Total Vehicles	0% (T +LT)	0% (T +LT)	0% (T +LT)	↑	Ped. 0
Kerr St		0	0	0	0	0	Kerr St
←	415	←	↓	↓	↓	↑	0
	0	↑	←	←	←	0%	221
	0%	0	↑	↑	↑	4%	0
	0	→	↓	↓	↓	0%	0
	0	→	←	←	←	0%	580
Kerr St		0	194	0	216	Total Vehicles	Ped. 0
	Ped. 1	↓	2%	0%	2%	↓	1

QEW; 62, 63

**Midday Peak Hour Report**                              **Start Time: 12:00**

Ped. 0		Total Vehicles	0% (T +LT)	0% (T +LT)	0% (T +LT)	↑	Ped. 0
Kerr St		0	0	0	0	0	Kerr St
←	493	←	↓	↓	↓	↑	0
	0	↑	←	←	←	0%	422
	0%	0	↑	↑	↑	2%	428
	0	→	↓	↓	↓	0%	0
	0	→	←	←	←	0%	598
Kerr St		0	71	0	170	Total Vehicles	Ped. 0
	Ped. 13	↓	6%	0%	6%	↓	13

QEW; 62, 63

**PM Peak Hour Report**                              **Start Time: 16:45**

Ped. 0		Total Vehicles	0% (T +LT)	0% (T +LT)	0% (T +LT)	↑	Ped. 0
Kerr St		0	0	0	0	0	Kerr St
←	649	←	↓	↓	↓	↑	0
	0	↑	←	←	←	0%	556
	0%	0	↑	↑	↑	1%	339
	0	→	↓	↓	↓	0%	0
	0	→	←	←	←	0%	550
Kerr St		0	93	0	211	Total Vehicles	Ped. 0
	Ped. 7	↓	0%	0%	1%	↓	7

QEW; 62, 63



**TVIS II - Traffic Volume Information System**  
**Turning Movement 15 Minute Report**

Description: **Kerr St**

Region: **CENTRAL**

Start Date: **14-Aug-2018 (Tue)**

End Date: **14-Aug-2018 (Tue)**

Survey Type: **TM - Interchange**

I/C Side: **E**

Int. Type: **T - S**

Hwy: **QEW**

LHRS: **10133**

Offset: **0**

Schedule Summary: **TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00**

Start Time	Major Road Approaches												Minor Road Approaches												Total Veh.			
	East Kerr St						West Kerr St						South QEW: Ramp(s): 62, 63						Not Configured									
	Cars		Trucks		Long Trucks		Ped	Cars		Trucks		Long Trucks		Ped	Cars		Trucks		Heavy Trucks		Ped							
←	↑	→	←	↑	→	←		↑	→	←	↑	→	←		↑	→	←	↑	→	←		↑	→					
Period 1																												
07:00	0	21	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	16	0	27	0	0	1	2	0	0	1	120
07:15	0	26	0	0	1	0	0	1	0	0	0	1	0	0	1	0	0	19	0	32	0	0	0	0	0	0	0	130
07:30	0	36	0	0	0	0	0	1	0	0	0	2	0	0	1	0	0	32	0	40	0	0	2	2	0	1	2	181
07:45	0	42	0	0	0	0	0	3	0	0	0	1	0	0	1	0	0	29	0	57	0	0	1	0	0	1	1	229
08:00	0	39	0	0	1	0	0	1	0	0	0	1	0	0	3	0	0	37	0	38	1	0	0	0	0	1	1	213
08:15	0	49	0	0	2	0	0	1	0	0	0	2	0	0	1	0	0	48	0	51	1	0	2	0	0	0	0	236
08:30	0	62	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	49	0	58	2	0	0	0	0	1	0	266
08:45	0	62	0	0	1	0	0	2	0	0	0	0	0	0	2	0	0	56	0	64	0	0	0	0	0	1	0	280
Period 2																												
11:00	0	76	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	19	0	41	1	0	5	0	0	2	4	232
11:15	0	82	0	0	2	0	0	2	0	0	0	1	0	0	1	0	0	19	0	28	1	0	1	0	0	1	0	222
11:30	0	81	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	23	0	40	1	0	0	0	0	0	5	240
11:45	0	92	0	0	3	0	0	1	0	0	0	2	0	0	2	0	0	20	0	40	0	0	1	0	0	0	4	262
12:00	0	119	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	16	0	38	1	0	2	1	0	1	4	276
12:15	0	107	0	0	2	0	0	1	0	0	0	0	0	0	1	0	0	15	0	38	1	0	2	0	0	0	2	275
12:30	0	76	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	15	0	39	0	0	1	0	0	1	3	251
12:45	0	112	0	0	2	0	0	1	0	0	0	0	0	0	1	0	0	21	0	45	0	0	2	1	0	1	4	289
13:00	0	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	39	0	0	4	0	0	1	0	269
13:15	0	85	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	23	0	44	2	0	0	0	0	0	2	252
13:30	0	90	0	0	1	0	0	2	0	0	0	1	0	0	1	0	0	17	0	41	0	0	2	0	0	0	3	240
13:45	0	83	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	23	0	38	0	0	2	0	0	2	3	256
Period 3																												
15:00	0	89	0	0	1	0	0	0	0	0	0	2	0	0	1	0	0	16	0	35	2	0	2	0	0	2	2	228
15:15	0	92	0	0	1	0	0	1	0	0	0	1	0	0	1	0	0	22	0	36	1	0	0	0	0	1	2	229



**TVIS II - Traffic Volume Information System**  
**Turning Movement 15 Minute Report**

Description: **Kerr St**

Region: **CENTRAL**

Start Date: **14-Aug-2018 (Tue)**

End Date: **14-Aug-2018 (Tue)**

Survey Type: **TM – Interchange**

I/C Side: **E**

Int. Type: **T - S**

Hwy: **QEW**

LHRS: **10133**

Offset: **0**

Schedule Summary: **TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00**

Start Time	Major Road Approaches										Minor Road Approaches										Total Veh.										
	East Kerr St					West Kerr St					South QEW: Ramp(s): 62, 63					Not Configured															
	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped		Cars			Trucks			Heavy Trucks			Ped
←	↑	→	←	↑	→	←	↑	→	←		↑	→	←	↑	→	←	↑	→	←		↑	→	←	↑	→	←	↑	→	←	↑	
15:30	0	87	0	0	1	0	0	2	0	0	0	74	0	0	0	0	0	0	0	0	15	0	40	0	0	1	0	0	1	1	221
15:45	0	76	0	0	0	0	0	1	0	0	0	101	0	0	0	0	0	1	0	0	25	0	43	0	0	2	0	0	0	2	249
16:00	0	120	0	0	1	0	0	0	0	0	0	86	0	0	1	0	0	1	0	0	20	0	57	0	0	2	0	0	0	0	288
16:15	0	114	0	0	1	0	0	1	0	0	0	79	0	0	0	0	0	0	0	0	20	0	44	1	0	0	0	0	0	2	260
16:30	0	137	0	0	1	0	0	1	0	0	0	92	0	0	2	0	0	1	0	0	24	0	51	0	0	0	0	0	0	2	309
16:45	0	109	0	0	2	0	0	1	0	0	0	85	0	0	0	0	0	0	0	0	29	0	55	0	0	0	0	0	0	1	281
17:00	0	146	0	0	1	0	0	0	0	0	0	92	0	0	1	0	0	2	0	0	21	0	60	0	0	1	0	0	1	3	325
17:15	0	134	0	0	0	0	0	1	0	0	0	80	0	0	0	0	0	0	0	0	20	0	42	0	0	0	0	0	0	0	277
17:30	0	160	0	0	1	0	0	1	0	0	0	78	0	0	0	0	0	1	0	0	23	0	52	0	0	0	0	0	0	3	316
17:45	0	129	0	0	0	0	0	1	0	0	0	75	0	0	0	0	0	0	0	0	27	0	42	0	0	0	0	0	0	0	274



Date: 03-May-22

Intersection: Trafalgar & QEW WB Ramp

**8 Phase Basic Timing Sheet**

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		X	X	X					X	X		
Direction		SB	Prot EBL	WB		NB		EB				
Min Green		28	7	10		28		10				
Veh Ext.		4.5	3.0	3.0		4.5		3.0				
Yellow		4	3	4		4		4				
Red		3	2	3		3		3				
Walk		7		7		7		7				
Don't Walk		21		24		21		24				
Max 1		30	20	40		30		40				
Max 2		70		90		70		90				
Max 3												
Veh Recall												
Ped Recall												
<b>Notes:</b>												

<p><b>Pattern 1</b>  <b>Time:</b> 6:00-7:00,9:00-10:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 81%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>58</td> <td>10</td> <td>32</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>58</td> <td>0</td> <td>42</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	58	10	32	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	58	0	42	<p><b>Pattern 2</b>  <b>Time:</b> 7:00-9:00  <b>Cycle Length:</b> 140  <b>Offset (%):</b> 91%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>62</td> <td>9</td> <td>29</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>62</td> <td>0</td> <td>38</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	62	9	29	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	62	0	38
<b>Direction</b>																																																													
<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>																																																									
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<b>%</b>	0	62	0	38																																																									
<p><b>Pattern 3</b>  <b>Time:</b> 10:00-15:15,19:00-22:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 81%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>55</td> <td>10</td> <td>35</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>55</td> <td>0</td> <td>45</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	55	10	35	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	55	0	45	<p><b>Pattern 4</b>  <b>Time:</b> 15:15-17:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 81%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>55</td> <td>10</td> <td>35</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>55</td> <td>0</td> <td>45</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	55	10	35	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	55	0	45
<b>Direction</b>																																																													
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<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>																																																									
<b>%</b>	0	55	0	45																																																									
<p><b>Pattern 5</b>  <b>Time:</b> 17:00-19:00  <b>Cycle Length:</b> 140  <b>Offset (%):</b> 46%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>57</td> <td>9</td> <td>34</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>57</td> <td>0</td> <td>43</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	57	9	34	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	57	0	43	<p><b>Pattern 6</b>  <b>Time:</b> 22:00  <b>Cycle Length:</b> local  <b>Offset (%):</b></p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	0	0	0	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	0	0	0
<b>Direction</b>																																																													
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<b>%</b>																																																													



Date: 03-May-22

Intersection: Trafalgar & QEW EB Ramp

**8 Phase Basic Timing Sheet**

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		X		X					X	X		
Direction		NB/SB		EB								
Min Green		29		10								
Veh Ext.				3.0								
Yellow		4		4								
Red		3		3								
Walk		7		7								
Don't Walk		22		24								
Max 1		50		40								
Max 2		70		90								
Max 3												
Veh Recall												
Ped Recall												
<b>Notes:</b>												



<p><b>Pattern 1</b>  <b>Time:</b> 6:00-7:00,9:00-10:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 97%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>60</td> <td>0</td> <td>40</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	60	0	40	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	0	0	0	<p><b>Pattern 2</b>  <b>Time:</b> 7:00-9:00  <b>Cycle Length:</b> 140  <b>Offset (%):</b> 4%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>59</td> <td>0</td> <td>41</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	59	0	41	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	0	0	0
<b>Direction</b>																																																													
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<b>%</b>	0	60	0	40																																																									
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<b>%</b>	0	0	0	0																																																									
<p><b>Pattern 3</b>  <b>Time:</b> 10:00-15:15, 19:00-22:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 97%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>60</td> <td>0</td> <td>40</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	60	0	40	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	0	0	0	<p><b>Pattern 4</b>  <b>Time:</b> 15:15-17:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 65%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>58</td> <td>0</td> <td>42</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	58	0	42	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	0	0	0
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<p><b>Pattern 5</b>  <b>Time:</b> 17:00-19:00  <b>Cycle Length:</b> 140  <b>Offset (%):</b> 37%</p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>60</td> <td>0</td> <td>40</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	60	0	40	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	0	0	0	<p><b>Pattern 6</b>  <b>Time:</b> 22:00  <b>Cycle Length:</b> local  <b>Offset (%):</b></p> <table border="0"> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	0	0	0	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	0	0	0
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TRAFALGAR RD & CORNWALL RD Direct port 13 - Trafalgar & Cross

Configuration Phase Sequence Page 1

Phase Ring (MM)1-1-1

Phase															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1	1	1	2	2	2	2	1	1	2	2	1	1	2	2

Hardware Alternate Sequence Enable: No

Phase Ring Sequence

Sequence	Ring	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Barrier Mode	B		B	B	B		B		B							
1	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
1	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
2	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
2	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
3	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
3	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
4	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
4	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
5	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
5	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
6	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
6	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
7	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
7	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
8	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
8	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
9	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
9	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
10	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
10	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
11	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
11	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
12	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
12	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
13	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
13	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
14	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
14	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
15	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
15	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0
16	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
16	2	5	6	8	7	11	12	15	16	0	0	0	0	0	0	0	0

**Phase  
Compatibility  
(MM)1-1-2**

Phase 1	Phase 2
1	5
1	6
2	5
2	6
3	8
4	7
9	11
9	12
10	11
10	12
13	15
13	16
14	15
14	16

**Phase Direction  
Descriptions**

Phase	Description
1	SBLT
2	NB
3	WBLT
4	EB
5	NBLT
6	SB
7	EBLT
8	WB

**Overlap Direction  
Descriptions**

Overlap	Description
---------	-------------

**Administration (MM)1-7-1**

Enable CRC Check: No

CRC: 0000

Request Download Program Data: No

Enable Automatic Backup to Datakey: Yes

TRAFALGAR RD & CORNWALL RD Direct port 13 - Trafalgar & Cross

Configuration Phase Sequence Page 2

In Use(MM)1-2

Exclusive Ped(MM)1-2

Backup Prevent(MM)1-1-3

Simultaneous Gap(MM)1-1-4

Disable(MM)1-1-4

Phases In Use
1
2
3
4
5
6
7
8

Phase

Phase	Timing Phase	Backup
1	2	Yes
2	3	Yes
3	4	Yes
4	5	Yes
5	6	B
6	7	Yes

Phase	Must Gap with Phase

Phase

Load Switch Assignments (MMU Channel) (MM)1-3

Phase	Overlap	Type	Dimming				Power Up			Auto		Flash Together	
			Red	Yellow	Green	Dark	Auto	Red	Yellow	Dark	Red		Yellow
1	1	V				+	Yes				Yes		
2	2	V				+	Yes				Yes		Yes
3	3	V				+	Yes				Yes		
4	4	V				+	Yes				Yes		Yes
5	5	V				-	Yes				Yes		
6	6	V				-	Yes				Yes		Yes
7	7	V				-	Yes				Yes		
8	8	V				-	Yes				Yes		Yes
9	2	P				+	Yes						
10	4	P				+	Yes						
11	6	P				-	Yes						
12	0					-	Yes						
13	1					+	Yes				Yes		
14	2	O				-	Yes				Yes		Yes
15	3	O				+	Yes				Yes		
16	4	O				-	Yes				Yes		Yes

TRAFALGAR RD & CORNWALL RD Direct port 13 - Trafalgar & Cross

**Configuration Port 1 (SDLC)**

**SDLC Options (MM)1-4-1**

**Bus Interface Terminal/Facilities**

BIU	Term and Facility Enable	Detector Rack Enable
1	Yes	Yes
2	Yes	Yes
3	No	No
4	No	No
5	No	No
6	No	No
7	No	No
8	No	No

Enable TS2/MMU Type Cabinet: Yes  
 Enable MMU Extended Status: Yes  
 Enable SDLC Stop Time: No  
 Enable 3 Critical RFE's Lockup: Yes  
 Diagonstics (Test Fixture) Enable: No

**Secondary To Secondary Addressing**

ID	Term and Facility Enable	Detector Rack Enable
1	No	No
2	No	No
3	No	No
4	No	No
5	No	No
6	No	No
7	No	No
8	No	No

Secondary To Secondary Addressing MMU: No  
 Secondary To Secondary Addressing Diagonstics: No

**MMU Program (MM)1-4-2**

Channel Can Serve with Channel	
Channel 1	Channel 2
1	5
1	6
1	11
2	5
2	6
2	9
2	11
3	7
3	8
3	12
4	7
4	8
4	10
4	12
5	9
6	9
6	11
7	10
8	10
8	12
9	11
10	12

**Color Check Enable (MM)1-4-3**

Enable Color Check: Yes

**Color Check Enable**

--	--	--	--

MMU Channel	Green	Yellow	Red
1	Yes	Yes	No
2	Yes	Yes	Yes
3	Yes	Yes	No
4	Yes	Yes	Yes
5	Yes	Yes	No
6	Yes	Yes	Yes
7	Yes	Yes	No
8	Yes	Yes	Yes
9	Yes	No	Yes
10	Yes	No	Yes
11	Yes	No	Yes

## TRAFALGAR RD &amp; CORNWALL RD Direct port 13 - Trafalgar &amp; Cross

## Controller Timing Plan (MM)2-1

## Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Green	7	27	12	10	7	27	10	10	5	5	5	5	5	5	5	5
BK Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	7	0	7	0	0	0	10	0	10	0	10	0	10
Walk 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	20	0	28	0	20	0	7	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	5.0	3.5	4.0	3.0	5.0	3.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max 1	25	50	25	40	25	50	35	45	35	35	35	35	35	35	35	35
Max 2	40	70	70	70	40	70	70	70	40	40	40	40	40	40	40	40
Max 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Stp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ACT B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPT Duc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0





## TRAFALGAR RD &amp; CORNWALL RD Direct port 13 - Trafalgar &amp; Cross

**Controller Start/Fash (MM) 2-5****Startup**

Phase	Phase Setting
2	Y
6	Y

Overlap
A
B
C
D

Flash > Mon: No  
Flash Time: 0  
All Red: 0  
Power Start Sequence: 1

**Automatic Flash**

Entry Phase
2
6

Exit Phase
2
6

Overlap Exit
A
B
C
D

Flash > Mon: No  
Exit Flash Interval: W  
Minimum Auto Flash: 8  
Minimum Recall: No  
Cycle Through Phase: No

## TRAFALGAR RD &amp; CORNWALL RD Direct port 13 - Trafalgar &amp; Cross

**Controller Options****Controller Options (MM)2-6-1**

Phase	Flashing Green Phase	Guaranteed Passage	Non Act 1	Non Act 2	Dual Entry	Conditional Service	Conditional Reservice	Ped Reservice	Rest In Walk	Flashing Walk	Ped Clear Yellow	Ped Clear Red	IGRN + Veh Ext
2	No	No	Yes	No	No	No	No	No	Yes	No	No	No	No
3	No	No	No	No	Yes	No	No	No	No	No	No	No	No
4	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No
6	No	No	Yes	No	No	Yes	No	No	Yes	No	No	No	No
7	No	No	No	No	Yes	No	No	No	No	No	No	No	No
8	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No

Ped Clear Protect: Off

Red Revert: 2.0

**Act Pre-Time (MM)2-7**

Pre-Time Mode Enable: No

Free Input Enables Pre-Timed: Yes

**Pre-Timed Phase**

## Phase Recall Options (MM)2-8

Plan	Phase	Lock Detector	Vehicle Recall	Ped Recall	Max Recall	Soft Recall	No Rest	AI Calc
1	2	No	Yes	Yes	No	No	No	No
1	6	No	Yes	Yes	No	No	No	No
2	1	Yes	No	No	No	No	No	No
2	2	Yes	No	No	No	No	No	No
2	3	Yes	No	No	No	No	No	No
2	4	Yes	No	No	No	No	No	No
2	5	Yes	No	No	No	No	No	No
2	6	Yes	No	No	No	No	No	No
2	7	Yes	No	No	No	No	No	No
2	8	Yes	No	No	No	No	No	No
2	9	Yes	No	No	No	No	No	No
2	10	Yes	No	No	No	No	No	No
2	11	Yes	No	No	No	No	No	No
2	12	Yes	No	No	No	No	No	No
2	13	Yes	No	No	No	No	No	No
2	14	Yes	No	No	No	No	No	No
2	15	Yes	No	No	No	No	No	No
2	16	Yes	No	No	No	No	No	No
3	1	Yes	No	No	No	No	No	No
3	2	Yes	No	No	No	No	No	No
3	3	Yes	No	No	No	No	No	No
3	4	Yes	No	No	No	No	No	No
3	5	Yes	No	No	No	No	No	No
3	6	Yes	No	No	No	No	No	No
3	7	Yes	No	No	No	No	No	No
3	8	Yes	No	No	No	No	No	No
3	9	Yes	No	No	No	No	No	No
3	10	Yes	No	No	No	No	No	No
3	11	Yes	No	No	No	No	No	No
3	12	Yes	No	No	No	No	No	No
3	13	Yes	No	No	No	No	No	No
3	14	Yes	No	No	No	No	No	No
3	15	Yes	No	No	No	No	No	No
3	16	Yes	No	No	No	No	No	No
4	1	Yes	No	No	No	No	No	No
4	2	Yes	No	No	No	No	No	No
4	3	Yes	No	No	No	No	No	No
4	4	Yes	No	No	No	No	No	No
4	5	Yes	No	No	No	No	No	No
4	6	Yes	No	No	No	No	No	No
4	7	Yes	No	No	No	No	No	No
4	8	Yes	No	No	No	No	No	No
4	9	Yes	No	No	No	No	No	No
4	10	Yes	No	No	No	No	No	No
4	11	Yes	No	No	No	No	No	No
4	12	Yes	No	No	No	No	No	No
4	13	Yes	No	No	No	No	No	No
4	14	Yes	No	No	No	No	No	No
4	15	Yes	No	No	No	No	No	No
4	16	Yes	No	No	No	No	No	No

## TRAFALGAR RD &amp; CORNWALL RD Direct port 13 - Trafalgar &amp; Cross

**Coordination Options****Coordination Options (MM)3-1**

Manual Pattern: Auto  
 ECPI Coord: Yes  
 System Source: TBC  
 System Format: STD  
 Splits In: Percent  
 Offsets In: Percent  
 Transition: Smooth  
 Max Select: MAXINH  
 Dwell/Add Time: 0  
 Dly Coord Wz-Lz: No  
 Force Off: Float  
 Offset Reference: Lead  
 Use Ped Time: Yes  
 Ped Recall: No  
 Ped Resv: No  
 Local Zero Ovr: No  
 Fo Add Ini Green: No  
 Re-sync Count: 3  
 Multisync: No

**Split Demand (MM)3-5**

Demand 1	Demand 2
Phase	Phase

Demand	Detector	Call Time	Cycle Count

**Auto Perm Minimum Green (Seconds) (MM)3-4**

Phase	Min Green
1	3

TRAFALGAR RD & CORNWALL RD Direct port 13 - Trafalgar & Cross

**Coordination Pattern Data**  
**Pattern Data (MM)3-2**

Pattern	Split Pattern	TS2	Cycle	Std(COS)	Offset Value	Dwell/Add Time	Splits In	Offsets In	Actuated Coord
1	1	0-1	120	111	12	0	Percent	Percent	Yes
2	2	0-2	140	0	6	0	Percent	Percent	Yes
3	3	0-3	120	0	12	0	Percent	Percent	Yes
4	4	1-1	120	0	49	0	Percent	Percent	Yes
5	5	1-2	140	0	42	0	Percent	Percent	Yes
6	6	1-3	255	0	0	0	Percent	Percent	No
11	11	3-2	120	0	85	0	Percent	Percent	No
12	12	3-3	120	0	45	0	Percent	Percent	No
13	13	4-1	150	0	10	0	Percent	Percent	No
18	18	5-3	150	0	19	0	Percent	Percent	No
21	21	6-3	120	0	85	0	Percent	Percent	No
23	23	7-2	120	0	85	0	Percent	Percent	No
24	24	7-3	120	0	0	0	Percent	Percent	No

Pattern	Timing Plan	Actuated Walk Rest	Sequence	Phase Reservice	Action Plan	Max Select	Force Off	Vehicle Perm 1	Vehicle Perm 2	Vehicle Perm 3
1	0	Yes	0	No	0	Max Inhibit	None	0	0	0
2	0	Yes	0	No	0	Max Inhibit	Float	0	0	0
3	0	Yes	0	No	0	Max Inhibit	Float	0	0	0
4	0	Yes	0	No	0	Max Inhibit	Float	0	0	0
5	0	Yes	0	No	0	None	None	0	0	0
6	0	No	0	No	0	None	None	0	0	0
11	0	No	0	No	0	None	None	0	0	0
12	0	No	0	No	0	None	None	0	0	0
13	0	No	0	No	0	None	None	0	0	0
18	0	No	0	No	0	None	None	0	0	0
21	0	No	0	No	0	None	None	0	0	0
23	0	No	0	No	0	None	None	0	0	0
24	0	No	0	No	0	None	None	0	0	0

Pattern	Ring Split Ext 1	Ring Split Ext 2	Ring Split Ext 3	Ring Split Ext 4	Split Demand Pattern 1	Split Demand Pattern 2	XArt Pattern	Ring Displ 2	Ring Displ 3	Ring Displ 4
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0

**Split Preference Phases**

Pattern	Phase	Preference 1	Preference 2
---------	-------	--------------	--------------

**Special Functions**

Pattern	Function	Output
---------	----------	--------

**Split Pattern Data (MM)3-3**  
**Coord Phases**

Split Pattern	Phase	Split
1	1	10
1	2	39

**Split/Modes**

Split Pattern	Mode	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Coord	X				X											
1		X			X												

1	3	15
1	4	36
1	5	14
1	6	35
1	7	36
1	8	15
2	1	9
2	2	47
2	3	12
2	4	32
2	5	12
2	6	44
2	7	32
2	8	12
3	1	10
3	2	39
3	3	15
3	4	36
3	5	14
3	6	35
3	7	36
3	8	15
4	1	10
4	2	39
4	3	15
4	4	36
4	5	14
4	6	35
4	7	36
4	8	15
5	1	10
5	2	44
5	3	13
5	4	33
5	5	12
5	6	42
5	7	33
5	8	13
11	1	15
11	2	36
11	3	19
11	4	30
11	5	15
11	6	36
11	7	30
11	8	19
12	1	19
12	2	36
12	3	17
12	4	28
12	5	19
12	6	36
12	7	28
12	8	17
13	1	13
13	2	49
13	3	13
13	4	25
13	5	13
13	6	49
13	7	25
13	8	13
18	1	11
18	2	38
18	3	21
18	4	30
18	5	11
18	6	38
18	7	30
18	8	21
21	1	15

	Ped Recall																			
2	Coord	X		X																
2	Ped Recall	X		X																
3	Coord	X		X																
3	Ped Recall	X		X																
4	Coord	X		X																
4	Ped Recall	X		X																
5	Coord	X		X																
5	Ped Recall	X		X																
6	Coord	X		X																
6	Ped Recall	X		X																
11	Coord	X		X																
11	Ped Recall	X		X																
12	Coord	X		X																
12	Ped Recall	X		X																
13	Coord	X		X																
13	Ped Recall	X		X																
18	Coord	X		X																
18	Ped Recall	X		X																
21	Coord	X		X																
21	Ped Recall	X		X																
23	Coord	X		X																
23	Ped Recall	X		X																
24	Ped Recall	X		X																

21	2	36
21	3	19
21	4	30
21	5	15
21	6	36
21	7	30
21	8	19
23	1	15
23	2	36
23	3	19
23	4	30
23	5	15
23	6	36
23	7	30
23	8	19

## TRAFALGAR RD &amp; CORNWALL RD Direct port 13 - Trafalgar &amp; Cross

## Preemptor Preempt Plan (MM)4-1

## Preempt Phases

Preempt	Phase	Track Clear Veh	Dwell Veh	Dwell Ped	Cycling Veh	Cycling Ped	Exit Phase	Exit Calls	Special Function
3	2	No	Yes	No	No	No	No	No	No
3	6	No	Yes	No	No	No	No	No	No
4	2	No	Yes	No	No	No	No	No	No
4	6	No	Yes	No	No	No	No	No	No

## Preempt Overlaps

Preempt	Overlap	Track Clear	Enable Trailing	Dwell Overlap	Cycling Overlap
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Preempt	Enable	Preempt Override	Interlock Enable	Detector Lock	Delay	Inhibit	Override Flash	Duration	CLR > GRN
1	No	Yes	No	Yes	0	0	No	0	No
2	No	Yes	No	Yes	0	0	No	0	No
3	Standard	Yes	No	Yes	0	0	No	15	No
4	Standard	Yes	No	Yes	0	0	No	15	No
5	No	Yes	No	Yes	0	0	No	0	No
6	No	Yes	No	Yes	0	0	No	0	No
7	No	Yes	No	Yes	0	0	No	0	No
8	No	Yes	No	Yes	0	0	No	0	No
9	No	Yes	No	Yes	0	0	No	0	No
10	No	Yes	No	Yes	0	0	No	0	No

Preempt	Term Overlap Asap	PC Through Yellow	Terminate Phase	Ped Dark	Track Clearance Re-service	Dwell Flash	Linked Pmt	Flash Exit Color	Preempt To Coord	Fault Type
1	No	No	No	No	No	Off	0	Green	No	Hard
2	No	No	No	No	No	Off	0	Green	No	Hard
3	No	Yes	No	No	No	Off	0	Green	No	Hard
4	No	No	No	No	No	Off	0	Green	No	Hard
5	No	No	No	No	No	Off	0	Green	No	Hard
6	No	No	No	No	No	Off	0	Green	No	Hard
7	No	No	No	No	No	Off	0	Green	No	Hard
8	No	No	No	No	No	Off	0	Green	No	Hard
9	No	No	No	No	No	Off	0	Green	No	Hard
10	No	No	No	No	No	Off	0	Green	No	Hard

Preempt	Exit Timing Plan	Reservice	Free During Pmt Ring 1	Free During Pmt Ring 2	Free During Pmt Ring 3	Free During Pmt Ring 4
1	0	0	No	No	No	No
2	0	0	No	No	No	No
3	0	0	No	No	No	No
4	0	0	No	No	No	No
5	0	0	No	No	No	No
6	0	0	No	No	No	No
7	0	0	No	No	No	No
8	0	0	No	No	No	No
9	0	0	No	No	No	No
10	0	0	No	No	No	No

Preempt	Entrance Walk	Entrance Ped Clear	Entrance Min Green	Entrance Yellow	Entrance Red	Track Clear Min Green	Gate Down Ext Green	Gate Down Max Green	Track Clear Yellow	Track Clear Red
1	0	255	5	4.0	1.0	0	0	0	4.0	1.0
2	0	255	5	4.0	1.0	0	0	0	4.0	1.0
3	0	7	5	4.0	2.0	0	0	0	4.0	1.0
4	0	7	5	4.0	2.0	0	0	0	4.0	1.0
5	0	255	5	4.0	1.0	0	0	0	4.0	1.0
6	0	255	5	4.0	1.0	0	0	0	4.0	1.0
7	0	255	5	4.0	1.0	0	0	0	4.0	1.0
8	0	255	5	4.0	1.0	0	0	0	4.0	1.0
9	0	255	5	4.0	1.0	0	0	0	4.0	1.0



10	0	255	5	4.0	1.0	0	0	0	4.0	1.0
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Preempt	Min Dwell Time	Extend Preempt Input Time	Max Preempt Call Time	Exit Yellow Time	Exit Red Time	Preempt Active Out	Preempt Active Dwell	Other Priority Preempt	Non-Priority Preempt	Inhibit Ext Time
1	0	0.0	0	4.0	1.0	On	No	Off	Off	0.0
2	0	0.0	0	4.0	1.0	On	No	Off	Off	0.0
3	0	0.0	0	4.0	1.0	On	No	Off	Off	0.0
4	0	0.0	0	4.0	1.0	On	No	Off	Off	0.0
5	0	0.0	0	4.0	1.0	On	No	Off	Off	0.0
6	0	0.0	0	4.0	1.0	On	No	Off	Off	0.0
7	0	0.0	0	4.0	1.0	On	No	Off	Off	0.0
8	0	0.0	0	4.0	1.0	On	No	Off	Off	0.0
9	0	0.0	0	4.0	1.0	On	No	Off	Off	0.0
10	0	0.0	0	4.0	1.0	On	No	Off	Off	0.0

TRAFALGAR RD & CORNWALL RD Direct port 13 - Trafalgar & Cross

**Time Base Clock/Calendar**

**Clock/Calendar Options (MM)5-1**

Enable Action Plan: 0  
Sync Reference Time: 3:15 AM  
Sync Reference: Reference Time  
Day Light Savings: USDLS  
Time Reset Input Set Time: 3:30:00  
Standard Time From GMT: -5

## TRAFALGAR RD &amp; CORNWALL RD Direct port 13 - Trafalgar &amp; Cross

**Time Base Action Plan****Action Plan (MM)5-2**

Plan	Pattern	Veh Det Plan	Flash	Red Rest	Controller Seq	Timing Plan	Override System	Detector Log	Veh Det Diag Plan	Ped Det Diag Plan	Dimming Enable
1	1	1	No	No	0	0	Yes	None	0	0	No
2	2	0	No	No	0	0	Yes	None	0	0	No
3	3	0	No	No	0	0	Yes	None	0	0	No
4	4	0	No	No	0	0	Yes	None	0	0	No
5	5	0	No	No	0	0	Yes	None	0	0	No
6	254 - FREE	0	No	No	0	0	Yes	None	0	0	No
7	21	0	No	No	0	0	No	None	0	0	No
8	23	0	No	No	0	0	No	None	0	0	No
9	24	0	No	No	0	0	No	None	0	0	No

**Action Plan Phases**

Plan	Phase	Ped Rcl	Walk 2	Vex 2	Veh Rcl	Max Rcl	Max 2	Max 3	CS Inhibit	Omit
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**Action Plan Special Functions**

Plan	Function
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**Action Plan Auxiliary Functions**

Plan	Function
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**Logic Statement Control**

Plan	LP	Statement Control
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## TRAFALGAR RD &amp; CORNWALL RD Direct port 13 - Trafalgar &amp; Cross

**Time Base Day Plan/Schedule****Day Plan (MM)5-3**

Plan	Event	Action Plan	Start Time
1	1	1	6:00 AM
1	2	2	7:00 AM
1	3	1	9:00 AM
1	4	3	10:00 AM
1	5	4	3:15 PM
1	6	5	5:00 PM
1	7	3	7:00 PM
1	8	6	10:00 PM

**Schedule (MM)5-4**

Schedule Number	Day Plan Number	Months	Days of Week	Days of Month
1	1	Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sept, Oct, Nov, Dec	Sun, Mon, Tues, Wed, Thurs, Fri, Sat	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31
2	2	Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sept, Oct, Nov, Dec	Sun, Sat	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31

## TRAFALGAR RD &amp; CORNWALL RD Direct port 13 - Trafalgar &amp; Cross

**Detectors****Detectors Page 1****Vehicle Detectors Setup (MM)6-1**

Vehicle Plan	Detector Number	Called	Type
1	3	3	S
1	4	4	S
1	7	7	S
1	8	8	S
1	9	9	S
1	10	10	S
1	11	11	S
1	12	12	S
1	15	7	S
1	16	7	S
1	17	1	S
1	18	2	S
1	21	5	S
1	22	6	S
1	25	1	S
1	26	2	S
1	29	5	S
1	30	6	S

## Vehicle Detector Setup (MM)6-2 continued

Detector Number	ECPI	TS2 Detector	Detector Description
1	S-STANDARD	Yes	
2	S-STANDARD	Yes	
3	S-STANDARD	Yes	
4	S-STANDARD	Yes	
5	S-STANDARD	Yes	
6	S-STANDARD	Yes	
7	S-STANDARD	Yes	
8	S-STANDARD	Yes	
9	S-STANDARD	Yes	
10	S-STANDARD	Yes	
11	S-STANDARD	Yes	
12	S-STANDARD	Yes	
13	S-STANDARD	Yes	
14	S-STANDARD	Yes	
15	S-STANDARD	Yes	
16	S-STANDARD	Yes	
17	S-STANDARD	Yes	
18	S-STANDARD	Yes	
19	S-STANDARD	Yes	
20	S-STANDARD	Yes	
21	S-STANDARD	Yes	
22	S-STANDARD	Yes	
23	S-STANDARD	Yes	
24	S-STANDARD	Yes	
25	S-STANDARD	Yes	
26	S-STANDARD	Yes	
27	S-STANDARD	Yes	
28	S-STANDARD	Yes	
29	S-STANDARD	Yes	
30	S-STANDARD	Yes	
31	S-STANDARD	Yes	
32	S-STANDARD	Yes	
33	S-STANDARD	Yes	
34	S-STANDARD	Yes	
35	S-STANDARD	Yes	
36	S-STANDARD	Yes	
37	S-STANDARD	Yes	
38	S-STANDARD	Yes	
39	S-STANDARD	Yes	
40	S-STANDARD	Yes	
41	S-STANDARD	Yes	
42	S-STANDARD	Yes	
43	S-STANDARD	Yes	
44	S-STANDARD	Yes	
45	N-NTCIP	Yes	
46	N-NTCIP	Yes	
47	N-NTCIP	Yes	
48	N-NTCIP	Yes	
49	N-NTCIP	Yes	
50	N-NTCIP	Yes	
51	N-NTCIP	Yes	
52	N-NTCIP	Yes	
53	N-NTCIP	Yes	
54	N-NTCIP	Yes	
55	N-NTCIP	Yes	
56	N-NTCIP	Yes	
57	N-NTCIP	Yes	
58	N-NTCIP	Yes	
59	N-NTCIP	Yes	
60	N-NTCIP	Yes	
61	N-NTCIP	Yes	
62	N-NTCIP	Yes	
63	N-NTCIP	Yes	
64	N-NTCIP	Yes	

## Vehicle Detector Setup (MM)6-2 continued

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Detector Number	Vehicle Plan	Assigned Phase	Switch Phase	Extend Time/Passage Time	Delay Time	Queue Limit/Disconnect Time	Added Option	Call Option	NTCIP Occupancy	NTCIP Volume	ECPI Log	Lock In	Ext Option
1	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
1	2	1	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
1	3	1	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
1	4	1	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
2	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
2	2	2	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
2	3	2	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
2	4	2	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
3	1	3	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
3	2	3	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
3	3	3	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
3	4	3	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
4	1	4	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
4	2	4	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
4	3	4	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
4	4	4	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
5	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
5	2	5	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
5	3	5	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
5	4	5	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
6	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
6	2	6	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
6	3	6	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
6	4	6	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
7	1	7	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
7	2	7	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
7	3	7	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
7	4	7	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
8	1	8	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
8	2	8	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
8	3	8	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
8	4	8	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
9	1	9	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
9	2	9	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
9	3	9	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
9	4	9	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
10	1	10	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
10	2	10	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
10	3	10	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
10	4	10	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
11	1	11	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
11	2	11	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
11	3	11	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
11	4	11	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
12	1	12	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
12	2	12	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
12	3	12	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
12	4	12	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
13	1	13	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
13	2	13	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
13	3	13	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
13	4	13	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
14	1	14	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
14	2	14	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
14	3	14	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
14	4	14	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
15	1	7	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
15	2	15	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
15	3	15	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
15	4	15	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
16	1	7	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
16	2	16	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
16	3	16	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
16	4	16	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
17	1	1	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
17	2	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
17	3	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
17	4	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage





35	4	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
36	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
36	2	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
36	3	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
36	4	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
37	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
37	2	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
37	3	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
37	4	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
38	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
38	2	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
38	3	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
38	4	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
39	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
39	2	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
39	3	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
39	4	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
40	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
40	2	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
40	3	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
40	4	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
41	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
41	2	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
41	3	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
41	4	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
42	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
42	2	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
42	3	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
42	4	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
43	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
43	2	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
43	3	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
43	4	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
44	1	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
44	2	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
44	3	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage
44	4	0	0	0.0	0.0	0	No	Yes	No	No	No	None	Passage

### Ped Detector Options (MM)6-3

#### Phase Ped Detector (NTCIP)

Local Ped Detector	Number
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

#### Local System Detector

Local System Detector	Number
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## TRAFALGAR RD &amp; CORNWALL RD Direct port 13 - Trafalgar &amp; Cross

## Detectors

## Detectors Page 2

## Log - Speed Detector Setup (MM)6-5

NTCIP Log Period: 0    ECPI Log Period: TBAP    Length Unit: Inch

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap Length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

## Vehicle Detector Diagnostics (MM)6-6

Plan	Detector	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay
1	1	0	0	0	1	255	0
1	2	0	0	0	1	255	0
1	3	0	0	0	1	255	0
1	4	0	0	0	1	255	0
1	5	0	0	0	1	255	0
1	6	0	0	0	1	255	0
1	7	0	0	0	1	255	0
1	8	0	0	0	1	255	0
1	9	0	0	0	1	255	0
1	10	0	0	0	1	255	0
1	11	0	0	0	1	255	0
1	12	0	0	0	1	255	0
1	13	0	0	0	1	255	0
1	14	0	0	0	1	255	0
1	15	0	0	0	1	255	0
1	16	0	0	0	1	255	0
1	17	0	0	0	1	255	0
1	18	0	0	0	1	255	0
1	19	0	0	0	1	255	0
1	20	0	0	0	1	255	0
1	21	0	0	0	1	255	0
1	22	0	0	0	1	255	0
1	23	0	0	0	1	255	0
1	24	0	0	0	1	255	0
1	25	0	0	0	1	255	0
1	26	0	0	0	1	255	0
1	27	0	0	0	1	255	0
1	28	0	0	0	1	255	0
1	29	0	0	0	1	255	0
1	30	0	0	0	1	255	0
1	31	0	0	0	1	255	0
1	32	0	0	0	1	255	0

## Pedestrian Detector Diagnostics (MM)6-7

Plan	Detector	Counts	Act	Pres	Multiplier
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Date: 03-May-22

Intersection: Trafalgar & Cornwall

**8 Phase Basic Timing Sheet**

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	X	X	X	X	X	X	X	X	X	X	X	X
Direction	Prot SBL	NB	Prot EBL	WB	Prot NBL	SB	Prot WBL	EB				
Min Green	7	20	7	10	7	20	7	10				
Veh Ext.												
Yellow	3	4	3	4	3	4	3	4				
Red	2	3	2	3	2	3	2	3				
Walk		7		7		7		7				
Don't Walk		25		23		25		23				
Max 1	25	50	25	40	25	50	25	40				
Max 2	40	70	45	65	40	70	45	65				
Max 3												
Veh Recall												
Ped Recall												
<b>Notes:</b>												

<p><b>Pattern 1</b>  <b>Time:</b> 6:00-7:00, 9:00-10:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 37%</p> <table border="1"> <tbody> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>20</td> <td>33</td> <td>10</td> <td>37</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>10</td> <td>43</td> <td>16</td> <td>31</td> </tr> </tbody> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	20	33	10	37	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	10	43	16	31	<p><b>Pattern 2</b>  <b>Time:</b> 7:00-9:00  <b>Cycle Length:</b> 140  <b>Offset (%):</b> 41%</p> <table border="1"> <tbody> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>27</td> <td>29</td> <td>9</td> <td>35</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>9</td> <td>47</td> <td>16</td> <td>28</td> </tr> </tbody> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	27	29	9	35	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	9	47	16	28
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<b>%</b>	9	47	16	28																																																									
<p><b>Pattern 3</b>  <b>Time:</b> 10:00-15:15, 19:00-22:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 37%</p> <table border="1"> <tbody> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>22</td> <td>33</td> <td>10</td> <td>35</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>10</td> <td>45</td> <td>14</td> <td>31</td> </tr> </tbody> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	22	33	10	35	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	10	45	14	31	<p><b>Pattern 4</b>  <b>Time:</b> 15:15-17:00  <b>Cycle Length:</b> 120  <b>Offset (%):</b> 78%</p> <table border="1"> <tbody> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>20</td> <td>33</td> <td>10</td> <td>37</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>10</td> <td>43</td> <td>16</td> <td>31</td> </tr> </tbody> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	20	33	10	37	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	10	43	16	31
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<b>%</b>	10	43	16	31																																																									
<p><b>Pattern 5</b>  <b>Time:</b> 17:00-19:00  <b>Cycle Length:</b> 140  <b>Offset (%):</b> 70</p> <table border="1"> <tbody> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>24</td> <td>30</td> <td>10</td> <td>36</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>10</td> <td>44</td> <td>18</td> <td>28</td> </tr> </tbody> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	24	30	10	36	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	10	44	18	28	<p><b>Pattern 6</b>  <b>Time:</b> 22:00  <b>Cycle Length:</b> local  <b>Offset (%):</b></p> <table border="1"> <tbody> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	0	0	0	0	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	0	0	0	0
<b>Direction</b>																																																													
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<b>%</b>	0	0	0	0																																																									
<p><b>Pattern 7</b>  <b>Time:</b>  <b>Cycle Length:</b>  <b>Offset (%):</b></p> <table border="1"> <tbody> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>					<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>					<p><b>Pattern 8</b>  <b>Time:</b> 7:15  <b>Cycle Length:</b> 140  <b>Offset (%):</b> 41%</p> <table border="1"> <tbody> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>1</b></td> <td><b>2</b></td> <td><b>3</b></td> <td><b>4</b></td> </tr> <tr> <td><b>%</b></td> <td>27</td> <td>29</td> <td>9</td> <td>35</td> </tr> <tr> <td><b>Direction</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Phase</b></td> <td><b>5</b></td> <td><b>6</b></td> <td><b>7</b></td> <td><b>8</b></td> </tr> <tr> <td><b>%</b></td> <td>9</td> <td>47</td> <td>16</td> <td>28</td> </tr> </tbody> </table>	<b>Direction</b>					<b>Phase</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>%</b>	27	29	9	35	<b>Direction</b>					<b>Phase</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>%</b>	9	47	16	28
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Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

Configuration Phase Sequence Page 1

Phase Ring (MM)1-1-1

Phase															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1	1	1	2	2	2	2	1	1	2	2	1	1	2	2

Hardware Alternate Sequence Enable: No

Phase Ring Sequence

Sequence	Ring	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Barrier Mode	B		B		B		B		B							
1	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
1	2	5	6	7	8	11	12	15	16	0	0	0	0	0	0	0	0
2	1	2	1	3	4	10	9	13	14	0	0	0	0	0	0	0	0
2	2	5	6	7	8	11	12	15	16	0	0	0	0	0	0	0	0
3	1	1	2	4	3	9	10	14	13	0	0	0	0	0	0	0	0
3	2	5	6	7	8	11	12	15	16	0	0	0	0	0	0	0	0
4	1	2	1	4	3	10	9	14	13	0	0	0	0	0	0	0	0
4	2	5	6	7	8	11	12	15	16	0	0	0	0	0	0	0	0
5	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
5	2	6	5	7	8	12	11	15	16	0	0	0	0	0	0	0	0
6	1	2	1	3	4	10	9	13	14	0	0	0	0	0	0	0	0
6	2	6	5	7	8	12	11	15	16	0	0	0	0	0	0	0	0
7	1	1	2	4	3	9	10	14	13	0	0	0	0	0	0	0	0
7	2	6	5	7	8	12	11	15	16	0	0	0	0	0	0	0	0
8	1	2	1	4	3	10	9	14	13	0	0	0	0	0	0	0	0
8	2	6	5	7	8	12	11	15	16	0	0	0	0	0	0	0	0
9	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
9	2	5	6	8	7	11	12	16	15	0	0	0	0	0	0	0	0
10	1	2	1	3	4	10	9	13	14	0	0	0	0	0	0	0	0
10	2	5	6	8	7	11	12	16	15	0	0	0	0	0	0	0	0
11	1	1	2	4	3	9	10	14	13	0	0	0	0	0	0	0	0
11	2	5	6	8	7	11	12	16	15	0	0	0	0	0	0	0	0
12	1	2	1	4	3	10	9	14	13	0	0	0	0	0	0	0	0
12	2	5	6	8	7	11	12	16	15	0	0	0	0	0	0	0	0
13	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
13	2	6	5	8	7	12	11	16	15	0	0	0	0	0	0	0	0
14	1	2	1	3	4	10	9	13	14	0	0	0	0	0	0	0	0
14	2	6	5	8	7	12	11	16	15	0	0	0	0	0	0	0	0
15	1	1	2	4	3	9	10	14	13	0	0	0	0	0	0	0	0
15	2	6	5	8	7	12	11	16	15	0	0	0	0	0	0	0	0
16	1	2	1	4	3	10	9	14	13	0	0	0	0	0	0	0	0
16	2	6	5	8	7	12	11	16	15	0	0	0	0	0	0	0	0

**Phase  
Compatibility  
(MM)1-1-2**

Phase 1	Phase 2
1	5
1	6
2	5
2	6
3	7
3	8
4	7
4	8
9	11
9	12
10	11
10	12
13	15
13	16
14	15
14	16

**Phase Direction  
Descriptions**

Phase	Description
1	WBLT
2	EB
4	SB
6	WB
8	NB

**Overlap Direction  
Descriptions**

Overlap	Description
---------	-------------

**Administration (MM)1-7-1**

Enable CRC Check: No

CRC: 0000

Request Download Program Data: No

Enable Automatic Backup to Datakey: Yes

## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

## Configuration Phase Sequence Page 2

In Use(MM)1-2		Exclusive Ped(MM)1-2		Backup Prevent(MM)1-1-3			Simultaneous Gap(MM)1-1-4		Disable(MM)1-1-4
Phases In Use	Phase	Phase	Timing Phase	Backup	Phase	Must Gap with Phase	Phase		
1		1	2	Yes					
2		3	4	Yes					
4		5	6	Yes					
6		7	8	Yes					
8									

## Load Switch Assignments (MMU Channel) (MM)1-3

Phase	Overlap	Type	Dim				Auto		Flash Together
			R	Y	G	D	R	Y	
1	1	V				+	Yes		
2	2	V				+	Yes		Yes
3	3	V				+	Yes		
4	4	V				+	Yes		Yes
5	5	V				-	Yes		
6	6	V				-	Yes		Yes
7	7	V				-	Yes		
8	8	V				-	Yes		Yes
9	2	P				+			
10	4	P				+			
11	6	P				-			
12	8	P				-			
13	1	O				+	Yes		
14	2	O				-	Yes		Yes
15	3	O				+	Yes		
16	4	O				-	Yes		Yes

## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

**Configuration Port 1 (SDLC)****SDLC Options (MM)1-4-1****Bus Interface Terminal/Facilities**

BIU	Term and Facility Enable	Detector Rack Enable
1	Yes	Yes
2	Yes	Yes
3	No	No
4	No	No
5	No	No
6	No	No
7	No	No
8	No	No

Enable TS2/MMU Type Cabinet: No  
 Enable MMU Extended Status: Yes  
 Enable SDLC Stop Time: No  
 Enable 3 Critical RFE's Lockup: Yes  
 MMU To CU SDLC External Start: Enabled  
 Diagnostics (Test Fixture) Enable: No

**Secondary To Secondary Addressing**

ID	Term and Facility Enable	Detector Rack Enable
1	No	No
2	No	No
3	No	No
4	No	No
5	No	No
6	No	No
7	No	No
8	No	No

Secondary To Secondary Addressing MMU: No  
 Secondary To Secondary Addressing Diagnostics: No

**MMU Program (MM)1-4-2**

Channel Can Serve with Channel	
Channel 1	Channel 2
1	5
1	6
1	11
2	5
2	6
2	9
2	11
3	7
3	8
3	12
4	7
4	8
4	10
4	12
5	9
6	9
6	11



7	10
8	10
8	12
9	11
10	12

**Color Check Enable (MM)1-4-3**

Enable Color Check: Yes

**Color Check Enable**

MMU Channel	Green	Yellow	Red
1	Yes	Yes	No
2	Yes	Yes	Yes
4	Yes	Yes	Yes
6	Yes	Yes	Yes
8	Yes	Yes	Yes
9	Yes	No	Yes
10	Yes	No	Yes
11	Yes	No	Yes
12	Yes	No	Yes

## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

**Controller Timing Plan (MM)2-1  
Plan 1**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Green	8	22	5	10	5	22	5	10	5	5	5	5	5	5	5	5
BK Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	7	0	7	0	7	0	10	0	10	0	10	0	10
Walk 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	2.5	5.0	0.0	4.0	0.0	5.0	0.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max 1	12	45	0	30	0	45	0	30	35	35	35	35	35	35	35	35
Max 2	0	0	0	0	0	0	0	0	40	40	40	40	40	40	40	40
Max 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Stp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	4.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ACT B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPT Duc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

**Controller Start/Fash (MM) 2-5****Startup**

Phase	Phase Setting
2	Y
6	Y

**Overlap**

Flash > Mon: Yes  
Flash Time: 0  
All Red: 9  
Power Start Sequence: 1

**Automatic Flash**

Entry Phase
2
6

Exit Phase
2
6

Overlap Exit
A
B
C
D

Flash > Mon: Yes  
Exit Flash Interval: W  
Minimum Auto Flash: 8  
Minimum Recall: No  
Cycle Through Phase: No

## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

**Controller Options****Controller Options (MM)2-6-1**

Phase	Flashing Green Phase	Guaranteed Passage	Non Act 1	Non Act 2	Dual Entry	Conditional Service	Conditional Reservice	Ped Reservice	Rest In Walk	Flashing Walk	Ped Clear Yellow	Ped Clear Red	IGRN + Veh Ext
2	No	No	Yes	No	Yes	No	No	Yes	No	No	No	No	No
4	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No
6	No	No	Yes	No	Yes	No	No	Yes	No	No	No	No	No
8	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No

Ped Clear Protect: Off

Red Revert: 2.0

**Act Pre-Time (MM)2-7**

Pre-Time Mode Enable: No

Free Input Enables Pre-Timed: Yes

Pre-Timed Phase
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## Phase Recall Options (MM)2-8

Plan	Phase	Lock Detector	Vehicle Recall	Ped Recall	Max Recall	Soft Recall	No Rest	AI Calc
1	2	No	Yes	No	No	No	No	No
1	4	No	Yes	No	No	No	No	No
1	6	No	Yes	No	No	No	No	No
1	8	No	Yes	No	No	No	No	No
2	1	Yes	No	No	No	No	No	No
2	2	Yes	No	No	No	No	No	No
2	3	Yes	No	No	No	No	No	No
2	4	Yes	No	No	No	No	No	No
2	5	Yes	No	No	No	No	No	No
2	6	Yes	No	No	No	No	No	No
2	7	Yes	No	No	No	No	No	No
2	8	Yes	No	No	No	No	No	No
2	9	Yes	No	No	No	No	No	No
2	10	Yes	No	No	No	No	No	No
2	11	Yes	No	No	No	No	No	No
2	12	Yes	No	No	No	No	No	No
2	13	Yes	No	No	No	No	No	No
2	14	Yes	No	No	No	No	No	No
2	15	Yes	No	No	No	No	No	No
2	16	Yes	No	No	No	No	No	No
3	1	Yes	No	No	No	No	No	No
3	2	Yes	No	No	No	No	No	No
3	3	Yes	No	No	No	No	No	No
3	4	Yes	No	No	No	No	No	No
3	5	Yes	No	No	No	No	No	No
3	6	Yes	No	No	No	No	No	No
3	7	Yes	No	No	No	No	No	No
3	8	Yes	No	No	No	No	No	No
3	9	Yes	No	No	No	No	No	No
3	10	Yes	No	No	No	No	No	No
3	11	Yes	No	No	No	No	No	No
3	12	Yes	No	No	No	No	No	No
3	13	Yes	No	No	No	No	No	No
3	14	Yes	No	No	No	No	No	No
3	15	Yes	No	No	No	No	No	No
3	16	Yes	No	No	No	No	No	No
4	1	Yes	No	No	No	No	No	No
4	2	Yes	No	No	No	No	No	No
4	3	Yes	No	No	No	No	No	No
4	4	Yes	No	No	No	No	No	No
4	5	Yes	No	No	No	No	No	No
4	6	Yes	No	No	No	No	No	No
4	7	Yes	No	No	No	No	No	No
4	8	Yes	No	No	No	No	No	No
4	9	Yes	No	No	No	No	No	No
4	10	Yes	No	No	No	No	No	No
4	11	Yes	No	No	No	No	No	No
4	12	Yes	No	No	No	No	No	No
4	13	Yes	No	No	No	No	No	No
4	14	Yes	No	No	No	No	No	No
4	15	Yes	No	No	No	No	No	No
4	16	Yes	No	No	No	No	No	No

## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

**Coordination Options****Coordination Options (MM)3-1**

Manual Pattern: Auto  
 ECPI Coord: Yes  
 System Source: TBC  
 System Format: STD  
 Splits In: Seconds  
 Offsets In: Seconds  
 Transition: Smooth  
 Max Select: MAXINH  
 Dwell/Add Time: 0  
 Dly Coord Wz-Lz: No  
 Force Off: Float  
 Offset Reference: Lead  
 Use Ped Time: Yes  
 Ped Recall: No  
 Ped Resv: No  
 Local Zero Ovrd: No  
 Fo Add Ini Green: No  
 Re-sync Count: 0  
 Multisync: No

**Split Demand (MM)3-5****Demand 1 Demand 2**

Phase	Phase
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Demand	Detector	Call Time	Cycle Count
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**Auto Perm Minimum Green (Seconds) (MM)3-4**

Phase	Min Green
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Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

**Coordination Pattern Data**  
**Pattern Data (MM)3-2**

Pattern	Split Pattern	TS2	Cycle	Std(COS)	Offset Value	Splits In	Offsets In	Actuated Coord
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Pattern	Timing Plan	Actuated Walk Rest	Sequence	Phase Reservice	Action Plan	XArt Pattern	Vehicle Perm 1	Vehicle Perm 2	Vehicle Perm 3
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Pattern	Ring Split Ext 1	Ring Split Ext 2	Ring Split Ext 3	Ring Split Ext 4	Split Demand Pattern 1	Split Demand Pattern 2	Ring Displ 2	Ring Displ 3	Ring Displ 4
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**Split Preference Phases**

Pattern	Phase	Preference 1	Preference 2
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**Special Functions**

Pattern	Function	Output
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**Split Pattern Data (MM)3-3**  
**Coord Phases**

Split Pattern	Phase	Split
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**Split/Modes**

Split Pattern	Mode	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16



## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

## Preemptor Preempt Plan (MM)4-1

## Preempt Phases

Preempt	Phase	Track Clear Veh	Dwell Veh	Dwell Ped	Cycling Veh	Cycling Ped	Exit Phase	Exit Calls	Special Function
3	2	No	Yes	No	No	No	Yes	No	No
3	6	No	Yes	No	No	No	Yes	No	No
5	2	No	Yes	No	No	No	Yes	No	No
5	6	No	Yes	No	No	No	Yes	No	No
6	2	No	Yes	No	No	No	Yes	No	No
6	6	No	Yes	No	No	No	Yes	No	No

## Preempt Overlaps

Preempt	Overlap	Track Clear	Enable Trailing	Dwell Overlap	Cycling Overlap
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Preempt	Enable	Preempt Override	Interlock Enable	Detector Lock	Delay	Inhibit	Override Flash	Duration	CLR > GRN
1	No	Yes	No	Yes	0	0	Yes	0	No
2	No	Yes	No	Yes	0	0	Yes	0	No
3	Standard	Yes	No	Yes	0	0	Yes	10	No
4	No	Yes	No	Yes	0	0	Yes	0	No
5	No	Yes	No	Yes	0	0	Yes	10	No
6	No	Yes	No	Yes	0	0	Yes	10	No
7	No	Yes	No	Yes	0	0	Yes	0	No
8	No	Yes	No	Yes	0	0	Yes	0	No
9	No	Yes	No	Yes	0	0	Yes	0	No
10	No	Yes	No	Yes	0	0	Yes	0	No

Preempt	Term Overlap Asap	PC Through Yellow	Terminate Phase	Ped Dark	Track Clearance Re-service	Dwell Flash	Linked Pmt	Flash Exit Color	Preempt To Coord	Fault Type
1	No	No	No	No	No	Off	0	Red	No	Hard
2	No	No	No	No	No	Off	0	Green	No	Hard
3	No	Yes	No	No	No	Off	0	Green	No	Hard
4	No	No	No	No	No	Off	0	Green	No	Hard
5	No	Yes	No	No	No	Off	0	Green	No	Hard
6	No	Yes	No	No	No	Off	0	Green	No	Hard
7	No	No	No	No	No	Off	0	Green	No	Hard
8	No	No	No	No	No	Off	0	Green	No	Hard
9	No	No	No	No	No	Off	0	Green	No	Hard
10	No	No	No	No	No	Off	0	Green	No	Hard

Preempt	Exit Timing Plan	Reservice	Free During Pmt Ring 1	Free During Pmt Ring 2	Free During Pmt Ring 3	Free During Pmt Ring 4
1	0	0	No	No	No	No
2	0	0	No	No	No	No
3	0	0	No	No	No	No
4	0	0	No	No	No	No
5	0	0	No	No	No	No
6	0	0	No	No	No	No
7	0	0	No	No	No	No
8	0	0	No	No	No	No
9	0	0	No	No	No	No
10	0	0	No	No	No	No

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Preempt	Entrance Walk	Entrance Ped Clear	Entrance Min Green	Entrance Yellow	Entrance Red	Track Clear Min Green	Gate Down Ext Green	Gate Down Max Green	Track Clear Yellow	Track Clear Red
1	0	255	5	4.0	1.0	0	0	0	4.0	1.0
2	0	255	5	4.0	1.0	0	0	0	4.0	1.0
3	0	7	3	4.0	2.0	0	0	0	4.0	1.0
4	0	255	5	4.0	1.0	0	0	0	4.0	1.0
5	0	7	3	4.0	1.0	0	0	0	4.0	1.0
6	0	7	3	4.0	1.0	0	0	0	4.0	1.0
7	0	255	5	4.0	1.0	0	0	0	4.0	1.0
8	0	255	5	4.0	1.0	0	0	0	4.0	1.0
9	0	255	5	4.0	1.0	0	0	0	4.0	1.0
10	0	255	5	4.0	1.0	0	0	0	4.0	1.0

Preempt	Min Dwell Time	Extend Preempt Input Time	Max Preempt Call Time	Exit Yellow Time	Exit Red Time	Preempt Active Out	Preempt Active Dwell	Other Priority Preempt	Non-Priority Preempt
1	0	0.0	0	4.0	1.0	On	No	Off	Off
2	0	0.0	0	4.0	1.0	On	No	Off	Off
3	0	0.0	0	4.0	1.0	On	No	Off	Off
4	0	0.0	0	4.0	1.0	On	No	Off	Off
5	0	0.0	0	4.0	1.0	On	No	Off	Off
6	0	0.0	0	4.0	1.0	On	No	Off	Off
7	0	0.0	0	4.0	1.0	On	No	Off	Off
8	0	0.0	0	4.0	1.0	On	No	Off	Off
9	0	0.0	0	4.0	1.0	On	No	Off	Off
10	0	0.0	0	4.0	1.0	On	No	Off	Off

Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

**Preemptor Preempt Filtering**  
**Enable Preempt Filtering and TSP/SCP**  
**(MM)4-2**

<b>Input</b>	<b>Solid</b>	<b>Pulsing</b>
3	Preemption -3	Preemption -7
4	Preemption -4	Preemption -8
5	Preemption -5	Preemption -9
6	Preemption -6	Preemption -10

Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

**Time Base Clock/Calendar**  
**Clock/Calendar Options (MM)5-1**

Enable Action Plan: 0  
Sync Reference Time: 3:15 AM  
Sync Reference: Reference Time  
Day Light Savings: USDLS  
Time Reset Input Set Time: 3:30:00  
Standard Time From GMT: -5

## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

**Time Base Action Plan****Action Plan (MM)5-2**

Plan	Pattern	Veh Det Plan	Flash	Red Rest	Controller Seq	Timing Plan	System Override	Detector Log	Veh Det Diag Plan	Ped Det Diag Plan	Dimming Enable
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**Action Plan Phases**

Plan	Phase	Ped Rcl	Walk 2	Vex 2	Veh Rcl	Max Rcl	Max 2	Max 3	CS Inhibit	Omit
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**Action Plan Special Functions**

Plan	Function
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**Action Plan Auxiliary Functions**

Plan	Function
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**Logic Statement Control**

Plan	LP	Statement Control
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Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

**Time Base Day Plan/Schedule**

**Day Plan (MM)5-3**

Plan	Event	Action Plan	Start Time
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**Schedule (MM)5-4**

Schedule Number	Day Plan Number	Months	Days of Week	Days of Month
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Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

**Detectors**

**Detectors Page 1**

**Vehicle Detectors Setup (MM)6-1**

Vehicle Plan	Detector Number	Called
1	8	4

## Vehicle Detector Setup (MM)6-2 continued

Detector Number	ECPI	TS2 Detector	Detector Description
1	6	Yes	
2	6	Yes	
3	6	Yes	
4	6	Yes	
5	6	Yes	
6	6	Yes	
7	6	Yes	
8	6	Yes	
9	6	Yes	
10	6	Yes	
11	6	Yes	
12	6	Yes	
13	6	Yes	
14	6	Yes	
15	6	Yes	
16	6	Yes	
18	6	Yes	
19	6	Yes	
21	6	Yes	
22	6	Yes	
23	6	Yes	
25	6	Yes	
26	6	Yes	
27	6	Yes	
28	6	Yes	
29	6	Yes	
30	6	Yes	
31	6	Yes	
32	6	Yes	
33	6	Yes	
34	6	Yes	
35	6	Yes	
36	6	Yes	
37	6	Yes	
38	6	Yes	
39	6	Yes	
40	6	Yes	
41	6	Yes	
42	6	Yes	
43	6	Yes	
44	6	Yes	
45	6	Yes	
46	6	Yes	
47	6	Yes	
48	6	Yes	
49	6	Yes	
50	6	Yes	
51	6	Yes	
52	6	Yes	
53	6	Yes	
54	6	Yes	
55	6	Yes	
56	6	Yes	
57	6	Yes	
58	6	Yes	
59	6	Yes	
60	6	Yes	
61	6	Yes	
62	6	Yes	
63	6	Yes	



64	6	Yes	
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### Vehicle Detector Setup (MM)6-2 continued

Detector Number	Vehicle Plan	Assigned Phase	Switch Phase	Extend Time	Delay Time	Queue Limit	Yellow Lock	Added Option	Call Option	Passage Option	Queue Option	NTCIP Occupancy	NTCIP Volume
2	1	2	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
4	1	4	0	0.0	4.0	0	No	No	Yes	Yes	No	No	No
5	1	5	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
6	1	6	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
7	1	4	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
9	1	9	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
10	1	10	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
11	1	11	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
12	1	12	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
13	1	13	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
14	1	14	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
15	1	15	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
16	1	16	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
17	1	1	6	0.0	0.0	0	No	No	Yes	Yes	No	No	No
24	1	8	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No

### Ped Detector Options (MM)6-3

#### Phase Ped Detector (NTCIP)

Local Ped Detector	Number
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

#### Local System Detector

Local System Detector	Number
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## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Argus Rd

## Detectors

## Detectors Page 2

## Log - Speed Detector Setup (MM)6-5

NTCIP Log Period: 0 ECPI Log Period: TBAP Length Unit: Inch

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap Length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

## Vehicle Detector Diagnostics (MM)6-6

Plan	Detector	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay
1	1	0	0	0	1	255	0
1	2	0	0	0	1	255	0
1	3	0	0	0	1	255	0
1	4	0	0	0	1	255	0
1	5	0	0	0	1	255	0
1	6	0	0	0	1	255	0
1	7	0	0	0	1	255	0
1	8	0	0	0	1	255	0
1	9	0	0	0	1	255	0
1	10	0	0	0	1	255	0
1	11	0	0	0	1	255	0
1	12	0	0	0	1	255	0
1	13	0	0	0	1	255	0
1	14	0	0	0	1	255	0
1	15	0	0	0	1	255	0
1	16	0	0	0	1	255	0
1	17	0	0	0	1	255	0
1	18	0	0	0	1	255	0
1	19	0	0	0	1	255	0
1	20	0	0	0	1	255	0
1	21	0	0	0	1	255	0
1	22	0	0	0	1	255	0
1	23	0	0	0	1	255	0
1	24	0	0	0	1	255	0
1	25	0	0	0	1	255	0
1	26	0	0	0	1	255	0
1	27	0	0	0	1	255	0
1	28	0	0	0	1	255	0
1	29	0	0	0	1	255	0

1	30	0	0	0	1	255	0
1	31	0	0	0	1	255	0
1	32	0	0	0	1	255	0
1	33	0	0	0	1	255	0
1	34	0	0	0	1	255	0
1	35	0	0	0	1	255	0
1	36	0	0	0	1	255	0
1	37	0	0	0	1	255	0
1	38	0	0	0	1	255	0
1	39	0	0	0	1	255	0
1	40	0	0	0	1	255	0
1	41	0	0	0	1	255	0
1	42	0	0	0	1	255	0
1	43	0	0	0	1	255	0
1	44	0	0	0	1	255	0
1	45	0	0	0	1	255	0
1	46	0	0	0	1	255	0
1	47	0	0	0	1	255	0
1	48	0	0	0	1	255	0
1	49	0	0	0	1	255	0
1	50	0	0	0	1	255	0
1	51	0	0	0	1	255	0
1	52	0	0	0	1	255	0
1	53	0	0	0	1	255	0
1	54	0	0	0	1	255	0
1	55	0	0	0	1	255	0
1	56	0	0	0	1	255	0
1	57	0	0	0	1	255	0
1	58	0	0	0	1	255	0
1	59	0	0	0	1	255	0
1	60	0	0	0	1	255	0
1	61	0	0	0	1	255	0
1	62	0	0	0	1	255	0
1	63	0	0	0	1	255	0
1	64	0	0	0	1	255	0

**Pedestrian Detector Diagnostics (MM)6-7**

Plan	Detector	Counts	Act	Pres	Multiplier
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Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

Configuration Phase Sequence Page 1

Phase Ring (MM)1-1-1

Phase															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1	1	1	2	2	2	2	1	1	2	2	1	1	2	2

Hardware Alternate Sequence Enable: No

Phase Ring Sequence

Sequence	Ring	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Barrier Mode	B		B		B		B		B		B		B		B	
1	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
1	2	5	6	7	8	11	12	15	16	0	0	0	0	0	0	0	0
2	1	2	1	3	4	10	9	13	14	0	0	0	0	0	0	0	0
2	2	5	6	7	8	11	12	15	16	0	0	0	0	0	0	0	0
3	1	1	2	4	3	9	10	14	13	0	0	0	0	0	0	0	0
3	2	5	6	7	8	11	12	15	16	0	0	0	0	0	0	0	0
4	1	2	1	4	3	10	9	14	13	0	0	0	0	0	0	0	0
4	2	5	6	7	8	11	12	15	16	0	0	0	0	0	0	0	0
5	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
5	2	6	5	7	8	12	11	15	16	0	0	0	0	0	0	0	0
6	1	2	1	3	4	10	9	13	14	0	0	0	0	0	0	0	0
6	2	6	5	7	8	12	11	15	16	0	0	0	0	0	0	0	0
7	1	1	2	4	3	9	10	14	13	0	0	0	0	0	0	0	0
7	2	6	5	7	8	12	11	15	16	0	0	0	0	0	0	0	0
8	1	2	1	4	3	10	9	14	13	0	0	0	0	0	0	0	0
8	2	6	5	7	8	12	11	15	16	0	0	0	0	0	0	0	0
9	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
9	2	5	6	8	7	11	12	16	15	0	0	0	0	0	0	0	0
10	1	2	1	3	4	10	9	13	14	0	0	0	0	0	0	0	0
10	2	5	6	8	7	11	12	16	15	0	0	0	0	0	0	0	0
11	1	1	2	4	3	9	10	14	13	0	0	0	0	0	0	0	0
11	2	5	6	8	7	11	12	16	15	0	0	0	0	0	0	0	0
12	1	2	1	4	3	10	9	14	13	0	0	0	0	0	0	0	0
12	2	5	6	8	7	11	12	16	15	0	0	0	0	0	0	0	0
13	1	1	2	3	4	9	10	13	14	0	0	0	0	0	0	0	0
13	2	6	5	8	7	12	11	16	15	0	0	0	0	0	0	0	0
14	1	2	1	3	4	10	9	13	14	0	0	0	0	0	0	0	0
14	2	6	5	8	7	12	11	16	15	0	0	0	0	0	0	0	0
15	1	1	2	4	3	9	10	14	13	0	0	0	0	0	0	0	0
15	2	6	5	8	7	12	11	16	15	0	0	0	0	0	0	0	0
16	1	2	1	4	3	10	9	14	13	0	0	0	0	0	0	0	0
16	2	6	5	8	7	12	11	16	15	0	0	0	0	0	0	0	0

**Phase  
Compatibility  
(MM)1-1-2**

Phase 1	Phase 2
1	5
1	6
2	5
2	6
3	7
3	8
4	7
4	8
9	11
9	12
10	11
10	12
13	15
13	16
14	15
14	16

**Phase Direction  
Descriptions**

Phase	Description
1	WBLT
2	EB
4	SB
6	WB
8	NB

**Overlap Direction  
Descriptions**

Overlap	Description
---------	-------------

**Administration (MM)1-7-1**

Enable CRC Check: No

CRC: 0000

Request Download Program Data: No

Enable Automatic Backup to Datakey: Yes

Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

Configuration Phase Sequence Page 2

In Use(MM)1-2		Exclusive Ped(MM)1-2		Backup Prevent(MM)1-1-3			Simultaneous Gap(MM)1-1-4		Disable(MM)1-1-4
Phases In Use	Phase	Phase	Timing Phase	Backup	Phase	Must Gap with Phase	Phase		
1		1	2	Yes					
2		5	6	Yes					
4									
6									
8									

Load Switch Assignments (MMU Channel) (MM)1-3

Phase	Overlap	Type	Dim				Auto		Flash Together
			R	Y	G	D	R	Y	
1	1	V				+	Yes		
2	2	V				+	Yes		Yes
3	3	V				+	Yes		
4	4	V				+	Yes		Yes
5	5	V				-	Yes		
6	6	V				-	Yes		Yes
7	7	V				-	Yes		
8	8	V				-	Yes		Yes
9	2	P				+			
10	4	P				+			
11	6	P				-			
12	8	P				-			
13	1	O				+	Yes		
14	2	O				-	Yes		Yes
15	3	O				+	Yes		
16	4	O				-	Yes		Yes

## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

**Configuration Port 1 (SDLC)****SDLC Options (MM)1-4-1****Bus Interface Terminal/Facilities**

BIU	Term and Facility Enable	Detector Rack Enable
1	Yes	Yes
2	Yes	No
3	No	No
4	No	No
5	No	No
6	No	No
7	No	No
8	No	No

Enable TS2/MMU Type Cabinet: No  
 Enable MMU Extended Status: Yes  
 Enable SDLC Stop Time: No  
 Enable 3 Critical RFE's Lockup: Yes  
 MMU To CU SDLC External Start: Enabled  
 Diagnostics (Test Fixture) Enable: No

**Secondary To Secondary Addressing**

ID	Term and Facility Enable	Detector Rack Enable
1	No	No
2	No	No
3	No	No
4	No	No
5	No	No
6	No	No
7	No	No
8	No	No

Secondary To Secondary Addressing MMU: No  
 Secondary To Secondary Addressing Diagnostics: No

**MMU Program (MM)1-4-2**

Channel Can Serve with Channel	
Channel 1	Channel 2
1	5
1	6
1	11
2	5
2	6
2	9
2	11
3	7
3	8
3	12
4	7
4	8
4	10
4	12
5	9
6	9
6	11

7	10
8	10
8	12
9	11
10	12

**Color Check Enable (MM)1-4-3**

Enable Color Check: Yes

**Color Check Enable**

MMU Channel	Green	Yellow	Red
1	Yes	Yes	No
2	Yes	Yes	Yes
4	Yes	Yes	Yes
6	Yes	Yes	Yes
8	Yes	Yes	Yes



## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

**Controller Timing Plan (MM)2-1  
Plan 1**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Green	8	35	5	10	5	35	5	10	5	5	5	5	5	5	5	5
BK Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	7	0	7	0	7	0	10	0	10	0	10	0	10
Walk 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	15	0	15	0	15	0	15	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	2.5	5.0	0.0	4.0	0.0	5.0	0.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max 1	10	45	0	35	0	45	0	35	35	35	35	35	35	35	35	35
Max 2	0	0	0	0	0	0	0	0	40	40	40	40	40	40	40	40
Max 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Stp	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ACT B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPT Duc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

**Controller Start/Fash (MM) 2-5****Startup**

Phase	Phase Setting
2	Y
6	Y

Overlap
A
B
C
D

Flash > Mon: No  
Flash Time: 0  
All Red: 0  
Power Start Sequence: 1

**Automatic Flash**

Entry Phase
2
6

Exit Phase
2
6

Overlap Exit
A
B
C
D

Flash > Mon: No  
Exit Flash Interval: W  
Minimum Auto Flash: 8  
Minimum Recall: No  
Cycle Through Phase: No

## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

**Controller Options****Controller Options (MM)2-6-1**

Phase	Flashing Green Phase	Guaranteed Passage	Non Act 1	Non Act 2	Dual Entry	Conditional Service	Conditional Reservice	Ped Reservice	Rest In Walk	Flashing Walk	Ped Clear Yellow	Ped Clear Red	IGRN + Veh Ext
2	No	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
4	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No
6	No	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
8	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No

Ped Clear Protect: Off

Red Revert: 2.0

**Act Pre-Time (MM)2-7**

Pre-Time Mode Enable: No

Free Input Enables Pre-Timed: Yes

Pre-Timed Phase
-----------------

## Phase Recall Options (MM)2-8

Plan	Phase	Lock Detector	Vehicle Recall	Ped Recall	Max Recall	Soft Recall	No Rest	AI Calc
1	2	No	Yes	Yes	No	No	No	No
1	6	No	Yes	Yes	No	No	No	No
1	13	Yes	No	No	No	No	No	No
1	14	Yes	No	No	No	No	No	No
1	15	Yes	No	No	No	No	No	No
1	16	Yes	No	No	No	No	No	No
2	1	Yes	No	No	No	No	No	No
2	2	Yes	No	No	No	No	No	No
2	3	Yes	No	No	No	No	No	No
2	4	Yes	No	No	No	No	No	No
2	5	Yes	No	No	No	No	No	No
2	6	Yes	No	No	No	No	No	No
2	7	Yes	No	No	No	No	No	No
2	8	Yes	No	No	No	No	No	No
2	9	Yes	No	No	No	No	No	No
2	10	Yes	No	No	No	No	No	No
2	11	Yes	No	No	No	No	No	No
2	12	Yes	No	No	No	No	No	No
2	13	Yes	No	No	No	No	No	No
2	14	Yes	No	No	No	No	No	No
2	15	Yes	No	No	No	No	No	No
2	16	Yes	No	No	No	No	No	No
3	1	Yes	No	No	No	No	No	No
3	2	Yes	No	No	No	No	No	No
3	3	Yes	No	No	No	No	No	No
3	4	Yes	No	No	No	No	No	No
3	5	Yes	No	No	No	No	No	No
3	6	Yes	No	No	No	No	No	No
3	7	Yes	No	No	No	No	No	No
3	8	Yes	No	No	No	No	No	No
3	9	Yes	No	No	No	No	No	No
3	10	Yes	No	No	No	No	No	No
3	11	Yes	No	No	No	No	No	No
3	12	Yes	No	No	No	No	No	No
3	13	Yes	No	No	No	No	No	No
3	14	Yes	No	No	No	No	No	No
3	15	Yes	No	No	No	No	No	No
3	16	Yes	No	No	No	No	No	No
4	1	Yes	No	No	No	No	No	No
4	2	Yes	No	No	No	No	No	No
4	3	Yes	No	No	No	No	No	No
4	4	Yes	No	No	No	No	No	No
4	5	Yes	No	No	No	No	No	No
4	6	Yes	No	No	No	No	No	No
4	7	Yes	No	No	No	No	No	No
4	8	Yes	No	No	No	No	No	No
4	9	Yes	No	No	No	No	No	No
4	10	Yes	No	No	No	No	No	No
4	11	Yes	No	No	No	No	No	No
4	12	Yes	No	No	No	No	No	No
4	13	Yes	No	No	No	No	No	No
4	14	Yes	No	No	No	No	No	No
4	15	Yes	No	No	No	No	No	No
4	16	Yes	No	No	No	No	No	No

## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

**Coordination Options****Coordination Options (MM)3-1**

Manual Pattern: Auto  
 ECPI Coord: Yes  
 System Source: TBC  
 System Format: STD  
 Splits In: Seconds  
 Offsets In: Seconds  
 Transition: Smooth  
 Max Select: MAXINH  
 Dwell/Add Time: 0  
 Dly Coord Wz-Lz: No  
 Force Off: Float  
 Offset Reference: Lead  
 Use Ped Time: Yes  
 Ped Recall: No  
 Ped Resv: No  
 Local Zero Ovrd: No  
 Fo Add Ini Green: No  
 Re-sync Count: 0  
 Multisync: No

**Split Demand (MM)3-5****Demand 1    Demand 2**

Phase	Phase
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Demand	Detector	Call Time	Cycle Count
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**Auto Perm Minimum Green (Seconds) (MM)3-4**

Phase	Min Green
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Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

**Coordination Pattern Data**

**Pattern Data (MM)3-2**

Pattern	Split Pattern	TS2	Cycle	Std(COS)	Offset Value	Splits In	Offsets In	Actuated Coord
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Pattern	Timing Plan	Actuated Walk Rest	Sequence	Phase Reservice	Action Plan	XArt Pattern	Vehicle Perm 1	Vehicle Perm 2	Vehicle Perm 3
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Pattern	Ring Split Ext 1	Ring Split Ext 2	Ring Split Ext 3	Ring Split Ext 4	Split Demand Pattern 1	Split Demand Pattern 2	Ring Displ 2	Ring Displ 3	Ring Displ 4
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**Split Preference Phases**

Pattern	Phase	Preference 1	Preference 2
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**Special Functions**

Pattern	Function	Output
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**Split Pattern Data (MM)3-3**

**Coord Phases**

Split Pattern	Phase	Split
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**Split/Modes**

Split Pattern	Mode	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

## Preemptor Preempt Plan (MM)4-1

## Preempt Phases

Preempt	Phase	Track Clear Veh	Dwell Veh	Dwell Ped	Cycling Veh	Cycling Ped	Exit Phase	Exit Calls	Special Function
3	2	No	Yes	No	No	No	No	No	No
3	6	No	Yes	No	No	No	No	No	No

## Preempt Overlaps

Preempt	Overlap	Track Clear	Enable Trailing	Dwell Overlap	Cycling Overlap
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Preempt	Enable	Preempt Override	Interlock Enable	Detector Lock	Delay	Inhibit	Override Flash	Duration	CLR > GRN
1	No	Yes	No	Yes	0	0	Yes	0	No
2	No	Yes	No	Yes	0	0	Yes	0	No
3	Standard	Yes	No	Yes	0	0	Yes	10	No
4	No	Yes	No	Yes	0	0	Yes	0	No
5	No	Yes	No	Yes	0	0	Yes	0	No
6	No	Yes	No	Yes	0	0	Yes	0	No
7	No	Yes	No	Yes	0	0	Yes	0	No
8	No	Yes	No	Yes	0	0	Yes	0	No
9	No	Yes	No	Yes	0	0	Yes	0	No
10	No	Yes	No	Yes	0	0	Yes	0	No

Preempt	Term Overlap Asap	PC Through Yellow	Terminate Phase	Ped Dark	Track Clearance Re-service	Dwell Flash	Linked Pmt	Flash Exit Color	Preempt To Coord	Fault Type
1	No	No	No	No	No	Off	0	Red	No	Hard
2	No	No	No	No	No	Off	0	Green	No	Hard
3	No	Yes	No	No	No	Off	0	Green	No	Hard
4	No	No	No	No	No	Off	0	Green	No	Hard
5	No	No	No	No	No	Off	0	Green	No	Hard
6	No	No	No	No	No	Off	0	Green	No	Hard
7	No	No	No	No	No	Off	0	Green	No	Hard
8	No	No	No	No	No	Off	0	Green	No	Hard
9	No	No	No	No	No	Off	0	Green	No	Hard
10	No	No	No	No	No	Off	0	Green	No	Hard

Preempt	Exit Timing Plan	Reservice	Free During Pmt Ring 1	Free During Pmt Ring 2	Free During Pmt Ring 3	Free During Pmt Ring 4
1	0	0	No	No	No	No
2	0	0	No	No	No	No
3	0	0	No	No	No	No
4	0	0	No	No	No	No
5	0	0	No	No	No	No
6	0	0	No	No	No	No
7	0	0	No	No	No	No
8	0	0	No	No	No	No
9	0	0	No	No	No	No
10	0	0	No	No	No	No

Preempt	Entrance Walk	Entrance Ped Clear	Entrance Min Green	Entrance Yellow	Entrance Red	Track Clear Min Green	Gate Down Ext Green	Gate Down Max Green	Track Clear Yellow	Track Clear Red
1	0	255	5	4.0	1.0	0	0	0	4.0	1.0



2	0	255	5	4.0	1.0	0	0	0	4.0	1.0
3	0	7	4	3.0	2.0	0	0	0	4.0	1.0
4	0	255	5	4.0	1.0	0	0	0	4.0	1.0
5	0	255	5	4.0	1.0	0	0	0	4.0	1.0
6	0	255	5	4.0	1.0	0	0	0	4.0	1.0
7	0	255	5	4.0	1.0	0	0	0	4.0	1.0
8	0	255	5	4.0	1.0	0	0	0	4.0	1.0
9	0	255	5	4.0	1.0	0	0	0	4.0	1.0
10	0	255	5	4.0	1.0	0	0	0	4.0	1.0

Preempt	Min Dwell Time	Extend Preempt Input Time	Max Preempt Call Time	Exit Yellow Time	Exit Red Time	Preempt Active Out	Preempt Active Dwell	Other Priority Preempt	Non-Priority Preempt
1	0	0.0	0	4.0	1.0	On	No	Off	Off
2	0	0.0	0	4.0	1.0	On	No	Off	Off
3	0	0.0	0	4.0	1.0	On	No	Off	Off
4	0	0.0	0	4.0	1.0	On	No	Off	Off
5	0	0.0	0	4.0	1.0	On	No	Off	Off
6	0	0.0	0	4.0	1.0	On	No	Off	Off
7	0	0.0	0	4.0	1.0	On	No	Off	Off
8	0	0.0	0	4.0	1.0	On	No	Off	Off
9	0	0.0	0	4.0	1.0	On	No	Off	Off
10	0	0.0	0	4.0	1.0	On	No	Off	Off

Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

**Preemptor Preempt Filtering**  
**Enable Preempt Filtering and TSP/SCP**  
**(MM)4-2**

<b>Input</b>	<b>Solid</b>	<b>Pulsing</b>
3	Preemption -3	Preemption -7
4	Preemption -4	Preemption -8
5	Preemption -5	Preemption -9
6	Preemption -6	Preemption -10

Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

**Time Base Clock/Calendar**  
**Clock/Calendar Options (MM)5-1**

Enable Action Plan: 0  
Sync Reference Time: 3:15 AM  
Sync Reference: Reference Time  
Day Light Savings: USDLS  
Time Reset Input Set Time: 3:30:00  
Standard Time From GMT: -5

## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

**Time Base Action Plan****Action Plan (MM)5-2**

Plan	Pattern	Veh Det Plan	Flash	Red Rest	Controller Seq	Timing Plan	System Override	Detector Log	Veh Det Diag Plan	Ped Det Diag Plan	Dimming Enable
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**Action Plan Phases**

Plan	Phase	Ped Rcl	Walk 2	Vex 2	Veh Rcl	Max Rcl	Max 2	Max 3	CS Inhibit	Omit
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**Action Plan Special Functions**

Plan	Function
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**Action Plan Auxiliary Functions**

Plan	Function
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**Logic Statement Control**

Plan	LP	Statement Control
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Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

**Time Base Day Plan/Schedule**

**Day Plan (MM)5-3**

Plan	Event	Action Plan	Start Time
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**Schedule (MM)5-4**

Schedule Number	Day Plan Number	Months	Days of Week	Days of Month
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Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

## Detectors

### Detectors Page 1

#### Vehicle Detectors Setup (MM)6-1

Vehicle Plan	Detector Number	Called
1	3	4
1	4	8
1	7	8
1	8	4
1	12	8

## Vehicle Detector Setup (MM)6-2 continued

Detector Number	ECPI	TS2 Detector	Detector Description
1	6	Yes	
2	6	Yes	
3	6	Yes	
4	6	Yes	
5	6	Yes	
6	6	Yes	
7	6	Yes	
8	6	Yes	
9	6	Yes	
10	6	Yes	
11	6	Yes	
12	6	Yes	
13	6	Yes	
14	6	Yes	
15	6	Yes	
16	6	Yes	
17	6	Yes	
18	6	Yes	
19	6	Yes	
20	6	Yes	
21	6	Yes	
22	6	Yes	
23	6	Yes	
24	6	Yes	
25	6	Yes	
26	6	Yes	
27	6	Yes	
28	6	Yes	
29	6	Yes	
30	6	Yes	
31	6	Yes	
32	6	Yes	
33	6	Yes	
34	6	Yes	
35	6	Yes	
36	6	Yes	
37	6	Yes	
38	6	Yes	
39	6	Yes	
40	6	Yes	
41	6	Yes	
42	6	Yes	
43	6	Yes	
44	6	Yes	
45	6	Yes	
46	6	Yes	
47	6	Yes	
48	6	Yes	
49	6	Yes	
50	6	Yes	
51	6	Yes	
52	6	Yes	
53	6	Yes	
54	6	Yes	
55	6	Yes	
56	6	Yes	
57	6	Yes	
58	6	Yes	
59	6	Yes	
60	6	Yes	

61	6	Yes	
62	6	Yes	
63	6	Yes	
64	6	Yes	

#### Vehicle Detector Setup (MM)6-2 continued

Detector Number	Vehicle Plan	Assigned Phase	Switch Phase	Extend Time	Delay Time	Queue Limit	Yellow Lock	Added Option	Call Option	Passage Option	Queue Option	NTCIP Occupancy	NTCIP Volume
1	1	1	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
2	1	2	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
3	1	8	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
4	1	4	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
7	1	4	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
8	1	8	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
11	1	2	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
12	1	4	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
13	1	13	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
14	1	14	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
15	1	15	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No
16	1	16	0	0.0	0.0	0	No	No	Yes	Yes	No	No	No

#### Ped Detector Options (MM)6-3

##### Phase Ped Detector (NTCIP)

Local Ped Detector	Number
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

##### Local System Detector

Local System Detector	Number
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## Trafalgar Rd @ Cornwall Rd (Master) - Cross Ave @ Lyons Lane

## Detectors

## Detectors Page 2

## Log - Speed Detector Setup (MM)6-5

NTCIP Log Period: 0 ECPI Log Period: TBAP Length Unit: Inch

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap Length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

## Vehicle Detector Diagnostics (MM)6-6

Plan	Detector	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay
1	1	0	0	0	1	255	0
1	2	0	0	0	1	255	0
1	3	0	0	0	1	255	0
1	4	0	0	0	1	255	0
1	5	0	0	0	1	255	0
1	6	0	0	0	1	255	0
1	7	0	0	0	1	255	0
1	8	0	0	0	1	255	0
1	9	0	0	0	1	255	0
1	10	0	0	0	1	255	0
1	11	0	0	0	1	255	0
1	12	0	0	0	1	255	0
1	13	0	0	0	1	255	0
1	14	0	0	0	1	255	0
1	15	0	0	0	1	255	0
1	16	0	0	0	1	255	0
1	17	0	0	0	1	255	0
1	18	0	0	0	1	255	0
1	19	0	0	0	1	255	0
1	20	0	0	0	1	255	0
1	21	0	0	0	1	255	0
1	22	0	0	0	1	255	0
1	23	0	0	0	1	255	0
1	24	0	0	0	1	255	0
1	25	0	0	0	1	255	0
1	26	0	0	0	1	255	0
1	27	0	0	0	1	255	0
1	28	0	0	0	1	255	0
1	29	0	0	0	1	255	0

1	30	0	0	0	1	255	0
1	31	0	0	0	1	255	0
1	32	0	0	0	1	255	0
1	33	0	0	0	1	255	0
1	34	0	0	0	1	255	0
1	35	0	0	0	1	255	0
1	36	0	0	0	1	255	0
1	37	0	0	0	1	255	0
1	38	0	0	0	1	255	0
1	39	0	0	0	1	255	0
1	40	0	0	0	1	255	0
1	41	0	0	0	1	255	0
1	42	0	0	0	1	255	0
1	43	0	0	0	1	255	0
1	44	0	0	0	1	255	0
1	45	0	0	0	1	255	0
1	46	0	0	0	1	255	0
1	47	0	0	0	1	255	0
1	48	0	0	0	1	255	0
1	49	0	0	0	1	255	0
1	50	0	0	0	1	255	0
1	51	0	0	0	1	255	0
1	52	0	0	0	1	255	0
1	53	0	0	0	1	255	0
1	54	0	0	0	1	255	0
1	55	0	0	0	1	255	0
1	56	0	0	0	1	255	0
1	57	0	0	0	1	255	0
1	58	0	0	0	1	255	0
1	59	0	0	0	1	255	0
1	60	0	0	0	1	255	0
1	61	0	0	0	1	255	0
1	62	0	0	0	1	255	0
1	63	0	0	0	1	255	0
1	64	0	0	0	1	255	0

**Pedestrian Detector Diagnostics (MM)6-7**

Plan	Detector	Counts	Act	Pres	Multiplier
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## Town of Oakville, ON



MOVING TRAFFIC FORWARD

MTO0307 - Dorval Dr @ QEW N Ramp - Econolite Type - ASC/3

## Controller Timing Plan (MM) 2-1

## Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction		<b>NBSB</b>		<b>WB</b>												
Min Green	5	20	5	10	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	5	0	5	0	5	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	11	0	7	0	7	0	7	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	40	35	40	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	45	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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### Town of Oakville, ON



MOVING TRAFFIC FORWARD

#### MTO0307 - Dorval Dr @ QEW N Ramp - Econolite Type - ASC/3

#### Coordination Pattern Data Coordinator Pattern Data (MM) 3-2

#### Coordinator Pattern # 1

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Percent
Cycle	120	Std (COS)	9	Offsets In	Percent
Offset Value	59%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

#### Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		NBSB		WB												
Splits (Split Pat 1)	0	62	0	38	0	0	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	0%	0%	0%

Misc. Data			
Veh Perm 1	0	Veh Perm 2	0
Split Demand Pat 1	0	Split Demand Pat 2	0
		Veh Perm 2 Disp	0
		Crossing Arterial Pat	0

#### Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X														
Vehicle Recall																
Pedestrian Recall		X														
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 2**

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Percent
Cycle	120	Std (COS)	17	Offsets In	Percent
Offset Value	45%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		NBSB		WB												
Splits (Split Pat 2)	0	62	0	38	0	0	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	0%	0%	0%

Misc. Data  
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0  
 Split Demand 0 Split Demand 0 Crossing Arterial 0  
 Pat 1 Pat 2 Pat

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X														
Vehicle Recall																
Pedestrian Recall		X														
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 3**

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Percent
Cycle	120	Std (COS)	25	Offsets In	Percent
Offset Value	56%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		NBSB		WB												
Splits (Split Pat 3)	0	58	0	42	0	0	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	0%	0%	0%

Misc. Data

Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0  
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X														
Vehicle Recall																
Pedestrian Recall		X														
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 4**

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Percent
Cycle	120	Std (COS)	33	Offsets In	Percent
Offset Value	45%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		NBSB		WB												
Splits (Split Pat 4)	0	62	0	38	0	0	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	0%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X														
Vehicle Recall																
Pedestrian Recall		X														
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																



## Town of Oakville, ON



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*MOVING TRAFFIC FORWARD*

MTO0307 - Dorval Dr @ QEW N Ramp - Econolite Type - ASC/3

**Time Base Day Plan/Schedule**  
**Day Plan (MM) 5-3****Day Plan #1**

Event	Action Plan	Start Time
1	1	06:00
2	2	10:00
3	3	15:15
4	4	19:00
5	5	22:00

**Schedule (MM) 5-4****Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X	X	X	X	X	X	X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>
	X	X	X	X	X	X	X	X	X	X	X
	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>		
	X	X	X	X	X	X	X	X	X		

## Town of Oakville, ON



MOVING TRAFFIC FORWARD

MTO0306 - Dorval Dr @ QEW S Ramp - Econolite Type - ASC/3

## Controller Timing Plan (MM) 2-1

## Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction		<b>NBSB</b>		<b>EB</b>												
Min Green	5	20	5	10	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	0	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	11	0	7	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	40	35	30	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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## Town of Oakville, ON



MOVING TRAFFIC FORWARD

MTO0306 - Dorval Dr @ QEW S Ramp - Econolite Type - ASC/3

**Coordination Options****Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Percent	Offsets In	Percent
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	No
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

**Auto Perm Minimum Green (Seconds) (MM) 3-4**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Split Demand (MM) 3-5**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

### Town of Oakville, ON



MOVING TRAFFIC FORWARD

## MTO0306 - Dorval Dr @ QEW S Ramp - Econolite Type - ASC/3

### Coordination Pattern Data Coordinator Pattern Data (MM) 3-2

#### Coordinator Pattern # 1

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Percent
Cycle	120	Std (COS)	0	Offsets In	Percent
Offset Value	80%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

#### Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		NBSB		EB												
Splits (Split Pat 1)	0	62	0	38	0	0	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	0%	0%	0%

Misc. Data			
Veh Perm 1	0	Veh Perm 2	0
Split Demand Pat 1	0	Split Demand Pat 2	0
		Veh Perm 2 Disp	0
		Crossing Arterial Pat	0

#### Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X														
Vehicle Recall																
Pedestrian Recall		X														
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 2**

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Percent
Cycle	120	Std (COS)	0	Offsets In	Percent
Offset Value	8%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		NBSB		EB												
Splits (Split Pat 2)	0	62	0	38	0	0	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	0%	0%	0%

Misc. Data  
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0  
 Split Demand 0 Split Demand 0 Crossing Arterial 0  
 Pat 1 Pat 2 Pat

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X														
Vehicle Recall																
Pedestrian Recall		X														
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

**Coordinator Pattern # 3**

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Percent
Cycle	120	Std (COS)	0	Offsets In	Percent
Offset Value	68%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		NBSB		EB												
Splits (Split Pat 3)	0	62	0	38	0	0	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	0%	0%	0%

Misc. Data

Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0  
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X														
Vehicle Recall																
Pedestrian Recall		X														
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																



**Coordinator Pattern # 4**

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Percent
Cycle	120	Std (COS)	0	Offsets In	Percent
Offset Value	80%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

**Split Preference Phases**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description		NBSB		EB												
Splits (Split Pat 4)	0	62	0	38	0	0	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	0%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

**Split Pattern**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X														
Vehicle Recall																
Pedestrian Recall		X														
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

## Town of Oakville, ON



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*MOVING TRAFFIC FORWARD*

MTO0306 - Dorval Dr @ QEW S Ramp - Econolite Type - ASC/3

**Time Base Day Plan/Schedule**  
**Day Plan (MM) 5-3****Day Plan #1**

Event	Action Plan	Start Time
1	1	06:00
2	2	10:00
3	3	15:15
4	4	19:00
5	5	22:00

**Schedule (MM) 5-4****Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X	X	X	X	X	X	X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>
	X	X	X	X	X	X	X	X	X	X	X
	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>31</b>		
	X	X	X	X	X	X	X	X	X		

## Town of Oakville, ON



MOVING TRAFFIC FORWARD

## OAK0714 - Royal Windsor Dr @ South Service Rd - Econolite Type - Cobalt

## Controller Timing Plan (MM) 2-1

## Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	W-L	E-T	N	S-T	E-L	W-T	W	N-T	N	N	N	N	N	N	N	N
Min Green	8	20	0	10	8	30	0	8	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	10	0	20	0	10	0	10	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.5	4.5	0.0	3.5	3.5	6.0	0.0	3.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	45	45	0	35	25	45	0	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	4.0	5.4	3.0	3.7	4.0	5.4	3.0	3.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	2.0	3.0	0.0	4.1	2.0	3.0	0.0	4.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

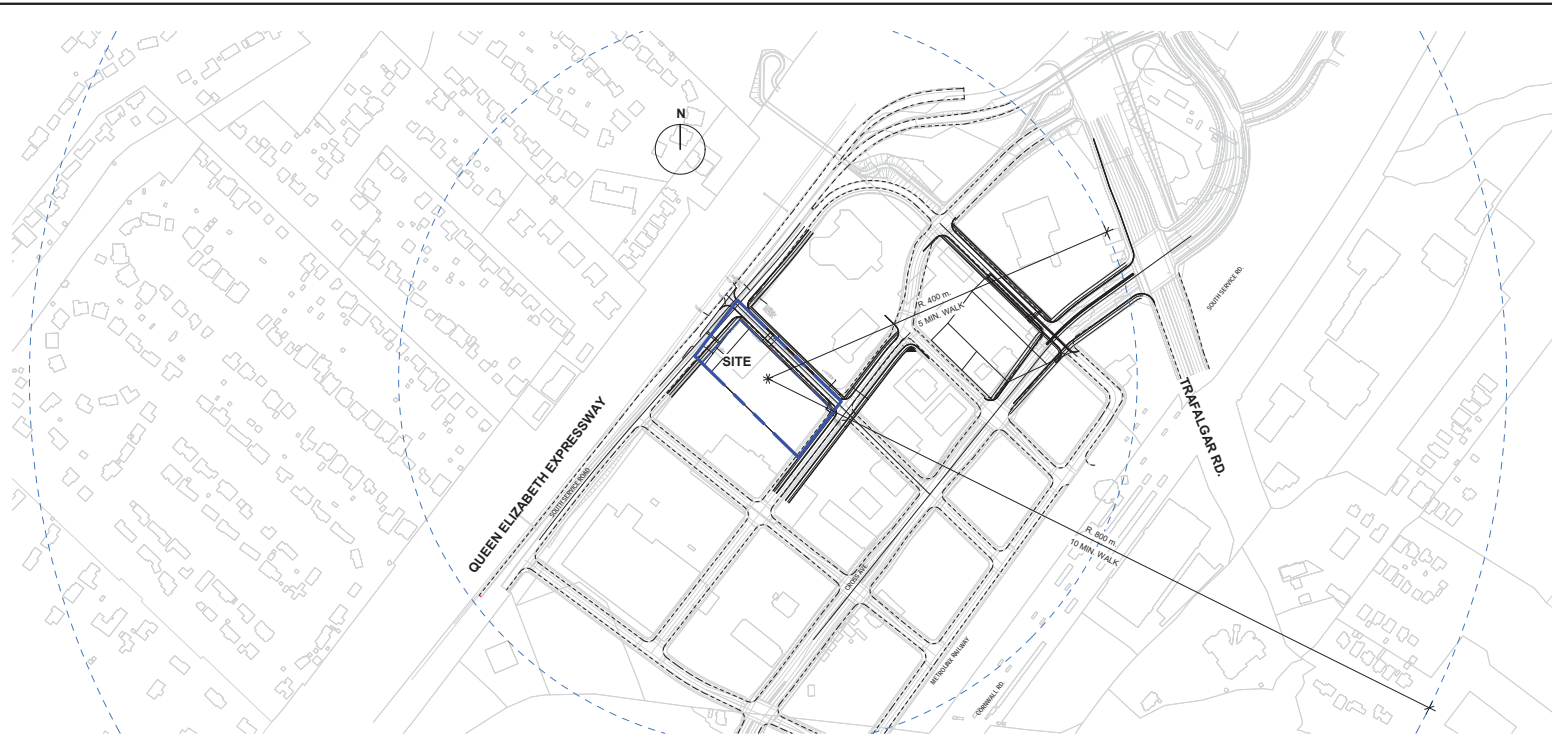
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

# Appendix C

## Reduced Scale Architectural Drawings







1 AZ\_Context Plan  
AZ001 1:2500

HEIGHT	FLOOR AREA BYLAW 2014/14		NET FLOOR AREA BYLAW 2014/14						INDOOR AMENITY		OUTDOOR AMENITY	
	Storero	Minima	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF
<b>UNDERGROUND</b>												
<b>PARKING</b>												
Level 0	0	3.00 m	283.97 SF	176.50 SF	3,816 SF	--	--	176.50 SF	0.00 SF	--	--	--
Level 1	0	3.00 m	681.32 SF	7,340 SF	185.06 SF	1,798 SF	--	--	185.06 SF	1,798 SF	--	--
Level 2	0	3.00 m	681.32 SF	7,340 SF	185.06 SF	1,798 SF	--	--	185.06 SF	1,798 SF	--	--
Level 3	0	3.00 m	681.32 SF	7,340 SF	185.06 SF	1,798 SF	--	--	185.06 SF	1,798 SF	--	--
Level 4	0	3.00 m	681.32 SF	7,340 SF	185.06 SF	1,798 SF	--	--	185.06 SF	1,798 SF	--	--
Level 5	0	3.00 m	3,384.83 SF	29,743 SF	--	--	--	--	--	--	--	--
Level 6	0	3.00 m	4,473.22 SF	39,713 SF	--	--	--	--	--	--	--	--
<b>AG TOTAL</b>			<b>5,473.22 SF</b>	<b>58,913 SF</b>	<b>1,584.82 SF</b>	<b>16,413 SF</b>	<b>--</b>	<b>--</b>	<b>18,837 SF</b>	<b>17,892 SF</b>	<b>--</b>	<b>--</b>
<b>UG TOTAL</b>			<b>0</b>	<b>158.68 SF</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>

HEIGHT	FLOOR AREA BYLAW 2014/14		NET FLOOR AREA BYLAW 2014/14						INDOOR AMENITY		OUTDOOR AMENITY		TOTAL RESIDENTIAL UNIT COUNT
	Storero	Minima	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	
<b>ACTIVE GRADE</b>													
<b>PARKING (Tower 1)</b>													
Level 0	0	3.00 m	2,147.37 SF	23,710 SF	114.36 SF	1,231 SF	602.41 SF	6,484 SF	137.93 SF	1,480 SF	854.29 SF	9,195 SF	
Level 1	0	3.00 m	688.72 SF	7,847 SF	--	--	--	--	--	--	--	--	
Level 2	0	3.00 m	688.72 SF	7,847 SF	--	--	--	--	--	--	--	--	
Level 3	0	3.00 m	688.72 SF	7,847 SF	--	--	--	--	--	--	--	--	
Level 4	0	3.00 m	3,384.83 SF	29,743 SF	--	--	--	--	--	--	--	--	
Level 5	0	3.00 m	4,473.22 SF	39,713 SF	--	--	--	--	--	--	--	--	
Level 6	0	3.00 m	1,784.48 SF	16,413 SF	--	--	--	--	--	--	--	--	
Level 7	0	3.00 m	1,784.48 SF	16,413 SF	--	--	--	--	--	--	--	--	
<b>AG TOTAL</b>			<b>8,207.82 SF</b>	<b>72,126 SF</b>	<b>114.36 SF</b>	<b>1,231 SF</b>	<b>602.41 SF</b>	<b>6,484 SF</b>	<b>137.93 SF</b>	<b>1,480 SF</b>	<b>854.29 SF</b>	<b>9,195 SF</b>	
<b>UG TOTAL</b>			<b>0</b>	<b>158.68 SF</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	

HEIGHT	FLOOR AREA BYLAW 2014/14		NET FLOOR AREA BYLAW 2014/14						INDOOR AMENITY		OUTDOOR AMENITY		TOTAL RESIDENTIAL UNIT COUNT
	Storero	Minima	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	
<b>TOWER (Tower 6)</b>													
Level 0	0	4.00 m	838.25 SF	9,334 SF	--	--	--	--	--	--	--	--	
Level 1	0	3.00 m	792.50 SF	8,975 SF	684.36 SF	7,388 SF	--	--	684.36 SF	7,388 SF	--	--	
Level 2 to 30	43	139.10 m	32,250.72 SF	347,738 SF	29,428.70 SF	318,729 SF	--	--	29,428.70 SF	318,729 SF	--	--	
Level 31	0	3.00 m	788.13 SF	8,788 SF	--	--	--	--	--	--	--	--	
<b>UG TOTAL</b>			<b>0</b>	<b>158.68 SF</b>	<b>838.25 SF</b>	<b>8,975 SF</b>	<b>684.36 SF</b>	<b>7,388 SF</b>	<b>--</b>	<b>--</b>	<b>684.36 SF</b>	<b>7,388 SF</b>	

HEIGHT	FLOOR AREA BYLAW 2014/14		NET FLOOR AREA BYLAW 2014/14						INDOOR AMENITY		OUTDOOR AMENITY		TOTAL RESIDENTIAL UNIT COUNT
	Storero	Minima	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	
<b>TOWER (Tower 7)</b>													
Level 0	0	3.00 m	2,782.87 SF	29,238 SF	483.47 SF	5,293 SF	1,411.41 SF	15,192 SF	--	--	1,864.82 SF	20,386 SF	
Level 1	0	3.00 m	1,261.50 SF	13,953 SF	--	--	--	--	--	--	4,972.37 SF	49,214 SF	
Level 2	0	3.00 m	1,261.50 SF	13,953 SF	--	--	--	--	--	--	4,972.37 SF	49,214 SF	
Level 3	0	3.00 m	1,261.50 SF	13,953 SF	--	--	--	--	--	--	4,972.37 SF	49,214 SF	
Level 4	0	3.00 m	1,261.50 SF	13,953 SF	--	--	--	--	--	--	4,972.37 SF	49,214 SF	
Level 5	0	3.00 m	1,261.50 SF	13,953 SF	--	--	--	--	--	--	4,972.37 SF	49,214 SF	
Level 6	0	3.00 m	1,261.50 SF	13,953 SF	--	--	--	--	--	--	4,972.37 SF	49,214 SF	
Level 7	0	3.00 m	1,261.50 SF	13,953 SF	--	--	--	--	--	--	4,972.37 SF	49,214 SF	
<b>AG TOTAL</b>			<b>10,112.64 SF</b>	<b>111,006 SF</b>	<b>483.47 SF</b>	<b>5,293 SF</b>	<b>1,411.41 SF</b>	<b>15,192 SF</b>	<b>--</b>	<b>--</b>	<b>10,379.85 SF</b>	<b>111,006 SF</b>	
<b>UG TOTAL</b>			<b>0</b>	<b>158.68 SF</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	

HEIGHT	FLOOR AREA TOTAL		NET FLOOR AREA TOTAL						INDOOR AMENITY TOTAL		OUTDOOR AMENITY TOTAL		TOTAL RESIDENTIAL UNIT COUNT
	Storero	Minima	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	Area SF	
<b>AG TOTAL</b>			<b>10,112.64 SF</b>	<b>111,006 SF</b>	<b>483.47 SF</b>	<b>5,293 SF</b>	<b>1,411.41 SF</b>	<b>15,192 SF</b>	<b>10,379.85 SF</b>	<b>111,006 SF</b>	<b>--</b>	<b>--</b>	
<b>UG TOTAL</b>			<b>0</b>	<b>158.68 SF</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	

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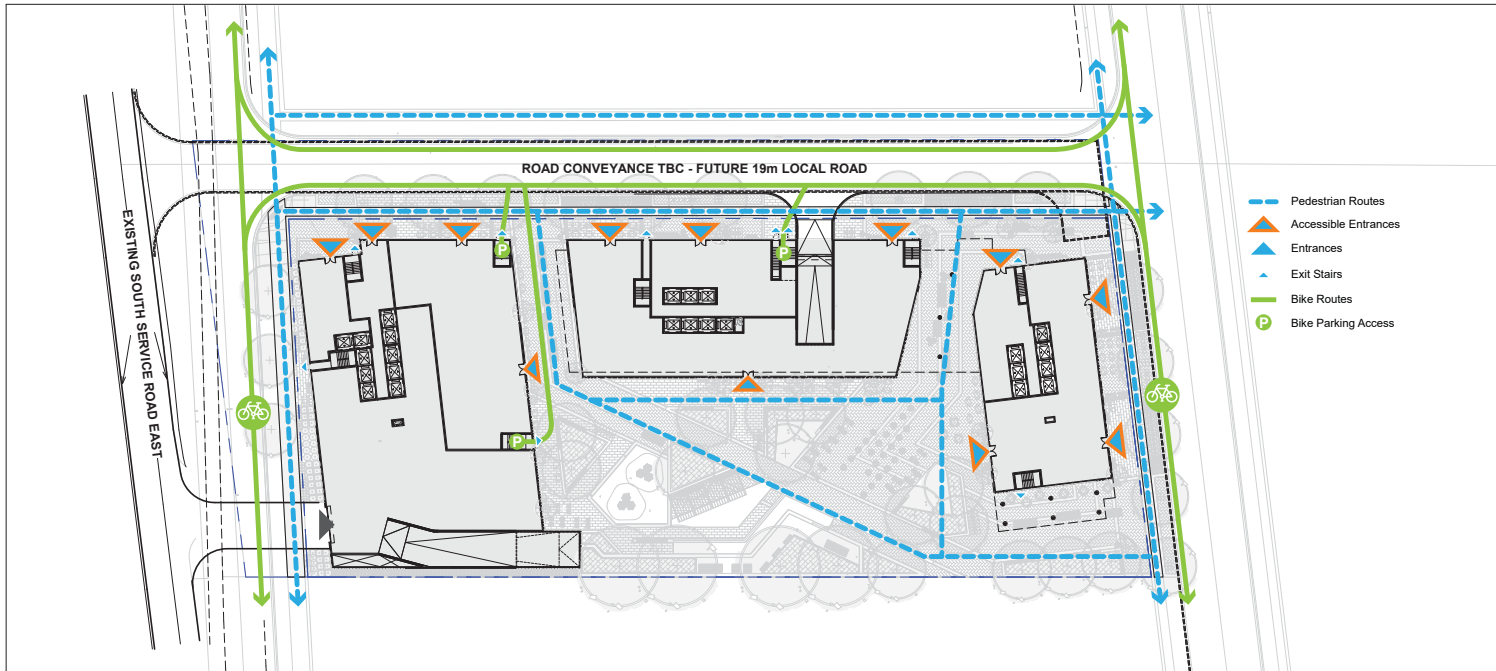
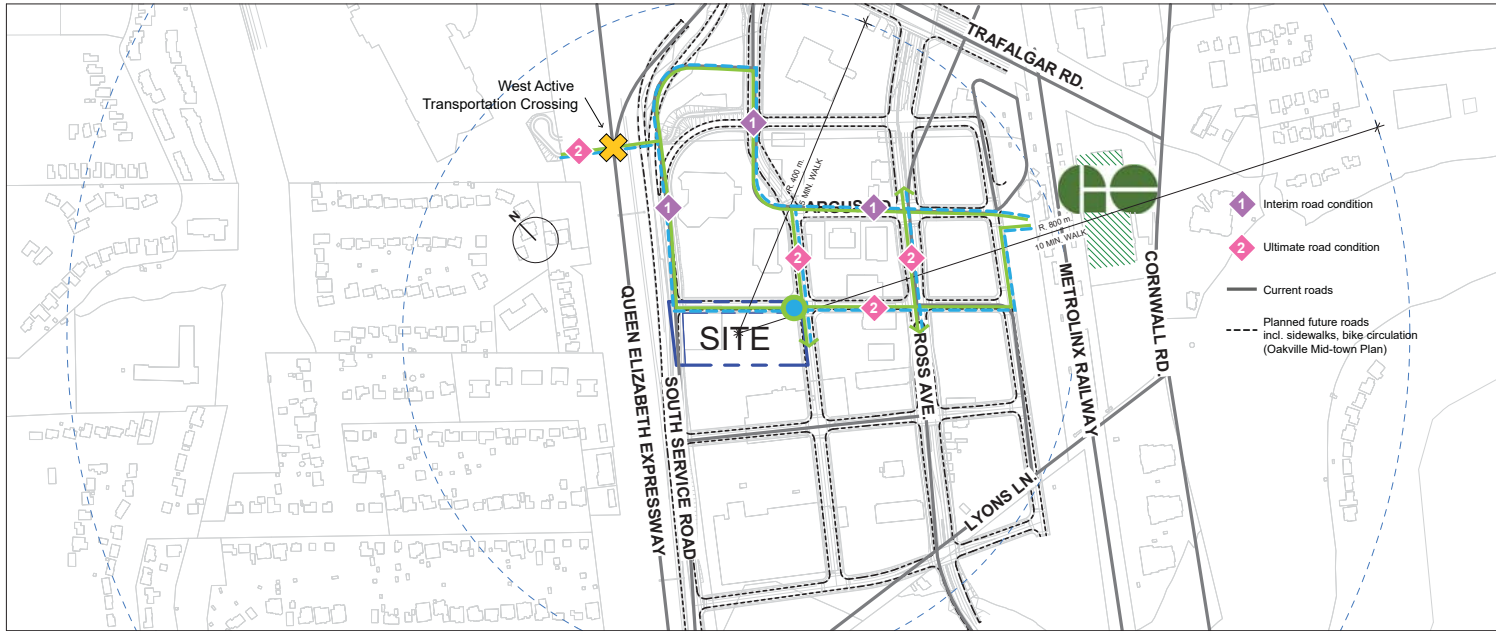
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DWG No.  
AZ001

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**166 South Service Road**  
 South Service Road & Trafalgar

OWNER  
**166 South Service Inc.**

DWG TITLE  
**Pedestrian Circulation**

DATE: 2022-01-18  
 SCALE: As indicated  
 DRAWN: MS/FT  
 CHECKED: DS  
 PRJ. No.: 2128

DWG No.  
**AZ010**

**ZONING REQUIREMENTS**

VEHICULAR PARKING	UNITS / M2	REQUIRED	PROVIDED
Residential	1,606 units	0.3 spaces/unit = 502	803
Residential Walker	1,606 units	0.2 spaces/unit = 322	302
Retail	2,013.81 m <sup>2</sup>	1.08 per 100.00 m <sup>2</sup> = 22	22
Office	3,872.58 m <sup>2</sup>	1.08 per 100.00 m <sup>2</sup> = 42	42
<b>TOTAL</b>			<b>1169</b>

LEVEL	REGULAR	VISITOR	RETAIL/OFFICE	BARRIER-FREE	LVL TOTAL
P1	0	81	64	0	145
P2	0	98	0	0	98
P3	211	14	0	0	225
P4	226	0	0	0	226
P5	226	0	0	0	226
P6	142	0	0	0	142
<b>TOTAL PARKING</b>	<b>803</b>	<b>382</b>	<b>64</b>	<b>0</b>	<b>1249</b>

BICYCLE PARKING	UNITS / M2	REQUIRED	PROVIDED
Res LONG TERM	1,606 units	0.75 spaces/unit	1205
Res SHORT TERM	1,606 units	0.25 spaces/unit	402
Office LONG TERM	2,013.81 m <sup>2</sup>	1 per 1000.00 m <sup>2</sup>	2
Office LONG TERM	3,872.58 m <sup>2</sup>	1 per 1000.00 m <sup>2</sup>	4
<b>TOTAL BICYCLE PARKING</b>			<b>1613</b>

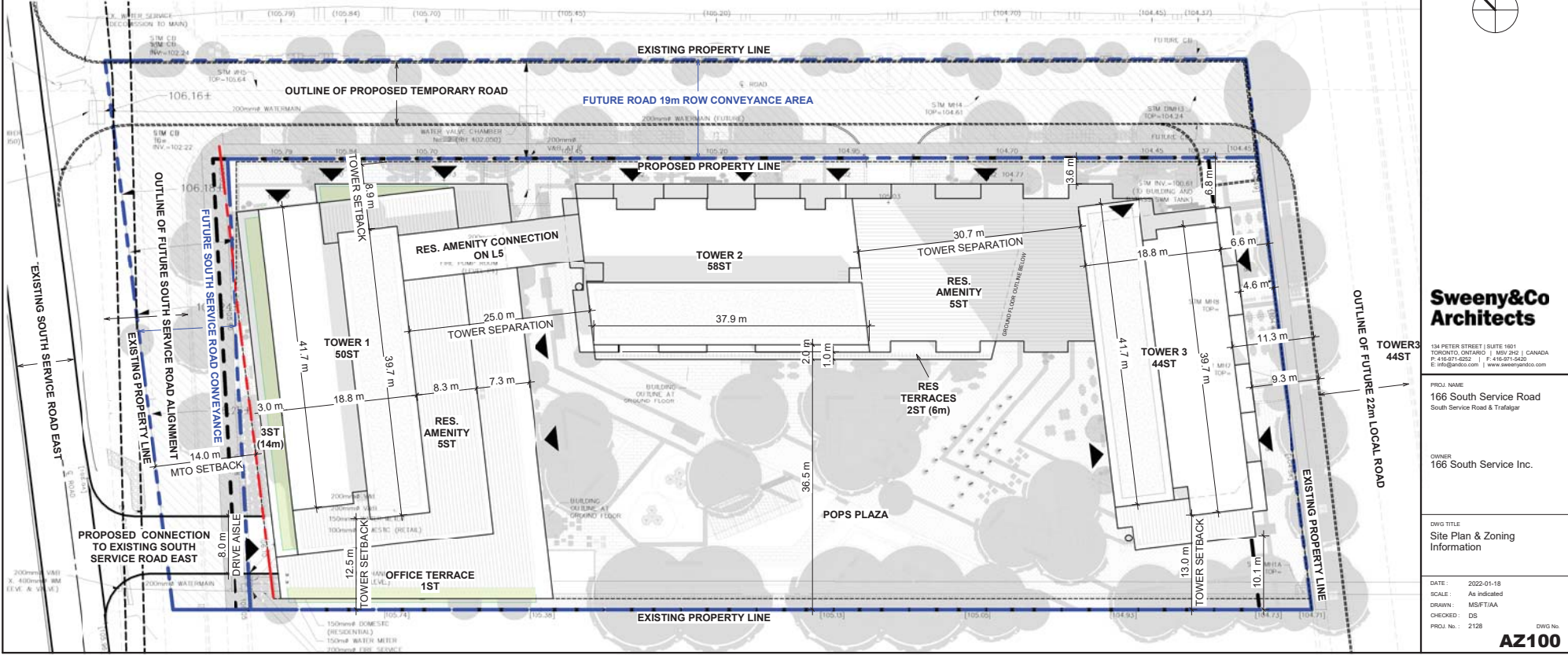
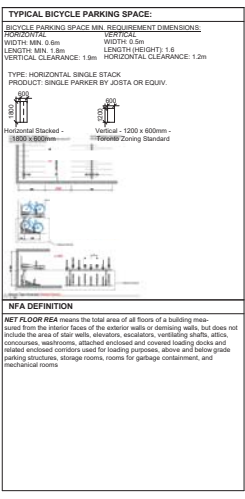
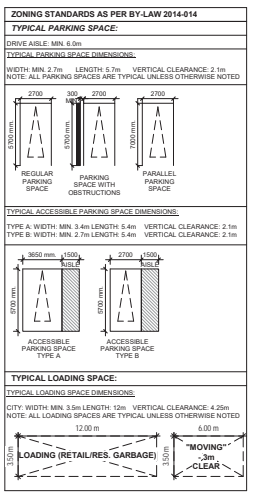
LOADING & STAGING	REQUIRED	PROVIDED
Loading (Moving) - 3.5m/min		
Loading (Hoist) - 28.0m/min		
Loading (Flea Garage) - 3.5m/min		
STAGING	155.00 m <sup>2</sup>	174.00 m <sup>2</sup>

RESIDENTIAL AMENITY	UNITS / M2	PROVIDED RATIO	PROVIDED (m <sup>2</sup> )
INDOOR	1,606 units	1 m <sup>2</sup> /unit	1,606.13 m <sup>2</sup>
OUTDOOR	1,606 units	3 m <sup>2</sup> /unit	4,818.27 m <sup>2</sup>
<b>TOTAL RESIDENTIAL AMENITY</b>			<b>6,424.40 m<sup>2</sup></b>

SITE AMENITY	UNITS / M2	PROVIDED (m <sup>2</sup> )	PROVIDED (m <sup>2</sup> )
TOTAL SITE AREA		1188.3	127,565.71 m <sup>2</sup>
(POPS - NOT DEDUCTED FROM SITE AREA)		4572	49,212.85 m <sup>2</sup>
FUTURE CONVEYANCES*		2084.4	31,585.58 m <sup>2</sup>
<b>NET SITE AREA</b>		<b>5213.3</b>	<b>66,767.28 m<sup>2</sup></b>
TOTAL GFA		<b>106,443</b>	<b>1,145,160 m<sup>2</sup></b>
PSI (TOTAL SITE)		<b>8.99</b>	
PSI (NET SITE)		<b>11.89</b>	



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PRJ. NAME  
 166 South Service Road  
 South Service Road & Trafalgar

OWNER  
 166 South Service Inc.

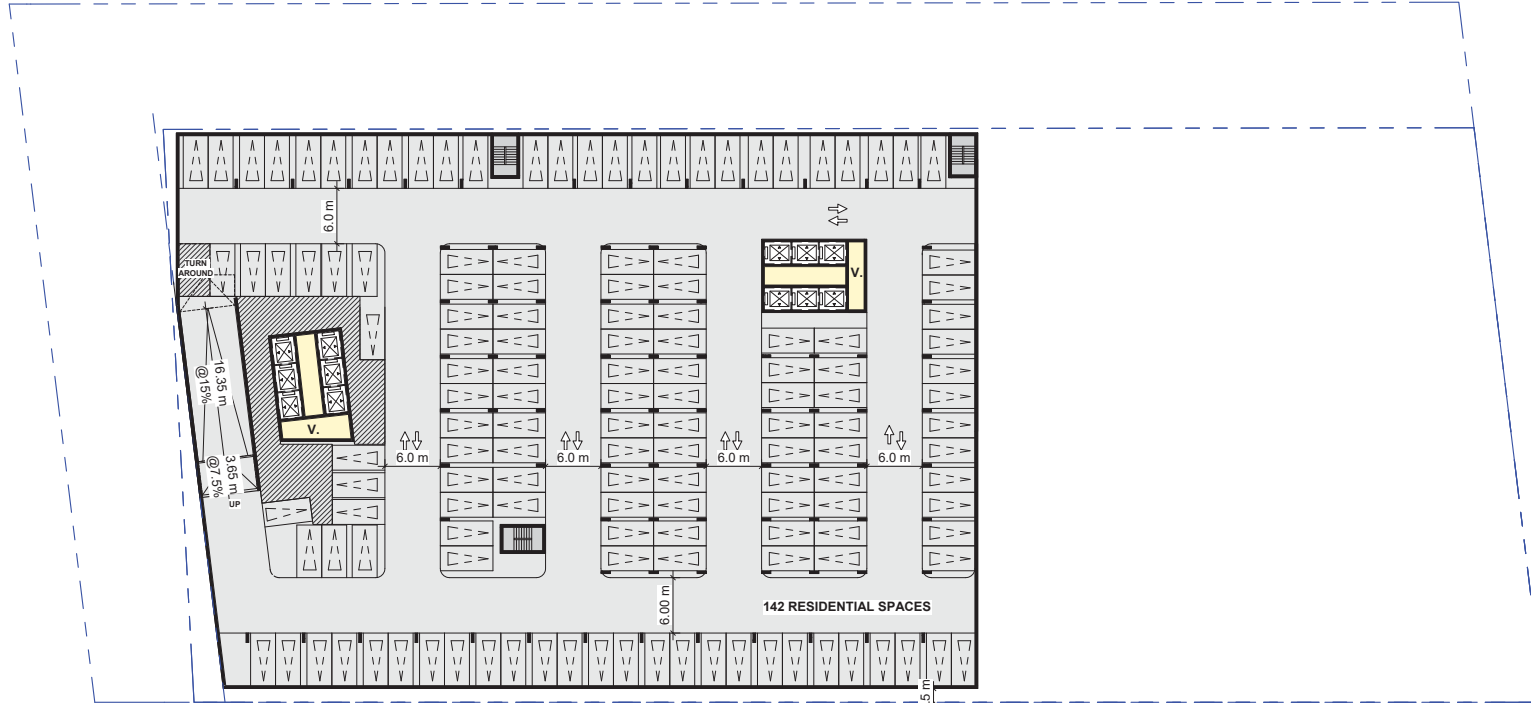
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DATE: 2022-01-18  
 SCALE: As indicated  
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 CHECKED: DS  
 PRJ. No.: 2128

DWG No.  
**AZ100**

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142 RESIDENTIAL SPACES

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PRJ. NAME  
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South Service Road & Trafalgar

OWNER  
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DWG TITLE  
**Level P6**

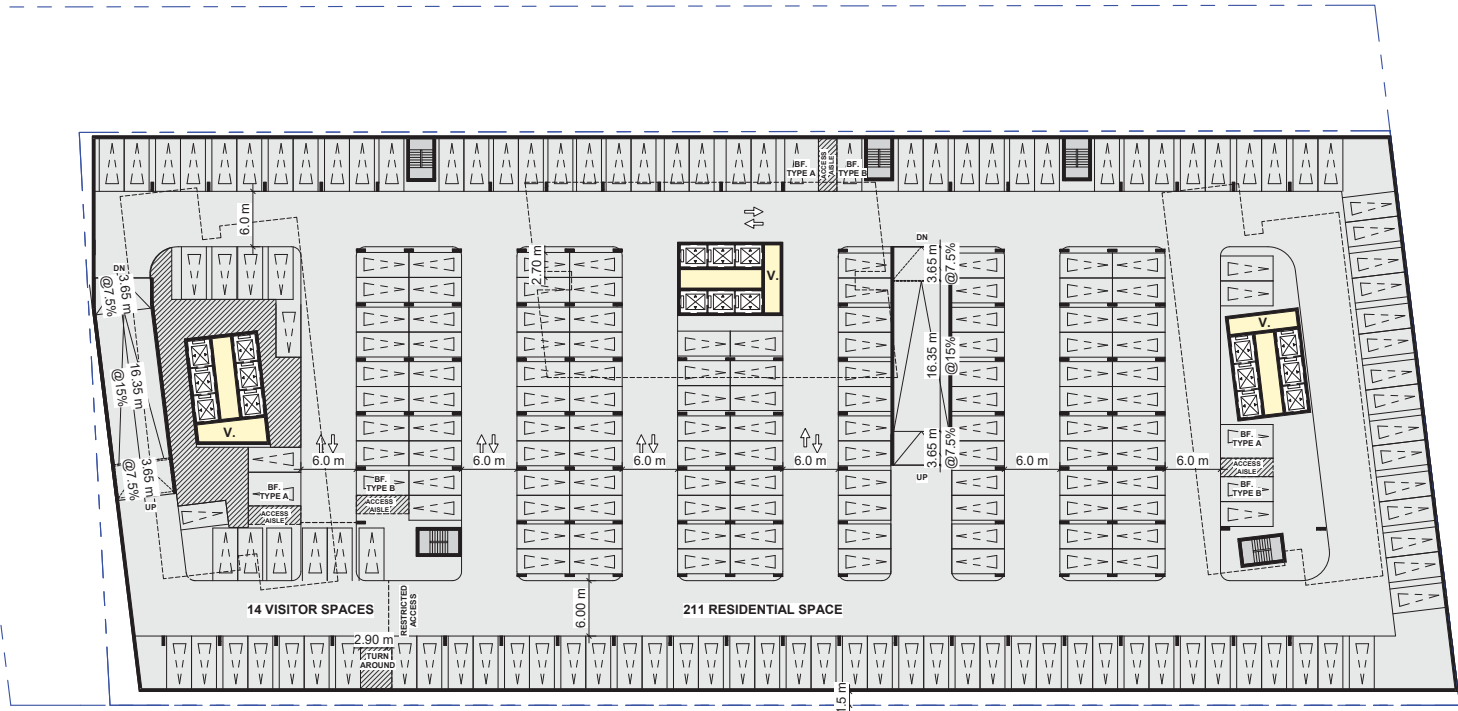
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DWG No. **AZ101**



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**DWG TITLE**  
 Level P3

**DATE:** 2022-01-18  
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**CHECKED:** Checker  
**PRJ. No.:** 2128

DWG No. **AZ103**



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South Service Road & Trafalgar

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DWG TITLE  
**Level P1**

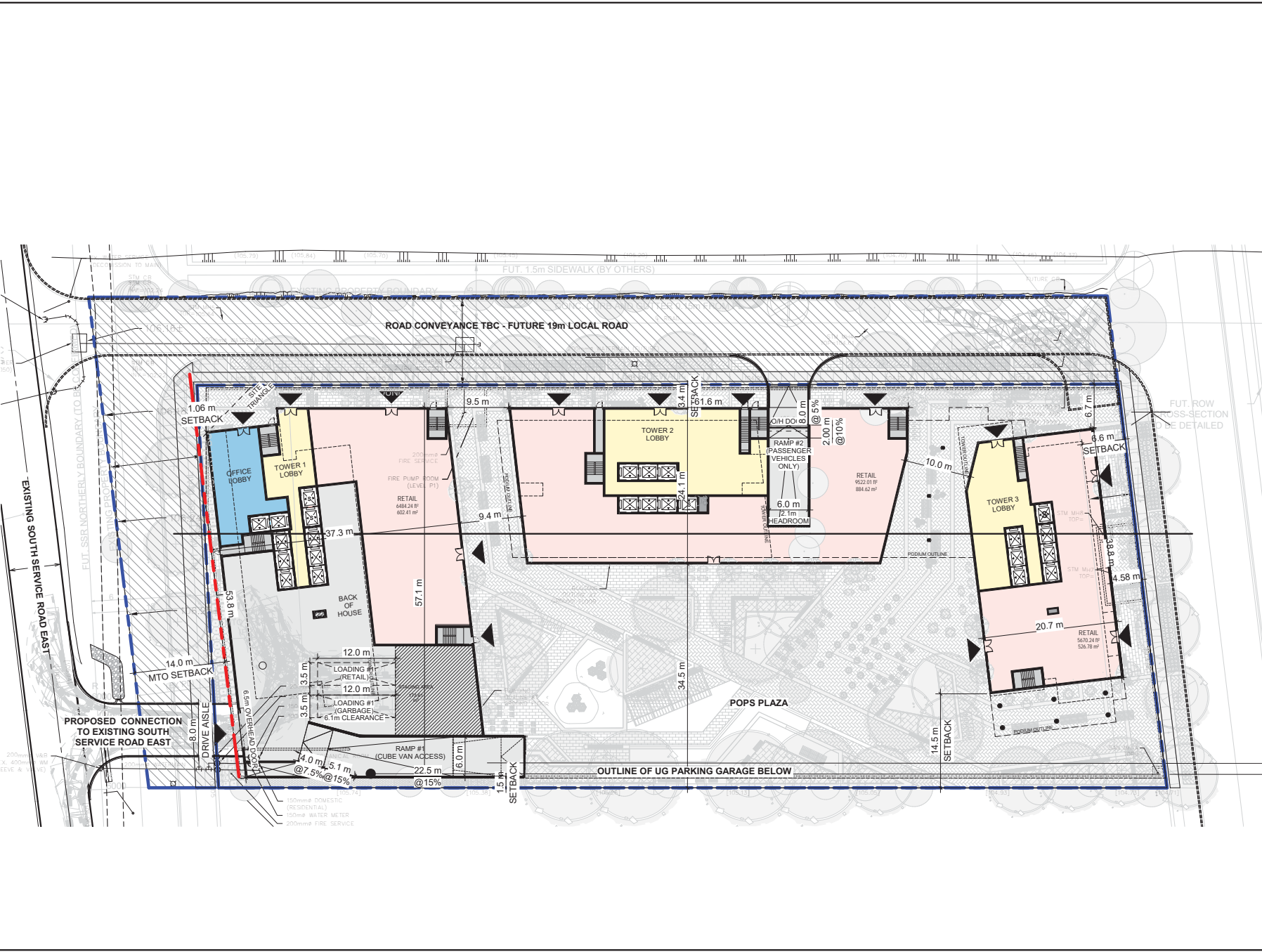
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DWG No.  
**AZ105**

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**166 South Service Road**  
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DWG TITLE  
**Level 1 - Ground Floor Plan**

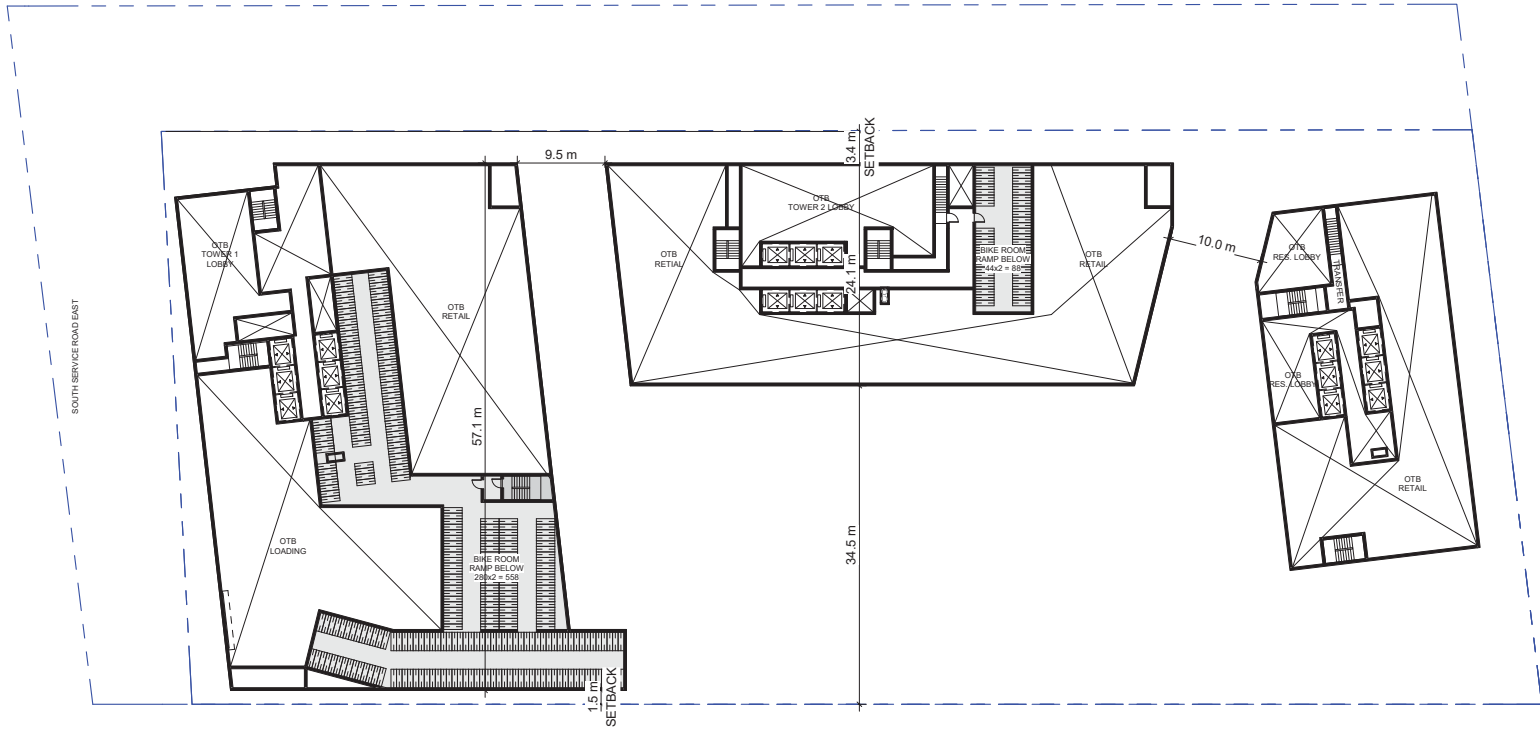
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DWG TITLE  
**Level 1 Mezzanine**

DATE: 2022-01-18  
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PRDJ. No.: 2128







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DWG TITLE  
**Levels 4-5**

DATE: 2022-01-18  
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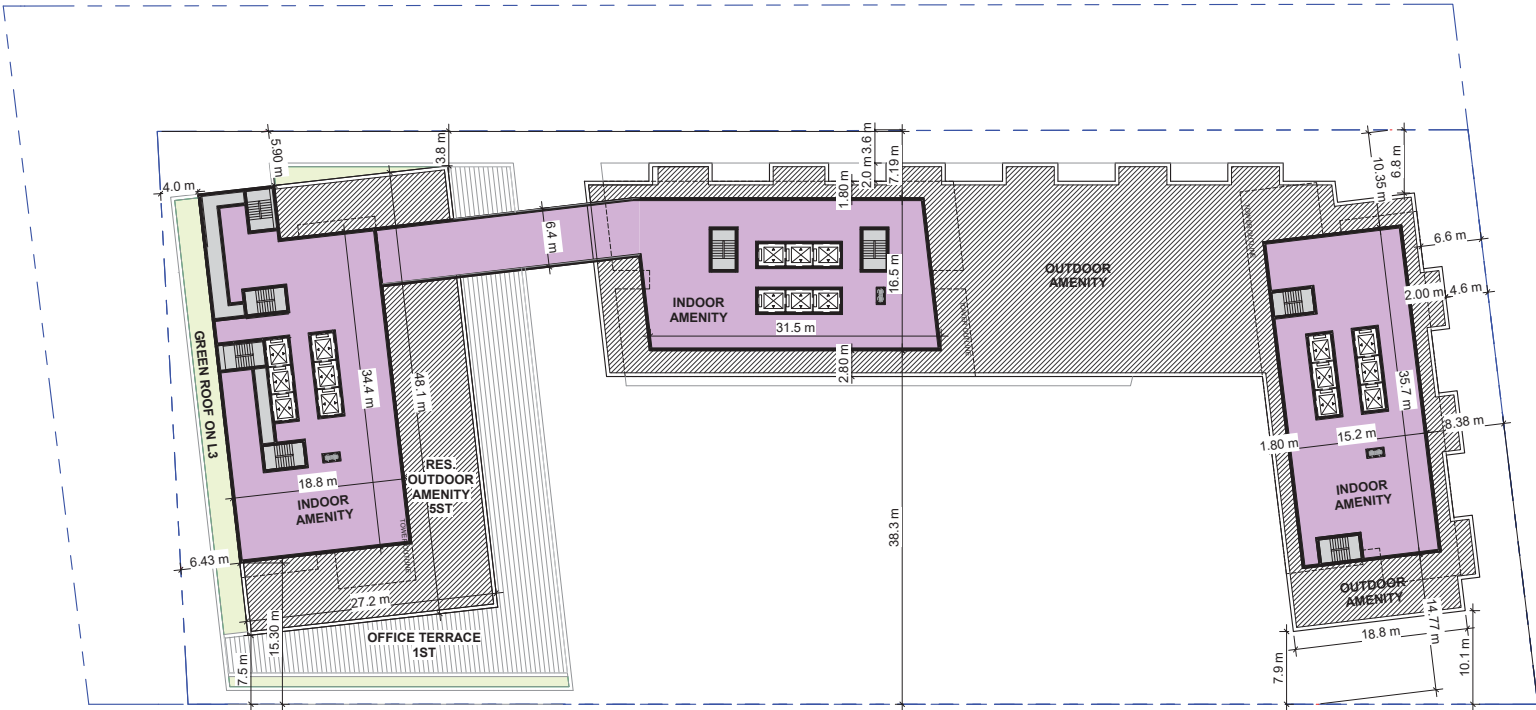
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NO.	DATE	DESCRIPTION



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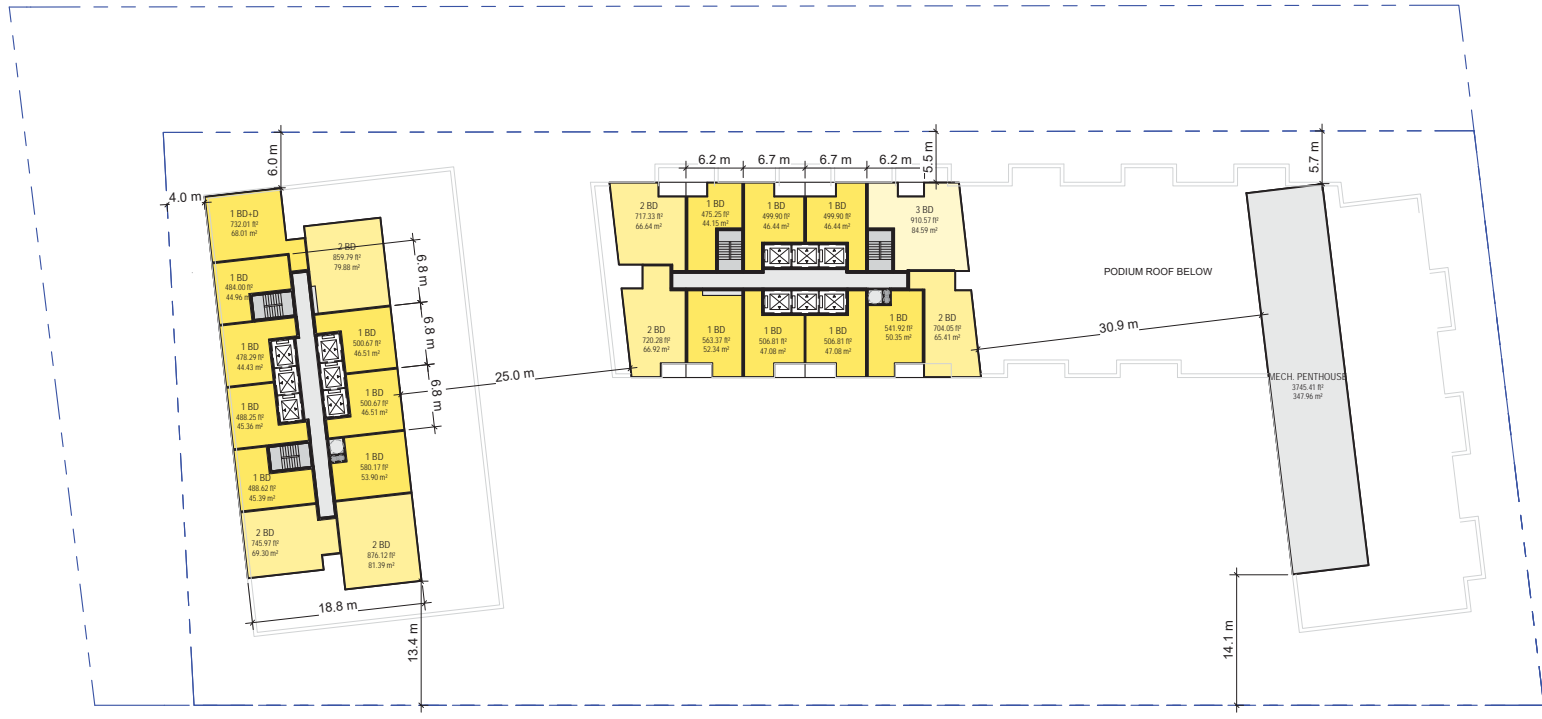
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**166 South Service Inc.**

DWG TITLE  
**Level 6 - Amenity**

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PRJ No : 2128  
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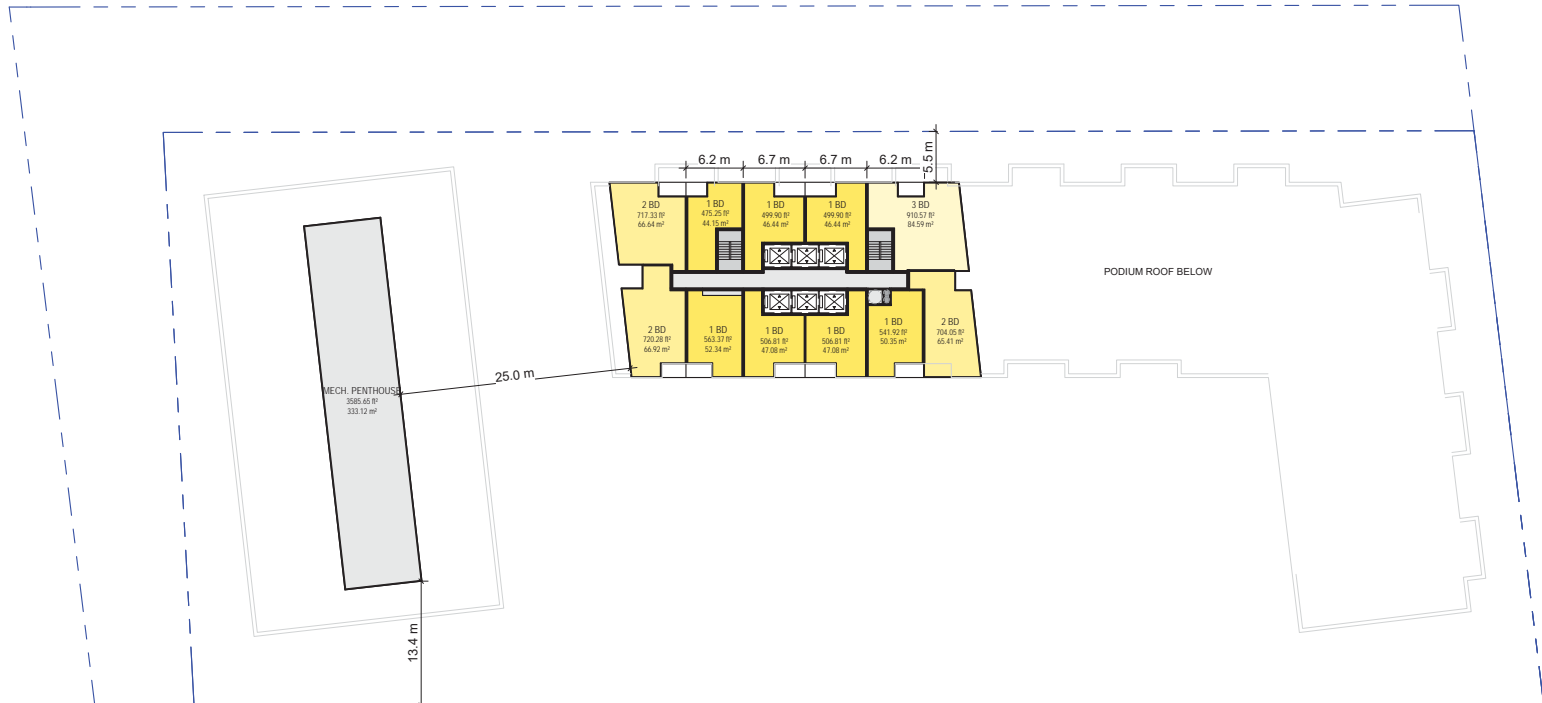
OWNER  
166 South Service Inc.

DWG TITLE  
Levels 45-50

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PRJ. No.: 2126  
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South Service Road & Trafalgar

OWNER  
**166 South Service Inc.**

DWG TITLE  
**Levels 51-58**

DATE: 2022-01-18  
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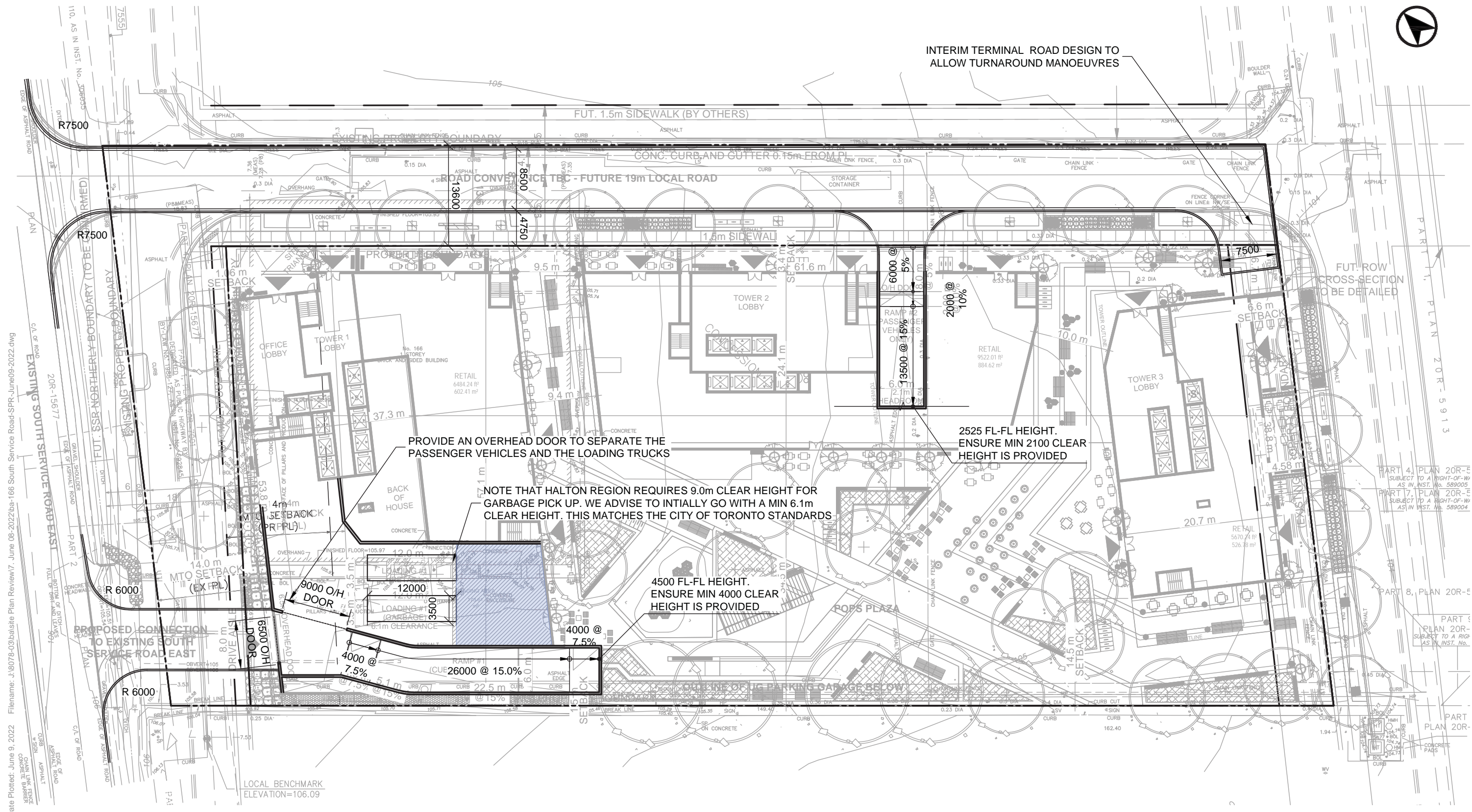
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# Appendix D

## Functional Design Drawings & Vehicle Manoeuvring Diagrams (VMDs), BA Group, June 2022





Date Plotted: June 9, 2022  
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 Date: June 9, 2022

**166 SOUTH SERVICE ROAD**  
 SITE PLAN REVIEW  
 GROUND FLOOR

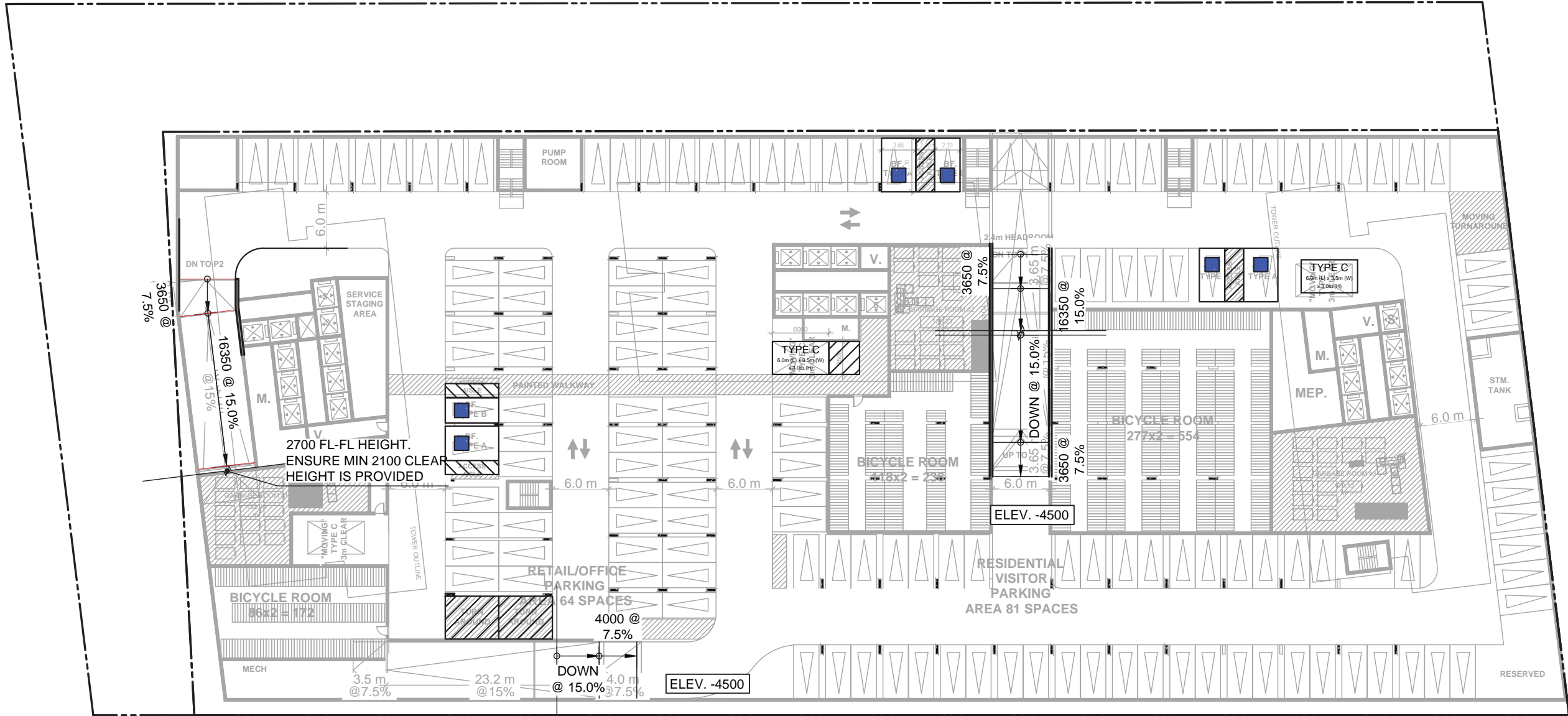


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 Project No. 8078-03  
 Date: June 09, 2022  
 Revised: --

Scale: 1:500

Drawing No. **SPR-01**

PART 4, PLAN 20R-5  
 SUBJECT TO A RIGHT-OF-WAY AS IN INST. No. 589005  
 PART 7, PLAN 20R-5  
 SUBJECT TO A RIGHT-OF-WAY AS IN INST. No. 589004  
 PART 8, PLAN 20R-5  
 PART 5, PLAN 20R-5  
 SUBJECT TO A RIGHT-OF-WAY AS IN INST. No. 589004  
 PART 1, PLAN 20R-5 913



P1 PARKING LEVEL  
143 NON-RESIDENTIAL SPACES

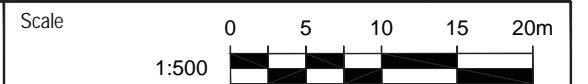
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Date Plotted: June 9, 2022



### 166 SOUTH SERVICE ROAD

SITE PLAN REVIEW  
P1 LEVEL

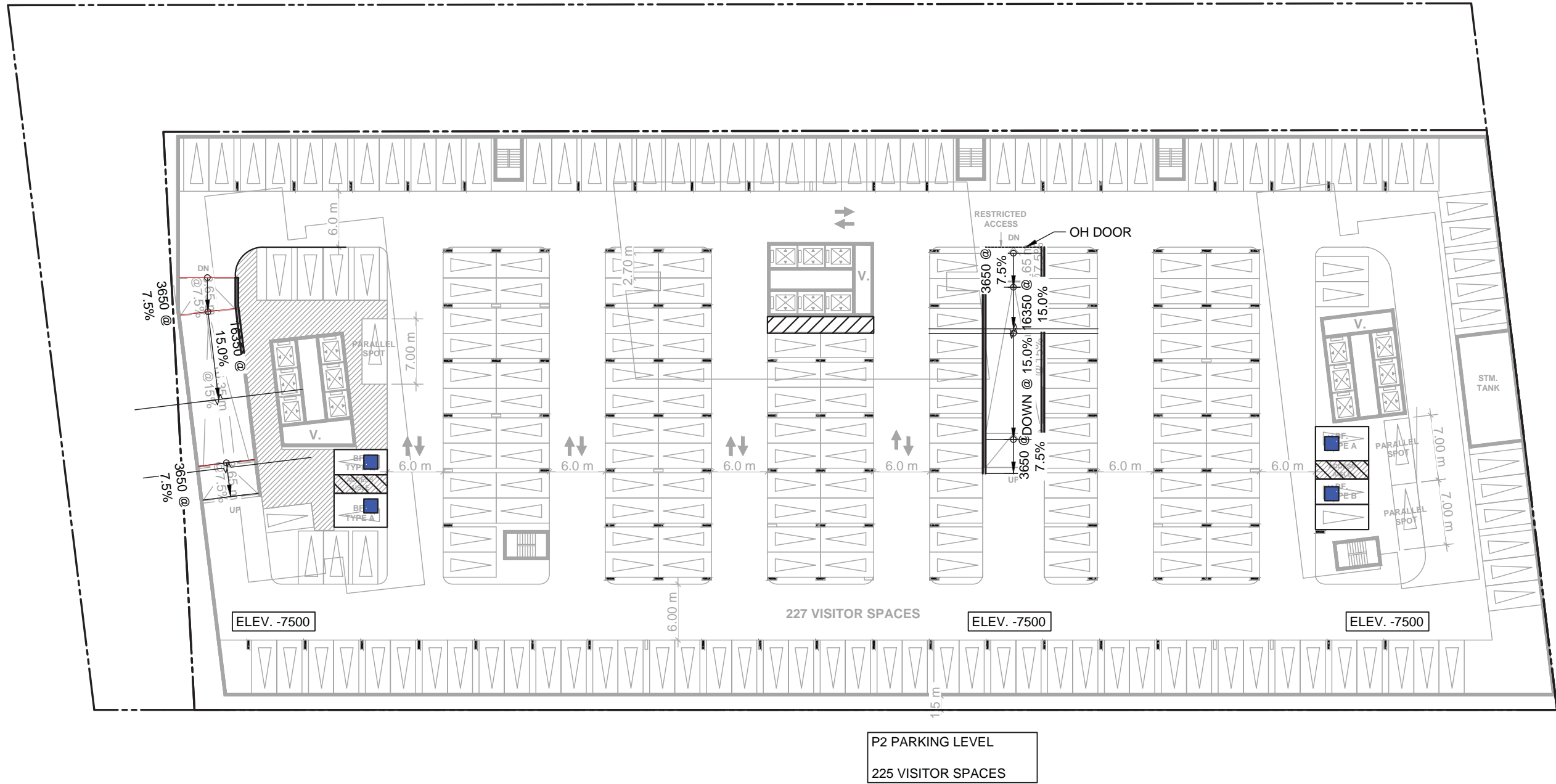
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Project No. 8078-03  
Date: June 09, 2022  
Revised: --



Drawing No. **SPR-02**

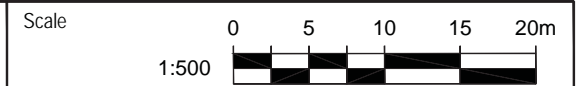


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Date Plotted: June 9, 2022



**166 SOUTH SERVICE ROAD**  
 SITE PLAN REVIEW  
 P2 LEVEL

Project: 166 SOUTH SERVICE RD  
 Project No. 8078-03  
 Date: June 09, 2022  
 Revised: --

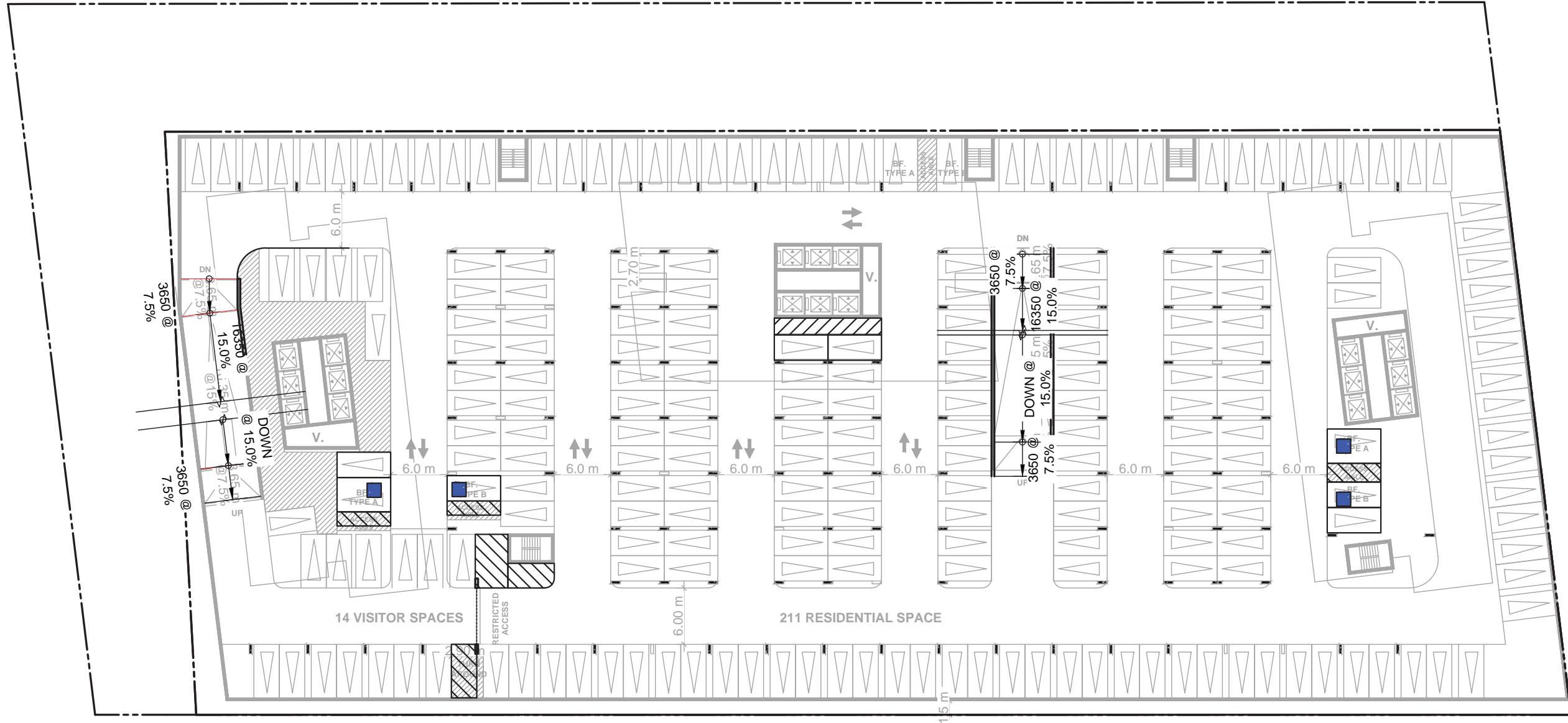


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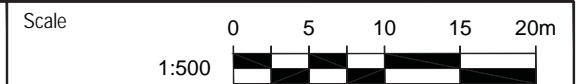


P3 PARKING LEVEL  
 14 VISITOR SPACES  
 211 RESIDENT SPACES

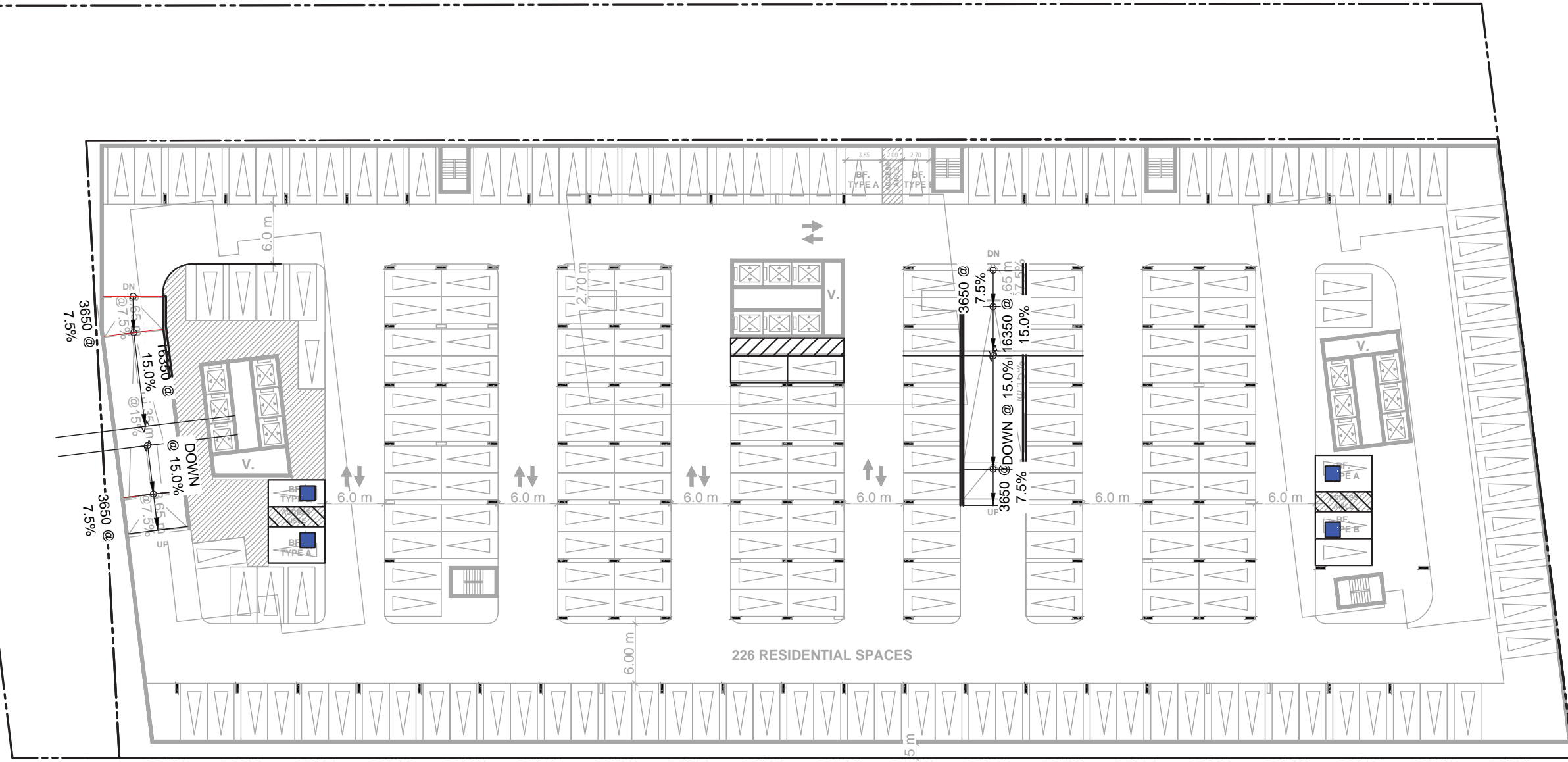


**166 SOUTH SERVICE ROAD**  
 SITE PLAN REVIEW  
 P3 LEVEL

Project: 166 SOUTH SERVICE RD  
 Project No. 8078-03  
 Date: June 09, 2022  
 Revised: --



Drawing No. **SPR-04**



P4-P5 PARKING LEVEL  
 226 RESIDENT SPACES PER LEVEL

Date Plotted: June 9, 2022  
 Filename: J:\8078-03\basite Plan Review\7. June 08-2022\ba-166 South Service Road-SPR-June09-2022.dwg



**166 SOUTH SERVICE ROAD**  
 SITE PLAN REVIEW  
 P4-P5 LEVEL

Project: 166 SOUTH SERVICE RD  
 Project No. 8078-03  
 Date: June 09, 2022  
 Revised: --

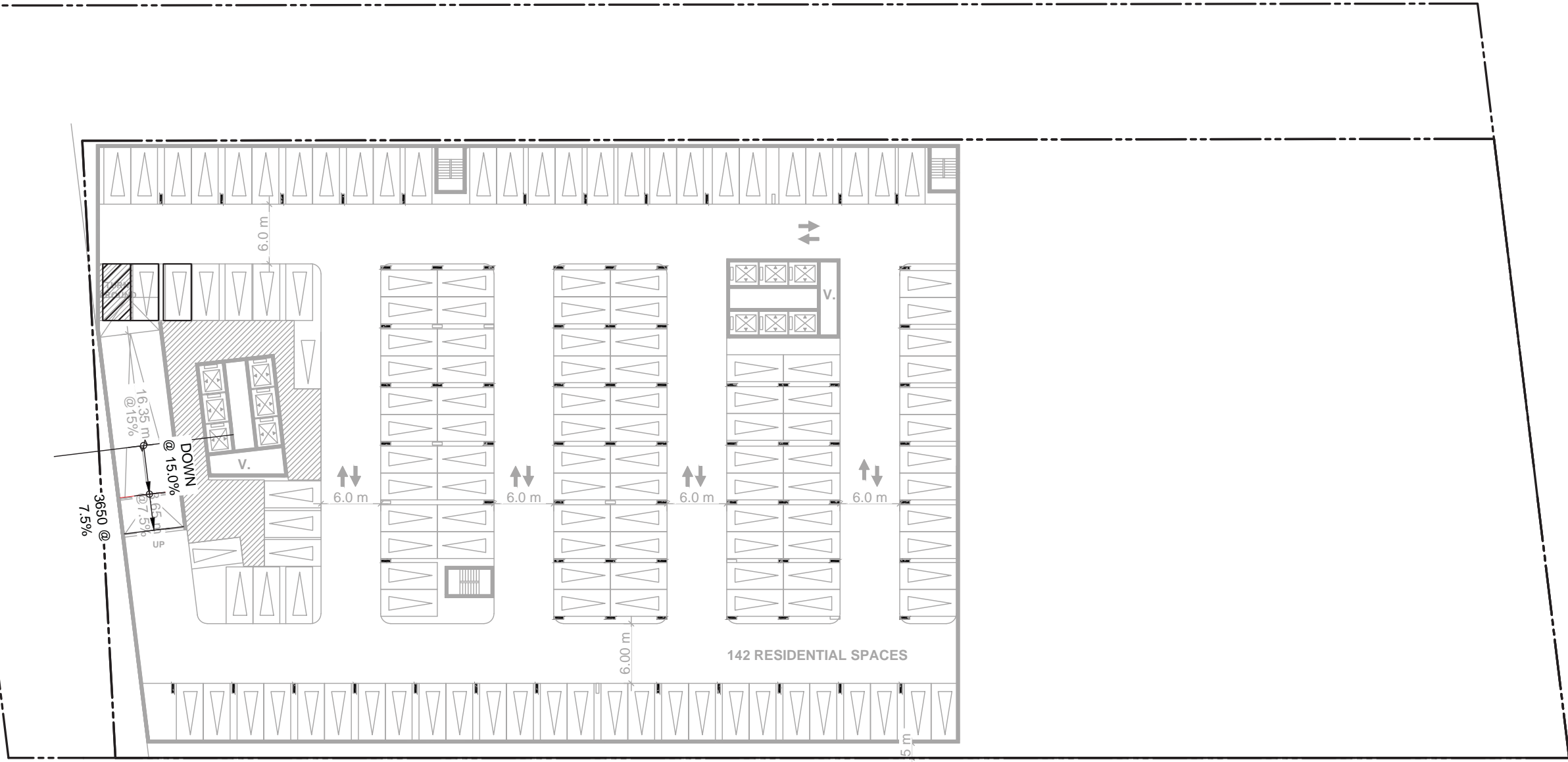
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Drawing No. **SPR-05**



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Date Plotted: June 9, 2022

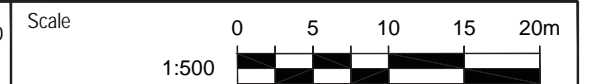


P6 PARKING LEVEL  
142 RESIDENT SPACES

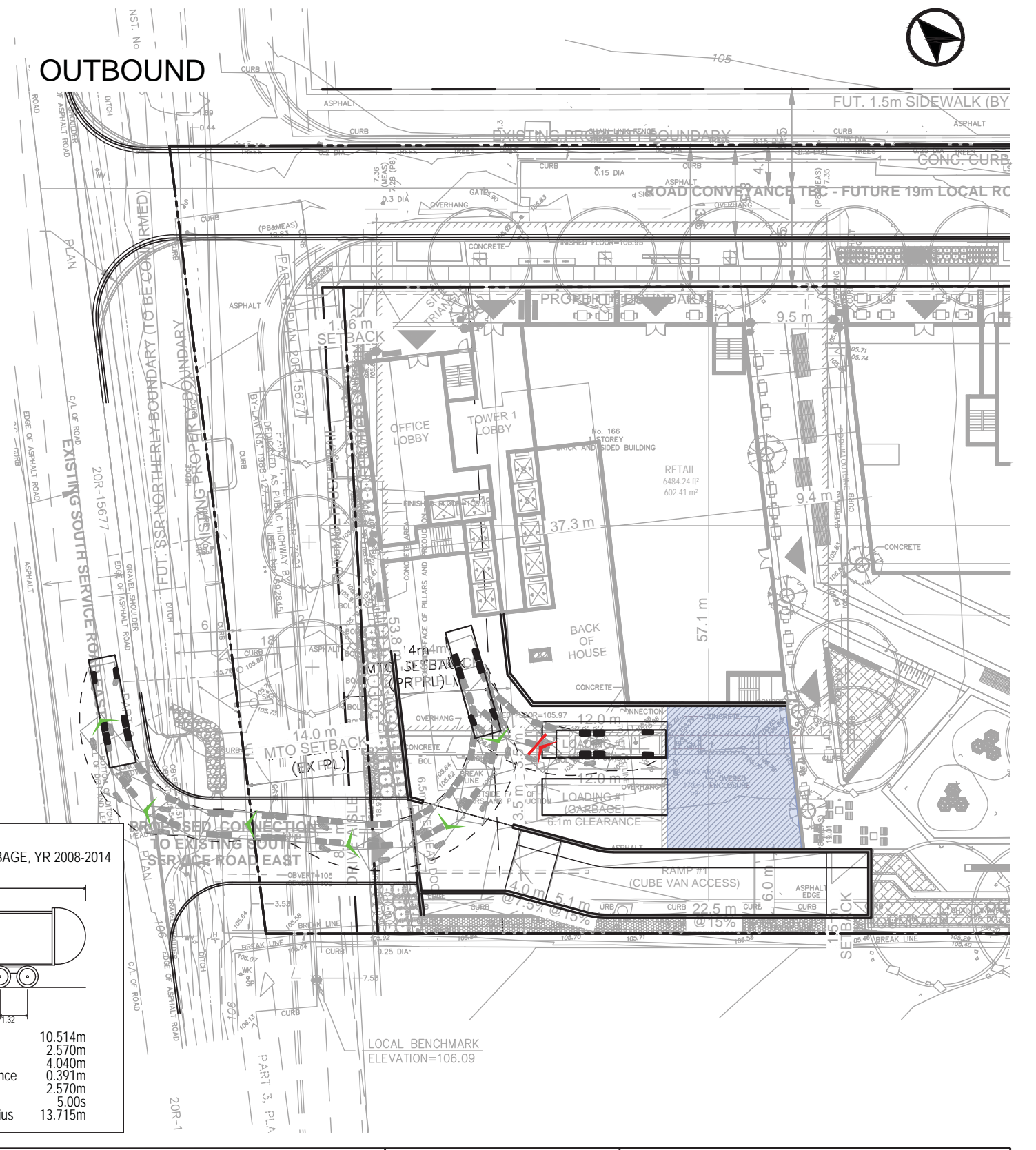
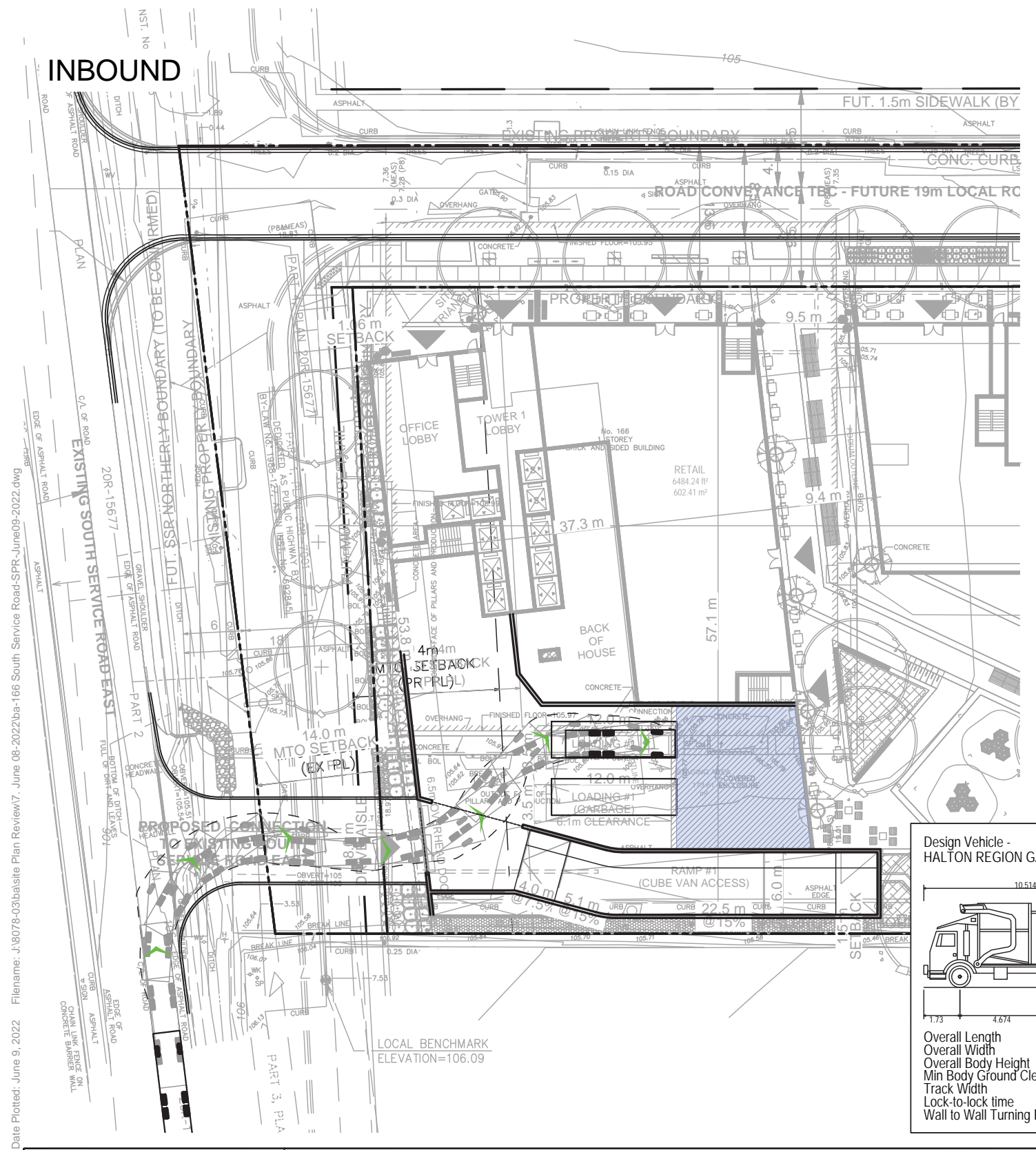


166 SOUTH SERVICE ROAD  
SITE PLAN REVIEW  
P6 LEVEL

Project: 166 SOUTH SERVICE RD  
Project No. 8078-03  
Date: June 09, 2022  
Revised: --



Drawing No. SPR-06



**Design Vehicle - HALTON REGION GARBAGE, YR 2008-2014**

Overall Length	10.514m
Overall Width	2.570m
Overall Body Height	4.040m
Min Body Ground Clearance	0.391m
Track Width	2.570m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	13.715m

Date Plotted: June 9, 2022 File name: J:\8078-03\basite Plan Review\7. June 08-2022\ba-166 South Service Road-SPR-June09-2022.dwg



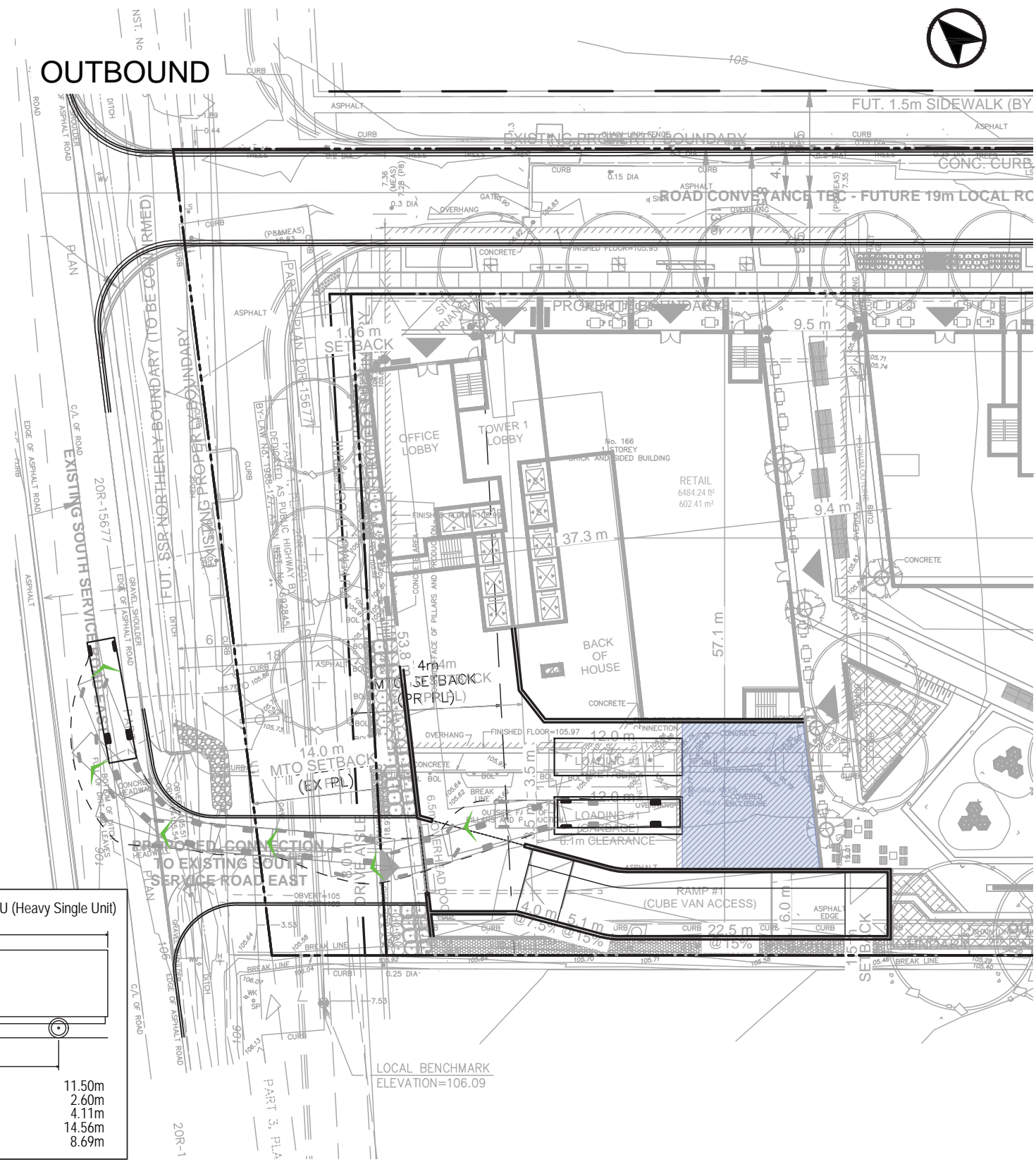
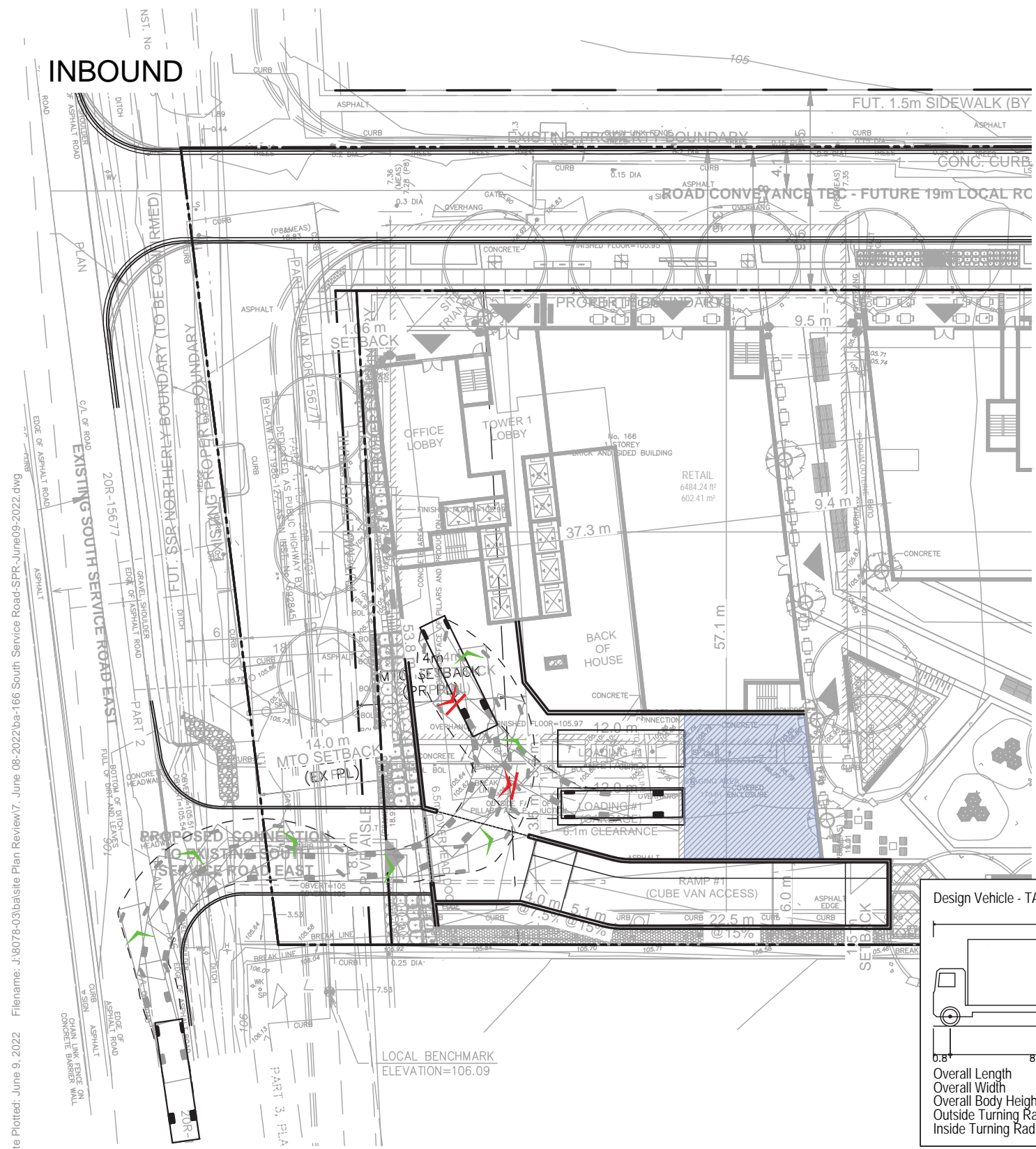
**166 SOUTH SERVICE ROAD  
VEHICLE MANOEUVRING DIAGRAM  
HALTON REGION GARBAGE TRUCK**

Project: 166 SOUTH SERVICE RD  
Project No. 8078-03  
Date: June 09, 2022  
Revised: --

Scale: 1:500

Drawing No. **VMD-01**





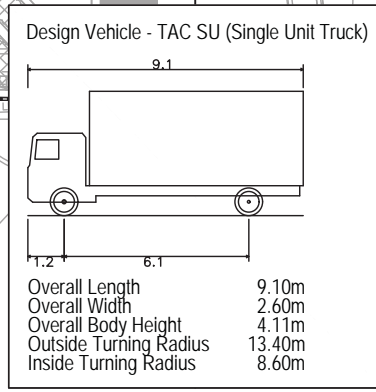
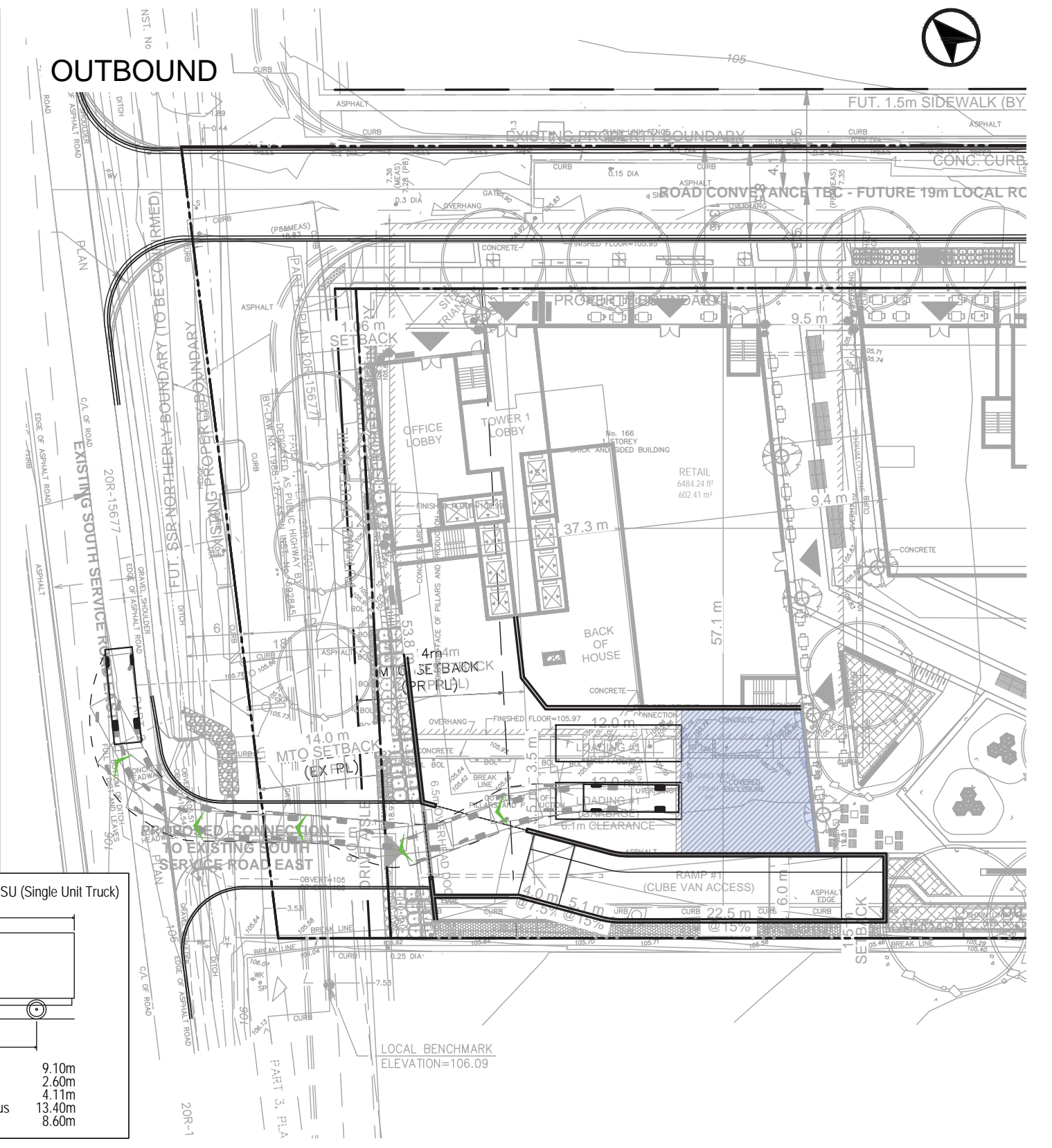
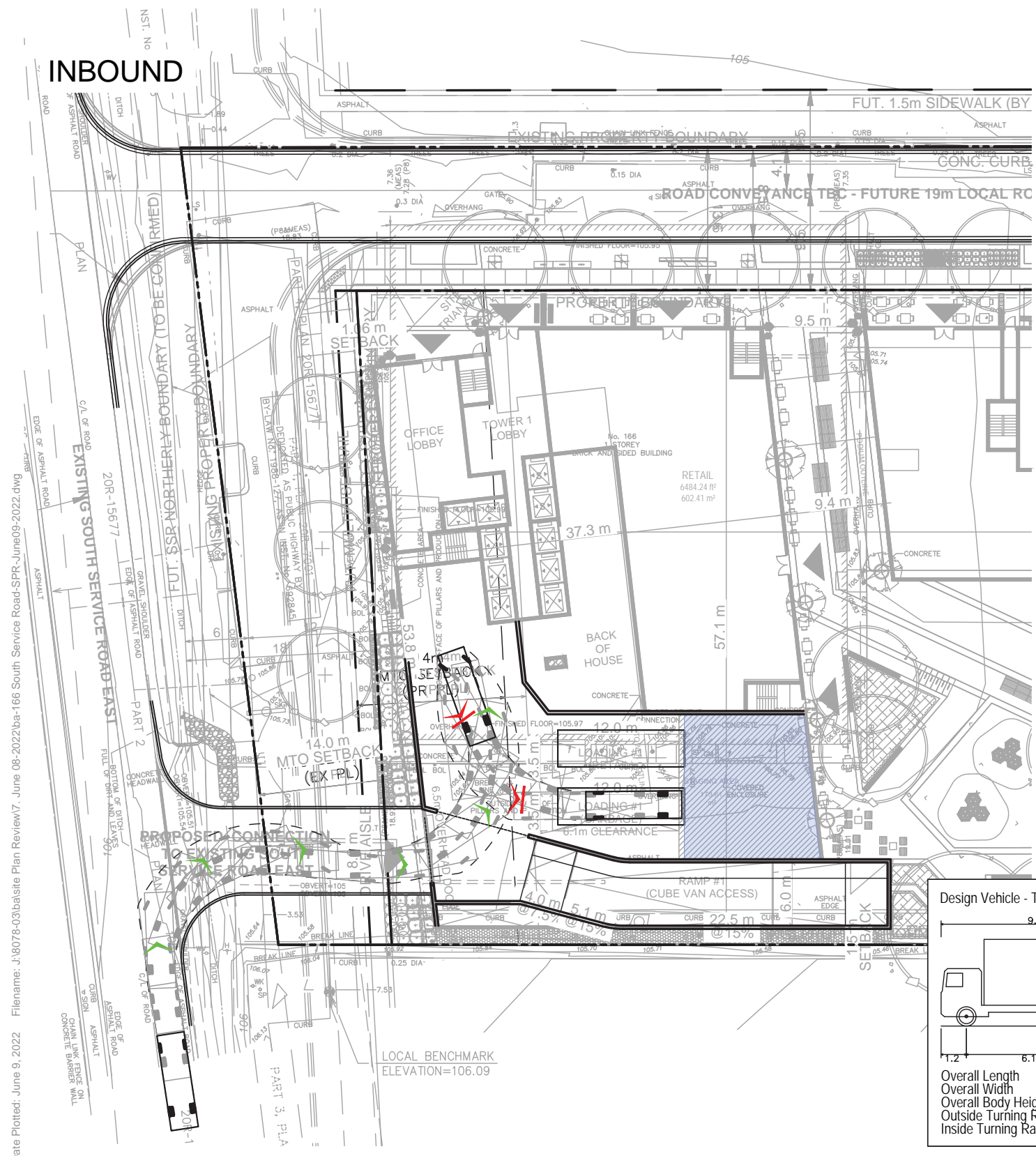
**166 SOUTH SERVICE ROAD  
VEHICLE MANOEUVRING DIAGRAM  
HEAVY SINGLE UNIT TRUCK**

Project: 166 SOUTH SERVICE RD  
Project No. 8078-03  
Date: June 09, 2022  
Revised: --

Scale: 1:500

Drawing No. **VMD-02**

Date Plotted: June 9, 2022 File Name: J:\8078-03\basite Plan Review\7. June 08-2022\ba-166 South Service Road-SPR-June09-2022.dwg



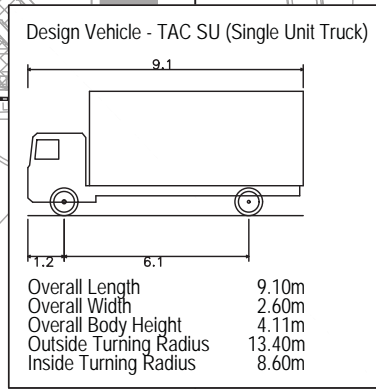
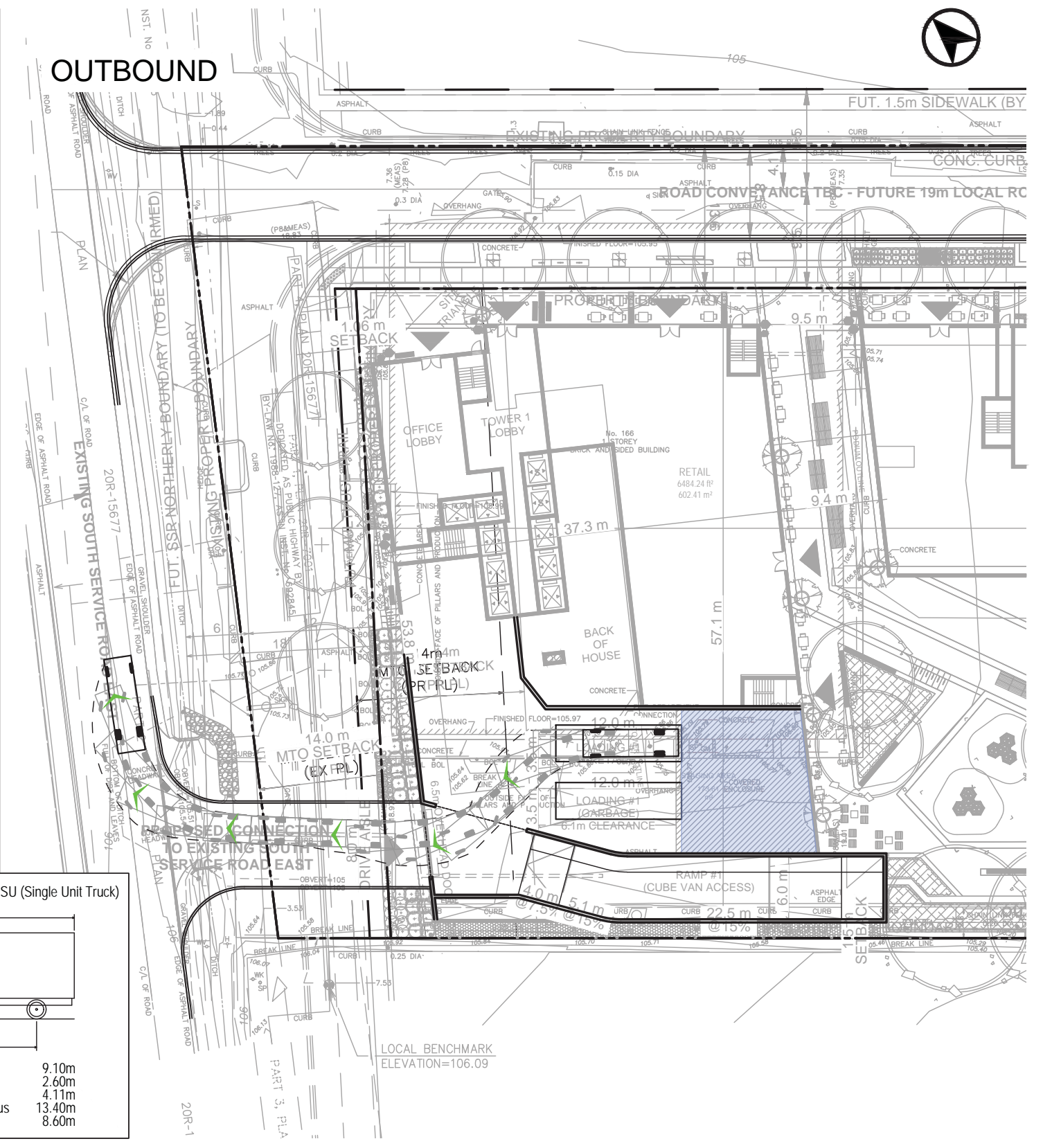
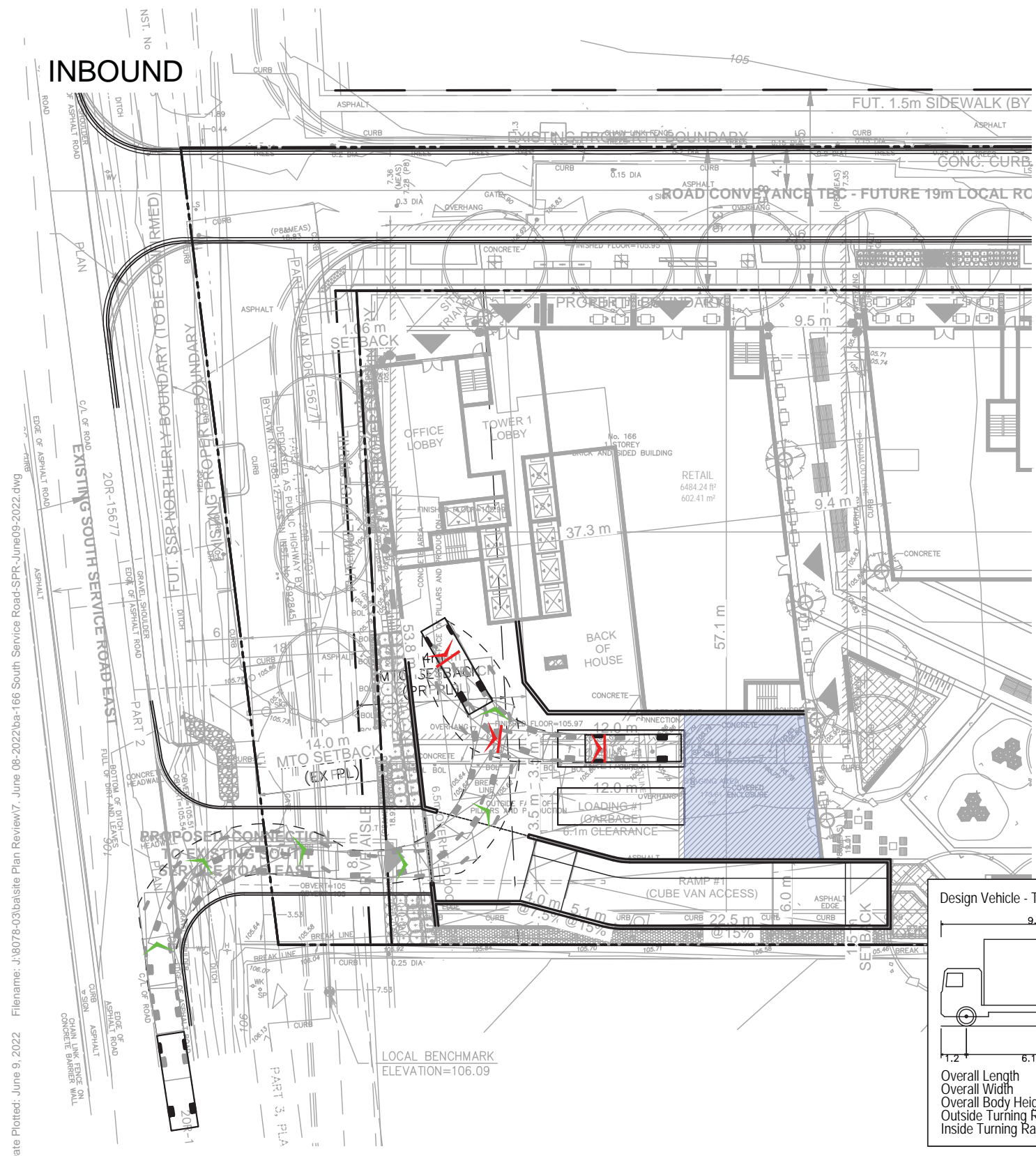
**166 SOUTH SERVICE ROAD  
VEHICLE MANOEUVRING DIAGRAM  
SINGLE UNIT TRUCK**

Project: 166 SOUTH SERVICE RD  
Project No. 8078-03  
Date: June 09, 2022  
Revised: --

Scale: 1:500

Drawing No. **VMD-03**

Date Plotted: June 9, 2022 File name: J:\8078-03\basite Plan Review\7. June 08-2022\ba-166 South Service Road-SPR-June09-2022.dwg



**166 SOUTH SERVICE ROAD**  
**VEHICLE MANOEUVRING DIAGRAM**  
**SINGLE UNIT TRUCK**

Project: 166 SOUTH SERVICE RD  
 Project No. 8078-03  
 Date: June 09, 2022  
 Revised: --

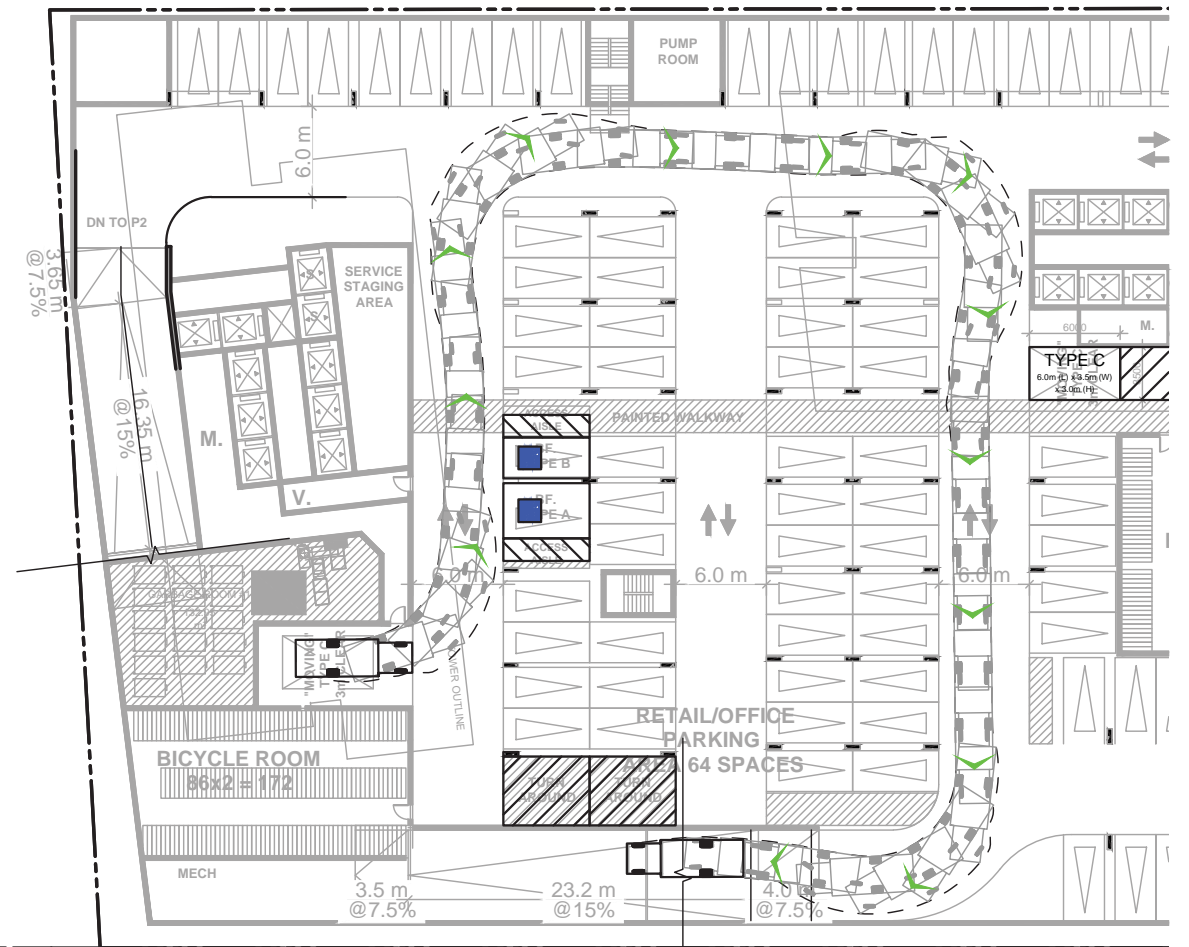
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Drawing No. **VMD-04**

Date Plotted: June 9, 2022 File name: J:\8078-03\basite Plan Review\7. June 08-2022\ba-166 South Service Road-SPR-June09-2022.dwg

INBOUND

OUTBOUND



Design Vehicle - CUBEVAN (Ford E350)

Overall Length	7.70m
Overall Width	2.45m
Overall Body Height	3.66m
Outside Turning Radius	9.49m
Inside Turning Radius	5.68m

Date Plotted: June 9, 2022  
Filename: J:\8078-03\basite Plan Review\7. June 08-2022\ba-166 South Service Road-SPR-June09-2022.dwg



**166 SOUTH SERVICE ROAD**  
**VEHICLE MANOEUVRING DIAGRAM**  
**CUBE VAN**

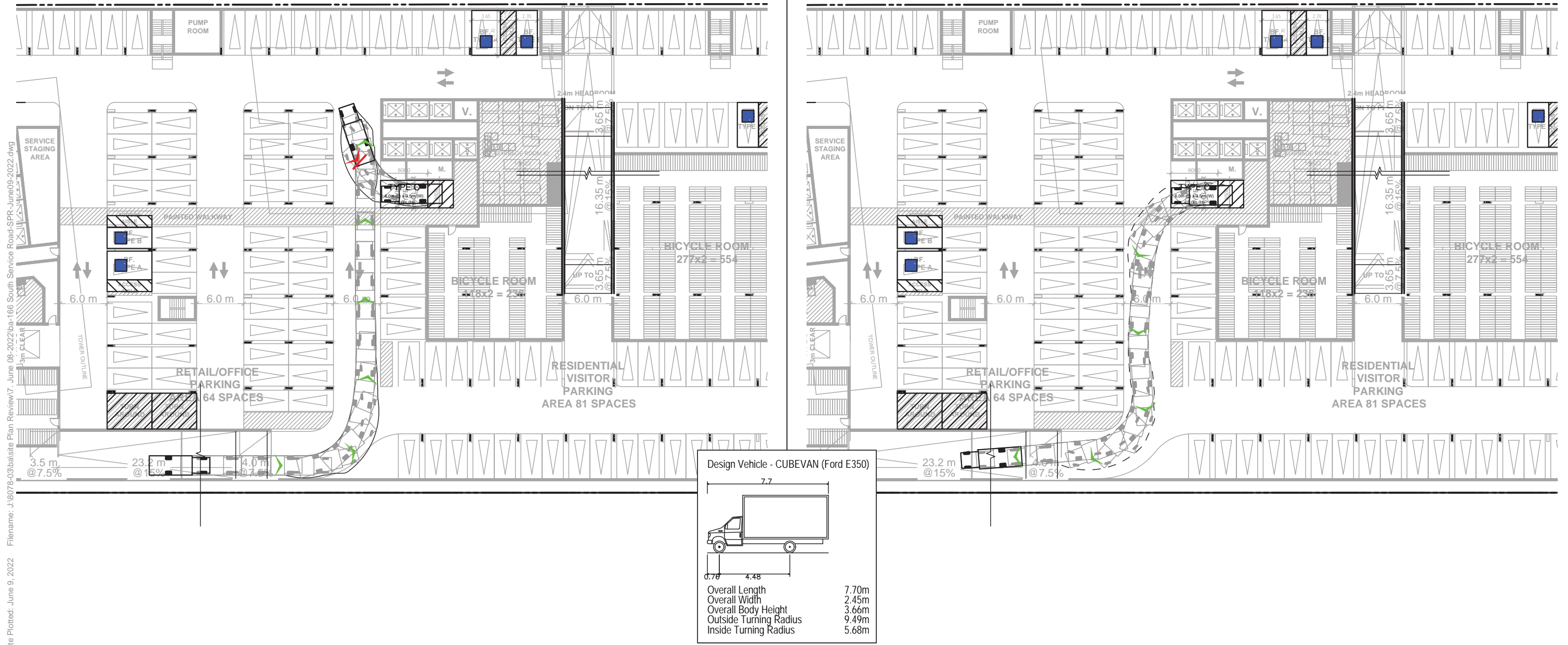
Project: 166 SOUTH SERVICE RD  
 Project No. 8078-03  
 Date: June 09, 2022  
 Revised: --



Drawing No. **VMD-05**

INBOUND

OUTBOUND



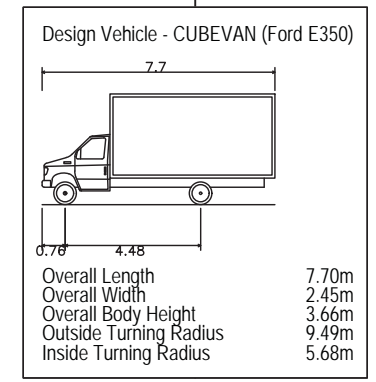
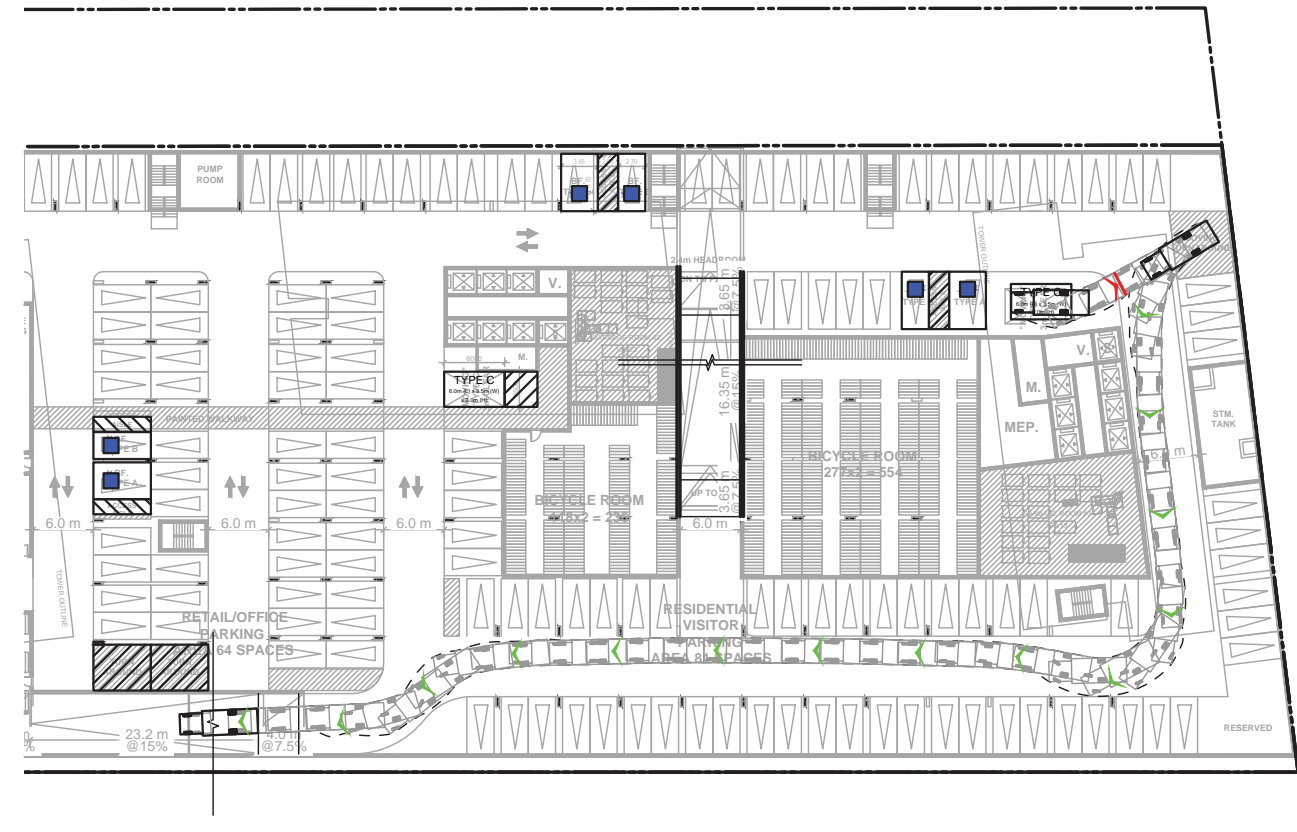
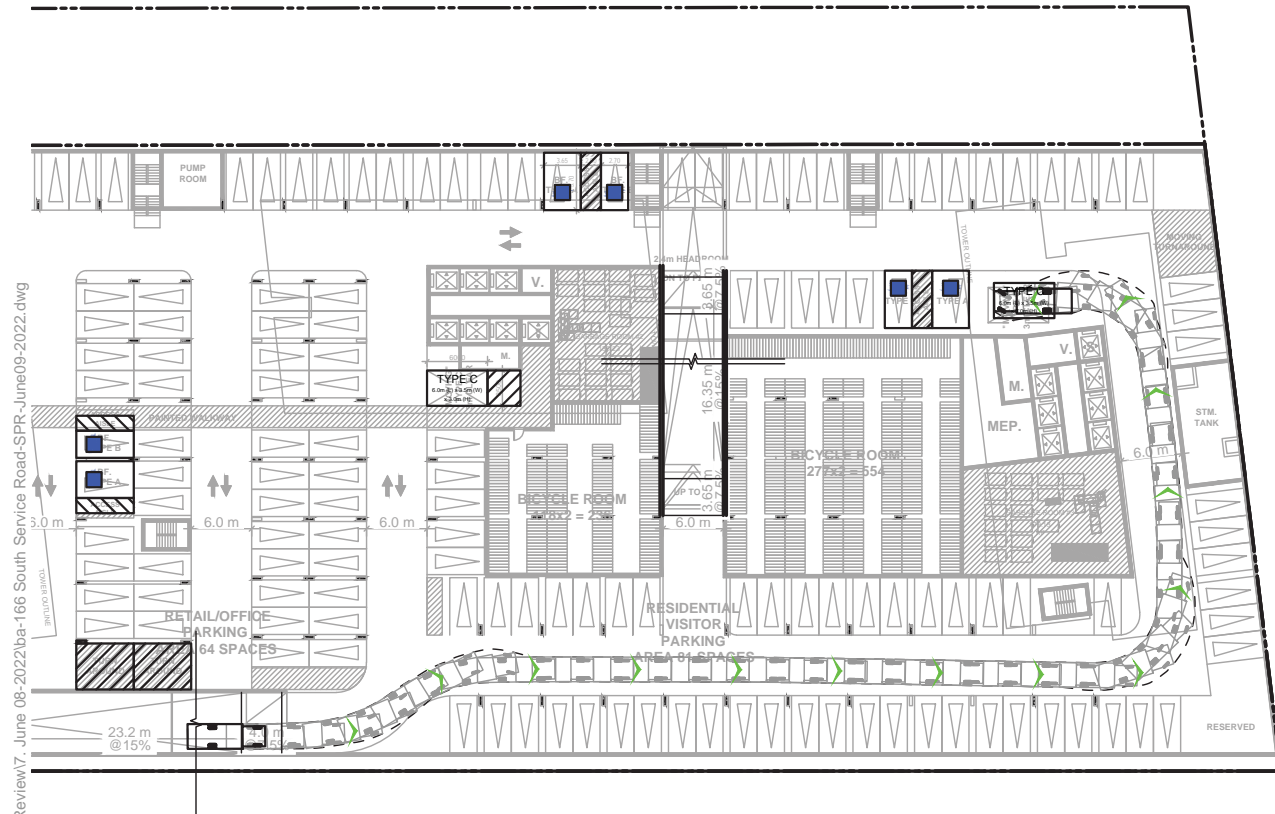
Filename: J:\8078-03\basite Plan Review\7 - June 08-2022\ba-166 South Service Road\_SPR-June09-2022.dwg  
 Date Plotted: June 9, 2022

	<p><b>166 SOUTH SERVICE ROAD</b>                  VEHICLE MANOEUVRING DIAGRAM                  CUBE VAN</p>	Project: 166 SOUTH SERVICE RD	Scale
		Project No. 8078-03	0 5 10 15 20m 1:500
		Date: June 09, 2022	Drawing No.
		Revised: --	<b>VMD-06</b>



**INBOUND**


**OUTBOUND**



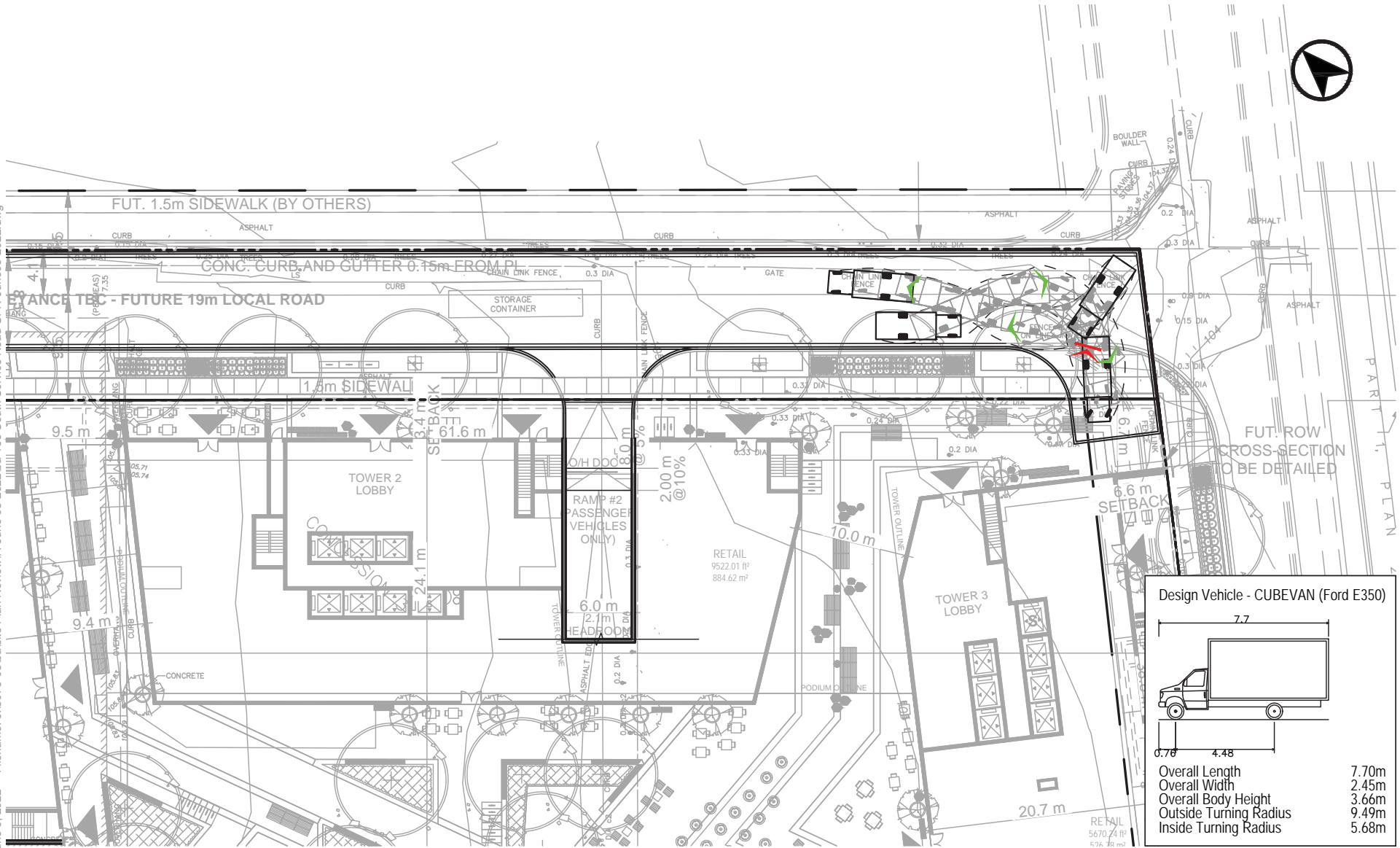
Date Plotted: June 9, 2022  
Filename: J:\8078-03\ba\ba166\ba166 South Service Road-SPR-June09-2022.dwg



**166 SOUTH SERVICE ROAD  
VEHICLE MANOEUVRING DIAGRAM  
CUBE VAN**

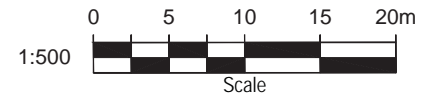
Project: 166 SOUTH SERVICE RD Project No: 8078-03 Date: June 09, 2022 Revised: --	Scale 1:750 
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Date Plotted: June 9, 2022  
 Filename: J:\00\8-03\03\03\166 South Service Road-SPK-June09-2022.dwg



**Design Vehicle - CUBEVAN (Ford E350)**

Overall Length	7.70m
Overall Width	2.45m
Overall Body Height	3.66m
Outside Turning Radius	9.49m
Inside Turning Radius	5.68m



## 166 SOUTH SERVICE ROAD VEHICLE MANOEUVRING DIAGRAM CUBE VAN

Project:	166 SOUTH SERV RD
Project No.	8078-03
Date:	June 09, 2022
Revised:	--
Drawing No.	<b>VMD-08</b>

# Appendix E

## ITE Internal Capture Calculations





NCHRP 8-51 Internal Trip Capture Estimation Tool			
<b>Project Name:</b>	210590 - 166 South Service Rd	<b>Organization:</b>	Paradigm Transportation Solutions Limited
<b>Project Location:</b>	Oakville, ON	<b>Performed By:</b>	
<b>Scenario Description:</b>		<b>Date:</b>	
<b>Analysis Year:</b>	Site Generated Traffic	<b>Checked By:</b>	
<b>Analysis Period:</b>	AM Street Peak Hour	<b>Date:</b>	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs <sup>1</sup>	Quantity	Units	Total	Entering	Exiting
Office	710	41,683	Square Feet	63	55	8
Retail	820	21,676	Square Feet	51	31	20
Restaurant	-	-	-	0		
Cinema/Entertainment	-	-	-	0		
Residential	222	1,606	Dwelling Units	353	39	314
Hotel				0		
All Other Land Uses <sup>2</sup>	-	-	-	0		
<b>Total</b>				<b>467</b>	<b>125</b>	<b>342</b>

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

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

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	0	0	0	0
Retail	2		0	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	3	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	467	125	342
Internal Capture Percentage	4%	8%	3%
External Vehicle-Trips <sup>3</sup>	447	115	332
External Transit-Trips <sup>4</sup>	0	0	0
External Non-Motorized Trips <sup>4</sup>	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	7%	25%
Retail	16%	15%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	3%	2%
Hotel	N/A	N/A

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

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

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

<sup>4</sup>Person-Trips

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

*Estimation Tool Developed by the Texas Transportation Institute*

<b>Project Name:</b>	210590 - 166 South Service Rd
<b>Analysis Period:</b>	AM Street Peak Hour

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	55	55	1.00	8	8
Retail	1.00	31	31	1.00	20	20
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	39	39	1.00	314	314
Hotel	1.00	0	0	1.00	0	0

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	5	0	0	0
Retail	6		3	0	3	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	6	3	63	0		0
Hotel	0	0	0	0	0	

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		10	0	0	0	0
Retail	2		0	0	1	0
Restaurant	8	2		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	5	0	0		0
Hotel	2	1	0	0	0	

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	4	51	55	51	0	0
Retail	5	26	31	26	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	38	39	38	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	2	6	8	6	0	0
Retail	3	17	20	17	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	5	309	314	309	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

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

NCHRP 8-51 Internal Trip Capture Estimation Tool			
<b>Project Name:</b>	210590 - 166 South Service Rd	<b>Organization:</b>	Paradigm Transportation Solutions Limited
<b>Project Location:</b>	Oakville, ON	<b>Performed By:</b>	
<b>Scenario Description:</b>		<b>Date:</b>	
<b>Analysis Year:</b>	Site Generated Traffic	<b>Checked By:</b>	
<b>Analysis Period:</b>	PM Street Peak Hour	<b>Date:</b>	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs <sup>1</sup>	Quantity	Units	Total	Entering	Exiting
Office	710	41,683	Square Feet	60	10	50
Retail	820	21,676	Square Feet	144	72	72
Restaurant	-	-	-	0		
Cinema/Entertainment	-	-	-	0		
Residential	222	1,606	Dwelling Units	305	210	95
Hotel				0		
All Other Land Uses <sup>2</sup>	-	-	-	0		
<b>Total</b>				<b>509</b>	<b>292</b>	<b>217</b>

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

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

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		6	0	0	1	0
Retail	1		0	0	19	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	4	7	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	509	292	217
Internal Capture Percentage	15%	13%	18%
External Vehicle-Trips <sup>3</sup>	433	254	179
External Transit-Trips <sup>4</sup>	0	0	0
External Non-Motorized Trips <sup>4</sup>	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	50%	14%
Retail	18%	28%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	10%	12%
Hotel	N/A	N/A

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

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

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

<sup>4</sup>Person-Trips

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

*Estimation Tool Developed by the Texas Transportation Institute*

<b>Project Name:</b>	210590 - 166 South Service Rd
<b>Analysis Period:</b>	PM Street Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	10	10	1.00	50	50
Retail	1.00	72	72	1.00	72	72
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	210	210	1.00	95	95
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		10	2	0	1	0
Retail	1		21	3	19	4
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	4	40	20	0		3
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		6	0	0	8	0
Retail	3		0	0	97	0
Restaurant	3	36		0	34	0
Cinema/Entertainment	1	3	0		8	0
Residential	6	7	0	0		0
Hotel	0	1	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	5	5	10	5	0	0
Retail	13	59	72	59	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	20	190	210	190	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	7	43	50	43	0	0
Retail	20	52	72	52	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	11	84	95	84	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

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

<sup>2</sup>Person-Trips

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

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

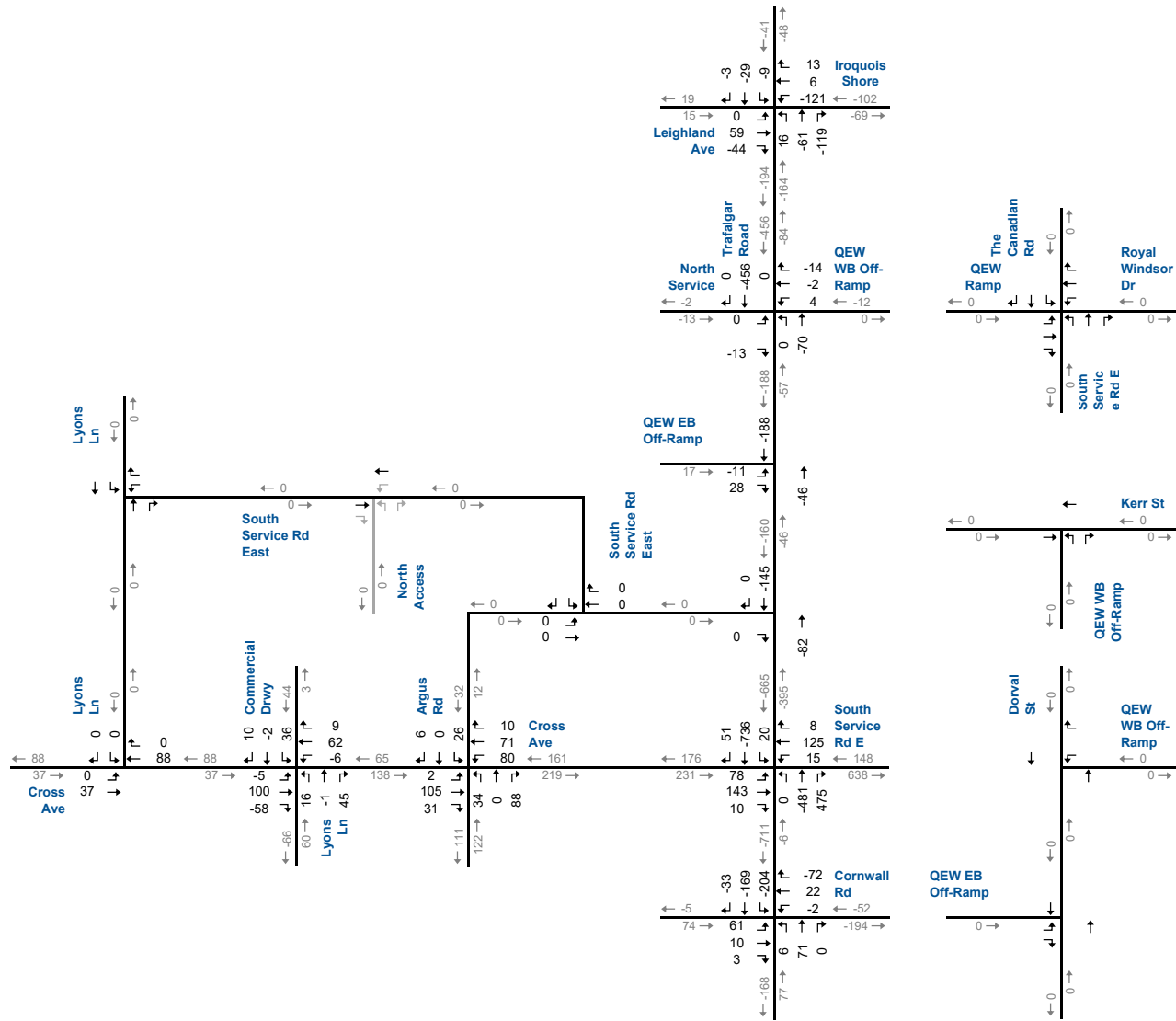
# Appendix F

## Midtown Oakville Background Traffic



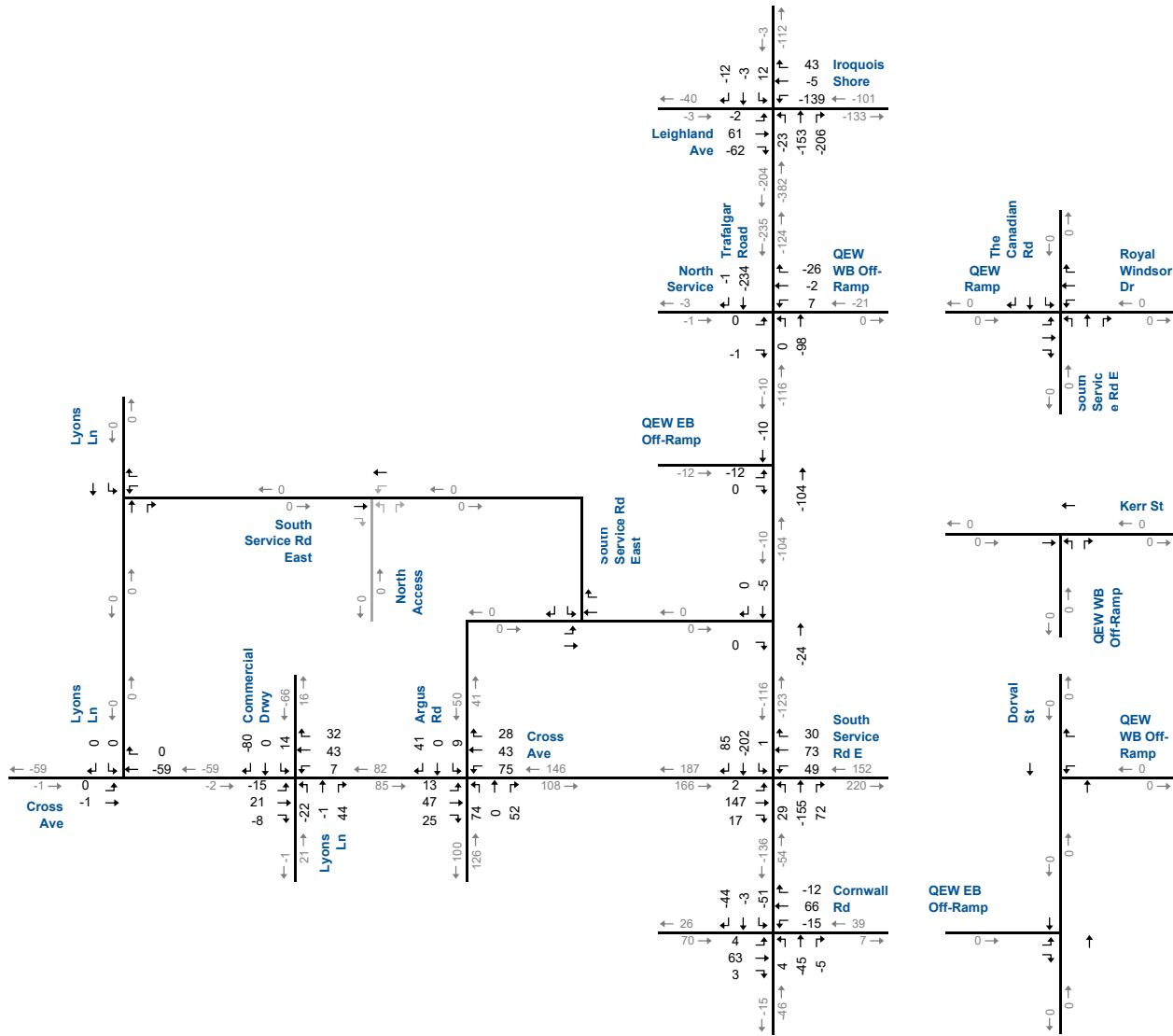


# MOEA Traffic Volumes (20%) AM Peak Hour



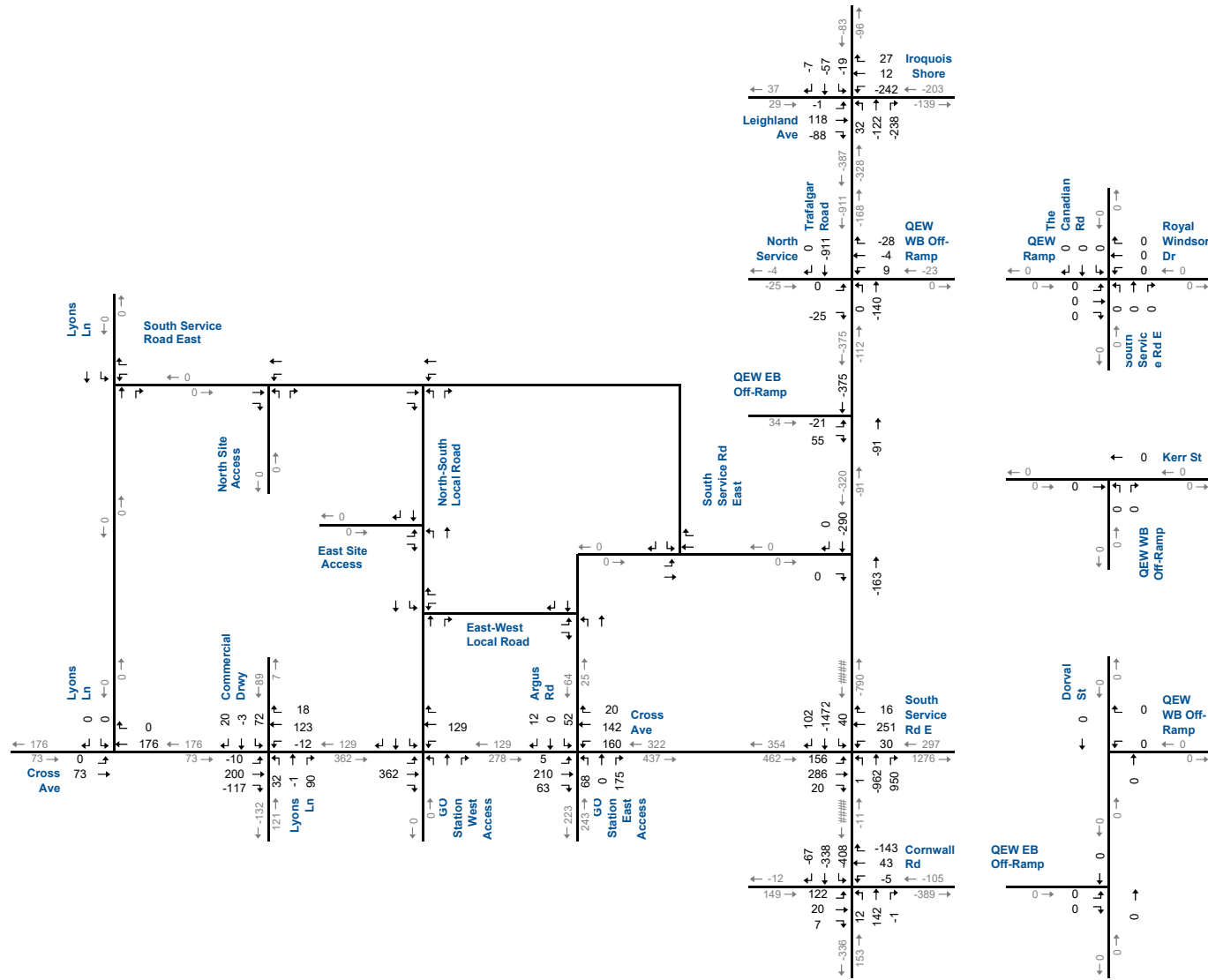


# MOEA Traffic Volumes (20%) PM Peak Hour





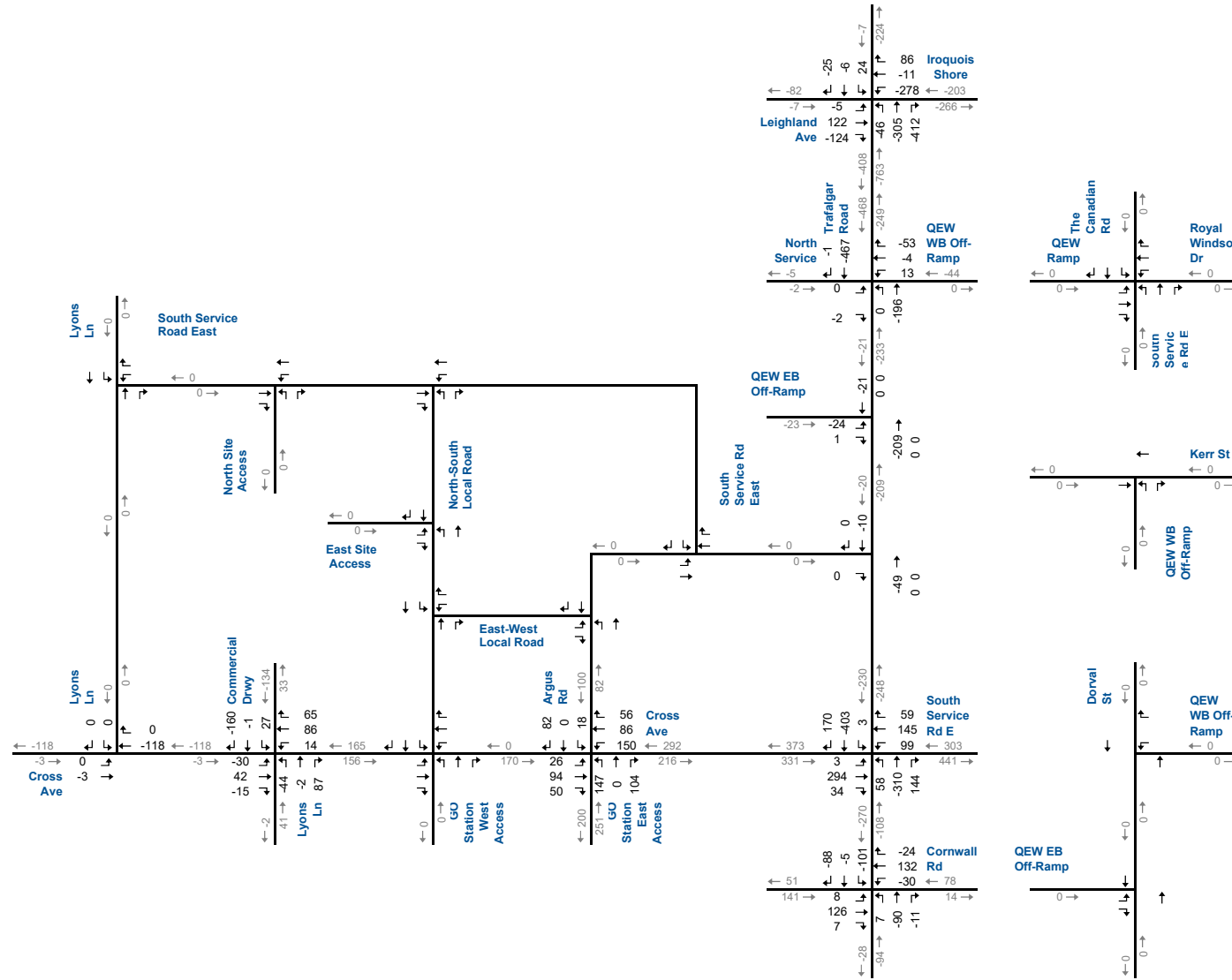
# MOEA Traffic Volumes (40%) AM Peak Hour







166 South Service Road East, Oakville  
210590



## MOEA Traffic Volumes (40%) PM Peak Hour

### Appendix F4

# Appendix G

## Synchro Analysis



Lanes, Volumes, Timings

101: Trafalgar Rd & Cross Ave/South Service Rd

Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	409	85	118	44	88	126	118	1227	56	270	1401	434
Future Volume (vph)	409	85	118	44	88	126	118	1227	56	270	1401	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0	0.0	25.0	0.0	50.0	0.0	25.0	0.0	25.0	0.0	25.0	0.0
Storage Lanes	1	0	1	1	1	1	1	0	1	1	1	0
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91	0.91
Ped Bike Factor	1.00	0.99		0.99		0.99		0.99		0.99		0.99
Frt	0.906					0.850		0.993				0.964
Fit Protected	0.950			0.950		0.950		0.950		0.950		
Satd. Flow (prot)	2795	1393	0	1525	1583	1382	1428	4460	0	1525	4323	0
Fit Permitted	0.950			0.561		0.085		0.078		0.078		
Satd. Flow (perm)	2789	1393	0	895	1583	1362	128	4460	0	125	4323	0
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)		58				179		6			73	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		151.2			330.4			150.2			270.2	
Travel Time (s)		10.9			23.8			10.8			19.5	
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Peak Hour Factor	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Adj. Flow (vph)	470	110	184	57	114	164	146	1394	70	321	1668	523
Shared Lane Traffic (%)												
Lane Group Flow (vph)	470	294	0	57	114	164	146	1464	0	321	2191	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Thru	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

101: Trafalgar Rd & Cross Ave/South Service Rd

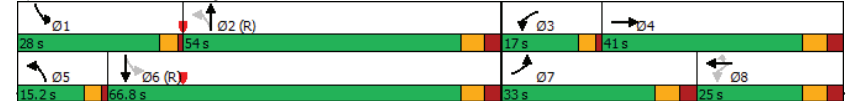
Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phases	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		12.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		17.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	33.0	41.0		17.0	25.0	25.0	15.2	54.0		28.0	66.8	
Total Split (%)	23.6%	29.3%		12.1%	17.9%	17.9%	10.9%	38.6%		20.0%	47.7%	
Maximum Green (s)	26.0	34.0		13.0	18.0	18.0	11.2	47.0		24.0	59.8	
Yellow Time (s)	4.0	4.0		3.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		1.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	Min	C-Max		Min	C-Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	28.2	34.4		30.4	18.3	18.3	62.7	50.3		81.5	65.0	
Actuated g/C Ratio	0.20	0.25		0.22	0.13	0.13	0.45	0.36		0.58	0.46	
v/c Ratio	0.83	0.76		0.23	0.55	0.49	0.85	0.91		0.93	1.07	
Control Delay	67.5	52.1		32.4	66.9	10.8	44.0	49.4		57.1	76.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	67.5	52.1		32.4	66.9	10.8	44.0	49.4		57.1	76.1	
LOS	E	D		C	E	B	D	D		E	E	
Approach Delay		61.6			33.6			48.9			73.6	
Approach LOS		E			C			D			E	

Intersection Summary

Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	128 (91%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	140
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.07
Intersection Signal Delay:	61.7
Intersection LOS:	E
Intersection Capacity Utilization:	83.7%
ICU Level of Service:	E
Analysis Period (min):	15


Splits and Phases: 101: Trafalgar Rd & Cross Ave/South Service Rd



Queues

101: Trafalgar Rd & Cross Ave/South Service Rd

Base  
AM Peak Hour




Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	470	294	57	114	164	146	1464	321	2191
v/c Ratio	0.83	0.76	0.23	0.55	0.49	0.85	0.91	0.93	1.07
Control Delay	67.5	52.1	32.4	66.9	10.8	44.0	49.4	57.1	76.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	52.1	32.4	66.9	10.8	44.0	49.4	57.1	76.1
Queue Length 50th (m)	67.9	64.0	10.8	31.3	0.0	30.2	126.2	81.5	~259.9
Queue Length 95th (m)	85.3	77.5	17.4	43.5	7.7	m31.7	m122.0	m#82.8	m#232.5
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	578	413	258	237	356	172	1606	344	2047
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.71	0.22	0.48	0.46	0.85	0.91	0.93	1.07

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
101: Trafalgar Rd & Cross Ave/South Service Rd

Base  
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	409	85	118	44	88	126	118	1227	56	270	1401	434
Future Volume (vph)	409	85	118	44	88	126	118	1227	56	270	1401	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2795	1393		1520	1583	1362	1428	4459		1525	4324	
Flt Permitted	0.95	1.00		0.56	1.00	1.00	0.08	1.00		0.08	1.00	
Satd. Flow (perm)	2795	1393		897	1583	1362	127	4459		125	4324	
Peak-hour factor, PHF	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Adj. Flow (vph)	470	110	184	57	114	164	146	1394	70	321	1668	523
RTOR Reduction (vph)	0	44	0	0	0	143	0	4	0	0	39	0
Lane Group Flow (vph)	470	250	0	57	114	21	146	1460	0	321	2152	0
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8			8	2		6		
Actuated Green, G (s)	25.2	31.4		27.4	15.3	15.3	59.7	47.3		78.5	62.1	
Effective Green, g (s)	28.2	34.4		27.4	18.3	18.3	59.7	50.3		78.5	65.1	
Actuated g/C Ratio	0.20	0.25		0.20	0.13	0.13	0.43	0.36		0.56	0.46	
Clearance Time (s)	7.0	7.0		4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	562	342		229	206	178	169	1602		342	2010	
v/s Ratio Prot	c0.17	c0.18		0.02	0.07		0.08	0.33		c0.18	c0.50	
v/s Ratio Perm				0.03		0.02	0.29			0.34		
v/c Ratio	0.84	0.73		0.25	0.55	0.12	0.86	0.91		0.94	1.07	
Uniform Delay, d1	53.7	48.6		47.0	57.0	53.7	36.7	42.7		43.9	37.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.82	1.09		1.00	1.17	
Incremental Delay, d2	10.4	8.4		0.7	3.9	0.4	12.4	3.0		15.9	36.0	
Delay (s)	64.1	56.9		47.7	61.0	54.2	42.6	49.4		59.7	80.0	
Level of Service	E	E		D	E	D	D	D		E	E	
Approach Delay (s)		61.3			55.4			48.8			77.4	
Approach LOS		E			E			D			E	

Intersection Summary

- HCM 2000 Control Delay: 64.8
- HCM 2000 Volume to Capacity ratio: 0.98
- Actuated Cycle Length (s): 140.0
- Intersection Capacity Utilization: 83.7%
- Analysis Period (min): 15
- HCM 2000 Level of Service: E
- Sum of lost time (s): 16.0
- ICU Level of Service: E

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	31	377	14	39	585	23	20	0	48	56	16	491
Future Volume (vph)	31	377	14	39	585	23	20	0	48	56	16	491
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0	0.0	20.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	0
Taper Length (m)	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00	0.994	1.00	1.00	0.994	1.00	0.994	1.00	0.994	1.00	0.994
Frt	0.993	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994	0.994
Fit Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1570	3046	0	818	3189	0	805	734	0	1570	1386	0
Fit Permitted	0.388	0.388	0.388	0.388	0.388	0.388	0.388	0.388	0.388	0.388	0.388	0.388
Satd. Flow (perm)	641	3046	0	310	3189	0	136	734	0	1152	1386	0
Right Turn on Red		Yes		Yes		Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		8		9		410		277		277		277
Link Speed (k/h)	50	50	50	50	50	50	50	50	50	50	50	50
Link Distance (m)	374.0	374.0	374.0	374.0	374.0	374.0	374.0	374.0	374.0	374.0	374.0	374.0
Travel Time (s)	26.9	26.9	26.9	26.9	26.9	26.9	26.9	26.9	26.9	26.9	26.9	26.9
Confl. Peds. (#/hr)	1	3	3	1	3	20	20	3	20	20	3	3
Peak Hour Factor	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%
Adj. Flow (vph)	60	433	22	46	665	29	38	0	69	72	26	552
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	455	0	46	694	0	38	69	0	72	578	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24	24	24	24	24	24	24	24	24	24	24	24
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Detector 2 Size(m)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

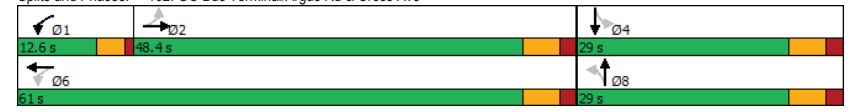
Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6		8		8		4	
Permitted Phases		2		6			8		8		4	
Detector Phase	2	2		1	6		8		8		4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0		10.0		10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0		29.0		29.0	
Total Split (s)	48.4	48.4		12.6	61.0		29.0		29.0		29.0	
Total Split (%)	53.8%	53.8%		14.0%	67.8%		32.2%		32.2%		32.2%	
Maximum Green (s)	42.4	42.4		8.6	55.0		23.0		23.0		23.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0		4.0		4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0		-2.0		-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0		4.0		4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0		4.0		4.0	
Recall Mode	Min	Min		Min	Min		Min		Min		Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0		7.0		7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0		16.0		16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0		0		0	
Act Effct Green (s)	24.3	24.3		36.4	36.4		25.0		25.0		25.0	
Actuated g/C Ratio	0.35	0.35		0.52	0.52		0.36		0.36		0.36	
v/c Ratio	0.27	0.43		0.21	0.41		0.78		0.13		0.17	
Control Delay	20.2	18.4		10.7	10.8		107.2		0.5		16.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0		0.0		0.0	
Total Delay	20.2	18.4		10.7	10.8		107.2		0.5		16.8	
LOS	C	B		B	B		F		A		B	
Approach Delay		18.6			10.8				38.4			24.5
Approach LOS		B			B				D			C

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	69.4
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.86
Intersection Signal Delay:	18.7
Intersection LOS:	B
Intersection Capacity Utilization:	77.7%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 102: GO Bus Terminal/Argus Rd & Cross Ave



Queues  
102: GO Bus Terminal/Argus Rd & Cross Ave

Base  
AM Peak Hour

	↖	→	↘	←	↙	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	455	46	694	38	69	72	578
v/c Ratio	0.27	0.43	0.21	0.41	0.78	0.13	0.17	0.86
Control Delay	20.2	18.4	10.7	10.8	107.2	0.5	16.8	25.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	18.4	10.7	10.8	107.2	0.5	16.8	25.5
Queue Length 50th (m)	5.7	23.9	2.9	27.6	4.5	0.0	6.5	37.3
Queue Length 95th (m)	7.9	35.0	7.3	38.1	#10.1	0.0	13.3	30.9
Internal Link Dist (m)		350.0		48.9		57.9		156.7
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	410	1952	225	2621	49	526	415	676
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.23	0.20	0.26	0.78	0.13	0.17	0.86

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
102: GO Bus Terminal/Argus Rd & Cross Ave

Base  
AM Peak Hour

	↖	→	↘	↙	←	↘	↑	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖		↖	↖	↖
Traffic Volume (vph)	31	377	14	39	585	23	20	0	48	56	16	491
Future Volume (vph)	31	377	14	39	585	23	20	0	48	56	16	491
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1569	3045		817	3189		805	738		1545	1387	
Flt Permitted	0.39	1.00		0.36	1.00		0.16	1.00		0.71	1.00	
Satd. Flow (perm)	641	3045		310	3189		136	738		1158	1387	
Peak-hour factor, PHF	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Adj. Flow (vph)	60	433	22	46	665	29	38	0	69	72	26	552
RTOR Reduction (vph)	0	5	0	0	4	0	0	44	0	0	177	0
Lane Group Flow (vph)	60	450	0	46	690	0	38	25	0	72	401	0
Confl. Peds. (#/hr)	1		3	3		1	3		20	20		3
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	22.3	22.3		34.4	34.4		23.0	23.0		23.0	23.0	
Effective Green, g (s)	24.3	24.3		34.4	36.4		25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.35	0.35		0.50	0.52		0.36	0.36		0.36	0.36	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	224	1066		212	1672		48	265		417	499	
v/s Ratio Prot		0.15		0.03	c0.22			0.03			c0.29	
v/s Ratio Perm	0.09			0.08			0.28			0.06		
v/c Ratio	0.27	0.42		0.22	0.41		0.79	0.09		0.17	0.80	
Uniform Delay, d1	16.2	17.2		9.7	10.0		19.9	14.7		15.1	20.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.6		0.4	0.3		61.0	0.2		0.3	9.6	
Delay (s)	17.5	17.8		10.1	10.4		80.8	14.9		15.4	29.6	
Level of Service	B	B		B	B		F	B		B	C	
Approach Delay (s)		17.7			10.3			38.3			28.0	
Approach LOS		B			B			D			C	

Intersection Summary

HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	56	169	193	215	115	5	17	3	13	16	23	40
Future Volume (vph)	56	169	193	215	115	5	17	3	13	16	23	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0	0.0	25.0		0.0	20.0		0.0	0.0		0.0	0.0
Storage Lanes	1	0	1		0	1		0	1		0	1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Frt	0.916			0.989			0.873			0.902		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1540	2803	0	1570	2727	0	1570	1473	0	1468	1497	0
Flt Permitted	0.652			0.416			0.710			0.740		
Satd. Flow (perm)	1048	2803	0	687	2727	0	1170	1473	0	1139	1497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		264			12			22			47	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		40.1			374.0			69.1			70.9	
Travel Time (s)		2.9			26.9			5.0			5.1	
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3
Peak Hour Factor	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%
Adj. Flow (vph)	72	209	264	326	146	12	21	4	22	26	25	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	473	0	326	158	0	21	26	0	26	72	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6		8		8		4	
Permitted Phases		2		6			8		8		4	
Detector Phase		2	2	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	42.0	42.0		13.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	46.7%	46.7%		14.4%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	36.0	36.0		9.0	49.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0			15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	37.0	37.0		49.8	49.8		12.2	12.2		12.2	12.2	
Actuated g/C Ratio	0.53	0.53		0.71	0.71		0.17	0.17		0.17	0.17	
v/c Ratio	0.13	0.29		0.54	0.08		0.10	0.09		0.13	0.24	
Control Delay	9.3	4.4		7.4	3.0		25.9	13.4		26.4	14.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	9.3	4.4		7.4	3.0		25.9	13.4		26.4	14.7	
LOS	A	A		A	A		C	B		C	B	
Approach Delay		5.1			5.9			19.0			17.8	
Approach LOS		A			A			B			B	
Intersection Summary												
Area Type:	CBD											
Cycle Length:	90											
Actuated Cycle Length:	70											
Natural Cycle:	85											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.54											
Intersection Signal Delay:	7.0						Intersection LOS: A					
Intersection Capacity Utilization:	77.6%						ICU Level of Service D					
Analysis Period (min):	15											
Splits and Phases:	103: Lyons Lane/Commercial Driveway & Cross Ave											

Queues  
103: Lyons Lane/Commercial Driveway & Cross Ave

Base  
AM Peak Hour

	↖	→	↗	←	↖	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	72	473	326	158	21	26	26	72
v/c Ratio	0.13	0.29	0.54	0.08	0.10	0.09	0.13	0.24
Control Delay	9.3	4.4	7.4	3.0	25.9	13.4	26.4	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	4.4	7.4	3.0	25.9	13.4	26.4	14.7
Queue Length 50th (m)	4.7	7.1	12.8	2.5	2.5	0.5	3.1	3.0
Queue Length 95th (m)	9.5	12.0	15.1	4.3	7.3	5.1	6.4	13.5
Internal Link Dist (m)		16.1		350.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	569	1643	602	1991	518	664	504	689
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	0.13	0.29	0.54	0.08	0.04	0.04	0.05	0.10

Intersection Summary

Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	2		1	6		8		4
Permitted Phases	2		6		8		4	
Actuated Green, G (s)	35.0	35.0	47.8	47.8	10.2	10.2	10.2	10.2
Effective Green, g (s)	37.0	37.0	47.8	49.8	12.2	12.2	12.2	12.2
Actuated g/C Ratio	0.53	0.53	0.68	0.71	0.17	0.17	0.17	0.17
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	5.0	5.0	2.5	5.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	555	1482	580	1940	204	256	198	261
v/s Ratio Prot		0.12	c0.07	0.06		0.01		0.02
v/s Ratio Perm	0.07		c0.31		0.02		c0.02	
v/c Ratio	0.13	0.24	0.56	0.08	0.10	0.03	0.13	0.13
Uniform Delay, d1	8.4	8.9	4.8	3.1	24.3	24.0	24.4	24.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2	1.0	0.0	0.3	0.1	0.4	0.3
Delay (s)	8.6	9.1	5.8	3.1	24.6	24.1	24.8	24.7
Level of Service	A	A	A	A	C	C	C	C
Approach Delay (s)		9.0		4.9		24.3		24.7
Approach LOS		A		A		C		C
Intersection Summary								
HCM 2000 Control Delay	9.2		HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio	0.48							
Actuated Cycle Length (s)	70.0				Sum of lost time (s)			
Intersection Capacity Utilization	77.6%		ICU Level of Service				D	
Analysis Period (min)	15							
c Critical Lane Group								

HCM Signalized Intersection Capacity Analysis  
103: Lyons Lane/Commercial Driveway & Cross Ave

Base  
AM Peak Hour

	↖	→	↗	←	↖	↑	↗	↓	↖			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖		↖	↖	
Traffic Volume (vph)	56	169	193	215	115	5	17	3	13	16	23	40
Future Volume (vph)	56	169	193	215	115	5	17	3	13	16	23	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.99		1.00	0.87		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1530	2805		1570	2727		1566	1474		1464	1498	
Flt Permitted	0.65	1.00		0.42	1.00		0.71	1.00		0.74	1.00	
Satd. Flow (perm)	1050	2805		687	2727		1171	1474		1141	1498	
Peak-hour factor, PHF	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Adj. Flow (vph)	72	209	264	326	146	12	21	4	22	26	25	47
RTOR Reduction (vph)	0	124	0	0	3	0	0	18	0	0	39	0
Lane Group Flow (vph)	72	349	0	326	155	0	21	8	0	26	33	0
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8				4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		47.8	47.8		10.2	10.2		10.2	10.2	
Effective Green, g (s)	37.0	37.0		47.8	49.8		12.2	12.2		12.2	12.2	
Actuated g/C Ratio	0.53	0.53		0.68	0.71		0.17	0.17		0.17	0.17	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	555	1482		580	1940		204	256		198	261	
v/s Ratio Prot		0.12		c0.07	0.06			0.01			0.02	
v/s Ratio Perm	0.07			c0.31			0.02			c0.02		
v/c Ratio	0.13	0.24		0.56	0.08		0.10	0.03		0.13	0.13	
Uniform Delay, d1	8.4	8.9		4.8	3.1		24.3	24.0		24.4	24.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2		1.0	0.0		0.3	0.1		0.4	0.3	
Delay (s)	8.6	9.1		5.8	3.1		24.6	24.1		24.8	24.7	
Level of Service	A	A		A	A		C	C		C	C	
Approach Delay (s)		9.0			4.9			24.3			24.7	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM 2000 Control Delay	9.2		HCM 2000 Level of Service				A					
HCM 2000 Volume to Capacity ratio	0.48											
Actuated Cycle Length (s)	70.0				Sum of lost time (s)				12.0			
Intersection Capacity Utilization	77.6%		ICU Level of Service				D					
Analysis Period (min)	15											
c Critical Lane Group												



Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	381	510	79	20	417	615	53	351	50	565	520	352
Future Volume (vph)	381	510	79	20	417	615	53	351	50	565	520	352
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0	0.0	80.0	0.0	25.0	0.0	80.0	0.0	80.0	0.0	0.0	0.0
Storage Lanes	2	0	1	0	1	0	1	0	1	0	1	1
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	0.97		0.99	1.00		0.98		0.98
Frt		0.971			0.912			0.979				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2987	3029	0	1481	2799	0	1540	3138	0	2929	1676	1356
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2966	3029	0	1472	2799	0	1532	3138	0	2870	1676	1324
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			242			13				321
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.8			142.3			311.4				130.3
Travel Time (s)		20.6			10.2			22.4				9.4
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Peak Hour Factor	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Adj. Flow (vph)	410	560	132	27	485	683	88	408	67	673	605	440
Shared Lane Traffic (%)												
Lane Group Flow (vph)	410	692	0	27	1168	0	88	475	0	673	605	440
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			6.6				6.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

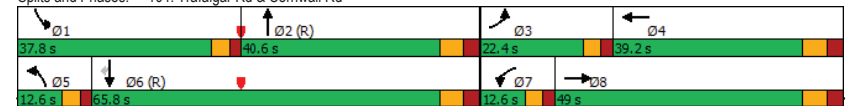
Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	22.4	49.0		12.6	39.2		12.6	40.6		37.8	65.8	65.8
Total Split (%)	16.0%	35.0%		9.0%	28.0%		9.0%	29.0%		27.0%	47.0%	47.0%
Maximum Green (s)	17.4	42.0		7.6	32.2		7.6	33.6		32.8	58.8	58.8
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	18.4	45.0		8.6	35.2		8.6	36.6		33.8	61.8	61.8
Actuated g/C Ratio	0.13	0.32		0.06	0.25		0.06	0.26		0.24	0.44	0.44
v/c Ratio	1.05	0.70		0.30	1.32		0.94	0.57		0.95	0.82	0.58
Control Delay	115.5	44.7		71.9	185.3		140.9	46.8		82.3	29.1	8.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	115.5	44.7		71.9	185.3		140.9	46.8		82.3	29.1	8.1
LOS	F	D		E	F		F	D		F	C	A
Approach Delay		71.1			182.8			61.5			44.5	
Approach LOS		E			F			E			D	

Intersection Summary


Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.32
Intersection Signal Delay:	89.1
Intersection LOS:	F
Intersection Capacity Utilization:	106.2%
ICU Level of Service:	G
Analysis Period (min):	15

Splits and Phases: 104: Trafalgar Rd & Cornwall Rd



Queues  
104: Trafalgar Rd & Cornwall Rd

Base  
AM Peak Hour




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	410	692	27	1168	88	475	673	605	440
v/c Ratio	1.05	0.70	0.30	1.32	0.94	0.57	0.95	0.82	0.58
Control Delay	115.5	44.7	71.9	185.3	140.9	46.8	82.3	29.1	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.5	44.7	71.9	185.3	140.9	46.8	82.3	29.1	8.1
Queue Length 50th (m)	-66.5	90.2	7.7	-202.5	26.0	61.8	106.8	81.3	25.4
Queue Length 95th (m)	#101.2	113.7	15.3	#229.0	#31.9	76.5	m102.0	m78.3	m23.5
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	392	988	90	884	94	829	707	739	763
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.70	0.30	1.32	0.94	0.57	0.95	0.82	0.58

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

HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Base  
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕		↔↔	↕↕		↔↔	↕↕		↔↔	↕↕	↔↔
Traffic Volume (vph)	381	510	79	20	417	615	53	351	50	565	520	352
Future Volume (vph)	381	510	79	20	417	615	53	351	50	565	520	352
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.91		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)	2987	3030		1481	2800		1540	3138		2929	1676	1324
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2987	3030		1481	2800		1540	3138		2929	1676	1324
Peak-hour factor, PHF	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Adj. Flow (vph)	410	560	132	27	485	683	88	408	67	673	605	440
RTOR Reduction (vph)	0	15	0	0	181	0	0	10	0	0	0	179
Lane Group Flow (vph)	410	677	0	27	987	0	88	465	0	673	605	261
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	17.4	42.0		7.6	32.2		7.6	33.6		32.8	58.8	58.8
Effective Green, g (s)	18.4	45.0		8.6	35.2		8.6	36.6		33.8	61.8	61.8
Actuated g/C Ratio	0.13	0.32		0.06	0.25		0.06	0.26		0.24	0.44	0.44
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	392	973		90	704		94	820		707	739	584
v/s Ratio Prot	c0.14	0.22		0.02	c0.35		0.06	0.15		c0.23	c0.36	
v/s Ratio Perm												0.20
v/c Ratio	1.05	0.70		0.30	1.40		0.94	0.57		0.95	0.82	0.45
Uniform Delay, d1	60.8	41.5		62.8	52.4		65.4	44.8		52.3	34.2	27.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.53	0.80	1.04
Incremental Delay, d2	58.0	4.1		8.4	189.3		70.8	2.8		3.9	1.0	0.2
Delay (s)	118.8	45.6		71.2	241.7		136.3	47.7		84.1	28.3	28.4
Level of Service	F	D		E	F		F	D		F	C	C
Approach Delay (s)		72.8			237.9			61.5			50.2	
Approach LOS		E			F			E			D	

**Intersection Summary**  
 HCM 2000 Control Delay 106.0 HCM 2000 Level of Service F  
 HCM 2000 Volume to Capacity ratio 1.07  
 Actuated Cycle Length (s) 140.0 Sum of lost time (s) 16.0  
 Intersection Capacity Utilization 106.2% ICU Level of Service G  
 Analysis Period (min) 15  
 c Critical Lane Group

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Base  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔		↑↑↑	↑↑↑	
Traffic Volume (vph)	908	661	0	1174	2259	0
Future Volume (vph)	908	661	0	1174	2259	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt	0.850					
Flt Protected	0.950					
Satd. Flow (prot)	2958	1423	0	4404	4489	0
Flt Permitted	0.950					
Satd. Flow (perm)	2958	1423	0	4404	4489	0
Right Turn on Red	Yes		Yes			
Satd. Flow (RTOR)	2					
Link Speed (k/h)	50		50		50	
Link Distance (m)	199.2		51.4		324.8	
Travel Time (s)	14.3		3.7		23.4	
Peak Hour Factor	0.98	0.92	0.25	0.91	0.90	0.25
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Adj. Flow (vph)	927	718	0	1290	2510	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	927	718	0	1290	2510	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1		2		2	
Detector Template	Left	Right	Thru		Thru	
Leading Detector (m)	2.0	2.0	10.0		10.0	
Trailing Detector (m)	0.0		0.0		0.0	
Detector 1 Position(m)	0.0		0.0		0.0	
Detector 1 Size(m)	2.0		0.6		0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	
Detector 1 Queue (s)	0.0		0.0		0.0	
Detector 1 Delay (s)	0.0		0.0		0.0	
Detector 2 Position(m)			9.4		9.4	
Detector 2 Size(m)			0.6		0.6	
Detector 2 Type			Cl+Ex		Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)			0.0		0.0	
Turn Type	Prot	Perm	NA		NA	
Protected Phases	4		2		2	
Permitted Phases	4					
Detector Phase	4	4	2		2	

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Base  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR		
Switch Phase								
Minimum Initial (s)	10.0	10.0	29.0		29.0			
Minimum Split (s)	38.0	38.0	36.0		36.0			
Total Split (s)	57.4	57.4	82.6		82.6			
Total Split (%)	41.0%	41.0%	59.0%		59.0%			
Maximum Green (s)	50.4	50.4	75.6		75.6			
Yellow Time (s)	4.0	4.0	4.0		4.0			
All-Red Time (s)	3.0	3.0	3.0		3.0			
Lost Time Adjust (s)	-3.0	-3.0	-3.0		-3.0			
Total Lost Time (s)	4.0	4.0	4.0		4.0			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0		3.0			
Recall Mode	None	None	C-Max		C-Max			
Walk Time (s)	7.0	7.0	7.0		7.0			
Flash Dont Walk (s)	24.0	24.0	22.0		22.0			
Pedestrian Calls (#/hr)	0		0		0			
Act Effct Green (s)	53.4	53.4	78.6		78.6			
Actuated g/C Ratio	0.38	0.38	0.56		0.56			
v/c Ratio	0.82	1.32	0.52		1.00			
Control Delay	46.3	192.3	11.0		19.8			
Queue Delay	0.0	0.0	0.0		0.0			
Total Delay	46.3	192.3	11.0		19.8			
LOS	D	F	B		B			
Approach Delay	110.0		11.0		19.8			
Approach LOS	F		B		B			
Intersection Summary								
Area Type:	CBD							
Cycle Length:	140							
Actuated Cycle Length:	140							
Offset:	133.6 (95%), Referenced to phase 2:NBSB and 6.; Start of Green							
Natural Cycle:	120							
Control Type:	Actuated-Coordinated							
Maximum v/c Ratio:	1.32							
Intersection Signal Delay:	45.0			Intersection LOS: D				
Intersection Capacity Utilization	100.6%			ICU Level of Service G				
Analysis Period (min)	15							
Plots and Phases:	105: Trafalgar Rd & QEW EB-Off Ramp							

Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Base  
AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	927	718	1290	2510
v/c Ratio	0.82	1.32	0.52	1.00
Control Delay	46.3	192.3	11.0	19.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.3	192.3	11.0	19.8
Queue Length 50th (m)	124.7	~270.8	29.5	207.8
Queue Length 95th (m)	153.2	#350.6	m36.8	m37.3
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1128	544	2472	2520
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.82	1.32	0.52	1.00

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Base  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	908	661	0	1174	2259	0
Future Volume (vph)	908	661	0	1174	2259	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Fr't	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Sat'd. Flow (prot)	2958	1423		4404	4489	
Flt Permitted	0.95	1.00		1.00	1.00	
Sat'd. Flow (perm)	2958	1423		4404	4489	
Peak-hour factor, PHF	0.98	0.92	0.25	0.91	0.90	0.25
Adj. Flow (vph)	927	718	0	1290	2510	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	927	717	0	1290	2510	0
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	50.4	50.4		75.6	75.6	
Effective Green, g (s)	53.4	53.4		78.6	78.6	
Actuated g/C Ratio	0.38	0.38		0.56	0.56	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1128	542		2472	2520	
v/s Ratio Prot	0.31			0.29	c0.56	
v/s Ratio Perm		c0.50				
v/c Ratio	0.82	1.32		0.52	1.00	
Uniform Delay, d1	39.0	43.3		19.0	30.5	
Progression Factor	1.00	1.00		0.55	0.46	
Incremental Delay, d2	4.9	157.6		0.4	4.5	
Delay (s)	43.9	200.9		10.9	18.6	
Level of Service	D	F		B	B	
Approach Delay (s)	112.5			10.9	18.6	
Approach LOS	F			B	B	

Intersection Summary

HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	→	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1	0	200	402	33	250	0	1789	0	0	3406	6
Future Volume (vph)	1	0	200	402	33	250	0	1789	0	0	3406	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Lanes	1		1	1		1	0		0	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor												0.96
Frt			0.850			0.850						0.850
Flt Protected	0.950			0.950	0.961							
Satd. Flow (prot)	1570	0	1395	1421	1439	1356	0	4446	0	0	4532	1437
Flt Permitted	0.950			0.950	0.961							
Satd. Flow (perm)	1570	0	1395	1421	1439	1356	0	4446	0	0	4532	1380
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)			31			216						70
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		142.1			192.6			324.8			275.1	
Travel Time (s)		10.2			13.9			23.4			19.8	
Confl. Peds. (#/hr)							8		5	5		8
Peak Hour Factor	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Adj. Flow (vph)	4	0	220	457	49	342	0	1924	0	0	3784	10
Shared Lane Traffic (%)				45%								
Lane Group Flow (vph)	4	0	220	251	255	342	0	1924	0	0	3784	10
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1		1		2		2		1
Detector Template	Left		Right	Left	Thru	Right		Thru		Thru		Right
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0		10.0		2.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6		0.6		2.0
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)												
Turn Type	Prot		Perm	Perm	NA	Perm					NA	Perm
Protected Phases	3				4					6		2
Permitted Phases			8	4		4						
Detector Phase	3		8	4	4	4				6		2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0				5.0		28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0				35.0		35.0
Total Split (s)	23.0		61.0	38.0	38.0	38.0				79.0		79.0
Total Split (%)	16.4%		43.6%	27.1%	27.1%	27.1%				56.4%		56.4%
Maximum Green (s)	18.0		54.0	31.0	31.0	31.0				72.0		72.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0				4.0		4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0				3.0		3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0				-3.0		-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0				4.0		4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0				4.5		4.5
Recall Mode	Min		Min	Min	Min	Min				C-Min		C-Min
Walk Time (s)			7.0	7.0	7.0	7.0				7.0		7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0				21.0		21.0
Pedestrian Calls (#/hr)			0	0	0	0				0		0
Act Effct Green (s)	8.0		46.0	34.0	34.0	34.0				86.0		86.0
Actuated g/C Ratio	0.06		0.33	0.24	0.24	0.24				0.61		0.61
v/c Ratio	0.04		0.46	0.73	0.73	0.70				0.70		1.36
Control Delay	64.0		33.5	60.3	60.3	23.8				21.9		190.4
Queue Delay	0.0		0.0	0.0	0.0	0.0				0.0		0.0
Total Delay	64.0		33.5	60.3	60.3	23.8				21.9		190.4
LOS	E		C	E	E	C				C		A
Approach Delay		34.1				45.6				21.9		189.9
Approach LOS		C				D				C		F

Intersection Summary

Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.36
Intersection Signal Delay:	119.2
Intersection LOS:	F
Intersection Capacity Utilization:	110.2%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Base  
AM Peak Hour

	↖	↘	↙	←	↖	↗	↘	↙
Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	4	220	251	255	342	1924	3784	10
v/c Ratio	0.04	0.46	0.73	0.73	0.70	0.70	1.36	0.01
Control Delay	64.0	33.5	60.3	60.3	23.8	21.9	190.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	33.5	60.3	60.3	23.8	21.9	190.4	0.0
Queue Length 50th (m)	1.1	43.5	71.4	72.6	33.7	153.2	-529.0	0.0
Queue Length 95th (m)	1.4	60.9	92.1	67.3	35.6	173.3	#587.2	0.0
Internal Link Dist (m)				168.6		300.8	251.1	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	586	376	380	517	2730	2783	874
Starvation Cap Reductn	0	0	0	0	0	0	45	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.38	0.67	0.67	0.66	0.70	1.38	0.01

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Base  
AM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↗	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↖	↖	↖	↖		↖↖↖			↖↖↖	↖
Traffic Volume (vph)	1	0	200	402	33	250	0	1789	0	0	3406	6
Future Volume (vph)	1	0	200	402	33	250	0	1789	0	0	3406	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		0.91			0.91	1.00
Frbp, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	0.96
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00		0.85	1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	0.96	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1570		1395	1421	1440	1356		4446			4532	1380
Flt Permitted	0.95		1.00	0.95	0.96	1.00		1.00			1.00	1.00
Satd. Flow (perm)	1570		1395	1421	1440	1356		4446			4532	1380
Peak-hour factor, PHF	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Adj. Flow (vph)	4	0	220	457	49	342	0	1924	0	0	3784	10
RTOR Reduction (vph)	0	0	21	0	0	164	0	0	0	0	0	4
Lane Group Flow (vph)	4	0	199	251	255	178	0	1924	0	0	3784	6
Confl. Peds. (#/hr)							8		5	5		8
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA			NA	Perm
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	7.0		43.0	31.0	31.0	31.0		83.0			83.0	83.0
Effective Green, g (s)	8.0		46.0	34.0	34.0	34.0		86.0			86.0	86.0
Actuated g/C Ratio	0.06		0.33	0.24	0.24	0.24		0.61			0.61	0.61
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Lane Grp Cap (vph)	89		458	345	349	329		2731			2783	847
v/s Ratio Prot	0.00							0.43			0.83	
v/s Ratio Perm			0.14	0.18	0.18	0.13						0.00
v/c Ratio	0.04		0.43	0.73	0.73	0.54		0.70			1.36	0.01
Uniform Delay, d1	62.4		36.8	48.7	48.8	46.2		18.4			27.0	10.5
Progression Factor	1.00		1.00	1.00	1.00	1.00		1.04			1.00	1.00
Incremental Delay, d2	0.2		0.7	7.5	7.7	1.8		1.2			164.3	0.0
Delay (s)	62.6		37.5	56.2	56.4	48.0		20.3			191.3	10.5
Level of Service	E		D	E	E	D		C			F	B
Approach Delay (s)		37.9						20.3			190.8	
Approach LOS		D						C			F	

Intersection Summary

HCM 2000 Control Delay	120.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	110.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Base  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕	0	0	↕↕
Traffic Volume (vph)	737	343	422	0	0	1177
Future Volume (vph)	737	343	422	0	0	1177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3423	1441	3539	0	0	3539
Flt Permitted	0.954					
Satd. Flow (perm)	3423	1441	3539	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	4	336				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	801	373	459	0	0	1279
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	838	336	459	0	0	1279
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Base  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	45.6	45.6	74.4			74.4
Total Split (%)	38.0%	38.0%	62.0%			62.0%
Maximum Green (s)	39.6	39.6	68.4			68.4
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	37.9	37.9	70.5			70.5
Actuated g/C Ratio	0.33	0.33	0.61			0.61
v/c Ratio	0.75	0.48	0.21			0.60
Control Delay	39.6	5.5	11.2			16.1
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	39.6	5.5	11.2			16.1
LOS	D	A	B			B
Approach Delay	29.8		11.2			16.1
Approach LOS	C		B			B
Intersection Summary						
Area Type:	Other					
Cycle Length:	120					
Actuated Cycle Length:	116.4					
Natural Cycle:	50					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.75					
Intersection Signal Delay:	20.9			Intersection LOS: C		
Intersection Capacity Utilization:	63.8%			ICU Level of Service B		
Analysis Period (min):	15					
Splits and Phases:	107: Dorval Drive & QEW WB Off-Ramp					

Queues  
107: Dorval Drive & QEW WB Off-Ramp

Base  
AM Peak Hour

	↙	↖	↑	↓
Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	838	336	459	1279
v/c Ratio	0.75	0.48	0.21	0.60
Control Delay	39.6	5.5	11.2	16.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.6	5.5	11.2	16.1
Queue Length 50th (m)	91.5	0.0	26.3	100.1
Queue Length 95th (m)	114.8	22.5	35.8	123.9
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1228	731	2144	2144
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.46	0.21	0.60
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Base  
AM Peak Hour

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙↖	↖	↑			↗↘
Traffic Volume (vph)	737	343	422	0	0	1177
Future Volume (vph)	737	343	422	0	0	1177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr <sub>t</sub>	0.99	0.85	1.00			1.00
Fit Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3426	1441	3539			3539
Fit Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3426	1441	3539			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	801	373	459	0	0	1279
RTOR Reduction (vph)	3	227	0	0	0	0
Lane Group Flow (vph)	835	109	459	0	0	1279
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	35.9	35.9	68.5			68.5
Effective Green, g (s)	37.9	37.9	70.5			70.5
Actuated g/C Ratio	0.33	0.33	0.61			0.61
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1115	469	2143			2143
v/s Ratio Prot	c0.24		0.13			c0.36
v/s Ratio Perm		0.08				
v/c Ratio	0.75	0.23	0.21			0.60
Uniform Delay, d1	35.0	28.6	10.4			14.2
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	3.2	0.4	0.2			1.2
Delay (s)	38.2	29.1	10.6			15.4
Level of Service	D	C	B			B
Approach Delay (s)	35.6		10.6			15.4
Approach LOS	D		B			B
<b>Intersection Summary</b>						
HCM 2000 Control Delay			22.8		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.65			
Actuated Cycle Length (s)			116.4		Sum of lost time (s)	8.0
Intersection Capacity Utilization			63.8%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						



Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Base  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕	↕↕	
Traffic Volume (vph)	108	430	0	594	1272	0
Future Volume (vph)	108	430	0	594	1272	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr	0.900	0.850				
Flt Protected	0.984					
Satd. Flow (prot)	3200	1441	0	3539	3539	0
Flt Permitted	0.984					
Satd. Flow (perm)	3200	1441	0	3539	3539	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	46	46				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	467	0	646	1383	0
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	351	233	0	646	1383	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Base  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	45.6	45.6		74.4	74.4	
Total Split (%)	38.0%	38.0%		62.0%	62.0%	
Maximum Green (s)	39.6	39.6		68.4	68.4	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	21.9	21.9		70.7	70.7	
Actuated g/C Ratio	0.22	0.22		0.70	0.70	
v/c Ratio	0.48	0.67		0.26	0.56	
Control Delay	31.3	38.0		6.5	9.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	31.3	38.0		6.5	9.3	
LOS	C	D		A	A	
Approach Delay	34.0			6.5	9.3	
Approach LOS	C			A	A	
Intersection Summary						
Area Type:	Other					
Cycle Length:	120					
Actuated Cycle Length:	100.6					
Natural Cycle:	55					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.67					
Intersection Signal Delay:	14.1			Intersection LOS: B		
Intersection Capacity Utilization:	63.8%			ICU Level of Service B		
Analysis Period (min):	15					
Splits and Phases:	108: Dorval Drive & QEW EB Off-Ramp					

Queues  
108: Dorval Drive & QEW EB Off-Ramp

Base  
AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	351	233	646	1383
v/c Ratio	0.48	0.67	0.26	0.56
Control Delay	31.3	38.0	6.5	9.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.3	38.0	6.5	9.3
Queue Length 50th (m)	28.0	38.6	21.5	61.8
Queue Length 95th (m)	41.3	66.5	41.5	112.8
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1355	625	2486	2486
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.37	0.26	0.56
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Base  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	108	430	0	594	1272	0
Future Volume (vph)	108	430	0	594	1272	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Fr't	0.90	0.85		1.00	1.00	
Fit Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3199	1441		3539	3539	
Fit Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3199	1441		3539	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	467	0	646	1383	0
RTOR Reduction (vph)	36	36	0	0	0	0
Lane Group Flow (vph)	315	197	0	646	1383	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	19.9	19.9		68.7	68.7	
Effective Green, g (s)	21.9	21.9		70.7	70.7	
Actuated g/C Ratio	0.22	0.22		0.70	0.70	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	696	313		2487	2487	
v/s Ratio Prot	0.10			0.18	c0.39	
v/s Ratio Perm		c0.14				
v/c Ratio	0.45	0.63		0.26	0.56	
Uniform Delay, d1	34.1	35.7		5.4	7.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	4.5		0.3	0.9	
Delay (s)	34.8	40.1		5.7	8.2	
Level of Service	C	D		A	A	
Approach Delay (s)	36.9			5.7	8.2	
Approach LOS	D			A	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			14.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.57			
Actuated Cycle Length (s)			100.6		Sum of lost time (s)	8.0
Intersection Capacity Utilization			63.8%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Base  
AM Peak Hour

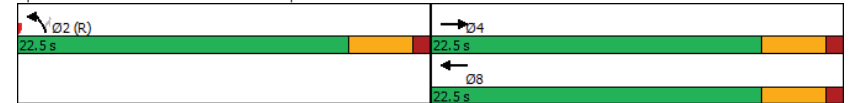
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	↑
Traffic Volume (vph)	394	0	0	239	210	234
Future Volume (vph)	394	0	0	239	210	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						254
Link Speed (k/h)	60			60	40	
Link Distance (m)	128.8			184.7	258.8	
Travel Time (s)	7.7			11.1	23.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	428	0	0	260	228	254
Shared Lane Traffic (%)						
Lane Group Flow (vph)	428	0	0	260	228	254
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
v/c Ratio	0.30			0.18	0.32	0.32

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Base  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	10.0			9.2	10.9	3.0
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.0			9.2	10.9	3.0
LOS	A			A	B	A
Approach Delay	10.0			9.2	6.7	
Approach LOS	A			A	A	
<b>Intersection Summary</b>						
Area Type:	Other					
Cycle Length:	45					
Actuated Cycle Length:	45					
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green					
Natural Cycle:	45					
Control Type:	Pre-timed					
Maximum v/c Ratio:	0.32					
Intersection Signal Delay:	8.5			Intersection LOS: A		
Intersection Capacity Utilization	32.9%			ICU Level of Service A		
Analysis Period (min)	15					

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street



Queues  
109: QEW WB Off-Ramp & Kerr Street

Base  
AM Peak Hour

	→	←	↖	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	428	260	228	254
v/c Ratio	0.30	0.18	0.32	0.32
Control Delay	10.0	9.2	10.9	3.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.0	9.2	10.9	3.0
Queue Length 50th (m)	12.0	6.8	12.2	0.0
Queue Length 95th (m)	19.9	12.5	24.6	9.8
Internal Link Dist (m)	104.8	160.7	234.8	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1415	1415	708	785
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.30	0.18	0.32	0.32
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Base  
AM Peak Hour

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (vph)	394	0	0	239	210	234
Future Volume (vph)	394	0	0	239	210	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr't	1.00			1.00	1.00	0.85
Fit Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	1583
Fit Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	428	0	0	260	228	254
RTOR Reduction (vph)	0	0	0	0	0	152
Lane Group Flow (vph)	428	0	0	260	228	102
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1415			1415	708	633
v/s Ratio Prot	c0.12			0.07	c0.13	
v/s Ratio Perm						0.06
v/c Ratio	0.30			0.18	0.32	0.16
Uniform Delay, d1	9.2			8.7	9.3	8.7
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.6			0.3	1.2	0.5
Delay (s)	9.8			9.0	10.5	9.2
Level of Service	A			A	B	A
Approach Delay (s)	9.8			9.0	9.8	
Approach LOS	A			A	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			9.6		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.31			
Actuated Cycle Length (s)			45.0		Sum of lost time (s)	9.0
Intersection Capacity Utilization			32.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

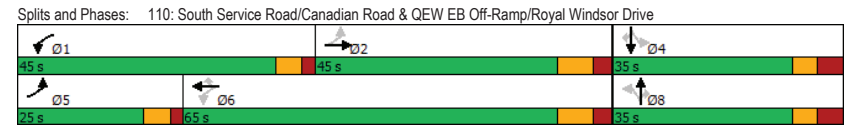
Lanes, Volumes, Timings  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	37	460	25	75	453	6	2	7	42	3	17	24
Future Volume (vph)	37	460	25	75	453	6	2	7	42	3	17	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0	0.0	155.0		70.0	15.0		0.0	0.0			30.0
Storage Lanes	2	0	1		1	1		1	1			1
Taper Length (m)	7.5		7.5		7.5			7.5				7.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992				0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3299	0	1719	3139	1380	1805	1667	1468	1805	1792	1495
Fit Permitted	0.470			0.428			0.745			0.752		
Satd. Flow (perm)	1682	3299	0	774	3139	1380	1416	1667	1468	1429	1792	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				94			152			152
Link Speed (k/h)	80			80			60					40
Link Distance (m)	324.5			247.2			158.7					215.5
Travel Time (s)	14.6			11.1			9.5					19.4
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Adj. Flow (vph)	41	505	27	82	498	7	2	8	46	3	19	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	532	0	82	498	7	2	8	46	3	19	26
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	7.2			7.2			3.6					3.6
Link Offset(m)	0.0			0.0			0.0					0.0
Crosswalk Width(m)	4.8			4.8			4.8					4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

Lanes, Volumes, Timings  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	34.0		14.0	38.4	38.4	28.8	28.8	28.8	35.0	35.0	35.0
Total Split (s)	25.0	45.0		45.0	65.0	65.0	35.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	20.0%	36.0%		36.0%	52.0%	52.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
Maximum Green (s)	19.0	36.6		39.0	56.6	56.6	27.2	27.2	27.2	27.2	27.2	27.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)	10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	70.2	62.9		71.2	67.8	67.8	13.2	13.2	13.2	14.2	14.2	14.2
Actuated g/C Ratio	0.81	0.72		0.82	0.78	0.78	0.15	0.15	0.15	0.16	0.16	0.16
v/c Ratio	0.03	0.22		0.11	0.20	0.01	0.01	0.03	0.13	0.01	0.07	0.07
Control Delay	2.4	6.4		2.7	6.0	0.0	36.0	36.3	0.8	36.0	36.5	0.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.4	6.4		2.7	6.0	0.0	36.0	36.3	0.8	36.0	36.5	0.4
LOS	A	A		A	A	A	D	D	A	D	D	A
Approach Delay		6.1			5.4			7.1				16.9
Approach LOS		A			A			A				B

Intersection Summary	
Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	87.1
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.22
Intersection Signal Delay:	6.2
Intersection Capacity Utilization:	50.0%
ICU Level of Service:	A
Analysis Period (min):	15



Queues Base  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

	↖	→	↗	←	↖	↗	↑	↖	↗	↓	↖
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	41	532	82	498	7	2	8	46	3	19	26
v/c Ratio	0.03	0.22	0.11	0.20	0.01	0.01	0.03	0.13	0.01	0.07	0.07
Control Delay	2.4	6.4	2.7	6.0	0.0	36.0	36.3	0.8	36.0	36.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.4	6.4	2.7	6.0	0.0	36.0	36.3	0.8	36.0	36.5	0.4
Queue Length 50th (m)	0.7	21.9	3.0	20.6	0.0	0.3	1.4	0.0	0.5	3.3	0.0
Queue Length 95th (m)	1.7	29.9	6.0	28.6	0.0	2.4	5.6	0.0	3.1	10.1	0.0
Internal Link Dist (m)	300.5		223.2		134.7			191.5			
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0
Base Capacity (vph)	1841	2385	1108	2442	1094	516	608	632	521	653	642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.22	0.07	0.20	0.01	0.00	0.01	0.07	0.01	0.03	0.04

Intersection Summary


HCM Signalized Intersection Capacity Analysis Base  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

	↖	→	↗	←	↖	↗	↑	↖	↗	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗		↖↗	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	37	460	25	75	453	6	2	7	42	3	17	24
Future Volume (vph)	37	460	25	75	453	6	2	7	42	3	17	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3301		1719	3139	1380	1805	1667	1468	1805	1792	1495
Fit Permitted	0.47	1.00		0.43	1.00	1.00	0.75	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1680	3301		774	3139	1380	1416	1667	1468	1430	1792	1495
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)	41	505	27	82	498	7	2	8	46	3	19	26
RTOR Reduction (vph)	0	2	0	0	0	2	0	0	41	0	0	23
Lane Group Flow (vph)	41	530	0	82	498	5	2	8	5	3	19	3
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	63.4	59.1		67.8	61.3	61.3	5.4	5.4	5.4	5.4	5.4	5.4
Effective Green, g (s)	67.4	63.5		71.8	65.7	65.7	9.2	9.2	9.2	9.2	9.2	9.2
Actuated g/C Ratio	0.72	0.68		0.77	0.70	0.70	0.10	0.10	0.10	0.10	0.10	0.10
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	1331	2249		682	2212	972	139	164	144	141	176	147
v/s Ratio Prot	0.00	c0.16		c0.01	0.16			0.00			c0.01	
v/s Ratio Perm	0.02			0.08		0.00	0.00		0.00	0.00		0.00
v/c Ratio	0.03	0.24		0.12	0.23	0.01	0.01	0.05	0.03	0.02	0.11	0.02
Uniform Delay, d1	3.6	5.6		2.7	4.8	4.1	37.9	38.0	38.0	37.9	38.3	37.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2		0.1	0.2	0.0	0.0	0.1	0.1	0.1	0.3	0.1
Delay (s)	3.6	5.9		2.8	5.1	4.1	38.0	38.2	38.1	38.0	38.6	38.0
Level of Service	A	A		A	A	A	D	D	D	D	D	D
Approach Delay (s)	5.7		4.7			38.1			38.2			
Approach LOS	A		A			D			D			

Intersection Summary	
HCM 2000 Control Delay	7.9 HCM 2000 Level of Service A
HCM 2000 Volume to Capacity ratio	0.21
Actuated Cycle Length (s)	93.2 Sum of lost time (s) 12.0
Intersection Capacity Utilization	50.0% ICU Level of Service A
Analysis Period (min)	15
c Critical Lane Group	

Lanes, Volumes, Timings  
201: Cross Ave & Lyons Lane

Base  
AM Peak Hour




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕	↔
Traffic Volume (vph)	23	404	184	6	5	4
Future Volume (vph)	23	404	184	6	5	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.992		0.932	
Flt Protected	0.950				0.976	
Satd. Flow (prot)	1624	3094	2799	0	1383	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1624	3094	2799	0	1383	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	4			4	7	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Heavy Vehicles (%)	0%	5%	16%	0%	0%	25%
Adj. Flow (vph)	33	697	209	12	8	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	697	221	0	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	CBD
Control Type:	Unsignalized
Intersection Capacity Utilization	23.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Base  
AM Peak Hour




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕	↔
Traffic Volume (veh/h)	23	404	184	6	5	4
Future Volume (Veh/h)	23	404	184	6	5	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Hourly flow rate (vph)	33	697	209	12	8	8
Pedestrians			7		4	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked						
vC, conflicting volume	225				640	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	225				640	114
tC, single (s)	4.1				6.8	7.4
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.5
p0 queue free %	98				98	99
cM capacity (veh/h)	1351				398	845
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	33	348	348	139	82	16
Volume Left	33	0	0	0	0	8
Volume Right	0	0	0	0	12	8
eSH	1351	1700	1700	1700	1700	541
Volume to Capacity	0.02	0.20	0.20	0.08	0.05	0.03
Queue Length 95th (m)	0.6	0.0	0.0	0.0	0.0	0.7
Control Delay (s)	7.7	0.0	0.0	0.0	0.0	11.9
Lane LOS	A					B
Approach Delay (s)	0.3			0.0		11.9
Approach LOS						B

Intersection Summary	
Average Delay	0.5
Intersection Capacity Utilization	23.5%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Road

Base  
AM Peak Hour




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	4	3	3	3	1
Future Volume (vph)	0	4	3	3	3	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.932			0.955	
Flt Protected					0.968	
Satd. Flow (prot)	0	1710	1594	0	1296	0
Flt Permitted					0.968	
Satd. Flow (perm)	0	1710	1594	0	1296	0
Link Speed (k/h)		50			50	
Link Distance (m)		60.5			37.6	
Travel Time (s)		4.4			2.7	
Confl. Peds. (#/hr)	6			6		1
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	33%	0%
Adj. Flow (vph)	0	8	4	4	8	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	8	8	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0			3.6	
Link Offset(m)		0.0			0.0	
Crosswalk Width(m)		4.8			4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free			Stop	

Intersection Summary	
Area Type:	CBD
Control Type:	Unsignalized
Intersection Capacity Utilization	15.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Road

Base  
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	4	3	3	3	1
Future Volume (Veh/h)	0	4	3	3	3	1
Sign Control		Free			Stop	
Grade		0%			0%	
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Hourly flow rate (vph)	0	8	4	4	8	4
Pedestrians			1			6
Lane Width (m)			3.6			3.6
Walking Speed (m/s)			1.2			1.2
Percent Blockage			0			1
Right turn flare (veh)						
Median type		None			None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	14				21	12
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	14				21	12
tC, single (s)	4.1				6.7	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1609				916	1069


Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	8	8	12
Volume Left	0	0	8
Volume Right	0	4	4
eSH	1609	1700	962
Volume to Capacity	0.00	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	8.8
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.8
Approach LOS			A

Intersection Summary	
Average Delay	3.8
Intersection Capacity Utilization	15.1%
Analysis Period (min)	15
	ICU Level of Service A



Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd

Base  
AM Peak Hour




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	5	572	120	4	3
Future Volume (vph)	1	5	572	120	4	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.973		0.942	
Flt Protected		0.988			0.972	
Satd. Flow (prot)	0	1352	1625	0	1566	0
Flt Permitted		0.988			0.972	
Satd. Flow (perm)	0	1352	1625	0	1566	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)	1			1	5	1
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Heavy Vehicles (%)	100%	0%	3%	0%	0%	0%
Adj. Flow (vph)	4	12	665	167	16	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	16	832	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	CBD
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd

Base  
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	5	572	120	4	3
Future Volume (Veh/h)	1	5	572	120	4	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Hourly flow rate (vph)	4	12	665	167	16	12
Pedestrians		1	5		1	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	833				774	750
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	833				774	750
tC, single (s)	5.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	3.1				3.5	3.3
p0 queue free %	99				96	97
cM capacity (veh/h)	500				365	414

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	16	832	28
Volume Left	4	0	16
Volume Right	0	167	12
eSH	500	1700	384
Volume to Capacity	0.01	0.49	0.07
Queue Length 95th (m)	0.2	0.0	1.9
Control Delay (s)	3.1	0.0	15.1
Lane LOS	A		C
Approach Delay (s)	3.1	0.0	15.1
Approach LOS			C

Intersection Summary	
Average Delay	0.5
Intersection Capacity Utilization	51.9%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Base  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	17	0	1761	2134	713
Future Volume (vph)	0	17	0	1761	2134	713
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Fr <sub>t</sub>		0.865			0.957	
Flt Protected						
Satd. Flow (prot)	0	1367	0	4363	4319	0
Flt Permitted						
Satd. Flow (perm)	0	1367	0	4363	4319	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	145.7			270.2	51.4	
Travel Time (s)	10.5			19.5	3.7	
Confl. Peds. (#/hr)						11
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82
Heavy Vehicles (%)	0%	7%	0%	7%	4%	2%
Adj. Flow (vph)	0	31	0	1914	2200	870
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	31	0	1914	3070	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	73.8%		ICU Level of Service D			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Base  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Volume (veh/h)	0	17	0	1761	2134	713	
Future Volume (Veh/h)	0	17	0	1761	2134	713	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82	
Hourly flow rate (vph)	0	31	0	1914	2200	870	
Pedestrians	11						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	1						
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.59	0.45	0.45				
vC, conflicting volume	3284	1179	3081				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	0	0	1341				
tC, single (s)	6.8	7.0	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	93	100				
cM capacity (veh/h)	599	476	232				
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>NB 3</b>	<b>SB 1</b>	<b>SB 2</b>	<b>SB 3</b>
Volume Total	31	638	638	638	880	880	1310
Volume Left	0	0	0	0	0	0	0
Volume Right	31	0	0	0	0	0	870
eSH	476	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.07	0.38	0.38	0.38	0.52	0.52	0.77
Queue Length 95th (m)	1.7	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	13.1	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	13.1	0.0			0.0		
Approach LOS	B						
<b>Intersection Summary</b>							
Average Delay				0.1			
Intersection Capacity Utilization	73.8%		ICU Level of Service		D		
Analysis Period (min)	15						

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	20	97	710	919	49	126	142	1072	825	141	1783	25
Future Volume (vph)	20	97	710	919	49	126	142	1072	825	141	1783	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0		25.0	145.0		0.0	95.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	0.99					0.98			0.97	1.00		
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1693	1425	3060	1676	1398	1425	4446	1398	1562	4532	1398
Fit Permitted	0.722			0.573			0.090			0.137		
Satd. Flow (perm)	1222	1693	1425	1846	1676	1366	135	4446	1363	225	4532	1398
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			155			135			678			155
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		285.9			293.8			275.1			252.7	
Travel Time (s)		20.6			21.2			19.8			18.2	
Confl. Peds. (#/hr)	11					11			10	10		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Adj. Flow (vph)	22	104	763	988	53	135	153	1153	887	152	1917	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	104	763	988	53	135	153	1153	887	152	1917	27
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)												
Link Offset(m)												
Crosswalk Width(m)		4.8				4.8			4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd


Base  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		2	6	6
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	10.0	34.0	34.0	11.0	43.0	43.0	10.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	12.0	37.2	37.2	18.0	43.2	43.2	12.0	52.8	52.8	12.0	52.8	52.8
Total Split (%)	10.0%	31.0%	31.0%	15.0%	36.0%	36.0%	10.0%	44.0%	44.0%	10.0%	44.0%	44.0%
Maximum Green (s)	8.0	30.2	30.2	13.0	36.2	36.2	8.0	45.8	45.8	8.0	45.8	45.8
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	39.9	33.2	33.2	50.2	44.5	44.5	56.8	48.8	48.8	56.8	48.8	48.8
Actuated g/C Ratio	0.33	0.28	0.28	0.42	0.37	0.37	0.47	0.41	0.41	0.47	0.41	0.41
v/c Ratio	0.05	0.22	1.51	1.09	0.09	0.23	1.03	0.64	0.93	0.78	1.04	0.04
Control Delay	20.9	35.0	265.3	90.8	27.3	5.8	108.5	30.5	24.9	45.3	67.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	35.0	265.3	90.8	27.3	5.8	108.5	30.5	24.9	45.3	67.5	0.1
LOS	C	D	F	F	C	A	F	C	C	D	E	A
Approach Delay		232.3			78.2		33.7				65.0	
Approach LOS		F			E		C				E	
Intersection Summary												
Area Type:	CBD											
Cycle Length:	120											
Actuated Cycle Length:	120											
Offset:	33.6 (28%), Referenced to phase 2:NBT and 6:SBTL, Start of Green											
Natural Cycle:	140											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.51											
Intersection Signal Delay:	80.0						Intersection LOS: F					
Intersection Capacity Utilization:	126.5%						ICU Level of Service H					
Analysis Period (min):	15											
Splits and Phases:	205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd											

Queues

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Base  
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	22	104	763	988	53	135	153	1153	887	152	1917	27
v/c Ratio	0.05	0.22	1.51	1.09	0.09	0.23	1.03	0.64	0.93	0.78	1.04	0.04
Control Delay	20.9	35.0	265.3	90.8	27.3	5.8	108.5	30.5	24.9	45.3	67.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	35.0	265.3	90.8	27.3	5.8	108.5	30.5	24.9	45.3	67.5	0.1
Queue Length 50th (m)	3.1	19.9	~235.3	~122.2	8.9	0.0	~24.9	82.6	61.2	19.9	~188.0	0.0
Queue Length 95th (m)	8.4	35.3	#313.0	#184.0	19.0	14.3	#70.2	98.9	#183.2	#47.8	#218.8	0.0
Internal Link Dist (m)	261.9			269.8			251.1			228.7		
Turn Bay Length (m)	60.0	165.0			25.0	145.0	95.0			90.0		
Base Capacity (vph)	446	468	506	903	622	592	149	1808	956	195	1843	660
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.22	1.51	1.09	0.09	0.23	1.03	0.64	0.93	0.78	1.04	0.04


Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Base  
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	20	97	710	919	49	126	142	1072	825	141	1783	25
Future Volume (vph)	20	97	710	919	49	126	142	1072	825	141	1783	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00
Ftbp, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1613	1693	1425	3060	1676	1366	1425	4446	1363	1562	4532	1398
Flt Permitted	0.72	1.00	1.00	0.57	1.00	1.00	0.09	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	1226	1693	1425	1846	1676	1366	136	4446	1363	225	4532	1398
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	22	104	763	988	53	135	153	1153	887	152	1917	27
RTOR Reduction (vph)	0	0	110	0	0	85	0	0	411	0	0	16
Lane Group Flow (vph)	22	104	653	988	53	50	153	1153	476	152	1917	11
Confl. Peds. (#/hr)	11			11			10			10		
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	36.1	31.8	31.8	49.8	41.5	41.5	52.2	44.2	44.2	52.2	44.2	44.2
Effective Green, g (s)	36.1	34.8	34.8	49.8	44.5	44.5	52.2	47.2	47.2	52.2	47.2	47.2
Actuated g/C Ratio	0.30	0.29	0.29	0.41	0.37	0.37	0.44	0.39	0.39	0.44	0.39	0.39
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	382	490	413	897	621	506	145	1748	536	187	1782	549
v/s Ratio Prot	0.00	0.06		c0.12	0.03		c0.07	0.26		0.05	c0.42	
v/s Ratio Perm	0.02		c0.46	0.34		0.04	0.39		0.35	0.30		0.01
v/c Ratio	0.06	0.21	1.58	1.10	0.09	0.10	1.06	0.66	0.89	0.81	1.08	0.02
Uniform Delay, d1	29.7	32.2	42.6	34.4	24.5	24.7	30.6	29.8	33.9	23.5	36.4	22.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.3	272.8	61.8	0.1	0.1	90.2	2.0	19.2	22.9	45.0	0.1
Delay (s)	29.8	32.5	315.4	96.1	24.6	24.8	120.7	31.8	53.1	46.4	81.4	22.3
Level of Service	C	C	F	F	C	C	F	C	D	D	F	C
Approach Delay (s)	275.3			84.7			46.6			78.1		
Approach LOS	F			F			D			E		

Intersection Summary

- HCM 2000 Control Delay: 96.0
- HCM 2000 Level of Service: F
- HCM 2000 Volume to Capacity ratio: 1.26
- Actuated Cycle Length (s): 120.0
- Sum of lost time (s): 17.0
- Intersection Capacity Utilization: 126.5%
- ICU Level of Service: H
- Analysis Period (min): 15
- c Critical Lane Group

Queuing and Blocking Report

Base  
AM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	L	TR	L	T	R	L	T	T	TR	L	T
Maximum Queue (m)	90.5	95.0	73.4	32.2	63.3	46.9	57.4	88.2	110.1	115.5	32.4	242.2
Average Queue (m)	50.5	55.6	40.1	11.4	24.0	17.9	33.2	62.2	75.9	82.8	31.9	171.9
95th Queue (m)	79.0	83.0	68.4	27.3	49.7	34.3	61.2	85.8	102.7	108.7	35.1	261.8
Link Distance (m)		123.0	123.0		313.2	313.2		128.0	128.0	128.0		239.0
Upstream Blk Time (%)										0		8
Queuing Penalty (veh)										0		57
Storage Bay Dist (m)	130.0			25.0			50.0				25.0	
Storage Blk Time (%)				1	13		1	16				67
Queuing Penalty (veh)				1	6		5	19				315
Queuing Penalty (veh)												84

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	246.8	234.4
Average Queue (m)	157.8	151.8
95th Queue (m)	256.9	228.0
Link Distance (m)	239.0	239.0
Upstream Blk Time (%)	1	0
Queuing Penalty (veh)	10	1
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	27.3	51.8	39.7	27.1	43.8	38.4	30.6	32.3	22.3	85.5
Average Queue (m)	7.4	24.5	17.3	9.5	19.7	18.1	8.1	12.4	10.7	35.8
95th Queue (m)	20.1	42.9	33.2	25.2	35.9	31.4	24.1	27.7	24.4	65.9
Link Distance (m)		352.9	352.9		51.4	51.4	66.7	66.7		159.0
Upstream Blk Time (%)										0
Queuing Penalty (veh)										0
Storage Bay Dist (m)	20.0			20.0					15.0	
Storage Blk Time (%)	0	12		2	5				4	32
Queuing Penalty (veh)	1	4		6	2				18	18

Queuing and Blocking Report

Base  
AM Peak Hour

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	19.2	21.1	24.3	30.2	16.2	17.6	15.9	9.9	15.1	26.3
Average Queue (m)	8.4	11.3	14.9	14.7	3.0	4.8	3.9	3.3	3.8	10.5
95th Queue (m)	17.5	21.7	23.9	25.1	12.1	14.0	12.4	10.3	12.2	20.7
Link Distance (m)	21.8	21.8	21.8		352.9	352.9		54.8	56.7	56.7
Upstream Blk Time (%)	0	1	2							
Queuing Penalty (veh)	1	2	3							
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)				1	0		0	0		
Queuing Penalty (veh)				0	0		0	0		

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.2	86.3	139.2	130.4	44.4	117.0	130.2	32.3	72.6	63.4	87.2	107.8
Average Queue (m)	59.1	66.5	82.8	76.4	6.6	70.8	84.3	15.5	38.6	34.3	54.0	61.0
95th Queue (m)	90.0	92.8	178.6	157.7	24.9	108.3	146.6	34.0	61.5	58.1	80.7	93.0
Link Distance (m)			266.8	266.8		122.1	122.1		289.9	289.9		101.5
Upstream Blk Time (%)			0	0		1	6					1
Queuing Penalty (veh)			0	0		0	0					4
Storage Bay Dist (m)	80.0	80.0			80.0		25.0				80.0	
Storage Blk Time (%)	2	14	0			5	3	25			1	3
Queuing Penalty (veh)	5	36	1			1	6	13			2	9

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB	B34
Directions Served	T	R	T
Maximum Queue (m)	68.1	34.2	1.4
Average Queue (m)	32.8	10.0	0.0
95th Queue (m)	58.8	24.0	1.0
Link Distance (m)	101.5	101.5	128.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report

Base  
AM Peak Hour

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	176.4	186.6	190.3	35.8	39.6	40.6	254.6	292.9	288.7
Average Queue (m)	81.0	174.9	182.2	22.0	26.7	29.3	107.9	142.8	167.0
95th Queue (m)	140.6	213.6	186.3	36.1	38.0	37.9	234.1	277.2	284.9
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	0	34	75	12	19	27	0	0	1
Queuing Penalty (veh)	0	0	0	70	111	161	2	4	7
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	4.4	85.9	90.5	97.0	8.8	85.8	125.3	159.1	262.7	269.3	265.8	274.8
Average Queue (m)	0.1	42.1	53.9	52.3	0.3	26.5	49.9	87.8	249.7	256.2	255.0	262.4
95th Queue (m)	1.8	73.3	80.7	80.7	6.2	57.1	106.6	143.9	265.3	267.2	262.9	313.9
Link Distance (m)		117.8	171.3	171.3	171.3	299.7	299.7	299.7	249.2	249.2	249.2	249.2
Upstream Blk Time (%)		0							7	14	18	37
Queuing Penalty (veh)		0							57	119	154	317
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)		9										
Queuing Penalty (veh)		0										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	117.6	115.2	100.1	45.9	47.5	103.6	87.2
Average Queue (m)	75.4	74.5	52.0	20.3	21.2	65.5	54.2
95th Queue (m)	105.6	104.1	92.9	38.7	39.9	92.8	82.7
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Base  
AM Peak Hour

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	50.5	76.0	62.9	61.8	46.6	89.5	87.2
Average Queue (m)	14.8	47.3	33.4	32.3	13.7	43.5	47.9
95th Queue (m)	42.9	67.1	58.3	54.1	34.8	76.6	80.5
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	37.6	23.6	25.8	11.8	42.9	28.1
Average Queue (m)	20.7	6.3	14.1	2.7	19.2	14.5
95th Queue (m)	33.0	16.5	24.3	9.7	32.3	23.4
Link Distance (m)	121.6	121.6	175.0	175.0	246.4	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report

Base  
AM Peak Hour

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	1.5	14.4	49.9	30.4	16.7	34.5	26.7	4.0	6.2	8.8	7.3	13.1
Average Queue (m)	0.0	4.0	15.8	7.8	5.8	10.5	4.6	0.1	0.4	1.4	0.6	2.8
95th Queue (m)	1.0	10.6	36.7	21.7	13.1	27.6	16.3	2.1	3.2	6.1	3.9	8.8
Link Distance (m)			312.4	312.4			232.2	232.2			141.8	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0			70.0	15.0			
Storage Blk Time (%)										0		
Queuing Penalty (veh)										0		

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	SB
Directions Served	R
Maximum Queue (m)	2.5
Average Queue (m)	0.1
95th Queue (m)	1.8
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	9.3	5.0	21.3	9.5	1.8	19.2
Average Queue (m)	1.0	0.2	3.0	0.4	0.1	2.9
95th Queue (m)	5.8	2.6	13.9	4.6	1.8	11.4
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)				0		0
Queuing Penalty (veh)				0		0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	1	0				

Queuing and Blocking Report

Base  
AM Peak Hour

Intersection: 202: Lyons Lane & South Service Road

Movement	SB
Directions Served	LR
Maximum Queue (m)	19.5
Average Queue (m)	1.8
95th Queue (m)	9.8
Link Distance (m)	21.6
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 203: Argus Rd & South Service Rd

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (m)	14.8	7.5	9.0
Average Queue (m)	0.6	0.3	1.8
95th Queue (m)	5.8	3.5	7.6
Link Distance (m)	160.7	112.3	88.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	16.0	48.2	55.8	55.1	26.4	35.4	36.5
Average Queue (m)	4.2	9.4	12.0	21.8	6.5	5.7	8.3
95th Queue (m)	12.3	33.5	36.9	48.1	26.2	26.4	29.1
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)					4	1	1
Queuing Penalty (veh)					35	5	6
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Base  
AM Peak Hour

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	R
Maximum Queue (m)	15.4	40.4	179.5	172.5	289.4	287.1	28.8	65.8	83.0	91.4	194.0	9.2
Average Queue (m)	3.6	16.9	69.0	172.1	279.7	278.4	11.0	27.9	36.6	42.9	51.4	0.3
95th Queue (m)	11.3	34.7	144.9	173.5	284.6	289.7	24.8	51.7	68.8	75.7	113.9	6.4
Link Distance (m)		265.0	265.0		273.8	273.8			249.2	249.2	249.2	249.2
Upstream Blk Time (%)					93	69						0
Queuing Penalty (veh)					0	0						0
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				
Storage Blk Time (%)				34	84	1	1					
Queuing Penalty (veh)				154	387	1	1					

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	R
Maximum Queue (m)	102.4	250.0	251.3	250.0	97.5
Average Queue (m)	83.6	240.4	239.9	239.7	46.3
95th Queue (m)	143.4	251.6	253.0	257.7	126.0
Link Distance (m)		234.2	234.2	234.2	
Upstream Blk Time (%)		78	81	79	
Queuing Penalty (veh)		0	0	0	
Storage Bay Dist (m)	95.0				90.0
Storage Blk Time (%)	0	72		88	0
Queuing Penalty (veh)	0	101		22	1

Network Summary

Network wide Queuing Penalty: 2349
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Lanes, Volumes, Timings

101: Trafalgar Rd & Cross Ave/South Service Rd

Base  
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔	↔	↔	↔	↔	↔↔↔	↔↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	956	86	132	151	144	274	128	1382	41	131	1390	320
Future Volume (vph)	956	86	132	151	144	274	128	1382	41	131	1390	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.97		0.98				0.99				0.99
Frt		0.913				0.850		0.994				0.973
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2958	1399	0	1540	1644	1423	1496	4544	0	1570	4438	0
Fit Permitted	0.950			0.587			0.070			0.067		
Satd. Flow (perm)	2958	1399	0	929	1644	1423	110	4544	0	111	4438	0
Right Turn on Red			Yes			Yes		Yes			Yes	Yes
Satd. Flow (RTOR)		57				236		5			45	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		151.2			330.4			150.2			270.2	
Travel Time (s)		10.9			23.8			10.8			19.5	
Confl. Peds. (#/hr)			15	15			18		70	70		18
Peak Hour Factor	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%
Adj. Flow (vph)	1138	119	163	184	178	334	151	1502	62	146	1562	344
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1138	282	0	184	178	334	151	1564	0	146	1906	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lanes, Volumes, Timings

101: Trafalgar Rd & Cross Ave/South Service Rd

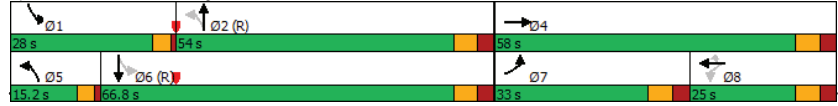
Base  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		25.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	33.0	58.0		25.0	25.0	25.0	15.2	54.0		28.0	66.8	
Total Split (%)	23.6%	41.4%		17.9%	17.9%	17.9%	10.9%	38.6%		20.0%	47.7%	
Maximum Green (s)	26.0	51.0		18.0	18.0	18.0	11.2	47.0		24.0	59.8	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	Min	C-Max		Min	C-Max	
Walk Time (s)		7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0	0	0		0			0	
Act Effct Green (s)	29.0	54.0		18.0	21.0	21.0	71.7	60.5		75.2	62.8	
Actuated g/C Ratio	0.21	0.39		0.13	0.15	0.15	0.51	0.43		0.54	0.45	
v/c Ratio	1.86	0.49		1.55	0.72	0.81	0.90	0.80		0.73	0.95	
Control Delay	424.0	29.0		322.1	74.2	33.0	42.8	44.4		48.9	44.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	424.0	29.0		322.1	74.2	33.0	42.8	44.4		48.9	44.8	
LOS	F	C		F	E	C	D	D		D	D	
Approach Delay		345.5			120.0			44.3			45.1	
Approach LOS		F			F			D			D	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 128 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.86  
 Intersection Signal Delay: 126.2 Intersection LOS: F  
 Intersection Capacity Utilization 98.0% ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 101: Trafalgar Rd & Cross Ave/South Service Rd



Queues

101: Trafalgar Rd & Cross Ave/South Service Rd

Base  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1138	282	184	178	334	151	1564	146	1906
v/c Ratio	1.86	0.49	1.55	0.72	0.81	0.90	0.80	0.73	0.95
Control Delay	424.0	29.0	322.1	74.2	33.0	42.8	44.4	48.9	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	424.0	29.0	322.1	74.2	33.0	42.8	44.4	48.9	44.8
Queue Length 50th (m)	~259.2	49.2	~75.2	50.1	28.1	35.3	137.6	29.6	150.2
Queue Length 95th (m)	#276.0	55.2	#111.4	68.5	52.6	m28.1	m106.0	m46.1	#170.0
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	612	574	119	246	414	167	1965	311	2015
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.86	0.49	1.55	0.72	0.81	0.90	0.80	0.47	0.95

Intersection Summary

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



Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

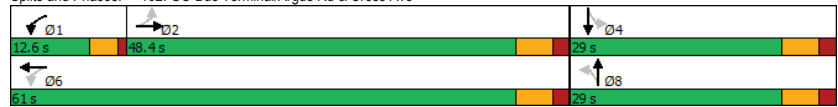
Base  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	48.4	48.4		12.6	61.0		29.0	29.0		29.0	29.0	
Total Split (%)	53.8%	53.8%		14.0%	67.8%		32.2%	32.2%		32.2%	32.2%	
Maximum Green (s)	42.4	42.4		8.6	55.0		23.0	23.0		23.0	23.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	36.2	36.2		48.7	48.7		18.8	18.8		18.8	18.8	
Actuated g/C Ratio	0.48	0.48		0.64	0.64		0.25	0.25		0.25	0.25	
v/c Ratio	0.05	0.69		0.25	0.20		0.19	0.33		0.58	0.43	
Control Delay	11.9	18.5		9.9	5.8		29.3	12.5		35.6	9.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.9	18.5		9.9	5.8		29.3	12.5		35.6	9.6	
LOS	B	B		A	A		C	B		D	A	
Approach Delay		18.3			6.1			16.1			21.7	
Approach LOS		B			A			B			C	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	75.8
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	16.0
Intersection LOS:	B
Intersection Capacity Utilization:	56.6%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 102: GO Bus Terminal/Argus Rd & Cross Ave



Queues  
102: GO Bus Terminal/Argus Rd & Cross Ave

Base  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	21	1052	38	416	21	77	165	189
v/c Ratio	0.05	0.69	0.25	0.20	0.19	0.33	0.58	0.43
Control Delay	11.9	18.5	9.9	5.8	29.3	12.5	35.6	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	18.5	9.9	5.8	29.3	12.5	35.6	9.6
Queue Length 50th (m)	1.6	61.2	1.9	10.8	2.5	0.9	22.1	2.9
Queue Length 95th (m)	4.3	80.4	6.2	20.2	7.1	0.0	43.5	12.0
Internal Link Dist (m)		350.0		48.9		57.9		156.7
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	501	1916	158	2463	152	289	388	544
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.55	0.24	0.17	0.14	0.27	0.43	0.35

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
102: GO Bus Terminal/Argus Rd & Cross Ave

Base  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↕	↔	↕↕	↕↕	↔	↕↕	↕↕	↔	↕↕	↕↕	↔
Traffic Volume (vph)	14	835	16	36	347	41	15	2	46	142	19	128
Future Volume (vph)	14	835	16	36	347	41	15	2	46	142	19	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.98	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1557	3174		797	3176		778	719		1543	1287	
Fit Permitted	0.51	1.00		0.15	1.00		0.55	1.00		0.71	1.00	
Satd. Flow (perm)	834	3174		125	3176		449	719		1148	1287	
Peak-hour factor, PHF	0.66	0.81	0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75	0.78
Adj. Flow (vph)	21	1031	21	38	365	51	21	8	69	165	25	164
RTOR Reduction (vph)	0	2	0	0	12	0	0	52	0	0	123	0
Lane Group Flow (vph)	21	1050	0	38	404	0	21	25	0	165	66	0
Confl. Peds. (#/hr)	9		4	4		9	12		20	20		12
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	0%	100%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	6		8	8		4	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	34.4	34.4		46.7	46.7		16.8	16.8		16.8	16.8	
Effective Green, g (s)	36.4	36.4		46.7	48.7		18.8	18.8		18.8	18.8	
Actuated g/C Ratio	0.48	0.48		0.62	0.65		0.25	0.25		0.25	0.25	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	402	1530		151	2048		111	179		285	320	
v/s Ratio Prot		c0.33		c0.03	0.13			0.04			0.05	
v/s Ratio Perm	0.03			0.13			0.05			c0.14		
v/c Ratio	0.05	0.69		0.25	0.20		0.19	0.14		0.58	0.21	
Uniform Delay, d1	10.4	15.1		8.2	5.5		22.3	22.1		24.9	22.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.7		0.6	0.1		1.1	0.5		3.4	0.4	
Delay (s)	10.5	16.8		8.8	5.6		23.5	22.6		28.3	22.9	
Level of Service	B	B		A	A		C	C		C	C	
Approach Delay (s)		16.7			5.8			22.8			25.4	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	75.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave

Base  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕	↕↕	↔	↕↕	↕↕	↔	↕↕	↕↕	↔	↕↕	↕↕	↔
Traffic Volume (vph)	37	150	13	14	307	12	229	4	155	15	2	62
Future Volume (vph)	37	150	13	14	307	12	229	4	155	15	2	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0	0.0	25.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	0
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.98	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Frt		0.987			0.990			0.859			0.856	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1525	2908	0	1570	3068	0	1570	1446	0	1570	1418	0
Fit Permitted	0.545			0.564			0.688			0.550		
Satd. Flow (perm)	871	2908	0	931	3068	0	1136	1446	0	906	1418	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			13			196			103	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		40.1			374.0			69.1			70.9	
Travel Time (s)		2.9			26.9			5.0			5.1	
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1
Peak Hour Factor	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	64	179	17	26	323	22	309	12	196	21	4	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	196	0	26	345	0	309	208	0	21	107	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

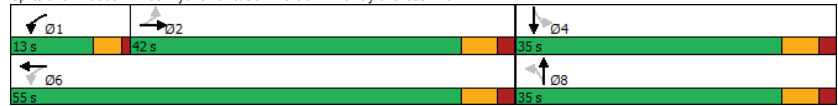
Base  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	42.0	42.0		13.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	46.7%	46.7%		14.4%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	36.0	36.0		9.0	49.0		29.0	29.0		29.0	29.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.1	37.1		49.1	49.1		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.44	0.44		0.58	0.58		0.33	0.33		0.33	0.33	
v/c Ratio	0.17	0.15		0.04	0.19		0.83	0.34		0.07	0.20	
Control Delay	17.4	14.6		9.0	9.1		46.3	5.5		19.9	5.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.4	14.6		9.0	9.1		46.3	5.5		19.9	5.7	
LOS	B	B		A	A		D	A		B	A	
Approach Delay		15.3			9.1			29.8			8.0	
Approach LOS		B			A			C			A	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	85.2
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	18.7
Intersection LOS:	B
Intersection Capacity Utilization:	61.6%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 103: Lyons Lane/Commercial Driveway & Cross Ave



Queues

103: Lyons Lane/Commercial Driveway & Cross Ave

Base  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	196	26	345	309	208	21	107
v/c Ratio	0.17	0.15	0.04	0.19	0.83	0.34	0.07	0.20
Control Delay	17.4	14.6	9.0	9.1	46.3	5.5	19.9	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	14.6	9.0	9.1	46.3	5.5	19.9	5.7
Queue Length 50th (m)	6.9	10.2	2.0	14.4	48.1	1.4	2.5	0.5
Queue Length 95th (m)	9.6	15.9	3.2	21.6	61.2	0.0	5.8	0.6
Internal Link Dist (m)		16.1		350.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	389	1308	604	1847	414	652	330	582
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.15	0.04	0.19	0.75	0.32	0.06	0.18

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
103: Lyons Lane/Commercial Driveway & Cross Ave

Base  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	37	150	13	14	307	12	229	4	155	15	2	62
Future Volume (vph)	37	150	13	14	307	12	229	4	155	15	2	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.3	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Fipb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1519	2908		1569	3069		1569	1445		1565	1417	
Flt Permitted	0.54	1.00		0.56	1.00		0.69	1.00		0.55	1.00	
Satd. Flow (perm)	871	2908		932	3069		1136	1445		906	1417	
Peak-hour factor, PHF	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60
Adj. Flow (vph)	64	179	17	26	323	22	309	12	196	21	4	103
RTOR Reduction (vph)	0	8	0	0	5	0	0	132	0	0	69	0
Lane Group Flow (vph)	64	188	0	26	340	0	309	76	0	21	38	0
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	35.1	35.1		47.1	47.1		26.0	26.0		26.0	26.0	
Effective Green, g (s)	37.1	37.1		47.1	49.1		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.44	0.44		0.55	0.58		0.33	0.33		0.33	0.33	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	379	1267		575	1770		373	475		298	466	
v/s Ratio Prot		0.06		0.00	c0.11			0.05			0.03	
v/s Ratio Perm	0.07			0.02			c0.27			0.02		
v/c Ratio	0.17	0.15		0.05	0.19		0.83	0.16		0.07	0.08	
Uniform Delay, d1	14.6	14.5		8.7	8.6		26.3	20.2		19.6	19.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.0	0.1		14.6	0.2		0.1	0.1	
Delay (s)	15.1	14.6		8.7	8.7		41.0	20.4		19.7	19.8	
Level of Service	B	B		A	A		D	C		B	B	
Approach Delay (s)		14.7			8.7			32.7			19.8	
Approach LOS		B			A			C			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		20.8					HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		85.1		Sum of lost time (s)				12.0				
Intersection Capacity Utilization		61.6%		ICU Level of Service				B				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Base  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	474	507	179	63	707	623	126	449	43	538	581	519
Future Volume (vph)	474	507	179	63	707	623	126	449	43	538	581	519
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0		0.0	80.0		0.0	25.0		0.0	80.0		0.0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00
Ped Bike Factor	1.00	0.99		0.99	0.98		0.99	1.00		0.99	0.97	0.97
Frt		0.958			0.934			0.985				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3016	2994	0	1570	2951	0	1540	3192	0	2987	1710	1409
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3006	2994	0	1554	2951	0	1526	3192	0	2957	1710	1361
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			152			9				205
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.8			142.3			311.4				130.3
Travel Time (s)		20.6			10.2			22.4				9.4
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Peak Hour Factor	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Adj. Flow (vph)	533	604	236	75	852	670	142	499	57	690	660	590
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	533	840	0	75	1522	0	142	556	0	690	660	590
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	6.6				6.6			6.6				6.6
Link Offset(m)	0.0				0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

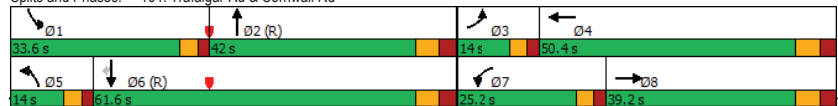
Base  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	14.0	39.2		25.2	50.4		14.0	42.0		33.6	61.6	61.6
Total Split (%)	10.0%	28.0%		18.0%	36.0%		10.0%	30.0%		24.0%	44.0%	44.0%
Maximum Green (s)	9.0	32.2		20.2	43.4		9.0	35.0		28.6	54.6	54.6
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	10.0	35.2		21.2	46.4		10.0	38.0		29.6	57.6	57.6
Actuated g/C Ratio	0.07	0.25		0.15	0.33		0.07	0.27		0.21	0.41	0.41
v/c Ratio	2.48	1.08		0.32	1.41		1.29	0.64		1.09	0.94	0.87
Control Delay	704.3	101.2		57.1	222.9		232.0	48.1		122.8	40.2	22.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	704.3	101.2		57.1	222.9		232.0	48.1		122.8	40.2	22.3
LOS	F	F		E	F		F	D		F	D	C
Approach Delay		335.3			215.1			85.5			64.1	
Approach LOS		F			F			F			E	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 2.48  
 Intersection Signal Delay: 176.2 Intersection LOS: F  
 Intersection Capacity Utilization 117.0% ICU Level of Service H  
 Analysis Period (min) 15

Splits and Phases: 104: Trafalgar Rd & Cornwall Rd



Queues  
104: Trafalgar Rd & Cornwall Rd

Base  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	533	840	75	1522	142	556	690	660	590
v/c Ratio	2.48	1.08	0.32	1.41	1.29	0.64	1.09	0.94	0.87
Control Delay	704.3	101.2	57.1	222.9	232.0	48.1	122.8	40.2	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	704.3	101.2	57.1	222.9	232.0	48.1	122.8	40.2	22.3
Queue Length 50th (m)	~132.5	~138.3	19.8	~298.0	~52.6	74.3	~119.2	106.3	41.9
Queue Length 95th (m)	#167.7	#160.6	33.4	#301.5	#96.2	95.3 m	#117.2	m136.5	m50.7
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	215	781	237	1079	110	872	631	703	680
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	2.48	1.08	0.32	1.41	1.29	0.64	1.09	0.94	0.87

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Base  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	474	507	179	63	707	623	126	449	43	538	581	519
Future Volume (vph)	474	507	179	63	707	623	126	449	43	538	581	519
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		0.97	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.93		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)	3016	2994		1570	2950		1540	3191		2987	1710	1361
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3016	2994		1570	2950		1540	3191		2987	1710	1361
Peak-hour factor, PHF	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Adj. Flow (vph)	533	604	236	75	852	670	142	499	57	690	660	590
RTOR Reduction (vph)	0	29	0	0	102	0	0	7	0	0	0	121
Lane Group Flow (vph)	533	811	0	75	1420	0	142	549	0	690	660	469
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	9.0	32.2		20.2	43.4		9.0	35.0		28.6	54.6	54.6
Effective Green, g (s)	10.0	35.2		21.2	46.4		10.0	38.0		29.6	57.6	57.6
Actuated g/C Ratio	0.07	0.25		0.15	0.33		0.07	0.27		0.21	0.41	0.41
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	215	752		237	977		110	866		631	703	559
v/s Ratio Prot	c0.18	0.27		0.05	c0.48		c0.09	0.17		c0.23	c0.39	
v/s Ratio Perm												0.34
v/c Ratio	2.48	1.08		0.32	1.45		1.29	0.63		1.09	0.94	0.84
Uniform Delay, d1	65.0	52.4		52.9	46.8		65.0	44.9		55.2	39.5	37.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.48	0.75	0.67
Incremental Delay, d2	679.3	55.9		3.5	210.0		182.9	3.5		51.0	9.5	5.1
Delay (s)	744.3	108.3		56.4	256.8		247.9	48.4		132.9	39.3	30.0
Level of Service	F	F		E	F		F	D		F	D	C
Approach Delay (s)		355.2			247.3			89.0			69.7	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	192.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	117.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Base  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↕	↕	↕
Traffic Volume (vph)	984	463	0	2190	1640	0
Future Volume (vph)	984	463	0	2190	1640	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor		0.99				
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3046	1423	0	4577	4577	0
Flt Permitted	0.950					
Satd. Flow (perm)	3046	1402	0	4577	4577	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		17				
Link Speed (k/h)	50			50	50	
Link Distance (m)	199.2			51.4	324.8	
Travel Time (s)	14.3			3.7	23.4	
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.87	0.93	0.25	0.97	0.94	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Adj. Flow (vph)	1131	498	0	2258	1745	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1131	498	0	2258	1745	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	



Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Base  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	56.0	56.0		84.0	84.0	
Total Split (%)	40.0%	40.0%		60.0%	60.0%	
Maximum Green (s)	49.0	49.0		77.0	77.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	52.0	52.0		80.0	80.0	
Actuated g/C Ratio	0.37	0.37		0.57	0.57	
v/c Ratio	1.00	0.94		0.86	0.67	
Control Delay	70.5	67.7		25.3	9.0	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	70.5	67.7		25.3	9.0	
LOS	E	E		C	A	
Approach Delay	69.6			25.3	9.0	
Approach LOS	E			C	A	

Intersection Summary

Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	133.6 (95%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.00
Intersection Signal Delay:	33.1
Intersection LOS:	C
Intersection Capacity Utilization:	84.9%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 105: Trafalgar Rd & QEW EB-Off Ramp



Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Base  
PM Peak Hour








Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1131	498	2258	1745
v/c Ratio	1.00	0.94	0.86	0.67
Control Delay	70.5	67.7	25.3	9.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	70.5	67.7	25.3	9.0
Queue Length 50th (m)	169.0	135.6	195.1	51.8
Queue Length 95th (m)	#206.4	#209.2	m85.6	m39.5
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1131	531	2615	2615
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.00	0.94	0.86	0.67

Intersection Summary

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

















HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Base  
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	984	463	0	2190	1640	0
Future Volume (vph)	984	463	0	2190	1640	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3046	1402		4577	4577	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3046	1402		4577	4577	
Peak-hour factor, PHF	0.87	0.93	0.25	0.97	0.94	0.25
Adj. Flow (vph)	1131	498	0	2258	1745	0
RTOR Reduction (vph)	0	11	0	0	0	0
Lane Group Flow (vph)	1131	487	0	2258	1745	0
Confl. Peds. (#/hr)	2					
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases	4					
Actuated Green, G (s)	49.0	49.0		77.0	77.0	
Effective Green, g (s)	52.0	52.0		80.0	80.0	
Actuated g/C Ratio	0.37	0.37		0.57	0.57	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1131	520		2615	2615	
v/s Ratio Prot	c0.37			c0.49	0.38	
v/s Ratio Perm	0.35					
v/c Ratio	1.00	0.94		0.86	0.67	
Uniform Delay, d1	44.0	42.4		25.4	20.8	
Progression Factor	1.00	1.00		0.96	0.42	
Incremental Delay, d2	26.8	24.5		0.4	0.1	
Delay (s)	70.8	67.0		24.9	8.9	
Level of Service	E	E		C	A	
Approach Delay (s)	69.6			24.9		8.9
Approach LOS	E			C		A
<b>Intersection Summary</b>						
HCM 2000 Control Delay			32.9	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.92			
Actuated Cycle Length (s)			140.0	Sum of lost time (s)		8.0
Intersection Capacity Utilization			84.9%	ICU Level of Service		E
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Base  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	247	457	129	360	0	2651	0	0	2506	11
Future Volume (vph)	19	0	247	457	129	360	0	2651	0	0	2506	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		1
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	1.00		0.850		0.850		0.99		0.95		0.850	
Frt			0.850		0.850						0.850	
Flt Protected	0.950			0.950	0.975							
Satd. Flow (prot)	1570	0	1437	1463	1560	1409	0	4577	0	0	3795	1437
Flt Permitted	0.950			0.950	0.975							
Satd. Flow (perm)	1568	0	1437	1463	1560	1389	0	4577	0	0	3795	1359
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)			31		164						70	
Link Speed (k/h)	50		50		50		50		50		50	
Link Distance (m)	142.1		192.6		324.8		280.4		280.4			
Travel Time (s)	10.2		13.9		23.4		20.2		20.2			
Confl. Peds. (#/hr)	2		2		14		14		14		14	
Peak Hour Factor	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Adj. Flow (vph)	31	0	260	544	182	444	0	2820	0	0	2610	17
Shared Lane Traffic (%)			34%									
Lane Group Flow (vph)	31	0	260	359	367	444	0	2820	0	0	2610	17
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.3		3.3		3.6		3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8		4.8		4.8		4.8	
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1		1	1		1	1		1
Detector Template	Left		Right	Left	Thru	Right		Thru		Thru		Right
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0		10.0		2.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6		0.6		2.0
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex		CI+Ex		CI+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 2 Position(m)					9.4			9.4		9.4		9.4
Detector 2 Size(m)					0.6			0.6		0.6		0.6
Detector 2 Type					CI+Ex			CI+Ex		CI+Ex		CI+Ex
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Base  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Perm		Perm		NA		NA	NA	Perm
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Detector Phase	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		61.0	38.0	38.0	38.0		79.0			79.0	79.0
Total Split (%)	16.4%		43.6%	27.1%	27.1%	27.1%		56.4%			56.4%	56.4%
Maximum Green (s)	18.0		54.0	31.0	31.0	31.0		72.0			72.0	72.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)			7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (#/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	9.6		56.9	43.3	43.3	43.3		75.1			75.1	75.1
Actuated g/C Ratio	0.07		0.41	0.31	0.31	0.31		0.54			0.54	0.54
v/c Ratio	0.29		0.43	0.79	0.76	0.82		1.15			1.28	0.02
Control Delay	68.3		28.7	58.6	55.6	41.3		98.8			161.1	0.1
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	68.3		28.7	58.6	55.6	41.3		98.8			161.1	0.1
LOS	E		C	E	E	D		F			F	A
Approach Delay		33.0				51.1		98.8			160.0	
Approach LOS		C				D		F			F	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.28  
 Intersection Signal Delay: 111.2 Intersection LOS: F  
 Intersection Capacity Utilization 99.1% ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Base  
PM Peak Hour

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	31	260	359	367	444	2820	2610	17
v/c Ratio	0.29	0.43	0.79	0.76	0.82	1.15	1.28	0.02
Control Delay	68.3	28.7	58.6	55.6	41.3	98.8	161.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	28.7	58.6	55.6	41.3	98.8	161.1	0.1
Queue Length 50th (m)	8.8	47.4	100.4	101.2	79.4	~351.2	~352.9	0.0
Queue Length 95th (m)	13.1	73.4	#140.9	107.3	106.4 m#370.1	#379.9	0.0	
Internal Link Dist (m)				168.6		300.8	256.4	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	603	452	482	543	2454	2035	761
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.43	0.79	0.76	0.82	1.15	1.28	0.02

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Base  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	19	0	247	457	129	360	0	2651	0	0	2506	11
Future Volume (vph)	19	0	247	457	129	360	0	2651	0	0	2506	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		0.91		0.91	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99		1.00		1.00	0.95	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Fr	1.00		0.85	1.00	1.00	0.85		1.00		1.00	0.85	
Flt Protected	0.95		1.00	0.95	0.98	1.00		1.00		1.00	1.00	
Satd. Flow (prot)	1570		1437	1463	1561	1389		4577		3795	1359	
Flt Permitted	0.95		1.00	0.95	0.98	1.00		1.00		1.00	1.00	
Satd. Flow (perm)	1570		1437	1463	1561	1389		4577		3795	1359	
Peak-hour factor, PHF	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Adj. Flow (vph)	31	0	260	544	182	444	0	2820	0	0	2610	17
RTOR Reduction (vph)	0	0	18	0	0	113	0	0	0	0	0	8
Lane Group Flow (vph)	31	0	242	359	367	331	0	2820	0	0	2610	9
Confl. Peds. (#/hr)	2					2	14		14	14		14
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	Perm	
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	8.6		53.9	40.3	40.3	40.3		72.1		72.1	72.1	
Effective Green, g (s)	9.6		56.9	43.3	43.3	43.3		75.1		75.1	75.1	
Actuated g/C Ratio	0.07		0.41	0.31	0.31	0.31		0.54		0.54	0.54	
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0		7.0	7.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5		4.5	4.5	
Lane Grp Cap (vph)	107		584	452	482	429		2455		2035	729	
v/s Ratio Prot	0.02							0.62		c0.69		
v/s Ratio Perm			c0.17	c0.25	0.24	0.24					0.01	
v/c Ratio	0.29		0.41	0.79	0.76	0.77		1.15		1.28	0.01	
Uniform Delay, d1	62.0		29.6	44.3	43.7	43.9		32.5		32.5	15.1	
Progression Factor	1.00		1.00	1.00	1.00	1.00		0.92		1.00	1.00	
Incremental Delay, d2	1.5		0.5	9.3	7.0	8.3		69.1		131.0	0.0	
Delay (s)	63.5		30.1	53.6	50.7	52.2		99.0		163.5	15.2	
Level of Service	E		C	D	D	D		F		F	B	
Approach Delay (s)		33.7			52.1		99.0				162.5	
Approach LOS		C			D		F				F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			112.5				HCM 2000 Level of Service				F	
HCM 2000 Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			99.1%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Base  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	619	544	869	0	0	923
Future Volume (vph)	619	544	869	0	0	923
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Fr	0.966	0.850				
Flt Protected	0.963					
Satd. Flow (prot)	3344	1455	3574	0	0	3539
Flt Permitted	0.963					
Satd. Flow (perm)	3344	1455	3574	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	38	111				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Adj. Flow (vph)	673	591	945	0	0	1003
Shared Lane Traffic (%)		33%				
Lane Group Flow (vph)	868	396	945	0	0	1003
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex			CI+Ex
<b>Detector 1 Channel</b>						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
<b>Detector 2 Channel</b>						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

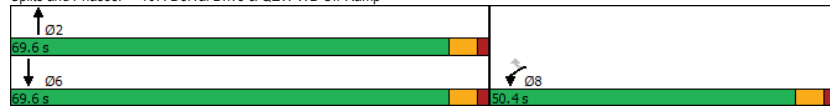
Base  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8					
Detector Phase	8	8	2	6		
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0	20.0		
Minimum Split (s)	24.0	24.0	26.0	26.0		
Total Split (s)	50.4	50.4	69.6	69.6		
Total Split (%)	42.0%	42.0%	58.0%	58.0%		
Maximum Green (s)	44.4	44.4	63.6	63.6		
Yellow Time (s)	4.0	4.0	4.0	4.0		
All-Red Time (s)	2.0	2.0	2.0	2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	4.0	4.0	4.0	4.0		
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0	5.0		
Recall Mode	None	None	Max	Max		
Walk Time (s)	5.0	5.0	7.0	7.0		
Flash Dont Walk (s)	7.0	7.0	11.0	11.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	39.6	39.6	65.8	65.8		
Actuated g/C Ratio	0.35	0.35	0.58	0.58		
v/c Ratio	0.73	0.68	0.46	0.49		
Control Delay	34.5	28.6	15.2	15.7		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	34.5	28.6	15.2	15.7		
LOS	C	C	B	B		
Approach Delay	32.6	15.2		15.7		
Approach LOS	C	B		B		

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 113.4  
 Natural Cycle: 50  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 22.2      Intersection LOS: C  
 Intersection Capacity Utilization 55.5%      ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 107: Dorval Drive & QEW WB Off-Ramp



Queues  
107: Dorval Drive & QEW WB Off-Ramp

Base  
PM Peak Hour

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	868	396	945	1003
v/c Ratio	0.73	0.68	0.46	0.49
Control Delay	34.5	28.6	15.2	15.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.5	28.6	15.2	15.7
Queue Length 50th (m)	86.4	62.5	64.8	70.6
Queue Length 95th (m)	109.0	101.7	90.0	97.5
Internal Link Dist (m)	301.1	286.2		242.9
Turn Bay Length (m)	190.0			
Base Capacity (vph)	1394	662	2073	2053
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	0.60	0.46	0.49

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Base  
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕			↕↕
Traffic Volume (vph)	619	544	869	0	0	923
Future Volume (vph)	619	544	869	0	0	923
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr	0.97	0.85	1.00			1.00
Fit Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3344	1455	3574			3539
Fit Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3344	1455	3574			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	673	591	945	0	0	1003
RTOR Reduction (vph)	25	72	0	0	0	0
Lane Group Flow (vph)	843	324	945	0	0	1003
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	37.6	37.6	63.8			63.8
Effective Green, g (s)	39.6	39.6	65.8			65.8
Actuated g/C Ratio	0.35	0.35	0.58			0.58
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1167	508	2073			2053
v/s Ratio Prot	c0.25		0.26			c0.28
v/s Ratio Perm		0.22				
v/c Ratio	0.72	0.64	0.46			0.49
Uniform Delay, d1	32.1	30.9	13.6			13.9
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	2.6	3.3	0.7			0.8
Delay (s)	34.7	34.2	14.3			14.8
Level of Service	C	C	B			B
Approach Delay (s)	34.5		14.3			14.8
Approach LOS	C		B			B
<b>Intersection Summary</b>						
HCM 2000 Control Delay			22.4			HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.58			
Actuated Cycle Length (s)			113.4			Sum of lost time (s) 8.0
Intersection Capacity Utilization			55.5%			ICU Level of Service B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Base  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕	↕↕	
Traffic Volume (vph)	240	286	0	1043	987	0
Future Volume (vph)	240	286	0	1043	987	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr	0.950	0.850				
Fit Protected	0.968					
Satd. Flow (prot)	3302	1441	0	3539	3505	0
Fit Permitted	0.968					
Satd. Flow (perm)	3302	1441	0	3539	3505	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	85	96				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Adj. Flow (vph)	261	311	0	1134	1073	0
Shared Lane Traffic (%)		42%				
Lane Group Flow (vph)	392	180	0	1134	1073	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
<b>Detector 1 Channel</b>						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
<b>Detector 2 Channel</b>						
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
<b>Detector 2 Channel</b>						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

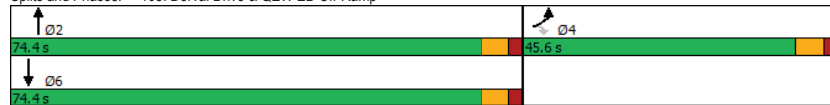
Base  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	45.6	45.6		74.4	74.4	
Total Split (%)	38.0%	38.0%		62.0%	62.0%	
Maximum Green (s)	39.6	39.6		68.4	68.4	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	17.6	17.6		70.5	70.5	
Actuated g/C Ratio	0.18	0.18		0.73	0.73	
v/c Ratio	0.58	0.53		0.44	0.42	
Control Delay	31.3	22.7		6.0	5.8	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	31.3	22.7		6.0	5.8	
LOS	C	C		A	A	
Approach Delay	28.6			6.0	5.8	
Approach LOS	C			A	A	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	96.1
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.58
Intersection Signal Delay:	10.6
Intersection Capacity Utilization:	55.5%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	B

Splits and Phases: 108: Dorval Drive & QEW EB Off-Ramp



Queues  
108: Dorval Drive & QEW EB Off-Ramp

Base  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	392	180	1134	1073
v/c Ratio	0.58	0.53	0.44	0.42
Control Delay	31.3	22.7	6.0	5.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.3	22.7	6.0	5.8
Queue Length 50th (m)	28.2	15.8	37.4	34.8
Queue Length 95th (m)	42.9	39.0	60.9	56.7
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1479	679	2596	2571
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.27	0.27	0.44	0.42

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Base  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↗		↕↕	↕↕	
Traffic Volume (vph)	240	286	0	1043	987	0
Future Volume (vph)	240	286	0	1043	987	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Fr <sub>t</sub>	0.95	0.85		1.00	1.00	
Fl <sub>t</sub> Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3300	1441		3539	3505	
Fl <sub>t</sub> Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3300	1441		3539	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	311	0	1134	1073	0
RTOR Reduction (vph)	69	78	0	0	0	0
Lane Group Flow (vph)	323	102	0	1134	1073	0
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	15.6	15.6		68.5	68.5	
Effective Green, g (s)	17.6	17.6		70.5	70.5	
Actuated g/C Ratio	0.18	0.18		0.73	0.73	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	604	263		2596	2571	
v/s Ratio Prot	c0.10			c0.32	0.31	
v/s Ratio Perm		0.07				
v/c Ratio	0.53	0.39		0.44	0.42	
Uniform Delay, d1	35.5	34.5		5.0	4.9	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	1.3		0.5	0.5	
Delay (s)	36.7	35.8		5.6	5.4	
Level of Service	D	D		A	A	
Approach Delay (s)	36.4			5.6	5.4	
Approach LOS	D			A	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			11.9	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.46			
Actuated Cycle Length (s)			96.1	Sum of lost time (s)		8.0
Intersection Capacity Utilization			55.5%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Base  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕↕	↕↕
Traffic Volume (vph)	367	0	0	602	101	228
Future Volume (vph)	367	0	0	602	101	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	3574	0	0	3574	1805	1599
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	3574	0	0	3574	1805	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						248
Link Speed (k/h)	60			60	40	
Link Distance (m)	130.3			194.2	262.1	
Travel Time (s)	7.8			11.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Adj. Flow (vph)	399	0	0	654	110	248
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	399	0	0	654	110	248
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
<b>Lead/Lag</b>						
<b>Lead-Lag Optimize?</b>						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40



Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Base  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
v/c Ratio	0.28			0.46	0.15	0.31
Control Delay	9.8			11.2	9.4	2.9
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	9.8			11.2	9.4	2.9
LOS	A			B	A	A
Approach Delay	9.8			11.2	4.9	
Approach LOS	A			B	A	

Intersection Summary

Area Type: Other  
 Cycle Length: 45  
 Actuated Cycle Length: 45  
 Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green  
 Natural Cycle: 45  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.46  
 Intersection Signal Delay: 9.2 Intersection LOS: A  
 Intersection Capacity Utilization 31.8% ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street

Ø2 (R)	→ Ø4
22.5 s	22.5 s
	← Ø8
	22.5 s

Queues  
109: QEW WB Off-Ramp & Kerr Street

Base  
PM Peak Hour

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	399	654	110	248
v/c Ratio	0.28	0.46	0.15	0.31
Control Delay	9.8	11.2	9.4	2.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.8	11.2	9.4	2.9
Queue Length 50th (m)	11.0	19.6	5.5	0.0
Queue Length 95th (m)	18.5	30.7	12.8	9.7
Internal Link Dist (m)	106.3	170.2	238.1	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1429	1429	722	788
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.46	0.15	0.31

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Base  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	↑
Traffic Volume (vph)	367	0	0	602	101	228
Future Volume (vph)	367	0	0	602	101	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr't	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3574			3574	1805	1599
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3574			3574	1805	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	399	0	0	654	110	248
RTOR Reduction (vph)	0	0	0	0	0	149
Lane Group Flow (vph)	399	0	0	654	110	99
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1429			1429	722	639
v/s Ratio Prot	0.11			c0.18	0.06	
v/s Ratio Perm						c0.06
v/c Ratio	0.28			0.46	0.15	0.16
Uniform Delay, d1	9.1			9.9	8.6	8.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.5			1.1	0.4	0.5
Delay (s)	9.6			11.0	9.1	9.2
Level of Service	A			B	A	A
Approach Delay (s)	9.6			11.0	9.1	
Approach LOS	A			B	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			10.1		HCM 2000 Level of Service B	
HCM 2000 Volume to Capacity ratio			0.31			
Actuated Cycle Length (s)			45.0		Sum of lost time (s)	9.0
Intersection Capacity Utilization			31.8%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

Lanes, Volumes, Timings  
110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Base  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑		↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	272	474	15	159	567	24	12	41	87	12	113	370
Future Volume (vph)	272	474	15	159	567	24	12	41	87	12	113	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0		0.0	155.0		70.0	15.0		0.0	0.0		30.0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't		0.995				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950		0.950			0.950
Satd. Flow (prot)	3502	3395	0	1752	3505	1615	1805	1900	1615	1805	1900	1599
Flt Permitted	0.360			0.423			0.576		0.726			
Satd. Flow (perm)	1327	3395	0	780	3505	1615	1094	1900	1615	1379	1900	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			3			94			152			420
Link Speed (k/h)		80			80			60				40
Link Distance (m)		324.5			247.2			158.7				215.5
Travel Time (s)		14.6			11.1			9.5				19.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Adj. Flow (vph)	309	539	17	181	644	27	14	47	99	14	128	420
Shared Lane Traffic (%)												
Lane Group Flow (vph)	309	556	0	181	644	27	14	47	99	14	128	420
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

Lanes, Volumes, Timings Base  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	29.4		14.0	38.4	38.4	28.8	28.8	28.8	28.8	28.8	28.8
Total Split (s)	25.0	45.0		45.0	65.0	65.0	35.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	20.0%	36.0%		36.0%	52.0%	52.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
Maximum Green (s)	19.0	36.6		39.0	56.6	56.6	27.2	27.2	27.2	27.2	27.2	27.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	74.9	62.4		72.5	61.1	61.1	17.5	17.5	17.5	17.5	17.5	17.5
Actuated g/C Ratio	0.73	0.60		0.70	0.59	0.59	0.17	0.17	0.17	0.17	0.17	0.17
v/c Ratio	0.25	0.27		0.28	0.31	0.03	0.08	0.15	0.25	0.06	0.40	0.68
Control Delay	4.3	10.7		5.2	11.7	0.0	36.9	37.5	2.9	36.3	42.1	9.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	10.7		5.2	11.7	0.0	36.9	37.5	2.9	36.3	42.1	9.8
LOS	A	B		A	B	A	D	D	A	D	D	A
Approach Delay		8.4			9.9		16.0				17.8	
Approach LOS		A			A		B				B	

**Intersection Summary**

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 103.2

Natural Cycle: 85

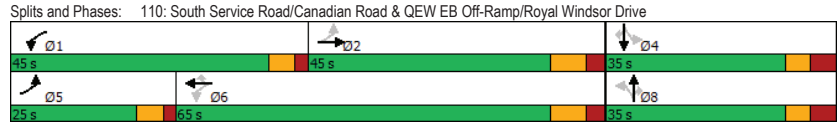
Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 11.6 Intersection LOS: B

Intersection Capacity Utilization 64.6% ICU Level of Service C

Analysis Period (min) 15



Queues Base  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	309	556	181	644	27	14	47	99	14	128	420
v/c Ratio	0.25	0.27	0.28	0.31	0.03	0.08	0.15	0.25	0.06	0.40	0.68
Control Delay	4.3	10.7	5.2	11.7	0.0	36.9	37.5	2.9	36.3	42.1	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	10.7	5.2	11.7	0.0	36.9	37.5	2.9	36.3	42.1	9.8
Queue Length 50th (m)	7.1	25.5	8.2	32.0	0.0	2.5	8.5	0.0	2.5	24.2	0.0
Queue Length 95th (m)	14.2	44.1	18.6	53.0	0.0	8.2	18.9	3.2	8.1	42.0	24.2
Internal Link Dist (m)		300.5		223.2		134.7				191.5	
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0
Base Capacity (vph)	1442	2052	974	2076	995	329	572	592	415	572	774
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.27	0.19	0.31	0.03	0.04	0.08	0.17	0.03	0.22	0.54

**Intersection Summary**

HCM Signalized Intersection Capacity Analysis  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Base

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↕	↔	↕	↔
Traffic Volume (vph)	272	474	15	159	567	24	12	41	87	12	113	370
Future Volume (vph)	272	474	15	159	567	24	12	41	87	12	113	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	3396		1752	3505	1615	1805	1900	1615	1805	1900	1599
Flt Permitted	0.36	1.00		0.42	1.00	1.00	0.58	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1327	3396		781	3505	1615	1095	1900	1615	1380	1900	1599
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)	309	539	17	181	644	27	14	47	99	14	128	420
RTOR Reduction (vph)	0	1	0	0	0	11	0	0	82	0	0	349
Lane Group Flow (vph)	309	555	0	181	644	16	14	47	17	14	128	71
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	68.5	58.0		66.1	56.8	56.8	13.7	13.7	13.7	13.7	13.7	13.7
Effective Green, g (s)	72.5	62.4		70.1	61.2	61.2	17.5	17.5	17.5	17.5	17.5	17.5
Actuated g/C Ratio	0.70	0.60		0.68	0.59	0.59	0.17	0.17	0.17	0.17	0.17	0.17
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	1195	2053		636	2078	957	185	322	273	234	322	271
v/s Ratio Prot	c0.03	0.16		0.03	c0.18			0.02			c0.07	
v/s Ratio Perm	0.15			0.16		0.01	0.01		0.01	0.01		0.04
v/c Ratio	0.26	0.27		0.28	0.31	0.02	0.08	0.15	0.06	0.06	0.40	0.26
Uniform Delay, d1	5.3	9.6		6.0	10.5	8.6	36.0	36.5	36.0	35.9	38.2	37.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.3		0.3	0.4	0.0	0.2	0.2	0.1	0.1	1.0	0.6
Delay (s)	5.4	10.0		6.3	10.9	8.7	36.3	36.7	36.1	36.1	39.1	37.9
Level of Service	A	A		A	B	A	D	D	D	D	D	D
Approach Delay (s)		8.3			9.8			36.3			38.1	
Approach LOS		A			A			D			D	

Intersection Summary	
HCM 2000 Control Delay	17.5
HCM 2000 Volume to Capacity ratio	0.32
Actuated Cycle Length (s)	103.2
Intersection Capacity Utilization	64.6%
Analysis Period (min)	15
c Critical Lane Group	

Lanes, Volumes, Timings  
 201: Cross Ave & Lyons Lane

Base

PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↕	↔	↔
Traffic Volume (vph)	6	180	587	7	15	28
Future Volume (vph)	6	180	587	7	15	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.997		0.910	
Fr						
Flt Protected	0.950				0.984	
Satd. Flow (prot)	1388	2954	3146	0	1491	0
Flt Permitted	0.950				0.984	
Satd. Flow (perm)	1388	2954	3146	0	1491	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	1			1	9	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Heavy Vehicles (%)	17%	10%	3%	0%	0%	4%
Adj. Flow (vph)	12	196	699	12	34	68
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	196	711	0	102	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	3.6	3.6			3.6	
Link Offset(m)	0.0	0.0			0.0	
Crosswalk Width(m)	4.8	4.8			4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	CBD
Control Type:	Unsignalized
Intersection Capacity Utilization	28.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Base  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	
Traffic Volume (veh/h)	6	180	587	7	15	28
Future Volume (Veh/h)	6	180	587	7	15	28
Sign Control	Free		Free	Stop		
Grade	0%		0%	0%		
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Hourly flow rate (vph)	12	196	699	12	34	68
Pedestrians			9	1		
Lane Width (m)			3.6	3.6		
Walking Speed (m/s)			1.2	1.2		
Percent Blockage			1	0		
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)	40					
pX, platoon unblocked	0.96			0.96	0.96	
vC, conflicting volume	712			837	356	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	615			745	244	
tC, single (s)	4.4			6.8	7.0	
tC, 2 stage (s)						
tF (s)	2.4			3.5	3.3	
p0 queue free %	99			90	91	
cM capacity (veh/h)	829			332	719	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>EB 3</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>
Volume Total	12	98	98	466	245	102
Volume Left	12	0	0	0	0	34
Volume Right	0	0	0	0	12	68
cSH	829	1700	1700	1700	1700	518
Volume to Capacity	0.01	0.06	0.06	0.27	0.14	0.20
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.0	5.8
Control Delay (s)	9.4	0.0	0.0	0.0	0.0	13.7
Lane LOS	A				B	
Approach Delay (s)	0.5		0.0		13.7	
Approach LOS					B	
<b>Intersection Summary</b>						
Average Delay			1.5			
Intersection Capacity Utilization			28.3%		ICU Level of Service A	
Analysis Period (min)	15					

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Road

Base  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	3	5	1	5	13	5
Future Volume (vph)	3	5	1	5	13	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.910			0.957
Fit Protected	0.976				0.967	
Satd. Flow (prot)	0	1669	1357	0	1582	0
Fit Permitted	0.976					
Satd. Flow (perm)	0	1669	1357	0	1582	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	60.5		89.6		37.6	
Travel Time (s)	4.4		6.5		2.7	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Heavy Vehicles (%)	0%	0%	0%	22%	0%	0%
Adj. Flow (vph)	8	8	4	8	26	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	16	12	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24		14		24	
Sign Control	Free		Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 15.4%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Road

Base  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	3	5	1	5	13	5
Future Volume (Veh/h)	3	5	1	5	13	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Hourly flow rate (vph)	8	8	4	8	26	12
Pedestrians					7	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked					39	15
vC, conflicting volume	19					
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	19				39	15
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	99
cM capacity (veh/h)	1601				967	1064
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	16	12	38			
Volume Left	8	0	26			
Volume Right	0	8	12			
cSH	1601	1700	996			
Volume to Capacity	0.00	0.01	0.04			
Queue Length 95th (m)	0.1	0.0	1.0			
Control Delay (s)	3.6	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	3.6	0.0	8.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			5.9			
Intersection Capacity Utilization		15.4%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd

Base  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	10	8	279	82	13	14
Future Volume (vph)	10	8	279	82	13	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.963		0.924	
Fit Protected		0.972			0.979	
Satd. Flow (prot)	0	1576	1535	0	1547	0
Fit Permitted		0.972			0.979	
Satd. Flow (perm)	0	1576	1535	0	1547	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)					5	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Heavy Vehicles (%)	0%	13%	10%	0%	0%	0%
Adj. Flow (vph)	22	16	321	121	17	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	38	442	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	31.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd

Base  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (veh/h)	10	8	279	82	13	14
Future Volume (Veh/h)	10	8	279	82	13	14
Sign Control		Free	Free		Stop	Stop
Grade		0%	0%		0%	0%
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Hourly flow rate (vph)	22	16	321	121	17	22
Pedestrians			5			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.2			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	442				446	382
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	442				446	382
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	97
cM capacity (veh/h)	1129				560	670
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	38	442	39			
Volume Left	22	0	17			
Volume Right	0	121	22			
eSH	1129	1700	617			
Volume to Capacity	0.02	0.26	0.06			
Queue Length 95th (m)	0.5	0.0	1.6			
Control Delay (s)	4.8	0.0	11.2			
Lane LOS	A		B			
Approach Delay (s)	4.8	0.0	11.2			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			1.2			
Intersection Capacity Utilization		31.9%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Base  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕↕	↕↕↕	↕
Traffic Volume (vph)	0	42	0	2612	1727	375
Future Volume (vph)	0	42	0	2612	1727	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Fr <sub>t</sub>		0.865			0.971	
Fit Protected						
Satd. Flow (prot)	0	1354	0	4577	4435	0
Fit Permitted						
Satd. Flow (perm)	0	1354	0	4577	4435	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	145.7			270.2	51.4	
Travel Time (s)	10.5			19.5	3.7	
Confl. Peds. (#/hr)						24
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87
Heavy Vehicles (%)	0%	8%	0%	2%	2%	3%
Adj. Flow (vph)	0	67	0	2902	1762	431
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	67	0	2902	2193	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 59.4%				ICU Level of Service B		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Base  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations		↗		↖↖	↗↗		
Traffic Volume (veh/h)	0	42	0	2612	1727	375	
Future Volume (Veh/h)	0	42	0	2612	1727	375	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87	
Hourly flow rate (vph)	0	67	0	2902	1762	431	
Pedestrians	24						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	2						
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.86	0.74	0.74				
vC, conflicting volume	2969	827	2217				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	660	0	1412				
tC, single (s)	6.8	7.1	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	91	100				
cM capacity (veh/h)	336	772	355				
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	67	967	967	967	705	705	783
Volume Left	0	0	0	0	0	0	0
Volume Right	67	0	0	0	0	0	431
sSH	772	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.09	0.57	0.57	0.57	0.41	0.41	0.46
Queue Length 95th (m)	2.3	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.1	0.0			0.0		
Approach LOS	B						
Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			59.4%		ICU Level of Service		B
Analysis Period (min)			15				

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Base  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖↖	↗↗	↘↘	↖	↗	↘	↖↖	↗↗	↘↘
Traffic Volume (vph)	119	97	298	932	142	224	370	1685	994	118	1287	67
Future Volume (vph)	119	97	298	932	142	224	370	1685	994	118	1287	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0		25.0	145.0		0.0	95.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	0.97					0.95			0.97			0.850
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1710	1425	3120	1710	1425	1608	4577	1425	1608	4532	1425
Fit Permitted	0.663			0.516			0.089			0.087		
Satd. Flow (perm)	1102	1710	1425	1695	1710	1360	151	4577	1382	147	4532	1425
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			155			219		685				155
Link Speed (k/h)		50			50			50				50
Link Distance (m)		347.0			285.9			280.4				353.6
Travel Time (s)		25.0			20.6			20.2				25.5
Confl. Peds. (#/hr)	34					34			14		14	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Adj. Flow (vph)	124	101	310	971	148	233	385	1755	1035	123	1341	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	124	101	310	971	148	233	385	1755	1035	123	1341	70
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)				7.2				3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0



Lanes, Volumes, Timings

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

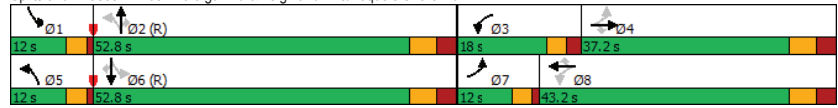
Base  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	11.0	25.0	25.0	11.0	43.0	43.0	11.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	12.0	37.2	37.2	18.0	43.2	43.2	12.0	52.8	52.8	12.0	52.8	52.8
Total Split (%)	10.0%	31.0%	31.0%	15.0%	36.0%	36.0%	10.0%	44.0%	44.0%	10.0%	44.0%	44.0%
Maximum Green (s)	8.0	30.2	30.2	13.0	36.2	36.2	8.0	45.8	45.8	8.0	45.8	45.8
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	32.3	24.3	24.3	41.3	30.3	30.3	68.1	56.6	56.6	58.0	48.8	48.8
Actuated g/C Ratio	0.27	0.20	0.20	0.34	0.25	0.25	0.57	0.47	0.47	0.48	0.41	0.41
v/c Ratio	0.37	0.29	0.75	1.32	0.34	0.46	1.32	0.81	1.02	0.68	0.73	0.10
Control Delay	29.8	40.5	33.0	184.2	37.2	37.2	8.1	197.2	32.5	46.6	38.7	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	40.5	33.0	184.2	37.2	37.2	8.1	197.2	32.5	46.6	38.7	32.8
LOS	C	D	C	F	D	A	F	C	D	D	C	A
Approach Delay		33.7			137.8			57.1			31.8	
Approach LOS		C			F			E			C	

Intersection Summary

Area Type:	CBD
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	105.6 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	130
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.32
Intersection Signal Delay:	65.8
Intersection LOS:	E
Intersection Capacity Utilization:	101.9%
ICU Level of Service:	G
Analysis Period (min):	15

Splits and Phases: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd



Queues

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Base  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	124	101	310	971	148	233	385	1755	1035	123	1341	70
v/c Ratio	0.37	0.29	0.75	1.32	0.34	0.46	1.32	0.81	1.02	0.68	0.73	0.10
Control Delay	29.8	40.5	33.0	184.2	37.2	37.2	8.1	197.2	32.5	46.6	38.7	32.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	40.5	33.0	184.2	37.2	37.2	8.1	197.2	32.5	46.6	38.7	32.8
Queue Length 50th (m)	21.3	21.3	36.7	~159.3	30.0	2.6	~107.6	137.5	~176.1	13.4	101.1	0.0
Queue Length 95th (m)	32.2	34.5	65.3	#184.8	44.6	21.5	#204.1	#186.7	#259.2	#45.0	119.4	0.0
Internal Link Dist (m)		323.0			261.9		256.4				329.6	
Turn Bay Length (m)	60.0			165.0		25.0	145.0			95.0		90.0
Base Capacity (vph)	331	473	506	737	558	591	291	2157	1013	184	1843	671
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.21	0.61	1.32	0.27	0.39	1.32	0.81	1.02	0.67	0.73	0.10

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Base  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	119	97	298	932	142	224	370	1685	994	118	1287	67
Future Volume (vph)	119	97	298	932	142	224	370	1685	994	118	1287	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1595	1710	1425	3120	1710	1360	1608	4577	1382	1608	4532	1425
Flt Permitted	0.66	1.00	1.00	0.52	1.00	1.00	0.09	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	1113	1710	1425	1694	1710	1360	151	4577	1382	148	4532	1425
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	124	101	310	971	148	233	385	1755	1035	123	1341	70
RTOR Reduction (vph)	0	0	124	0	0	164	0	0	362	0	0	42
Lane Group Flow (vph)	124	101	186	971	148	69	385	1755	673	123	1341	28
Confl. Peds. (#/hr)	34				34				14	14		
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	29.3	21.3	21.3	39.3	27.3	27.3	66.7	53.5	53.5	55.0	45.8	45.8
Effective Green, g (s)	29.3	24.3	24.3	39.3	30.3	30.3	66.7	56.5	56.5	55.0	48.8	48.8
Actuated g/C Ratio	0.24	0.20	0.20	0.33	0.25	0.25	0.56	0.47	0.47	0.46	0.41	0.41
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	303	346	288	709	431	343	289	2155	650	179	1843	579
v/s Ratio Prot	0.03	0.06		c0.15	0.09		c0.19	0.38		0.05	0.30	
v/s Ratio Perm	0.07		0.13	c0.30		0.05	c0.55		0.49	0.26		0.02
v/c Ratio	0.41	0.29	0.65	1.37	0.34	0.20	1.33	0.81	1.03	0.69	0.73	0.05
Uniform Delay, d1	37.2	40.6	43.9	39.2	36.7	35.3	35.7	27.2	31.8	22.9	30.0	21.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	1.0	6.7	175.2	1.0	0.6	171.3	3.5	44.5	10.4	2.6	0.2
Delay (s)	38.1	41.5	50.6	214.4	37.7	35.9	207.0	30.8	76.3	33.4	32.6	21.7
Level of Service	D	D	D	F	D	D	F	C	E	C	C	C
Approach Delay (s)		46.0			164.3			67.0			32.1	
Approach LOS		D			F			E			C	

Intersection Summary			
HCM 2000 Control Delay	77.1	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	
Intersection Capacity Utilization	101.9%	ICU Level of Service	
Analysis Period (min)	15		

c Critical Lane Group

Queuing and Blocking Report

Base  
PM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	154.8	59.6	77.8	71.8	32.3	225.2	127.6	57.3	109.9	117.9	123.6
Average Queue (m)	122.0	146.3	25.7	73.0	27.4	30.9	147.5	44.7	22.9	54.2	66.5	73.7
95th Queue (m)	126.7	150.9	52.2	85.0	70.7	36.5	273.7	123.2	48.8	89.5	101.3	106.8
Link Distance (m)		123.0	123.0	51.4	51.4		313.2	313.2		128.0	128.0	128.0
Upstream Blk Time (%)	7	66		60	10		1	0		0	0	1
Queuing Penalty (veh)	0	340		306	52		0	0		1	2	3
Storage Bay Dist (m)	130.0					25.0			50.0			
Storage Blk Time (%)	7	66				60	43		1	9		
Queuing Penalty (veh)	35	317				87	65		3	12		

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	SB	SB	SB	SB
Directions Served	T	T	L	T	T	TR
Maximum Queue (m)	1.6	3.1	32.3	202.7	222.0	224.8
Average Queue (m)	0.1	0.1	23.5	107.4	128.6	151.8
95th Queue (m)	1.1	2.2	37.9	195.7	219.8	239.4
Link Distance (m)	101.5	101.5		239.0	239.0	
Upstream Blk Time (%)				0	1	3
Queuing Penalty (veh)				2	5	15
Storage Bay Dist (m)			25.0			
Storage Blk Time (%)			13	37		
Queuing Penalty (veh)			61	48		

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	B14
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR	T
Maximum Queue (m)	27.2	280.5	273.8	27.3	43.7	41.1	45.1	67.1	22.4	195.0	165.2
Average Queue (m)	2.0	224.3	215.5	12.4	12.5	15.3	9.9	23.9	19.8	180.4	124.6
95th Queue (m)	12.2	267.0	263.9	27.9	33.0	32.2	32.2	55.7	27.6	208.0	223.2
Link Distance (m)		352.9	352.9		51.4	51.4	66.7	66.7		159.0	160.7
Upstream Blk Time (%)					0	0	1	3		85	44
Queuing Penalty (veh)					1	0	0	0		248	129
Storage Bay Dist (m)	20.0			20.0					15.0		
Storage Blk Time (%)		81		10	3				80	35	
Queuing Penalty (veh)		11		18	1				117	49	

Queuing and Blocking Report

Base  
PM Peak Hour

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	17.8	23.2	22.4	11.2	28.1	33.8	27.4	59.4	12.8	20.1
Average Queue (m)	5.8	11.9	8.0	1.4	8.7	13.0	24.2	35.1	3.6	8.4
95th Queue (m)	15.1	22.5	19.7	6.9	22.7	27.2	30.2	67.1	11.2	16.9
Link Distance (m)	21.8	21.8	21.8		352.9	352.9		54.8	56.7	56.7
Upstream Blk Time (%)	0	3	1					4		
Queuing Penalty (veh)	0	2	1					0		
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)					0		31	1		
Queuing Penalty (veh)					0		50	3		

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.7	87.4	276.7	274.9	87.4	126.7	135.7	32.5	296.5	291.2	84.4	90.4
Average Queue (m)	82.8	87.2	271.8	224.8	32.5	115.0	123.7	32.2	206.8	193.7	53.2	57.7
95th Queue (m)	86.4	87.6	274.1	360.9	86.5	143.5	146.9	32.9	318.5	304.6	79.7	85.1
Link Distance (m)			266.8	266.8		122.1	122.1		289.9	289.9		101.5
Upstream Blk Time (%)		98	11			17	48		10	2		0
Queuing Penalty (veh)		0	0			0	0		0	0		0
Storage Bay Dist (m)	80.0	80.0			80.0			25.0			80.0	
Storage Blk Time (%)	20	89	0		0	36		94	11		0	2
Queuing Penalty (veh)	52	226	1		0	22		210	14		1	6

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB	B34
Directions Served	T	R	T
Maximum Queue (m)	91.4	67.6	1.1
Average Queue (m)	45.4	30.6	0.0
95th Queue (m)	81.5	58.4	0.8
Link Distance (m)	101.5	101.5	128.0
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	3		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report

Base  
PM Peak Hour

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	180.5	181.5	184.2	38.3	42.9	39.8	265.4	300.6	267.2
Average Queue (m)	104.7	132.2	143.5	29.4	32.3	30.4	117.0	137.2	150.8
95th Queue (m)	189.3	213.4	221.8	34.7	39.7	35.5	292.4	320.8	321.0
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	6	26	39	36	39	45	4	6	8
Queuing Penalty (veh)	0	0	0	315	343	396	38	60	80
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	57.2	99.2	125.0	135.0	52.0	288.3	300.2	298.6	257.6	263.4	260.7	270.4
Average Queue (m)	7.8	47.9	69.3	78.5	4.9	187.2	220.2	237.5	223.9	231.5	230.6	123.1
95th Queue (m)	31.1	81.5	110.7	123.3	46.1	351.7	363.7	357.2	283.1	284.0	283.7	321.8
Link Distance (m)		117.8	171.3	171.3	171.3	299.7	299.7	299.7	251.7	251.7	251.7	251.7
Upstream Blk Time (%)		0		1	0	4	5	10	7	8	8	7
Queuing Penalty (veh)		0		0	0	47	57	108	43	52	50	44
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)				12								
Queuing Penalty (veh)				2								

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	108.1	111.6	99.6	91.9	89.0	86.4	78.5
Average Queue (m)	66.5	71.1	55.7	44.2	45.3	57.0	45.1
95th Queue (m)	94.5	97.6	88.0	75.9	75.5	82.6	74.7
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Base  
PM Peak Hour

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	66.9	78.2	61.0	85.4	76.9	76.5	77.8
Average Queue (m)	29.7	48.8	30.0	49.0	33.6	33.5	39.2
95th Queue (m)	59.6	68.8	58.6	77.2	66.5	61.9	68.3
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	34.8	20.2	48.4	37.6	28.1	28.1
Average Queue (m)	19.1	5.5	26.9	12.4	11.3	13.9
95th Queue (m)	30.2	15.3	41.7	26.3	22.6	23.0
Link Distance (m)	122.4	122.4	184.7	184.7	249.3	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report

Base  
PM Peak Hour

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	18.8	41.1	50.0	42.3	29.2	57.3	48.3	9.8	12.7	22.9	11.6	35.0
Average Queue (m)	5.8	20.4	23.7	18.0	13.1	29.8	20.8	2.7	3.2	6.8	2.2	17.6
95th Queue (m)	15.1	34.3	42.5	35.5	24.0	51.1	41.6	8.9	10.0	17.6	8.0	30.8
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0			70.0	15.0			
Storage Blk Time (%)									1	5		1
Queuing Penalty (veh)									0	1		5

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	SB
Directions Served	R
Maximum Queue (m)	19.2
Average Queue (m)	4.9
95th Queue (m)	16.2
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	9.5	1.8	18.7	6.5	4.9	17.4
Average Queue (m)	0.7	0.1	1.7	0.3	0.2	6.7
95th Queue (m)	4.8	1.6	9.4	3.8	2.5	14.9
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)				0		0
Queuing Penalty (veh)				0		0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	0	0				

Queuing and Blocking Report

Base  
PM Peak Hour

Intersection: 202: Lyons Lane & South Service Road

Movement	SB
Directions Served	LR
Maximum Queue (m)	16.1
Average Queue (m)	3.6
95th Queue (m)	12.2
Link Distance (m)	21.6
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 203: Argus Rd & South Service Rd

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (m)	7.4	117.9	25.7
Average Queue (m)	0.7	64.0	7.4
95th Queue (m)	4.6	153.9	18.8
Link Distance (m)	160.7	112.3	88.3
Upstream Blk Time (%)		28	
Queuing Penalty (veh)		103	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	18.8	205.7	210.5	215.6	17.5	30.1	33.8
Average Queue (m)	6.7	97.0	109.6	118.7	1.6	5.7	17.3
95th Queue (m)	15.2	237.5	246.4	247.6	12.3	24.1	40.0
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)		1	2	3	0	1	22
Queuing Penalty (veh)		7	18	28	2	9	157
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Base  
PM Peak Hour

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	R
Maximum Queue (m)	53.2	45.6	53.7	172.5	277.7	276.9	32.5	152.5	249.8	255.5	265.2	255.0
Average Queue (m)	23.2	21.1	4.3	172.0	270.5	267.6	24.4	137.8	174.8	168.7	160.2	69.0
95th Queue (m)	42.1	37.8	30.3	174.6	280.8	309.1	39.1	186.7	321.0	319.7	316.2	251.9
Link Distance (m)		327.2	327.2		266.7	266.7			251.7	251.7	251.7	251.7
Upstream Blk Time (%)					79	51			6	4	4	1
Queuing Penalty (veh)					0	0			43	30	31	8
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				
Storage Blk Time (%)	0			25	76	12	14	64	0			
Queuing Penalty (veh)	0			115	352	26	19	357	0			

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	102.4	231.5	225.1	214.3
Average Queue (m)	32.5	112.2	105.9	93.0
95th Queue (m)	87.7	209.8	200.2	186.3
Link Distance (m)		339.8	339.8	339.8
Upstream Blk Time (%)		1	1	1
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (m)	95.0			90.0
Storage Blk Time (%)	0	17		12
Queuing Penalty (veh)	0	20		8

Network Summary

Network wide Queuing Penalty: 5493
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Lanes, Volumes, Timings  
101: Trafalgar Rd & Cross Ave/South Service Rd  
Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	769	111	164	49	111	139	164	840	62	320	914	521
Future Volume (vph)	769	111	164	49	111	139	164	840	62	320	914	521
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0	0.0	25.0	0.0	50.0	0.0	25.0	0.0	25.0	0.0	0.0	0.0
Storage Lanes	1	0	1	1	1	1	1	0	1	0	1	0
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor	1.00	0.99		0.99		0.99		0.98		0.99		0.99
Frt	0.904					0.850		0.989		0.945		
Fit Protected	0.950			0.950		0.950		0.950		0.950		
Satd. Flow (prot)	2795	1388	0	1525	1583	1382	1428	4418	0	1525	4213	0
Fit Permitted	0.950			0.526		0.123		0.110		0.110		
Satd. Flow (perm)	2790	1388	0	840	1583	1362	185	4418	0	177	4213	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		69				181		9		116		
Link Speed (k/h)	50			50		50		50		50		50
Link Distance (m)	151.2			330.4		150.2		270.2		19.5		
Travel Time (s)	10.9			23.8		10.8		19.5				
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Peak Hour Factor	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Adj. Flow (vph)	884	144	256	64	144	181	202	955	78	381	1088	628
Shared Lane Traffic (%)												
Lane Group Flow (vph)	884	400	0	64	144	181	202	1033	0	381	1716	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	6.6			6.6		6.6		3.3		3.3		3.3
Link Offset(m)	0.0			0.0		0.0		0.0		0.0		0.0
Crosswalk Width(m)	4.8			4.8		4.8		4.8		4.8		4.8
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14		24		24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

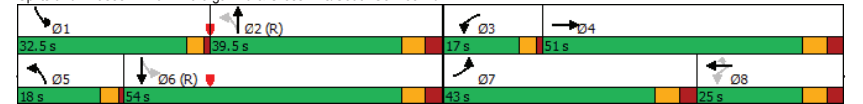
Lanes, Volumes, Timings  
101: Trafalgar Rd & Cross Ave/South Service Rd  
Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phases	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		12.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		17.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	43.0	51.0		17.0	25.0	25.0	18.0	39.5		32.5	54.0	
Total Split (%)	30.7%	36.4%		12.1%	17.9%	17.9%	12.9%	28.2%		23.2%	38.6%	
Maximum Green (s)	36.0	44.0		13.0	18.0	18.0	14.0	32.5		28.5	47.0	
Yellow Time (s)	4.0	4.0		3.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		1.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	Min	C-Max		Min	C-Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	39.0	46.4		31.5	19.4	19.4	51.1	35.5		69.6	50.0	
Actuated g/C Ratio	0.28	0.33		0.22	0.14	0.14	0.36	0.25		0.50	0.36	
v/c Ratio	1.14	0.79		0.26	0.66	0.52	0.99	0.92		1.01	1.11dr	
Control Delay	122.0	47.1		28.4	71.6	12.9	76.8	72.2		83.3	96.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	122.0	47.1		28.4	71.6	12.9	76.8	72.2		83.3	96.0	
LOS	F	D		C	E	B	E	E		F	F	
Approach Delay		98.7			37.2			72.9			93.7	
Approach LOS		F			D			E			F	

Intersection Summary

Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	128 (91%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.14
Intersection Signal Delay:	85.5
Intersection LOS:	F
Intersection Capacity Utilization:	89.3%
ICU Level of Service:	E
Analysis Period (min):	15
dr	Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 101: Trafalgar Rd & Cross Ave/South Service Rd



Queues Background Opening Year  
101: Trafalgar Rd & Cross Ave/South Service Rd AM Peak Hour

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	884	400	64	144	181	202	1033	381	1716
v/c Ratio	1.14	0.79	0.26	0.66	0.52	0.99	0.92	1.01	1.11dr
Control Delay	122.0	47.1	28.4	71.6	12.9	76.8	72.2	83.3	96.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.0	47.1	28.4	71.6	12.9	76.8	72.2	83.3	96.0
Queue Length 50th (m)	~154.1	87.6	10.4	39.8	0.0	~50.3	111.3	~107.1	~193.9
Queue Length 95th (m)	#185.6	101.6	16.8	53.6	11.7	m#61.7	m116.7	m#117.7	m#191.8
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	778	517	258	237	358	205	1126	377	1579
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.77	0.25	0.61	0.51	0.99	0.92	1.01	1.09

**Intersection Summary**  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

HCM Signalized Intersection Capacity Analysis Background Opening Year  
101: Trafalgar Rd & Cross Ave/South Service Rd AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	769	111	164	49	111	139	164	840	62	320	914	521
Future Volume (vph)	769	111	164	49	111	139	164	840	62	320	914	521
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2795	1388		1521	1583	1362	1428	4417		1525	4214	
Flt Permitted	0.95	1.00		0.53	1.00	1.00	0.12	1.00		0.11	1.00	
Satd. Flow (perm)	2795	1388		843	1583	1362	185	4417		176	4214	
Peak-hour factor, PHF	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Adj. Flow (vph)	884	144	256	64	144	181	202	955	78	381	1088	628
RTOR Reduction (vph)	0	46	0	0	0	156	0	7	0	0	75	0
Lane Group Flow (vph)	884	354	0	64	144	25	202	1026	0	381	1641	0
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8			8	2		6		
Actuated Green, G (s)	36.0	43.4		28.4	16.4	16.4	48.1	32.5		66.6	47.0	
Effective Green, g (s)	39.0	46.4		28.4	19.4	19.4	48.1	35.5		66.6	50.0	
Actuated g/C Ratio	0.28	0.33		0.20	0.14	0.14	0.34	0.25		0.48	0.36	
Clearance Time (s)	7.0	7.0		4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	778	460		229	219	188	202	1120		373	1505	
v/s Ratio Prot	c0.32	c0.25		0.02	0.09		0.11	0.23		c0.22	c0.39	
v/s Ratio Perm				0.03		0.02	0.23			0.27		
v/c Ratio	1.14	0.77		0.28	0.66	0.13	1.00	0.92		1.02	1.11dr	
Uniform Delay, d1	50.5	42.0		46.4	57.2	52.9	40.6	50.8		43.5	45.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.01	1.31		1.10	1.29	
Incremental Delay, d2	76.7	8.0		0.8	7.7	0.4	40.9	6.3		42.5	48.4	
Delay (s)	127.2	50.0		47.2	64.8	53.4	81.8	73.0		90.6	106.3	
Level of Service	F	D		D	E	D	F	E		F	F	
Approach Delay (s)		103.2			56.6			74.5			103.5	
Approach LOS		F			E			E			F	

**Intersection Summary**  
 HCM 2000 Control Delay 92.6 HCM 2000 Level of Service F  
 HCM 2000 Volume to Capacity ratio 1.08  
 Actuated Cycle Length (s) 140.0 Sum of lost time (s) 16.0  
 Intersection Capacity Utilization 89.3% ICU Level of Service E  
 Analysis Period (min) 15  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.  
 c Critical Lane Group

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background Opening Year  
AM Peak Hour

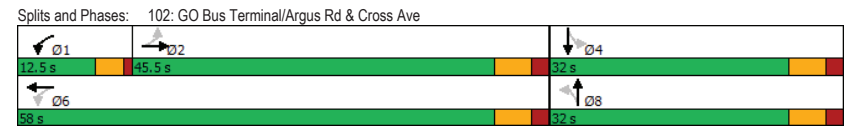
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	37	513	15	43	676	44	22	0	53	306	18	561
Future Volume (vph)	37	513	15	43	676	44	22	0	53	306	18	561
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0	0.0	20.0	0.0	0.0	0.0	0.0	15.0	0.0	15.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	0
Taper Length (m)	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00	0.994	1.00	1.00	0.990	1.00	0.996	1.00	0.98	1.00	0.99
Frt	0.994	0.994	0.994	0.990	0.990	0.990	0.850	0.850	0.857	0.857	0.857	0.857
Flt Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1570	3081	0	818	3171	0	805	734	0	1570	1387	0
Flt Permitted	0.341	0.341	0.341	0.265	0.265	0.265	0.142	0.142	0.142	0.708	0.708	0.708
Satd. Flow (perm)	563	3081	0	228	3171	0	120	734	0	1146	1387	0
Right Turn on Red		Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Satd. Flow (RTOR)		6		15	15		295	295		203	203	203
Link Speed (k/h)		50		50	50		50	50		50	50	50
Link Distance (m)		374.0		72.9	72.9		81.9	81.9		180.7	180.7	180.7
Travel Time (s)		26.9		5.2	5.2		5.9	5.9		13.0	13.0	13.0
Confl. Peds. (#/hr)	1	3	3	3	3	1	3	3	20	20	3	3
Peak Hour Factor	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%
Adj. Flow (vph)	71	590	23	51	768	56	42	0	76	392	29	630
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	613	0	51	824	0	42	76	0	392	659	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3		3.3	3.3		3.3	3.3		3.3	3.3	3.3
Link Offset(m)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Crosswalk Width(m)		4.8		4.8	4.8		4.8	4.8		4.8	4.8	4.8
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24	24	14	24	24	14	24	24	14	24	24	14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6		8	8		4	4	
Permitted Phases		2		6	6		8	8		4	4	
Detector Phase		2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	45.5	45.5		12.5	58.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.6%	50.6%		13.9%	64.4%		35.6%	35.6%		35.6%	35.6%	
Maximum Green (s)	39.5	39.5		8.5	52.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	26.6	26.6		38.8	38.8		28.1	28.1		28.1	28.1	
Actuated g/C Ratio	0.36	0.36		0.52	0.52		0.38	0.38		0.38	0.38	
v/c Ratio	0.36	0.56		0.28	0.50		0.93	0.17		0.91	1.02	
Control Delay	23.6	21.3		13.1	12.6		154.1	0.8		52.6	60.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.6	21.3		13.1	12.6		154.1	0.8		52.6	60.0	
LOS	C	C		B	B		F	A		D	E	
Approach Delay		21.6			12.6			55.4			57.2	
Approach LOS		C			B			E			E	

Intersection Summary	
Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	74.9
Natural Cycle:	100
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.02
Intersection Signal Delay:	33.9
Intersection LOS:	C
Intersection Capacity Utilization:	86.3%
ICU Level of Service:	E
Analysis Period (min):	15





Queues Background Opening Year  
102: GO Bus Terminal/Argus Rd & Cross Ave AM Peak Hour

	↖	→	↗	←	↖	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	613	51	824	42	76	392	659
v/c Ratio	0.36	0.56	0.28	0.50	0.93	0.17	0.91	1.02
Control Delay	23.6	21.3	13.1	12.6	154.1	0.8	52.6	60.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	21.3	13.1	12.6	154.1	0.8	52.6	60.0
Queue Length 50th (m)	7.6	37.2	3.6	38.2	5.5	0.0	50.8	69.1
Queue Length 95th (m)	9.5	50.3	8.3	50.4	#13.7	0.0	#96.2	64.8
Internal Link Dist (m)		350.0		48.9		57.9		156.7
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	312	1714	185	2296	45	459	429	646
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	0.23	0.36	0.28	0.36	0.93	0.17	0.91	1.02

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

HCM Signalized Intersection Capacity Analysis Background Opening Year  
102: GO Bus Terminal/Argus Rd & Cross Ave AM Peak Hour

	↖	→	↗	↖	←	↖	↖	↑	↗	↗	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖		↖	↖	↖
Traffic Volume (vph)	37	513	15	43	676	44	22	0	53	306	18	561
Future Volume (vph)	37	513	15	43	676	44	22	0	53	306	18	561
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1570	3082		818	3171		805	737		1543	1387	
Flt Permitted	0.34	1.00		0.26	1.00		0.14	1.00		0.71	1.00	
Satd. Flow (perm)	564	3082		228	3171		121	737		1149	1387	
Peak-hour factor, PHF	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Adj. Flow (vph)	71	590	23	51	768	56	42	0	76	392	29	630
RTOR Reduction (vph)	0	4	0	0	7	0	0	47	0	0	127	0
Lane Group Flow (vph)	71	609	0	51	817	0	42	29	0	392	532	0
Confl. Peds. (#/hr)	1		3	3		1	3		20	20		3
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	24.6	24.6		36.8	36.8		26.1	26.1		26.1	26.1	
Effective Green, g (s)	26.6	26.6		36.8	38.8		28.1	28.1		28.1	28.1	
Actuated g/C Ratio	0.36	0.36		0.49	0.52		0.38	0.38		0.38	0.38	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	200	1094		176	1642		45	276		431	520	
v/s Ratio Prot		c0.20		0.03	c0.26			0.04			c0.38	
v/s Ratio Perm	0.13			0.11			0.35			0.34		
v/c Ratio	0.35	0.56		0.29	0.50		0.93	0.10		0.91	1.02	
Uniform Delay, d1	17.8	19.4		11.2	11.7		22.5	15.2		22.2	23.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	1.0		0.7	0.5		109.0	0.2		23.1	45.5	
Delay (s)	20.1	20.5		11.9	12.2		131.5	15.4		45.2	68.9	
Level of Service	C	C		B	B		F	B		D	E	
Approach Delay (s)		20.4			12.2			56.8			60.1	
Approach LOS		C			B			E			E	

**Intersection Summary**  
 HCM 2000 Control Delay 34.6 HCM 2000 Level of Service C  
 HCM 2000 Volume to Capacity ratio 0.77  
 Actuated Cycle Length (s) 74.9 Sum of lost time (s) 12.0  
 Intersection Capacity Utilization 86.3% ICU Level of Service E  
 Analysis Period (min) 15  
 c Critical Lane Group

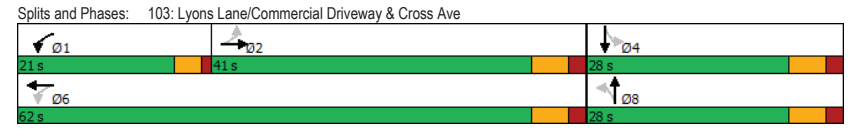
Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave  
Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	62	259	213	237	184	6	19	3	14	18	25	44
Future Volume (vph)	62	259	213	237	184	6	19	3	14	18	25	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0	0.0	25.0		0.0	20.0		0.0	0.0			0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Frt		0.928			0.991			0.872			0.902	
Flt Protected	0.950			0.950		0.950			0.950			
Satd. Flow (prot)	1540	2821	0	1570	2726	0	1570	1471	0	1468	1497	0
Flt Permitted	0.599			0.337		0.706			0.740			
Satd. Flow (perm)	964	2821	0	557	2726	0	1163	1471	0	1139	1497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		292			14			23			51	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		40.1			374.0			69.1			70.9	
Travel Time (s)		2.9			26.9			5.0			5.1	
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3
Peak Hour Factor	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%
Adj. Flow (vph)	79	320	292	359	233	14	24	4	23	29	27	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	612	0	359	247	0	24	27	0	29	78	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave  
Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6		8		8		4	
Permitted Phases		2		6			8		8		4	
Detector Phase		2		1	6		8		8		4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.0	41.0		21.0	62.0		28.0	28.0		28.0	28.0	
Total Split (%)	45.6%	45.6%		23.3%	68.9%		31.1%	31.1%		31.1%	31.1%	
Maximum Green (s)	35.0	35.0		17.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0			15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	37.1	37.1		52.5	52.5		12.3	12.3		12.3	12.3	
Actuated g/C Ratio	0.51	0.51		0.72	0.72		0.17	0.17		0.17	0.17	
v/c Ratio	0.16	0.39		0.64	0.13		0.12	0.10		0.15	0.26	
Control Delay	11.7	6.6		9.4	3.1		28.6	14.3		29.1	15.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.7	6.6		9.4	3.1		28.6	14.3		29.1	15.8	
LOS	B	A		A	A		C	B		C	B	
Approach Delay		7.1			6.8			21.0			19.4	
Approach LOS		A			A			C			B	

Intersection Summary	
Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	72.8
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	8.4
Intersection LOS:	A
Intersection Capacity Utilization:	77.6%
ICU Level of Service:	D
Analysis Period (min):	15



Queues Background Opening Year  
 103: Lyons Lane/Commercial Driveway & Cross Ave AM Peak Hour

	↖	→	↘	←	↙	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	79	612	359	247	24	27	29	78
v/c Ratio	0.16	0.39	0.64	0.13	0.12	0.10	0.15	0.26
Control Delay	11.7	6.6	9.4	3.1	28.6	14.3	29.1	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	6.6	9.4	3.1	28.6	14.3	29.1	15.8
Queue Length 50th (m)	5.6	12.2	14.6	4.2	2.9	0.5	3.6	3.3
Queue Length 95th (m)	13.0	21.4	17.2	6.5	8.7	5.6	7.6	15.2
Internal Link Dist (m)		16.1		350.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	491	1580	638	2180	384	501	376	528
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.39	0.56	0.11	0.06	0.05	0.08	0.15

Intersection Summary

Intersection Summary								
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HCM Signalized Intersection Capacity Analysis Background Opening Year  
 103: Lyons Lane/Commercial Driveway & Cross Ave AM Peak Hour

	↖	→	↘	↙	←	↘	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	62	259	213	237	184	6	19	3	14	18	25	44
Future Volume (vph)	62	259	213	237	184	6	19	3	14	18	25	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.99		1.00	0.87		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1531	2823		1570	2727		1566	1473		1463	1498	
Flt Permitted	0.60	1.00		0.34	1.00		0.71	1.00		0.74	1.00	
Satd. Flow (perm)	964	2823		557	2727		1164	1473		1139	1498	
Peak-hour factor, PHF	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Adj. Flow (vph)	79	320	292	359	233	14	24	4	23	29	27	51
RTOR Reduction (vph)	0	143	0	0	4	0	0	19	0	0	42	0
Lane Group Flow (vph)	79	469	0	359	243	0	24	8	0	29	36	0
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.1	35.1		50.4	50.4		10.3	10.3		10.3	10.3	
Effective Green, g (s)	37.1	37.1		50.4	52.4		12.3	12.3		12.3	12.3	
Actuated g/C Ratio	0.51	0.51		0.69	0.72		0.17	0.17		0.17	0.17	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	491	1440		543	1965		196	249		192	253	
v/s Ratio Prot		0.17		c0.10	0.09			0.01			0.02	
v/s Ratio Perm	0.08			c0.36			0.02			c0.03		
v/c Ratio	0.16	0.33		0.66	0.12		0.12	0.03		0.15	0.14	
Uniform Delay, d1	9.5	10.5		5.3	3.1		25.6	25.2		25.7	25.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.3		2.7	0.1		0.4	0.1		0.5	0.3	
Delay (s)	9.8	10.7		8.0	3.2		26.0	25.3		26.2	26.1	
Level of Service	A	B		A	A		C	C		C	C	
Approach Delay (s)		10.6			6.0			25.6			26.1	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	72.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd  
Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	401	496	93	27	420	538	50	418	60	375	474	289
Future Volume (vph)	401	496	93	27	420	538	50	418	60	375	474	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0	0.0	80.0	0.0	25.0	0.0	80.0	0.0	80.0	0.0	0.0	0.0
Storage Lanes	2	0	1		0	1	0	1	0	1		1
Taper Length (m)	7.5		7.5		7.5		7.5		7.5			
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	0.97		0.99	1.00		0.98		0.98
Frt		0.967		0.917		0.950		0.979		0.950		0.850
Flt Protected	0.950		0.950		0.950		0.950		0.950			
Satd. Flow (prot)	2987	3016	0	1481	2819	0	1540	3138	0	2929	1676	1356
Flt Permitted	0.950		0.950		0.950		0.950		0.950			
Satd. Flow (perm)	2964	3016	0	1472	2819	0	1531	3138	0	2877	1676	1324
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)		32		234		13		288		288		288
Link Speed (k/h)		50		50		50		50		50		50
Link Distance (m)		285.8		142.3		311.4		130.3		130.3		130.3
Travel Time (s)		20.6		10.2		22.4		9.4		9.4		9.4
Confl. Peds. (#/hr)	25		7	7		25	9	18	18		9	9
Peak Hour Factor	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Adj. Flow (vph)	431	545	155	36	488	598	83	486	80	446	551	361
Shared Lane Traffic (%)												
Lane Group Flow (vph)	431	700	0	36	1086	0	83	566	0	446	551	361
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6		6.6		6.6		6.6		6.6		6.6
Link Offset(m)		0.0		0.0		0.0		0.0		0.0		0.0
Crosswalk Width(m)		4.8		4.8		4.8		4.8		4.8		4.8
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

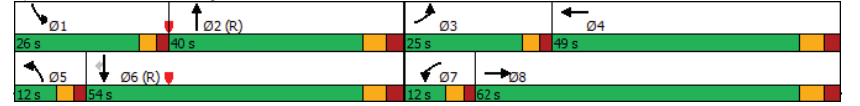
Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd  
Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	25.0	62.0		12.0	49.0		12.0	40.0		26.0	54.0	54.0
Total Split (%)	17.9%	44.3%		8.6%	35.0%		8.6%	28.6%		18.6%	38.6%	38.6%
Maximum Green (s)	20.0	55.0		7.0	42.0		7.0	33.0		21.0	47.0	47.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	21.0	58.0		8.0	45.0		8.0	36.0		22.0	50.0	50.0
Actuated g/C Ratio	0.15	0.41		0.06	0.32		0.06	0.26		0.16	0.36	0.36
v/c Ratio	0.96	0.55		0.43	1.02		0.94	0.69		0.97	0.92	0.55
Control Delay	92.7	31.6		79.8	69.5		145.8	51.1		97.8	34.5	2.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	92.7	31.6		79.8	69.5		145.8	51.1		97.8	34.5	2.5
LOS	F	C		E	E		F	D		F	C	A
Approach Delay		54.9			69.8			63.2			46.7	
Approach LOS		D			E			D			D	

Intersection Summary

Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection
Natural Cycle:	130
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.02
Intersection Signal Delay:	57.5
Intersection LOS:	E
Intersection Capacity Utilization:	98.0%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 104: Trafalgar Rd & Cornwall Rd



Queues Background Opening Year  
104: Trafalgar Rd & Cornwall Rd AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	431	700	36	1086	83	566	446	551	361
v/c Ratio	0.96	0.55	0.43	1.02	0.94	0.69	0.97	0.92	0.55
Control Delay	92.7	31.6	79.8	69.5	145.8	51.1	97.8	34.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.7	31.6	79.8	69.5	145.8	51.1	97.8	34.5	2.5
Queue Length 50th (m)	65.2	77.0	10.3	~150.2	24.6	77.2	68.8	90.0	2.8
Queue Length 95th (m)	#99.7	97.3	19.0	#177.3	#30.8	93.2	m67.3	m84.6	m2.6
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	448	1268	84	1064	88	816	460	598	658
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.55	0.43	1.02	0.94	0.69	0.97	0.92	0.55

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

HCM Signalized Intersection Capacity Analysis Background Opening Year  
104: Trafalgar Rd & Cornwall Rd AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	401	496	93	27	420	538	50	418	60	375	474	289
Future Volume (vph)	401	496	93	27	420	538	50	418	60	375	474	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.92		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)	2987	3015		1481	2820		1540	3137		2929	1676	1324
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2987	3015		1481	2820		1540	3137		2929	1676	1324
Peak-hour factor, PHF	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Adj. Flow (vph)	431	545	155	36	488	598	83	486	80	446	551	361
RTOR Reduction (vph)	0	19	0	0	159	0	0	10	0	0	0	185
Lane Group Flow (vph)	431	681	0	36	927	0	83	556	0	446	551	176
Conf. Peds. (#/hr)	25		7	7		25	9		18	18		9
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	20.0	55.0		7.0	42.0		7.0	33.0		21.0	47.0	47.0
Effective Green, g (s)	21.0	58.0		8.0	45.0		8.0	36.0		22.0	50.0	50.0
Actuated g/C Ratio	0.15	0.41		0.06	0.32		0.06	0.26		0.16	0.36	0.36
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	448	1249		84	906		88	806		460	598	472
v/s Ratio Prot	c0.14	0.23		0.02	c0.33		0.05	0.18		c0.15	c0.33	
v/s Ratio Perm												0.13
v/c Ratio	0.96	0.55		0.43	1.02		0.94	0.69		0.97	0.92	0.37
Uniform Delay, d1	59.1	31.0		63.8	47.5		65.8	47.0		58.7	43.1	33.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.46	0.61	0.21
Incremental Delay, d2	34.0	1.7		15.2	36.0		76.1	4.8		14.5	7.1	0.5
Delay (s)	93.1	32.7		79.0	83.5		141.9	51.8		100.5	33.2	7.7
Level of Service	F	C		E	F		F	D		F	C	A
Approach Delay (s)		55.8			83.3			63.3			48.5	
Approach LOS		E			F			E			D	

**Intersection Summary**  
 HCM 2000 Control Delay 61.9 HCM 2000 Level of Service E  
 HCM 2000 Volume to Capacity ratio 0.99  
 Actuated Cycle Length (s) 140.0 Sum of lost time (s) 16.0  
 Intersection Capacity Utilization 98.0% ICU Level of Service F  
 Analysis Period (min) 15  
 c Critical Lane Group

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕↕	↕↕↕	
Traffic Volume (vph)	903	778	0	1079	1503	0
Future Volume (vph)	903	778	0	1079	1503	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt	0.850					
Flt Protected	0.950					
Satd. Flow (prot)	2958	1423	0	4404	4489	0
Flt Permitted	0.950					
Satd. Flow (perm)	2958	1423	0	4404	4489	0
Right Turn on Red	Yes		Yes			
Satd. Flow (RTOR)	2					
Link Speed (k/h)	50			50	50	
Link Distance (m)	199.2			51.4	324.8	
Travel Time (s)	14.3			3.7	23.4	
Peak Hour Factor	0.98	0.92	0.25	0.91	0.90	0.25
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Adj. Flow (vph)	921	846	0	1186	1670	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	921	846	0	1186	1670	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1	2		2	
Detector Template	Left	Right	Thru		Thru	
Leading Detector (m)	2.0	2.0	10.0		10.0	
Trailing Detector (m)	0.0	0.0	0.0		0.0	
Detector 1 Position(m)	0.0	0.0	0.0		0.0	
Detector 1 Size(m)	2.0	2.0	0.6		0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)			9.4		9.4	
Detector 2 Size(m)			0.6		0.6	
Detector 2 Type			Cl+Ex		Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)			0.0		0.0	
Turn Type	Prot	Perm	NA		NA	
Protected Phases	4			2	2	
Permitted Phases	4					
Detector Phase	4	4	2		2	

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

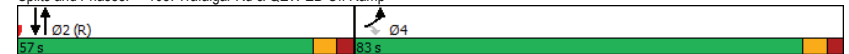
Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	10.0	10.0	29.0		29.0	
Minimum Split (s)	38.0	38.0	36.0		36.0	
Total Split (s)	83.0	83.0	57.0		57.0	
Total Split (%)	59.3%	59.3%	40.7%		40.7%	
Maximum Green (s)	76.0	76.0	50.0		50.0	
Yellow Time (s)	4.0	4.0	4.0		4.0	
All-Red Time (s)	3.0	3.0	3.0		3.0	
Lost Time Adjust (s)	-3.0	-3.0	-3.0		-3.0	
Total Lost Time (s)	4.0	4.0	4.0		4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	None	C-Max		C-Max	
Walk Time (s)	7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	24.0	24.0	22.0		22.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)	79.0	79.0	53.0		53.0	
Actuated g/C Ratio	0.56	0.56	0.38		0.38	
v/c Ratio	0.55	1.05	0.71		0.98	
Control Delay	20.9	77.1	36.4		57.8	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	20.9	77.1	36.4		57.8	
LOS	C	E	D		E	
Approach Delay	47.8			36.4	57.8	
Approach LOS	D			D	E	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 133.6 (95%), Referenced to phase 2:NBSB and 6.; Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 48.5  
 Intersection Capacity Utilization 92.5%  
 Intersection LOS: D  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 105: Trafalgar Rd & QEW EB-Off Ramp



Queues

105: Trafalgar Rd & QEW EB-Off Ramp

Background Opening Year

AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	921	846	1186	1670
v/c Ratio	0.55	1.05	0.71	0.98
Control Delay	20.9	77.1	36.4	57.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.9	77.1	36.4	57.8
Queue Length 50th (m)	84.2	-268.6	68.3	182.1
Queue Length 95th (m)	103.7	#350.8	m69.5	#215.0
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1669	803	1667	1699
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	1.05	0.71	0.98

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

105: Trafalgar Rd & QEW EB-Off Ramp

Background Opening Year

AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	903	778	0	1079	1503	0
Future Volume (vph)	903	778	0	1079	1503	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Fr't	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Sat'd. Flow (prot)	2958	1423		4404	4489	
Flt Permitted	0.95	1.00		1.00	1.00	
Sat'd. Flow (perm)	2958	1423		4404	4489	
Peak-hour factor, PHF	0.98	0.92	0.25	0.91	0.90	0.25
Adj. Flow (vph)	921	846	0	1186	1670	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	921	845	0	1186	1670	0
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	76.0	76.0		50.0	50.0	
Effective Green, g (s)	79.0	79.0		53.0	53.0	
Actuated g/C Ratio	0.56	0.56		0.38	0.38	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1669	802		1667	1699	
v/s Ratio Prot	0.31			0.27	c0.37	
v/s Ratio Perm		c0.59				
v/c Ratio	0.55	1.05		0.71	0.98	
Uniform Delay, d1	19.3	30.5		37.0	43.1	
Progression Factor	1.00	1.00		0.96	0.96	
Incremental Delay, d2	0.4	46.9		0.7	16.3	
Delay (s)	19.7	77.4		36.1	57.8	
Level of Service	B	E		D	E	
Approach Delay (s)	47.3			36.1	57.8	
Approach LOS	D			D	E	

Intersection Summary

- HCM 2000 Control Delay 48.2 HCM 2000 Level of Service D
- HCM 2000 Volume to Capacity ratio 1.02
- Actuated Cycle Length (s) 140.0 Sum of lost time (s) 8.0
- Intersection Capacity Utilization 92.5% ICU Level of Service F
- Analysis Period (min) 15
- c Critical Lane Group

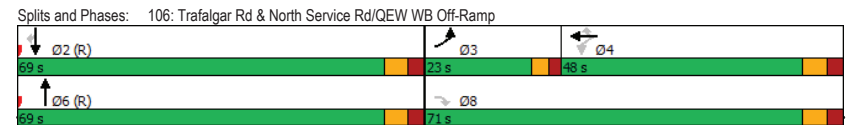
Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp  
Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	→	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1	0	221	480	36	276	0	1523	0	0	1333	7
Future Volume (vph)	1	0	221	480	36	276	0	1523	0	0	1333	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Lanes	1		1	1		1	0		0	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor												0.96
Frt			0.850			0.850						0.850
Flt Protected	0.950			0.950	0.961							
Satd. Flow (prot)	1570	0	1395	1421	1443	1356	0	4446	0	0	4532	1437
Flt Permitted	0.950			0.950	0.961							
Satd. Flow (perm)	1570	0	1395	1421	1443	1356	0	4446	0	0	4532	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			31			243						70
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		142.1			192.6			324.8			275.1	
Travel Time (s)		10.2			13.9			23.4			19.8	
Confl. Peds. (#/hr)							8		5	5		8
Peak Hour Factor	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Adj. Flow (vph)	4	0	243	545	53	378	0	1638	0	0	1481	11
Shared Lane Traffic (%)				45%								
Lane Group Flow (vph)	4	0	243	300	298	378	0	1638	0	0	1481	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1		1		2		2		1
Detector Template	Left		Right	Left	Thru	Right		Thru		Thru	Right	
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0		10.0	2.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6		0.6	2.0	
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Detector 2 Position(m)					9.4			9.4			9.4	
Detector 2 Size(m)					0.6			0.6			0.6	
Detector 2 Type					CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp  
Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)						0.0					0.0	
Turn Type	Prot		Perm	Perm	NA	Perm					NA	Perm
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Detector Phase	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		71.0	48.0	48.0	48.0		69.0			69.0	69.0
Total Split (%)	16.4%		50.7%	34.3%	34.3%	34.3%		49.3%			49.3%	49.3%
Maximum Green (s)	18.0		64.0	41.0	41.0	41.0		62.0			62.0	62.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead				Lag	Lag		Lag				
Lead-Lag Optimize?	Yes				Yes	Yes		Yes				
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)			7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (#/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	8.0		50.8	38.8	38.8	38.8		81.2			81.2	81.2
Actuated g/C Ratio	0.06		0.36	0.28	0.28	0.28		0.58			0.58	0.58
v/c Ratio	0.04		0.46	0.76	0.75	0.69		0.64			0.56	0.01
Control Delay	64.0		31.2	58.5	57.1	21.1		27.2			20.5	0.0
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	64.0		31.2	58.5	57.1	21.1		27.2			20.5	0.0
LOS	E		C	E	E	C		C			C	A
Approach Delay		31.7				43.6		27.2			20.4	
Approach LOS		C				D		C			C	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 28.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 69.6%  
 ICU Level of Service C  
 Analysis Period (min) 15





Queues Background Opening Year  
 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp AM Peak Hour

	↖	↘	↙	←	↖	↗	↘	↙
Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	4	243	300	298	378	1638	1481	11
v/c Ratio	0.04	0.46	0.76	0.75	0.69	0.64	0.56	0.01
Control Delay	64.0	31.2	58.5	57.1	21.1	27.2	20.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	31.2	58.5	57.1	21.1	27.2	20.5	0.0
Queue Length 50th (m)	1.1	46.7	84.2	83.2	34.9	114.6	95.4	0.0
Queue Length 95th (m)	1.4	63.8	106.1	74.8	35.3	136.0	131.4	0.0
Internal Link Dist (m)				168.6		300.8	251.1	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	683	458	465	601	2579	2629	830
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.36	0.66	0.64	0.63	0.64	0.56	0.01

Intersection Summary

HCM Signalized Intersection Capacity Analysis Background Opening Year  
 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp AM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↗	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↖	↖	↖	↖		↖↖↖			↖↖↖	↖
Traffic Volume (vph)	1	0	221	480	36	276	0	1523	0	0	1333	7
Future Volume (vph)	1	0	221	480	36	276	0	1523	0	0	1333	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		0.91			0.91	1.00
Frbp, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	0.96
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00		0.85	1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	0.96	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1570		1395	1421	1442	1356		4446			4532	1380
Flt Permitted	0.95		1.00	0.95	0.96	1.00		1.00			1.00	1.00
Satd. Flow (perm)	1570		1395	1421	1442	1356		4446			4532	1380
Peak-hour factor, PHF	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Adj. Flow (vph)	4	0	243	545	53	378	0	1638	0	0	1481	11
RTOR Reduction (vph)	0	0	20	0	0	176	0	0	0	0	0	5
Lane Group Flow (vph)	4	0	223	300	298	202	0	1638	0	0	1481	6
Confl. Peds. (#/hr)							8		5	5		8
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA			NA	Perm
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	7.0		47.8	35.8	35.8	35.8		78.2			78.2	78.2
Effective Green, g (s)	8.0		50.8	38.8	38.8	38.8		81.2			81.2	81.2
Actuated g/C Ratio	0.06		0.36	0.28	0.28	0.28		0.58			0.58	0.58
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Lane Grp Cap (vph)	89		506	393	399	375		2578			2628	800
v/s Ratio Prot	0.00							c0.37			0.33	
v/s Ratio Perm			c0.16	c0.21	0.21	0.15						0.00
v/c Ratio	0.04		0.44	0.76	0.75	0.54		0.64			0.56	0.01
Uniform Delay, d1	62.4		33.8	46.4	46.1	43.0		19.6			18.3	12.4
Progression Factor	1.00		1.00	1.00	1.00	1.00		1.25			1.00	1.00
Incremental Delay, d2	0.2		0.6	8.5	7.4	1.5		0.9			0.9	0.0
Delay (s)	62.6		34.4	54.9	53.6	44.5		25.4			19.2	12.4
Level of Service	E		C	D	D	D		C			B	B
Approach Delay (s)		34.9						25.4			19.2	
Approach LOS		C				D		C			B	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Background Opening Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕			↕↕
Traffic Volume (vph)	814	379	466	0	0	1300
Future Volume (vph)	814	379	466	0	0	1300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3423	1441	3539	0	0	3539
Flt Permitted	0.954					
Satd. Flow (perm)	3423	1441	3539	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	5	336				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	885	412	507	0	0	1413
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	926	371	507	0	0	1413
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Background Opening Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	49.0	49.0	71.0			71.0
Total Split (%)	40.8%	40.8%	59.2%			59.2%
Maximum Green (s)	43.0	43.0	65.0			65.0
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	41.2	41.2	67.1			67.1
Actuated g/C Ratio	0.35	0.35	0.58			0.58
v/c Ratio	0.76	0.51	0.25			0.69
Control Delay	37.6	6.8	13.0			20.2
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	37.6	6.8	13.0			20.2
LOS	D	A	B			C
Approach Delay	28.8		13.0			20.2
Approach LOS	C		B			C
Intersection Summary						
Area Type:	Other					
Cycle Length:	120					
Actuated Cycle Length:	116.3					
Natural Cycle:	60					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.76					
Intersection Signal Delay:	22.6			Intersection LOS: C		
Intersection Capacity Utilization:	69.8%			ICU Level of Service C		
Analysis Period (min):	15					
Splits and Phases:	107: Dorval Drive & QEW WB Off-Ramp					

Queues  
107: Dorval Drive & QEW WB Off-Ramp

Background Opening Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	926	371	507	1413
v/c Ratio	0.76	0.51	0.25	0.69
Control Delay	37.6	6.8	13.0	20.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	37.6	6.8	13.0	20.2
Queue Length 50th (m)	99.7	6.0	32.0	127.3
Queue Length 95th (m)	124.2	32.3	42.8	156.5
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1329	764	2041	2041
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.70	0.49	0.25	0.69
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Background Opening Year  
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	814	379	466	0	0	1300
Future Volume (vph)	814	379	466	0	0	1300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr't	0.99	0.85	1.00			1.00
Fit Protected	0.95	1.00	1.00			1.00
Sat'd. Flow (prot)	3426	1441	3539			3539
Fit Permitted	0.95	1.00	1.00			1.00
Sat'd. Flow (perm)	3426	1441	3539			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	885	412	507	0	0	1413
RTOR Reduction (vph)	3	217	0	0	0	0
Lane Group Flow (vph)	923	154	507	0	0	1413
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	39.2	39.2	65.1			65.1
Effective Green, g (s)	41.2	41.2	67.1			67.1
Actuated g/C Ratio	0.35	0.35	0.58			0.58
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1213	510	2041			2041
v/s Ratio Prot	c0.27		0.14			c0.40
v/s Ratio Perm		0.11				
v/c Ratio	0.76	0.30	0.25			0.69
Uniform Delay, d1	33.2	27.2	12.1			17.3
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	3.2	0.6	0.3			2.0
Delay (s)	36.4	27.7	12.4			19.3
Level of Service	D	C	B			B
Approach Delay (s)	33.9		12.4			19.3
Approach LOS	C		B			B
<b>Intersection Summary</b>						
HCM 2000 Control Delay			24.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			116.3		Sum of lost time (s)	8.0
Intersection Capacity Utilization			69.8%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕	↕↕	
Traffic Volume (vph)	119	475	0	656	1404	0
Future Volume (vph)	119	475	0	656	1404	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Frt	0.900	0.850				
Flt Protected	0.984					
Satd. Flow (prot)	3200	1441	0	3539	3539	0
Flt Permitted	0.984					
Satd. Flow (perm)	3200	1441	0	3539	3539	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	43	43				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	516	0	713	1526	0
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	387	258	0	713	1526	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				





Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	40.0	40.0		80.0	80.0	
Total Split (%)	33.3%	33.3%		66.7%	66.7%	
Maximum Green (s)	34.0	34.0		74.0	74.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	25.1	25.1		76.4	76.4	
Actuated g/C Ratio	0.23	0.23		0.70	0.70	
v/c Ratio	0.50	0.71		0.29	0.62	
Control Delay	34.2	43.0		7.4	11.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	34.2	43.0		7.4	11.3	
LOS	C	D		A	B	
Approach Delay	37.7			7.4	11.3	
Approach LOS	D			A	B	
Intersection Summary						
Area Type:	Other					
Cycle Length:	120					
Actuated Cycle Length:	109.5					
Natural Cycle:	60					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.71					
Intersection Signal Delay:	16.2			Intersection LOS: B		
Intersection Capacity Utilization:	69.8%			ICU Level of Service C		
Analysis Period (min):	15					
Splits and Phases:	108: Dorval Drive & QEW EB Off-Ramp					














Queues  
108: Dorval Drive & QEW EB Off-Ramp

Background Opening Year  
AM Peak Hour

				
Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	387	258	713	1526
v/c Ratio	0.50	0.71	0.29	0.62
Control Delay	34.2	43.0	7.4	11.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.2	43.0	7.4	11.3
Queue Length 50th (m)	34.6	49.1	28.7	86.3
Queue Length 95th (m)	49.0	80.6	50.4	144.0
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1085	504	2467	2467
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.51	0.29	0.62
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Background Opening Year  
AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	 			 	 	
Traffic Volume (vph)	119	475	0	656	1404	0
Future Volume (vph)	119	475	0	656	1404	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Fr't	0.90	0.85		1.00	1.00	
Fit Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3199	1441		3539	3539	
Fit Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3199	1441		3539	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	516	0	713	1526	0
RTOR Reduction (vph)	33	33	0	0	0	0
Lane Group Flow (vph)	354	225	0	713	1526	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	23.1	23.1		74.3	74.3	
Effective Green, g (s)	25.1	25.1		76.3	76.3	
Actuated g/C Ratio	0.23	0.23		0.70	0.70	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	733	330		2468	2468	
v/s Ratio Prot	0.11			0.20	c0.43	
v/s Ratio Perm		c0.16				
v/c Ratio	0.48	0.68		0.29	0.62	
Uniform Delay, d1	36.5	38.5		6.3	8.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	6.2		0.3	1.2	
Delay (s)	37.2	44.7		6.6	10.0	
Level of Service	D	D		A	A	
Approach Delay (s)	40.2			6.6	10.0	
Approach LOS	D			A	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			15.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			109.4		Sum of lost time (s)	8.0
Intersection Capacity Utilization			69.8%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background Opening Year  
AM Peak Hour

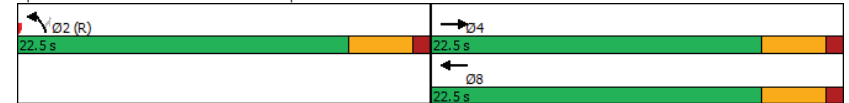
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↔	↔
Traffic Volume (vph)	435	0	0	264	232	258
Future Volume (vph)	435	0	0	264	232	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						233
Link Speed (k/h)	60			60	40	
Link Distance (m)	128.8			184.7	258.8	
Travel Time (s)	7.7			11.1	23.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	473	0	0	287	252	280
Shared Lane Traffic (%)						
Lane Group Flow (vph)	473	0	0	287	252	280
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
v/c Ratio	0.33			0.20	0.36	0.36

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background Opening Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	10.2			9.3	11.3	4.1
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.2			9.3	11.3	4.1
LOS	B			A	B	A
Approach Delay	10.2			9.3	7.5	
Approach LOS	B			A	A	
<b>Intersection Summary</b>						
Area Type:	Other					
Cycle Length:	45					
Actuated Cycle Length:	45					
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green					
Natural Cycle:	45					
Control Type:	Pretimed					
Maximum v/c Ratio:	0.36					
Intersection Signal Delay:	8.9			Intersection LOS: A		
Intersection Capacity Utilization	35.5%			ICU Level of Service A		
Analysis Period (min)	15					

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street



Queues  
109: QEW WB Off-Ramp & Kerr Street

Background Opening Year  
AM Peak Hour

	→	←	↖	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	473	287	252	280
v/c Ratio	0.33	0.20	0.36	0.36
Control Delay	10.2	9.3	11.3	4.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.2	9.3	11.3	4.1
Queue Length 50th (m)	13.4	7.6	13.7	2.3
Queue Length 95th (m)	22.0	13.7	27.1	13.2
Internal Link Dist (m)	104.8	160.7	234.8	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1415	1415	708	773
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.20	0.36	0.36
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Background Opening Year  
AM Peak Hour

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (vph)	435	0	0	264	232	258
Future Volume (vph)	435	0	0	264	232	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr't	1.00			1.00	1.00	0.85
Fit Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	1583
Fit Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	473	0	0	287	252	280
RTOR Reduction (vph)	0	0	0	0	0	140
Lane Group Flow (vph)	473	0	0	287	252	140
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1415			1415	708	633
v/s Ratio Prot	c0.13			0.08	c0.14	
v/s Ratio Perm						0.09
v/c Ratio	0.33			0.20	0.36	0.22
Uniform Delay, d1	9.4			8.8	9.4	8.9
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.6			0.3	1.4	0.8
Delay (s)	10.0			9.1	10.8	9.7
Level of Service	A			A	B	A
Approach Delay (s)	10.0			9.1	10.2	
Approach LOS	A			A	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			9.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.35			
Actuated Cycle Length (s)			45.0		Sum of lost time (s)	9.0
Intersection Capacity Utilization			35.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

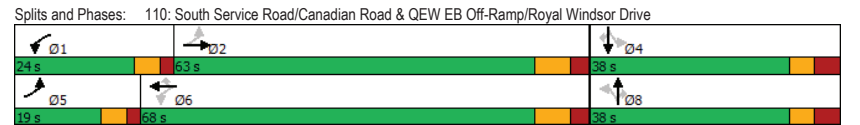
Lanes, Volumes, Timings Background Opening Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	41	508	28	83	500	7	2	8	46	3	19	26
Future Volume (vph)	41	508	28	83	500	7	2	8	46	3	19	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0	0.0	155.0		70.0	15.0		0.0	0.0			30.0
Storage Lanes	2	0	1		1	1		1	1			1
Taper Length (m)	7.5		7.5		7.5			7.5				7.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992				0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3300	0	1719	3139	1380	1805	1667	1468	1805	1792	1495
Fit Permitted	0.446			0.403			0.744			0.752		
Satd. Flow (perm)	1596	3300	0	729	3139	1380	1414	1667	1468	1429	1792	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				94			99			99
Link Speed (k/h)	80			80			60					40
Link Distance (m)	324.5			247.2			158.7					215.5
Travel Time (s)	14.6			11.1			9.5					19.4
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Adj. Flow (vph)	45	558	31	91	549	8	2	9	51	3	21	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	589	0	91	549	8	2	9	51	3	21	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Thru	Right	Left	Left	Right
Median Width(m)	7.2			7.2			3.6					3.6
Link Offset(m)	0.0			0.0			0.0					0.0
Crosswalk Width(m)	4.8			4.8			4.8					4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

Lanes, Volumes, Timings Background Opening Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	34.0		14.0	38.4	38.4	28.8	28.8	28.8	35.0	35.0	35.0
Total Split (s)	19.0	63.0		24.0	68.0	68.0	38.0	38.0	38.0	38.0	38.0	38.0
Total Split (%)	15.2%	50.4%		19.2%	54.4%	54.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%
Maximum Green (s)	13.0	54.6		18.0	59.6	59.6	30.2	30.2	30.2	30.2	30.2	30.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	74.5	67.6		75.3	70.5	70.5	13.4	13.4	13.4	13.9	13.9	13.9
Actuated g/C Ratio	0.78	0.71		0.79	0.74	0.74	0.14	0.14	0.14	0.15	0.15	0.15
v/c Ratio	0.03	0.25		0.13	0.24	0.01	0.01	0.04	0.18	0.01	0.08	0.10
Control Delay	2.6	7.2		3.0	6.4	0.0	37.5	37.9	2.3	37.3	38.4	0.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.6	7.2		3.0	6.4	0.0	37.5	37.9	2.3	37.3	38.4	0.6
LOS	A	A		A	A	A	D	D	A	D	D	A
Approach Delay		6.9			5.8			8.6				17.7
Approach LOS		A			A			A				B

Intersection Summary	
Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	95.4
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.25
Intersection Signal Delay:	6.9
Intersection Capacity Utilization:	50.0%
Intersection LOS:	A
ICU Level of Service:	A
Analysis Period (min):	15





Queues Background Opening Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

	↖	→	↘	←	↙	↗	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	45	589	91	549	8	2	9	51	3	21	29
v/c Ratio	0.03	0.25	0.13	0.24	0.01	0.01	0.04	0.18	0.01	0.08	0.10
Control Delay	2.6	7.2	3.0	6.4	0.0	37.5	37.9	2.3	37.3	38.4	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.6	7.2	3.0	6.4	0.0	37.5	37.9	2.3	37.3	38.4	0.6
Queue Length 50th (m)	0.8	24.6	3.4	23.2	0.0	0.4	1.6	0.0	0.6	3.8	0.0
Queue Length 95th (m)	1.8	33.4	6.5	31.5	0.0	2.5	6.4	2.0	3.3	10.9	0.0
Internal Link Dist (m)		300.5		223.2			134.7			191.5	
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0
Base Capacity (vph)	1583	2341	801	2318	1044	506	596	589	511	641	598
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.25	0.11	0.24	0.01	0.00	0.02	0.09	0.01	0.03	0.05

Intersection Summary


HCM Signalized Intersection Capacity Analysis Background Opening Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

	↖	→	↘	←	↙	↗	↑	↘	↙	↓	↘	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗	↖ ↗		↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗
Traffic Volume (vph)	41	508	28	83	500	7	2	8	46	3	19	26
Future Volume (vph)	41	508	28	83	500	7	2	8	46	3	19	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3300		1719	3139	1380	1805	1667	1468	1805	1792	1495
Fit Permitted	0.45	1.00		0.40	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1595	3300		729	3139	1380	1413	1667	1468	1428	1792	1495
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)	45	558	31	91	549	8	2	9	51	3	21	29
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	45	0	0	26
Lane Group Flow (vph)	45	587	0	91	549	6	2	9	6	3	21	3
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	68.2	63.6		71.4	65.2	65.2	7.8	7.8	7.8	7.8	7.8	7.8
Effective Green, g (s)	72.2	68.0		75.4	69.6	69.6	11.6	11.6	11.6	11.6	11.6	11.6
Actuated g/C Ratio	0.72	0.68		0.76	0.70	0.70	0.12	0.12	0.12	0.12	0.12	0.12
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	1273	2248		632	2189	962	164	193	170	165	208	173
v/s Ratio Prot	0.00	c0.18		c0.01	0.17			0.01			c0.01	
v/s Ratio Perm	0.02			0.10		0.00	0.00		0.00	0.00		0.00
v/c Ratio	0.04	0.26		0.14	0.25	0.01	0.01	0.05	0.03	0.02	0.10	0.02
Uniform Delay, d1	3.9	6.2		3.3	5.5	4.6	39.0	39.2	39.1	39.1	39.4	39.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.3		0.1	0.3	0.0	0.0	0.1	0.1	0.1	0.3	0.1
Delay (s)	3.9	6.4		3.4	5.8	4.6	39.1	39.3	39.2	39.1	39.7	39.1
Level of Service	A	A		A	A	A	D	D	D	D	D	D
Approach Delay (s)		6.3			5.5			39.2			39.3	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
201: Cross Ave & Lyons Lane

Background Opening Year  
AM Peak Hour




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↔		↕↔	
Traffic Volume (vph)	31	464	219	48	60	34
Future Volume (vph)	31	464	219	48	60	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.958		0.944	
Flt Protected	0.950				0.971	
Satd. Flow (prot)	1624	3094	2790	0	1421	0
Flt Permitted	0.950				0.971	
Satd. Flow (perm)	1624	3094	2790	0	1421	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	4			4	7	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Heavy Vehicles (%)	0%	5%	16%	0%	0%	25%
Adj. Flow (vph)	45	800	249	96	97	68
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	800	345	0	165	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	CBD
Control Type:	Unsignalized
Intersection Capacity Utilization	28.4%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Background Opening Year  
AM Peak Hour




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↔		↕↔	
Traffic Volume (veh/h)	31	464	219	48	60	34
Future Volume (Veh/h)	31	464	219	48	60	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Hourly flow rate (vph)	45	800	249	96	97	68
Pedestrians			7		4	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked	1.00				1.00	1.00
vC, conflicting volume	349				798	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	337				788	164
tC, single (s)	4.1				6.8	7.4
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.5
p0 queue free %	96				69	91
cM capacity (veh/h)	1224				316	778

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	45	400	400	166	179	165
Volume Left	45	0	0	0	0	97
Volume Right	0	0	0	0	96	68
sSH	1224	1700	1700	1700	1700	418
Volume to Capacity	0.04	0.24	0.24	0.10	0.11	0.39
Queue Length 95th (m)	0.9	0.0	0.0	0.0	0.0	14.8
Control Delay (s)	8.1	0.0	0.0	0.0	0.0	19.1
Lane LOS	A					C
Approach Delay (s)	0.4			0.0		19.1
Approach LOS						C

Intersection Summary	
Average Delay	2.6
Intersection Capacity Utilization	28.4%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Background Opening Year  
AM Peak Hour

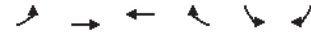


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	4	3	25	15	1
Future Volume (vph)	0	4	3	25	15	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.880			0.987	
Flt Protected					0.957	
Satd. Flow (prot)	0	1710	1505	0	1243	0
Flt Permitted					0.957	
Satd. Flow (perm)	0	1710	1505	0	1243	0
Link Speed (k/h)		50			50	
Link Distance (m)		60.5			89.6	
Travel Time (s)		4.4			6.5	
Confl. Peds. (#/hr)	6			6		1
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	33%	0%
Adj. Flow (vph)	0	8	4	33	39	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	8	37	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0			3.6	
Link Offset(m)		0.0			0.0	
Crosswalk Width(m)		4.8			4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free			Stop	

Intersection Summary	
Area Type:	CBD
Control Type:	Unsignalized
Intersection Capacity Utilization	15.1% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Background Opening Year  
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	4	3	25	15	1
Future Volume (Veh/h)	0	4	3	25	15	1
Sign Control		Free			Free	
Grade		0%			0%	
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Hourly flow rate (vph)	0	8	4	33	39	4
Pedestrians			1			6
Lane Width (m)			3.6			3.6
Walking Speed (m/s)			1.2			1.2
Percent Blockage			0			1
Right turn flare (veh)						
Median type		None			None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	43				36	26
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	43				36	26
tC, single (s)	4.1				6.7	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.3
p0 queue free %	100				96	100
cM capacity (veh/h)	1571				899	1050

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	8	37	43
Volume Left	0	0	39
Volume Right	0	33	4
eSH	1571	1700	911
Volume to Capacity	0.00	0.02	0.05
Queue Length 95th (m)	0.0	0.0	1.2
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	4.5
Intersection Capacity Utilization	15.1% ICU Level of Service A
Analysis Period (min)	15

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	1	78	690	153	35	54
Future Volume (vph)	1	78	690	153	35	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.972		0.918	
Flt Protected		0.999			0.981	
Satd. Flow (prot)	0	1673	1624	0	1540	0
Flt Permitted		0.999			0.981	
Satd. Flow (perm)	0	1673	1624	0	1540	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)	1			1	5	1
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Heavy Vehicles (%)	100%	0%	3%	0%	0%	0%
Adj. Flow (vph)	4	186	802	213	140	216
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	190	1015	0	356	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	CBD
Control Type:	Unsignalized
Intersection Capacity Utilization	63.5%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Background Opening Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (veh/h)	1	78	690	153	35	54
Future Volume (Veh/h)	1	78	690	153	35	54
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Hourly flow rate (vph)	4	186	802	213	140	216
Pedestrians		1	5		1	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	1016				1108	910
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1016				1108	910
tC, single (s)	5.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	3.1				3.5	3.3
p0 queue free %	99				39	35
cM capacity (veh/h)	413				231	335

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	190	1015	356
Volume Left	4	0	140
Volume Right	0	213	216
eSH	413	1700	284
Volume to Capacity	0.01	0.60	1.25
Queue Length 95th (m)	0.2	0.0	134.9
Control Delay (s)	0.4	0.0	176.0
Lane LOS	A		F
Approach Delay (s)	0.4	0.0	176.0
Approach LOS			F

Intersection Summary	
Average Delay	40.2
Intersection Capacity Utilization	63.5%
Analysis Period (min)	15
	ICU Level of Service B

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	122	0	1737	1534	766
Future Volume (vph)	0	122	0	1737	1534	766
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Frt		0.865			0.944	
Fit Protected						
Satd. Flow (prot)	0	1367	0	4363	4268	0
Fit Permitted						
Satd. Flow (perm)	0	1367	0	4363	4268	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	145.7			270.2	51.4	
Travel Time (s)	10.5			19.5	3.7	
Confl. Peds. (#/hr)						11
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82
Heavy Vehicles (%)	0%	7%	0%	7%	4%	2%
Adj. Flow (vph)	0	226	0	1888	1581	934
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	226	0	1888	2515	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	67.4%		ICU Level of Service C			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Background Opening Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Volume (veh/h)	0	122	0	1737	1534	766	
Future Volume (Veh/h)	0	122	0	1737	1534	766	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82	
Hourly flow rate (vph)	0	226	0	1888	1581	934	
Pedestrians	11						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	1						
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.73	0.64	0.64				
vC, conflicting volume	2688	1005	2526				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	330	0	1393				
tC, single (s)	6.8	7.0	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	66	100				
cM capacity (veh/h)	463	673	313				
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>NB 3</b>	<b>SB 1</b>	<b>SB 2</b>	<b>SB 3</b>
Volume Total	226	629	629	629	632	632	1250
Volume Left	0	0	0	0	0	0	0
Volume Right	226	0	0	0	0	0	934
eSH	673	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.34	0.37	0.37	0.37	0.37	0.37	0.74
Queue Length 95th (m)	11.8	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	13.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	13.0	0.0			0.0		
Approach LOS	B						
<b>Intersection Summary</b>							
Average Delay				0.6			
Intersection Capacity Utilization	67.4%		ICU Level of Service		C		
Analysis Period (min)	15						

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd  
Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagrammatic arrows for lane configurations]											
Traffic Volume (vph)	22	107	283	215	54	139	157	887	711	156	842	28
Future Volume (vph)	22	107	283	215	54	139	157	887	711	156	842	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0			25.0	145.0		0.0	95.0	90.0
Storage Lanes	1		1	1			1	1		1	1	1
Taper Length (m)	7.5			7.5			7.5	7.5		7.5	7.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	0.99						0.98		0.97	1.00		
Frt			0.850				0.850		0.850			0.850
Fit Protected	0.950			0.950			0.950		0.950			
Satd. Flow (prot)	1624	1693	1425	3060	1676	1398	1425	4446	1398	1562	4532	1398
Fit Permitted	0.719			0.473			0.261		0.251			
Satd. Flow (perm)	1217	1693	1425	1523	1676	1366	392	4446	1363	411	4532	1398
Right Turn on Red			Yes			Yes		Yes		Yes		
Satd. Flow (RTOR)			261			149		666				145
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		285.9			293.8			275.1			252.7	
Travel Time (s)		20.6			21.2			19.8			18.2	
Confl. Peds. (#/hr)	11				11			10		10		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Adj. Flow (vph)	24	115	304	231	58	149	169	954	765	168	905	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	115	304	231	58	149	169	954	765	168	905	30
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25			15	25		15	25	
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd  
Background Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		2	6	6
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	10.0	34.0	34.0	11.0	43.0	43.0	10.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	10.0	42.0	42.0	11.0	43.0	43.0	19.0	54.0	54.0	13.0	48.0	48.0
Total Split (%)	8.3%	35.0%	35.0%	9.2%	35.8%	35.8%	15.8%	45.0%	45.0%	10.8%	40.0%	40.0%
Maximum Green (s)	6.0	35.0	35.0	6.0	36.0	36.0	15.0	47.0	47.0	9.0	41.0	41.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	24.3	18.3	18.3	25.9	23.3	23.3	79.3	68.5	68.5	78.1	67.9	67.9
Actuated g/C Ratio	0.20	0.15	0.15	0.22	0.19	0.19	0.66	0.57	0.57	0.65	0.57	0.57
v/c Ratio	0.09	0.45	0.69	0.57	0.18	0.39	0.48	0.38	0.72	0.46	0.35	0.04
Control Delay	33.3	50.6	17.5	44.1	42.0	9.4	12.2	15.7	7.6	11.7	15.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	50.6	17.5	44.1	42.0	9.4	12.2	15.7	7.6	11.7	15.7	0.1
LOS	C	D	B	D	D	A	B	B	A	B	B	A
Approach Delay		26.9			32.0			12.1			14.7	
Approach LOS		C			C			B			B	
Intersection Summary	[Summary text]											
Area Type:	CBD											
Cycle Length:	120											
Actuated Cycle Length:	120											
Offset:	33.6 (28%), Referenced to phase 2:NBT and 6:SBTL, Start of Green											
Natural Cycle:	100											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.72											
Intersection Signal Delay:	16.8						Intersection LOS: B					
Intersection Capacity Utilization:	77.9%						ICU Level of Service D					
Analysis Period (min):	15											
Splits and Phases:	205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd											
[Diagram]	[Diagrammatic representation of splits and phases for 8 lane groups]											

Queues  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd  
Background Opening Year  
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	24	115	304	231	58	149	169	954	765	168	905	30
v/c Ratio	0.09	0.45	0.69	0.57	0.18	0.39	0.48	0.38	0.72	0.46	0.35	0.04
Control Delay	33.3	50.6	17.5	44.1	42.0	9.4	12.2	15.7	7.6	11.7	15.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	50.6	17.5	44.1	42.0	9.4	12.2	15.7	7.6	11.7	15.7	0.1
Queue Length 50th (m)	4.6	26.5	9.5	24.7	12.8	0.0	12.9	43.7	10.5	12.7	41.1	0.0
Queue Length 95th (m)	10.8	42.0	37.5	33.0	23.6	17.3	27.3	69.3	26.8	66.0	66.0	0.0
Internal Link Dist (m)		261.9		269.8			251.1			228.7		
Turn Bay Length (m)	60.0			165.0		25.0	145.0			95.0		90.0
Base Capacity (vph)	266	536	629	405	544	398	2536	1063	371	2563	853	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.21	0.48	0.57	0.11	0.27	0.42	0.38	0.72	0.45	0.35	0.04

Intersection Summary

Intersection Summary												
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HCM Signalized Intersection Capacity Analysis  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd  
Background Opening Year  
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	22	107	283	215	54	139	157	887	711	156	842	28
Future Volume (vph)	22	107	283	215	54	139	157	887	711	156	842	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1613	1693	1425	3060	1676	1366	1425	4446	1363	1561	4532	1398
Flt Permitted	0.72	1.00	1.00	0.47	1.00	1.00	0.26	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	1221	1693	1425	1524	1676	1366	392	4446	1363	412	4532	1398
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	24	115	304	231	58	149	169	954	765	168	905	30
RTOR Reduction (vph)	0	0	218	0	0	120	0	0	295	0	0	13
Lane Group Flow (vph)	24	115	86	231	58	29	169	954	470	168	905	17
Confl. Peds. (#/hr)	11					11			10		10	
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	20.5	16.9	16.9	26.3	20.3	20.3	74.7	63.9	63.9	73.5	63.3	63.3
Effective Green, g (s)	20.5	19.9	19.9	26.3	23.3	23.3	74.7	66.9	66.9	73.5	66.3	66.3
Actuated g/C Ratio	0.17	0.17	0.17	0.22	0.19	0.19	0.62	0.56	0.56	0.61	0.55	0.55
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	220	280	236	410	325	265	336	2478	759	350	2503	772
v/s Ratio Prot	0.00	0.07		c0.03	0.03		c0.05	0.21		0.04	0.20	
v/s Ratio Perm	0.02		0.06	c0.10		0.02	0.27		c0.35	0.25		0.01
v/c Ratio	0.11	0.41	0.37	0.56	0.18	0.11	0.50	0.38	0.62	0.48	0.36	0.02
Uniform Delay, d1	41.9	44.8	44.4	41.0	40.4	39.8	10.2	15.0	17.9	10.5	15.0	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	1.3	1.3	1.8	0.4	0.2	1.2	0.5	3.8	1.0	0.4	0.1
Delay (s)	42.1	46.1	45.8	42.8	40.7	40.1	11.4	15.4	21.7	11.6	15.4	12.2
Level of Service	D	D	D	D	D	D	B	B	C	B	B	B
Approach Delay (s)		45.7					41.6		17.6			14.7
Approach LOS		D					D		B			B

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
303: North Access & South Service Rd E

Background Opening Year  
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↘	↗	
Traffic Volume (vph)	85	0	0	25	0	0
Future Volume (vph)	85	0	0	25	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fit</b>						
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	523.2			302.5	113.1	
Travel Time (s)	37.7			21.8	8.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	0	0	27	0	0
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	92	0	0	27	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	7.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Background Opening Year  
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↘	↗	
Traffic Volume (veh/h)	85	0	0	25	0	0
Future Volume (Veh/h)	85	0	0	25	0	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)	92	0	0	27	0	0
<b>Pedestrians</b>						
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			92		119	92
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			92		119	92
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1503		877	965

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	92	27	0
Volume Left	0	0	0
Volume Right	0	0	0
eSH	1700	1503	1700
Volume to Capacity	0.05	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

**Intersection Summary**

Average Delay		0.0	
Intersection Capacity Utilization		7.8%	ICU Level of Service A
Analysis Period (min)		15	



Queuing and Blocking Report

Background Opening Year  
AM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.8	148.6	88.8	46.5	10.7	32.3	66.0	46.8	57.4	109.1	114.3	123.2
Average Queue (m)	96.0	103.5	42.9	2.8	0.4	14.2	33.6	18.2	45.2	66.1	76.6	87.2
95th Queue (m)	127.3	140.7	77.6	19.5	5.4	32.6	60.6	35.2	68.9	97.2	104.7	115.8
Link Distance (m)		123.0	123.0	51.4	51.4		313.2	313.2		128.0	128.0	128.0
Upstream Blk Time (%)	0	3		0							0	0
Queuing Penalty (veh)	0	13		1							0	1
Storage Bay Dist (m)	130.0					25.0			50.0			
Storage Blk Time (%)	0	3				0	24		7	18		
Queuing Penalty (veh)	2	12				0	12		19	30		

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	SB	SB	SB	SB
Directions Served	T	T	L	T	T	TR
Maximum Queue (m)	17.8	13.8	32.4	229.9	239.2	243.1
Average Queue (m)	0.6	0.5	31.9	154.8	149.3	170.2
95th Queue (m)	12.5	9.7	35.3	242.1	244.9	257.1
Link Distance (m)	101.5	101.5		239.0	239.0	239.0
Upstream Blk Time (%)				0	1	3
Queuing Penalty (veh)				2	4	18
Storage Bay Dist (m)			25.0			
Storage Blk Time (%)			63	26		
Queuing Penalty (veh)			193	83		

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	B14
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR	T
Maximum Queue (m)	27.3	82.6	67.0	27.3	50.2	42.7	36.4	37.6	22.5	184.8	44.3
Average Queue (m)	8.9	42.1	26.2	12.4	25.0	23.7	9.7	15.0	22.2	145.7	5.5
95th Queue (m)	24.3	69.4	54.3	28.6	44.0	41.2	27.1	31.0	24.0	193.6	29.8
Link Distance (m)		352.9	352.9		51.4	51.4	66.7	66.7		159.0	160.7
Upstream Blk Time (%)					0	0					12
Queuing Penalty (veh)					0	0					92
Storage Bay Dist (m)	20.0			20.0					15.0		
Storage Blk Time (%)	1	29		4	11				45	48	
Queuing Penalty (veh)	2	11		12	5				259	146	

Queuing and Blocking Report

Background Opening Year  
AM Peak Hour

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	21.6	24.8	23.1	30.9	22.3	21.0	15.8	12.7	15.0	24.7
Average Queue (m)	8.0	15.8	17.7	15.9	4.5	6.4	4.7	4.2	3.8	9.7
95th Queue (m)	19.3	26.2	25.9	26.7	15.8	17.1	12.9	11.7	11.4	19.1
Link Distance (m)	21.8	21.8	21.8		352.9	352.9		54.8	56.7	56.7
Upstream Blk Time (%)	1	5	4							
Queuing Penalty (veh)	1	9	8							
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)				1	0		0	0		
Queuing Penalty (veh)				1	1		0	0		

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.3	86.5	118.0	97.8	30.7	108.8	127.1	32.3	81.4	72.2	57.3	64.0
Average Queue (m)	55.4	63.8	50.5	51.0	8.1	61.9	67.2	14.8	46.9	39.9	35.0	39.6
95th Queue (m)	84.2	88.7	99.8	88.2	21.4	93.8	125.1	35.3	71.9	65.4	53.5	58.6
Link Distance (m)			266.8	266.8		122.1	122.1		289.9	289.9		101.5
Upstream Blk Time (%)						0	2					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (m)	80.0	80.0			80.0		25.0				80.0	
Storage Blk Time (%)	2	4	0			2	5	32				
Queuing Penalty (veh)	4	10	0			0	10	16				

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	63.0	25.8
Average Queue (m)	29.8	7.7
95th Queue (m)	55.0	19.2
Link Distance (m)	101.5	101.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Background Opening Year  
AM Peak Hour

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	167.9	185.5	192.4	37.4	48.2	40.2	318.7	319.2	312.7
Average Queue (m)	69.2	163.5	176.8	28.9	32.1	30.0	296.6	307.6	305.5
95th Queue (m)	126.4	235.1	208.9	32.9	41.0	35.1	342.3	316.0	310.4
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	0	25	60	42	48	54	18	35	48
Queuing Penalty (veh)	0	0	0	242	277	310	124	234	326
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	1.5	114.5	176.7	182.2	179.9	145.7	190.2	215.0	260.1	266.0	258.9	275.6
Average Queue (m)	0.1	59.3	111.2	123.3	37.5	71.4	96.2	133.3	246.4	249.0	247.0	244.8
95th Queue (m)	1.2	105.6	194.6	201.2	156.2	125.7	172.4	215.3	285.9	286.1	280.8	364.4
Link Distance (m)		117.8	171.3	171.3	171.3	299.7	299.7	299.7	249.2	249.2	249.2	249.2
Upstream Blk Time (%)		3	10	18	7			0	49	57	61	85
Queuing Penalty (veh)		0	0	0	0			2	164	190	204	283
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)		32										
Queuing Penalty (veh)		0										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	128.0	161.4	105.4	48.7	47.5	121.5	115.1
Average Queue (m)	84.0	84.1	59.2	23.8	24.2	77.9	66.8
95th Queue (m)	118.8	129.4	94.3	42.8	43.5	109.3	100.1
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)		0					
Queuing Penalty (veh)		0					
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Background Opening Year  
AM Peak Hour

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	64.6	77.6	69.5	60.0	50.4	93.8	97.9
Average Queue (m)	22.2	51.4	40.3	32.6	15.1	48.4	55.6
95th Queue (m)	55.5	70.2	63.2	54.5	36.3	82.6	87.8
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	41.8	19.8	31.2	23.2	39.7	31.6
Average Queue (m)	22.2	6.8	16.3	4.7	18.8	15.4
95th Queue (m)	35.0	16.6	26.8	15.2	32.8	25.7
Link Distance (m)	121.6	121.6	175.0	175.0	246.4	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						140.0
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	4.0	13.9	45.1	29.8	21.2	43.1	28.7	4.1	3.1	12.6	6.3	19.8
Average Queue (m)	0.2	4.3	17.1	8.1	6.6	11.2	5.6	0.3	0.1	1.8	0.5	3.7
95th Queue (m)	1.8	11.0	37.4	22.6	14.9	29.4	19.4	2.4	1.7	8.0	3.0	12.1
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0					155.0	70.0	15.0			
Storage Blk Time (%)												1
Queuing Penalty (veh)												0

Queuing and Blocking Report

Background Opening Year  
AM Peak Hour

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	9.3	6.4	31.0	7.1	6.6	23.0
Average Queue (m)	1.5	0.4	7.4	0.3	0.3	11.7
95th Queue (m)	7.0	3.6	24.1	2.8	3.1	20.0
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)						1
Queuing Penalty (veh)						0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	0	0				
Queuing Penalty (veh)	1	0				

Intersection: 202: Lyons Lane & South Service Rd E

Movement	SB
Directions Served	LR
Maximum Queue (m)	18.7
Average Queue (m)	4.6
95th Queue (m)	15.0
Link Distance (m)	21.6
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 203: Argus Rd & South Service Rd E

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (m)	3.0	10.8	23.0
Average Queue (m)	0.1	0.4	11.5
95th Queue (m)	2.1	5.6	19.5
Link Distance (m)	160.7	112.3	88.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report

Background Opening Year  
AM Peak Hour

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	30.4	127.6	147.3	149.1	17.9	26.3	42.4
Average Queue (m)	13.4	68.1	79.7	89.2	1.1	3.7	10.8
95th Queue (m)	24.4	113.9	127.6	136.9	9.8	17.6	32.2
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)					0	0	2
Queuing Penalty (veh)					0	1	13
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	R
Maximum Queue (m)	18.1	275.1	275.6	161.8	239.1	184.9	32.4	63.2	103.8	103.6	255.4	203.4
Average Queue (m)	3.0	167.9	204.2	94.3	123.3	46.0	15.0	27.0	27.0	31.0	56.2	11.9
95th Queue (m)	11.3	366.5	374.0	190.9	263.3	190.3	29.4	51.1	71.8	77.0	172.1	100.7
Link Distance (m)		265.0	265.0		273.8	273.8		249.2	249.2	249.2	249.2	
Upstream Blk Time (%)		47	61		12	8					0	0
Queuing Penalty (veh)		0	0		0	0					1	2
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				
Storage Blk Time (%)				13	24	2	2					
Queuing Penalty (veh)				14	26	3	1					

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	R
Maximum Queue (m)	102.4	247.9	246.6	247.7	97.5
Average Queue (m)	67.0	195.1	193.1	188.8	18.7
95th Queue (m)	140.3	324.5	322.6	327.6	81.0
Link Distance (m)		234.2	234.2	234.2	
Upstream Blk Time (%)		62	59	61	
Queuing Penalty (veh)		0	0	0	
Storage Bay Dist (m)	95.0				90.0
Storage Blk Time (%)	0	74		77	0
Queuing Penalty (veh)	0	115		22	0

Queuing and Blocking Report

Background Opening Year  
AM Peak Hour

Intersection: 303: North Access & South Service Rd E

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 3536

Lanes, Volumes, Timings

Background Opening Year  
PM Peak Hour

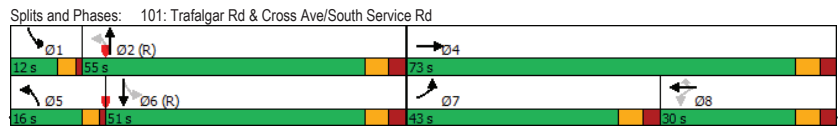
101: Trafalgar Rd & Cross Ave/South Service Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1142	109	171	167	196	253	224	1546	45	151	1272	444
Future Volume (vph)	1142	109	171	167	196	253	224	1546	45	151	1272	444
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.97		0.98				0.99			0.99	
Frt		0.913				0.850		0.994			0.962	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2958	1399	0	1540	1644	1423	1496	4545	0	1570	4366	0
Fit Permitted	0.950			0.545			0.083			0.091		
Satd. Flow (perm)	2958	1399	0	865	1644	1423	131	4545	0	150	4366	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		71				117		5		65		
Link Speed (k/h)		50			50			50		50		
Link Distance (m)		151.2			330.4			150.2		270.2		
Travel Time (s)		10.9			23.8			10.8		19.5		
Confl. Peds. (#/hr)			15	15			18		70	70		18
Peak Hour Factor	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%
Adj. Flow (vph)	1360	151	211	204	242	309	264	1680	68	168	1429	477
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1360	362	0	204	242	309	264	1748	0	168	1906	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings Background Opening Year  
 101: Trafalgar Rd & Cross Ave/South Service Rd PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		25.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	43.0	73.0		30.0	30.0	30.0	16.0	55.0		12.0	51.0	
Total Split (%)	30.7%	52.1%		21.4%	21.4%	21.4%	11.4%	39.3%		8.6%	36.4%	
Maximum Green (s)	36.0	66.0		23.0	23.0	23.0	12.0	48.0		8.0	44.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	C-Max			Min	C-Max	
Walk Time (s)		7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0	0	0		0			0	
Act Effct Green (s)	39.0	69.0		23.0	26.0	26.0	63.0	51.0		55.0	47.0	
Actuated g/C Ratio	0.28	0.49		0.16	0.19	0.19	0.45	0.36		0.39	0.34	
v/c Ratio	1.65	0.50		1.44	0.79	0.86	1.51	1.05		1.20	1.26	
Control Delay	331.0	21.5		272.7	73.8	57.1	272.6	78.8		166.8	162.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	331.0	21.5		272.7	73.8	57.1	272.6	78.8		166.8	162.9	
LOS	F	C		F	E	E	F	E		F	F	
Approach Delay		266.0			120.7			104.2			163.2	
Approach LOS		F			F			F			F	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 128 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.65  
 Intersection Signal Delay: 167.2 Intersection LOS: F  
 Intersection Capacity Utilization 113.6% ICU Level of Service H  
 Analysis Period (min) 15



Queues Background Opening Year  
 101: Trafalgar Rd & Cross Ave/South Service Rd PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1360	362	204	242	309	264	1748	168	1906
v/c Ratio	1.65	0.50	1.44	0.79	0.86	1.51	1.05	1.20	1.26
Control Delay	331.0	21.5	272.7	73.8	57.1	272.6	78.8	166.8	162.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	331.0	21.5	272.7	73.8	57.1	272.6	78.8	166.8	162.9
Queue Length 50th (m)	-295.4	55.5	-80.4	68.1	56.9	-92.3	-200.1	-44.1	-247.2
Queue Length 95th (m)	#308.2	58.7	#117.3	88.5	#87.9	m#92.5	m153.1	m#73.4	#273.7
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	824	725	142	305	359	175	1658	140	1508
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.65	0.50	1.44	0.79	0.86	1.51	1.05	1.20	1.26

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

HCM Signalized Intersection Capacity Analysis  
101: Trafalgar Rd & Cross Ave/South Service Rd

Background Opening Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	1142	109	171	167	196	253	224	1546	45	151	1272	444	
Future Volume (vph)	1142	109	171	167	196	253	224	1546	45	151	1272	444	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6	
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0		
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91		
Frbp, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	0.99		1.00	0.99		
Flpb, ped/bikes	1.00	1.00		0.98	1.00	1.00	1.00	1.00		1.00	1.00		
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	0.96		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	2958	1398		1507	1644	1423	1496	4546		1570	4368		
Flt Permitted	0.95	1.00		0.55	1.00	1.00	0.08	1.00		0.09	1.00		
Satd. Flow (perm)	2958	1398		865	1644	1423	131	4546		150	4368		
Peak-hour factor, PHF	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93	
Adj. Flow (vph)	1360	151	211	204	242	309	264	1680	68	168	1429	477	
RTOR Reduction (vph)	0	36	0	0	0	95	0	3	0	0	43	0	
Lane Group Flow (vph)	1360	326	0	204	242	214	264	1745	0	168	1863	0	
Confl. Peds. (#/hr)			15	15			18		70	70		18	
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%	
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA		
Protected Phases	7	4		8		8	5	2		1	6		
Permitted Phases				8		8		2		6			
Actuated Green, G (s)	36.0	66.0		23.0	23.0	23.0	60.0	48.0		52.0	44.0		
Effective Green, g (s)	39.0	69.0		23.0	26.0	26.0	60.0	51.0		52.0	47.0		
Actuated g/C Ratio	0.28	0.49		0.16	0.19	0.19	0.43	0.36		0.37	0.34		
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	4.0	7.0		4.0	7.0		
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0	5.0		
Lane Grp Cap (vph)	824	689		142	305	264	173	1656		136	1466		
v/s Ratio Prot	c0.46	0.23			0.15		c0.13	0.38		0.07	0.43		
v/s Ratio Perm				c0.24		0.15	c0.52			0.39			
v/c Ratio	1.65	0.47		1.44	0.79	0.81	1.53	1.05		1.24	1.27		
Uniform Delay, d1	50.5	23.5		58.5	54.4	54.6	41.1	44.5		37.6	46.5		
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.18	1.12		1.42	1.08		
Incremental Delay, d2	298.2	0.7		231.8	13.9	17.4	249.3	31.3		144.4	126.0		
Delay (s)	348.7	24.2		290.3	68.4	72.0	297.8	81.0		197.9	176.2		
Level of Service	F	C		F	E	E	F	F		F	F		
Approach Delay (s)	280.4			129.8				109.5			178.0		
Approach LOS	F			F				F			F		

Intersection Summary			
HCM 2000 Control Delay	178.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.51		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	113.6%	ICU Level of Service	H
Analysis Period (min)	15		

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	992	18	40	449	105	17	2	51	267	21	180
Future Volume (vph)	33	992	18	40	449	105	17	2	51	267	21	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99	0.99	0.99	0.97		0.98	0.98	
Frt	0.997				0.968			0.864		0.866		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1570	3176	0	797	3120	0	785	715	0	1570	1306	0
Flt Permitted	0.424			0.095			0.462			0.702		
Satd. Flow (perm)	696	3176	0	80	3120	0	379	715	0	1136	1306	0
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)	3				70		76				231	
Link Speed (k/h)	50				50		50				50	
Link Distance (m)	374.0				72.9		81.9				180.7	
Travel Time (s)	26.9				5.2		5.9				13.0	
Confl. Peds. (#/hr)	9		4	4		9	12		20	20		12
Peak Hour Factor	0.66	0.81	0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75	0.78
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	0%	100%	0%
Adj. Flow (vph)	50	1225	24	43	473	130	24	8	76	310	28	231
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	1249	0	43	603	0	24	84	0	310	259	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.3				3.3		3.3				3.3	
Link Offset(m)	0.0				0.0		0.0				0.0	
Crosswalk Width(m)	4.8				4.8		4.8				4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)	9.4				9.4		9.4				9.4	
Detector 2 Size(m)	0.6				0.6		0.6				0.6	
Detector 2 Type	Cl+Ex				Cl+Ex		Cl+Ex				Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings Background Opening Year  
 102: GO Bus Terminal/Argus Rd & Cross Ave PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	45.4	45.4		12.6	58.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.4%	50.4%		14.0%	64.4%		35.6%	35.6%		35.6%	35.6%	
Maximum Green (s)	39.4	39.4		8.6	52.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	40.3	40.3		52.5	52.5		26.9	26.9		26.9	26.9	
Actuated g/C Ratio	0.46	0.46		0.60	0.60		0.31	0.31		0.31	0.31	
v/c Ratio	0.16	0.85		0.38	0.32		0.21	0.31		0.89	0.46	
Control Delay	15.7	28.2		19.4	8.2		28.2	10.3		57.9	7.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.7	28.2		19.4	8.2		28.2	10.3		57.9	7.7	
LOS	B	C		B	A		C	B		E	A	
Approach Delay		27.7			8.9			14.3			35.1	
Approach LOS		C			A			B			D	

**Intersection Summary**

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 87.4

Natural Cycle: 90

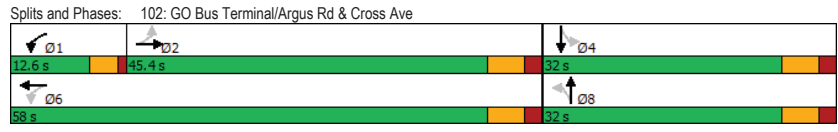
Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 24.1      Intersection LOS: C

Intersection Capacity Utilization 66.7%      ICU Level of Service C

Analysis Period (min) 15



Queues Background Opening Year  
 102: GO Bus Terminal/Argus Rd & Cross Ave PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	1249	43	603	24	84	310	259
v/c Ratio	0.16	0.85	0.38	0.32	0.21	0.31	0.89	0.46
Control Delay	15.7	28.2	19.4	8.2	28.2	10.3	57.9	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	28.2	19.4	8.2	28.2	10.3	57.9	7.7
Queue Length 50th (m)	5.0	101.0	3.1	22.6	3.2	1.0	52.5	3.5
Queue Length 95th (m)	8.8	110.8	10.0	32.1	7.7	0.0	#94.6	11.9
Internal Link Dist (m)		350.0		48.9		57.9		156.7
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	330	1509	118	1959	121	281	364	576
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.83	0.36	0.31	0.20	0.30	0.85	0.45

**Intersection Summary**

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

HCM Signalized Intersection Capacity Analysis  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background Opening Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	33	992	18	40	449	105	17	2	51	267	21	180
Future Volume (vph)	33	992	18	40	449	105	17	2	51	267	21	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.98	
Fpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.98	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	0.86		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1559	3177		797	3119		779	716		1538	1306	
Flt Permitted	0.42	1.00		0.09	1.00		0.46	1.00		0.70	1.00	
Satd. Flow (perm)	695	3177		79	3119		378	716		1138	1306	
Peak-hour factor, PHF	0.66	0.81	0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75	0.78
Adj. Flow (vph)	50	1225	24	43	473	130	24	8	76	310	28	231
RTOR Reduction (vph)	0	2	0	0	28	0	0	53	0	0	160	0
Lane Group Flow (vph)	50	1247	0	43	575	0	24	31	0	310	99	0
Confl. Peds. (#/hr)	9		4	4		9	12		20	20		12
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	0%	100%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	6		8	8		4	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	38.3	38.3		50.5	50.5		24.9	24.9		24.9	24.9	
Effective Green, g (s)	40.3	40.3		50.5	52.5		26.9	26.9		26.9	26.9	
Actuated g/C Ratio	0.46	0.46		0.58	0.60		0.31	0.31		0.31	0.31	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	320	1464		113	1873		116	220		350	401	
v/s Ratio Prot		c0.39		c0.04	0.18			0.04			0.08	
v/s Ratio Perm	0.07			0.18			0.06			c0.27		
v/c Ratio	0.16	0.85		0.38	0.31		0.21	0.14		0.89	0.25	
Uniform Delay, d1	13.7	20.9		13.5	8.5		22.4	21.9		28.8	22.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	5.5		1.6	0.2		1.2	0.4		22.9	0.4	
Delay (s)	14.2	26.4		15.0	8.7		23.6	22.3		51.7	23.1	
Level of Service	B	C		B	A		C	C		D	C	
Approach Delay (s)		25.9			9.2			22.6			38.7	
Approach LOS		C			A			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		24.4										C
HCM 2000 Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		87.4			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		66.7%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave

Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	41	231	14	15	431	13	253	4	171	17	2	68
Future Volume (vph)	41	231	14	15	431	13	253	4	171	17	2	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0		0.0	25.0		0.0	20.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95		1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00	0.95	1.00	0.98		1.00	0.99	
Frt		0.990			0.992			0.858			0.855	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1525	2912		1570	3073		1570	1444		1570	1416	
Flt Permitted	0.479			0.503			0.682			0.529		
Satd. Flow (perm)	766	2912		830	3073		1126	1444		872	1416	
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			9			216			113	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		40.1			374.0			69.1			70.9	
Travel Time (s)		2.9			26.9			5.0			5.1	
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1
Peak Hour Factor	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	71	275	19	28	454	24	342	12	216	24	4	113
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	71	294	0	28	478	0	342	228	0	24	117	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
<b>Detector 2 Channel</b>												



Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

Background Opening Year

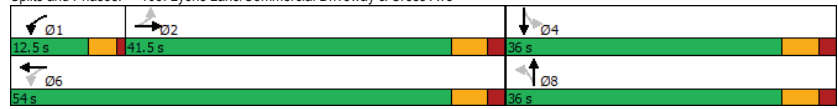
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.5	41.5		12.5	54.0		36.0	36.0		36.0	36.0	
Total Split (%)	46.1%	46.1%		13.9%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	35.5	35.5		8.5	48.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.0	37.0		49.0	49.0		30.3	30.3		30.3	30.3	
Actuated g/C Ratio	0.42	0.42		0.56	0.56		0.35	0.35		0.35	0.35	
v/c Ratio	0.22	0.24		0.05	0.28		0.88	0.36		0.08	0.21	
Control Delay	19.1	16.6		9.5	10.6		51.6	5.2		19.8	5.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.1	16.6		9.5	10.6		51.6	5.2		19.8	5.4	
LOS	B	B		A	B		D	A		B	A	
Approach Delay		17.1			10.5			33.0			7.8	
Approach LOS		B			B			C			A	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	87.4
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	19.9
Intersection Capacity Utilization:	66.8%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	C

Splits and Phases: 103: Lyons Lane/Commercial Driveway & Cross Ave



Queues

103: Lyons Lane/Commercial Driveway & Cross Ave

Background Opening Year

PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	294	28	478	342	228	24	117
v/c Ratio	0.22	0.24	0.05	0.28	0.88	0.36	0.08	0.21
Control Delay	19.1	16.6	9.5	10.6	51.6	5.2	19.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	16.6	9.5	10.6	51.6	5.2	19.8	5.4
Queue Length 50th (m)	8.0	16.9	2.2	22.0	55.7	1.4	2.8	0.5
Queue Length 95th (m)	10.7	24.1	3.5	31.3	69.3	0.0	6.4	0.3
Internal Link Dist (m)		16.1		350.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	328	1256	537	1763	412	665	319	590
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	0.22	0.23	0.05	0.27	0.83	0.34	0.08	0.20

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
103: Lyons Lane/Commercial Driveway & Cross Ave

Background Opening Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	41	231	14	15	431	13	253	4	171	17	2	68
Future Volume (vph)	41	231	14	15	431	13	253	4	171	17	2	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.3	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp. ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb. ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1520	2913		1569	3074		1569	1444		1565	1416	
Flt Permitted	0.48	1.00		0.50	1.00		0.68	1.00		0.53	1.00	
Satd. Flow (perm)	766	2913		831	3074		1126	1444		872	1416	
Peak-hour factor, PHF	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60
Adj. Flow (vph)	71	275	19	28	454	24	342	12	216	24	4	113
RTOR Reduction (vph)	0	6	0	0	4	0	0	141	0	0	74	0
Lane Group Flow (vph)	71	288	0	28	474	0	342	87	0	24	43	0
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	6		8	8		4	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.1	35.1		47.1	47.1		28.4	28.4		28.4	28.4	
Effective Green, g (s)	37.1	37.1		47.1	49.1		30.4	30.4		30.4	30.4	
Actuated g/C Ratio	0.42	0.42		0.54	0.56		0.35	0.35		0.35	0.35	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	324	1235		514	1724		391	501		302	491	
v/s Ratio Prot		0.10		0.00	c0.15			0.06			0.03	
v/s Ratio Perm	0.09			0.02			c0.30			0.03		
v/c Ratio	0.22	0.23		0.05	0.27		0.87	0.17		0.08	0.09	
Uniform Delay, d1	16.0	16.1		9.6	10.0		26.8	19.8		19.2	19.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.2		0.0	0.2		19.5	0.2		0.2	0.1	
Delay (s)	16.7	16.3		9.7	10.1		46.3	20.1		19.3	19.3	
Level of Service	B	B		A	B		D	C		B	B	
Approach Delay (s)	16.4			10.1			35.8			19.3		
Approach LOS	B			B			D			B		
<b>Intersection Summary</b>												
HCM 2000 Control Delay		21.6		HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		87.5		Sum of lost time (s)				12.0				
Intersection Capacity Utilization		66.8%		ICU Level of Service				C				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	423	570	201	75	794	531	145	466	51	509	538	473
Future Volume (vph)	423	570	201	75	794	531	145	466	51	509	538	473
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0		0.0	80.0		0.0	25.0		0.0	80.0		0.0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00
Ped Bike Factor	1.00	0.99		0.99	0.98		0.99	1.00		0.99	0.99	0.97
Frt		0.958			0.944			0.983				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3016	2994	0	1570	2990	0	1540	3185	0	2987	1710	1409
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3006	2994	0	1557	2990	0	1525	3185	0	2958	1710	1361
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48			98			10				204
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.8			142.3			311.4				130.3
Travel Time (s)		20.6			10.2			22.4				9.4
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Peak Hour Factor	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Adj. Flow (vph)	475	679	264	89	957	571	163	518	68	653	611	538
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	475	943	0	89	1528	0	163	586	0	653	611	538
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			6.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

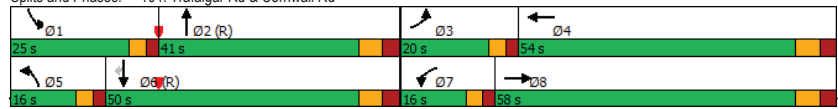
Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	20.0	58.0		16.0	54.0		16.0	41.0		25.0	50.0	50.0
Total Split (%)	14.3%	41.4%		11.4%	38.6%		11.4%	29.3%		17.9%	35.7%	35.7%
Maximum Green (s)	15.0	51.0		11.0	47.0		11.0	34.0		20.0	43.0	43.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	16.0	54.0		12.0	50.0		12.0	37.0		21.0	46.0	46.0
Actuated g/C Ratio	0.11	0.39		0.09	0.36		0.09	0.26		0.15	0.33	0.33
v/c Ratio	1.38	0.80		0.66	1.35		1.23	0.69		1.46	1.09	0.92
Control Delay	233.0	42.1		85.5	198.4		205.5	50.5		256.9	82.6	26.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	233.0	42.1		85.5	198.4		205.5	50.5		256.9	82.6	26.9
LOS	F	D		F	F		F	D		F	F	C
Approach Delay		106.1			192.2			84.2			129.1	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.46  
 Intersection Signal Delay: 135.5  
 Intersection LOS: F  
 Intersection Capacity Utilization 113.6%  
 ICU Level of Service H  
 Analysis Period (min) 15

Splits and Phases: 104: Trafalgar Rd & Cornwall Rd



Queues  
104: Trafalgar Rd & Cornwall Rd

Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	475	943	89	1528	163	586	653	611	538
v/c Ratio	1.38	0.80	0.66	1.35	1.23	0.69	1.46	1.09	0.92
Control Delay	233.0	42.1	85.5	198.4	205.5	50.5	256.9	82.6	26.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	233.0	42.1	85.5	198.4	205.5	50.5	256.9	82.6	26.9
Queue Length 50th (m)	-94.3	121.8	25.6	-297.8	-58.7	80.0	-137.7	-193.6	48.7
Queue Length 95th (m)	#128.6	134.7	#44.6	#301.4	#104.6	101.8	m#97.6	m84.0	m33.4
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	344	1184	134	1130	132	849	448	561	584
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.38	0.80	0.66	1.35	1.23	0.69	1.46	1.09	0.92

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Background Opening Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	423	570	201	75	794	531	145	466	51	509	538	473
Future Volume (vph)	423	570	201	75	794	531	145	466	51	509	538	473
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		0.97	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00		1.00	1.00	0.97
Fibp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.94		1.00	0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3016	2994		1570	2990		1540	3183		2987	1710	1361
Fit Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3016	2994		1570	2990		1540	3183		2987	1710	1361
Peak-hour factor, PHF	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Adj. Flow (vph)	475	679	264	89	957	571	163	518	68	653	611	538
RTOR Reduction (vph)	0	29	0	0	63	0	0	7	0	0	0	137
Lane Group Flow (vph)	475	914	0	89	1465	0	163	579	0	653	611	401
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	15.0	51.0		11.0	47.0		11.0	34.0		20.0	43.0	43.0
Effective Green, g (s)	16.0	54.0		12.0	50.0		12.0	37.0		21.0	46.0	46.0
Actuated g/C Ratio	0.11	0.39		0.09	0.36		0.09	0.26		0.15	0.33	0.33
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	344	1154		134	1067		132	841		448	561	447
v/s Ratio Prot	c0.16	c0.31		0.06	c0.49		0.11	0.18		c0.22	c0.36	
v/s Ratio Perm												0.29
v/c Ratio	1.38	0.79		0.66	1.37		1.23	0.69		1.46	1.09	0.90
Uniform Delay, d1	62.0	38.0		62.0	45.0		64.0	46.3		59.5	47.0	44.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.32	0.87	0.83
Incremental Delay, d2	188.6	5.6		23.1	173.8		154.7	4.6		207.1	43.4	3.0
Delay (s)	250.6	43.6		85.1	218.8		218.7	50.9		285.5	84.4	40.2
Level of Service	F	D		F	F		F	D		F	F	D
Approach Delay (s)		113.0			211.5			87.4			144.1	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	148.1	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	1.31	F	
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	
Intersection Capacity Utilization	113.6%	ICU Level of Service	
Analysis Period (min)	15	H	
c Critical Lane Group			

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Background Opening Year  
PM Peak Hour

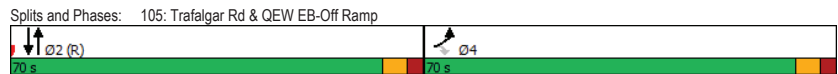
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	886	509	0	1807	1734	0
Future Volume (vph)	886	509	0	1807	1734	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor		0.99				
Frt		0.850				
Fit Protected	0.950					
Satd. Flow (prot)	3046	1423	0	4577	4577	0
Fit Permitted	0.950					
Satd. Flow (perm)	3046	1402	0	4577	4577	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		5				
Link Speed (k/h)		50		50	50	
Link Distance (m)	199.2			51.4	324.8	
Travel Time (s)	14.3			3.7	23.4	
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.87	0.93	0.25	0.97	0.94	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Adj. Flow (vph)	1018	547	0	1863	1845	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1018	547	0	1863	1845	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	70.0	70.0		70.0	70.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	63.0	63.0		63.0	63.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	61.8	61.8		70.2	70.2	
Actuated g/C Ratio	0.44	0.44		0.50	0.50	
v/c Ratio	0.76	0.88		0.81	0.80	
Control Delay	36.6	51.7		30.5	22.6	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	36.6	51.7		30.5	22.6	
LOS	D	D		C	C	
Approach Delay	41.9			30.5	22.6	
Approach LOS	D			C	C	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 133.6 (95%), Referenced to phase 2:NBSB and 6:, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 31.1 Intersection LOS: C  
 Intersection Capacity Utilization 79.1% ICU Level of Service D  
 Analysis Period (min) 15



Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1018	547	1863	1845
v/c Ratio	0.76	0.88	0.81	0.80
Control Delay	36.6	51.7	30.5	22.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	36.6	51.7	30.5	22.6
Queue Length 50th (m)	120.8	136.2	139.5	135.2
Queue Length 95th (m)	137.4	#194.1	m96.0	173.3
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1435	663	2294	2294
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.83	0.81	0.80

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

HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Background Opening Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔		↑↑↑	↑↑↑	
Traffic Volume (vph)	886	509	0	1807	1734	0
Future Volume (vph)	886	509	0	1807	1734	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3046	1402		4577	4577	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3046	1402		4577	4577	
Peak-hour factor, PHF	0.87	0.93	0.25	0.97	0.94	0.25
Adj. Flow (vph)	1018	547	0	1863	1845	0
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	1018	544	0	1863	1845	0
Confl. Peds. (#/hr)		2				
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	58.8	58.8		67.2	67.2	
Effective Green, g (s)	61.8	61.8		70.2	70.2	
Actuated g/C Ratio	0.44	0.44		0.50	0.50	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1344	618		2295	2295	
v/s Ratio Prot	0.33			0.41	0.40	
v/s Ratio Perm		0.39				
v/c Ratio	0.76	0.88		0.81	0.80	
Uniform Delay, d1	32.8	35.7		29.3	29.2	
Progression Factor	1.00	1.00		0.99	0.69	
Incremental Delay, d2	2.5	13.8		0.3	1.8	
Delay (s)	35.3	49.5		29.3	21.8	
Level of Service	D	D		C	C	
Approach Delay (s)	40.3			29.3	21.8	
Approach LOS	D			C	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			29.9			HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.84			
Actuated Cycle Length (s)			140.0		Sum of lost time (s) 8.0	
Intersection Capacity Utilization			79.1%		ICU Level of Service D	
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

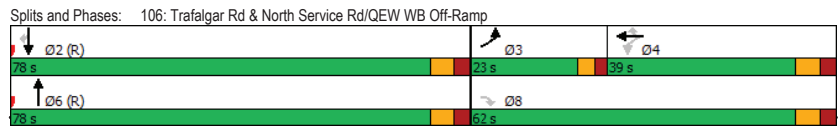
Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔		↑↑↑			↑↑↑	↔
Traffic Volume (vph)	21	0	201	531	92	197	0	2309	0	0	1661	12
Future Volume (vph)	21	0	201	531	92	197	0	2309	0	0	1661	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	1.00					0.99						0.95
Frt			0.850			0.850						0.850
Flt Protected	0.950			0.950	0.968							
Satd. Flow (prot)	1570	0	1437	1463	1547	1409	0	4577	0	0	3795	1437
Flt Permitted	0.950			0.950	0.968							
Satd. Flow (perm)	1568	0	1437	1463	1547	1389	0	4577	0	0	3795	1359
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			31			161						70
Link Speed (k/h)		50			50			50				50
Link Distance (m)		142.1			192.6			324.8				280.4
Travel Time (s)		10.2			13.9			23.4				20.2
Confl. Peds. (#/hr)	2					2	14		14	14		14
Peak Hour Factor	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Adj. Flow (vph)	34	0	212	632	130	243	0	2456	0	0	1730	19
Shared Lane Traffic (%)				40%								
Lane Group Flow (vph)	34	0	212	379	383	243	0	2456	0	0	1730	19
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1		1	1		1	1		1
Detector Template	Left		Right	Left	Thru	Right		Thru		Thru		Right
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0		10.0		10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6		0.6		2.0
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings Background Opening Year  
 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	Perm	
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Detector Phase	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		62.0	39.0	39.0	39.0		78.0			78.0	78.0
Total Split (%)	16.4%		44.3%	27.9%	27.9%	27.9%		55.7%			55.7%	55.7%
Maximum Green (s)	18.0		55.0	32.0	32.0	32.0		71.0			71.0	71.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)			7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (#/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	9.8		58.0	44.2	44.2	44.2		74.0			74.0	74.0
Actuated g/C Ratio	0.07		0.41	0.32	0.32	0.32		0.53			0.53	0.53
v/c Ratio	0.31		0.35	0.82	0.78	0.44		1.02			0.86	0.03
Control Delay	68.7		25.6	60.3	56.6	16.0		48.9			34.3	0.1
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	68.7		25.6	60.3	56.6	16.0		48.9			34.3	0.1
LOS	E		C	E	E	B		D			C	A
Approach Delay		31.5				48.2		48.9			33.9	
Approach LOS		C				D		D			C	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.02  
 Intersection Signal Delay: 43.2 Intersection LOS: D  
 Intersection Capacity Utilization 81.9% ICU Level of Service D  
 Analysis Period (min) 15



Queues Background Opening Year  
 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp PM Peak Hour

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	34	212	379	383	243	2456	1730	19
v/c Ratio	0.31	0.35	0.82	0.78	0.44	1.02	0.86	0.03
Control Delay	68.7	25.6	60.3	56.6	16.0	48.9	34.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	25.6	60.3	56.6	16.0	48.9	34.3	0.1
Queue Length 50th (m)	9.6	35.4	106.9	106.5	17.3	~206.2	155.3	0.0
Queue Length 95th (m)	14.2	56.9	#152.0	112.4	34.4	#301.6	180.0	0.0
Internal Link Dist (m)				168.6		300.8	256.4	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	613	461	488	548	2419	2005	751
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.35	0.82	0.78	0.44	1.02	0.86	0.03

**Intersection Summary**  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background Opening Year  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	0	201	531	92	197	0	2309	0	0	1661	12
Future Volume (vph)	21	0	201	531	92	197	0	2309	0	0	1661	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.91	0.91	0.91	0.91	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.95	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frft	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1570	1437	1463	1547	1389	4577	3795	1359	3795	1359	1359	1359
Flt Permitted	0.95	1.00	0.95	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1570	1437	1463	1547	1389	4577	3795	1359	3795	1359	1359	1359
Peak-hour factor, PHF	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Adj. Flow (vph)	34	0	212	632	130	243	0	2456	0	0	1730	19
RTOR Reduction (vph)	0	0	18	0	0	110	0	0	0	0	0	9
Lane Group Flow (vph)	34	0	194	379	383	133	0	2456	0	0	1730	10
Conf. Peds. (#/hr)	2					2	14		14	14		14
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA			NA	Perm
Protected Phases	3			4				6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	8.8		55.0	41.2	41.2	41.2		71.0			71.0	71.0
Effective Green, g (s)	9.8		58.0	44.2	44.2	44.2		74.0			74.0	74.0
Actuated g/C Ratio	0.07		0.41	0.32	0.32	0.32		0.53			0.53	0.53
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Lane Grp Cap (vph)	109		595	461	488	438		2419			2005	718
v/s Ratio Prot	0.02							c0.54			0.46	
v/s Ratio Perm			c0.13	c0.26	0.25	0.10						0.01
v/c Ratio	0.31		0.33	0.82	0.78	0.30		1.02			0.86	0.01
Uniform Delay, d1	61.9		27.8	44.3	43.6	36.2		33.0			28.6	15.7
Progression Factor	1.00		1.00	1.00	1.00	1.00		0.93			1.00	1.00
Incremental Delay, d2	1.6		0.3	11.3	8.1	0.4		18.2			5.2	0.0
Delay (s)	63.5		28.1	55.5	51.7	36.6		48.9			33.8	15.7
Level of Service	E		C	E	D	D		D			C	B
Approach Delay (s)		33.0			49.5			48.9			33.6	
Approach LOS		C			D			D			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			43.4									D
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			140.0		Sum of lost time (s)			12.0				
Intersection Capacity Utilization			81.9%		ICU Level of Service			D				
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
 107: Dorval Drive & QEW WB Off-Ramp

Background Opening Year  
 PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	683	601	959	0	0	1019
Future Volume (vph)	683	601	959	0	0	1019
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frft	0.966	0.850				
Flt Protected	0.963					
Satd. Flow (prot)	3344	1455	3574	0	0	3539
Flt Permitted	0.963					
Satd. Flow (perm)	3344	1455	3574	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	43	58				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Adj. Flow (vph)	742	653	1042	0	0	1108
Shared Lane Traffic (%)		33%				
Lane Group Flow (vph)	957	438	1042	0	0	1108
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex			CI+Ex
<b>Detector 1 Channel</b>						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
<b>Detector 2 Channel</b>						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8	2				6



Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

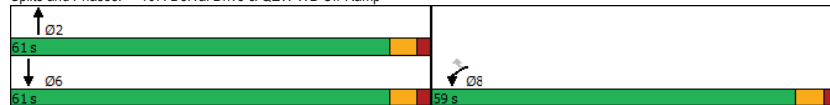
Background Opening Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	59.0	59.0	61.0			61.0
Total Split (%)	49.2%	49.2%	50.8%			50.8%
Maximum Green (s)	53.0	53.0	55.0			55.0
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	43.0	43.0	57.3			57.3
Actuated g/C Ratio	0.40	0.40	0.53			0.53
v/c Ratio	0.71	0.72	0.55			0.59
Control Delay	28.9	30.5	19.6			20.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	28.9	30.5	19.6			20.5
LOS	C	C	B			C
Approach Delay	29.4		19.6			20.5
Approach LOS	C		B			C

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	108.4
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	23.7
Intersection Capacity Utilization:	60.6%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	B

Splits and Phases: 107: Dorval Drive & QEW WB Off-Ramp



Queues  
107: Dorval Drive & QEW WB Off-Ramp

Background Opening Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	957	438	1042	1108
v/c Ratio	0.71	0.72	0.55	0.59
Control Delay	28.9	30.5	19.6	20.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.9	30.5	19.6	20.5
Queue Length 50th (m)	86.0	77.1	76.7	84.1
Queue Length 95th (m)	107.9	117.8	120.4	131.6
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1727	770	1889	1871
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.57	0.55	0.59

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	108.4
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	23.7
Intersection Capacity Utilization:	60.6%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	B

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Background Opening Year  
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕			↕↕
Traffic Volume (vph)	683	601	959	0	0	1019
Future Volume (vph)	683	601	959	0	0	1019
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr	0.97	0.85	1.00			1.00
Fit Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3344	1455	3574			3539
Fit Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3344	1455	3574			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	742	653	1042	0	0	1108
RTOR Reduction (vph)	26	35	0	0	0	0
Lane Group Flow (vph)	931	403	1042	0	0	1108
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	41.0	41.0	55.3			55.3
Effective Green, g (s)	43.0	43.0	57.3			57.3
Actuated g/C Ratio	0.40	0.40	0.53			0.53
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1327	577	1890			1872
v/s Ratio Prot	c0.28		0.29			c0.31
v/s Ratio Perm		0.28				
v/c Ratio	0.70	0.70	0.55			0.59
Uniform Delay, d1	27.3	27.2	17.0			17.5
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	1.9	4.3	1.2			1.4
Delay (s)	29.2	31.5	18.1			18.9
Level of Service	C	C	B			B
Approach Delay (s)	29.9		18.1			18.9
Approach LOS	C		B			B
<b>Intersection Summary</b>						
HCM 2000 Control Delay			23.0			HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.64			
Actuated Cycle Length (s)			108.3			Sum of lost time (s) 8.0
Intersection Capacity Utilization			60.6%			ICU Level of Service B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Background Opening Year  
PM Peak Hour

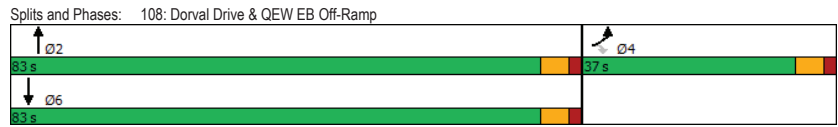
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕	↕↕	
Traffic Volume (vph)	265	316	0	1152	1090	0
Future Volume (vph)	265	316	0	1152	1090	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr	0.90	0.850				
Fit Protected	0.968					
Satd. Flow (prot)	3302	1441	0	3539	3505	0
Fit Permitted	0.968					
Satd. Flow (perm)	3302	1441	0	3539	3505	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	75	100				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Adj. Flow (vph)	288	343	0	1252	1185	0
Shared Lane Traffic (%)		42%				
Lane Group Flow (vph)	432	199	0	1252	1185	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
<b>Detector 1 Channel</b>						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
<b>Detector 2 Channel</b>						
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
<b>Detector 2 Channel</b>						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	37.0	37.0		83.0	83.0	
Total Split (%)	30.8%	30.8%		69.2%	69.2%	
Maximum Green (s)	31.0	31.0		77.0	77.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	20.6	20.6		79.1	79.1	
Actuated g/C Ratio	0.19	0.19		0.73	0.73	
v/c Ratio	0.63	0.56		0.48	0.46	
Control Delay	36.8	25.5		7.1	6.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	36.8	25.5		7.1	6.9	
LOS	D	C		A	A	
Approach Delay	33.3			7.1	6.9	
Approach LOS	C			A	A	

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	107.7
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.63
Intersection Signal Delay:	12.4
Intersection Capacity Utilization:	60.6%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	B



Queues  
108: Dorval Drive & QEW EB Off-Ramp

Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	432	199	1252	1185
v/c Ratio	0.63	0.56	0.48	0.46
Control Delay	36.8	25.5	7.1	6.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	36.8	25.5	7.1	6.9
Queue Length 50th (m)	37.5	21.0	51.7	47.8
Queue Length 95th (m)	53.8	46.9	81.5	75.5
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1065	511	2599	2574
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.39	0.48	0.46

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Background Opening Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↗		↕↕	↕↕	
Traffic Volume (vph)	265	316	0	1152	1090	0
Future Volume (vph)	265	316	0	1152	1090	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Fr <sub>t</sub>	0.95	0.85		1.00	1.00	
Fit Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3301	1441		3539	3505	
Fit Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3301	1441		3539	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	288	343	0	1252	1185	0
RTOR Reduction (vph)	61	81	0	0	0	0
Lane Group Flow (vph)	371	118	0	1252	1185	0
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	18.6	18.6		77.1	77.1	
Effective Green, g (s)	20.6	20.6		79.1	79.1	
Actuated g/C Ratio	0.19	0.19		0.73	0.73	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	631	275		2599	2574	
v/s Ratio Prot	c0.11			c0.35	0.34	
v/s Ratio Perm		0.08				
v/c Ratio	0.59	0.43		0.48	0.46	
Uniform Delay, d1	39.7	38.4		5.9	5.7	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	1.5		0.6	0.6	
Delay (s)	41.4	39.8		6.5	6.3	
Level of Service	D	D		A	A	
Approach Delay (s)	40.9			6.5	6.3	
Approach LOS	D			A	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			13.5	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			107.7	Sum of lost time (s)		8.0
Intersection Capacity Utilization			60.6%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background Opening Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕	↕
Traffic Volume (vph)	772	0	0	1267	213	480
Future Volume (vph)	772	0	0	1267	213	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Fr <sub>t</sub>						0.850
Fit Protected					0.950	
Satd. Flow (prot)	3574	0	0	3574	1805	1599
Fit Permitted					0.950	
Satd. Flow (perm)	3574	0	0	3574	1805	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						66
Link Speed (k/h)	60			60	40	
Link Distance (m)	130.3			194.2	262.1	
Travel Time (s)	7.8			11.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Adj. Flow (vph)	839	0	0	1377	232	522
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	839	0	0	1377	232	522
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
<b>Lead/Lag</b>						
<b>Lead-Lag Optimize?</b>						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background Opening Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
v/c Ratio	0.59			0.96	0.32	0.77
Control Delay	12.7			32.8	10.9	20.6
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	12.7			32.8	10.9	20.6
LOS	B			C	B	C
Approach Delay	12.7			32.8	17.6	
Approach LOS	B			C	B	

**Intersection Summary**

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green

Natural Cycle: 55

Control Type: Pretimed

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 23.2      Intersection LOS: C

Intersection Capacity Utilization 58.6%      ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street

	<p>Ø2 (R)</p> <p>22.5 s</p>	<p>Ø4</p> <p>22.5 s</p>
		<p>Ø8</p> <p>22.5 s</p>

Queues  
109: QEW WB Off-Ramp & Kerr Street

Background Opening Year  
PM Peak Hour

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	839	1377	232	522
v/c Ratio	0.59	0.96	0.32	0.77
Control Delay	12.7	32.8	10.9	20.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.7	32.8	10.9	20.6
Queue Length 50th (m)	26.9	55.1	12.4	30.3
Queue Length 95th (m)	41.1	#97.5	24.8	#75.8
Internal Link Dist (m)	106.3	170.2	238.1	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1429	1429	722	679
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.96	0.32	0.77

**Intersection Summary**

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

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Background Opening Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	↑
Traffic Volume (vph)	772	0	0	1267	213	480
Future Volume (vph)	772	0	0	1267	213	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr't	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3574			3574	1805	1599
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3574			3574	1805	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	839	0	0	1377	232	522
RTOR Reduction (vph)	0	0	0	0	0	40
Lane Group Flow (vph)	839	0	0	1377	232	482
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1429			1429	722	639
v/s Ratio Prot	0.23			c0.39	0.13	
v/s Ratio Perm						c0.30
v/c Ratio	0.59			0.96	0.32	0.75
Uniform Delay, d1	10.6			13.2	9.3	11.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.8			16.6	1.2	8.1
Delay (s)	12.4			29.8	10.5	19.7
Level of Service	B			C	B	B
Approach Delay (s)	12.4			29.8	16.9	
Approach LOS	B			C	B	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑		↑	↑↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	300	523	17	176	626	26	13	45	96	13	125	409
Future Volume (vph)	300	523	17	176	626	26	13	45	96	13	125	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0		0.0	155.0		70.0	15.0		0.0	0.0		30.0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't		0.995				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950		0.950			0.950
Satd. Flow (prot)	3502	3395	0	1752	3505	1615	1805	1900	1615	1805	1900	1599
Flt Permitted	0.319			0.362			0.598		0.724			
Satd. Flow (perm)	1176	3395	0	668	3505	1615	1136	1900	1615	1376	1900	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				94			109			330
Link Speed (k/h)		80			80			60				40
Link Distance (m)		324.5			247.2			158.7				215.5
Travel Time (s)		14.6			11.1			9.5				19.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Adj. Flow (vph)	341	594	19	200	711	30	15	51	109	15	142	465
Shared Lane Traffic (%)												
Lane Group Flow (vph)	341	613	0	200	711	30	15	51	109	15	142	465
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

Lanes, Volumes, Timings Background Opening Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	29.4		14.0	38.4	38.4	28.8	28.8	28.8	28.8	28.8	28.8
Total Split (s)	18.0	47.0		23.0	52.0	52.0	55.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	14.4%	37.6%		18.4%	41.6%	41.6%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%
Maximum Green (s)	12.0	38.6		17.0	43.6	43.6	47.2	47.2	47.2	47.2	47.2	47.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	59.9	48.1		60.7	48.5	48.5	21.3	21.3	21.3	21.3	21.3	21.3
Actuated g/C Ratio	0.64	0.51		0.65	0.52	0.52	0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	0.33	0.35		0.35	0.39	0.03	0.06	0.12	0.24	0.05	0.33	0.75
Control Delay	7.1	15.9		8.3	16.0	0.1	27.5	28.3	6.8	27.2	31.7	18.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	15.9		8.3	16.0	0.1	27.5	28.3	6.8	27.2	31.7	18.0
LOS	A	B		A	B	A	C	C	A	C	C	B
Approach Delay		12.8			13.8			14.9			21.3	
Approach LOS		B			B			B			C	

**Intersection Summary**

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 93.7

Natural Cycle: 85

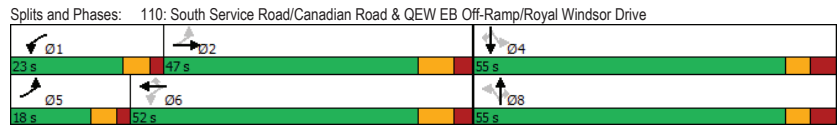
Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 15.3      Intersection LOS: B

Intersection Capacity Utilization 67.0%      ICU Level of Service C

Analysis Period (min) 15



Queues Background Opening Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	341	613	200	711	30	15	51	109	15	142	465
v/c Ratio	0.33	0.35	0.35	0.39	0.03	0.06	0.12	0.24	0.05	0.33	0.75
Control Delay	7.1	15.9	8.3	16.0	0.1	27.5	28.3	6.8	27.2	31.7	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	15.9	8.3	16.0	0.1	27.5	28.3	6.8	27.2	31.7	18.0
Queue Length 50th (m)	9.6	33.0	11.2	39.7	0.0	2.2	7.7	0.0	2.2	22.4	21.7
Queue Length 95th (m)	21.9	63.8	28.9	71.5	0.0	7.3	16.8	11.7	7.2	38.4	55.0
Internal Link Dist (m)		300.5		223.2		134.7				191.5	
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0
Base Capacity (vph)	1131	1742	680	1812	880	624	1043	936	755	1043	1027
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.35	0.29	0.39	0.03	0.02	0.05	0.12	0.02	0.14	0.45

**Intersection Summary**

HCM Signalized Intersection Capacity Analysis Background Opening Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕	↕	↔	↕	↕	↔	↕	↕
Traffic Volume (vph)	300	523	17	176	626	26	13	45	96	13	125	409
Future Volume (vph)	300	523	17	176	626	26	13	45	96	13	125	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	3396		1752	3505	1615	1805	1900	1615	1805	1900	1599
Flt Permitted	0.32	1.00		0.36	1.00	1.00	0.60	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	1177	3396		668	3505	1615	1136	1900	1615	1375	1900	1599
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)	341	594	19	200	711	30	15	51	109	15	142	465
RTOR Reduction (vph)	0	1	0	0	14	0	0	84	0	0	255	
Lane Group Flow (vph)	341	612	0	200	711	16	15	51	25	15	142	210
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	53.4	43.6		54.2	44.0	44.0	17.4	17.4	17.4	17.4	17.4	17.4
Effective Green, g (s)	57.4	48.0		58.2	48.4	48.4	21.2	21.2	21.2	21.2	21.2	21.2
Actuated g/C Ratio	0.61	0.51		0.62	0.52	0.52	0.23	0.23	0.23	0.23	0.23	0.23
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	1017	1745		557	1816	836	257	431	366	312	431	362
v/s Ratio Prot	0.04	0.18		c0.05	c0.20			0.03			0.07	
v/s Ratio Perm	0.16			0.18		0.01	0.01		0.02	0.01		c0.13
v/c Ratio	0.34	0.35		0.36	0.39	0.02	0.06	0.12	0.07	0.05	0.33	0.58
Uniform Delay, d1	8.1	13.5		7.8	13.6	10.9	28.3	28.7	28.3	28.2	30.2	32.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.6		0.5	0.6	0.0	0.1	0.1	0.1	0.1	0.5	2.4
Delay (s)	8.3	14.0		8.2	14.2	11.0	28.4	28.8	28.4	28.3	30.7	34.6
Level of Service	A	B		A	B	B	C	C	C	C	C	C
Approach Delay (s)		12.0			12.9			28.5			33.5	
Approach LOS		B			B			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		18.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		93.4			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		67.0%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings Background Opening Year  
 201: Cross Ave & Lyons Lane PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↕
Traffic Volume (vph)	39	245	654	94	36	55
Future Volume (vph)	39	245	654	94	36	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.974		0.916	
Fr						
Flt Protected	0.950				0.981	
Satd. Flow (prot)	1388	2954	3088	0	1499	0
Flt Permitted	0.950				0.981	
Satd. Flow (perm)	1388	2954	3088	0	1499	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	1			1	9	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Heavy Vehicles (%)	17%	10%	3%	0%	0%	4%
Adj. Flow (vph)	78	266	779	162	82	134
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	78	266	941	0	216	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	3.6	3.6			3.6	
Link Offset(m)	0.0	0.0			0.0	
Crosswalk Width(m)	4.8	4.8			4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	42.7%			ICU Level of Service A		
Analysis Period (min)	15					



HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Background Opening Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗		↘	
Traffic Volume (veh/h)	39	245	654	94	36	55
Future Volume (Veh/h)	39	245	654	94	36	55
Sign Control	Free		Free	Stop		
Grade	0%		0%	0%		
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Hourly flow rate (vph)	78	266	779	162	82	134
Pedestrians			9	1		
Lane Width (m)			3.6	3.6		
Walking Speed (m/s)			1.2	1.2		
Percent Blockage			1	0		
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)	40					
pX, platoon unblocked	0.93			0.93	0.93	
vC, conflicting volume	942			1159	472	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	784			1017	277	
tC, single (s)	4.4			6.8	7.0	
tC, 2 stage (s)						
tF (s)	2.4			3.5	3.3	
p0 queue free %	89			58	80	
cM capacity (veh/h)	686			194	663	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>EB 3</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>
Volume Total	78	133	133	519	422	216
Volume Left	78	0	0	0	0	82
Volume Right	0	0	0	0	162	134
cSH	686	1700	1700	1700	1700	345
Volume to Capacity	0.11	0.08	0.08	0.31	0.25	0.63
Queue Length 95th (m)	3.1	0.0	0.0	0.0	0.0	32.1
Control Delay (s)	10.9	0.0	0.0	0.0	0.0	31.4
Lane LOS	B					D
Approach Delay (s)	2.5			0.0	31.4	
Approach LOS					D	
<b>Intersection Summary</b>						
Average Delay			5.1			
Intersection Capacity Utilization			42.7%	ICU Level of Service	A	
Analysis Period (min)	15					

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↗	↗		↘	
Traffic Volume (vph)	3	6	1	32	47	6
Future Volume (vph)	3	6	1	32	47	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.875			0.982
Fit Protected			0.978			0.958
Satd. Flow (prot)	0	1672	1242	0	1609	0
Fit Permitted			0.978			0.958
Satd. Flow (perm)	0	1672	1242	0	1609	0
Link Speed (k/h)			50			50
Link Distance (m)			60.5			37.6
Travel Time (s)			4.4			2.7
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Heavy Vehicles (%)	0%	0%	0%	22%	0%	0%
Adj. Flow (vph)	8	10	4	52	94	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	18	56	0	108	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)			0.0			3.6
Link Offset(m)			0.0			0.0
Crosswalk Width(m)			4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24		14		24	
Sign Control	Free		Free	Stop		
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 15.4%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Background Opening Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	3	6	1	32	47	6
Future Volume (Veh/h)	3	6	1	32	47	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Hourly flow rate (vph)	8	10	4	52	94	14
Pedestrians					7	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	63				63	37
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	63				63	37
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				90	99
cM capacity (veh/h)	1544				938	1035
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	18	56	108			
Volume Left	8	0	94			
Volume Right	0	52	14			
cSH	1544	1700	949			
Volume to Capacity	0.01	0.03	0.11			
Queue Length 95th (m)	0.1	0.0	3.1			
Control Delay (s)	3.3	0.0	9.3			
Lane LOS	A		A			
Approach Delay (s)	3.3	0.0	9.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			5.8			
Intersection Capacity Utilization		15.4%		ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	11	36	464	164	29	43
Future Volume (vph)	11	36	464	164	29	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.958		0.915	
Fit Protected		0.988			0.982	
Satd. Flow (prot)	0	1539	1533	0	1536	0
Fit Permitted		0.988			0.982	
Satd. Flow (perm)	0	1539	1533	0	1536	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)					5	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Heavy Vehicles (%)	0%	13%	10%	0%	0%	0%
Adj. Flow (vph)	24	72	533	241	39	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	96	774	0	105	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 49.6%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Background Opening Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	11	36	464	164	29	43
Future Volume (Veh/h)	11	36	464	164	29	43
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Hourly flow rate (vph)	24	72	533	241	39	66
Pedestrians			5			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.2			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	774				778	654
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	774				778	654
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				89	86
cM capacity (veh/h)	851				356	471
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	96	774	105			
Volume Left	24	0	39			
Volume Right	0	241	66			
cSH	851	1700	420			
Volume to Capacity	0.03	0.46	0.25			
Queue Length 95th (m)	0.7	0.0	7.8			
Control Delay (s)	2.5	0.0	16.4			
Lane LOS	A		C			
Approach Delay (s)	2.5	0.0	16.4			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			2.0			
Intersection Capacity Utilization		49.6%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕↕	↕↕↕	
Traffic Volume (vph)	0	88	0	2727	1649	643
Future Volume (vph)	0	88	0	2727	1649	643
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Fr <sub>t</sub>		0.865			0.954	
Fit Protected						
Satd. Flow (prot)	0	1354	0	4577	4353	0
Fit Permitted						
Satd. Flow (perm)	0	1354	0	4577	4353	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	145.7			270.2	51.4	
Travel Time (s)	10.5			19.5	3.7	
Confl. Peds. (#/hr)						24
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87
Heavy Vehicles (%)	0%	8%	0%	2%	2%	3%
Adj. Flow (vph)	0	140	0	3030	1683	739
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	140	0	3030	2422	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	64.7%		ICU Level of Service C			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Background Opening Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations		↗		↖↖	↗↗		
Traffic Volume (veh/h)	0	88	0	2727	1649	643	
Future Volume (Veh/h)	0	88	0	2727	1649	643	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87	
Hourly flow rate (vph)	0	140	0	3030	1683	739	
Pedestrians	24						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	2						
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.83	0.67	0.67				
vC, conflicting volume	3086	954	2446				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	131	0	1413				
tC, single (s)	6.8	7.1	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	80	100				
cM capacity (veh/h)	695	695	319				
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	140	1010	1010	1010	673	673	1076
Volume Left	0	0	0	0	0	0	0
Volume Right	140	0	0	0	0	0	739
sSH	695	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.20	0.59	0.59	0.59	0.40	0.40	0.63
Queue Length 95th (m)	6.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	11.5	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	11.5	0.0			0.0		
Approach LOS	B						
<b>Intersection Summary</b>							
Average Delay			0.3				
Intersection Capacity Utilization			64.7%		ICU Level of Service		C
Analysis Period (min)			15				

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

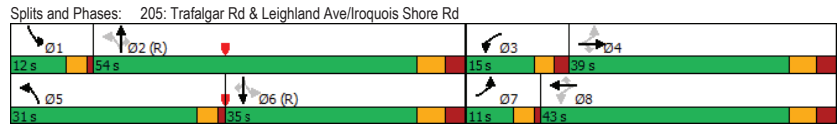
Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	131	107	229	429	157	247	409	1437	697	130	1015	74
Future Volume (vph)	131	107	229	429	157	247	409	1437	697	130	1015	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0		25.0	145.0		0.0	95.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	0.97					0.95			0.97	1.00		
Fr			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1710	1425	3120	1710	1425	1608	4577	1425	1608	4532	1425
Fit Permitted	0.580			0.454			0.119			0.163		
Satd. Flow (perm)	965	1710	1425	1491	1710	1360	201	4577	1382	275	4532	1425
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			239			218			657			145
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		347.0			285.9			280.4			353.6	
Travel Time (s)		25.0			20.6			20.2			25.5	
Confl. Peds. (#/hr)	34					34			14		14	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Adj. Flow (vph)	136	111	239	447	164	257	426	1497	726	135	1057	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	136	111	239	447	164	257	426	1497	726	135	1057	77
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)					7.2				3.6			3.6
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighton Ave/Iroquois Shore Rd  
Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	11.0	25.0	25.0	11.0	43.0	43.0	11.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	11.0	39.0	39.0	15.0	43.0	43.0	31.0	54.0	54.0	12.0	35.0	35.0
Total Split (%)	9.2%	32.5%	32.5%	12.5%	35.8%	35.8%	25.8%	45.0%	45.0%	10.0%	29.2%	29.2%
Maximum Green (s)	7.0	32.0	32.0	10.0	36.0	36.0	27.0	47.0	47.0	8.0	28.0	28.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	25.7	18.7	18.7	31.7	22.7	22.7	78.3	62.4	62.4	51.6	39.8	39.8
Actuated g/C Ratio	0.21	0.16	0.16	0.26	0.19	0.19	0.65	0.52	0.52	0.43	0.33	0.33
v/c Ratio	0.56	0.42	0.57	0.84	0.51	0.59	0.80	0.63	0.70	0.54	0.70	0.14
Control Delay	44.0	49.4	10.7	53.4	48.4	14.5	38.0	23.3	7.3	26.8	39.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	49.4	10.7	53.4	48.4	14.5	38.0	23.3	7.3	26.8	39.3	0.5
LOS	D	D	B	D	D	B	D	C	A	C	D	D
Approach Delay		28.8			40.9			21.3			35.7	
Approach LOS		C			D			C			D	

Intersection Summary	
Area Type:	CBD
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	105.6 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	110
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.84
Intersection Signal Delay:	28.7
Intersection LOS:	C
Intersection Capacity Utilization:	91.7%
ICU Level of Service:	F
Analysis Period (min):	15



Queues  
205: Trafalgar Rd & Leighton Ave/Iroquois Shore Rd  
Background Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	136	111	239	447	164	257	426	1497	726	135	1057	77
v/c Ratio	0.56	0.42	0.57	0.84	0.51	0.59	0.80	0.63	0.70	0.54	0.70	0.14
Control Delay	44.0	49.4	10.7	53.4	48.4	14.5	38.0	23.3	7.3	26.8	39.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	49.4	10.7	53.4	48.4	14.5	38.0	23.3	7.3	26.8	39.3	0.5
Queue Length 50th (m)	26.7	25.3	0.0	49.0	37.1	8.2	75.0	92.0	8.2	11.5	83.2	0.0
Queue Length 95th (m)	40.9	40.8	21.9	59.9	55.3	32.7	#121.9	133.5	58.0	31.2	#118.9	0.0
Internal Link Dist (m)		323.0			261.9			256.4			329.6	
Turn Bay Length (m)	60.0			165.0		25.0	145.0			95.0		90.0
Base Capacity (vph)	245	498	584	529	555	589	535	2381	1034	250	1502	569
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.22	0.41	0.84	0.30	0.44	0.80	0.63	0.70	0.54	0.70	0.14

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

HCM Signalized Intersection Capacity Analysis  
 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd  
 Background Opening Year  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	131	107	229	429	157	247	409	1437	697	130	1015	74
Future Volume (vph)	131	107	229	429	157	247	409	1437	697	130	1015	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1601	1710	1425	3120	1710	1360	1608	4577	1382	1608	4532	1425
Fit Permitted	0.58	1.00	1.00	0.45	1.00	1.00	0.12	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	978	1710	1425	1491	1710	1360	202	4577	1382	275	4532	1425
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	136	111	239	447	164	257	426	1497	726	135	1057	77
RTOR Reduction (vph)	0	0	202	0	0	177	0	0	315	0	0	51
Lane Group Flow (vph)	136	111	37	447	164	80	426	1497	411	135	1057	26
Confl. Peds. (#/hr)	34				34				14		14	
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	22.7	15.7	15.7	29.7	19.7	19.7	75.3	59.4	59.4	48.7	36.8	36.8
Effective Green, g (s)	22.7	18.7	18.7	29.7	22.7	22.7	75.3	62.4	62.4	48.7	39.8	39.8
Actuated g/C Ratio	0.19	0.16	0.16	0.25	0.19	0.19	0.63	0.52	0.52	0.41	0.33	0.33
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	221	266	222	504	323	257	530	2380	718	243	1503	472
v/s Ratio Prot	0.04	0.06		c0.07	0.10		c0.23	0.33		0.05	0.23	
v/s Ratio Perm	0.08		0.03	c0.15		0.06	c0.27		0.30	0.17		0.02
v/c Ratio	0.62	0.42	0.17	0.89	0.51	0.31	0.80	0.63	0.57	0.56	0.70	0.05
Uniform Delay, d1	43.6	45.7	43.9	42.3	43.6	41.9	28.3	20.5	19.7	23.1	35.0	27.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	2.2	0.8	17.0	2.6	1.5	8.6	1.3	3.3	2.7	2.8	0.2
Delay (s)	48.6	47.9	44.7	59.3	46.3	43.4	36.9	21.8	23.0	25.9	37.7	27.5
Level of Service	D	D	D	E	D	D	D	C	C	C	D	C
Approach Delay (s)		46.5			52.1			24.6			35.9	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	
Intersection Capacity Utilization	91.7%	ICU Level of Service	
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
 303: North Access & South Service Rd E  
 Background Opening Year  
 PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	52	0	0	93	0	0
Future Volume (vph)	52	0	0	93	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	518.9			306.8	108.8	
Travel Time (s)	37.4			22.1	7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	0	0	101	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	57	0	0	101	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	8.2%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Background Opening Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	52	0	0	93	0	0
Future Volume (Veh/h)	52	0	0	93	0	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)	57	0	0	101	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			57		158	57
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			57		158	57
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1547		833	1009
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	57	101	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1547	1700			
Volume to Capacity	0.03	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS				A		
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS				A		
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			8.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Queuing and Blocking Report

Background Opening Year  
PM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	156.3	111.7	78.4	70.4	32.3	324.4	319.3	57.4	128.4	136.4	146.1
Average Queue (m)	122.0	146.7	32.4	69.8	26.7	31.3	273.9	191.5	50.6	102.7	110.6	115.1
95th Queue (m)	126.6	152.0	71.6	84.0	70.5	35.8	394.4	412.5	69.6	134.4	142.0	149.1
Link Distance (m)	123.0		123.0	51.4	51.4	313.2		313.2	128.0		128.0	128.0
Upstream Blk Time (%)	4	49	0	42	8	49		14	1		3	6
Queuing Penalty (veh)	0	324	2	277	50	0		0	6		13	28
Storage Bay Dist (m)	130.0				25.0				50.0			
Storage Blk Time (%)	4	49			56		47	26		43		
Queuing Penalty (veh)	23	282			111		79	135		95		

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	B34	SB	SB	SB	SB
Directions Served	T	T	T	L	T	T	TR
Maximum Queue (m)	28.3	29.3	8.8	32.3	249.9	253.9	250.7
Average Queue (m)	0.9	1.2	0.7	25.3	193.4	223.9	232.2
95th Queue (m)	14.4	15.2	5.5	40.3	286.6	281.1	268.7
Link Distance (m)	101.5	101.5	101.5	239.0		239.0	239.0
Upstream Blk Time (%)				3		12	28
Queuing Penalty (veh)				15		67	161
Storage Bay Dist (m)				25.0			
Storage Blk Time (%)				26		49	
Queuing Penalty (veh)				111		74	

Queuing and Blocking Report

Background Opening Year  
PM Peak Hour

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	B7	B7	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	26.7	277.8	268.3	27.1	59.8	57.5	5.4	2.4	41.4	56.0	22.4	193.8
Average Queue (m)	5.5	221.6	213.6	11.6	16.4	20.7	0.2	0.1	10.1	18.9	21.1	153.5
95th Queue (m)	20.3	259.4	251.8	28.1	42.4	42.6	2.8	1.7	30.2	41.3	25.6	235.3
Link Distance (m)		352.9	352.9		51.4	51.4	123.0	123.0	66.7	66.7		159.0
Upstream Blk Time (%)					1	1				0		53
Queuing Penalty (veh)					5	5				0		270
Storage Bay Dist (m)	20.0			20.0							15.0	
Storage Blk Time (%)	0	73		9	4						78	19
Queuing Penalty (veh)	0	24		20	1						157	52

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	B14
Directions Served	T
Maximum Queue (m)	159.0
Average Queue (m)	78.4
95th Queue (m)	196.0
Link Distance (m)	160.7
Upstream Blk Time (%)	14
Queuing Penalty (veh)	69
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	17.9	22.4	22.0	19.5	34.0	36.9	27.4	59.4	16.6	22.4
Average Queue (m)	7.3	15.9	11.2	2.4	10.7	15.7	24.9	36.8	3.4	8.7
95th Queue (m)	16.6	26.5	24.3	11.3	26.3	31.7	30.3	69.5	11.5	17.8
Link Distance (m)	21.8	21.8	21.8		352.9	352.9		54.8	56.7	56.7
Upstream Blk Time (%)	0	7	3					5		
Queuing Penalty (veh)	0	6	3					0		
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)					1		32	1		
Queuing Penalty (veh)					0		56	4		

Queuing and Blocking Report

Background Opening Year  
PM Peak Hour

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.7	87.4	281.0	272.9	87.4	132.3	135.7	32.5	296.8	294.5	67.5	81.7
Average Queue (m)	82.2	86.7	252.6	236.1	37.5	121.0	125.6	32.2	264.8	247.8	42.1	47.1
95th Queue (m)	89.6	92.7	323.3	318.5	89.1	139.7	139.8	32.9	343.8	350.0	67.4	77.3
Link Distance (m)			266.8	266.8		122.1	122.1		289.9	289.9		101.5
Upstream Blk Time (%)			58	4		24	50		50	14		1
Queuing Penalty (veh)			0	0		0	0		0	0		3
Storage Bay Dist (m)	80.0	80.0			80.0			25.0			80.0	
Storage Blk Time (%)	19	75	1		0	44		93	11		0	1
Queuing Penalty (veh)	55	214	5		0	33		217	16		1	3

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB	B34
Directions Served	T	R	T
Maximum Queue (m)	84.5	45.6	1.2
Average Queue (m)	44.9	20.4	0.1
95th Queue (m)	76.7	39.5	1.1
Link Distance (m)	101.5	101.5	128.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	148.5	164.5	185.6	35.7	46.5	44.8	321.0	319.4	313.5
Average Queue (m)	80.5	100.9	136.0	29.0	32.1	31.4	294.1	305.0	303.4
95th Queue (m)	139.2	194.4	212.4	32.2	40.7	39.0	362.4	328.6	325.6
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	0	10	25	39	43	46	26	43	54
Queuing Penalty (veh)	0	0	0	357	391	414	208	340	428
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									



Queuing and Blocking Report

Background Opening Year  
PM Peak Hour

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	57.3	122.4	180.1	182.7	179.1	148.4	165.8	183.6	264.2	265.8	264.4	277.3
Average Queue (m)	15.7	74.4	156.3	164.6	117.4	97.4	107.1	123.8	246.5	247.6	246.2	223.7
95th Queue (m)	52.3	139.1	221.0	211.7	250.6	142.7	157.8	179.1	299.3	303.5	302.3	383.3
Link Distance (m)		117.8	171.3	171.3	171.3	299.7	299.7	299.7	251.7	251.7	251.7	251.7
Upstream Blk Time (%)		21	42	79	35				38	44	48	65
Queuing Penalty (veh)		0	0	0	0				157	182	203	272
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)	0	50										
Queuing Penalty (veh)	0	11										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	97.0	101.3	97.6	99.1	99.0	106.4	95.6
Average Queue (m)	65.5	70.7	56.5	58.9	60.2	69.4	58.1
95th Queue (m)	91.5	94.9	88.5	91.9	91.7	95.9	85.8
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	67.3	83.5	70.2	83.6	76.5	72.0	70.8
Average Queue (m)	35.6	54.5	36.7	53.0	37.9	35.5	41.0
95th Queue (m)	65.2	75.2	63.8	77.9	69.9	61.9	66.4
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Background Opening Year  
PM Peak Hour

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	58.7	50.6	108.3	100.3	40.8	66.8
Average Queue (m)	34.5	19.3	65.8	54.7	19.7	30.0
95th Queue (m)	51.1	39.2	100.3	89.5	34.2	50.7
Link Distance (m)	122.4	122.4	184.7	184.7	249.3	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	29.9	48.2	47.7	43.0	34.0	69.5	59.5	9.8	14.6	24.0	12.9	42.9
Average Queue (m)	6.8	24.5	24.8	20.2	15.5	32.7	22.8	2.9	3.4	8.0	2.4	20.1
95th Queue (m)	20.5	41.3	43.0	37.8	28.5	55.9	44.8	9.4	10.8	18.4	8.0	34.8
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0			70.0	15.0			
Storage Blk Time (%)									1	6		2
Queuing Penalty (veh)									0	1		9

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	SB
Directions Served	R
Maximum Queue (m)	22.1
Average Queue (m)	5.7
95th Queue (m)	18.7
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

Background Opening Year  
PM Peak Hour

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	19.4	11.8	30.8	10.3	13.5	21.1
Average Queue (m)	5.1	1.1	4.3	0.6	0.9	9.4
95th Queue (m)	14.5	7.7	18.2	5.0	6.0	17.9
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)				0	0	0
Queuing Penalty (veh)				0	0	0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	4	0				
Queuing Penalty (veh)	4	0				

Intersection: 202: Lyons Lane & South Service Rd E

Movement	SB
Directions Served	LR
Maximum Queue (m)	19.4
Average Queue (m)	6.6
95th Queue (m)	15.7
Link Distance (m)	21.6
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 203: Argus Rd & South Service Rd E

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (m)	7.2	85.5	27.5
Average Queue (m)	0.4	23.4	11.5
95th Queue (m)	3.6	94.2	23.9
Link Distance (m)	160.7	112.3	88.3
Upstream Blk Time (%)		7	
Queuing Penalty (veh)		48	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report

Background Opening Year  
PM Peak Hour

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	48.6	168.3	179.4	178.2	35.1	33.7	39.8
Average Queue (m)	15.8	86.8	99.8	106.3	7.1	16.0	27.3
95th Queue (m)	36.9	158.3	174.8	183.4	26.7	37.2	41.3
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)			0	0	1	3	26
Queuing Penalty (veh)			0	0	9	26	191
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	R
Maximum Queue (m)	54.5	217.5	298.3	172.5	276.2	275.0	32.5	140.2	151.8	200.0	224.8	149.5
Average Queue (m)	24.7	85.8	147.3	130.1	192.4	158.8	23.7	63.9	48.7	56.7	65.5	8.2
95th Queue (m)	45.0	289.7	359.7	220.5	346.0	347.7	42.8	117.3	112.8	134.5	155.2	81.0
Link Distance (m)		327.2	327.2		266.7	266.7		251.7	251.7	251.7	251.7	
Upstream Blk Time (%)		15	17		43	36		0	0	0	0	0
Queuing Penalty (veh)		0	0		0	0		0	0	1	1	
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				
Storage Blk Time (%)	0			23	56	15	10	1				
Queuing Penalty (veh)	0			50	119	38	16	3				

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	R
Maximum Queue (m)	102.5	353.8	351.9	351.6	97.5
Average Queue (m)	60.0	293.5	291.1	287.1	34.6
95th Queue (m)	137.6	452.8	453.3	457.5	110.1
Link Distance (m)		339.8	339.8	339.8	
Upstream Blk Time (%)		65	64	67	
Queuing Penalty (veh)		0	0	0	
Storage Bay Dist (m)	95.0				90.0
Storage Blk Time (%)	0	81		83	0
Queuing Penalty (veh)	0	105		61	0

Queuing and Blocking Report

Background Opening Year  
PM Peak Hour

Intersection: 303: North Access & South Service Rd E

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 6719

Lanes, Volumes, Timings

Background 5 Year  
AM Peak Hour

101: Trafalgar Rd & Cross Ave/South Service Rd

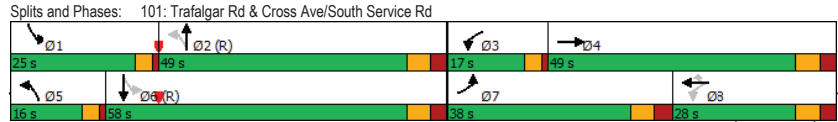
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	894	264	188	69	246	162	178	900	543	371	939	622
Future Volume (vph)	894	264	188	69	246	162	178	900	543	371	939	622
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor	1.00	0.99				0.99		0.91			0.99	
Frt		0.931				0.850		0.940			0.940	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2795	1449	0	1525	1583	1382	1428	3935	0	1525	4184	0
Fit Permitted	0.950			0.190			0.095			0.087		
Satd. Flow (perm)	2791	1449	0	305	1583	1362	143	3935	0	140	4184	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		32				210		126		141		
Link Speed (k/h)		50			50			50		50		
Link Distance (m)		151.2			330.4			150.2		270.2		
Travel Time (s)		10.9			23.8			10.8		19.5		
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Peak Hour Factor	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Heavy Vehicles (%)	9%	6%	12%	3%	8%	3%	10%	3%	0%	3%	3%	4%
Adj. Flow (vph)	1028	343	294	90	319	210	220	1023	679	442	1118	749
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1028	637	0	90	319	210	220	1702	0	442	1867	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
101: Trafalgar Rd & Cross Ave/South Service Rd

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		12.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		17.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	38.0	49.0		17.0	28.0	28.0	16.0	49.0		25.0	58.0	
Total Split (%)	27.1%	35.0%		12.1%	20.0%	20.0%	11.4%	35.0%		17.9%	41.4%	
Maximum Green (s)	31.0	42.0		13.0	21.0	21.0	12.0	42.0		21.0	51.0	
Yellow Time (s)	4.0	4.0		3.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		1.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	C-Max			Min	C-Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	34.0	45.7		36.3	24.0	24.0	57.0	45.0		70.0	54.0	
Actuated g/C Ratio	0.24	0.33		0.26	0.17	0.17	0.41	0.32		0.50	0.39	
v/c Ratio	1.52	1.29		0.48	1.18	0.52	1.31	1.33dr		1.60	1.21dr	
Control Delay	276.4	181.3		36.1	160.6	11.1	175.7	161.0		309.0	91.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	276.4	181.3		36.1	160.6	11.1	175.7	161.0		309.0	91.9	
LOS	F	F		D	F	B	F	F		F	F	
Approach Delay		240.0			91.8			162.7			133.5	
Approach LOS		F			F			F			F	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 128 (91%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.60  
 Intersection Signal Delay: 165.3 Intersection LOS: F  
 Intersection Capacity Utilization 113.3% ICU Level of Service H  
 Analysis Period (min) 15  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Queues  
101: Trafalgar Rd & Cross Ave/South Service Rd

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1028	637	90	319	210	220	1702	442	1867
v/c Ratio	1.52	1.29	0.48	1.18	0.52	1.31	1.33dr	1.60	1.21dr
Control Delay	276.4	181.3	36.1	160.6	11.1	175.7	161.0	309.0	91.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	276.4	181.3	36.1	160.6	11.1	175.7	161.0	309.0	91.9
Queue Length 50th (m)	-214.6	-229.3	15.3	-110.9	0.0	-68.6	-216.1	-171.0	-212.8
Queue Length 95th (m)	#245.4	#242.2	22.7	#135.6	11.4	m#63.3	m#183.9	m#165.1	m#185.2
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	678	494	193	271	407	168	1350	277	1700
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.52	1.29	0.47	1.18	0.52	1.31	1.26	1.60	1.10

**Intersection Summary**  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

HCM Signalized Intersection Capacity Analysis  
101: Trafalgar Rd & Cross Ave/South Service Rd

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	894	264	188	69	246	162	178	900	543	371	939	622
Future Volume (vph)	894	264	188	69	246	162	178	900	543	371	939	622
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	0.91		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	1.00	0.85	1.00	0.94		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2795	1449		1525	1583	1362	1428	3936		1525	4184	
Flt Permitted	0.95	1.00		0.19	1.00	1.00	0.10	1.00		0.09	1.00	
Satd. Flow (perm)	2795	1449		306	1583	1362	143	3936		140	4184	
Peak-hour factor, PHF	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Adj. Flow (vph)	1028	343	294	90	319	210	220	1023	679	442	1118	749
RTOR Reduction (vph)	0	22	0	0	0	174	0	86	0	0	87	0
Lane Group Flow (vph)	1028	615	0	90	319	36	220	1617	0	442	1780	0
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8			8	2		6		
Actuated Green, G (s)	31.0	42.7		33.3	21.0	21.0	54.0	42.0		67.0	51.0	
Effective Green, g (s)	34.0	45.7		33.3	24.0	24.0	54.0	45.0		67.0	54.0	
Actuated g/C Ratio	0.24	0.33		0.24	0.17	0.17	0.39	0.32		0.48	0.39	
Clearance Time (s)	7.0	7.0		4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	678	472		179	271	233	165	1265		274	1613	
v/s Ratio Prot	c0.37	c0.42		0.04	0.20		0.11	0.41		c0.24	0.43	
v/s Ratio Perm				0.08			0.03	0.40		c0.53		
v/c Ratio	1.52	1.30		0.50	1.18	0.15	1.33	1.33dr		1.61	1.21dr	
Uniform Delay, d1	53.0	47.1		44.3	58.0	49.4	39.5	47.5		45.2	43.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.01	1.23		1.08	1.13	
Incremental Delay, d2	239.9	151.5		2.6	111.3	0.4	153.8	125.6		285.4	52.7	
Delay (s)	292.9	198.7		46.9	169.3	49.8	193.9	183.9		334.3	101.4	
Level of Service	F	F		D	F	D	F	F		F	F	
Approach Delay (s)	256.8			111.0			185.1			146.0		
Approach LOS	F			F			F			F		

Intersection Summary			
HCM 2000 Control Delay	182.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.54		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	113.3%	ICU Level of Service	H
Analysis Period (min)	15		
dr	Defacto Right Lane. Recode with 1 though lane as a right lane.		
c	Critical Lane Group		

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔		
Traffic Volume (vph)	43	662	48	128	814	57	58	0	147	338	20	624		
Future Volume (vph)	43	662	48	128	814	57	58	0	147	338	20	624		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6		
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	15.0		0.0		
Storage Lanes	1		0	1		0	1		0	1		0		
Taper Length (m)	7.5			7.5			7.5			7.5				
Lane Util. Factor	1.00	0.95		1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00		
Ped Bike Factor	1.00	1.00		1.00	1.00			0.96		0.98	0.99			
Frt		0.987			0.989			0.850			0.857			
Flt Protected	0.950			0.950			0.950			0.950				
Satd. Flow (prot)	1570	2915		818	3167		805	734		1570	1387			
Flt Permitted	0.287			0.190			0.142			0.555				
Satd. Flow (perm)	474	2915		163	3167		120	734		903	1387			
Right Turn on Red			Yes		Yes			Yes			Yes			
Satd. Flow (RTOR)		15			16			229			142			
Link Speed (k/h)		50			50			50			50			
Link Distance (m)		374.0			72.9			81.9			180.7			
Travel Time (s)		26.9			5.2			5.9			13.0			
Confl. Peds. (#/hr)	1		3	3		1	3		20	20		3		
Peak Hour Factor	0.52	0.87		0.65	0.84		0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%		
Adj. Flow (vph)	83	761		74	152		925	72	109	0	210	433	32	701
Shared Lane Traffic (%)														
Lane Group Flow (vph)	83	835		152	997		109	210		433	733			
Enter Blocked Intersection	No	No		No	No		No	No		No	No			
Lane Alignment	Left	Left		Right	Left		Left	Left		Right	Left			
Median Width(m)		3.3			3.3			3.3			3.3			
Link Offset(m)		0.0			0.0			0.0			0.0			
Crosswalk Width(m)		4.8			4.8			4.8			4.8			
Two way Left Turn Lane														
Headway Factor	1.19	1.14		1.14	1.19		1.14	1.14		1.14	1.14			
Turning Speed (k/h)	24			14	24		14	24		14	24			
Number of Detectors	1	2		1	2		1	2		1	2			
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru			
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0			
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0			
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0			
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6			
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			
Detector 1 Channel														
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0			
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0			
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0			
Detector 2 Position(m)		9.4			9.4			9.4			9.4			
Detector 2 Size(m)		0.6			0.6			0.6			0.6			
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex			
Detector 2 Channel														

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

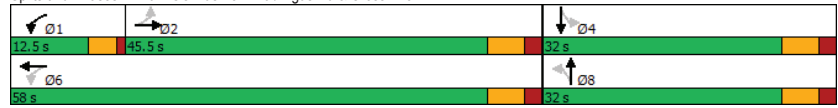
Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	45.5	45.5		12.5	58.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.6%	50.6%		13.9%	64.4%		35.6%	35.6%		35.6%	35.6%	
Maximum Green (s)	39.5	39.5		8.5	52.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	33.8	33.8		46.4	46.4		28.1	28.1		28.1	28.1	
Actuated g/C Ratio	0.41	0.41		0.56	0.56		0.34	0.34		0.34	0.34	
v/c Ratio	0.43	0.69		0.96	0.56		2.73	0.53		1.41	1.30	
Control Delay	24.9	22.9		78.9	12.5		847.7	8.0		229.4	168.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.9	22.9		78.9	12.5		847.7	8.0		229.4	168.9	
LOS	C	C		E	B		F	A		F	F	
Approach Delay		23.1			21.3			294.9			191.4	
Approach LOS		C			C			F			F	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	82.6
Natural Cycle:	130
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	2.73
Intersection Signal Delay:	102.2
Intersection LOS:	F
Intersection Capacity Utilization:	111.4%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 102: GO Bus Terminal/Argus Rd & Cross Ave



Queues  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	83	835	152	997	109	210	433	733
v/c Ratio	0.43	0.69	0.96	0.56	2.73	0.53	1.41	1.30
Control Delay	24.9	22.9	78.9	12.5	847.7	8.0	229.4	168.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	22.9	78.9	12.5	847.7	8.0	229.4	168.9
Queue Length 50th (m)	9.5	57.0	12.5	50.1	~31.1	0.0	~98.2	~142.4
Queue Length 95th (m)	10.9	73.0	#39.7	63.8	#37.2	0.0	#139.8	#120.7
Internal Link Dist (m)		350.0		48.9		57.9		156.7
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	239	1479	159	2086	40	400	307	566
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	0.35	0.56	0.96	0.48	2.73	0.53	1.41	1.30

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↗	↖	↖↗	↗	↖	↖	↗	↖	↖	↗
Traffic Volume (vph)	43	662	48	128	814	57	58	0	147	338	20	624
Future Volume (vph)	43	662	48	128	814	57	58	0	147	338	20	624
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.99	
Fpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1570	2914		818	3168		805	736		1547	1387	
Flt Permitted	0.29	1.00		0.19	1.00		0.14	1.00		0.56	1.00	
Satd. Flow (perm)	475	2914		163	3168		121	736		904	1387	
Peak-hour factor, PHF	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Adj. Flow (vph)	83	761	74	152	925	72	109	0	210	433	32	701
RTOR Reduction (vph)	0	9	0	0	7	0	0	138	0	0	94	0
Lane Group Flow (vph)	83	826	0	152	990	0	109	72	0	433	639	0
Confl. Peds. (#/hr)	1		3	3		1	3		20	20		3
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	31.9	31.9		44.4	44.4		26.1	26.1		26.1	26.1	
Effective Green, g (s)	33.9	33.9		44.4	46.4		28.1	28.1		28.1	28.1	
Actuated g/C Ratio	0.41	0.41		0.54	0.56		0.34	0.34		0.34	0.34	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	195	1197		155	1781		41	250		307	472	
v/s Ratio Prot		0.28		c0.10	0.31			0.10			0.46	
v/s Ratio Perm	0.17			c0.42			c0.90			0.48		
v/c Ratio	0.43	0.69		0.98	0.56		2.66	0.29		1.41	1.35	
Uniform Delay, d1	17.3	20.0		14.3	11.5		27.2	19.9		27.2	27.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	2.2		66.2	0.6		811.1	0.9		203.0	173.0	
Delay (s)	20.5	22.2		80.5	12.1		838.3	20.7		230.2	200.2	
Level of Service	C	C		F	B		F	C		F	F	
Approach Delay (s)		22.0			21.2			300.1			211.3	
Approach LOS		C			C			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		108.9									F	
HCM 2000 Volume to Capacity ratio		1.65										
Actuated Cycle Length (s)		82.5			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		111.4%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↗	↖	↖↗	↗	↖	↖	↗	↖	↖	↗
Traffic Volume (vph)	63	378	177	256	259	15	37	3	61	56	26	59
Future Volume (vph)	63	378	177	256	259	15	37	3	61	56	26	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0	0.0	25.0		0.0	20.0		0.0	0.0		0.0	0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		1.00	1.00		1.00	0.98		1.00	0.99	
Frt		0.949			0.985			0.856			0.893	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1540	2853	0	1570	2724	0	1570	1442	0	1468	1479	0
Flt Permitted	0.535			0.277			0.694			0.689		
Satd. Flow (perm)	862	2853	0	458	2724	0	1143	1442	0	1061	1479	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		125			26			102			69	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		40.1			374.0			69.1			70.9	
Travel Time (s)		2.9			26.9			5.0			5.1	
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3
Peak Hour Factor	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	7%	0%	3%	0%
Adj. Flow (vph)	81	467	242	388	328	36	46	4	102	90	28	69
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	81	709	0	388	364	0	46	106	0	90	97	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings

Background 5 Year

103: Lyons Lane/Commercial Driveway & Cross Ave

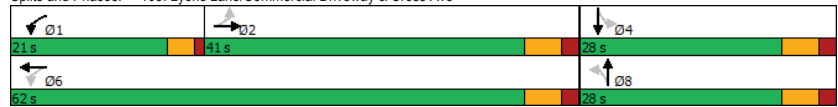
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.0	41.0		21.0	62.0		28.0	28.0		28.0	28.0	
Total Split (%)	45.6%	45.6%		23.3%	68.9%		31.1%	31.1%		31.1%	31.1%	
Maximum Green (s)	35.0	35.0		17.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.2	37.2		54.9	54.9		15.6	15.6		15.6	15.6	
Actuated g/C Ratio	0.47	0.47		0.70	0.70		0.20	0.20		0.20	0.20	
v/c Ratio	0.20	0.50		0.76	0.19		0.20	0.29		0.43	0.28	
Control Delay	15.9	14.0		17.2	4.4		29.1	8.8		35.0	13.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.9	14.0		17.2	4.4		29.1	8.8		35.0	13.3	
LOS	B	B		B	A		C	A		C	B	
Approach Delay		14.2			11.0			14.9			23.7	
Approach LOS		B			B			B			C	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	78.5
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	13.9
Intersection LOS:	B
Intersection Capacity Utilization:	79.2%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 103: Lyons Lane/Commercial Driveway & Cross Ave



Queues

Background 5 Year

103: Lyons Lane/Commercial Driveway & Cross Ave

AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	709	388	364	46	106	90	97
v/c Ratio	0.20	0.50	0.76	0.19	0.20	0.29	0.43	0.28
Control Delay	15.9	14.0	17.2	4.4	29.1	8.8	35.0	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	14.0	17.2	4.4	29.1	8.8	35.0	13.3
Queue Length 50th (m)	6.9	30.4	19.5	7.6	6.1	0.5	12.4	3.6
Queue Length 95th (m)	16.2	48.0	27.6	13.7	13.7	8.2	17.7	16.1
Internal Link Dist (m)		16.1		350.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	408	1418	562	2032	351	514	326	502
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	0.20	0.50	0.69	0.18	0.13	0.21	0.28	0.19

Intersection Summary



HCM Signalized Intersection Capacity Analysis  
103: Lyons Lane/Commercial Driveway & Cross Ave

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	63	378	177	256	259	15	37	3	61	56	26	59
Future Volume (vph)	63	378	177	256	259	15	37	3	61	56	26	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.99		1.00	0.86		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1531	2853		1570	2725		1566	1442		1464	1480	
Flt Permitted	0.53	1.00		0.28	1.00		0.69	1.00		0.69	1.00	
Satd. Flow (perm)	862	2853		458	2725		1144	1442		1061	1480	
Peak-hour factor, PHF	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Adj. Flow (vph)	81	467	242	388	328	36	46	4	102	90	28	69
RTOR Reduction (vph)	0	66	0	0	8	0	0	82	0	0	55	0
Lane Group Flow (vph)	81	643	0	388	356	0	46	24	0	90	42	0
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2			1		6		8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.3	35.3		52.9	52.9		13.6	13.6		13.6	13.6	
Effective Green, g (s)	37.3	37.3		52.9	54.9		15.6	15.6		15.6	15.6	
Actuated g/C Ratio	0.48	0.48		0.67	0.70		0.20	0.20		0.20	0.20	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	409	1355		501	1905		227	286		210	294	
v/s Ratio Prot		0.23		c0.13	0.13			0.02			0.03	
v/s Ratio Perm	0.09			c0.39			0.04			c0.08		
v/c Ratio	0.20	0.47		0.77	0.19		0.20	0.08		0.43	0.14	
Uniform Delay, d1	11.9	14.0		7.5	4.1		26.3	25.6		27.5	25.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.6		7.1	0.1		0.6	0.2		1.9	0.3	
Delay (s)	12.4	14.5		14.5	4.2		26.9	25.8		29.5	26.2	
Level of Service	B	B		B	A		C	C		C	C	
Approach Delay (s)		14.3			9.5			26.1			27.8	
Approach LOS		B			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		14.7									B	
HCM 2000 Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		78.5			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		79.2%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	505	565	105	27	490	612	62	529	66	486	515	346
Future Volume (vph)	505	565	105	27	490	612	62	529	66	486	515	346
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0		0.0	80.0		0.0	25.0		0.0	80.0		0.0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	0.97		0.99	1.00		0.99		0.98
Frt		0.967			0.918			0.981				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2987	3016	0	1481	2823	0	1540	3146	0	2929	1676	1356
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2968	3016	0	1473	2823	0	1532	3146	0	2886	1676	1324
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			224			11				318
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.8			142.3			311.4				130.3
Travel Time (s)		20.6			10.2			22.4				9.4
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Peak Hour Factor	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Adj. Flow (vph)	543	621	175	36	570	680	103	615	88	579	599	433
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	543	796	0	36	1250	0	103	703	0	579	599	433
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	6.6				6.6			6.6				6.6
Link Offset(m)	0.0				0.0			0.0				0.0
Crosswalk Width(m)	4.8				4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

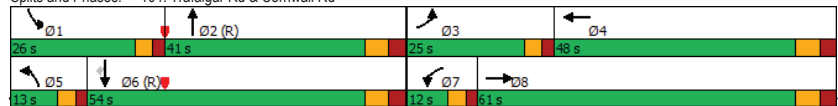
Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	25.0	61.0		12.0	48.0		13.0	41.0		26.0	54.0	54.0
Total Split (%)	17.9%	43.6%		8.6%	34.3%		9.3%	29.3%		18.6%	38.6%	38.6%
Maximum Green (s)	20.0	54.0		7.0	41.0		8.0	34.0		21.0	47.0	47.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	21.0	57.0		8.0	44.0		9.0	37.0		22.0	50.0	50.0
Actuated g/C Ratio	0.15	0.41		0.06	0.31		0.06	0.26		0.16	0.36	0.36
v/c Ratio	1.21	0.64		0.43	1.20		1.04	0.84		1.26	1.00	0.64
Control Delay	163.5	34.7		79.8	134.6		163.3	58.0		177.4	49.2	7.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	163.5	34.7		79.8	134.6		163.3	58.0		177.4	49.2	7.7
LOS	F	C		E	F		F	E		F	D	A
Approach Delay		87.0			133.1			71.5			84.1	
Approach LOS		F			F			E			F	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.26  
 Intersection Signal Delay: 95.3  
 Intersection LOS: F  
 Intersection Capacity Utilization 109.6%  
 ICU Level of Service H  
 Analysis Period (min) 15

Splits and Phases: 104: Trafalgar Rd & Cornwall Rd



Queues  
104: Trafalgar Rd & Cornwall Rd

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	543	796	36	1250	103	703	579	599	433
v/c Ratio	1.21	0.64	0.43	1.20	1.04	0.84	1.26	1.00	0.64
Control Delay	163.5	34.7	79.8	134.6	163.3	58.0	177.4	49.2	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	163.5	34.7	79.8	134.6	163.3	58.0	177.4	49.2	7.7
Queue Length 50th (m)	-99.4	93.4	10.3	-208.0	-32.4	101.0	-111.7	-148.8	15.9
Queue Length 95th (m)	#136.8	116.4	19.0	#233.5	#38.4	118.9	m#95.4	m118.2	m12.5
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	448	1246	84	1040	99	839	460	598	677
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.64	0.43	1.20	1.04	0.84	1.26	1.00	0.64

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕		↔	↕		↔	↕	↔
Traffic Volume (vph)	505	565	105	27	490	612	62	529	66	486	515	346
Future Volume (vph)	505	565	105	27	490	612	62	529	66	486	515	346
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		0.97	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.97		1.00	1.00		1.00	1.00	0.98
Fpb, 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	0.92		1.00	0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2987	3016		1481	2824		1540	3146		2929	1676	1324
Fit Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2987	3016		1481	2824		1540	3146		2929	1676	1324
Peak-hour factor, PHF	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Adj. Flow (vph)	543	621	175	36	570	680	103	615	88	579	599	432
RTOR Reduction (vph)	0	18	0	0	154	0	0	8	0	0	0	204
Lane Group Flow (vph)	543	778	0	36	1096	0	103	695	0	579	599	229
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	20.0	54.0		7.0	41.0		8.0	34.0		21.0	47.0	47.0
Effective Green, g (s)	21.0	57.0		8.0	44.0		9.0	37.0		22.0	50.0	50.0
Actuated g/C Ratio	0.15	0.41		0.06	0.31		0.06	0.26		0.16	0.36	0.36
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	448	1227		84	887		99	831		460	598	472
v/s Ratio Prot	c0.18	0.26		0.02	c0.39		0.07	0.22		c0.20	c0.36	
v/s Ratio Perm												0.17
v/c Ratio	1.21	0.63		0.43	1.24		1.04	0.84		1.26	1.00	0.48
Uniform Delay, d1	59.5	33.2		63.8	48.0		65.5	48.6		59.0	45.0	35.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.34	0.83	0.74
Incremental Delay, d2	114.6	2.5		15.2	116.0		101.8	9.8		118.1	11.4	0.3
Delay (s)	174.1	35.7		79.0	164.0		167.3	58.4		197.1	48.6	26.2
Level of Service	F	D		E	F		F	E		F	D	C
Approach Delay (s)		91.8			161.6			72.3			95.9	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	107.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	109.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↕		↕↕	↕↕	
Traffic Volume (vph)	996	882	0	1168	1575	0
Future Volume (vph)	996	882	0	1168	1575	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt		0.850				
Fit Protected	0.950					
Satd. Flow (prot)	2958	1423	0	4404	4489	0
Fit Permitted	0.950					
Satd. Flow (perm)	2958	1423	0	4404	4489	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				
Link Speed (k/h)	50			50	50	
Link Distance (m)	199.2			51.4	324.8	
Travel Time (s)	14.3			3.7	23.4	
Peak Hour Factor	0.98	0.92	0.25	0.91	0.90	0.25
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Adj. Flow (vph)	1016	959	0	1284	1750	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1016	959	0	1284	1750	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	85.0	85.0		55.0	55.0	
Total Split (%)	60.7%	60.7%		39.3%	39.3%	
Maximum Green (s)	78.0	78.0		48.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	81.0	81.0		51.0	51.0	
Actuated g/C Ratio	0.58	0.58		0.36	0.36	
v/c Ratio	0.59	1.17		0.80	1.07	
Control Delay	20.7	116.4		48.8	77.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	20.7	116.4		48.8	77.9	
LOS	C	F		D	E	
Approach Delay	67.2			48.8	77.9	
Approach LOS	E			D	E	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 133.6 (95%), Referenced to phase 2:NBSB and 6:, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.17  
 Intersection Signal Delay: 66.2 Intersection LOS: E  
 Intersection Capacity Utilization 101.2% ICU Level of Service G  
 Analysis Period (min) 15

Splits and Phases: 105: Trafalgar Rd & QEW EB-Off Ramp



Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1016	959	1284	1750
v/c Ratio	0.59	1.17	0.80	1.07
Control Delay	20.7	116.4	48.8	77.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.7	116.4	48.8	77.9
Queue Length 50th (m)	93.9	~331.9	105.8	~208.9
Queue Length 95th (m)	114.9	#415.3	m74.6	#235.1
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1711	823	1604	1635
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	1.17	0.80	1.07

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 5 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔		↑↑↑	↑↑↑	
Traffic Volume (vph)	996	882	0	1168	1575	0
Future Volume (vph)	996	882	0	1168	1575	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Fr't	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	2958	1423		4404	4489	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	2958	1423		4404	4489	
Peak-hour factor, PHF	0.98	0.92	0.25	0.91	0.90	0.25
Adj. Flow (vph)	1016	959	0	1284	1750	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1016	959	0	1284	1750	0
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases	4					
Actuated Green, G (s)	78.0	78.0		48.0	48.0	
Effective Green, g (s)	81.0	81.0		51.0	51.0	
Actuated g/C Ratio	0.58	0.58		0.36	0.36	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1711	823		1604	1635	
v/s Ratio Prot	0.34			0.29	c0.39	
v/s Ratio Perm		c0.67				
v/c Ratio	0.59	1.16		0.80	1.07	
Uniform Delay, d1	18.9	29.5		39.9	44.5	
Progression Factor	1.00	1.00		1.20	0.86	
Incremental Delay, d2	0.6	87.3		0.4	40.9	
Delay (s)	19.5	116.8		48.4	79.0	
Level of Service	B	F		D	E	
Approach Delay (s)	66.7			48.4	79.0	
Approach LOS	E			D	E	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		66.3		HCM 2000 Level of Service		E
HCM 2000 Volume to Capacity ratio		1.13				
Actuated Cycle Length (s)		140.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		101.2%		ICU Level of Service		G
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔		↑↑↑			↑↑↑	↔
Traffic Volume (vph)	1	0	231	530	38	291	0	1659	0	0	1669	7
Future Volume (vph)	1	0	231	530	38	291	0	1659	0	0	1669	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor												0.96
Fr't			0.850			0.850						0.850
Flt Protected	0.950			0.950	0.960							
Satd. Flow (prot)	1570	0	1395	1421	1444	1356	0	4446	0	0	4532	1437
Flt Permitted	0.950			0.950	0.960							
Satd. Flow (perm)	1570	0	1395	1421	1444	1356	0	4446	0	0	4532	1380
Right Turn on Red			Yes			Yes		Yes			Yes	Yes
Satd. Flow (RTOR)			31			238						70
Link Speed (k/h)		50			50			50				50
Link Distance (m)		142.1			192.6			324.8				275.1
Travel Time (s)		10.2			13.9			23.4				19.8
Confl. Peds. (#/hr)							8		5	5		8
Peak Hour Factor	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Adj. Flow (vph)	4	0	254	602	56	399	0	1784	0	0	1854	11
Shared Lane Traffic (%)				46%								
Lane Group Flow (vph)	4	0	254	325	333	399	0	1784	0	0	1854	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1	2	1						1
Detector Template	Left		Right	Left	Thru	Right		Thru				Thru
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0				10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6				0.6
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex				CI+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					CI+Ex			CI+Ex				CI+Ex
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 5 Year

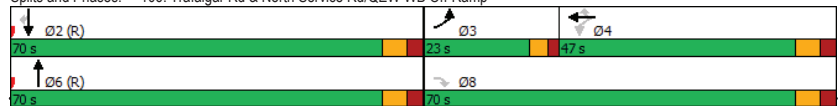
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	Perm	
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Detector Phase	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		70.0	47.0	47.0	47.0		70.0			70.0	70.0
Total Split (%)	16.4%		50.0%	33.6%	33.6%	33.6%		50.0%			50.0%	50.0%
Maximum Green (s)	18.0		63.0	40.0	40.0	40.0		63.0			63.0	63.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)	7.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (#/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	8.0		53.9	41.9	41.9	41.9		78.1			78.1	78.1
Actuated g/C Ratio	0.06		0.38	0.30	0.30	0.30		0.56			0.56	0.56
v/c Ratio	0.04		0.46	0.76	0.77	0.70		0.72			0.73	0.01
Control Delay	64.0		29.4	55.9	56.2	22.4		29.5			26.9	0.0
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	64.0		29.4	55.9	56.2	22.4		29.5			26.9	0.0
LOS	E		C	E	E	C		C			C	A
Approach Delay		29.9				43.4		29.5			26.7	
Approach LOS		C				D		C			C	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 31.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 79.1%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 5 Year

AM Peak Hour

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	4	254	325	333	399	1784	1854	11
v/c Ratio	0.04	0.46	0.76	0.77	0.70	0.72	0.73	0.01
Control Delay	64.0	29.4	55.9	56.2	22.4	29.5	26.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	29.4	55.9	56.2	22.4	29.5	26.9	0.0
Queue Length 50th (m)	1.1	48.1	90.7	93.2	42.2	121.1	142.8	0.0
Queue Length 95th (m)	1.4	63.3	110.8	80.0	40.2	157.2	196.7	0.0
Internal Link Dist (m)				168.6		300.8	251.1	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	674	466	473	604	2480	2528	800
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.38	0.70	0.70	0.66	0.72	0.73	0.01

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1	0	231	530	38	291	0	1659	0	0	1669	7
Future Volume (vph)	1	0	231	530	38	291	0	1659	0	0	1669	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		0.91		0.91	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00		1.00	0.96	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00		0.85	1.00	1.00	0.85		1.00		1.00	0.85	
Flt Protected	0.95		1.00	0.95	0.96	1.00		1.00		1.00	1.00	
Satd. Flow (prot)	1570		1395	1421	1444	1356		4446		4532	1380	
Flt Permitted	0.95		1.00	0.95	0.96	1.00		1.00		1.00	1.00	
Satd. Flow (perm)	1570		1395	1421	1444	1356		4446		4532	1380	
Peak-hour factor, PHF	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Adj. Flow (vph)	4	0	254	602	56	399	0	1784	0	0	1854	11
RTOR Reduction (vph)	0	0	19	0	0	167	0	0	0	0	0	5
Lane Group Flow (vph)	4	0	235	325	333	232	0	1784	0	0	1854	6
Confl. Peds. (#/hr)							8		5	5		8
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	Perm	
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	7.0		50.9	38.9	38.9	38.9		75.1		75.1	75.1	
Effective Green, g (s)	8.0		53.9	41.9	41.9	41.9		78.1		78.1	78.1	
Actuated g/C Ratio	0.06		0.38	0.30	0.30	0.30		0.56		0.56	0.56	
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0		7.0	7.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5		4.5	4.5	
Lane Grp Cap (vph)	89		537	425	432	405		2480		2528	769	
v/s Ratio Prot	0.00							0.40		c0.41		
v/s Ratio Perm			c0.17	0.23	0.23	0.17						0.00
v/c Ratio	0.04		0.44	0.76	0.77	0.57		0.72		0.73	0.01	
Uniform Delay, d1	62.4		31.8	44.6	44.7	41.5		22.9		23.2	13.7	
Progression Factor	1.00		1.00	1.00	1.00	1.00		1.15		1.00	1.00	
Incremental Delay, d2	0.2		0.6	8.0	8.3	2.0		1.3		1.9	0.0	
Delay (s)	62.6		32.4	52.6	53.0	43.5		27.5		25.1	13.8	
Level of Service	E		C	D	D	D		C		C	B	
Approach Delay (s)		32.9				49.2		27.5			25.0	
Approach LOS		C				D		C			C	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Background 5 Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	898	418	514	0	0	1435
Future Volume (vph)	898	418	514	0	0	1435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3423	1441	3539	0	0	3539
Flt Permitted	0.954					
Satd. Flow (perm)	3423	1441	3539	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	4	297				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	976	454	559	0	0	1560
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1021	409	559	0	0	1560
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				

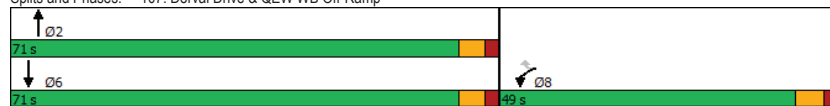
Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Background 5 Year  
AM Peak Hour

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	49.0	49.0	71.0			71.0
Total Split (%)	40.8%	40.8%	59.2%			59.2%
Maximum Green (s)	43.0	43.0	65.0			65.0
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	43.2	43.2	67.1			67.1
Actuated g/C Ratio	0.37	0.37	0.57			0.57
v/c Ratio	0.81	0.57	0.28			0.78
Control Delay	39.9	11.4	13.9			23.7
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	39.9	11.4	13.9			23.7
LOS	D	B	B			C
Approach Delay	31.8		13.9			23.7
Approach LOS	C		B			C

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	118.3
Natural Cycle:	60
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	25.4
Intersection LOS:	C
Intersection Capacity Utilization:	76.3%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 107: Dorval Drive & QEW WB Off-Ramp



Queues  
107: Dorval Drive & QEW WB Off-Ramp

Background 5 Year  
AM Peak Hour

	↖	↗	↑	↓
Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1021	409	559	1560
v/c Ratio	0.81	0.57	0.28	0.78
Control Delay	39.9	11.4	13.9	23.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.9	11.4	13.9	23.7
Queue Length 50th (m)	114.5	20.4	36.5	153.3
Queue Length 95th (m)	141.5	55.8	47.5	185.0
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1305	732	2005	2005
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.78	0.56	0.28	0.78

Intersection Summary

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HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Background 5 Year  
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕			↕↕
Traffic Volume (vph)	898	418	514	0	0	1435
Future Volume (vph)	898	418	514	0	0	1435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr't	0.99	0.85	1.00			1.00
Fit Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3426	1441	3539			3539
Fit Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3426	1441	3539			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	976	454	559	0	0	1560
RTOR Reduction (vph)	3	188	0	0	0	0
Lane Group Flow (vph)	1018	221	559	0	0	1560
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	41.2	41.2	65.0			65.0
Effective Green, g (s)	43.2	43.2	67.0			67.0
Actuated g/C Ratio	0.37	0.37	0.57			0.57
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1252	526	2006			2006
v/s Ratio Prot	c0.30		0.16			c0.44
v/s Ratio Perm		0.15				
v/c Ratio	0.81	0.42	0.28			0.78
Uniform Delay, d1	33.9	28.1	13.2			19.8
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	4.6	0.9	0.3			3.0
Delay (s)	38.5	29.0	13.5			22.9
Level of Service	D	C	B			C
Approach Delay (s)	35.8		13.5			22.9
Approach LOS	D		B			C

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	118.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Background 5 Year  
AM Peak Hour

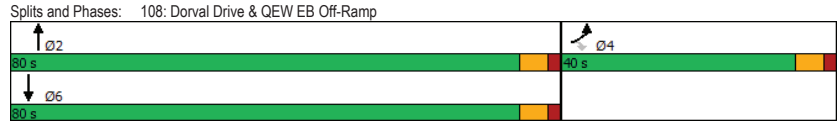
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕	↕↕	
Traffic Volume (vph)	132	524	0	724	1551	0
Future Volume (vph)	132	524	0	724	1551	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr't	0.900	0.850				
Fit Protected	0.984					
Satd. Flow (prot)	3200	1441	0	3539	3539	0
Fit Permitted	0.984					
Satd. Flow (perm)	3200	1441	0	3539	3539	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	30	30				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	570	0	787	1686	0
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	428	285	0	787	1686	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	40.0	40.0		80.0	80.0	
Total Split (%)	33.3%	33.3%		66.7%	66.7%	
Maximum Green (s)	34.0	34.0		74.0	74.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	28.2	28.2		76.3	76.3	
Actuated g/C Ratio	0.25	0.25		0.68	0.68	
v/c Ratio	0.52	0.74		0.33	0.70	
Control Delay	35.5	46.8		8.7	14.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	35.5	46.8		8.7	14.2	
LOS	D	D		A	B	
Approach Delay	40.0			8.7	14.2	
Approach LOS	D			A	B	

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	112.5
Natural Cycle:	60
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	18.6
Intersection LOS:	B
Intersection Capacity Utilization:	76.3%
ICU Level of Service:	D
Analysis Period (min):	15



Queues  
108: Dorval Drive & QEW EB Off-Ramp

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	428	285	787	1686
v/c Ratio	0.52	0.74	0.33	0.70
Control Delay	35.5	46.8	8.7	14.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.5	46.8	8.7	14.2
Queue Length 50th (m)	40.8	60.0	36.6	116.8
Queue Length 95th (m)	56.2	94.5	56.6	172.3
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1048	483	2400	2400
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.59	0.33	0.70

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Background 5 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↗		↕↕	↕↕	
Traffic Volume (vph)	132	524	0	724	1551	0
Future Volume (vph)	132	524	0	724	1551	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.90	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3199	1441		3539	3539	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3199	1441		3539	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	570	0	787	1686	0
RTOR Reduction (vph)	23	23	0	0	0	0
Lane Group Flow (vph)	406	263	0	787	1686	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	26.1	26.1		74.3	74.3	
Effective Green, g (s)	28.1	28.1		76.3	76.3	
Actuated g/C Ratio	0.25	0.25		0.68	0.68	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	799	360		2402	2402	
v/s Ratio Prot	0.13			0.22	c0.48	
v/s Ratio Perm		c0.18				
v/c Ratio	0.51	0.73		0.33	0.70	
Uniform Delay, d1	36.2	38.7		7.5	11.1	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	7.7		0.4	1.7	
Delay (s)	36.9	46.4		7.8	12.8	
Level of Service	D	D		A	B	
Approach Delay (s)	40.7			7.8	12.8	
Approach LOS	D			A	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			17.8	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			112.4	Sum of lost time (s)		8.0
Intersection Capacity Utilization			76.3%	ICU Level of Service		D
Analysis Period (min)			15			

c Critical Lane Group

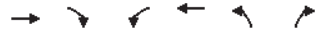
Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background 5 Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕↕	↕↕
Traffic Volume (vph)	480	0	0	291	256	285
Future Volume (vph)	480	0	0	291	256	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						197
Link Speed (k/h)	60			60	40	
Link Distance (m)	128.8			184.7	258.8	
Travel Time (s)	7.7			11.1	23.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	522	0	0	316	278	310
Shared Lane Traffic (%)						
Lane Group Flow (vph)	522	0	0	316	278	310
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
v/c Ratio	0.37			0.22	0.39	0.41

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background 5 Year  
AM Peak Hour






Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	10.5			9.4	11.7	5.8
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.5			9.4	11.7	5.8
LOS	B			A	B	A
Approach Delay	10.5			9.4	8.6	
Approach LOS	B			A	A	

**Intersection Summary**

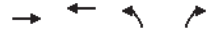
Area Type:	Other
Cycle Length:	45
Actuated Cycle Length:	45
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Natural Cycle:	45
Control Type:	Pretimed
Maximum v/c Ratio:	0.41
Intersection Signal Delay:	9.5
Intersection Capacity Utilization:	38.4%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street

 Ø2 (L) 22.5 s	 Ø4 22.5 s
	 Ø8 22.5 s

Queues  
109: QEW WB Off-Ramp & Kerr Street

Background 5 Year  
AM Peak Hour



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	522	316	278	310
v/c Ratio	0.37	0.22	0.39	0.41
Control Delay	10.5	9.4	11.7	5.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.5	9.4	11.7	5.8
Queue Length 50th (m)	15.0	8.5	15.4	5.7
Queue Length 95th (m)	24.3	15.0	30.0	18.4
Internal Link Dist (m)	104.8	160.7	234.8	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1415	1415	708	751
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.22	0.39	0.41

**Intersection Summary**

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Background 5 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	480	0	0	291	256	285
Future Volume (vph)	480	0	0	291	256	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr't	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	522	0	0	316	278	310
RTOR Reduction (vph)	0	0	0	0	0	118
Lane Group Flow (vph)	522	0	0	316	278	192
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1415			1415	708	633
v/s Ratio Prot	c0.15			0.09	c0.16	
v/s Ratio Perm						0.12
v/c Ratio	0.37			0.22	0.39	0.30
Uniform Delay, d1	9.5			8.9	9.6	9.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			0.4	1.6	1.2
Delay (s)	10.2			9.3	11.2	10.4
Level of Service	B			A	B	B
Approach Delay (s)	10.2			9.3	10.8	
Approach LOS	B			A	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			10.3		HCM 2000 Level of Service B	
HCM 2000 Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			45.0		Sum of lost time (s) 9.0	
Intersection Capacity Utilization			38.4%		ICU Level of Service A	
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings

110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	45	561	30	91	552	7	2	9	51	4	21	29
Future Volume (vph)	45	561	30	91	552	7	2	9	51	4	21	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0		0.0	155.0		70.0	15.0		0.0	0.0		30.0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't		0.992				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3299	0	1719	3139	1380	1805	1667	1468	1805	1792	1495
Flt Permitted	0.415			0.371			0.742			0.751		
Satd. Flow (perm)	1485	3299	0	671	3139	1380	1410	1667	1468	1427	1792	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				94			99			99
Link Speed (k/h)		80			80			60				40
Link Distance (m)		324.5			247.2			158.7				215.5
Travel Time (s)		14.6			11.1			9.5				19.4
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Adj. Flow (vph)	49	616	33	100	607	8	2	10	56	4	23	32
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	49	649	0	100	607	8	2	10	56	4	23	32
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
<b>Detector 2 Channel</b>												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

Lanes, Volumes, Timings Background 5 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	34.0		14.0	38.4	38.4	28.8	28.8	28.8	35.0	35.0	35.0
Total Split (s)	18.0	64.0		24.0	70.0	70.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	14.4%	51.2%		19.2%	56.0%	56.0%	29.6%	29.6%	29.6%	29.6%	29.6%	29.6%
Maximum Green (s)	12.0	55.6		18.0	61.6	61.6	29.2	29.2	29.2	29.2	29.2	29.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	77.9	67.9		78.9	71.9	71.9	13.4	13.4	13.4	13.8	13.8	13.8
Actuated g/C Ratio	0.78	0.68		0.79	0.72	0.72	0.13	0.13	0.13	0.14	0.14	0.14
v/c Ratio	0.04	0.29		0.16	0.27	0.01	0.01	0.05	0.20	0.02	0.09	0.11
Control Delay	2.5	7.5		3.0	7.2	0.0	38.5	39.0	3.5	38.5	39.7	0.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	7.5		3.0	7.2	0.0	38.5	39.0	3.5	38.5	39.7	0.8
LOS	A	A		A	A	A	D	D	A	D	D	A
Approach Delay		7.1			6.5			9.7			18.5	
Approach LOS		A			A			A			B	

**Intersection Summary**

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 100

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.29

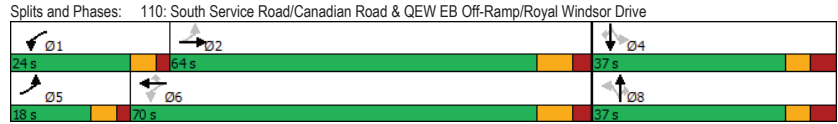
Intersection Signal Delay: 7.4

Intersection Capacity Utilization 50.0%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A



Queues Background 5 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	49	649	100	607	8	2	10	56	4	23	32
v/c Ratio	0.04	0.29	0.16	0.27	0.01	0.01	0.05	0.20	0.02	0.09	0.11
Control Delay	2.5	7.5	3.0	7.2	0.0	38.5	39.0	3.5	38.5	39.7	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	7.5	3.0	7.2	0.0	38.5	39.0	3.5	38.5	39.7	0.8
Queue Length 50th (m)	0.9	27.8	3.7	26.2	0.0	0.4	1.9	0.0	0.7	4.3	0.0
Queue Length 95th (m)	1.9	37.4	7.0	35.1	0.0	2.6	6.9	3.1	4.1	11.9	0.0
Internal Link Dist (m)		300.5		223.2			134.7			191.5	
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0
Base Capacity (vph)	1485	2242	760	2256	1018	466	550	550	471	591	560
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.29	0.13	0.27	0.01	0.00	0.02	0.10	0.01	0.04	0.06

**Intersection Summary**

HCM Signalized Intersection Capacity Analysis  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Background 5 Year

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↕	↔	↕	↔
Traffic Volume (vph)	45	561	30	91	552	7	2	9	51	4	21	29
Future Volume (vph)	45	561	30	91	552	7	2	9	51	4	21	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3301		1719	3139	1380	1805	1667	1468	1805	1792	1495
Flt Permitted	0.42	1.00		0.37	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1486	3301		672	3139	1380	1410	1667	1468	1427	1792	1495
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)	49	616	33	100	607	8	2	10	56	4	23	32
RTOR Reduction (vph)	0	2	0	0	0	2	0	0	50	0	0	28
Lane Group Flow (vph)	49	647	0	100	607	6	2	10	6	4	23	4
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	71.1	64.8		74.7	66.6	66.6	7.9	7.9	7.9	7.9	7.9	7.9
Effective Green, g (s)	75.1	69.2		78.7	71.0	71.0	11.7	11.7	11.7	11.7	11.7	11.7
Actuated g/C Ratio	0.73	0.67		0.76	0.69	0.69	0.11	0.11	0.11	0.11	0.11	0.11
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	1237	2217		616	2163	951	160	189	166	162	203	169
v/s Ratio Prot	0.00	c0.20		c0.02	0.19			0.01			c0.01	
v/s Ratio Perm	0.03			0.11		0.00	0.00		0.00	0.00		0.00
v/c Ratio	0.04	0.29		0.16	0.28	0.01	0.01	0.05	0.04	0.02	0.11	0.02
Uniform Delay, d1	3.8	6.9		3.2	6.2	5.0	40.5	40.7	40.6	40.6	41.0	40.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.3		0.1	0.3	0.0	0.0	0.1	0.1	0.1	0.3	0.1
Delay (s)	3.9	7.2		3.4	6.5	5.0	40.6	40.8	40.8	40.7	41.3	40.6
Level of Service	A	A		A	A	A	D	D	D	D	D	D
Approach Delay (s)		7.0			6.0			40.8			40.9	
Approach LOS		A			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay	9.3		HCM 2000 Level of Service				A					
HCM 2000 Volume to Capacity ratio	0.25											
Actuated Cycle Length (s)	103.0		Sum of lost time (s)				12.0					
Intersection Capacity Utilization	50.0%		ICU Level of Service				A					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
 201: Cross Ave & Lyons Lane

Background 5 Year  
 AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕
Traffic Volume (vph)	34	547	328	48	60	35
Future Volume (vph)	34	547	328	48	60	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.969		0.943	
Flt Protected	0.950				0.972	
Satd. Flow (prot)	1624	3094	2793	0	1419	0
Flt Permitted	0.950				0.972	
Satd. Flow (perm)	1624	3094	2793	0	1419	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	4			4	7	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Heavy Vehicles (%)	0%	5%	16%	0%	0%	25%
Adj. Flow (vph)	49	943	373	96	97	70
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	49	943	469	0	167	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	31.4%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	
Traffic Volume (veh/h)	34	547	328	48	60	35
Future Volume (Veh/h)	34	547	328	48	60	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Hourly flow rate (vph)	49	943	373	96	97	70
Pedestrians			7		4	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked	0.98			0.98	0.98	
vC, conflicting volume	473			1002	238	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	411			953	171	
tC, single (s)	4.1			6.8	7.4	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.5	
p0 queue free %	96			60	91	
cM capacity (veh/h)	1127			241	754	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>EB 3</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>
Volume Total	49	472	472	249	220	167
Volume Left	49	0	0	0	0	97
Volume Right	0	0	0	0	96	70
eSH	1127	1700	1700	1700	1700	338
Volume to Capacity	0.04	0.28	0.28	0.15	0.13	0.49
Queue Length 95th (m)	1.1	0.0	0.0	0.0	0.0	20.9
Control Delay (s)	8.3	0.0	0.0	0.0	0.0	25.7
Lane LOS	A					D
Approach Delay (s)	0.4			0.0		25.7
Approach LOS						D
<b>Intersection Summary</b>						
Average Delay			2.9			
Intersection Capacity Utilization			31.4%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	5	4	26	16	1
Future Volume (vph)	0	5	4	26	16	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.882		0.988	
Fit Protected					0.956	
Satd. Flow (prot)	0	1710	1508	0	1241	0
Fit Permitted					0.956	
Satd. Flow (perm)	0	1710	1508	0	1241	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		60.5	89.6		37.6	
Travel Time (s)		4.4	6.5		2.7	
Confl. Peds. (#/hr)	6			6	1	
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	33%	0%
Adj. Flow (vph)	0	10	5	35	42	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	10	40	0	46	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 15.1%				ICU Level of Service A		
Analysis Period (min) 15						



HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	5	4	26	16	1
Future Volume (Veh/h)	0	5	4	26	16	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Hourly flow rate (vph)	0	10	5	35	42	4
Pedestrians			1		6	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	46				40	28
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	46				40	28
tC, single (s)	4.1				6.7	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1567				894	1047
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	10	40	46			
Volume Left	0	0	42			
Volume Right	0	35	4			
cSH	1567	1700	905			
Volume to Capacity	0.00	0.02	0.05			
Queue Length 95th (m)	0.0	0.0	1.3			
Control Delay (s)	0.0	0.0	9.2			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			4.4			
Intersection Capacity Utilization		15.1%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	78	755	167	36	55
Future Volume (vph)	1	78	755	167	36	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.972		0.918	
Fit Protected		0.999			0.981	
Satd. Flow (prot)	0	1673	1624	0	1540	0
Fit Permitted		0.999			0.981	
Satd. Flow (perm)	0	1673	1624	0	1540	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)	1			1	5	1
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Heavy Vehicles (%)	100%	0%	3%	0%	0%	0%
Adj. Flow (vph)	4	186	878	232	144	220
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	190	1110	0	364	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	24	14	24	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	68.4%			ICU Level of Service C		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	78	755	167	36	55
Future Volume (Veh/h)	1	78	755	167	36	55
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Hourly flow rate (vph)	4	186	878	232	144	220
Pedestrians		1	5		1	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	1111				1194	996
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1111				1194	996
tC, single (s)	5.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	3.1				3.5	3.3
p0 queue free %	99				30	26
cM capacity (veh/h)	374				205	299
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	190	1110	364			
Volume Left	4	0	144			
Volume Right	0	232	220			
eSH	374	1700	253			
Volume to Capacity	0.01	0.65	1.44			
Queue Length 95th (m)	0.3	0.0	164.3			
Control Delay (s)	0.5	0.0	255.8			
Lane LOS	A		F			
Approach Delay (s)	0.5	0.0	255.8			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			56.0			
Intersection Capacity Utilization			68.4%		ICU Level of Service	C
Analysis Period (min)			15			

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕↕	↕↕↕	
Traffic Volume (vph)	0	124	0	1858	1634	848
Future Volume (vph)	0	124	0	1858	1634	848
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)		3.6	3.5	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Frts		0.865			0.943	
Fit Protected						
Satd. Flow (prot)	0	1367	0	4363	4264	0
Fit Permitted						
Satd. Flow (perm)	0	1367	0	4363	4264	0
Link Speed (k/h)		50		50	50	
Link Distance (m)		145.7		270.2	51.4	
Travel Time (s)		10.5		19.5	3.7	
Confl. Peds. (#/hr)						11
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82
Heavy Vehicles (%)	0%	7%	0%	7%	4%	2%
Adj. Flow (vph)	0	230	0	2020	1685	1034
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	230	0	2020	2719	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment		Left Right		Left Left	Left Right	
Median Width(m)		0.0		3.3	3.3	
Link Offset(m)		0.0		0.0	0.0	
Crosswalk Width(m)		4.8		4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	71.7%			ICU Level of Service C		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Background 5 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations		↗		↖↖	↗↗		
Traffic Volume (veh/h)	0	124	0	1858	1634	848	
Future Volume (Veh/h)	0	124	0	1858	1634	848	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82	
Hourly flow rate (vph)	0	230	0	2020	1685	1034	
Pedestrians	11						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	1						
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.64	0.64	0.64				
vC, conflicting volume	2886	1090	2730				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1989	0	1746				
tC, single (s)	6.8	7.0	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	66	100				
cM capacity (veh/h)	35	680	232				
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	230	673	673	673	674	674	1371
Volume Left	0	0	0	0	0	0	0
Volume Right	230	0	0	0	0	0	1034
sSH	680	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.34	0.40	0.40	0.40	0.40	0.40	0.81
Queue Length 95th (m)	11.9	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	13.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	13.0	0.0			0.0		
Approach LOS	B						
<b>Intersection Summary</b>							
Average Delay			0.6				
Intersection Capacity Utilization			71.7%		ICU Level of Service		C
Analysis Period (min)			15				

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

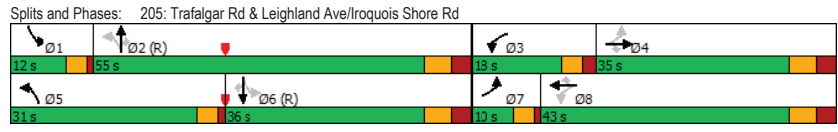
Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	24	177	372	399	66	167	189	949	887	163	917	27
Future Volume (vph)	24	177	372	399	66	167	189	949	887	163	917	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0		25.0	145.0		0.0	95.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	0.99					0.98			0.97	1.00		
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1693	1425	3060	1676	1398	1425	4446	1398	1562	4532	1398
Fit Permitted	0.711			0.347			0.180			0.223		
Satd. Flow (perm)	1205	1693	1425	1118	1676	1366	270	4446	1363	365	4532	1398
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			400			180		514				191
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.9			293.8			275.1				252.7
Travel Time (s)		20.6			21.2			19.8				18.2
Confl. Peds. (#/hr)	11					11			10		10	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Adj. Flow (vph)	26	190	400	429	71	180	203	1020	954	175	986	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	190	400	429	71	180	203	1020	954	175	986	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)				7.2					3.6			3.6
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4				9.4			9.4
Detector 2 Size(m)		0.6			0.6				0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0				0.0			0.0

Lanes, Volumes, Timings Background 5 Year  
 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	10.0	34.0	34.0	11.0	43.0	43.0	10.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	10.0	35.0	35.0	18.0	43.0	43.0	31.0	55.0	55.0	12.0	36.0	36.0
Total Split (%)	8.3%	29.2%	29.2%	15.0%	35.8%	35.8%	25.8%	45.8%	45.8%	10.0%	30.0%	30.0%
Maximum Green (s)	6.0	28.0	28.0	13.0	36.0	36.0	27.0	48.0	48.0	8.0	29.0	29.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	29.2	23.2	23.2	40.2	35.2	35.2	68.9	56.1	56.1	61.5	50.8	50.8
Actuated g/C Ratio	0.24	0.19	0.19	0.34	0.29	0.29	0.57	0.47	0.47	0.51	0.42	0.42
v/c Ratio	0.08	0.58	0.67	0.73	0.14	0.34	0.66	0.49	1.05	0.60	0.51	0.04
Control Delay	25.1	50.3	9.7	38.4	31.9	6.2	24.7	24.0	59.8	25.9	28.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	50.3	9.7	38.4	31.9	6.2	24.7	24.0	59.8	25.9	28.9	0.1
LOS	C	D	A	D	C	A	C	C	E	C	C	A
Approach Delay		22.9			29.2			39.7			27.8	
Approach LOS		C			C			D			C	

Intersection Summary	
Area Type:	CBD
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	33.6 (28%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	130
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.05
Intersection Signal Delay:	32.9
Intersection LOS:	C
Intersection Capacity Utilization:	92.4%
ICU Level of Service:	F
Analysis Period (min):	15



Queues Background 5 Year  
 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	26	190	400	429	71	180	203	1020	954	175	986	29
v/c Ratio	0.08	0.58	0.67	0.73	0.14	0.34	0.66	0.49	1.05	0.60	0.51	0.04
Control Delay	25.1	50.3	9.7	38.4	31.9	6.2	24.7	24.0	59.8	25.9	28.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	50.3	9.7	38.4	31.9	6.2	24.7	24.0	59.8	25.9	28.9	0.1
Queue Length 50th (m)	4.3	43.1	0.0	42.0	13.6	0.0	22.9	64.9	~186.3	19.1	64.5	0.0
Queue Length 95th (m)	9.8	62.9	27.3	51.2	24.0	16.3	45.5	82.1	#269.6	#54.2	99.4	0.0
Internal Link Dist (m)		261.9			269.8			251.1			228.7	
Turn Bay Length (m)	60.0			165.0		25.0	145.0			95.0		90.0
Base Capacity (vph)	314	437	664	585	544	565	419	2077	910	294	1919	701
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.43	0.60	0.73	0.13	0.32	0.48	0.49	1.05	0.60	0.51	0.04

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

HCM Signalized Intersection Capacity Analysis  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	24	177	372	399	66	167	189	949	887	163	917	27
Future Volume (vph)	24	177	372	399	66	167	189	949	887	163	917	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1613	1693	1425	3060	1676	1366	1425	4446	1363	1561	4532	1398
Fit Permitted	0.71	1.00	1.00	0.35	1.00	1.00	0.18	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	1207	1693	1425	1117	1676	1366	270	4446	1363	366	4532	1398
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	26	190	400	429	71	180	203	1020	954	175	986	29
RTOR Reduction (vph)	0	0	317	0	0	127	0	0	281	0	0	17
Lane Group Flow (vph)	26	190	83	429	71	53	203	1020	673	175	986	12
Confl. Peds. (#/hr)	11				11				10	10		
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	25.4	21.8	21.8	39.8	32.2	32.2	66.2	51.5	51.5	57.0	46.3	46.3
Effective Green, g (s)	25.4	24.8	24.8	39.8	35.2	35.2	66.2	54.5	54.5	57.0	49.3	49.3
Actuated g/C Ratio	0.21	0.21	0.21	0.33	0.29	0.29	0.55	0.45	0.45	0.48	0.41	0.41
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	4.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	267	349	294	580	491	400	301	2019	619	280	1861	574
v/s Ratio Prot	0.00	0.11		c0.08	0.04		c0.09	0.23		0.06	0.22	
v/s Ratio Perm	0.02		0.06	c0.16		0.04	0.28		c0.49	0.24		0.01
v/c Ratio	0.10	0.54	0.28	0.74	0.14	0.13	0.67	0.51	1.09	0.62	0.53	0.02
Uniform Delay, d1	37.9	42.6	40.1	32.0	31.3	31.2	16.6	23.2	32.8	19.1	26.6	21.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	2.2	0.7	4.9	0.2	0.2	5.9	0.9	62.4	4.3	1.1	0.1
Delay (s)	38.1	44.7	40.8	36.9	31.5	31.4	22.5	24.1	95.1	23.4	27.7	21.1
Level of Service	D	D	D	D	C	C	C	C	F	C	C	C
Approach Delay (s)		41.9			34.9			55.1			26.9	
Approach LOS		D			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
303: North Access & South Service Rd E

Background 5 Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	86	0	0	26	0	0
Future Volume (vph)	86	0	0	26	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	523.2			302.5	113.1	
Travel Time (s)	37.7			21.8	8.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	0	0	28	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	93	0	0	28	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization 7.9%	ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Background 5 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	86	0	0	26	0	0
Future Volume (Veh/h)	86	0	0	26	0	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)	93	0	0	28	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			93		121	93
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			93		121	93
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1501		874	964
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	93	28	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
sSH	1700	1501	1700			
Volume to Capacity	0.05	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS				A		
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS				A		
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			7.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Queuing and Blocking Report

Background 5 Year  
AM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	157.9	150.4	79.4	77.3	32.3	284.8	206.6	57.4	130.5	147.4	155.0
Average Queue (m)	121.5	148.3	87.7	67.3	39.4	21.6	200.2	56.5	42.7	91.5	107.9	148.4
95th Queue (m)	128.9	156.1	153.0	90.4	90.3	40.9	321.9	226.0	69.8	132.0	153.1	154.9
Link Distance (m)	123.0		123.0	51.4	51.4	313.2		313.2	128.0		128.0	128.0
Upstream Blk Time (%)	5	54	9	41	15	13		5	1		6	85
Queuing Penalty (veh)	0	311	53	235	85	0		0	5		31	469
Storage Bay Dist (m)	130.0					25.0						
Storage Blk Time (%)	5	54			7	82		5		36		
Queuing Penalty (veh)	23	242			18	57		14		65		

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	B34	SB	SB	SB	SB
Directions Served	T	T	T	L	T	T	TR
Maximum Queue (m)	101.6	110.1	135.6	32.4	244.6	236.6	242.3
Average Queue (m)	34.4	91.8	119.9	30.5	149.4	123.7	116.1
95th Queue (m)	100.3	126.3	159.1	39.7	283.1	255.7	222.4
Link Distance (m)	101.5	101.5	101.5	239.0		239.0	239.0
Upstream Blk Time (%)	0	3	58	11		2	0
Queuing Penalty (veh)	1	16	320	64		9	1
Storage Bay Dist (m)				25.0			
Storage Blk Time (%)				65		9	
Queuing Penalty (veh)				203		35	

Queuing and Blocking Report

Background 5 Year  
AM Peak Hour

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	B7	B7	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	27.4	234.5	240.3	27.4	81.9	61.2	34.0	8.9	75.4	85.2	22.4	193.2
Average Queue (m)	10.2	146.5	141.9	24.7	56.3	38.4	4.0	0.7	32.1	62.2	21.2	179.4
95th Queue (m)	28.6	270.3	277.7	32.2	85.1	64.5	22.3	9.2	71.7	101.5	26.0	201.6
Link Distance (m)		352.9	352.9		51.4	51.4	123.0	123.0	66.7	66.7		159.0
Upstream Blk Time (%)					23	2			6	44		86
Queuing Penalty (veh)					119	10			0	0		694
Storage Bay Dist (m)	20.0			20.0							15.0	
Storage Blk Time (%)	2	66		50	12						75	38
Queuing Penalty (veh)	5	28		205	15						481	128

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	B14
Directions Served	T
Maximum Queue (m)	164.4
Average Queue (m)	139.6
95th Queue (m)	226.3
Link Distance (m)	160.7
Upstream Blk Time (%)	48
Queuing Penalty (veh)	386
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	22.0	24.5	31.6	31.0	37.3	32.9	22.0	23.5	28.9	28.8
Average Queue (m)	8.5	18.4	20.9	15.5	6.3	9.3	8.1	8.1	11.4	12.3
95th Queue (m)	18.6	26.8	29.0	29.9	22.3	23.6	18.6	17.2	24.4	23.5
Link Distance (m)	21.8	21.8	21.8		352.9	352.9		54.8	56.7	56.7
Upstream Blk Time (%)	1	9	12							
Queuing Penalty (veh)	2	17	25							
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)				2	0		1	0		
Queuing Penalty (veh)				3	1		1	0		

Queuing and Blocking Report

Background 5 Year  
AM Peak Hour

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.7	87.4	279.4	277.1	85.9	133.1	139.4	32.3	210.5	215.8	71.7	80.4
Average Queue (m)	82.8	87.0	261.8	238.5	12.7	111.6	124.8	18.8	122.2	141.1	40.2	42.7
95th Queue (m)	87.6	88.4	328.4	338.8	48.5	155.6	150.1	37.0	247.0	257.1	65.2	71.1
Link Distance (m)			266.8	266.8		122.1	122.1		289.9	289.9		101.5
Upstream Blk Time (%)			76	8		15	74		2	3		0
Queuing Penalty (veh)			0	0		0	0		0	0		1
Storage Bay Dist (m)	80.0	80.0			80.0			25.0			80.0	
Storage Blk Time (%)	8	74	2		0	9		7	48		0	1
Queuing Penalty (veh)	23	210	8		0	2		18	30		0	3

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	72.2	39.1
Average Queue (m)	35.9	10.3
95th Queue (m)	65.7	24.9
Link Distance (m)	101.5	101.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	170.0	184.9	187.6	36.5	43.5	39.5	319.1	316.8	312.6
Average Queue (m)	44.8	155.1	180.9	28.2	30.2	30.1	293.1	305.8	304.7
95th Queue (m)	121.4	252.5	187.9	33.8	38.1	35.9	360.6	313.6	310.2
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	0	35	82	38	41	48	33	49	64
Queuing Penalty (veh)	0	0	0	234	253	295	271	398	520
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report

Background 5 Year  
AM Peak Hour

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	128.4	178.9	183.6	183.4	88.9	133.8	156.4	259.6	265.8	259.3	271.6
Average Queue (m)	106.1	129.0	146.1	82.4	35.1	48.5	82.5	252.2	254.1	251.8	258.9
95th Queue (m)	146.4	216.3	220.0	224.2	72.2	104.5	142.4	257.4	261.9	257.9	329.8
Link Distance (m)	117.8	171.3	171.3	171.3	299.7	299.7	299.7	249.2	249.2	249.2	249.2
Upstream Blk Time (%)	52	24	55	24				63	70	71	93
Queuing Penalty (veh)	0	0	0	0				266	294	302	393
Storage Bay Dist (m)											
Storage Blk Time (%)	86										
Queuing Penalty (veh)	1										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	162.5	150.5	132.0	57.4	58.4	129.7	117.9
Average Queue (m)	98.7	96.6	74.1	29.8	29.7	88.4	76.8
95th Queue (m)	141.5	136.3	117.6	51.9	52.2	118.0	109.3
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	73.2	90.1	77.0	73.5	58.4	111.9	110.0
Average Queue (m)	27.6	59.1	48.5	39.6	20.4	65.0	71.7
95th Queue (m)	64.6	80.8	71.9	63.5	46.7	101.8	104.9
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Background 5 Year  
AM Peak Hour

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	40.4	30.2	35.6	14.4	44.4	31.1
Average Queue (m)	24.1	8.2	17.1	4.3	22.5	16.2
95th Queue (m)	38.1	20.4	28.6	12.2	37.4	26.3
Link Distance (m)	121.6	121.6	175.0	175.0	246.4	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	4.5	15.6	45.8	37.6	24.7	40.5	36.3	5.5	6.0	11.3	7.6	16.9
Average Queue (m)	0.1	4.7	17.1	8.5	7.4	14.0	6.8	0.3	0.4	1.5	1.1	4.3
95th Queue (m)	1.9	11.5	39.0	25.0	17.3	33.5	22.5	3.0	2.9	7.0	4.9	12.0
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0			70.0	15.0			
Storage Blk Time (%)											1	
Queuing Penalty (veh)											0	

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	SB
Directions Served	R
Maximum Queue (m)	1.5
Average Queue (m)	0.0
95th Queue (m)	1.0
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	
Queuing Penalty (veh)	



Queuing and Blocking Report

Background 5 Year  
AM Peak Hour

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	9.9	8.6	76.1	5.1	5.5	23.4
Average Queue (m)	1.8	0.5	22.3	0.2	0.3	12.1
95th Queue (m)	7.9	4.1	55.9	2.5	3.0	20.4
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)						2
Queuing Penalty (veh)						0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	1	0				
Queuing Penalty (veh)	2	0				

Intersection: 202: Lyons Lane & South Service Rd E

Movement	SB
Directions Served	LR
Maximum Queue (m)	19.3
Average Queue (m)	3.7
95th Queue (m)	14.1
Link Distance (m)	21.6
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 203: Argus Rd & South Service Rd E

Movement	EB	WB	SB	B17	B18
Directions Served	LT	TR	LR	T	T
Maximum Queue (m)	4.8	119.5	93.5	22.3	20.6
Average Queue (m)	0.2	87.4	43.7	4.8	2.8
95th Queue (m)	2.8	165.2	96.7	27.9	24.5
Link Distance (m)	160.7	112.3	88.3	39.8	290.0
Upstream Blk Time (%)		42	13	6	
Queuing Penalty (veh)		355	12	5	
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report

Background 5 Year  
AM Peak Hour

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	70.6	79.8	94.3	110.1	23.5	31.7	38.0
Average Queue (m)	19.9	43.9	54.5	64.1	6.3	10.1	22.7
95th Queue (m)	58.5	75.1	84.7	95.7	25.3	31.0	42.6
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)	1				5	0	33
Queuing Penalty (veh)	2				44	4	269
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	L	L	T	R	L	T	T	R
Maximum Queue (m)	11.7	271.4	272.3	172.4	284.9	282.2	32.5	59.4	60.8	134.4	257.9
Average Queue (m)	1.7	200.1	234.8	150.8	241.0	206.3	10.0	22.2	19.3	25.9	37.4
95th Queue (m)	7.5	372.7	357.1	208.2	357.1	396.3	27.8	48.9	50.5	77.7	129.2
Link Distance (m)		265.0	265.0		273.8	273.8		249.2	249.2	249.2	249.2
Upstream Blk Time (%)		56	76		71	61				0	0
Queuing Penalty (veh)		0	0		0	0				0	1
Storage Bay Dist (m)	60.0			165.0			25.0	145.0			
Storage Blk Time (%)		0		35	78	2	2				
Queuing Penalty (veh)		0		70	156	3	1				

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	R
Maximum Queue (m)	102.4	251.4	250.8	248.0	97.5
Average Queue (m)	52.9	217.3	216.2	212.9	14.7
95th Queue (m)	134.2	307.0	307.8	310.0	71.5
Link Distance (m)		234.2	234.2	234.2	
Upstream Blk Time (%)		73	72	72	
Queuing Penalty (veh)		0	0	0	
Storage Bay Dist (m)	95.0				90.0
Storage Blk Time (%)	0	86		89	0
Queuing Penalty (veh)	0	141		24	0

Queuing and Blocking Report

Background 5 Year  
AM Peak Hour

Intersection: 303: North Access & South Service Rd E

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 8989

Lanes, Volumes, Timings

Background 5 Year  
PM Peak Hour

101: Trafalgar Rd & Cross Ave/South Service Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1253	266	203	233	286	314	268	1550	122	167	1379	566
Future Volume (vph)	1253	266	203	233	286	314	268	1550	122	167	1379	566
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.98		0.99				0.97			0.98	
Frt		0.939				0.850		0.985			0.958	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2958	1453	0	1540	1644	1423	1496	4428	0	1570	4337	0
Fit Permitted	0.950			0.430			0.087			0.095		
Satd. Flow (perm)	2958	1453	0	687	1644	1423	137	4428	0	157	4337	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		35				117		15		75		
Link Speed (k/h)		50			50			50		50		
Link Distance (m)		151.2			330.4			150.2		270.2		
Travel Time (s)		10.9			23.8			10.8		19.5		
Confl. Peds. (#/hr)			15	15			18		70	70		18
Peak Hour Factor	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%
Adj. Flow (vph)	1492	369	251	284	353	383	315	1685	185	186	1549	609
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1492	620	0	284	353	383	315	1870	0	186	2158	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
101: Trafalgar Rd & Cross Ave/South Service Rd

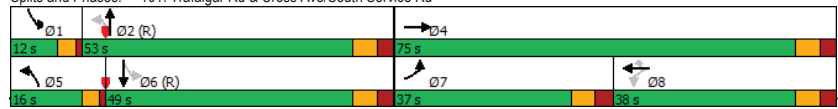
Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		25.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	37.0	75.0		38.0	38.0	38.0	16.0	53.0		12.0	49.0	
Total Split (%)	26.4%	53.6%		27.1%	27.1%	27.1%	11.4%	37.9%		8.6%	35.0%	
Maximum Green (s)	30.0	68.0		31.0	31.0	31.0	12.0	46.0		8.0	42.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	C-Max			Min	C-Max	
Walk Time (s)		7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0	0	0		0			0	
Act Effct Green (s)	33.0	71.0		31.0	34.0	34.0	61.0	49.0		53.0	45.0	
Actuated g/C Ratio	0.24	0.51		0.22	0.24	0.24	0.44	0.35		0.38	0.32	
v/c Ratio	2.14	0.82		1.87	0.88	0.88	1.79	1.20		1.33	1.49	
Control Delay	544.7	38.2		445.3	75.2	57.6	384.9	135.4		209.9	261.8	
Queue Delay	0.0	2.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	544.7	40.2		445.3	75.2	57.6	384.9	135.4		209.9	261.8	
LOS	F	D		F	E	E	F	F		F	F	
Approach Delay		396.6			171.6			171.4			257.7	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	128 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	140
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	2.14
Intersection Signal Delay:	259.9
Intersection LOS:	F
Intersection Capacity Utilization:	130.4%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 101: Trafalgar Rd & Cross Ave/South Service Rd



Queues  
101: Trafalgar Rd & Cross Ave/South Service Rd

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1492	620	284	353	383	315	1870	186	2158
v/c Ratio	2.14	0.82	1.87	0.88	0.88	1.79	1.20	1.33	1.49
Control Delay	544.7	38.2	445.3	75.2	57.6	384.9	135.4	209.9	261.8
Queue Delay	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	544.7	40.2	445.3	75.2	57.6	384.9	135.4	209.9	261.8
Queue Length 50th (m)	~356.3	142.1	~125.7	99.9	78.8	~123.2	~238.8	~55.4	~310.6
Queue Length 95th (m)	#366.3	132.5	#165.1	#129.0	#112.2	m#95.4	m146.6	m#71.5	#335.1
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	697	754	152	399	434	176	1559	140	1444
Starvation Cap Reductn	0	50	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	2.14	0.88	1.87	0.88	0.88	1.79	1.20	1.33	1.49

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
101: Trafalgar Rd & Cross Ave/South Service Rd

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	1253	266	203	233	286	314	268	1550	122	167	1379	566	
Future Volume (vph)	1253	266	203	233	286	314	268	1550	122	167	1379	566	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6	
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0		
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91		
Frbp, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	0.97		1.00	0.98		
Ftp, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00		1.00	1.00		
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	0.96		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	2958	1454		1517	1644	1423	1496	4429		1570	4336		
Flt Permitted	0.95	1.00		0.43	1.00	1.00	0.09	1.00		0.10	1.00		
Satd. Flow (perm)	2958	1454		686	1644	1423	137	4429		157	4336		
Peak-hour factor, PHF	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93	
Adj. Flow (vph)	1492	369	251	284	353	383	315	1685	185	186	1549	609	
RTOR Reduction (vph)	0	17	0	0	0	89	0	10	0	0	51	0	
Lane Group Flow (vph)	1492	603	0	284	353	294	315	1860	0	186	2107	0	
Confl. Peds. (#/hr)			15	15			18		70	70		18	
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%	
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA		
Protected Phases	7	4		8	8	5	2	1		6	6		
Permitted Phases			8		8	2		6					
Actuated Green, G (s)	30.0	68.0		31.0	31.0	31.0	58.0	46.0		50.0	42.0		
Effective Green, g (s)	33.0	71.0		31.0	34.0	34.0	58.0	49.0		50.0	45.0		
Actuated g/C Ratio	0.24	0.51		0.22	0.24	0.24	0.41	0.35		0.36	0.32		
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	4.0	7.0		4.0	7.0		
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0	5.0		
Lane Grp Cap (vph)	697	737		151	399	345	173	1550		136	1393		
v/s Ratio Prot	c0.50	0.41		0.21			c0.16	0.42		0.08	0.49		
v/s Ratio Perm			c0.41		0.21		c0.60			0.41			
v/c Ratio	2.14	0.82		1.88	0.88	0.85	1.82	1.20		1.37	1.51		
Uniform Delay, d1	53.5	29.1		54.5	51.1	50.6	40.6	45.5		39.0	47.5		
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.19	1.17		1.47	1.18		
Incremental Delay, d2	518.1	7.4		420.4	20.6	18.7	371.4	90.7		191.9	233.0		
Delay (s)	571.6	36.4		474.9	71.7	69.3	419.6	144.0		249.1	288.9		
Level of Service	F	D		F	E	E	F	F		F	F		
Approach Delay (s)	414.5			183.1			183.8			285.7			
Approach LOS	F			F			F			F			
<b>Intersection Summary</b>													
HCM 2000 Control Delay		278.5		HCM 2000 Level of Service				F					
HCM 2000 Volume to Capacity ratio		1.87											
Actuated Cycle Length (s)		140.0		Sum of lost time (s)				16.0					
Intersection Capacity Utilization		130.4%		ICU Level of Service				H					
Analysis Period (min)		15											
c Critical Lane Group													

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	48	1135	45	119	532	138	92	2	108	292	23	236
Future Volume (vph)	48	1135	45	119	532	138	92	2	108	292	23	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95		0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99	0.95	0.99	0.97		0.98	0.98	
Frt		0.994			0.965			0.857			0.864	
Flt Protected	0.950			0.950		0.950				0.950		
Satd. Flow (prot)	1570	3099		797	3108	0	785	708		1570	1320	0
Flt Permitted	0.374			0.092		0.357				0.594		
Satd. Flow (perm)	614	3099		0	77	3108	0	293	708	0	965	1320
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			79			139			303	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		374.0			72.9			81.9			180.7	
Travel Time (s)		26.9			5.2			5.9			13.0	
Confl. Peds. (#/hr)	9		4	4		9	12		20	20		12
Peak Hour Factor	0.66	0.81		0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	100%	0%	100%
Adj. Flow (vph)	73	1401		60	127	560	170	131	8	161	340	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	1461		0	127	730	0	131	169	0	340	334
Enter Blocked Intersection	No	No		No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left		Right	Left	Left	Right	Left	Left	Right	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14		1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14
Turning Speed (k/h)	24			14	24		14	24		14	24	14
Number of Detectors	1	2			1	2		1	2		1	2
Detector Template	Left	Thru			Left	Thru		Left	Thru		Left	Thru
Leading Detector (m)	2.0	10.0			2.0	10.0		2.0	10.0		2.0	10.0
Trailing Detector (m)	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6			2.0	0.6		2.0	0.6		2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4				9.4			9.4			9.4
Detector 2 Size(m)		0.6				0.6			0.6			0.6
Detector 2 Type		Cl+Ex				Cl+Ex			Cl+Ex			Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

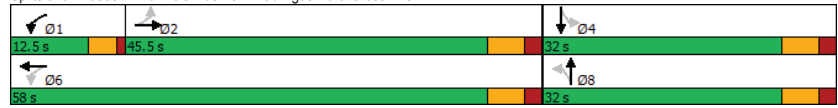
Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	45.5	45.5		12.5	58.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.6%	50.6%		13.9%	64.4%		35.6%	35.6%		35.6%	35.6%	
Maximum Green (s)	39.5	39.5		8.5	52.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	41.5	41.5		54.0	54.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.46	0.46		0.60	0.60		0.31	0.31		0.31	0.31	
v/c Ratio	0.26	1.02		1.11	0.39		1.44	0.53		1.13	0.54	
Control Delay	18.0	54.4		143.7	8.9		278.3	13.7		124.7	7.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.0	54.4		143.7	8.9		278.3	13.7		124.7	7.8	
LOS	B	D		F	A		F	B		F	A	
Approach Delay		52.7			28.9			129.2			66.8	
Approach LOS		D			C			F			E	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	90
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.44
Intersection Signal Delay:	56.3
Intersection LOS:	E
Intersection Capacity Utilization:	89.3%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 102: GO Bus Terminal/Argus Rd & Cross Ave



Queues  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	1461	127	730	131	169	340	334
v/c Ratio	0.26	1.02	1.11	0.39	1.44	0.53	1.13	0.54
Control Delay	18.0	54.4	143.7	8.9	278.3	13.7	124.7	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	54.4	143.7	8.9	278.3	13.7	124.7	7.8
Queue Length 50th (m)	7.8	~142.7	~19.1	29.1	~32.7	3.9	~72.6	4.0
Queue Length 95th (m)	12.2	#159.0	#55.5	40.5	#49.5	0.0	#117.8	12.0
Internal Link Dist (m)		350.0		48.9		57.9		156.7
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	283	1432	114	1896	91	316	300	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	1.02	1.11	0.39	1.44	0.53	1.13	0.54

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	48	1135	45	119	532	138	92	2	108	292	23	236
Future Volume (vph)	48	1135	45	119	532	138	92	2	108	292	23	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.98	
Fipb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.86		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1560	3098		797	3108		780	708		1543	1320	
Flt Permitted	0.37	1.00		0.09	1.00		0.36	1.00		0.59	1.00	
Satd. Flow (perm)	615	3098		77	3108		293	708		965	1320	
Peak-hour factor, PHF	0.66	0.81	0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75	0.78
Adj. Flow (vph)	73	1401	60	127	560	170	131	8	161	340	31	303
RTOR Reduction (vph)	0	3	0	0	32	0	0	96	0	0	209	0
Lane Group Flow (vph)	73	1458	0	127	698	0	131	73	0	340	125	0
Confl. Peds. (#/hr)	9		4	4		9	12		20	20		12
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	0%	100%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	6		8	8		4	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	39.5	39.5		52.0	52.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)	41.5	41.5		52.0	54.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.46	0.46		0.58	0.60		0.31	0.31		0.31	0.31	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	283	1428		112	1864		91	220		300	410	
v/s Ratio Prot		0.47		c0.11	0.22			0.10			0.09	
v/s Ratio Perm	0.12			c0.54			c0.45			0.35		
v/c Ratio	0.26	1.02		1.13	0.37		1.44	0.33		1.13	0.31	
Uniform Delay, d1	14.8	24.2		25.4	9.3		31.0	23.8		31.0	23.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	29.2		125.6	0.3		249.2	1.2		92.9	0.6	
Delay (s)	15.8	53.5		151.0	9.6		280.2	25.0		123.9	24.2	
Level of Service	B	D		F	A		F	C		F	C	
Approach Delay (s)		51.7			30.5			136.5			74.5	
Approach LOS		D			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	58.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	30	269	8	24	509	47	257	4	233	32	2	71
Future Volume (vph)	30	269	8	24	509	47	257	4	233	32	2	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0	0.0	25.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.98	1.00	1.00	0.99	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Frt		0.995			0.979			0.856			0.855	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1525	2920	0	1570	3038	0	1570	1440	0	1570	1416	0
Flt Permitted	0.416			0.475			0.675			0.429		
Satd. Flow (perm)	666	2920	0	784	3038	0	1115	1440	0	707	1416	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			32			295			118	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		40.1			374.0			69.1			70.9	
Travel Time (s)		2.9			26.9			5.0			5.1	
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1
Peak Hour Factor	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	52	320	11	44	536	85	347	12	295	46	4	118
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	331	0	44	621	0	347	307	0	46	122	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

Background 5 Year

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.5	41.5		12.5	54.0		36.0	36.0		36.0	36.0	
Total Split (%)	46.1%	46.1%		13.9%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	35.5	35.5		8.5	48.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.0	37.0		49.1	49.1		30.6	30.6		30.6	30.6	
Actuated g/C Ratio	0.42	0.42		0.56	0.56		0.35	0.35		0.35	0.35	
v/c Ratio	0.19	0.27		0.09	0.36		0.89	0.44		0.19	0.21	
Control Delay	18.8	17.3		9.8	11.1		54.2	5.2		22.1	5.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.8	17.3		9.8	11.1		54.2	5.2		22.1	5.3	
LOS	B	B		A	B		D	A		C	A	
Approach Delay		17.5			11.0			31.2			9.9	
Approach LOS		B			B			C			A	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	87.7
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.89
Intersection Signal Delay:	19.3
Intersection LOS:	B
Intersection Capacity Utilization:	64.4%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 103: Lyons Lane/Commercial Driveway & Cross Ave



Queues

103: Lyons Lane/Commercial Driveway & Cross Ave

Background 5 Year

PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	331	44	621	347	307	46	122
v/c Ratio	0.19	0.27	0.09	0.36	0.89	0.44	0.19	0.21
Control Delay	18.8	17.3	9.8	11.1	54.2	5.2	22.1	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	17.3	9.8	11.1	54.2	5.2	22.1	5.3
Queue Length 50th (m)	5.8	19.7	3.4	29.2	57.1	1.4	5.6	0.5
Queue Length 95th (m)	8.5	27.3	4.8	40.7	#71.1	0.0	10.5	0.1
Internal Link Dist (m)		16.1		350.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	285	1253	514	1747	407	713	258	592
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.26	0.09	0.36	0.85	0.43	0.18	0.21

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
103: Lyons Lane/Commercial Driveway & Cross Ave

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕		↔	↕		↔	↕	
Traffic Volume (vph)	30	269	8	24	509	47	257	4	233	32	2	71
Future Volume (vph)	30	269	8	24	509	47	257	4	233	32	2	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Fpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.86		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1521	2920		1570	3040		1569	1440		1566	1416	
Flt Permitted	0.42	1.00		0.48	1.00		0.68	1.00		0.43	1.00	
Satd. Flow (perm)	667	2920		785	3040		1115	1440		707	1416	
Peak-hour factor, PHF	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60
Adj. Flow (vph)	52	320	11	44	536	85	347	12	295	46	4	118
RTOR Reduction (vph)	0	3	0	0	14	0	0	192	0	0	77	0
Lane Group Flow (vph)	52	328	0	44	607	0	347	115	0	46	45	0
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	6		8	8		4	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		47.0	47.0		28.6	28.6		28.6	28.6	
Effective Green, g (s)	37.0	37.0		47.0	49.0		30.6	30.6		30.6	30.6	
Actuated g/C Ratio	0.42	0.42		0.54	0.56		0.35	0.35		0.35	0.35	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	281	1233		492	1700		389	503		246	494	
v/s Ratio Prot		0.11		0.01	c0.20			0.08			0.03	
v/s Ratio Perm	0.08			0.04			c0.31			0.07		
v/c Ratio	0.19	0.27		0.09	0.36		0.89	0.23		0.19	0.09	
Uniform Delay, d1	15.9	16.5		9.9	10.6		26.9	20.2		19.8	19.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.2		0.1	0.3		22.2	0.3		0.5	0.1	
Delay (s)	16.5	16.7		9.9	10.9		49.1	20.5		20.3	19.3	
Level of Service	B	B		A	B		D	C		C	B	
Approach Delay (s)	16.7			10.8			35.7			19.6		
Approach LOS	B			B			D			B		
<b>Intersection Summary</b>												
HCM 2000 Control Delay		21.5										C
HCM 2000 Volume to Capacity ratio		0.59										
Actuated Cycle Length (s)		87.6			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		64.4%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕		↔	↕		↔	↕	
Traffic Volume (vph)	532	691	224	67	941	690	164	522	51	620	702	539
Future Volume (vph)	532	691	224	67	941	690	164	522	51	620	702	539
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0		0.0	80.0		0.0	25.0		0.0	80.0		0.0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00
Ped Bike Factor	1.00	0.99		0.99	0.98		0.99	1.00		0.99	1.00	0.97
Frt		0.960			0.941			0.984				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3016	3002	0	1570	2978	0	1540	3189	0	2987	1710	1409
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3010	3002	0	1559	2978	0	1528	3189	0	2960	1710	1361
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		43			121			9				178
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.8			142.3			311.4				130.3
Travel Time (s)		20.6			10.2			22.4				9.4
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Peak Hour Factor	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Adj. Flow (vph)	598	823	295	80	1134	742	184	580	68	795	798	613
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	598	1118	0	80	1876	0	184	648	0	795	798	613
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	6.6				6.6			6.6				6.6
Link Offset(m)	0.0				0.0			0.0				0.0
Crosswalk Width(m)	4.8				4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
<b>Detector 2 Channel</b>												

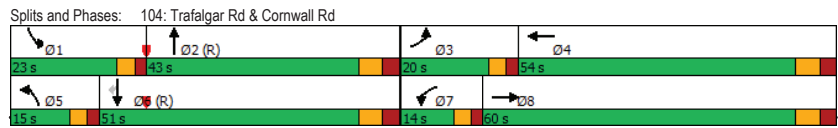


Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	20.0	60.0		14.0	54.0		15.0	43.0		23.0	51.0	51.0
Total Split (%)	14.3%	42.9%		10.0%	38.6%		10.7%	30.7%		16.4%	36.4%	36.4%
Maximum Green (s)	15.0	53.0		9.0	47.0		10.0	36.0		18.0	44.0	44.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	16.0	56.0		10.0	50.0		11.0	39.0		19.0	47.0	47.0
Actuated g/C Ratio	0.11	0.40		0.07	0.36		0.08	0.28		0.14	0.34	0.34
v/c Ratio	1.74	0.91		0.71	1.64		1.52	0.72		1.96	1.39	1.07
Control Delay	379.3	50.1		95.9	323.0		313.0	50.5		468.9	207.9	58.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	379.3	50.1		95.9	323.0		313.0	50.5		468.9	207.9	58.0
LOS	F	D		F	F		F	D		F	F	E
Approach Delay		164.9			313.7			108.5			260.3	
Approach LOS		F			F			F			F	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.96  
 Intersection Signal Delay: 232.7      Intersection LOS: F  
 Intersection Capacity Utilization 135.7%      ICU Level of Service H  
 Analysis Period (min) 15



Queues  
104: Trafalgar Rd & Cornwall Rd

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	598	1118	80	1876	184	648	795	798	613
v/c Ratio	1.74	0.91	0.71	1.64	1.52	0.72	1.96	1.39	1.07
Control Delay	379.3	50.1	95.9	323.0	313.0	50.5	468.9	207.9	58.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	379.3	50.1	95.9	323.0	313.0	50.5	468.9	207.9	58.0
Queue Length 50th (m)	~132.6	155.8	23.2	~406.0	~74.7	89.0	~190.0	~303.3	~77.2
Queue Length 95th (m)	#168.8	168.7	#44.7	#399.9	#123.1	112.1 m	#116.0 m	#138.5	m37.9
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	344	1226	112	1141	121	894	405	574	575
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.74	0.91	0.71	1.64	1.52	0.72	1.96	1.39	1.07

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

HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕		↔	↕		↔	↕	↔
Traffic Volume (vph)	532	691	224	67	941	690	164	522	51	620	702	539
Future Volume (vph)	532	691	224	67	941	690	164	522	51	620	702	539
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		0.97	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00		1.00	1.00	0.97
Fipb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.94		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)	3016	3003		1570	2977		1540	3190		2987	1710	1361
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3016	3003		1570	2977		1540	3190		2987	1710	1361
Peak-hour factor, PHF	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Adj. Flow (vph)	598	823	295	80	1134	742	184	580	68	795	798	612
RTOR Reduction (vph)	0	26	0	0	78	0	0	6	0	0	0	118
Lane Group Flow (vph)	598	1092	0	80	1798	0	184	642	0	795	798	495
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	15.0	53.0		9.0	47.0		10.0	36.0		18.0	44.0	44.0
Effective Green, g (s)	16.0	56.0		10.0	50.0		11.0	39.0		19.0	47.0	47.0
Actuated g/C Ratio	0.11	0.40		0.07	0.36		0.08	0.28		0.14	0.34	0.34
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	344	1201		112	1063		121	888		405	574	456
v/s Ratio Prot	c0.20	0.36		0.05	c0.60		0.12	0.20		c0.27	c0.47	
v/s Ratio Perm												0.36
v/c Ratio	1.74	0.91		0.71	1.69		1.52	0.72		1.96	1.39	1.08
Uniform Delay, d1	62.0	39.6		63.6	45.0		64.5	45.6		60.5	46.5	46.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.26	0.80	0.71
Incremental Delay, d2	344.2	11.7		32.1	315.3		271.8	5.1		434.1	176.6	42.3
Delay (s)	406.2	51.3		95.7	360.3		336.3	50.7		510.3	213.7	75.4
Level of Service	F	D		F	F		F	D		F	F	E
Approach Delay (s)		175.0			349.5			113.8			282.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	253.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.67		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	135.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 5 Year  
PM Peak Hour

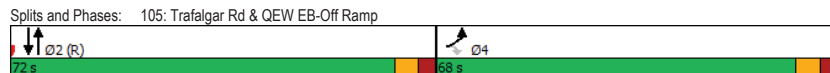
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↕		↕	↕	
Traffic Volume (vph)	987	562	0	1955	1962	0
Future Volume (vph)	987	562	0	1955	1962	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor		0.99				
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3046	1423	0	4577	4577	0
Flt Permitted	0.950					
Satd. Flow (perm)	3046	1402	0	4577	4577	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		3				
Link Speed (k/h)	50			50	50	
Link Distance (m)	199.2			51.4	324.8	
Travel Time (s)	14.3			3.7	23.4	
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.87	0.93	0.25	0.97	0.94	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Adj. Flow (vph)	1134	604	0	2015	2087	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1134	604	0	2015	2087	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	68.0	68.0		72.0	72.0	
Total Split (%)	48.6%	48.6%		51.4%	51.4%	
Maximum Green (s)	61.0	61.0		65.0	65.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	63.1	63.1		68.9	68.9	
Actuated g/C Ratio	0.45	0.45		0.49	0.49	
v/c Ratio	0.83	0.95		0.90	0.93	
Control Delay	39.7	63.1		36.7	28.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	39.7	63.1		36.7	28.3	
LOS	D	E		D	C	
Approach Delay	47.8			36.7	28.3	
Approach LOS	D			D	C	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 133.6 (95%), Referenced to phase 2:NBSB and 6:, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 37.0 Intersection LOS: D  
 Intersection Capacity Utilization 87.7% ICU Level of Service E  
 Analysis Period (min) 15



Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1134	604	2015	2087
v/c Ratio	0.83	0.95	0.90	0.93
Control Delay	39.7	63.1	36.7	28.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.7	63.1	36.7	28.3
Queue Length 50th (m)	144.8	164.3	179.1	177.7
Queue Length 95th (m)	165.7	#246.2	m87.1	m210.1
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1392	642	2251	2251
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.81	0.94	0.90	0.93

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

HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 5 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔		↕	↕	
Traffic Volume (vph)	987	562	0	1955	1962	0
Future Volume (vph)	987	562	0	1955	1962	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Fr t	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3046	1402		4577	4577	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3046	1402		4577	4577	
Peak-hour factor, PHF	0.87	0.93	0.25	0.97	0.94	0.25
Adj. Flow (vph)	1134	604	0	2015	2087	0
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	1134	602	0	2015	2087	0
Confl. Peds. (#/hr)		2				
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	60.1	60.1		65.9	65.9	
Effective Green, g (s)	63.1	63.1		68.9	68.9	
Actuated g/C Ratio	0.45	0.45		0.49	0.49	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1372	631		2252	2252	
v/s Ratio Prot	0.37			0.44	0.46	
v/s Ratio Perm		c0.43				
v/c Ratio	0.83	0.95		0.89	0.93	
Uniform Delay, d1	33.7	37.1		32.3	33.2	
Progression Factor	1.00	1.00		1.10	0.72	
Incremental Delay, d2	4.2	24.9		0.6	3.9	
Delay (s)	37.9	61.9		36.1	27.7	
Level of Service	D	E		D	C	
Approach Delay (s)	46.2			36.1	27.7	
Approach LOS	D			D	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			36.1			HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.94			
Actuated Cycle Length (s)			140.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			87.7%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔		↕	↕		↕	↕
Traffic Volume (vph)	23	0	228	590	105	213	0	2516	0	0	1815	12
Future Volume (vph)	23	0	228	590	105	213	0	2516	0	0	1815	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	1.00					0.99						0.95
Fr t			0.850			0.850						0.850
Flt Protected	0.950			0.950	0.968							
Satd. Flow (prot)	1570	0	1437	1463	1547	1409	0	4577	0	0	3795	1437
Flt Permitted	0.950			0.950	0.968							
Satd. Flow (perm)	1568	0	1437	1463	1547	1389	0	4577	0	0	3795	1359
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			31			157						70
Link Speed (k/h)		50			50			50				50
Link Distance (m)		142.1			192.6			324.8				280.4
Travel Time (s)		10.2			13.9			23.4				20.2
Confl. Peds. (#/hr)	2					2	14		14	14		14
Peak Hour Factor	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Adj. Flow (vph)	38	0	240	702	148	263	0	2677	0	0	1891	19
Shared Lane Traffic (%)				40%								
Lane Group Flow (vph)	38	0	240	421	429	263	0	2677	0	0	1891	19
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1		1		2		2		1
Detector Template	Left		Right	Left	Thru	Right		Thru		Thru		Right
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0		10.0		2.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6		0.6		2.0
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 5 Year

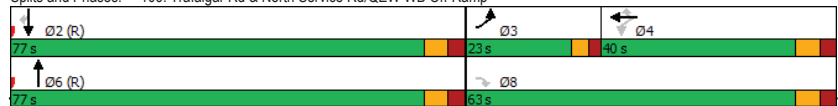
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Perm		Perm		NA		NA	NA	Perm
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Detector Phase	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		63.0	40.0	40.0	40.0		77.0			77.0	77.0
Total Split (%)	16.4%		45.0%	28.6%	28.6%	28.6%		55.0%			55.0%	55.0%
Maximum Green (s)	18.0		56.0	33.0	33.0	33.0		70.0			70.0	70.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)			7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (#/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	10.1		59.0	44.9	44.9	44.9		73.0			73.0	73.0
Actuated g/C Ratio	0.07		0.42	0.32	0.32	0.32		0.52			0.52	0.52
v/c Ratio	0.34		0.39	0.90	0.87	0.48		1.12			0.96	0.03
Control Delay	69.0		26.3	68.8	63.7	18.3		89.3			44.4	0.1
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	69.0		26.3	68.8	63.7	18.3		89.3			44.4	0.1
LOS	E		C	E	E	B		F			D	A
Approach Delay		32.1				54.9		89.3			44.0	
Approach LOS		C				D		F			D	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.12  
 Intersection Signal Delay: 65.8  
 Intersection LOS: E  
 Intersection Capacity Utilization 88.6%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 5 Year

PM Peak Hour

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	38	240	421	429	263	2677	1891	19
v/c Ratio	0.34	0.39	0.90	0.87	0.48	1.12	0.96	0.03
Control Delay	69.0	26.3	68.8	63.7	18.3	89.3	44.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.0	26.3	68.8	63.7	18.3	89.3	44.4	0.1
Queue Length 50th (m)	10.8	41.3	122.8	123.2	23.2	~326.0	187.2	0.0
Queue Length 95th (m)	15.0	64.7	#177.6	127.2	41.4	#353.9	#230.2	0.0
Internal Link Dist (m)				168.6		300.8	256.4	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	623	468	495	551	2386	1978	742
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.39	0.90	0.87	0.48	1.12	0.96	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	0	228	590	105	213	0	2516	0	0	1815	12
Future Volume (vph)	23	0	228	590	105	213	0	2516	0	0	1815	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.91	0.91	0.91	1.00	0.91	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1570	1437	1463	1547	1389	4577	3795	1359	3344	1455	3574	0
Flt Permitted	0.95	1.00	0.95	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1570	1437	1463	1547	1389	4577	3795	1359	3344	1455	3574	0
Peak-hour factor, PHF	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Adj. Flow (vph)	38	0	240	702	148	263	0	2677	0	0	1891	19
RTOR Reduction (vph)	0	0	18	0	0	107	0	0	0	0	0	9
Lane Group Flow (vph)	38	0	222	421	429	156	0	2677	0	0	1891	10
Confl. Peds. (#/hr)	2					2	14		14	14		14
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Turn Type	Prot	Perm	Perm	NA	Perm	NA	NA	NA	NA	NA	Perm	Perm
Protected Phases	3			4		6		2				
Permitted Phases		8	4		4							2
Actuated Green, G (s)	9.1	56.0	41.9	41.9	41.9	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Effective Green, g (s)	10.1	59.0	44.9	44.9	44.9	73.0	73.0	73.0	73.0	73.0	73.0	73.0
Actuated g/C Ratio	0.07	0.42	0.32	0.32	0.32	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Clearance Time (s)	5.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)	113	605	469	496	445	2386	1978	708				
v/s Ratio Prot	0.02					0.58		0.50				
v/s Ratio Perm		0.15	0.29	0.28	0.11							0.01
v/c Ratio	0.34	0.37	0.90	0.86	0.35	1.12	0.96	0.01				
Uniform Delay, d1	61.8	27.7	45.4	44.7	36.4	33.5	32.0	16.1				
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00				
Incremental Delay, d2	1.8	0.4	19.5	14.5	0.5	58.0	12.2	0.0				
Delay (s)	63.5	28.1	64.8	59.2	36.9	90.1	44.2	16.2				
Level of Service	E	C	E	E	D	F	D	B				
Approach Delay (s)	32.9			56.1		90.1		43.9				
Approach LOS	C			E		F		D				
<b>Intersection Summary</b>												
HCM 2000 Control Delay	66.4			HCM 2000 Level of Service			E					
HCM 2000 Volume to Capacity ratio	0.99											
Actuated Cycle Length (s)	140.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	88.6%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Background 5 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	755	663	1059	0	0	1125
Future Volume (vph)	755	663	1059	0	0	1125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frt	0.966	0.850				
Flt Protected	0.963					
Satd. Flow (prot)	3344	1455	3574	0	0	3539
Flt Permitted	0.963					
Satd. Flow (perm)	3344	1455	3574	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	42	42				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Adj. Flow (vph)	821	721	1151	0	0	1223
Shared Lane Traffic (%)	33%					
Lane Group Flow (vph)	1059	483	1151	0	0	1223
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex			CI+Ex
<b>Detector 1 Channel</b>						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
<b>Detector 2 Channel</b>						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8	2				6

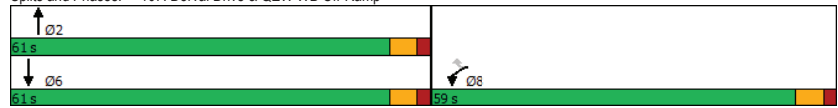
Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Background 5 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	59.0	59.0	61.0			61.0
Total Split (%)	49.2%	49.2%	50.8%			50.8%
Maximum Green (s)	53.0	53.0	55.0			55.0
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	47.3	47.3	57.2			57.2
Actuated g/C Ratio	0.42	0.42	0.51			0.51
v/c Ratio	0.74	0.76	0.63			0.68
Control Delay	29.6	33.7	23.1			24.3
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	29.6	33.7	23.1			24.3
LOS	C	C	C			C
Approach Delay	30.9		23.1			24.3
Approach LOS	C		C			C

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	112.6
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	26.6
Intersection Capacity Utilization:	66.2%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	C

Splits and Phases: 107: Dorval Drive & QEW WB Off-Ramp



Queues  
107: Dorval Drive & QEW WB Off-Ramp

Background 5 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1059	483	1151	1223
v/c Ratio	0.74	0.76	0.63	0.68
Control Delay	29.6	33.7	23.1	24.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.6	33.7	23.1	24.3
Queue Length 50th (m)	100.3	94.2	102.3	112.6
Queue Length 95th (m)	124.4	141.2	138.1	151.5
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1662	735	1817	1799
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.66	0.63	0.68

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Background 5 Year  
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕			↕↕
Traffic Volume (vph)	755	663	1059	0	0	1125
Future Volume (vph)	755	663	1059	0	0	1125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr	0.97	0.85	1.00			1.00
Fit Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3344	1455	3574			3539
Fit Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3344	1455	3574			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	821	721	1151	0	0	1223
RTOR Reduction (vph)	24	24	0	0	0	0
Lane Group Flow (vph)	1035	459	1151	0	0	1223
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	45.3	45.3	55.2			55.2
Effective Green, g (s)	47.3	47.3	57.2			57.2
Actuated g/C Ratio	0.42	0.42	0.51			0.51
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1405	611	1817			1799
v/s Ratio Prot	0.31		0.32			c0.35
v/s Ratio Perm		c0.32				
v/c Ratio	0.74	0.75	0.63			0.68
Uniform Delay, d1	27.4	27.6	20.0			20.8
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	2.3	5.8	1.7			2.1
Delay (s)	29.7	33.4	21.7			22.9
Level of Service	C	C	C			C
Approach Delay (s)	30.9		21.7			22.9
Approach LOS	C		C			C
<b>Intersection Summary</b>						
HCM 2000 Control Delay			25.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			112.5		Sum of lost time (s)	8.0
Intersection Capacity Utilization			66.2%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕	↕↕	
Traffic Volume (vph)	293	349	0	1271	1203	0
Future Volume (vph)	293	349	0	1271	1203	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr	0.950	0.850				
Fit Protected	0.968					
Satd. Flow (prot)	3302	1441	0	3539	3505	0
Fit Permitted	0.968					
Satd. Flow (perm)	3302	1441	0	3539	3505	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	76	77				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Adj. Flow (vph)	318	379	0	1382	1308	0
Shared Lane Traffic (%)		42%				
Lane Group Flow (vph)	477	220	0	1382	1308	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
<b>Detector 1 Channel</b>						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
<b>Detector 2 Channel</b>						
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
<b>Detector 2 Channel</b>						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	



Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

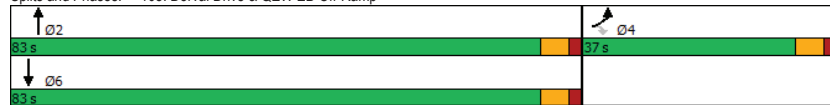
Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	37.0	37.0		83.0	83.0	
Total Split (%)	30.8%	30.8%		69.2%	69.2%	
Maximum Green (s)	31.0	31.0		77.0	77.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	22.5	22.5		79.1	79.1	
Actuated g/C Ratio	0.21	0.21		0.72	0.72	
v/c Ratio	0.65	0.62		0.54	0.52	
Control Delay	37.4	33.0		8.5	8.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	37.4	33.0		8.5	8.2	
LOS	D	C		A	A	
Approach Delay	36.0			8.5	8.2	
Approach LOS	D			A	A	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	109.6
Natural Cycle:	55
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.65
Intersection Signal Delay:	14.1
Intersection Capacity Utilization:	66.2%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	C

Splits and Phases: 108: Dorval Drive & QEW EB Off-Ramp



Queues  
108: Dorval Drive & QEW EB Off-Ramp

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	477	220	1382	1308
v/c Ratio	0.65	0.62	0.54	0.52
Control Delay	37.4	33.0	8.5	8.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	37.4	33.0	8.5	8.2
Queue Length 50th (m)	42.8	31.9	64.7	59.5
Queue Length 95th (m)	59.8	60.3	105.2	97.2
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1049	488	2555	2530
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.45	0.54	0.52

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Background 5 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↗		↕↕	↕↕	
Traffic Volume (vph)	293	349	0	1271	1203	0
Future Volume (vph)	293	349	0	1271	1203	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Fr <sub>t</sub>	0.95	0.85		1.00	1.00	
Fit Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3301	1441		3539	3505	
Fit Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3301	1441		3539	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	318	379	0	1382	1308	0
RTOR Reduction (vph)	60	61	0	0	0	0
Lane Group Flow (vph)	417	159	0	1382	1308	0
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	20.5	20.5		77.2	77.2	
Effective Green, g (s)	22.5	22.5		79.2	79.2	
Actuated g/C Ratio	0.21	0.21		0.72	0.72	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	677	295		2555	2530	
v/s Ratio Prot	c0.13			c0.39	0.37	
v/s Ratio Perm		0.11				
v/c Ratio	0.62	0.54		0.54	0.52	
Uniform Delay, d1	39.7	39.0		7.0	6.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	2.4		0.8	0.8	
Delay (s)	41.6	41.4		7.8	7.5	
Level of Service	D	D		A	A	
Approach Delay (s)	41.5			7.8	7.5	
Approach LOS	D			A	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		14.6		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.56				
Actuated Cycle Length (s)		109.7		Sum of lost time (s)		8.0
Intersection Capacity Utilization		66.2%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background 5 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕↕	↕↕
Traffic Volume (vph)	814	0	0	1336	224	506
Future Volume (vph)	814	0	0	1336	224	506
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Fr <sub>t</sub>						0.850
Fit Protected					0.950	
Satd. Flow (prot)	3574	0	0	3574	1805	1599
Fit Permitted					0.950	
Satd. Flow (perm)	3574	0	0	3574	1805	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						56
Link Speed (k/h)	60			60	40	
Link Distance (m)	130.3			194.2	262.1	
Travel Time (s)	7.8			11.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Adj. Flow (vph)	885	0	0	1452	243	550
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	885	0	0	1452	243	550
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
<b>Lead/Lag</b>						
<b>Lead-Lag Optimize?</b>						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background 5 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
v/c Ratio	0.62			1.02	0.34	0.82
Control Delay	13.1			45.0	11.0	24.1
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	13.1			45.0	11.0	24.1
LOS	B			D	B	C
Approach Delay	13.1			45.0	20.1	
Approach LOS	B			D	C	

**Intersection Summary**

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green

Natural Cycle: 60

Control Type: Pretimed

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 29.7

Intersection Capacity Utilization 61.3%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service B

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street


Queues  
109: QEW WB Off-Ramp & Kerr Street

Background 5 Year  
PM Peak Hour

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	885	1452	243	550
v/c Ratio	0.62	1.02	0.34	0.82
Control Delay	13.1	45.0	11.0	24.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.1	45.0	11.0	24.1
Queue Length 50th (m)	28.9	~61.8	13.2	34.1
Queue Length 95th (m)	43.8	#105.3	26.0	#83.5
Internal Link Dist (m)	106.3	170.2	238.1	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1429	1429	722	673
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	1.02	0.34	0.82

**Intersection Summary**

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

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

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Background 5 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↓	↑
Traffic Volume (vph)	814	0	0	1336	224	506
Future Volume (vph)	814	0	0	1336	224	506
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr <sub>t</sub>	1.00			1.00	1.00	0.85
Fl <sub>t</sub> Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3574			3574	1805	1599
Fl <sub>t</sub> Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3574			3574	1805	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	885	0	0	1452	243	550
RTOR Reduction (vph)	0	0	0	0	0	34
Lane Group Flow (vph)	885	0	0	1452	243	516
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1429			1429	722	639
v/s Ratio Prot	0.25			c0.41	0.13	
v/s Ratio Perm						c0.32
v/c Ratio	0.62			1.02	0.34	0.81
Uniform Delay, d1	10.8			13.5	9.4	12.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	2.0			27.9	1.3	10.6
Delay (s)	12.8			41.4	10.6	22.5
Level of Service	B			D	B	C
Approach Delay (s)	12.8			41.4	18.9	
Approach LOS	B			D	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			27.6	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.91			
Actuated Cycle Length (s)			45.0	Sum of lost time (s)		9.0
Intersection Capacity Utilization			61.3%	ICU Level of Service		B
Analysis Period (min)			15			

c Critical Lane Group

Lanes, Volumes, Timings

110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

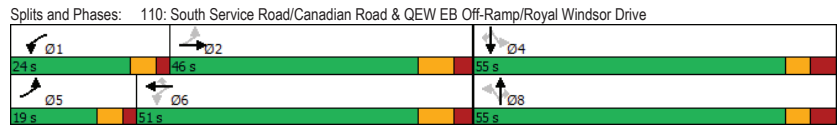
Background 5 Year

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↓	↑↑		↑↓	↑↑	↑↓	↑↓	↑↑	↑↓	↑↓	↑↓	↑↓
Traffic Volume (vph)	332	578	18	194	691	29	15	50	106	15	138	451
Future Volume (vph)	332	578	18	194	691	29	15	50	106	15	138	451
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0		0.0	155.0		70.0	15.0		0.0	0.0		30.0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.996				0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	3398	0	1752	3505	1615	1805	1900	1615	1805	1900	1599
Fl <sub>t</sub> Permitted	0.274			0.314			0.582			0.720		
Satd. Flow (perm)	1010	3398	0	579	3505	1615	1106	1900	1615	1368	1900	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			3			94			120			330
Link Speed (k/h)		80			80			60				40
Link Distance (m)		324.5			247.2			158.7				215.5
Travel Time (s)		14.6			11.1			9.5				19.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Adj. Flow (vph)	377	657	20	220	785	33	17	57	120	17	157	513
Shared Lane Traffic (%)												
Lane Group Flow (vph)	377	677	0	220	785	33	17	57	120	17	157	513
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

Lanes, Volumes, Timings Background 5 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	29.4		14.0	38.4	38.4	28.8	28.8	28.8	28.8	28.8	28.8
Total Split (s)	19.0	46.0		24.0	51.0	51.0	55.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	15.2%	36.8%		19.2%	40.8%	40.8%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%
Maximum Green (s)	13.0	37.6		18.0	42.6	42.6	47.2	47.2	47.2	47.2	47.2	47.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	59.6	47.0		60.9	47.6	47.6	25.2	25.2	25.2	25.2	25.2	25.2
Actuated g/C Ratio	0.61	0.48		0.62	0.49	0.49	0.26	0.26	0.26	0.26	0.26	0.26
v/c Ratio	0.40	0.41		0.42	0.46	0.04	0.06	0.12	0.24	0.05	0.32	0.78
Control Delay	9.4	19.8		11.0	19.6	0.1	26.1	26.9	6.0	25.8	30.2	20.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	19.8		11.0	19.6	0.1	26.1	26.9	6.0	25.8	30.2	20.1
LOS	A	B		B	B	A	C	C	A	C	C	C
Approach Delay		16.1			17.2			13.9			22.5	
Approach LOS		B			B			B			C	

Intersection Summary	
Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	97.7
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	17.8
Intersection Capacity Utilization:	69.6%
Intersection LOS:	B
ICU Level of Service:	C
Analysis Period (min):	15



Queues Background 5 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	377	677	220	785	33	17	57	120	17	157	513
v/c Ratio	0.40	0.41	0.42	0.46	0.04	0.06	0.12	0.24	0.05	0.32	0.78
Control Delay	9.4	19.8	11.0	19.6	0.1	26.1	26.9	6.0	25.8	30.2	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	19.8	11.0	19.6	0.1	26.1	26.9	6.0	25.8	30.2	20.1
Queue Length 50th (m)	12.7	42.2	14.8	50.8	0.0	2.5	8.6	0.0	2.5	25.0	32.9
Queue Length 95th (m)	28.6	82.6	37.3	91.5	0.0	7.6	17.8	11.7	7.5	41.4	69.0
Internal Link Dist (m)		300.5		223.2		134.7				191.5	
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0
Base Capacity (vph)	1028	1634	624	1708	835	585	1005	910	723	1005	1001
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.41	0.35	0.46	0.04	0.03	0.06	0.13	0.02	0.16	0.51

Intersection Summary

Intersection Summary	
Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	97.7
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	17.8
Intersection Capacity Utilization:	69.6%
Intersection LOS:	B
ICU Level of Service:	C
Analysis Period (min):	15

HCM Signalized Intersection Capacity Analysis  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Background 5 Year

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↕	↔	↕	↕	
Traffic Volume (vph)	332	578	18	194	691	29	15	50	106	15	138	451	
Future Volume (vph)	332	578	18	194	691	29	15	50	106	15	138	451	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Fr	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3502	3396		1752	3505	1615	1805	1900	1615	1805	1900	1599	
Flt Permitted	0.27	1.00		0.31	1.00	1.00	0.58	1.00	1.00	0.72	1.00	1.00	
Satd. Flow (perm)	1009	3396		580	3505	1615	1105	1900	1615	1368	1900	1599	
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)	377	657	20	220	785	33	17	57	120	17	157	512	
RTOR Reduction (vph)	0	2	0	0	0	17	0	0	89	0	0	245	
Lane Group Flow (vph)	377	675	0	220	785	16	17	57	31	17	157	268	
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	
Protected Phases	5	2		1	6			8			4		
Permitted Phases	2			6		6	8		8	4		4	
Actuated Green, G (s)	53.1	42.5		54.5	43.2	43.2	21.4	21.4	21.4	21.4	21.4	21.4	
Effective Green, g (s)	57.1	46.9		58.5	47.6	47.6	25.2	25.2	25.2	25.2	25.2	25.2	
Actuated g/C Ratio	0.59	0.48		0.60	0.49	0.49	0.26	0.26	0.26	0.26	0.26	0.26	
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8	
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5	
Lane Grp Cap (vph)	914	1635		508	1712	789	285	491	417	353	491	413	
v/s Ratio Prot	0.05	0.20		c0.06	c0.22			0.03			0.08		
v/s Ratio Perm	0.19			0.20		0.01	0.02		0.02	0.01		c0.17	
v/c Ratio	0.41	0.41		0.43	0.46	0.02	0.06	0.12	0.07	0.05	0.32	0.65	
Uniform Delay, d1	10.1	16.3		9.5	16.4	12.9	27.2	27.6	27.3	27.1	29.2	32.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.8		0.7	0.9	0.0	0.1	0.1	0.1	0.1	0.4	3.7	
Delay (s)	10.4	17.1		10.2	17.3	12.9	27.3	27.7	27.4	27.2	29.6	35.8	
Level of Service	B	B		B	B	B	C	C	C	C	C	D	
Approach Delay (s)		14.7			15.7			27.5			34.2		
Approach LOS		B			B			C			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			20.4	HCM 2000 Level of Service				C					
HCM 2000 Volume to Capacity ratio			0.51										
Actuated Cycle Length (s)			97.4	Sum of lost time (s)				12.0					
Intersection Capacity Utilization			69.6%	ICU Level of Service				C					
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings  
 201: Cross Ave & Lyons Lane

Background 5 Year  
 PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕
Traffic Volume (vph)	39	264	663	95	37	58
Future Volume (vph)	39	264	663	95	37	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Fr			0.974		0.915	
Flt Protected	0.950				0.982	
Satd. Flow (prot)	1388	2954	3088	0	1499	0
Flt Permitted	0.950				0.982	
Satd. Flow (perm)	1388	2954	3088	0	1499	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	1			1	9	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Heavy Vehicles (%)	17%	10%	3%	0%	0%	4%
Adj. Flow (vph)	78	287	789	164	84	141
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	78	287	953	0	225	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15		25	15
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↕↕	
Traffic Volume (veh/h)	39	264	663	95	37	58
Future Volume (Veh/h)	39	264	663	95	37	58
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Hourly flow rate (vph)	78	287	789	164	84	141
Pedestrians			9		1	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	954				1180	478
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	738				989	212
tC, single (s)	4.4				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	89				57	80
cM capacity (veh/h)	697				197	712
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	78	144	144	526	427	225
Volume Left	78	0	0	0	0	84
Volume Right	0	0	0	0	164	141
cSH	697	1700	1700	1700	1700	360
Volume to Capacity	0.11	0.08	0.08	0.31	0.25	0.62
Queue Length 95th (m)	3.0	0.0	0.0	0.0	0.0	32.2
Control Delay (s)	10.8	0.0	0.0	0.0	0.0	30.2
Lane LOS	B					D
Approach Delay (s)	2.3			0.0		30.2
Approach LOS						D
<b>Intersection Summary</b>						
Average Delay			5.0			
Intersection Capacity Utilization			43.3%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕↕	
Traffic Volume (vph)	4	6	1	32	49	6
Future Volume (vph)	4	6	1	32	49	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.875		0.983	
Fit Protected		0.974			0.958	
Satd. Flow (prot)	0	1666	1242	0	1610	0
Fit Permitted		0.974			0.958	
Satd. Flow (perm)	0	1666	1242	0	1610	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		60.5	89.6		37.6	
Travel Time (s)		4.4	6.5		2.7	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Heavy Vehicles (%)	0%	0%	0%	22%	0%	0%
Adj. Flow (vph)	11	10	4	52	98	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	21	56	0	112	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	4	6	1	32	49	6
Future Volume (Veh/h)	4	6	1	32	49	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Hourly flow rate (vph)	11	10	4	52	98	14
Pedestrians					7	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	63				69	37
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	63				69	37
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				89	99
cM capacity (veh/h)	1544				929	1035
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	21	56	112			
Volume Left	11	0	98			
Volume Right	0	52	14			
cSH	1544	1700	941			
Volume to Capacity	0.01	0.03	0.12			
Queue Length 95th (m)	0.2	0.0	3.2			
Control Delay (s)	3.9	0.0	9.3			
Lane LOS	A		A			
Approach Delay (s)	3.9	0.0	9.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			6.0			
Intersection Capacity Utilization		15.5%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	12	37	496	173	31	45
Future Volume (vph)	12	37	496	173	31	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.958		0.915	
Fit Protected		0.987			0.982	
Satd. Flow (prot)	0	1541	1532	0	1536	0
Fit Permitted		0.987			0.982	
Satd. Flow (perm)	0	1541	1532	0	1536	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)					5	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Heavy Vehicles (%)	0%	13%	10%	0%	0%	0%
Adj. Flow (vph)	27	74	570	254	41	69
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	101	824	0	110	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24		14		24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 52.3%				ICU Level of Service A		
Analysis Period (min) 15						



HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	12	37	496	173	31	45
Future Volume (Veh/h)	12	37	496	173	31	45
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Hourly flow rate (vph)	27	74	570	254	41	69
Pedestrians			5			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.2			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	824				830	697
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	824				830	697
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				88	84
cM capacity (veh/h)	815				330	444
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	101	824	110			
Volume Left	27	0	41			
Volume Right	0	254	69			
eSH	815	1700	394			
Volume to Capacity	0.03	0.48	0.28			
Queue Length 95th (m)	0.8	0.0	9.0			
Control Delay (s)	2.8	0.0	17.7			
Lane LOS	A		C			
Approach Delay (s)	2.8	0.0	17.7			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			2.1			
Intersection Capacity Utilization		52.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕↕	↕↕↕	
Traffic Volume (vph)	0	93	0	2853	1942	686
Future Volume (vph)	0	93	0	2853	1942	686
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Fr <sub>t</sub>		0.865			0.957	
Fit Protected						
Satd. Flow (prot)	0	1354	0	4577	4368	0
Fit Permitted						
Satd. Flow (perm)	0	1354	0	4577	4368	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	145.7			270.2	51.4	
Travel Time (s)	10.5			19.5	3.7	
Confl. Peds. (#/hr)						24
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87
Heavy Vehicles (%)	0%	8%	0%	2%	2%	3%
Adj. Flow (vph)	0	148	0	3170	1982	789
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	148	0	3170	2771	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	72.4%			ICU Level of Service C		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Background 5 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations		↗		↖↖	↗↗		
Traffic Volume (veh/h)	0	93	0	2853	1942	686	
Future Volume (Veh/h)	0	93	0	2853	1942	686	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87	
Hourly flow rate (vph)	0	148	0	3170	1982	789	
Pedestrians	24						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	2						
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.73	0.57	0.57				
vC, conflicting volume	3457	1079	2795				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	164	0	1535				
tC, single (s)	6.8	7.1	4.1				
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	75	100				
cM capacity (veh/h)	587	600	248				
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	148	1057	1057	1057	793	793	1185
Volume Left	0	0	0	0	0	0	0
Volume Right	148	0	0	0	0	0	789
sSH	600	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.25	0.62	0.62	0.62	0.47	0.47	0.70
Queue Length 95th (m)	7.7	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	12.9	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	12.9	0.0			0.0		
Approach LOS	B						
Intersection Summary							
Average Delay			0.3				
Intersection Capacity Utilization			72.4%		ICU Level of Service		C
Analysis Period (min)			15				

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

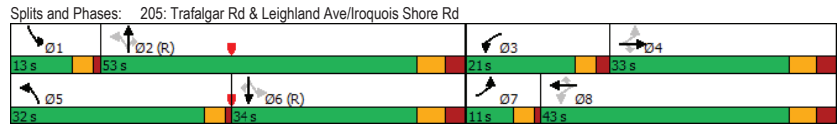
Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	143	179	301	597	168	316	428	1478	806	156	1010	70
Future Volume (vph)	143	179	301	597	168	316	428	1478	806	156	1010	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0		25.0	145.0		0.0	95.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	0.97					0.95			0.97	1.00		
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1710	1425	3120	1710	1425	1608	4577	1425	1608	4532	1425
Fit Permitted	0.647			0.334			0.125			0.143		
Satd. Flow (perm)	1077	1710	1425	1097	1710	1360	212	4577	1382	242	4532	1425
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			314			228		533				191
Link Speed (k/h)		50			50			50				50
Link Distance (m)		347.0			285.9			280.4				353.6
Travel Time (s)		25.0			20.6			20.2				25.5
Confl. Peds. (#/hr)	34					34			14	14		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Adj. Flow (vph)	149	186	314	622	175	329	446	1540	840	163	1052	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	186	314	622	175	329	446	1540	840	163	1052	73
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)					7.2			3.6				3.6
Link Offset(m)					0.0			0.0				0.0
Crosswalk Width(m)			4.8			4.8			4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4			9.4			9.4
Detector 2 Size(m)			0.6			0.6			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0			0.0			0.0

Lanes, Volumes, Timings Background 5 Year  
 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	11.0	25.0	25.0	11.0	43.0	43.0	11.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	11.0	33.0	33.0	21.0	43.0	43.0	32.0	53.0	53.0	13.0	34.0	34.0
Total Split (%)	9.2%	27.5%	27.5%	17.5%	35.8%	35.8%	26.7%	44.2%	44.2%	10.8%	28.3%	28.3%
Maximum Green (s)	7.0	26.0	26.0	16.0	36.0	36.0	28.0	46.0	46.0	9.0	27.0	27.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	30.4	23.4	23.4	43.4	33.4	33.4	67.6	52.3	52.3	42.3	31.0	31.0
Actuated g/c Ratio	0.25	0.20	0.20	0.36	0.28	0.28	0.56	0.44	0.44	0.35	0.26	0.26
v/c Ratio	0.49	0.56	0.59	0.93	0.37	0.61	0.90	0.77	0.93	0.77	0.90	0.14
Control Delay	34.1	49.4	9.1	53.5	36.2	15.9	53.0	32.8	30.2	51.0	54.5	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	49.4	9.1	53.5	36.2	15.9	53.0	32.8	30.2	51.0	54.5	0.6
LOS	C	D	A	D	D	B	D	C	C	D	D	A
Approach Delay		26.4			39.8			35.2			51.0	
Approach LOS		C			D			D			D	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 105.6 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.93  
 Intersection Signal Delay: 38.6  
 Intersection LOS: D  
 Intersection Capacity Utilization 93.7%  
 ICU Level of Service F  
 Analysis Period (min) 15



Queues Background 5 Year  
 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	186	314	622	175	329	446	1540	840	163	1052	73
v/c Ratio	0.49	0.56	0.59	0.93	0.37	0.61	0.90	0.77	0.93	0.77	0.90	0.14
Control Delay	34.1	49.4	9.1	53.5	36.2	15.9	53.0	32.8	30.2	51.0	54.5	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	49.4	9.1	53.5	36.2	15.9	53.0	32.8	30.2	51.0	54.5	0.6
Queue Length 50th (m)	25.2	41.8	0.0	62.3	34.7	19.7	88.8	122.9	95.0	21.9	93.7	0.0
Queue Length 95th (m)	38.7	62.8	24.5	#82.4	52.3	48.6	#168.0	143.8	#201.2	#66.7	#121.5	0.0
Internal Link Dist (m)		323.0			261.9			256.4			329.6	
Turn Bay Length (m)	60.0			165.0		25.0	145.0			95.0		90.0
Base Capacity (vph)	305	413	582	667	555	595	498	1994	902	213	1171	509
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.45	0.54	0.93	0.32	0.55	0.90	0.77	0.93	0.77	0.90	0.14

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

HCM Signalized Intersection Capacity Analysis  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	143	179	301	597	168	316	428	1478	806	156	1010	70
Future Volume (vph)	143	179	301	597	168	316	428	1478	806	156	1010	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1597	1710	1425	3120	1710	1360	1608	4577	1382	1608	4532	1425
Fit Permitted	0.65	1.00	1.00	0.33	1.00	1.00	0.12	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	1087	1710	1425	1099	1710	1360	212	4577	1382	242	4532	1425
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	149	186	314	622	175	329	446	1540	840	162	1052	73
RTOR Reduction (vph)	0	0	253	0	0	165	0	0	301	0	0	54
Lane Group Flow (vph)	149	186	61	622	175	164	446	1540	539	163	1052	19
Confl. Peds. (#/hr)	34					34			14		14	
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	27.4	20.4	20.4	41.4	30.4	30.4	64.6	49.3	49.3	39.3	28.0	28.0
Effective Green, g (s)	27.4	23.4	23.4	41.4	33.4	33.4	64.6	52.3	52.3	39.3	31.0	31.0
Actuated g/C Ratio	0.23	0.19	0.19	0.34	0.28	0.28	0.54	0.44	0.44	0.33	0.26	0.26
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	277	333	277	648	475	378	493	1994	602	207	1170	368
v/s Ratio Prot	0.03	0.11		c0.13	0.10		c0.25	0.34		0.07	0.23	
v/s Ratio Perm	0.09		0.04	c0.20		0.12	0.24		c0.39	0.18		0.01
v/c Ratio	0.54	0.56	0.22	0.96	0.37	0.44	0.90	0.77	0.90	0.79	0.90	0.05
Uniform Delay, d1	39.5	43.6	40.6	35.2	34.8	35.6	32.7	28.8	31.3	30.5	43.0	33.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	3.4	0.8	25.4	1.0	1.7	19.9	3.0	18.5	17.7	11.0	0.3
Delay (s)	41.6	47.1	41.5	60.6	35.8	37.2	52.6	31.8	49.8	48.2	54.0	33.7
Level of Service	D	D	D	E	D	D	D	C	D	D	D	C
Approach Delay (s)		43.1			49.9			40.4			52.1	
Approach LOS		D			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay				45.1	HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio	0.95											
Actuated Cycle Length (s)				120.0	Sum of lost time (s)				17.0			
Intersection Capacity Utilization				93.7%	ICU Level of Service				F			
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
303: North Access & South Service Rd E

Background 5 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	53	0	0	95	0	0
Future Volume (vph)	53	0	0	95	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	518.9			306.8	108.8	
Travel Time (s)	37.4			22.1	7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	0	0	103	0	0
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	58	0	0	103	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 8.3%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Background 5 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	53	0	0	95	0	0
Future Volume (Veh/h)	53	0	0	95	0	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)	58	0	0	103	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			58		161	58
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			58		161	58
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1546		830	1008
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	58	103	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
sSH	1700	1546	1700			
Volume to Capacity	0.03	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS				A		
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS				A		
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			8.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Queuing and Blocking Report

Background 5 Year  
PM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	156.4	121.5	78.2	74.6	32.3	326.4	323.1	57.4	124.4	132.8	137.9
Average Queue (m)	121.9	146.5	46.6	71.4	33.3	31.2	318.9	313.9	50.7	83.1	89.7	94.7
95th Queue (m)	126.8	151.6	98.7	84.4	79.0	36.7	323.3	337.1	70.6	117.2	121.8	128.1
Link Distance (m)	123.0		123.0	51.4	51.4	313.2		313.2	128.0		128.0	128.0
Upstream Blk Time (%)	6	55	1	46	11	88		39	0		1	2
Queuing Penalty (veh)	0	422	11	356	81	0		0	1		3	12
Storage Bay Dist (m)	130.0					25.0		50.0				
Storage Blk Time (%)	6	55			57	50		21		28		
Queuing Penalty (veh)	35	344			163	118		110		75		

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	B34	SB	SB	SB	SB
Directions Served	T	T	T	L	T	T	TR
Maximum Queue (m)	13.2	16.4	6.1	32.3	248.7	251.9	250.2
Average Queue (m)	0.4	1.1	0.2	22.2	154.2	211.2	225.3
95th Queue (m)	9.3	16.0	3.1	38.3	281.9	299.7	285.0
Link Distance (m)	101.5	101.5	101.5	239.0		239.0	239.0
Upstream Blk Time (%)				2		12	31
Queuing Penalty (veh)				15		82	209
Storage Bay Dist (m)	25.0						
Storage Blk Time (%)				14		41	
Queuing Penalty (veh)				66		69	

Queuing and Blocking Report

Background 5 Year  
PM Peak Hour

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	B7	B7	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	27.3	301.4	295.6	27.4	78.1	66.2	20.1	15.1	81.8	81.9	22.4	195.8
Average Queue (m)	9.1	245.2	238.5	24.9	41.6	30.7	1.8	0.9	49.2	42.8	21.5	182.9
95th Queue (m)	27.2	296.2	295.5	30.7	79.8	60.3	13.1	8.3	90.3	82.9	24.6	205.5
Link Distance (m)		352.9	352.9		51.4	51.4	123.0	123.0	66.7	66.7		159.0
Upstream Blk Time (%)					14	3			20	9		84
Queuing Penalty (veh)					79	17			0	0		456
Storage Bay Dist (m)	20.0			20.0							15.0	
Storage Blk Time (%)	1	77		52	4						81	28
Queuing Penalty (veh)	5	37		138	4						209	83

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	B14
Directions Served	T
Maximum Queue (m)	164.6
Average Queue (m)	119.7
95th Queue (m)	215.4
Link Distance (m)	160.7
Upstream Blk Time (%)	31
Queuing Penalty (veh)	168
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	20.3	23.3	25.0	15.4	31.4	49.0	27.4	59.4	20.2	19.4
Average Queue (m)	5.7	16.4	14.4	2.2	11.0	16.9	25.4	43.0	6.2	9.3
95th Queue (m)	14.9	26.2	26.6	9.6	26.9	37.2	30.2	72.6	16.0	16.6
Link Distance (m)	21.8	21.8	21.8		352.9	352.9		54.8	56.7	56.7
Upstream Blk Time (%)	1	7	7					10		
Queuing Penalty (veh)	1	7	7					0		
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)					1		35	5		
Queuing Penalty (veh)				0			83	12		

Queuing and Blocking Report

Background 5 Year  
PM Peak Hour

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.7	87.4	279.9	273.2	87.4	130.2	131.9	32.5	299.4	294.5	79.4	87.9
Average Queue (m)	82.9	87.2	272.3	257.1	33.0	121.8	127.0	32.1	280.8	261.0	45.2	48.5
95th Queue (m)	86.6	87.7	276.5	317.5	85.4	138.1	129.6	33.3	338.1	356.7	73.6	80.3
Link Distance (m)			266.8	266.8		122.1	122.1		289.9	289.9		101.5
Upstream Blk Time (%)			89	9		25	57		75	23		0
Queuing Penalty (veh)			0	0		0	0		0	0		2
Storage Bay Dist (m)	80.0	80.0			80.0			25.0			80.0	
Storage Blk Time (%)	24	78	2		0	45		94	10		1	2
Queuing Penalty (veh)	83	269	8		0	30		245	16		2	6

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	99.5	45.7
Average Queue (m)	47.2	17.5
95th Queue (m)	82.3	35.1
Link Distance (m)	101.5	101.5
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	3	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	180.4	181.5	188.7	34.8	40.8	45.6	319.7	317.6	314.0
Average Queue (m)	78.9	153.1	174.0	28.7	30.8	29.9	299.9	305.9	305.1
95th Queue (m)	169.8	237.9	214.1	32.1	36.7	36.5	332.6	314.2	311.0
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	1	33	69	33	38	40	32	54	66
Queuing Penalty (veh)	0	0	0	316	357	381	283	471	576
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report

Background 5 Year  
PM Peak Hour

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	57.4	122.4	178.2	181.1	180.8	132.4	154.0	176.1	262.7	263.8	260.7	275.1
Average Queue (m)	19.8	109.3	166.1	172.9	151.7	68.7	82.5	104.4	254.3	255.6	253.9	255.5
95th Queue (m)	61.7	154.6	204.6	186.8	244.4	120.6	141.1	164.2	261.9	261.5	258.1	344.4
Link Distance (m)		117.8	171.3	171.3	171.3	299.7	299.7	299.7	251.7	251.7	251.7	251.7
Upstream Blk Time (%)		74	62	91	63				56	62	68	82
Queuing Penalty (veh)		0	0	0	0				265	298	322	390
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)	0	86										
Queuing Penalty (veh)	0	20										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	119.8	115.4	108.4	114.7	116.2	125.6	111.8
Average Queue (m)	74.9	77.7	62.3	71.7	73.3	81.2	69.4
95th Queue (m)	105.6	106.2	95.1	106.4	107.1	114.2	101.7
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	71.0	85.7	71.3	102.8	87.2	82.4	80.7
Average Queue (m)	40.7	58.9	41.8	60.2	44.0	44.4	50.3
95th Queue (m)	69.7	80.1	65.3	90.4	78.8	75.1	79.5
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Background 5 Year  
PM Peak Hour

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	56.9	45.2	118.2	107.4	40.0	58.2
Average Queue (m)	35.9	18.8	68.7	55.7	19.1	30.0
95th Queue (m)	51.5	37.6	100.4	88.6	33.7	48.5
Link Distance (m)	122.4	122.4	184.7	184.7	249.3	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	41.0	51.9	66.5	60.8	39.2	74.8	69.0	10.2	17.1	25.3	15.3	55.0
Average Queue (m)	10.8	28.4	32.4	27.6	17.0	43.1	30.4	3.2	4.2	8.9	3.0	26.4
95th Queue (m)	31.2	47.2	55.7	50.1	30.8	67.6	56.3	9.9	12.2	20.9	9.8	46.4
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0			70.0	15.0			
Storage Blk Time (%)								0	1	8		8
Queuing Penalty (veh)								0	1	1		35

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	SB
Directions Served	R
Maximum Queue (m)	31.7
Average Queue (m)	6.5
95th Queue (m)	21.7
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

Background 5 Year  
PM Peak Hour

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	16.7	16.3	36.5	11.3	15.7	21.9
Average Queue (m)	4.5	1.3	7.6	0.7	1.0	9.6
95th Queue (m)	13.8	8.1	26.5	5.2	7.0	18.0
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)				0	0	1
Queuing Penalty (veh)				0	0	0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	3	0				
Queuing Penalty (veh)	4	0				

Intersection: 202: Lyons Lane & South Service Rd E

Movement	SB
Directions Served	LR
Maximum Queue (m)	14.8
Average Queue (m)	5.3
95th Queue (m)	14.0
Link Distance (m)	21.6
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 203: Argus Rd & South Service Rd E

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (m)	11.6	109.1	40.3
Average Queue (m)	0.9	50.4	16.1
95th Queue (m)	6.0	138.8	37.7
Link Distance (m)	160.7	112.3	88.3
Upstream Blk Time (%)		19	
Queuing Penalty (veh)		129	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report

Background 5 Year  
PM Peak Hour

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	67.2	68.6	76.3	80.2	35.7	38.1	46.6
Average Queue (m)	21.1	33.4	43.5	50.0	7.3	18.9	30.8
95th Queue (m)	51.0	58.2	70.1	75.2	27.8	40.3	42.0
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)					1	6	40
Queuing Penalty (veh)					10	50	333
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	R
Maximum Queue (m)	47.9	333.0	337.5	172.5	273.6	271.7	32.5	114.6	124.7	164.3	196.4	147.9
Average Queue (m)	18.5	230.1	259.1	163.1	259.6	242.2	17.2	48.3	36.5	42.8	52.5	8.0
95th Queue (m)	43.1	459.4	446.9	192.6	317.1	356.6	40.8	93.5	94.3	106.9	145.6	79.2
Link Distance (m)		327.2	327.2		266.7	266.7		251.7	251.7	251.7	251.7	
Upstream Blk Time (%)		52	57		78	62		0	0	0	0	0
Queuing Penalty (veh)		0	0		0	0		0	0	1	0	0
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				
Storage Blk Time (%)	0	1		31	90	9	8	0				
Queuing Penalty (veh)	0	1		91	269	27	13	1				

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	R
Maximum Queue (m)	102.5	356.2	351.5	351.1	97.5
Average Queue (m)	65.8	325.6	323.3	320.6	35.1
95th Queue (m)	144.0	418.7	418.8	424.0	112.1
Link Distance (m)		339.8	339.8	339.8	
Upstream Blk Time (%)		74	69	79	
Queuing Penalty (veh)		0	0	0	
Storage Bay Dist (m)	95.0				90.0
Storage Blk Time (%)	0	93		95	0
Queuing Penalty (veh)	0	144		66	0



Queuing and Blocking Report

Background 5 Year  
PM Peak Hour

Intersection: 303: North Access & South Service Rd E

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 9001
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Lanes, Volumes, Timings

Background 10 Year  
AM Peak Hour

101: Trafalgar Rd & Cross Ave/South Service Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1023	417	213	89	379	186	194	724	1025	416	1025	724
Future Volume (vph)	1023	417	213	89	379	186	194	724	1025	416	1025	724
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	0.91	1.00	*0.80	0.91
Ped Bike Factor	1.00	0.99				0.99		0.87			0.99	
Frt		0.943				0.850		0.909			0.937	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2795	1477	0	1525	1583	1382	1428	3197	0	1525	3664	0
Fit Permitted	0.950			0.154			0.093			0.085		
Satd. Flow (perm)	2792	1477	0	247	1583	1362	140	3197	0	136	3664	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		24				179		297			148	
Link Speed (k/h)		50			50		50			50		50
Link Distance (m)		151.2			330.4		150.2			270.2		
Travel Time (s)		10.9			23.8		10.8			19.5		
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Peak Hour Factor	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Adj. Flow (vph)	1176	542	333	116	492	242	240	823	1281	495	1220	872
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1176	875	0	116	492	242	240	2104	0	495	2092	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6		3.3			3.3		
Link Offset(m)		0.0			0.0		0.0			0.0		0.0
Crosswalk Width(m)		4.8			4.8		4.8			4.8		4.8
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4		9.4			9.4		9.4
Detector 2 Size(m)		0.6			0.6		0.6			0.6		0.6
Detector 2 Type		Cl+Ex			Cl+Ex		Cl+Ex			Cl+Ex		Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings

101: Trafalgar Rd & Cross Ave/South Service Rd

Background 10 Year

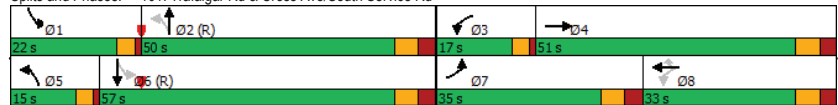
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		12.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		17.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	35.0	51.0		17.0	33.0	33.0	15.0	50.0		22.0	57.0	
Total Split (%)	25.0%	36.4%		12.1%	23.6%	23.6%	10.7%	35.7%		15.7%	40.7%	
Maximum Green (s)	28.0	44.0		13.0	26.0	26.0	11.0	43.0		18.0	50.0	
Yellow Time (s)	4.0	4.0		3.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		1.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	C-Max	C-Max		Min	C-Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	31.0	47.6		41.4	29.0	29.0	57.0	46.0		68.0	53.0	
Actuated g/C Ratio	0.22	0.34		0.30	0.21	0.21	0.41	0.33		0.49	0.38	
v/c Ratio	1.90	1.69		0.62	1.50	0.57	1.52	2.42dr		2.03	1.71dr	
Control Delay	442.4	349.5		44.2	280.3	19.8	265.8	339.5		489.7	222.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	442.4	349.5		44.2	280.3	19.8	265.8	339.5		489.7	222.2	
LOS	F	F		D	F	B	F	F		F	F	
Approach Delay		402.7			173.9			332.0			273.4	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 128 (91%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 2.03  
 Intersection Signal Delay: 314.0 Intersection LOS: F  
 Intersection Capacity Utilization 137.1% ICU Level of Service H  
 Analysis Period (min) 15  
 \* User Entered Value  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 101: Trafalgar Rd & Cross Ave/South Service Rd



Queues

101: Trafalgar Rd & Cross Ave/South Service Rd

Background 10 Year

AM Peak Hour


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1176	875	116	492	242	240	2104	495	2092
v/c Ratio	1.90	1.69	0.62	1.50	0.57	1.52	2.42dr	2.03	1.71dr
Control Delay	442.4	349.5	44.2	280.3	19.8	265.8	339.5	489.7	222.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	442.4	349.5	44.2	280.3	19.8	265.8	339.5	489.7	222.2
Queue Length 50th (m)	~270.1	~370.1	19.5	~198.4	15.4	~83.6	~366.9	~214.4	~326.3
Queue Length 95th (m)	#300.0	#365.8	29.8	#215.9	28.6	m#52.0	m#200.7	m#138.6	m#185.3
Internal Link Dist (m)		127.2		306.4		126.2		246.2	
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	618	517	192	327	424	158	1249	244	1479
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.90	1.69	0.60	1.50	0.57	1.52	1.68	2.03	1.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

HCM Signalized Intersection Capacity Analysis  
 101: Trafalgar Rd & Cross Ave/South Service Rd

Background 10 Year  
 AM Peak Hour




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1023	417	213	89	379	186	194	724	1025	416	1025	724
Future Volume (vph)	1023	417	213	89	379	186	194	724	1025	416	1025	724
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.80		1.00	0.80	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	0.87		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.91		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2795	1477		1525	1583	1362	1428	3196		1525	3666	
Flt Permitted	0.95	1.00		0.15	1.00	1.00	0.09	1.00		0.09	1.00	
Satd. Flow (perm)	2795	1477		247	1583	1362	140	3196		137	3666	
Peak-hour factor, PHF	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Adj. Flow (vph)	1176	542	333	116	492	242	240	823	1281	495	1220	872
RTOR Reduction (vph)	0	16	0	0	0	142	0	199	0	0	92	0
Lane Group Flow (vph)	1176	859	0	116	492	100	240	1905	0	495	2000	0
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8			8	2		6		
Actuated Green, G (s)	28.0	44.6		38.4	26.0	26.0	54.0	43.0		65.0	50.0	
Effective Green, g (s)	31.0	47.6		38.4	29.0	29.0	54.0	46.0		65.0	53.0	
Actuated g/C Ratio	0.22	0.34		0.27	0.21	0.21	0.39	0.33		0.46	0.38	
Clearance Time (s)	7.0	7.0		4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	618	502		180	327	282	155	1050		242	1387	
v/s Ratio Prot	c0.42	c0.58		0.06	0.31		0.12	0.60		c0.26	0.55	
v/s Ratio Perm				0.12		0.07	0.48			c0.69		
v/c Ratio	1.90	1.71		0.64	1.50	0.35	1.55	2.42dr		2.05	1.71dr	
Uniform Delay, d1	54.5	46.2		41.8	55.5	47.5	38.6	47.0		44.7	43.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.04	1.32		1.08	1.17	
Incremental Delay, d2	412.4	328.6		8.0	242.4	1.0	249.7	366.6		471.8	199.3	
Delay (s)	466.9	374.8		49.8	297.9	48.5	289.9	428.8		520.3	250.2	
Level of Service	F	F		D	F	D	F	F		F	F	
Approach Delay (s)	427.6			193.1			414.5			301.9		
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	356.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	137.1%	ICU Level of Service	H
Analysis Period (min)	15		
dr	Defacto Right Lane. Recode with 1 though lane as a right lane.		
c	Critical Lane Group		

Lanes, Volumes, Timings  
 102: GO Bus Terminal/Argus Rd & Cross Ave

Background 10 Year  
 AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	50	814	82	212	951	70	95	0	240	320	22	142
Future Volume (vph)	50	814	82	212	951	70	95	0	240	320	22	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95		1.00	0.95	0.95	1.00	1.00	1.00	1.00		1.00
Ped Bike Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.96		0.99		0.99
Frt		0.982			0.989			0.850				0.877
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1570	2821	0	818	3167	0	805	734	0	1570	1269	0
Flt Permitted	0.235			0.131			0.555			0.342		
Satd. Flow (perm)	388	2821	0	113	3167	0	469	734	0	559	1269	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			17			195			104	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		106.1			72.9			81.9			104.4	
Travel Time (s)		7.6			5.2			5.9			7.5	
Confl. Peds. (#/hr)	1		3	3		1	3		20	20		3
Peak Hour Factor	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%
Adj. Flow (vph)	96	936	126	252	1081	89	179	0	343	410	35	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	1062	0	252	1170	0	179	343	0	410	195	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings Background 10 Year  
102: GO Bus Terminal/Argus Rd & Cross Ave AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	46.0	46.0		13.0	59.0		31.0	31.0		31.0	31.0	
Total Split (%)	51.1%	51.1%		14.4%	65.6%		34.4%	34.4%		34.4%	34.4%	
Maximum Green (s)	40.0	40.0		9.0	53.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	40.0	40.0		53.0	53.0		27.1	27.1		27.1	27.1	
Actuated g/C Ratio	0.45	0.45		0.60	0.60		0.31	0.31		0.31	0.31	
v/c Ratio	0.55	0.82		1.80	0.61		1.24	0.95		2.40	0.42	
Control Delay	31.3	26.8		408.7	12.5		187.5	53.3		665.1	15.3	
Queue Delay	0.0	15.9		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	31.3	42.7		408.7	12.5		187.5	53.3		665.1	15.3	
LOS	C	D		F	B		F	D		F	B	
Approach Delay		41.7			82.7			99.3			455.7	
Approach LOS		D			F			F			F	

**Intersection Summary**

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 88.1

Natural Cycle: 120

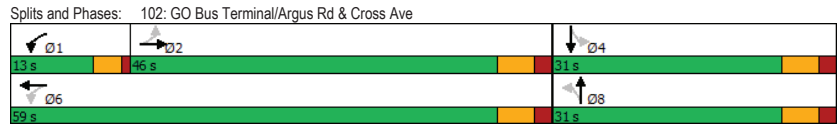
Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 2.40

Intersection Signal Delay: 133.1 Intersection LOS: F

Intersection Capacity Utilization 101.9% ICU Level of Service G

Analysis Period (min) 15



Queues Background 10 Year  
102: GO Bus Terminal/Argus Rd & Cross Ave AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	96	1062	252	1170	179	343	410	195
v/c Ratio	0.55	0.82	1.80	0.61	1.24	0.95	2.40	0.42
Control Delay	31.3	26.8	408.7	12.5	187.5	53.3	665.1	15.3
Queue Delay	0.0	15.9	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	42.7	408.7	12.5	187.5	53.3	665.1	15.3
Queue Length 50th (m)	11.9	81.6	~59.1	61.8	~41.6	30.4	~124.7	12.4
Queue Length 95th (m)	13.1	103.3	#97.5	77.9	#37.7	0.0	#153.0	14.8
Internal Link Dist (m)		82.1		48.9		57.9		80.4
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	185	1359	140	1988	144	360	171	461
Starvation Cap Reductn	0	306	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	0.52	1.01	1.80	0.59	1.24	0.95	2.40	0.42


**Intersection Summary**

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

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

HCM Signalized Intersection Capacity Analysis  
102: GO Bus Terminal/Argus Rd & Cross Ave


Background 10 Year  
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	50	814	82	212	951	70	95	0	240	320	22	142
Future Volume (vph)	50	814	82	212	951	70	95	0	240	320	22	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.99	
Ffpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.85		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1570	2822		818	3165		803	735		1553	1269	
Flt Permitted	0.23	1.00		0.13	1.00		0.55	1.00		0.34	1.00	
Satd. Flow (perm)	388	2822		113	3165		469	735		559	1269	
Peak-hour factor, PHF	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Adj. Flow (vph)	96	936	126	252	1081	89	179	0	343	410	35	160
RTOR Reduction (vph)	0	12	0	0	7	0	0	135	0	0	72	0
Lane Group Flow (vph)	96	1050	0	252	1163	0	179	208	0	410	123	0
Confl. Peds. (#/hr)	1		3	3		1	3		20	20		3
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	6		8	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	38.0	38.0		51.0	51.0		25.0	25.0		25.0	25.0	
Effective Green, g (s)	40.0	40.0		51.0	53.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio	0.45	0.45		0.58	0.60		0.31	0.31		0.31	0.31	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	176	1282		137	1906		143	225		171	389	
v/s Ratio Prot		0.37		c0.19	0.37			0.28			0.10	
v/s Ratio Perm	0.25			c0.88			0.38			c0.73		
v/c Ratio	0.55	0.82		1.84	0.61		1.25	0.92		2.40	0.32	
Uniform Delay, d1	17.4	20.9		19.2	11.0		30.5	29.5		30.5	23.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.0	4.8		404.6	0.8		158.1	39.8		646.5	0.6	
Delay (s)	23.4	25.6		423.8	11.8		188.6	69.3		677.0	24.1	
Level of Service	C	C		F	B		F	E		F	C	
Approach Delay (s)		25.4			84.9			110.2			466.6	
Approach LOS		C			F			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			132.2				HCM 2000 Level of Service				F	
HCM 2000 Volume to Capacity ratio			2.05									
Actuated Cycle Length (s)			88.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			101.9%			ICU Level of Service				G		
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave

Background 10 Year  
AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	65	448	143	277	327	25	55	3	107	94	28	74
Future Volume (vph)	65	448	143	277	327	25	55	3	107	94	28	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0		0.0	25.0		0.0	20.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		1.00	1.00		1.00	0.98		1.00	0.99	
Frt		0.961			0.981			0.853			0.889	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1540	2871	0	1570	2723	0	1570	1436	0	1468	1470	0
Flt Permitted	0.481			0.239			0.667			0.540		
Satd. Flow (perm)	775	2871	0	395	2723	0	1099	1436	0	832	1470	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			67			36			178			86
Link Speed (k/h)		50			50				50			50
Link Distance (m)		40.1			268.0			69.1				70.9
Travel Time (s)		2.9			19.3			5.0				5.1
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3
Peak Hour Factor	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%
Adj. Flow (vph)	83	553	196	420	414	60	69	4	178	152	30	86
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	83	749	0	420	474	0	69	182	0	152	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

Background 10 Year

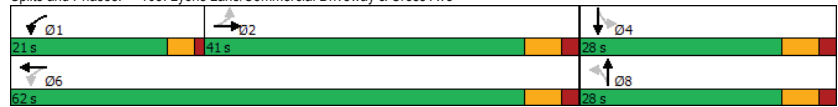
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.0	41.0		21.0	62.0		28.0	28.0		28.0	28.0	
Total Split (%)	45.6%	45.6%		23.3%	68.9%		31.1%	31.1%		31.1%	31.1%	
Maximum Green (s)	35.0	35.0		17.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.2	37.2		57.1	57.1		20.9	20.9		20.9	20.9	
Actuated g/C Ratio	0.43	0.43		0.66	0.66		0.24	0.24		0.24	0.24	
v/c Ratio	0.25	0.59		0.88	0.26		0.26	0.38		0.76	0.27	
Control Delay	19.8	19.9		32.7	6.2		29.1	7.1		54.8	11.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.8	19.9		32.7	6.2		29.1	7.1		54.8	11.3	
LOS	B	B		C	A		C	A		D	B	
Approach Delay		19.9			18.7			13.1			36.0	
Approach LOS		B			B			B			D	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	86
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	20.6
Intersection LOS:	C
Intersection Capacity Utilization:	81.3%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 103: Lyons Lane/Commercial Driveway & Cross Ave



Queues

103: Lyons Lane/Commercial Driveway & Cross Ave

Background 10 Year

AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	83	749	420	474	69	182	152	116
v/c Ratio	0.25	0.59	0.88	0.26	0.26	0.38	0.76	0.27
Control Delay	19.8	19.9	32.7	6.2	29.1	7.1	54.8	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	19.9	32.7	6.2	29.1	7.1	54.8	11.3
Queue Length 50th (m)	9.7	50.1	36.2	15.8	9.8	0.6	24.8	4.1
Queue Length 95th (m)	17.7	59.2	35.8	19.4	18.7	9.0	29.3	17.3
Internal Link Dist (m)		16.1		244.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	334	1279	495	1856	308	530	233	474
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	0.25	0.59	0.85	0.26	0.22	0.34	0.65	0.24

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
 103: Lyons Lane/Commercial Driveway & Cross Ave

Background 10 Year  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔ ↕			↔ ↕			↔ ↕			↔ ↕		
Traffic Volume (vph)	65	448	143	277	327	25	55	3	107	94	28	74
Future Volume (vph)	65	448	143	277	327	25	55	3	107	94	28	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.99	
Fipb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	0.85		1.00	0.89	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1532	2870		1570	2723		1566	1437		1464	1470	
Fit Permitted	0.48	1.00		0.24	1.00		0.67	1.00		0.54	1.00	
Satd. Flow (perm)	775	2870		395	2723		1099	1437		833	1470	
Peak-hour factor, PHF	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Adj. Flow (vph)	83	553	196	420	414	60	69	4	178	152	30	86
RTOR Reduction (vph)	0	38	0	0	12	0	0	135	0	0	65	0
Lane Group Flow (vph)	83	711	0	420	462	0	69	47	0	152	51	0
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.2	35.2		55.1	55.1		18.9	18.9		18.9	18.9	
Effective Green, g (s)	37.2	37.2		55.1	57.1		20.9	20.9		20.9	20.9	
Actuated g/C Ratio	0.43	0.43		0.64	0.66		0.24	0.24		0.24	0.24	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	335	1241		470	1807		267	349		202	357	
v/s Ratio Prot		0.25		c0.17	0.17			0.03			0.03	
v/s Ratio Perm	0.11			c0.41			0.06			c0.18		
v/c Ratio	0.25	0.57		0.89	0.26		0.26	0.14		0.75	0.14	
Uniform Delay, d1	15.5	18.4		12.2	5.8		26.3	25.5		30.2	25.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	1.0		18.9	0.2		0.7	0.2		15.5	0.3	
Delay (s)	16.3	19.4		31.1	6.0		27.0	25.7		45.6	25.8	
Level of Service	B	B		C	A		C	C		D	C	
Approach Delay (s)	19.1		17.8				26.1		37.0			
Approach LOS	B		B				C		D			
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.5		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			86.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			81.3%		ICU Level of Service				D			
Analysis Period (min)			15									
<b>c Critical Lane Group</b>												

Lanes, Volumes, Timings  
 104: Trafalgar Rd & Cornwall Rd

Background 10 Year  
 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔ ↕			↔ ↕			↔ ↕			↔ ↕		
Traffic Volume (vph)	635	710	113	27	613	694	83	644	71	476	533	407
Future Volume (vph)	635	710	113	27	613	694	83	644	71	476	533	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0		0.0	80.0		0.0	25.0		0.0	80.0		0.0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	*0.80	0.95	0.97	*0.80	1.00
Ped Bike Factor	1.00	0.99		1.00	0.98		1.00	1.00		0.99		0.98
Frt		0.971			0.922			0.983				0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2987	3029	0	1481	2838	0	1540	2655	0	2929	1341	1356
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2973	3029	0	1475	2838	0	1532	2655	0	2894	1341	1324
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			210			8				285
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.8			142.3			311.4				130.3
Travel Time (s)		20.6			10.2			22.4				9.4
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Peak Hour Factor	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Adj. Flow (vph)	683	780	188	36	713	771	138	749	95	567	620	509
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	683	968	0	36	1484	0	138	844	0	567	620	509
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	6.6		6.6				6.6		6.6			
Link Offset(m)	0.0		0.0				0.0		0.0			
Crosswalk Width(m)	4.8		4.8				4.8		4.8			
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)	9.4		9.4				9.4		9.4			
Detector 2 Size(m)	0.6		0.6				0.6		0.6			
Detector 2 Type	Cl+Ex		Cl+Ex				Cl+Ex		Cl+Ex			
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

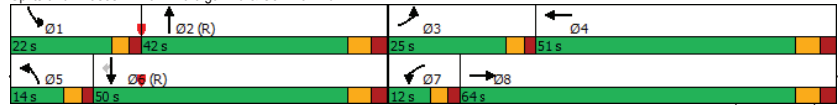
Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	25.0	64.0		12.0	51.0		14.0	42.0		22.0	50.0	50.0
Total Split (%)	17.9%	45.7%		8.6%	36.4%		10.0%	30.0%		15.7%	35.7%	35.7%
Maximum Green (s)	20.0	57.0		7.0	44.0		9.0	35.0		17.0	43.0	43.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	21.0	60.0		8.0	47.0		10.0	38.0		18.0	46.0	46.0
Actuated g/C Ratio	0.15	0.43		0.06	0.34		0.07	0.27		0.13	0.33	0.33
v/c Ratio	1.52	0.74		0.43	1.36		1.25	1.16		1.51	1.41	0.81
Control Delay	286.3	36.6		79.8	199.5		219.7	132.3		278.0	217.9	15.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	286.3	36.6		79.8	199.5		219.7	132.3		278.0	217.9	15.0
LOS	F	D		E	F		F	F		F	F	B
Approach Delay		139.9			196.7			144.6			177.1	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type:	CBD	
Cycle Length:	140	
Actuated Cycle Length:	140	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection		
Natural Cycle:	150	
Control Type:	Actuated-Coordinated	
Maximum v/c Ratio:	1.52	
Intersection Signal Delay:	166.2	Intersection LOS: F
Intersection Capacity Utilization	120.1%	ICU Level of Service H
Analysis Period (min)	15	
* User Entered Value		

Splits and Phases: 104: Trafalgar Rd & Cornwall Rd



Queues  
104: Trafalgar Rd & Cornwall Rd

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	683	968	36	1484	138	844	567	620	509
v/c Ratio	1.52	0.74	0.43	1.36	1.25	1.16	1.51	1.41	0.81
Control Delay	286.3	36.6	79.8	199.5	219.7	132.3	278.0	217.9	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	286.3	36.6	79.8	199.5	219.7	132.3	278.0	217.9	15.0
Queue Length 50th (m)	~143.0	119.5	10.3	~277.4	~50.2	~181.1	~121.3	~299.1	28.3
Queue Length 95th (m)	#182.9	146.7	19.0	#299.4	#52.6	#215.7	m#70.0m#150.5	m11.9	
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	448	1313	84	1092	110	726	376	440	626
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.52	0.74	0.43	1.36	1.25	1.16	1.51	1.41	0.81

Intersection Summary

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



HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Background 10 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	635	710	113	27	613	694	83	644	71	476	533	407
Future Volume (vph)	635	710	113	27	613	694	83	644	71	476	533	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	*0.80		0.97	*0.80	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Fr	1.00	0.97		1.00	0.92		1.00	0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2987	3029		1481	2839		1540	2656		2929	1341	1324
Fit Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2987	3029		1481	2839		1540	2656		2929	1341	1324
Peak-hour factor, PHF	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Adj. Flow (vph)	683	780	188	36	713	771	138	749	95	567	620	509
RTOR Reduction (vph)	0	15	0	0	140	0	0	6	0	0	0	191
Lane Group Flow (vph)	683	953	0	36	1345	0	138	838	0	567	620	318
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	20.0	57.0		7.0	44.0		9.0	35.0		17.0	43.0	43.0
Effective Green, g (s)	21.0	60.0		8.0	47.0		10.0	38.0		18.0	46.0	46.0
Actuated g/C Ratio	0.15	0.43		0.06	0.34		0.07	0.27		0.13	0.33	0.33
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	448	1298		84	953		110	720		376	440	435
v/s Ratio Prot	c0.23	0.31		0.02	c0.47		0.09	0.32		c0.19	c0.46	
v/s Ratio Perm												0.24
v/c Ratio	1.52	0.73		0.43	1.41		1.25	1.16		1.51	1.41	0.73
Uniform Delay, d1	59.5	33.4		63.8	46.5		65.0	51.0		61.0	47.0	41.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.30	0.85	0.73
Incremental Delay, d2	247.2	3.7		15.2	191.1		169.2	88.6		229.9	185.4	1.0
Delay (s)	306.7	37.1		79.0	237.6		234.2	139.6		308.9	225.4	31.3
Level of Service	F	D		E	F		F	F		F	F	C
Approach Delay (s)	148.6			233.9			152.9			195.1		
Approach LOS	F			F			F			F		

Intersection Summary			
HCM 2000 Control Delay	185.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	120.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↕		↕	↕	
Traffic Volume (vph)	1101	988	0	1563	2069	0
Future Volume (vph)	1101	988	0	1563	2069	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	*0.80	*0.80	1.00
Fr		0.850				
Fit Protected	0.950					
Satd. Flow (prot)	2958	1423	0	3872	3946	0
Fit Permitted	0.950					
Satd. Flow (perm)	2958	1423	0	3872	3946	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	199.2			51.4	324.8	
Travel Time (s)	14.3			3.7	23.4	
Peak Hour Factor	0.98	0.92	0.25	0.91	0.90	0.25
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Adj. Flow (vph)	1123	1074	0	1718	2299	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1123	1074	0	1718	2299	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

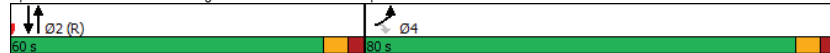
Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	80.0	80.0		60.0	60.0	
Total Split (%)	57.1%	57.1%		42.9%	42.9%	
Maximum Green (s)	73.0	73.0		53.0	53.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	76.0	76.0		56.0	56.0	
Actuated g/C Ratio	0.54	0.54		0.40	0.40	
v/c Ratio	0.70	1.39		1.11	1.46	
Control Delay	26.5	212.6		100.6	236.5	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	26.5	212.6		100.6	236.5	
LOS	C	F		F	F	
Approach Delay	117.5			100.6	236.5	
Approach LOS	F			F	F	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 133.6 (95%), Referenced to phase 2:NBSB and 6., Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.46  
 Intersection Signal Delay: 156.9 Intersection LOS: F  
 Intersection Capacity Utilization 119.1% ICU Level of Service H  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 105: Trafalgar Rd & QEW EB-Off Ramp



Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1123	1074	1718	2299
v/c Ratio	0.70	1.39	1.11	1.46
Control Delay	26.5	212.6	100.6	236.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.5	212.6	100.6	236.5
Queue Length 50th (m)	120.3	~415.9	~238.6	~380.4
Queue Length 95th (m)	146.4	#499.3	m109.8 m#364.7	
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1605	772	1548	1578
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.70	1.39	1.11	1.46

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 10 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔		↕	↕	
Traffic Volume (vph)	1101	988	0	1563	2069	0
Future Volume (vph)	1101	988	0	1563	2069	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		*0.80	*0.80	
Fr't	1.00	0.85		1.00	1.00	
Fit Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	2958	1423		3872	3946	
Fit Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	2958	1423		3872	3946	
Peak-hour factor, PHF	0.98	0.92	0.25	0.91	0.90	0.25
Adj. Flow (vph)	1123	1074	0	1718	2299	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1123	1074	0	1718	2299	0
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases	4					
Actuated Green, G (s)	73.0	73.0		53.0	53.0	
Effective Green, g (s)	76.0	76.0		56.0	56.0	
Actuated g/C Ratio	0.54	0.54		0.40	0.40	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1605	772		1548	1578	
v/s Ratio Prot	0.38			0.44	c0.58	
v/s Ratio Perm		c0.75				
v/c Ratio	0.70	1.39		1.11	1.46	
Uniform Delay, d1	23.6	32.0		42.0	42.0	
Progression Factor	1.00	1.00		1.32	0.85	
Incremental Delay, d2	1.4	184.0		50.5	206.8	
Delay (s)	24.9	216.0		106.0	242.6	
Level of Service	C	F		F	F	
Approach Delay (s)	118.3			106.0	242.6	
Approach LOS	F			F	F	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		160.9		HCM 2000 Level of Service		F
HCM 2000 Volume to Capacity ratio		1.42				
Actuated Cycle Length (s)		140.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		119.1%		ICU Level of Service		H
Analysis Period (min)		15				

Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔		↕	↕		↕	↕
Traffic Volume (vph)	1	0	244	583	40	308	0	1911	0	0	2036	8
Future Volume (vph)	1	0	244	583	40	308	0	1911	0	0	2036	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor												0.96
Fr't			0.850			0.850						0.850
Fit Protected	0.950			0.950	0.960							
Satd. Flow (prot)	1570	0	1395	1421	1445	1356	0	3909	0	0	3984	1437
Fit Permitted	0.950			0.950	0.960							
Satd. Flow (perm)	1570	0	1395	1421	1445	1356	0	3909	0	0	3984	1380
Right Turn on Red			Yes			Yes		Yes			Yes	Yes
Satd. Flow (RTOR)			31			221						70
Link Speed (k/h)		50			50			50				50
Link Distance (m)		142.1			192.6			324.8				275.1
Travel Time (s)		10.2			13.9			23.4				19.8
Confl. Peds. (#/hr)							8		5	5		8
Peak Hour Factor	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Adj. Flow (vph)	4	0	268	663	59	422	0	2055	0	0	2262	13
Shared Lane Traffic (%)				46%								
Lane Group Flow (vph)	4	0	268	358	364	422	0	2055	0	0	2262	13
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1	2	1						1
Detector Template	Left		Right	Left	Thru	Right		Thru				Thru
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0				10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6				0.6
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex				CI+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					CI+Ex			CI+Ex				CI+Ex
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 10 Year

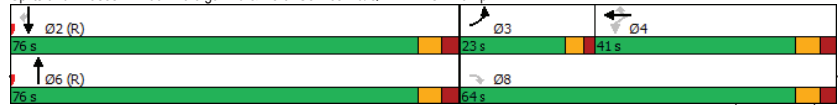
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	Perm	
Protected Phases	3			4	4			6			2	
Permitted Phases			8	4		4						2
Detector Phase	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		64.0	41.0	41.0	41.0		76.0			76.0	76.0
Total Split (%)	16.4%		45.7%	29.3%	29.3%	29.3%		54.3%			54.3%	54.3%
Maximum Green (s)	18.0		57.0	34.0	34.0	34.0		69.0			69.0	69.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)			7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (#/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	8.0		57.4	45.4	45.4	45.4		74.6			74.6	74.6
Actuated g/C Ratio	0.06		0.41	0.32	0.32	0.32		0.53			0.53	0.53
v/c Ratio	0.04		0.45	0.78	0.78	0.72		0.99			1.07	0.02
Control Delay	64.0		28.5	55.1	54.9	26.1		43.4			72.2	0.0
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	64.0		28.5	55.1	54.9	26.1		43.4			72.2	0.0
LOS	E		C	E	D	C		D			E	A
Approach Delay		29.0				44.3		43.4			71.8	
Approach LOS		C				D		D			E	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 54.1 Intersection LOS: D  
 Intersection Capacity Utilization 89.6% ICU Level of Service E  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 10 Year

AM Peak Hour

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	4	268	358	364	422	2055	2262	13
v/c Ratio	0.04	0.45	0.78	0.78	0.72	0.99	1.07	0.02
Control Delay	64.0	28.5	55.1	54.9	26.1	43.4	72.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	28.5	55.1	54.9	26.1	43.4	72.2	0.0
Queue Length 50th (m)	1.1	47.8	96.3	97.8	51.5	~260.8	~311.7	0.0
Queue Length 95th (m)	1.4	73.9	134.2	95.0	55.2	m176.2	#344.7	0.0
Internal Link Dist (m)				168.6		300.8	251.1	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	615	461	468	589	2082	2122	767
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.44	0.78	0.78	0.72	0.99	1.07	0.02

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 10 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1	0	244	583	40	308	0	1911	0	0	2036	8
Future Volume (vph)	1	0	244	583	40	308	0	1911	0	0	2036	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		*0.80		*0.80	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00		1.00	0.96	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00		0.85	1.00	1.00	0.85		1.00		1.00	0.85	
Flt Protected	0.95		1.00	0.95	0.96	1.00		1.00		1.00	1.00	
Satd. Flow (prot)	1570		1395	1421	1445	1356		3909		3984	1380	
Flt Permitted	0.95		1.00	0.95	0.96	1.00		1.00		1.00	1.00	
Satd. Flow (perm)	1570		1395	1421	1445	1356		3909		3984	1380	
Peak-hour factor, PHF	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Adj. Flow (vph)	4	0	268	662	59	422	0	2055	0	0	2262	13
RTOR Reduction (vph)	0	0	18	0	0	149	0	0	0	0	0	6
Lane Group Flow (vph)	4	0	250	358	364	273	0	2055	0	0	2262	7
Confl. Peds. (#/hr)							8		5	5		8
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	Perm	
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	7.0		54.4	42.4	42.4	42.4		71.6		71.6	71.6	
Effective Green, g (s)	8.0		57.4	45.4	45.4	45.4		74.6		74.6	74.6	
Actuated g/C Ratio	0.06		0.41	0.32	0.32	0.32		0.53		0.53	0.53	
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0		7.0	7.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5		4.5	4.5	
Lane Grp Cap (vph)	89		571	460	468	439		2082		2122	735	
v/s Ratio Prot	0.00							0.53		c0.57		
v/s Ratio Perm			c0.18	c0.25	0.25	0.20					0.01	
v/c Ratio	0.04		0.44	0.78	0.78	0.62		0.99		1.07	0.01	
Uniform Delay, d1	62.4		29.7	42.8	42.7	40.0		32.2		32.7	15.4	
Progression Factor	1.00		1.00	1.00	1.00	1.00		1.07		1.00	1.00	
Incremental Delay, d2	0.2		0.5	8.1	8.0	2.7		8.7		39.9	0.0	
Delay (s)	62.6		30.2	50.9	50.7	42.7		43.3		72.6	15.4	
Level of Service	E		C	D	D	D		D		E	B	
Approach Delay (s)		30.7			47.8			43.3			72.3	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	55.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Background 10 Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	992	462	568	0	0	1584
Future Volume (vph)	992	462	568	0	0	1584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3423	1441	3539	0	0	3539
Flt Permitted	0.954					
Satd. Flow (perm)	3423	1441	3539	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	5	258				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1078	502	617	0	0	1722
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1128	452	617	0	0	1722
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

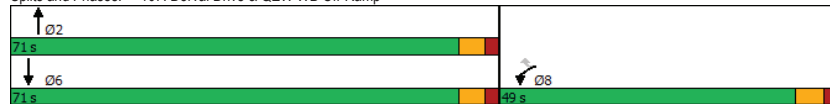
Background 10 Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	49.0	49.0	71.0			71.0
Total Split (%)	40.8%	40.8%	59.2%			59.2%
Maximum Green (s)	43.0	43.0	65.0			65.0
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	44.5	44.5	67.0			67.0
Actuated g/C Ratio	0.37	0.37	0.56			0.56
v/c Ratio	0.88	0.65	0.31			0.87
Control Delay	44.4	17.4	14.6			28.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	44.4	17.4	14.6			28.6
LOS	D	B	B			C
Approach Delay	36.7		14.6			28.6
Approach LOS	D		B			C

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 119.5  
 Natural Cycle: 70  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 29.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 83.6%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 107: Dorval Drive & QEW WB Off-Ramp



Queues  
107: Dorval Drive & QEW WB Off-Ramp

Background 10 Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1128	452	617	1722
v/c Ratio	0.88	0.65	0.31	0.87
Control Delay	44.4	17.4	14.6	28.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	44.4	17.4	14.6	28.6
Queue Length 50th (m)	132.3	42.1	41.1	184.5
Queue Length 95th (m)	#162.9	84.5	53.0	222.0
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1291	703	1983	1983
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.87	0.64	0.31	0.87

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Background 10 Year  
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕			↕↕
Traffic Volume (vph)	992	462	568	0	0	1584
Future Volume (vph)	992	462	568	0	0	1584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr't	0.99	0.85	1.00			1.00
Fit Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3426	1441	3539			3539
Fit Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3426	1441	3539			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1078	502	617	0	0	1722
RTOR Reduction (vph)	3	162	0	0	0	0
Lane Group Flow (vph)	1125	290	617	0	0	1722
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases	8					
Actuated Green, G (s)	42.5	42.5	65.0			65.0
Effective Green, g (s)	44.5	44.5	67.0			67.0
Actuated g/C Ratio	0.37	0.37	0.56			0.56
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1275	536	1984			1984
v/s Ratio Prot	c0.33		0.17			c0.49
v/s Ratio Perm		0.20				
v/c Ratio	0.88	0.54	0.31			0.87
Uniform Delay, d1	35.1	29.5	14.0			22.5
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	7.9	1.7	0.4			5.5
Delay (s)	42.9	31.2	14.4			27.9
Level of Service	D	C	B			C
Approach Delay (s)	39.6		14.4			27.9
Approach LOS	D		B			C

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	119.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕	↕↕	
Traffic Volume (vph)	145	579	0	799	1712	0
Future Volume (vph)	145	579	0	799	1712	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr't	0.900	0.850				
Fit Protected	0.984					
Satd. Flow (prot)	3200	1441	0	3539	3539	0
Fit Permitted	0.984					
Satd. Flow (perm)	3200	1441	0	3539	3539	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	20	20				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	629	0	868	1861	0
Shared Lane Traffic (%)	50%					
Lane Group Flow (vph)	473	314	0	868	1861	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases	4					

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

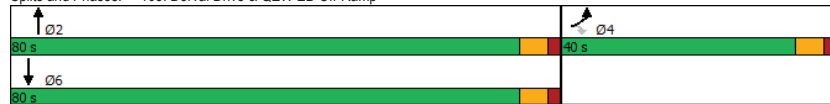
Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	40.0	40.0		80.0	80.0	
Total Split (%)	33.3%	33.3%		66.7%	66.7%	
Maximum Green (s)	34.0	34.0		74.0	74.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	30.3	30.3		76.2	76.2	
Actuated g/C Ratio	0.26	0.26		0.67	0.67	
v/c Ratio	0.55	0.79		0.37	0.79	
Control Delay	36.8	51.8		9.7	17.8	
Queue Delay	0.0	0.0		0.0	0.2	
Total Delay	36.8	51.8		9.7	17.9	
LOS	D	D		A	B	
Approach Delay	42.8			9.7	17.9	
Approach LOS	D			A	B	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 114.5  
 Natural Cycle: 60  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 21.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 83.6%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 108: Dorval Drive & QEW EB Off-Ramp



Queues  
108: Dorval Drive & QEW EB Off-Ramp

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	473	314	868	1861
v/c Ratio	0.55	0.79	0.37	0.79
Control Delay	36.8	51.8	9.7	17.8
Queue Delay	0.0	0.0	0.0	0.2
Total Delay	36.8	51.8	9.7	17.9
Queue Length 50th (m)	47.3	71.2	46.4	158.5
Queue Length 95th (m)	63.9	109.7	63.7	210.4
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1022	467	2354	2354
Starvation Cap Reductn	0	0	0	64
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.46	0.67	0.37	0.81

Intersection Summary



HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Background 10 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↗		↕↕	↕↕	
Traffic Volume (vph)	145	579	0	799	1712	0
Future Volume (vph)	145	579	0	799	1712	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.90	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3199	1441		3539	3539	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3199	1441		3539	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	629	0	868	1861	0
RTOR Reduction (vph)	15	15	0	0	0	0
Lane Group Flow (vph)	458	299	0	868	1861	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	28.3	28.3		74.2	74.2	
Effective Green, g (s)	30.3	30.3		76.2	76.2	
Actuated g/C Ratio	0.26	0.26		0.67	0.67	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	846	381		2355	2355	
v/s Ratio Prot	0.14			0.25	c0.53	
v/s Ratio Perm		c0.21				
v/c Ratio	0.54	0.79		0.37	0.79	
Uniform Delay, d1	36.1	39.1		8.5	13.5	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	10.8		0.4	2.8	
Delay (s)	37.0	49.9		8.9	16.3	
Level of Service	D	D		A	B	
Approach Delay (s)	42.1			8.9	16.3	
Approach LOS	D			A	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			20.3	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			114.5	Sum of lost time (s)		8.0
Intersection Capacity Utilization			83.6%	ICU Level of Service		E
Analysis Period (min)			15			

c Critical Lane Group

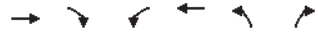
Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background 10 Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕	↕
Traffic Volume (vph)	530	0	0	322	283	315
Future Volume (vph)	530	0	0	322	283	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						164
Link Speed (k/h)	60			60	40	
Link Distance (m)	128.8			184.7	258.8	
Travel Time (s)	7.7			11.1	23.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	576	0	0	350	308	342
Shared Lane Traffic (%)						
Lane Group Flow (vph)	576	0	0	350	308	342
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
v/c Ratio	0.41			0.25	0.44	0.47

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background 10 Year  
AM Peak Hour






Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	10.8			9.6	12.2	7.7
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.8			9.6	12.2	7.7
LOS	B			A	B	A
Approach Delay	10.8			9.6	9.8	
Approach LOS	B			A	A	

**Intersection Summary**

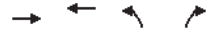
Area Type:	Other
Cycle Length:	45
Actuated Cycle Length:	45
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Natural Cycle:	45
Control Type:	Pretimed
Maximum v/c Ratio:	0.47
Intersection Signal Delay:	10.1
Intersection LOS:	B
Intersection Capacity Utilization:	41.7%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street

 Ø2 (L) 22.5 s	 Ø4 22.5 s
 Ø8 22.5 s	

Queues  
109: QEW WB Off-Ramp & Kerr Street

Background 10 Year  
AM Peak Hour



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	576	350	308	342
v/c Ratio	0.41	0.25	0.44	0.47
Control Delay	10.8	9.6	12.2	7.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.8	9.6	12.2	7.7
Queue Length 50th (m)	16.9	9.5	17.4	9.4
Queue Length 95th (m)	26.9	16.5	33.3	24.5
Internal Link Dist (m)	104.8	160.7	234.8	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1415	1415	708	731
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.25	0.44	0.47

**Intersection Summary**

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Background 10 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	↑
Traffic Volume (vph)	530	0	0	322	283	315
Future Volume (vph)	530	0	0	322	283	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr't	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	576	0	0	350	308	342
RTOR Reduction (vph)	0	0	0	0	0	98
Lane Group Flow (vph)	576	0	0	350	308	244
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1415			1415	708	633
v/s Ratio Prot	c0.16			0.10	c0.17	
v/s Ratio Perm						0.15
v/c Ratio	0.41			0.25	0.44	0.38
Uniform Delay, d1	9.7			9.0	9.8	9.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.9			0.4	1.9	1.8
Delay (s)	10.5			9.4	11.7	11.3
Level of Service	B			A	B	B
Approach Delay (s)	10.5			9.4	11.5	
Approach LOS	B			A	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			10.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.42			
Actuated Cycle Length (s)			45.0		Sum of lost time (s)	9.0
Intersection Capacity Utilization			41.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑		↑	↑↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	50	619	34	101	610	8	3	9	57	4	23	32
Future Volume (vph)	50	619	34	101	610	8	3	9	57	4	23	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0		0.0	155.0		70.0	15.0		0.0	0.0		30.0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't		0.992				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3299	0	1719	3139	1380	1805	1667	1468	1805	1792	1495
Flt Permitted	0.385			0.341			0.741			0.751		
Satd. Flow (perm)	1378	3299	0	617	3139	1380	1408	1667	1468	1427	1792	1495
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		6				94			99			99
Link Speed (k/h)		80			80			60				40
Link Distance (m)		324.5			247.2			158.7				215.5
Travel Time (s)		14.6			11.1			9.5				19.4
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Adj. Flow (vph)	55	680	37	111	670	9	3	10	63	4	25	35
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	55	717	0	111	670	9	3	10	63	4	25	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
<b>Detector 2 Channel</b>												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

Lanes, Volumes, Timings Background 10 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	34.0		14.0	38.4	38.4	28.8	28.8	28.8	35.0	35.0	35.0
Total Split (s)	19.0	64.0		23.0	68.0	68.0	38.0	38.0	38.0	38.0	38.0	38.0
Total Split (%)	15.2%	51.2%		18.4%	54.4%	54.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%
Maximum Green (s)	13.0	55.6		17.0	59.6	59.6	30.2	30.2	30.2	30.2	30.2	30.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	76.3	66.3		77.3	70.2	70.2	13.4	13.4	13.4	13.8	13.8	13.8
Actuated g/C Ratio	0.78	0.67		0.79	0.71	0.71	0.14	0.14	0.14	0.14	0.14	0.14
v/c Ratio	0.04	0.32		0.19	0.30	0.01	0.02	0.04	0.22	0.02	0.10	0.12
Control Delay	2.6	7.9		3.2	7.6	0.0	37.3	38.0	4.8	37.5	38.8	0.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.6	7.9		3.2	7.6	0.0	37.3	38.0	4.8	37.5	38.8	0.8
LOS	A	A		A	A	A	D	D	A	D	D	A
Approach Delay		7.5			6.9			10.5			18.0	
Approach LOS		A			A			B			B	

**Intersection Summary**

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 98.4

Natural Cycle: 90

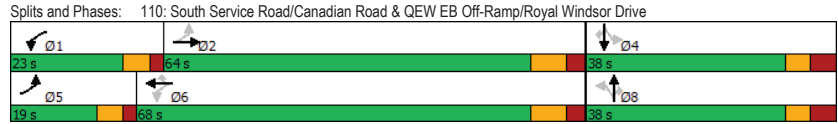
Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.32

Intersection Signal Delay: 7.7 Intersection LOS: A

Intersection Capacity Utilization 50.0% ICU Level of Service A

Analysis Period (min) 15



Queues Background 10 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	55	717	111	670	9	3	10	63	4	25	35	
v/c Ratio	0.04	0.32	0.19	0.30	0.01	0.02	0.04	0.22	0.02	0.10	0.12	
Control Delay	2.6	7.9	3.2	7.6	0.0	37.3	38.0	4.8	37.5	38.8	0.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.6	7.9	3.2	7.6	0.0	37.3	38.0	4.8	37.5	38.8	0.8	
Queue Length 50th (m)	1.0	31.6	4.2	29.7	0.0	0.6	1.8	0.0	0.7	4.5	0.0	
Queue Length 95th (m)	2.1	42.4	7.7	39.6	0.0	3.3	6.7	5.1	4.0	12.4	0.0	
Internal Link Dist (m)		300.5		223.2			134.7			191.5		
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0	
Base Capacity (vph)	1433	2223	717	2237	1010	486	575	572	493	619	581	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.32	0.15	0.30	0.01	0.01	0.02	0.11	0.01	0.04	0.06	

**Intersection Summary**

HCM Signalized Intersection Capacity Analysis  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Background 10 Year

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↕	↔	↕	↔
Traffic Volume (vph)	50	619	34	101	610	8	3	9	57	4	23	32
Future Volume (vph)	50	619	34	101	610	8	3	9	57	4	23	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3300		1719	3139	1380	1805	1667	1468	1805	1792	1495
Flt Permitted	0.38	1.00		0.34	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1377	3300		617	3139	1380	1408	1667	1468	1427	1792	1495
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)	55	680	37	111	670	9	3	10	63	4	25	35
RTOR Reduction (vph)	0	2	0	0	0	3	0	0	56	0	0	31
Lane Group Flow (vph)	55	715	0	111	670	6	3	10	7	4	25	4
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	69.4	63.1		73.0	64.9	64.9	7.9	7.9	7.9	7.9	7.9	7.9
Effective Green, g (s)	73.4	67.5		77.0	69.3	69.3	11.7	11.7	11.7	11.7	11.7	11.7
Actuated g/C Ratio	0.72	0.67		0.76	0.68	0.68	0.12	0.12	0.12	0.12	0.12	0.12
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	1163	2198		578	2147	944	162	192	169	164	206	172
v/s Ratio Prot	0.00	c0.22		c0.02	0.21			0.01			c0.01	
v/s Ratio Perm	0.03			0.13		0.00	0.00		0.00	0.00		0.00
v/c Ratio	0.05	0.33		0.19	0.31	0.01	0.02	0.05	0.04	0.02	0.12	0.02
Uniform Delay, d1	3.9	7.2		3.4	6.4	5.1	39.7	39.9	39.8	39.7	40.2	39.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.4		0.2	0.4	0.0	0.1	0.1	0.1	0.1	0.3	0.1
Delay (s)	3.9	7.6		3.6	6.8	5.1	39.8	40.0	39.9	39.8	40.5	39.8
Level of Service	A	A		A	A	A	D	D	D	D	D	D
Approach Delay (s)		7.3			6.3			39.9			40.1	
Approach LOS		A			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay	9.6		HCM 2000 Level of Service				A					
HCM 2000 Volume to Capacity ratio	0.28											
Actuated Cycle Length (s)	101.3		Sum of lost time (s)				12.0					
Intersection Capacity Utilization	50.0%		ICU Level of Service				A					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
 201: Cross Ave & Lyons Lane

Background 10 Year  
 AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕
Traffic Volume (vph)	32	630	424	41	10	8
Future Volume (vph)	32	630	424	41	10	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.978		0.932	
Flt Protected	0.950				0.976	
Satd. Flow (prot)	1624	3094	2795	0	1383	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1624	3094	2795	0	1383	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	4			4	7	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Heavy Vehicles (%)	0%	5%	16%	0%	0%	25%
Adj. Flow (vph)	46	1086	482	82	16	16
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	46	1086	564	0	32	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	3.6	3.6			3.6	
Link Offset(m)	0.0	0.0			0.0	
Crosswalk Width(m)	4.8	4.8			4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	31.2%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Background 10 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	
Traffic Volume (veh/h)	32	630	424	41	10	8
Future Volume (Veh/h)	32	630	424	41	10	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Hourly flow rate (vph)	46	1086	482	82	16	16
Pedestrians			7		4	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked	0.95			0.95	0.95	
vC, conflicting volume	568			1169	286	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	446			1078	150	
tC, single (s)	4.1			6.8	7.4	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.5	
p0 queue free %	96			92	98	
cM capacity (veh/h)	1067			196	760	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	46	543	543	321	243	32
Volume Left	46	0	0	0	0	16
Volume Right	0	0	0	0	82	16
eSH	1067	1700	1700	1700	1700	311
Volume to Capacity	0.04	0.32	0.32	0.19	0.14	0.10
Queue Length 95th (m)	1.1	0.0	0.0	0.0	0.0	2.7
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	17.9
Lane LOS	A					C
Approach Delay (s)	0.3			0.0		17.9
Approach LOS						C
<b>Intersection Summary</b>						
Average Delay			0.6			
Intersection Capacity Utilization			31.2%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	5	4	18	16	1
Future Volume (vph)	0	5	4	18	16	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.888		0.988	
Fit Protected					0.956	
Satd. Flow (prot)	0	1710	1518	0	1241	0
Fit Permitted					0.956	
Satd. Flow (perm)	0	1710	1518	0	1241	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		60.5	89.6		37.6	
Travel Time (s)		4.4	6.5		2.7	
Confl. Peds. (#/hr)	6			6	1	
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	33%	0%
Adj. Flow (vph)	0	10	5	24	42	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	10	29	0	46	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)		24		14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 15.1%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Background 10 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	5	4	18	16	1
Future Volume (Veh/h)	0	5	4	18	16	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Hourly flow rate (vph)	0	10	5	24	42	4
Pedestrians			1		6	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	35				34	23
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	35				34	23
tC, single (s)	4.1				6.7	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1581				900	1054
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	10	29	46			
Volume Left	0	0	42			
Volume Right	0	24	4			
cSH	1581	1700	912			
Volume to Capacity	0.00	0.02	0.05			
Queue Length 95th (m)	0.0	0.0	1.3			
Control Delay (s)	0.0	0.0	9.2			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			5.0			
Intersection Capacity Utilization		15.1%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	79	828	177	21	4
Future Volume (vph)	1	79	828	177	21	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.973		0.978	
Fit Protected		0.999			0.960	
Satd. Flow (prot)	0	1673	1625	0	1605	0
Fit Permitted		0.999			0.960	
Satd. Flow (perm)	0	1673	1625	0	1605	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)	1			1	5	1
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Heavy Vehicles (%)	100%	0%	3%	0%	0%	0%
Adj. Flow (vph)	4	188	963	246	84	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	192	1209	0	100	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24		14		24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 70.7%				ICU Level of Service C		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Background 10 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	79	828	177	21	4
Future Volume (Veh/h)	1	79	828	177	21	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Hourly flow rate (vph)	4	188	963	246	84	16
Pedestrians		1	5		1	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	1210				1288	1088
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1210				1288	1088
tC, single (s)	5.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	3.1				3.5	3.3
p0 queue free %	99				53	94
cM capacity (veh/h)	336				180	264
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	192	1209	100			
Volume Left	4	0	84			
Volume Right	0	246	16			
eSH	336	1700	189			
Volume to Capacity	0.01	0.71	0.53			
Queue Length 95th (m)	0.3	0.0	21.6			
Control Delay (s)	0.5	0.0	43.5			
Lane LOS	A		E			
Approach Delay (s)	0.5	0.0	43.5			
Approach LOS			E			
<b>Intersection Summary</b>						
Average Delay			3.0			
Intersection Capacity Utilization			70.7%		ICU Level of Service	C
Analysis Period (min)			15			

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕↕	↕↕↕	
Traffic Volume (vph)	0	111	0	2166	2256	933
Future Volume (vph)	0	111	0	2166	2256	933
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	*0.80	*0.80	0.91
Ped Bike Factor						
Fr <sub>t</sub>		0.865			0.951	
Fit Protected						
Satd. Flow (prot)	0	1367	0	3836	3777	0
Fit Permitted						
Satd. Flow (perm)	0	1367	0	3836	3777	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	145.7			270.2	51.4	
Travel Time (s)	10.5			19.5	3.7	
Confl. Peds. (#/hr)						11
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82
Heavy Vehicles (%)	0%	7%	0%	7%	4%	2%
Adj. Flow (vph)	0	206	0	2354	2326	1138
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	206	0	2354	3464	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	86.2%			ICU Level of Service E		
Analysis Period (min)	15					
* User Entered Value						



HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Background 10 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations		↗		↖↖	↗↗		
Traffic Volume (veh/h)	0	111	0	2166	2256	933	
Future Volume (Veh/h)	0	111	0	2166	2256	933	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82	
Hourly flow rate (vph)	0	206	0	2354	2326	1138	
Pedestrians	11						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	1						
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.61	0.61	0.61				
vC, conflicting volume	3691	1355	3475				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	3177	0	2824				
tC, single (s)	6.8	7.0	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	68	100				
cM capacity (veh/h)	5	647	84				
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	206	785	785	785	930	930	1603
Volume Left	0	0	0	0	0	0	0
Volume Right	206	0	0	0	0	0	1138
sSH	647	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.32	0.46	0.46	0.46	0.55	0.55	0.94
Queue Length 95th (m)	10.9	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	13.1	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	13.1	0.0			0.0		
Approach LOS	B						
Intersection Summary							
Average Delay			0.4				
Intersection Capacity Utilization			86.2%		ICU Level of Service		E
Analysis Period (min)			15				

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Background 10 Year  
AM Peak Hour

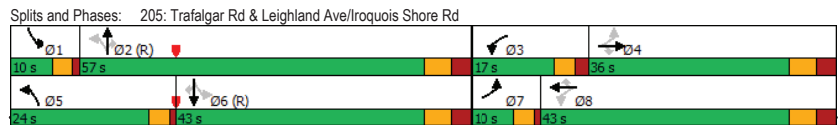
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	26	249	417	445	78	197	223	1119	872	171	1164	27
Future Volume (vph)	26	249	417	445	78	197	223	1119	872	171	1164	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0		25.0	145.0		0.0	95.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	0.99					0.98			0.97	1.00		
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1693	1425	3060	1676	1398	1425	3909	1398	1562	3984	1398
Fit Permitted	0.702			0.274			0.090			0.120		
Satd. Flow (perm)	1189	1693	1425	882	1676	1366	135	3909	1363	197	3984	1398
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			299			212			412			191
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.9			293.8			275.1				252.7
Travel Time (s)		20.6			21.2			19.8				18.2
Confl. Peds. (#/hr)	11					11			10		10	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Adj. Flow (vph)	28	268	448	478	84	212	240	1203	938	184	1252	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	268	448	478	84	212	240	1203	938	184	1252	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)					7.2				3.6			3.6
Link Offset(m)					0.0				0.0			0.0
Crosswalk Width(m)					4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4		9.4			9.4			9.4	
Detector 2 Size(m)			0.6		0.6			0.6			0.6	
Detector 2 Type			Cl+Ex		Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)			0.0		0.0			0.0			0.0	

Lanes, Volumes, Timings Background 10 Year  
 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	10.0	34.0	34.0	11.0	43.0	43.0	10.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	10.0	36.0	36.0	17.0	43.0	43.0	24.0	57.0	57.0	10.0	43.0	43.0
Total Split (%)	8.3%	30.0%	30.0%	14.2%	35.8%	35.8%	20.0%	47.5%	47.5%	8.3%	35.8%	35.8%
Maximum Green (s)	6.0	29.0	29.0	12.0	36.0	36.0	20.0	50.0	50.0	6.0	36.0	36.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	33.7	27.7	27.7	43.7	38.7	38.7	65.4	53.0	53.0	55.0	45.0	45.0
Actuated g/C Ratio	0.28	0.23	0.23	0.36	0.32	0.32	0.54	0.44	0.44	0.46	0.38	0.38
v/c Ratio	0.08	0.69	0.80	0.89	0.16	0.36	0.89	0.70	1.13	0.89	0.84	0.05
Control Delay	23.3	51.2	25.3	49.2	30.0	5.8	64.2	29.7	92.0	67.9	41.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	51.2	25.3	49.2	30.0	5.8	64.2	29.7	92.0	67.9	41.7	0.1
LOS	C	D	C	D	C	A	E	C	F	E	D	A
Approach Delay		34.6			35.2			57.7			44.1	
Approach LOS		C			D			E			D	

Intersection Summary	
Area Type:	CBD
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	33.6 (28%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.13
Intersection Signal Delay:	47.5
Intersection LOS:	D
Intersection Capacity Utilization:	96.1%
ICU Level of Service:	F
Analysis Period (min):	15

\* User Entered Value



Queues Background 10 Year  
 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	28	268	448	478	84	212	240	1203	938	184	1252	29
v/c Ratio	0.08	0.69	0.80	0.89	0.16	0.36	0.89	0.70	1.13	0.89	0.84	0.05
Control Delay	23.3	51.2	25.3	49.2	30.0	5.8	64.2	29.7	92.0	67.9	41.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	51.2	25.3	49.2	30.0	5.8	64.2	29.7	92.0	67.9	41.7	0.1
Queue Length 50th (m)	4.3	60.3	35.4	44.9	15.4	0.0	43.2	98.0	~208.8	27.8	124.3	0.0
Queue Length 95th (m)	10.3	87.5	77.7	#63.2	27.5	17.4	#90.3	118.4	#290.1	#89.3	#164.7	0.0
Internal Link Dist (m)		261.9			269.8			251.1			228.7	
Turn Bay Length (m)	60.0			165.0		25.0	145.0			95.0		90.0
Base Capacity (vph)	355	451	599	539	554	594	293	1726	832	207	1495	644
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.59	0.75	0.89	0.15	0.36	0.82	0.70	1.13	0.89	0.84	0.05

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

HCM Signalized Intersection Capacity Analysis  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Background 10 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	26	249	417	445	78	197	223	1119	872	171	1164	27
Future Volume (vph)	26	249	417	445	78	197	223	1119	872	171	1164	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1614	1693	1425	3060	1676	1366	1425	3909	1363	1562	3984	1398
Fit Permitted	0.70	1.00	1.00	0.27	1.00	1.00	0.09	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	1193	1693	1425	882	1676	1366	135	3909	1363	197	3984	1398
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	28	268	448	478	84	212	240	1203	938	184	1252	29
RTOR Reduction (vph)	0	0	226	0	0	144	0	0	236	0	0	19
Lane Group Flow (vph)	28	268	222	478	84	68	240	1203	702	184	1252	10
Confl. Peds. (#/hr)	11				11				10	10		
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	29.9	26.3	26.3	43.3	35.7	35.7	62.7	48.4	48.4	50.7	40.4	40.4
Effective Green, g (s)	29.9	29.3	29.3	43.3	38.7	38.7	62.7	51.4	51.4	50.7	43.4	43.4
Actuated g/C Ratio	0.25	0.24	0.24	0.36	0.32	0.32	0.52	0.43	0.43	0.42	0.36	0.36
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	309	413	347	536	540	440	267	1674	583	200	1440	505
v/s Ratio Prot	0.00	0.16		c0.09	0.05		c0.14	0.31		0.08	0.31	
v/s Ratio Perm	0.02		0.16	c0.23		0.05	0.33		c0.52	0.31		0.01
v/c Ratio	0.09	0.65	0.64	0.89	0.16	0.16	0.90	0.72	1.20	0.92	0.87	0.02
Uniform Delay, d1	34.4	40.7	40.6	32.9	29.0	29.0	34.8	28.3	34.3	24.9	35.7	24.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	3.9	4.3	16.9	0.2	0.2	29.8	2.7	107.8	41.8	7.4	0.1
Delay (s)	34.6	44.6	44.9	49.9	29.2	29.2	64.6	31.0	142.1	66.6	43.1	24.7
Level of Service	C	D	D	D	C	C	E	C	F	E	D	C
Approach Delay (s)		44.4			42.0			78.1			45.7	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	59.4	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
206: North-South Local Rd & South Service Rd E

Background 10 Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↗	↘	
Traffic Volume (vph)	20	51	0	20	0	0
Future Volume (vph)	20	51	0	20	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.904					
Fit Protected						
Satd. Flow (prot)	1684	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1684	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	59.5			243.2	108.4	
Travel Time (s)	4.3			17.5	7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	55	0	22	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	77	0	0	22	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization 7.5%	ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
206: North-South Local Rd & South Service Rd E

Background 10 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↔	
Traffic Volume (veh/h)	20	51	0	20	0	0
Future Volume (Veh/h)	20	51	0	20	0	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)	22	55	0	22	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			77		72	50
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			77		72	50
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1522		933	1019
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	77	22	0			
Volume Left	0	0	0			
Volume Right	55	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.05	0.01	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS				A		
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS				A		
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			7.5%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
207: Argus Rd & East-West Local Rd

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↑	↑	
Traffic Volume (vph)	0	0	0	145	266	550
Future Volume (vph)	0	0	0	145	266	550
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.909					
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1693	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1693	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	103.5		104.4		76.3	
Travel Time (s)	7.5		7.5		5.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	158	289	598
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	158	887	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.3		3.3	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15		25	
Sign Control	Stop		Free		Free	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	51.1%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
207: Argus Rd & East-West Local Rd

Background 10 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			T	T	
Traffic Volume (veh/h)	0	0	0	145	266	550
Future Volume (Veh/h)	0	0	0	145	266	550
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	158	289	598
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				105		
pX, platoon unblocked						
vC, conflicting volume	746	588	887			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	746	588	887			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	381	509	763			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	158	887			
Volume Left	0	0	0			
Volume Right	0	0	598			
eSH	1700	763	1700			
Volume to Capacity	0.00	0.00	0.52			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization		51.1%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
208: North-South Local Rd & East-West Local Rd

Background 10 Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Volume (vph)	550	0	0	0	0	51
Future Volume (vph)	550	0	0	0	0	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Fit Protected	0.950					
Satd. Flow (prot)	1770	0	1863	0	0	1863
Fit Permitted	0.950					
Satd. Flow (perm)	1770	0	1863	0	0	1863
Link Speed (k/h)	50		50			50
Link Distance (m)	103.5		120.8			67.8
Travel Time (s)	7.5		8.7			4.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	598	0	0	0	0	55
Shared Lane Traffic (%)						
Lane Group Flow (vph)	598	0	0	0	0	55
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	40.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
208: North-South Local Rd & East-West Local Rd

Background 10 Year  
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Volume (veh/h)	550	0	0	0	0	51
Future Volume (Veh/h)	550	0	0	0	0	51
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)	598	0	0	0	0	55
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)		121				
pX, platoon unblocked						
vC, conflicting volume	55	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	55	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	37	100			100	
cM capacity (veh/h)	953	1085			1623	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	598	0	55			
Volume Left	598	0	0			
Volume Right	0	0	0			
eSH	953	1700	1623			
Volume to Capacity	0.63	0.00	0.00			
Queue Length 95th (m)	36.7	0.0	0.0			
Control Delay (s)	14.9	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	14.9	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			13.7			
Intersection Capacity Utilization		40.5%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings  
209: GO Station West Access/North-South Local Rd & Cross Ave

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	13	636	0	482	596	19	0	0	302	92	542	27
Future Volume (vph)	13	636	0	482	596	19	0	0	302	92	542	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0
Storage Lanes	0	0	0	0	0	1	0	1	0	1	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.997			0.850			0.993	
Fit Protected		0.999			0.979					0.950		
Satd. Flow (prot)	0	3536	0	0	3454	0	1863	1583	0	1770	1850	0
Fit Permitted		0.920			0.574					0.487		
Satd. Flow (perm)	0	3256	0	0	2025	0	1863	1583	0	907	1850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4			138			6	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		268.0			106.1			82.9			120.8	
Travel Time (s)		19.3			7.6			6.0			8.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	691	0	524	648	21	0	0	328	100	589	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	705	0	0	1193	0	0	328	0	100	618	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	25	15	25	25	15	25	25	15	25	25	15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			2	
Permitted Phases		4			8			2			6	

Lanes, Volumes, Timings Background 10 Year  
209: GO Station West Access/North-South Local Rd & Cross Ave AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	26.0	26.0		26.0	26.0		24.0	24.0		24.0	24.0	
Total Split (%)	52.0%	52.0%		52.0%	52.0%		48.0%	48.0%		48.0%	48.0%	
Maximum Green (s)	20.0	20.0		20.0	20.0		18.0	18.0		18.0	18.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		22.0			22.0			20.0			20.0	
Actuated g/C Ratio		0.44			0.44			0.40			0.40	
v/c Ratio		0.49			1.94dl			0.46			0.28	0.83
Control Delay		11.5			178.2			8.7			12.8	26.3
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		11.5			178.2			8.7			12.8	26.3
LOS		B			F			A			B	C
Approach Delay		11.5			178.2			8.7			24.4	
Approach LOS		B			F			A			C	

**Intersection Summary**

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

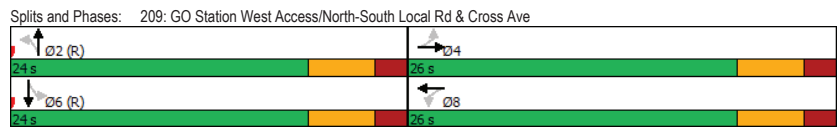
Maximum v/c Ratio: 1.34

Intersection Signal Delay: 81.9 Intersection LOS: F

Intersection Capacity Utilization 96.7% ICU Level of Service F

Analysis Period (min) 15

dl Defacto Left Lane. Recode with 1 though lane as a left lane.



Queues Background 10 Year  
209: GO Station West Access/North-South Local Rd & Cross Ave AM Peak Hour

Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	705	1193	328	100	618
v/c Ratio	0.49	1.94dl	0.46	0.28	0.83
Control Delay	11.5	178.2	8.7	12.8	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	178.2	8.7	12.8	26.3
Queue Length 50th (m)	23.2	~81.6	11.6	6.0	49.0
Queue Length 95th (m)	35.5	#117.0	28.0	15.2	#102.5
Internal Link Dist (m)	244.0	82.1	58.9		96.8
Turn Bay Length (m)				15.0	
Base Capacity (vph)	1432	893	716	362	743
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	0.49	1.34	0.46	0.28	0.83

**Intersection Summary**

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

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

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM Signalized Intersection Capacity Analysis  
 209: GO Station West Access/North-South Local Rd & Cross Ave  
 Background 10 Year  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	13	636	0	482	596	19	0	0	302	92	542	27
Future Volume (vph)	13	636	0	482	596	19	0	0	302	92	542	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Fr <sub>t</sub>		1.00			1.00			0.85		1.00		0.99
Fit Protected		1.00			0.98			1.00		0.95		1.00
Satd. Flow (prot)		3536			3454			1583		1770		1850
Fit Permitted		0.92			0.57			1.00		0.49		1.00
Satd. Flow (perm)		3256			2027			1583		907		1850
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	691	0	524	648	21	0	0	328	100	589	29
RTOR Reduction (vph)	0	0	0	0	2	0	0	83	0	0	4	0
Lane Group Flow (vph)	0	705	0	0	1191	0	0	245	0	100	614	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.0			20.0			18.0		18.0		18.0
Effective Green, g (s)		22.0			22.0			20.0		20.0		20.0
Actuated g/C Ratio		0.44			0.44			0.40		0.40		0.40
Clearance Time (s)		6.0			6.0			6.0		6.0		6.0
Vehicle Extension (s)		3.0			3.0			3.0		3.0		3.0
Lane Grp Cap (vph)		1432			891			633		362		740
v/s Ratio Prot								0.15				c0.33
v/s Ratio Perm		0.22			c0.59					0.11		
v/c Ratio		0.49			1.94dl			0.39		0.28		0.83
Uniform Delay, d1		10.0			14.0			10.7		10.1		13.5
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		0.3			159.0			1.8		1.9		10.5
Delay (s)		10.3			173.0			12.4		12.0		23.9
Level of Service		B			F			B		B		C
Approach Delay (s)		10.3			173.0			12.4				22.3
Approach LOS		B			F			B				C

Intersection Summary			
HCM 2000 Control Delay	79.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.  
 c Critical Lane Group

Lanes, Volumes, Timings  
 303: North Access & South Service Rd E  
 Background 10 Year  
 AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	71	0	0	20	0	0
Future Volume (vph)	71	0	0	20	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>						
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	523.2			59.5	96.0	
Travel Time (s)	37.7			4.3	6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	0	0	22	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	77	0	0	22	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	7.1%
ICU Level of Service	A
Analysis Period (min)	15



HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Background 10 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	71	0	0	20	0	0
Future Volume (Veh/h)	71	0	0	20	0	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)	77	0	0	22	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			77		99	77
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			77		99	77
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1522		900	984
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	77	22	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
eSH	1700	1522	1700			
Volume to Capacity	0.05	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			7.1%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
304: North-South Local Rd & East Access

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	0	0	0	0	51	0
Future Volume (vph)	0	0	0	0	51	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	42.8			67.8	108.4	
Travel Time (s)	3.1			4.9	7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	55	0
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	0	0	55	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	6.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
304: North-South Local Rd & East Access

Background 10 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↕	↕	
Traffic Volume (veh/h)	0	0	0	0	51	0
Future Volume (Veh/h)	0	0	0	0	51	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	55	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)			189			
pX, platoon unblocked						
vC, conflicting volume	55	55	55			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	55	55	55			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	953	1012	1550			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	0	55			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.03			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Queuing and Blocking Report

Background 10 Year  
AM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	158.4	148.0	79.7	78.0	32.3	327.5	323.9	56.6	112.8	130.4	151.2
Average Queue (m)	121.9	147.6	82.2	70.9	48.2	18.7	316.8	293.8	27.4	39.1	61.2	148.7
95th Queue (m)	125.9	154.2	143.2	85.2	94.4	39.7	343.9	413.5	53.0	78.2	120.8	149.9
Link Distance (m)		123.0	123.0	51.4	51.4		313.2	313.2		128.0	128.0	128.0
Upstream Blk Time (%)	9	59	6	50	21		92	51		0	0	88
Queueing Penalty (veh)	0	405	40	345	147		0	0		0	2	578
Storage Bay Dist (m)	130.0						25.0			50.0		
Storage Blk Time (%)	9	59					5	85		8	2	
Queueing Penalty (veh)	46	301					21	76		18	4	

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	B34	SB	SB	SB	SB
Directions Served	T	T	T	L	T	T	TR
Maximum Queue (m)	93.5	109.5	138.2	32.3	245.5	254.6	246.1
Average Queue (m)	8.2	101.1	127.9	31.1	169.1	175.4	189.3
95th Queue (m)	47.6	109.4	135.0	37.0	306.4	311.4	304.2
Link Distance (m)	101.5	101.5	101.5		239.0	239.0	239.0
Upstream Blk Time (%)	0	5	90		19	6	14
Queueing Penalty (veh)	1	36	593		153	49	107
Storage Bay Dist (m)				25.0			
Storage Blk Time (%)				65	12		
Queueing Penalty (veh)				221	50		

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	B7	B7	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	27.4	95.7	100.3	27.5	88.4	77.1	132.0	138.0	82.7	85.2	22.5	88.6
Average Queue (m)	9.9	87.4	88.9	21.8	79.6	47.7	99.3	86.6	58.1	76.0	21.2	79.3
95th Queue (m)	27.7	92.9	97.6	36.8	88.2	92.3	160.4	166.9	98.4	102.0	24.7	98.9
Link Distance (m)		83.8	83.8		51.4	51.4	123.0	123.0		66.7	66.7	84.8
Upstream Blk Time (%)		51	46		85	19	17	10		38	75	45
Queueing Penalty (veh)		261	236		553	121	109	67		0	0	119
Storage Bay Dist (m)	20.0			20.0								15.0
Storage Blk Time (%)	1	75		28	74							92
Queueing Penalty (veh)	2	37		131	157							151

Queuing and Blocking Report

Background 10 Year  
AM Peak Hour

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	22.0	36.9	32.9	31.8	38.8	29.7	27.3	54.1	65.8	35.8
Average Queue (m)	9.4	21.8	21.3	16.6	9.8	10.2	11.8	19.2	31.7	12.2
95th Queue (m)	20.6	31.0	31.7	30.0	27.3	25.0	26.5	42.5	65.7	26.0
Link Distance (m)	21.8	21.8	21.8		246.0	246.0		54.8	56.7	56.7
Upstream Blk Time (%)	1	39	33					3	18	
Queuing Penalty (veh)	3	84	70					0	0	
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)				3	1		2	13		
Queuing Penalty (veh)				5	2		3	7		

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.7	87.5	277.6	271.6	34.8	131.9	140.0	32.3	297.3	301.1	60.9	67.1
Average Queue (m)	79.9	87.3	269.9	205.1	4.6	113.3	129.4	13.2	286.1	291.3	33.5	36.5
95th Queue (m)	104.8	88.0	274.4	365.7	19.3	161.2	136.3	32.3	330.7	299.5	54.9	61.2
Link Distance (m)			264.0	264.0		122.1	122.1		286.8	286.8		101.5
Upstream Blk Time (%)		97	10		18	97		58	93			
Queuing Penalty (veh)		0	0		0	0		0	0			
Storage Bay Dist (m)	80.0	80.0			80.0		25.0				80.0	
Storage Blk Time (%)	1	87	5		5		5	27				
Queuing Penalty (veh)	4	309	31		1		18	22				

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB	B34
Directions Served	T	R	T
Maximum Queue (m)	66.7	27.8	31.4
Average Queue (m)	29.4	7.7	2.1
95th Queue (m)	55.3	19.6	31.8
Link Distance (m)	101.5	101.5	128.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report

Background 10 Year  
AM Peak Hour

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	153.1	188.1	187.7	33.2	43.2	38.6	318.2	318.2	314.1
Average Queue (m)	58.5	171.4	181.8	28.3	31.0	29.4	292.1	306.5	305.0
95th Queue (m)	135.3	233.0	185.8	31.3	38.8	35.1	371.5	314.6	310.7
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	0	38	80	38	40	41	27	47	60
Queuing Penalty (veh)	0	0	0	271	287	295	261	448	570
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	22.8	131.3	182.8	187.8	179.9	65.9	91.7	128.6	261.0	264.8	261.0	271.9
Average Queue (m)	1.2	105.4	149.0	158.2	93.1	25.5	34.3	63.4	252.8	254.6	252.8	265.9
95th Queue (m)	14.4	159.8	210.8	216.7	236.9	52.8	74.5	110.3	257.5	261.5	258.4	270.6
Link Distance (m)		117.8	171.3	171.3	171.3	299.7	299.7	299.7	249.2	249.2	249.2	249.2
Upstream Blk Time (%)		72	30	62	34				59	68	72	96
Queuing Penalty (veh)		0	0	0	0				299	347	364	484
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)		80										
Queuing Penalty (veh)		1										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	158.9	162.8	137.9	63.4	59.3	163.4	148.6
Average Queue (m)	112.8	110.6	87.3	31.8	30.7	104.3	93.9
95th Queue (m)	155.0	154.5	134.9	56.5	54.1	146.3	135.7
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Background 10 Year  
AM Peak Hour

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	76.4	96.5	88.7	75.2	63.1	113.4	115.7
Average Queue (m)	37.3	67.1	55.1	44.3	25.9	73.8	79.5
95th Queue (m)	73.8	90.9	81.2	67.4	54.4	106.0	110.8
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	42.3	23.1	33.7	20.2	44.7	33.4
Average Queue (m)	25.1	9.4	17.3	4.8	23.3	17.7
95th Queue (m)	38.4	19.4	29.0	14.3	38.5	27.8
Link Distance (m)	121.6	121.6	175.0	175.0	246.4	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	7.3	17.9	44.8	39.1	21.6	47.1	32.4	6.3	6.4	11.3	6.3	13.8
Average Queue (m)	0.4	6.1	19.9	10.8	7.8	14.6	7.7	0.3	0.8	2.0	0.7	3.1
95th Queue (m)	3.4	13.5	41.7	27.6	17.0	36.2	22.3	2.7	4.3	7.8	3.8	9.3
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0			70.0	15.0			
Storage Blk Time (%)										1		
Queuing Penalty (veh)										0		

Queuing and Blocking Report

Background 10 Year  
AM Peak Hour

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	9.6	285.6	289.6	6.2	9.1	18.6
Average Queue (m)	2.2	125.6	151.9	0.3	0.5	3.9
95th Queue (m)	8.6	346.3	349.9	3.6	3.7	12.9
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)		26	34	0		1
Queuing Penalty (veh)		0	0	0		0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	1	1				
Queuing Penalty (veh)	3	0				

Intersection: 202: Lyons Lane & South Service Rd E

Movement	SB
Directions Served	LR
Maximum Queue (m)	20.2
Average Queue (m)	3.7
95th Queue (m)	14.0
Link Distance (m)	21.6
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 203: Argus Rd & South Service Rd E

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (m)	26.1	119.0	24.6
Average Queue (m)	6.5	37.0	8.4
95th Queue (m)	41.7	120.1	26.4
Link Distance (m)	162.3	112.3	88.3
Upstream Blk Time (%)	14		
Queuing Penalty (veh)	129		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report

Background 10 Year  
AM Peak Hour

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	87.8	82.9	79.8	83.8	41.3	39.0	44.8
Average Queue (m)	41.0	46.5	47.0	53.3	12.7	16.6	24.2
95th Queue (m)	108.3	75.6	71.8	77.8	36.7	39.5	45.3
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)	12				11	3	23
Queuing Penalty (veh)	12				116	27	234
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	
Directions Served	L	T	R	L	L	T	R	L	T	T	R	
Maximum Queue (m)	22.7	269.6	273.8	172.5	283.3	285.4	32.5	64.6	54.6	59.7	217.9	53.3
Average Queue (m)	2.0	229.7	252.9	163.4	265.4	246.0	10.5	24.0	19.1	23.2	41.2	3.5
95th Queue (m)	12.2	369.1	332.5	188.3	326.1	383.3	30.5	50.5	44.0	51.3	137.7	53.7
Link Distance (m)		265.0	265.0		273.8	273.8			249.2	249.2	249.2	249.2
Upstream Blk Time (%)		70	86		82	75					0	0
Queuing Penalty (veh)		0	0		0	0					1	1
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				
Storage Blk Time (%)		1		30	91	2	3					
Queuing Penalty (veh)		0		67	202	5	2					

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	R
Maximum Queue (m)	102.4	248.9	246.6	245.5	97.5
Average Queue (m)	65.8	234.8	234.3	233.3	18.2
95th Queue (m)	145.2	270.9	271.0	270.9	80.9
Link Distance (m)		234.2	234.2	234.2	
Upstream Blk Time (%)		86	84	84	
Queuing Penalty (veh)		0	0	0	
Storage Bay Dist (m)	95.0				90.0
Storage Blk Time (%)	0	94		98	0
Queuing Penalty (veh)	0	161		27	0

Queuing and Blocking Report

Background 10 Year  
AM Peak Hour

Intersection: 206: North-South Local Rd & South Service Rd E

Movement		
Directions Served		
Maximum Queue (m)		
Average Queue (m)		
95th Queue (m)		
Link Distance (m)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 207: Argus Rd & East-West Local Rd

Movement	SB	B14
Directions Served	TR	T
Maximum Queue (m)	84.9	166.1
Average Queue (m)	60.0	88.4
95th Queue (m)	110.7	210.3
Link Distance (m)	57.6	162.3
Upstream Blk Time (%)	51	21
Queuing Penalty (veh)	422	178
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 208: North-South Local Rd & East-West Local Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	87.0	26.6
Average Queue (m)	38.8	5.2
95th Queue (m)	89.3	25.1
Link Distance (m)	82.8	53.4
Upstream Blk Time (%)	13	1
Queuing Penalty (veh)	74	1
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Background 10 Year  
AM Peak Hour

Intersection: 209: GO Station West Access/North-South Local Rd & Cross Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	TR	L	TR	L	TR
Maximum Queue (m)	258.8	256.3	92.0	94.0	75.1	80.4	22.5	99.1
Average Queue (m)	203.2	202.6	84.5	35.6	34.7	66.8	15.2	64.4
95th Queue (m)	314.9	315.4	98.3	88.0	92.9	92.0	27.6	118.5
Link Distance (m)	246.0	246.0	83.8	83.8	68.0	68.0		95.6
Upstream Blk Time (%)	25	25	40	2	23	69		20
Queuing Penalty (veh)	81	82	237	14	0	0		119
Storage Bay Dist (m)							15.0	
Storage Blk Time (%)							43	30
Queuing Penalty (veh)							247	27

Intersection: 303: North Access & South Service Rd E

Movement	
Directions Served	
Maximum Queue (m)	
Average Queue (m)	
95th Queue (m)	
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 304: North-South Local Rd & East Access

Movement	SB
Directions Served	TR
Maximum Queue (m)	4.4
Average Queue (m)	0.2
95th Queue (m)	3.6
Link Distance (m)	90.0
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	


Network Summary

Network wide Queuing Penalty: 11847
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Lanes, Volumes, Timings

101: Trafalgar Rd & Cross Ave/South Service Rd

Background 10 Year  
PM Peak Hour

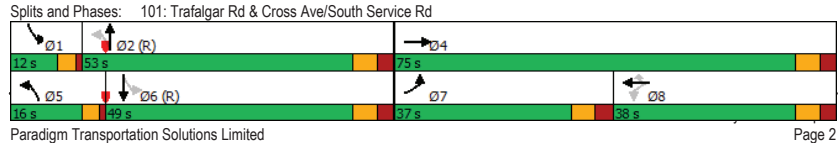


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1362	421	237	302	364	378	313	1420	199	184	1452	674
Future Volume (vph)	1362	421	237	302	364	378	313	1420	199	184	1452	674
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	0.91	1.00	*0.80	0.91
Ped Bike Factor		0.98						0.95			0.98	
Frt		0.950				0.850		0.975			0.954	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2958	1476	0	1540	1644	1423	1496	3782	0	1570	3790	0
Fit Permitted	0.950			0.129			0.087			0.095		
Satd. Flow (perm)	2958	1476	0	209	1644	1423	137	3782	0	157	3790	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		26				117		26			84	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		151.2			330.4			150.2			270.2	
Travel Time (s)		10.9			23.8			10.8			19.5	
Confl. Peds. (#/hr)			15	15			18		70	70		18
Peak Hour Factor	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%
Adj. Flow (vph)	1621	585	293	368	449	461	368	1543	302	204	1631	725
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1621	878	0	368	449	461	368	1845	0	204	2356	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	0.6	2.0		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings Background 10 Year  
101: Trafalgar Rd & Cross Ave/South Service Rd PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		25.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	37.0	75.0		38.0	38.0	38.0	16.0	53.0		12.0	49.0	
Total Split (%)	26.4%	53.6%		27.1%	27.1%	27.1%	11.4%	37.9%		8.6%	35.0%	
Maximum Green (s)	30.0	68.0		31.0	31.0	31.0	12.0	46.0		8.0	42.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	C-Max			Min	C-Max	
Walk Time (s)		7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0	0	0		0			0	
Act Effct Green (s)	33.0	71.0		31.0	34.0	34.0	61.0	49.0		53.0	45.0	
Actuated g/C Ratio	0.24	0.51		0.22	0.24	0.24	0.44	0.35		0.38	0.32	
v/c Ratio	2.33	1.15		8.00	1.13	1.06	2.09	1.38		1.46	1.85	
Control Delay	625.6	115.7		3201.5	131.2	98.0	516.9	211.5		247.6	413.0	
Queue Delay	0.0	0.3		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	625.6	116.0		3201.5	131.2	98.0	516.9	211.5		247.6	413.0	
LOS	F	F		F	F	F	F	F		F	F	
Approach Delay		446.6			1003.4			262.2			399.8	
Approach LOS		F			F			F			F	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 128 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 8.00  
 Intersection Signal Delay: 468.1 Intersection LOS: F  
 Intersection Capacity Utilization 145.5% ICU Level of Service H  
 Analysis Period (min) 15  
 \* User Entered Value




Queues Background 10 Year  
101: Trafalgar Rd & Cross Ave/South Service Rd PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1621	878	368	449	461	368	1845	204	2356
v/c Ratio	2.33	1.15	8.00	1.13	1.06	2.09	1.38	1.46	1.85
Control Delay	625.6	115.7	3201.5	131.2	98.0	516.9	211.5	247.6	413.0
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	625.6	116.0	3201.5	131.2	98.0	516.9	211.5	247.6	413.0
Queue Length 50th (m)	~396.5	~297.8	~198.8	~150.8	~120.2	~156.1	~294.7	~66.5	~425.2
Queue Length 95th (m)	#403.7	#256.1	#238.7	#185.9	#159.4	m#92.5	m151.5	m#60.0	m#361.7
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	697	761	46	399	434	176	1340	140	1275
Starvation Cap Reductn	0	38	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	2.33	1.21	8.00	1.13	1.06	2.09	1.38	1.46	1.85

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

HCM Signalized Intersection Capacity Analysis  
101: Trafalgar Rd & Cross Ave/South Service Rd

Background 10 Year  
PM Peak Hour




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔		↔	↔	
Traffic Volume (vph)	1362	421	237	302	364	378	313	1420	199	184	1452	674
Future Volume (vph)	1362	421	237	302	364	378	313	1420	199	184	1452	674
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.80		1.00	0.80	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	0.95		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	
Fr1	1.00	0.95		1.00	1.00	0.85	1.00	0.98		1.00	0.95	
Fl1 Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2958	1476		1540	1644	1423	1496	3784		1570	3789	
Fl Permitted	0.95	1.00		0.13	1.00	1.00	0.09	1.00		0.10	1.00	
Satd. Flow (perm)	2958	1476		209	1644	1423	137	3784		157	3789	
Peak-hour factor, PHF	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93
Adj. Flow (vph)	1621	585	293	368	449	461	368	1543	302	204	1631	725
RTOR Reduction (vph)	0	13	0	0	0	89	0	17	0	0	57	0
Lane Group Flow (vph)	1621	865	0	368	449	372	368	1828	0	204	2299	0
Confl. Peds. (#/hr)			15	15			18		70	70		18
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	30.0	68.0		31.0	31.0	31.0	58.0	46.0		50.0	42.0	
Effective Green, g (s)	33.0	71.0		31.0	34.0	34.0	58.0	49.0		50.0	45.0	
Actuated g/C Ratio	0.24	0.51		0.22	0.24	0.24	0.41	0.35		0.36	0.32	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	697	748		46	399	345	173	1324		136	1217	
v/s Ratio Prot	c0.55	0.59			0.27		c0.18	0.48		0.09	0.61	
v/s Ratio Perm				c1.76		0.26	c0.70			0.45		
v/c Ratio	2.33	1.16		8.00	1.13	1.08	2.13	1.38		1.50	1.89	
Uniform Delay, d1	53.5	34.5		54.5	53.0	53.0	40.6	45.5		39.0	47.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.19	1.25		1.47	1.22	
Incremental Delay, d2	601.1	85.2		3194.1	83.7	71.3	509.0	171.8		234.4	400.9	
Delay (s)	654.6	119.7		3248.6	136.7	124.3	557.2	228.8		291.6	458.6	
Level of Service	F	F		F	F	F	F	F		F	F	
Approach Delay (s)	466.6			1028.3					283.4		445.3	
Approach LOS	F			F					F		F	

Intersection Summary

HCM 2000 Control Delay		496.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	3.58			
Actuated Cycle Length (s)	140.0		Sum of lost time (s)	16.0
Intersection Capacity Utilization	145.5%		ICU Level of Service	H
Analysis Period (min)	15			
c Critical Lane Group				

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background 10 Year  
PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔		↔	↔	
Traffic Volume (vph)	63	1299	72	198	589	171	167	3	166	291	26	213
Future Volume (vph)	63	1299	72	198	589	171	167	3	166	291	26	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95		0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99	0.95	0.99	0.97		0.99	0.98	
Fr1		0.992			0.962			0.857			0.867	
Fl1 Protected	0.950			0.950		0.950				0.950		
Satd. Flow (prot)	1570	3046	0	797	3096	0	785	708	0	1570	1301	0
Fl Permitted	0.339			0.092			0.393			0.460		
Satd. Flow (perm)	557	3046	0	77	3096	0	322	708	0	750	1301	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			93			133			273	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		115.8			72.9			81.9			107.9	
Travel Time (s)		8.3			5.2			5.9			7.8	
Confl. Peds. (#/hr)	9		4	4		9	12		20	20		12
Peak Hour Factor	0.66	0.81	0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75	0.78
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	0%	100%	0%
Adj. Flow (vph)	95	1604	96	211	620	211	239	12	248	338	35	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	1700	0	211	831	0	239	260	0	338	308	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2			1	2			1	2		1
Detector Template	Left	Thru			Left	Thru			Left	Thru		Left
Leading Detector (m)	2.0	10.0			2.0	10.0			2.0	10.0		2.0
Trailing Detector (m)	0.0	0.0			0.0	0.0			0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0			0.0	0.0			0.0	0.0		0.0
Detector 1 Size(m)	2.0	0.6			2.0	0.6			2.0	0.6		2.0
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0			0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0			0.0	0.0			0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0			0.0	0.0			0.0	0.0		0.0
Detector 2 Position(m)		9.4				9.4				9.4		
Detector 2 Size(m)		0.6				0.6				0.6		
Detector 2 Type		Cl+Ex				Cl+Ex				Cl+Ex		Cl+Ex
Detector 2 Channel												



Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	45.5	45.5		12.5	58.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.6%	50.6%		13.9%	64.4%		35.6%	35.6%		35.6%	35.6%	
Maximum Green (s)	39.5	39.5		8.5	52.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	41.5	41.5		54.0	54.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.46	0.46		0.60	0.60		0.31	0.31		0.31	0.31	
v/c Ratio	0.37	1.21		1.85	0.44		2.39	0.84		1.45	0.52	
Control Delay	21.1	125.0		435.3	9.4		675.1	38.9		253.1	8.1	
Queue Delay	0.0	0.6		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	21.1	125.6		435.3	9.4		675.1	38.9		253.1	8.1	
LOS	C	F		F	A		F	D		F	A	
Approach Delay		120.1			95.6			343.6			136.3	
Approach LOS		F			F			F			F	

**Intersection Summary**

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 100

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 2.39

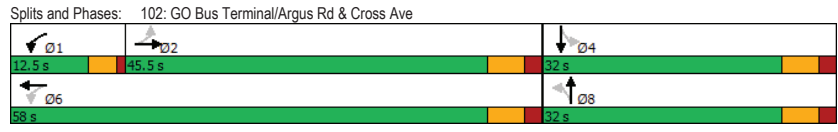
Intersection Signal Delay: 144.3

Intersection Capacity Utilization 102.2%

Analysis Period (min) 15

Intersection LOS: F

ICU Level of Service G



Queues  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	95	1700	211	831	239	260	338	308
v/c Ratio	0.37	1.21	1.85	0.44	2.39	0.84	1.45	0.52
Control Delay	21.1	125.0	435.3	9.4	675.1	38.9	253.1	8.1
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	125.6	435.3	9.4	675.1	38.9	253.1	8.1
Queue Length 50th (m)	10.8	~201.1	~51.9	34.5	~72.3	22.2	~84.7	4.5
Queue Length 95th (m)	15.9	#206.1	#96.9	47.4	#87.9	0.0	#129.4	12.8
Internal Link Dist (m)		91.8		48.9		57.9		83.9
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	256	1409	114	1894	100	311	233	592
Starvation Cap Reductn	0	212	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	1.42	1.85	0.44	2.39	0.84	1.45	0.52





















**Intersection Summary**

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

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





















HCM Signalized Intersection Capacity Analysis  
102: GO Bus Terminal/Argus Rd & Cross Ave

Background 10 Year  
PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	63	1299	72	198	589	171	167	3	166	291	26	213	
Future Volume (vph)	63	1299	72	198	589	171	167	3	166	291	26	213	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.98		
Ft, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.99	1.00		
Frt	1.00	0.99		1.00	0.96		1.00	0.86		1.00	0.87		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1562	3045		797	3096		779	708		1548	1301		
Flt Permitted	0.34	1.00		0.09	1.00		0.39	1.00		0.46	1.00		
Satd. Flow (perm)	557	3045		77	3096		322	708		750	1301		
Peak-hour factor, PHF	0.66	0.81	0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75	0.78	
Adj. Flow (vph)	95	1604	96	211	620	211	239	12	248	338	35	273	
RTOR Reduction (vph)	0	5	0	0	37	0	0	92	0	0	188	0	
Lane Group Flow (vph)	95	1695	0	211	794	0	239	168	0	338	120	0	
Confl. Peds. (#/hr)	9		4	4		9	12		20	20		12	
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	0%	100%	0%	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	6			8			4		
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	39.5	39.5		52.0	52.0		26.0	26.0		26.0	26.0		
Effective Green, g (s)	41.5	41.5		52.0	54.0		28.0	28.0		28.0	28.0		
Actuated g/C Ratio	0.46	0.46		0.58	0.60		0.31	0.31		0.31	0.31		
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0		
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0		
Lane Grp Cap (vph)	256	1404		112	1857		100	220		233	404		
v/s Ratio Prot		0.56		c0.18	0.26			0.24			0.09		
v/s Ratio Perm	0.17			c0.90			c0.74			0.45			
v/c Ratio	0.37	1.21		1.88	0.43		2.39	0.77		1.45	0.30		
Uniform Delay, d1	15.8	24.2		26.0	9.7		31.0	28.0		31.0	23.5		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	1.9	100.3		429.5	0.3		655.1	15.5		225.2	0.6		
Delay (s)	17.7	124.5		455.5	10.0		686.1	43.5		256.2	24.1		
Level of Service	B	F		F	B		F	D		F	C		
Approach Delay (s)	118.9			100.2			351.2			145.5			
Approach LOS	F			F			F			F			
<b>Intersection Summary</b>													
HCM 2000 Control Delay		147.4		HCM 2000 Level of Service				F					
HCM 2000 Volume to Capacity ratio		2.07											
Actuated Cycle Length (s)		90.0		Sum of lost time (s)				12.0					
Intersection Capacity Utilization		102.2%		ICU Level of Service				G					
Analysis Period (min)		15											
c Critical Lane Group													

Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave

Background 10 Year  
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	292	2	33	561	81	264	3	296	47	2	88
Future Volume (vph)	20	292	2	33	561	81	264	3	296	47	2	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0		0.0	25.0		0.0	20.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95		0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.99	
Frt		0.999			0.970			0.854			0.854	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1525	2926		0	1570	3014	0	1570	1436	0	1570	1414
Flt Permitted	0.371			0.459			0.636			0.343		
Satd. Flow (perm)	594	2926		0	758	3014	0	1050	1436	0	566	1414
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			55			375			147	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		40.1			258.2			69.1			70.9	
Travel Time (s)		2.9			18.6			5.0			5.1	
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1
Peak Hour Factor	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	34	348	3	61	591	147	357	9	375	67	4	147
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	34	351		0	61	738	0	357	384	0	67	151
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave

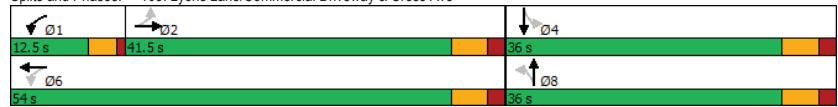
Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.5	41.5		12.5	54.0		36.0	36.0		36.0	36.0	
Total Split (%)	46.1%	46.1%		13.9%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	35.5	35.5		8.5	48.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.0	37.0		49.1	49.1		32.0	32.0		32.0	32.0	
Actuated g/C Ratio	0.42	0.42		0.55	0.55		0.36	0.36		0.36	0.36	
v/c Ratio	0.14	0.29		0.12	0.44		0.95	0.51		0.33	0.25	
Control Delay	18.1	18.1		10.0	11.8		65.3	5.2		26.6	5.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.1	18.1		10.0	11.8		65.3	5.2		26.6	5.0	
LOS	B	B		B	B		E	A		C	A	
Approach Delay		18.1			11.7			34.1			11.6	
Approach LOS		B			B			C			B	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	89.1
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.95
Intersection Signal Delay:	20.6
Intersection LOS:	C
Intersection Capacity Utilization:	69.8%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 103: Lyons Lane/Commercial Driveway & Cross Ave



Queues  
103: Lyons Lane/Commercial Driveway & Cross Ave

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	351	61	738	357	384	67	151
v/c Ratio	0.14	0.29	0.12	0.44	0.95	0.51	0.33	0.25
Control Delay	18.1	18.1	10.0	11.8	65.3	5.2	26.6	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	18.1	10.0	11.8	65.3	5.2	26.6	5.0
Queue Length 50th (m)	3.7	21.4	4.8	35.5	61.4	1.0	8.6	0.5
Queue Length 95th (m)	6.3	29.4	6.1	49.0	#84.4	0.0	14.9	0.0
Internal Link Dist (m)		16.1		234.2		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	250	1232	494	1715	377	756	203	602
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	0.14	0.28	0.12	0.43	0.95	0.51	0.33	0.25

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
103: Lyons Lane/Commercial Driveway & Cross Ave

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	292	2	33	561	81	264	3	296	47	2	88
Future Volume (vph)	20	292	2	33	561	81	264	3	296	47	2	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.98	1.00	0.99	1.00	0.99	1.00	0.99
Ft	1.00	1.00	1.00	0.97	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Fit Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1521	2925	1570	3015	1569	1436	1567	1414				
Fit Permitted	0.37	1.00	0.46	1.00	0.64	1.00	0.34	1.00				
Satd. Flow (perm)	595	2925	758	3015	1050	1436	565	1414				
Peak-hour factor, PHF	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60
Adj. Flow (vph)	34	348	3	61	591	147	357	9	375	67	4	147
RTOR Reduction (vph)	0	1	0	0	25	0	0	240	0	0	94	0
Lane Group Flow (vph)	34	350	0	61	713	0	357	144	0	67	57	0
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2	2	1	6	8	8	8	4	4	4	4	4
Permitted Phases	2		6		8		4					
Actuated Green, G (s)	35.0	35.0	47.1	47.1	30.0	30.0	30.0	30.0				
Effective Green, g (s)	37.0	37.0	47.1	49.1	32.0	32.0	32.0	32.0				
Actuated g/C Ratio	0.42	0.42	0.53	0.55	0.36	0.36	0.36	0.36				
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0				
Vehicle Extension (s)	5.0	5.0	2.5	5.0	4.0	4.0	4.0	4.0				
Lane Grp Cap (vph)	247	1214	474	1661	377	515	202	507				
v/s Ratio Prot		0.12	0.01	c0.24		0.10		0.04				
v/s Ratio Perm	0.06		0.06		c0.34		0.12					
v/c Ratio	0.14	0.29	0.13	0.43	0.95	0.28	0.33	0.11				
Uniform Delay, d1	16.2	17.3	10.5	11.8	27.7	20.3	20.8	19.1				
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	0.5	0.3	0.1	0.4	32.9	0.4	1.3	0.1				
Delay (s)	16.7	17.6	10.6	12.1	60.6	20.7	22.1	19.2				
Level of Service	B	B	B	B	E	C	C	B				
Approach Delay (s)	17.5		12.0		39.9		20.1					
Approach LOS	B		B		D		C					
<b>Intersection Summary</b>												
HCM 2000 Control Delay		23.5		HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio		0.67										
Actuated Cycle Length (s)		89.1		Sum of lost time (s)			12.0					
Intersection Capacity Utilization		69.8%		ICU Level of Service				C				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	596	816	248	60	1093	757	177	559	51	662	772	586
Future Volume (vph)	596	816	248	60	1093	757	177	559	51	662	772	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0	0.0	80.0	0.0	25.0	0.0	80.0	0.0	80.0	0.0	80.0	0.0
Storage Lanes	2	0	1	0	1	0	1	0	1	0	1	1
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	*0.80	0.95	0.97	*0.80	1.00
Ped Bike Factor	1.00	0.99	0.99	0.99	0.98	0.99	0.99	1.00	0.99	0.99	0.99	0.97
Ft	0.962			0.943		0.985		0.850				
Fit Protected	0.950		0.950		0.950		0.950		0.950		0.950	
Satd. Flow (prot)	3016	3010	0	1570	2986	0	1540	2688	0	2987	1368	1409
Fit Permitted	0.950		0.950		0.950		0.950		0.950		0.950	
Satd. Flow (perm)	3012	3010	0	1562	2986	0	1529	2688	0	2962	1368	1361
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)		39		106		7						172
Link Speed (k/h)		50		50		50		50			50	
Link Distance (m)		285.8		142.3		311.4		130.3			130.3	
Travel Time (s)		20.6		10.2		22.4		9.4			9.4	
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Peak Hour Factor	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Adj. Flow (vph)	670	971	326	71	1317	814	199	621	68	849	877	666
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	670	1297	0	71	2131	0	199	689	0	849	877	666
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6		6.6		6.6		6.6		6.6		6.6
Link Offset(m)		0.0		0.0		0.0		0.0		0.0		0.0
Crosswalk Width(m)		4.8		4.8		4.8		4.8		4.8		4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

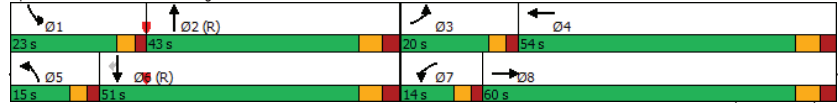
Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	20.0	60.0		14.0	54.0		15.0	43.0		23.0	51.0	51.0
Total Split (%)	14.3%	42.9%		10.0%	38.6%		10.7%	30.7%		16.4%	36.4%	36.4%
Maximum Green (s)	15.0	53.0		9.0	47.0		10.0	36.0		18.0	44.0	44.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	16.0	56.0		10.0	50.0		11.0	39.0		19.0	47.0	47.0
Actuated g/C Ratio	0.11	0.40		0.07	0.36		0.08	0.28		0.14	0.34	0.34
v/c Ratio	1.95	1.06		0.63	1.88		1.64	0.92		2.10	1.91	1.17
Control Delay	468.3	81.5		87.9	425.5		362.1	66.2		525.7	435.8	101.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	468.3	81.5		87.9	425.5		362.1	66.2		525.7	435.8	101.6
LOS	F	F		F	F		F	E		F	F	F
Approach Delay		213.2			414.6			132.5			374.6	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 2.10  
 Intersection Signal Delay: 315.0 Intersection LOS: F  
 Intersection Capacity Utilization 149.6% ICU Level of Service H  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 104: Trafalgar Rd & Cornwall Rd



Queues  
104: Trafalgar Rd & Cornwall Rd

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	670	1297	71	2131	199	689	849	877	666
v/c Ratio	1.95	1.06	0.63	1.88	1.64	0.92	2.10	1.91	1.17
Control Delay	468.3	81.5	87.9	425.5	362.1	66.2	525.7	435.8	101.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	468.3	81.5	87.9	425.5	362.1	66.2	525.7	435.8	101.6
Queue Length 50th (m)	~155.1	~213.9	20.5	~491.1	~83.8	121.0	~207.7	~486.2	~192.0
Queue Length 95th (m)	#192.2	#228.1	#37.5	#477.2	#134.0	#165.6	m#81.0	m#181.2	m27.2
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	344	1227	112	1134	121	753	405	459	571
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.95	1.06	0.63	1.88	1.64	0.92	2.10	1.91	1.17

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	596	816	248	60	1093	757	177	559	51	662	772	586
Future Volume (vph)	596	816	248	60	1093	757	177	559	51	662	772	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	*0.80		0.97	*0.80	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00		1.00	1.00	0.97
Ftp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.94		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)	3016	3010		1570	2985		1540	2689		2987	1368	1361
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3016	3010		1570	2985		1540	2689		2987	1368	1361
Peak-hour factor, PHF	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Adj. Flow (vph)	670	971	326	71	1317	814	199	621	68	849	877	666
RTOR Reduction (vph)	0	23	0	0	68	0	0	5	0	0	0	114
Lane Group Flow (vph)	670	1274	0	71	2063	0	199	684	0	849	877	552
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	15.0	53.0		9.0	47.0		10.0	36.0		18.0	44.0	44.0
Effective Green, g (s)	16.0	56.0		10.0	50.0		11.0	39.0		19.0	47.0	47.0
Actuated g/C Ratio	0.11	0.40		0.07	0.36		0.08	0.28		0.14	0.34	0.34
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	344	1204		112	1066		121	749		405	459	456
v/s Ratio Prot	c0.22	0.42		0.05	c0.69		0.13	0.25		c0.28	c0.64	
v/s Ratio Perm												0.41
v/c Ratio	1.95	1.06		0.63	1.94		1.64	0.91		2.10	1.91	1.21
Uniform Delay, d1	62.0	42.0		63.2	45.0		64.5	48.9		60.5	46.5	46.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.21	0.80	0.72
Incremental Delay, d2	436.9	42.7		24.3	424.3		324.1	17.5		494.1	410.5	96.5
Delay (s)	498.9	84.7		87.5	469.3		388.6	66.3		567.2	447.9	129.9
Level of Service	F	F		F	F		F	E		F	F	F
Approach Delay (s)		225.8			457.0			138.5			401.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	340.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	149.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 10 Year  
PM Peak Hour

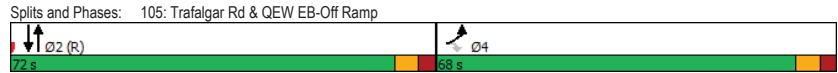
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↕		↕↕	↕↕	
Traffic Volume (vph)	1100	616	0	2309	2186	0
Future Volume (vph)	1100	616	0	2309	2186	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	*0.80	*0.80	1.00
Ped Bike Factor		0.99				
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3046	1423	0	4024	4024	0
Flt Permitted	0.950					
Satd. Flow (perm)	3046	1402	0	4024	4024	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				
Link Speed (k/h)	50			50	50	
Link Distance (m)	199.2			51.4	324.8	
Travel Time (s)	14.3			3.7	23.4	
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.87	0.93	0.25	0.97	0.94	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Adj. Flow (vph)	1264	662	0	2380	2326	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1264	662	0	2380	2326	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	68.0	68.0		72.0	72.0	
Total Split (%)	48.6%	48.6%		51.4%	51.4%	
Maximum Green (s)	61.0	61.0		65.0	65.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	64.0	64.0		68.0	68.0	
Actuated g/C Ratio	0.46	0.46		0.49	0.49	
v/c Ratio	0.91	1.03		1.22	1.19	
Control Delay	45.9	81.6		136.3	114.1	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	45.9	81.6		136.3	114.1	
LOS	D	F		F	F	
Approach Delay	58.2			136.3	114.1	
Approach LOS	E			F	F	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 133.6 (95%), Referenced to phase 2:NBSB and 6:, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.22  
 Intersection Signal Delay: 105.8 Intersection LOS: F  
 Intersection Capacity Utilization 96.2% ICU Level of Service F  
 Analysis Period (min) 15  
 \* User Entered Value



Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1264	662	2380	2326
v/c Ratio	0.91	1.03	1.22	1.19
Control Delay	45.9	81.6	136.3	114.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	45.9	81.6	136.3	114.1
Queue Length 50th (m)	173.4	~206.4	~358.0	~339.2
Queue Length 95th (m)	196.5	#284.3	m131.6 m#283.8	
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1392	641	1954	1954
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.91	1.03	1.22	1.19

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

HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Background 10 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔		↕	↕	
Traffic Volume (vph)	1100	616	0	2309	2186	0
Future Volume (vph)	1100	616	0	2309	2186	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		*0.80	*0.80	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Fr	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3046	1402		4024	4024	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3046	1402		4024	4024	
Peak-hour factor, PHF	0.87	0.93	0.25	0.97	0.94	0.25
Adj. Flow (vph)	1264	662	0	2380	2326	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	1264	661	0	2380	2326	0
Confl. Peds. (#/hr)		2				
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	61.0	61.0		65.0	65.0	
Effective Green, g (s)	64.0	64.0		68.0	68.0	
Actuated g/C Ratio	0.46	0.46		0.49	0.49	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1392	640		1954	1954	
v/s Ratio Prot	0.41			c0.59	0.58	
v/s Ratio Perm		c0.47				
v/c Ratio	0.91	1.03		1.22	1.19	
Uniform Delay, d1	35.3	38.0		36.0	36.0	
Progression Factor	1.00	1.00		1.19	0.78	
Incremental Delay, d2	8.8	44.5		98.6	86.2	
Delay (s)	44.1	82.5		141.5	114.3	
Level of Service	D	F		F	F	
Approach Delay (s)	57.3			141.5	114.3	
Approach LOS	E			F	F	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			107.5			HCM 2000 Level of Service F
HCM 2000 Volume to Capacity ratio			1.13			
Actuated Cycle Length (s)			140.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			96.2%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔		↕	↕		↕	↕
Traffic Volume (vph)	26	0	258	642	120	232	0	2747	0	0	1980	14
Future Volume (vph)	26	0	258	642	120	232	0	2747	0	0	1980	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	1.00					0.99						0.95
Fr			0.850			0.850						0.850
Flt Protected	0.950			0.950	0.969							
Satd. Flow (prot)	1570	0	1437	1463	1549	1409	0	4024	0	0	3337	1437
Flt Permitted	0.950			0.950	0.969							
Satd. Flow (perm)	1568	0	1437	1463	1549	1389	0	4024	0	0	3337	1359
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			31			149						70
Link Speed (k/h)		50			50			50				50
Link Distance (m)		142.1			192.6			324.8				280.4
Travel Time (s)		10.2			13.9			23.4				20.2
Confl. Peds. (#/hr)	2					2	14		14	14		14
Peak Hour Factor	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Adj. Flow (vph)	43	0	272	764	169	286	0	2922	0	0	2063	22
Shared Lane Traffic (%)				39%								
Lane Group Flow (vph)	43	0	272	466	467	286	0	2922	0	0	2063	22
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1		1	1		1	1		1
Detector Template	Left		Right	Left	Thru	Right		Thru		Thru		Right
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0		10.0		2.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6		0.6		2.0
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
<b>Detector 2 Channel</b>												



Lanes, Volumes, Timings

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 10 Year

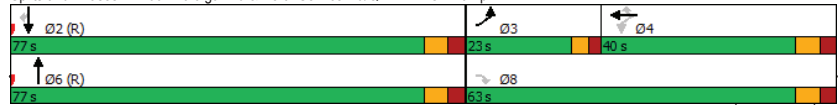
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	Perm	
Protected Phases	3			4	4			6			2	
Permitted Phases			8	4		4						2
Detector Phase	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		63.0	40.0	40.0	40.0		77.0			77.0	77.0
Total Split (%)	16.4%		45.0%	28.6%	28.6%	28.6%		55.0%			55.0%	55.0%
Maximum Green (s)	18.0		56.0	33.0	33.0	33.0		70.0			70.0	70.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)			7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (#/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	10.5		59.0	44.5	44.5	44.5		73.0			73.0	73.0
Actuated g/C Ratio	0.08		0.42	0.32	0.32	0.32		0.52			0.52	0.52
v/c Ratio	0.36		0.44	1.00	0.95	0.53		1.39			1.19	0.03
Control Delay	69.5		27.8	90.0	76.6	22.4		207.4			121.4	0.1
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	69.5		27.8	90.0	76.6	22.4		207.4			121.4	0.1
LOS	E		C	F	E	C		F			F	A
Approach Delay		33.5				69.0		207.4			120.1	
Approach LOS		C				E		F			F	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.39  
 Intersection Signal Delay: 145.4 Intersection LOS: F  
 Intersection Capacity Utilization 95.6% ICU Level of Service F  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 10 Year

PM Peak Hour

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	43	272	466	467	286	2922	2063	22
v/c Ratio	0.36	0.44	1.00	0.95	0.53	1.39	1.19	0.03
Control Delay	69.5	27.8	90.0	76.6	22.4	207.4	121.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	27.8	90.0	76.6	22.4	207.4	121.4	0.1
Queue Length 50th (m)	12.2	49.1	142.6	139.5	31.7	~471.5	~300.5	0.0
Queue Length 95th (m)	16.7	75.2	#209.2	#144.3	51.5 m	#394.5	#334.5	0.0
Internal Link Dist (m)				168.6		300.8	256.4	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	623	464	492	543	2098	1740	742
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	0.20	0.44	1.00	0.95	0.53	1.39	1.19	0.03

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	0	258	642	120	232	0	2747	0	0	1980	14
Future Volume (vph)	26	0	258	642	120	232	0	2747	0	0	1980	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		*0.80		*0.80	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99		1.00		1.00	0.95	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Fr	1.00		0.85	1.00	1.00	0.85		1.00		1.00	0.85	
Flt Protected	0.95		1.00	0.95	0.97	1.00		1.00		1.00	1.00	
Satd. Flow (prot)	1570		1437	1463	1549	1389		4024		3337	1359	
Flt Permitted	0.95		1.00	0.95	0.97	1.00		1.00		1.00	1.00	
Satd. Flow (perm)	1570		1437	1463	1549	1389		4024		3337	1359	
Peak-hour factor, PHF	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Adj. Flow (vph)	43	0	272	764	169	286	0	2922	0	0	2062	22
RTOR Reduction (vph)	0	0	18	0	0	102	0	0	0	0	0	11
Lane Group Flow (vph)	43	0	254	466	467	184	0	2922	0	0	2063	11
Confl. Peds. (#/hr)	2					2	14		14	14		14
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	Perm	
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	9.5		56.0	41.5	41.5	41.5		70.0		70.0	70.0	
Effective Green, g (s)	10.5		59.0	44.5	44.5	44.5		73.0		73.0	73.0	
Actuated g/C Ratio	0.08		0.42	0.32	0.32	0.32		0.52		0.52	0.52	
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0		7.0	7.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5		4.5	4.5	
Lane Grp Cap (vph)	117		605	465	492	441		2098		1740	708	
v/s Ratio Prot	0.03							c0.73			0.62	
v/s Ratio Perm			c0.18	c0.32	0.30	0.13						0.01
v/c Ratio	0.37		0.42	1.00	0.95	0.42		1.39		1.19	0.02	
Uniform Delay, d1	61.6		28.5	47.8	46.6	37.6		33.5		33.5	16.2	
Progression Factor	1.00		1.00	1.00	1.00	1.00		1.06		1.00	1.00	
Incremental Delay, d2	2.0		0.5	42.3	27.9	0.6		177.0		89.7	0.0	
Delay (s)	63.5		28.9	90.0	74.5	38.2		212.5		123.2	16.2	
Level of Service	E		C	F	E	D		F		F	B	
Approach Delay (s)		33.7			71.9			212.5			122.1	
Approach LOS		C			E			F			F	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			148.8									F
HCM 2000 Volume to Capacity ratio			1.18									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)		12.0				
Intersection Capacity Utilization			95.6%			ICU Level of Service		F				
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Background 10 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	833	732	1170	0	0	1242
Future Volume (vph)	833	732	1170	0	0	1242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Fr	0.966	0.850				
Flt Protected	0.963					
Satd. Flow (prot)	3344	1455	3574	0	0	3539
Flt Permitted	0.963					
Satd. Flow (perm)	3344	1455	3574	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	29	29				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Adj. Flow (vph)	905	796	1272	0	0	1350
Shared Lane Traffic (%)		33%				
Lane Group Flow (vph)	1168	533	1272	0	0	1350
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex			CI+Ex
<b>Detector 1 Channel</b>						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
<b>Detector 2 Channel</b>						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6

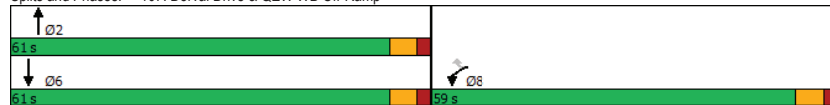
Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Background 10 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8					
Detector Phase	8	8	2	6		
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0	20.0		
Minimum Split (s)	24.0	24.0	26.0	26.0		
Total Split (s)	59.0	59.0	61.0	61.0		
Total Split (%)	49.2%	49.2%	50.8%	50.8%		
Maximum Green (s)	53.0	53.0	55.0	55.0		
Yellow Time (s)	4.0	4.0	4.0	4.0		
All-Red Time (s)	2.0	2.0	2.0	2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	4.0	4.0	4.0	4.0		
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0	5.0		
Recall Mode	None	None	Max	Max		
Walk Time (s)	5.0	5.0	7.0	7.0		
Flash Dont Walk (s)	7.0	7.0	11.0	11.0		
Pedestrian Calls (#/hr)	0	0	0	0		
Act Effct Green (s)	51.0	51.0	57.1	57.1		
Actuated g/C Ratio	0.44	0.44	0.49	0.49		
v/c Ratio	0.79	0.81	0.72	0.78		
Control Delay	31.5	38.1	27.0	28.8		
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	31.5	38.1	27.0	28.8		
LOS	C	D	C	C		
Approach Delay	33.6	27.0		28.8		
Approach LOS	C	C		C		

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	116.1
Natural Cycle:	55
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	30.2
Intersection Capacity Utilization:	72.4%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	C

Splits and Phases: 107: Dorval Drive & QEW WB Off-Ramp



Queues  
107: Dorval Drive & QEW WB Off-Ramp

Background 10 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1168	533	1272	1350
v/c Ratio	0.79	0.81	0.72	0.78
Control Delay	31.5	38.1	27.0	28.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.5	38.1	27.0	28.8
Queue Length 50th (m)	118.0	114.0	131.7	145.5
Queue Length 95th (m)	145.3	168.9	159.7	176.1
Internal Link Dist (m)	301.1	286.2		242.9
Turn Bay Length (m)	190.0			
Base Capacity (vph)	1603	706	1758	1741
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.75	0.72	0.78

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Background 10 Year  
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕			↕↕
Traffic Volume (vph)	833	732	1170	0	0	1242
Future Volume (vph)	833	732	1170	0	0	1242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr	0.97	0.85	1.00			1.00
Fit Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3343	1455	3574			3539
Fit Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3343	1455	3574			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	905	796	1272	0	0	1350
RTOR Reduction (vph)	16	16	0	0	0	0
Lane Group Flow (vph)	1152	517	1272	0	0	1350
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	49.0	49.0	55.1			55.1
Effective Green, g (s)	51.0	51.0	57.1			57.1
Actuated g/C Ratio	0.44	0.44	0.49			0.49
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1468	639	1757			1740
v/s Ratio Prot	0.34		0.36			c0.38
v/s Ratio Perm		c0.36				
v/c Ratio	0.78	0.81	0.72			0.78
Uniform Delay, d1	27.8	28.3	23.3			24.2
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	3.2	8.3	2.6			3.5
Delay (s)	31.0	36.6	25.9			27.7
Level of Service	C	D	C			C
Approach Delay (s)	32.8		25.9			27.7
Approach LOS	C		C			C
<b>Intersection Summary</b>						
HCM 2000 Control Delay			29.2		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			116.1		Sum of lost time (s)	8.0
Intersection Capacity Utilization			72.4%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Background 10 Year  
PM Peak Hour

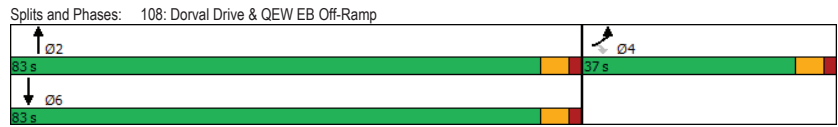
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕	↕↕	
Traffic Volume (vph)	323	385	0	1404	1328	0
Future Volume (vph)	323	385	0	1404	1328	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr	0.950	0.850				
Fit Protected	0.968					
Satd. Flow (prot)	3302	1441	0	3539	3505	0
Fit Permitted	0.968					
Satd. Flow (perm)	3302	1441	0	3539	3505	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	58	58				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Adj. Flow (vph)	351	418	0	1526	1443	0
Shared Lane Traffic (%)		42%				
Lane Group Flow (vph)	527	242	0	1526	1443	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
<b>Detector 1 Channel</b>						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
<b>Detector 2 Channel</b>						
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
<b>Detector 2 Channel</b>						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	37.0	37.0		83.0	83.0	
Total Split (%)	30.8%	30.8%		69.2%	69.2%	
Maximum Green (s)	31.0	31.0		77.0	77.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	25.2	25.2		79.2	79.2	
Actuated g/C Ratio	0.22	0.22		0.70	0.70	
v/c Ratio	0.67	0.66		0.61	0.58	
Control Delay	39.5	38.6		10.6	10.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	39.5	38.6		10.6	10.2	
LOS	D	D		B	B	
Approach Delay	39.3			10.6	10.2	
Approach LOS	D			B	B	

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	112.4
Natural Cycle:	60
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.67
Intersection Signal Delay:	16.4
Intersection Capacity Utilization:	72.4%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	C



Queues  
108: Dorval Drive & QEW EB Off-Ramp

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	527	242	1526	1443
v/c Ratio	0.67	0.66	0.61	0.58
Control Delay	39.5	38.6	10.6	10.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.5	38.6	10.6	10.2
Queue Length 50th (m)	51.3	42.7	84.5	77.2
Queue Length 95th (m)	69.4	73.1	132.5	121.6
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1012	464	2492	2469
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.52	0.61	0.58

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Background 10 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↗		↖↖	↖↖	
Traffic Volume (vph)	323	385	0	1404	1328	0
Future Volume (vph)	323	385	0	1404	1328	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Fr <sub>t</sub>	0.95	0.85		1.00	1.00	
Fl <sub>t</sub> Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3301	1441		3539	3505	
Fl <sub>t</sub> Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3301	1441		3539	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	351	418	0	1526	1443	0
RTOR Reduction (vph)	45	45	0	0	0	0
Lane Group Flow (vph)	482	197	0	1526	1443	0
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	23.2	23.2		77.2	77.2	
Effective Green, g (s)	25.2	25.2		79.2	79.2	
Actuated g/C Ratio	0.22	0.22		0.70	0.70	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	740	323		2493	2469	
v/s Ratio Prot	c0.15			c0.43	0.41	
v/s Ratio Perm		0.14				
v/c Ratio	0.65	0.61		0.61	0.58	
Uniform Delay, d1	39.6	39.2		8.6	8.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	3.8		1.1	1.0	
Delay (s)	41.9	42.9		9.8	9.4	
Level of Service	D	D		A	A	
Approach Delay (s)	42.2			9.8	9.4	
Approach LOS	D			A	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		16.3		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.62				
Actuated Cycle Length (s)		112.4		Sum of lost time (s)		8.0
Intersection Capacity Utilization		72.4%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background 10 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖↖			↖↖	↖↖	↖↖
Traffic Volume (vph)	494	0	0	810	136	307
Future Volume (vph)	494	0	0	810	136	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	3574	0	0	3574	1805	1599
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	3574	0	0	3574	1805	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						188
Link Speed (k/h)	60			60	40	
Link Distance (m)	130.3			194.2	262.1	
Travel Time (s)	7.8			11.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Adj. Flow (vph)	537	0	0	880	148	334
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	537	0	0	880	148	334
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
<b>Lead/Lag</b>						
<b>Lead-Lag Optimize?</b>						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Background 10 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
v/c Ratio	0.38			0.62	0.20	0.44
Control Delay	10.5			13.1	9.8	6.6
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.5			13.1	9.8	6.6
LOS	B			B	A	A
Approach Delay	10.5			13.1	7.6	
Approach LOS	B			B	A	

**Intersection Summary**

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green

Natural Cycle: 45

Control Type: Pretimed

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 11.0      Intersection LOS: B

Intersection Capacity Utilization 40.2%      ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street

<p>Ø2 (R) 22.5 s</p>	<p>Ø4 22.5 s</p>
<p>Ø8 22.5 s</p>	

Queues  
109: QEW WB Off-Ramp & Kerr Street

Background 10 Year  
PM Peak Hour

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	537	880	148	334
v/c Ratio	0.38	0.62	0.20	0.44
Control Delay	10.5	13.1	9.8	6.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.5	13.1	9.8	6.6
Queue Length 50th (m)	15.5	28.7	7.6	7.5
Queue Length 95th (m)	24.8	43.5	16.4	21.4
Internal Link Dist (m)	106.3	170.2	238.1	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1429	1429	722	752
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.38	0.62	0.20	0.44

**Intersection Summary**

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Background 10 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↔	↔
Traffic Volume (vph)	494	0	0	810	136	307
Future Volume (vph)	494	0	0	810	136	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr't	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3574			3574	1805	1599
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3574			3574	1805	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	537	0	0	880	148	334
RTOR Reduction (vph)	0	0	0	0	0	113
Lane Group Flow (vph)	537	0	0	880	148	221
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1429			1429	722	639
v/s Ratio Prot	0.15			c0.25	0.08	
v/s Ratio Perm						c0.14
v/c Ratio	0.38			0.62	0.20	0.35
Uniform Delay, d1	9.5			10.7	8.8	9.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.8			2.0	0.6	1.5
Delay (s)	10.3			12.7	9.5	10.9
Level of Service	B			B	A	B
Approach Delay (s)	10.3			12.7	10.4	
Approach LOS	B			B	B	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

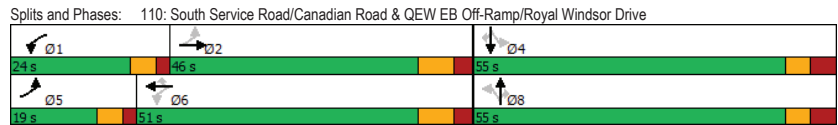
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑		↔	↑		↔	↑		↔	↑	↔
Traffic Volume (vph)	366	638	20	214	763	32	16	55	117	16	152	498
Future Volume (vph)	366	638	20	214	763	32	16	55	117	16	152	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0		0.0	155.0		70.0	15.0		0.0	0.0		30.0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5		7.5	7.5		7.5	7.5		7.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't		0.995				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950		0.950			0.950
Satd. Flow (prot)	3502	3395	0	1752	3505	1615	1805	1900	1615	1805	1900	1599
Flt Permitted	0.224			0.263			0.568		0.716			0.716
Satd. Flow (perm)	826	3395	0	485	3505	1615	1079	1900	1615	1360	1900	1599
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		3				94			133			317
Link Speed (k/h)		80			80			60				40
Link Distance (m)		324.5			247.2			158.7				215.5
Travel Time (s)		14.6			11.1			9.5				19.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Adj. Flow (vph)	416	725	23	243	867	36	18	63	133	18	173	566
Shared Lane Traffic (%)												
Lane Group Flow (vph)	416	748	0	243	867	36	18	63	133	18	173	566
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4



Lanes, Volumes, Timings Background 10 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	29.4		14.0	38.4	38.4	28.8	28.8	28.8	28.8	28.8	28.8
Total Split (s)	19.0	46.0		24.0	51.0	51.0	55.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	15.2%	36.8%		19.2%	40.8%	40.8%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%
Maximum Green (s)	13.0	37.6		18.0	42.6	42.6	47.2	47.2	47.2	47.2	47.2	47.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	60.3	46.8		62.1	47.8	47.8	30.6	30.6	30.6	30.6	30.6	30.6
Actuated g/C Ratio	0.58	0.45		0.60	0.46	0.46	0.29	0.29	0.29	0.29	0.29	0.29
v/c Ratio	0.51	0.49		0.52	0.54	0.05	0.06	0.11	0.23	0.04	0.31	0.82
Control Delay	12.7	24.6		15.1	24.2	0.1	24.7	25.6	5.1	24.4	28.8	24.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	24.6		15.1	24.2	0.1	24.7	25.6	5.1	24.4	28.8	24.1
LOS	B	C		B	C	A	C	C	A	C	C	C
Approach Delay		20.4			21.5			12.8			25.2	
Approach LOS		C			C			B			C	

Intersection Summary	
Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	104.1
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.82
Intersection Signal Delay:	21.4
Intersection Capacity Utilization:	72.5%
Intersection LOS:	C
ICU Level of Service:	C
Analysis Period (min):	15



Queues Background 10 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	416	748	243	867	36	18	63	133	18	173	566	
v/c Ratio	0.51	0.49	0.52	0.54	0.05	0.06	0.11	0.23	0.04	0.31	0.82	
Control Delay	12.7	24.6	15.1	24.2	0.1	24.7	25.6	5.1	24.4	28.8	24.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.7	24.6	15.1	24.2	0.1	24.7	25.6	5.1	24.4	28.8	24.1	
Queue Length 50th (m)	17.3	56.1	20.2	67.3	0.0	2.7	9.7	0.0	2.7	28.3	50.9	
Queue Length 95th (m)	37.3	105.0	48.7	116.4	0.0	7.6	18.8	11.7	7.5	44.4	89.3	
Internal Link Dist (m)		300.5		223.2			134.7			191.5		
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0	
Base Capacity (vph)	883	1528	552	1610	793	538	947	872	678	947	956	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.47	0.49	0.44	0.54	0.05	0.03	0.07	0.15	0.03	0.18	0.59	

Intersection Summary

Intersection Summary	
Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	104.1
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.82
Intersection Signal Delay:	21.4
Intersection Capacity Utilization:	72.5%
Intersection LOS:	C
ICU Level of Service:	C
Analysis Period (min):	15

HCM Signalized Intersection Capacity Analysis  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Background 10 Year

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↕	↔	↕	↕
Traffic Volume (vph)	366	638	20	214	763	32	16	55	117	16	152	498
Future Volume (vph)	366	638	20	214	763	32	16	55	117	16	152	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	3396		1752	3505	1615	1805	1900	1615	1805	1900	1599
Flt Permitted	0.22	1.00		0.26	1.00	1.00	0.57	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	825	3396		485	3505	1615	1079	1900	1615	1360	1900	1599
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)	416	725	23	243	867	36	18	62	133	18	173	566
RTOR Reduction (vph)	0	2	0	0	0	19	0	0	94	0	0	224
Lane Group Flow (vph)	416	746	0	243	867	17	18	63	39	18	173	342
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	53.7	42.3		55.7	43.3	43.3	26.7	26.7	26.7	26.7	26.7	26.7
Effective Green, g (s)	57.7	46.7		59.7	47.7	47.7	30.5	30.5	30.5	30.5	30.5	30.5
Actuated g/C Ratio	0.56	0.45		0.58	0.46	0.46	0.29	0.29	0.29	0.29	0.29	0.29
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	805	1530		455	1613	743	317	559	475	400	559	470
v/s Ratio Prot	0.07	0.22		c0.07	c0.25			0.03			0.09	
v/s Ratio Perm	0.22			0.23		0.01	0.02		0.02	0.01		c0.21
v/c Ratio	0.52	0.49		0.53	0.54	0.02	0.06	0.11	0.08	0.04	0.31	0.73
Uniform Delay, d1	13.0	20.0		12.1	20.0	15.2	26.2	26.7	26.4	26.1	28.4	32.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	1.1		1.4	1.3	0.1	0.1	0.1	0.1	0.1	0.4	5.8
Delay (s)	13.6	21.1		13.4	21.3	15.3	26.3	26.8	26.5	26.2	28.7	38.6
Level of Service	B	C		B	C	B	C	C	C	C	C	D
Approach Delay (s)		18.5			19.5			26.6			36.1	
Approach LOS		B			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		23.4			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		103.6		Sum of lost time (s)				12.0				
Intersection Capacity Utilization		72.5%		ICU Level of Service			C					
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings  
 201: Cross Ave & Lyons Lane

Background 10 Year  
 PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕
Traffic Volume (vph)	11	285	678	65	22	40
Future Volume (vph)	11	285	678	65	22	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.982		0.911	
Fr						
Flt Protected	0.950				0.983	
Satd. Flow (prot)	1388	2954	3109	0	1492	0
Flt Permitted	0.950				0.983	
Satd. Flow (perm)	1388	2954	3109	0	1492	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	1			1	9	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Heavy Vehicles (%)	17%	10%	3%	0%	0%	4%
Adj. Flow (vph)	22	310	807	112	50	98
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	22	310	919	0	148	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15		25	15
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	33.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↕
Traffic Volume (veh/h)	11	285	678	65	22	40
Future Volume (Veh/h)	11	285	678	65	22	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Hourly flow rate (vph)	22	310	807	112	50	98
Pedestrians			9		1	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked	0.91				0.91	0.91
vC, conflicting volume	920				1072	460
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	720				886	216
tC, single (s)	4.4				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	97				80	86
cM capacity (veh/h)	715				252	713
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	22	155	155	538	381	148
Volume Left	22	0	0	0	0	50
Volume Right	0	0	0	0	112	98
eSH	715	1700	1700	1700	1700	441
Volume to Capacity	0.03	0.09	0.09	0.32	0.22	0.34
Queue Length 95th (m)	0.8	0.0	0.0	0.0	0.0	11.7
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	17.2
Lane LOS	B					C
Approach Delay (s)	0.7			0.0		17.2
Approach LOS						C
<b>Intersection Summary</b>						
Average Delay			2.0			
Intersection Capacity Utilization			33.9%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	4	7	0	44	25	7
Future Volume (vph)	4	7	0	44	25	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.865		0.966	
Fit Protected		0.976			0.964	
Satd. Flow (prot)	0	1669	1212	0	1592	0
Fit Permitted		0.976			0.964	
Satd. Flow (perm)	0	1669	1212	0	1592	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		60.5	89.6		37.6	
Travel Time (s)		4.4	6.5		2.7	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Heavy Vehicles (%)	0%	0%	0%	22%	0%	0%
Adj. Flow (vph)	11	11	0	71	50	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	22	71	0	67	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 15.8%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	4	7	0	44	25	7
Future Volume (Veh/h)	4	7	0	44	25	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Hourly flow rate (vph)	11	11	0	71	50	17
Pedestrians					7	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked					76	42
vC, conflicting volume	78					
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	78				76	42
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				95	98
cM capacity (veh/h)	1524				921	1028
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	22	71	67			
Volume Left	11	0	50			
Volume Right	0	71	17			
cSH	1524	1700	946			
Volume to Capacity	0.01	0.04	0.07			
Queue Length 95th (m)	0.2	0.0	1.8			
Control Delay (s)	3.7	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	3.7	0.0	9.1			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			4.3			
Intersection Capacity Utilization		15.8%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	13	38	531	198	39	19
Future Volume (vph)	13	38	531	198	39	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.956		0.952	
Fit Protected		0.986			0.969	
Satd. Flow (prot)	0	1541	1531	0	1577	0
Fit Permitted		0.986			0.969	
Satd. Flow (perm)	0	1541	1531	0	1577	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)					5	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Heavy Vehicles (%)	0%	13%	10%	0%	0%	0%
Adj. Flow (vph)	29	76	610	291	52	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	105	901	0	81	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	54.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	13	38	531	198	39	19
Future Volume (Veh/h)	13	38	531	198	39	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Hourly flow rate (vph)	29	76	610	291	52	29
Pedestrians			5			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.2			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	901				894	756
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	901				894	756
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				83	93
cM capacity (veh/h)	763				301	412
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	105	901	81			
Volume Left	29	0	52			
Volume Right	0	291	29			
eSH	763	1700	333			
Volume to Capacity	0.04	0.53	0.24			
Queue Length 95th (m)	0.9	0.0	7.5			
Control Delay (s)	3.0	0.0	19.3			
Lane LOS	A		C			
Approach Delay (s)	3.0	0.0	19.3			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization		54.8%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕↕	↕↕↕	
Traffic Volume (vph)	0	95	0	3051	2188	705
Future Volume (vph)	0	95	0	3051	2188	705
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	*0.80	*0.80	0.91
Ped Bike Factor						
Frts		0.865			0.960	
Fit Protected						
Satd. Flow (prot)	0	1354	0	4024	3853	0
Fit Permitted						
Satd. Flow (perm)	0	1354	0	4024	3853	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	145.7			270.2	51.4	
Travel Time (s)	10.5			19.5	3.7	
Confl. Peds. (#/hr)						24
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87
Heavy Vehicles (%)	0%	8%	0%	2%	2%	3%
Adj. Flow (vph)	0	151	0	3390	2233	810
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	151	0	3390	3043	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	78.2%		ICU Level of Service D			
Analysis Period (min)	15					
* User Entered Value						

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Background 10 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations		↗		↖↖	↗↗		
Traffic Volume (veh/h)	0	95	0	3051	2188	705	
Future Volume (Veh/h)	0	95	0	3051	2188	705	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87	
Hourly flow rate (vph)	0	151	0	3390	2233	810	
Pedestrians	24						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	2						
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.67	0.53	0.53				
vC, conflicting volume	3792	1173	3067				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	474	0	1771				
tC, single (s)	6.8	7.1	4.1				
tF (s)	3.5	3.4	2.2				
pD queue free %	100	72	100				
cM capacity (veh/h)	346	548	184				
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	151	1130	1130	1130	893	893	1257
Volume Left	0	0	0	0	0	0	0
Volume Right	151	0	0	0	0	0	810
sSH	548	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.28	0.66	0.66	0.66	0.53	0.53	0.74
Queue Length 95th (m)	8.9	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	14.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	14.0	0.0			0.0		
Approach LOS	B						
Intersection Summary							
Average Delay			0.3				
Intersection Capacity Utilization			78.2%		ICU Level of Service		D
Analysis Period (min)			15				

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Background 10 Year  
PM Peak Hour

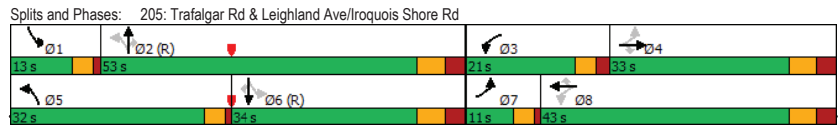
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	155	253	277	626	180	387	452	1583	926	183	1141	65
Future Volume (vph)	155	253	277	626	180	387	452	1583	926	183	1141	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0		25.0	145.0		0.0	95.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	0.97					0.95			0.97	1.00		
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1710	1425	3120	1710	1425	1608	4024	1425	1608	3984	1425
Fit Permitted	0.639			0.242			0.129			0.148		
Satd. Flow (perm)	1064	1710	1425	795	1710	1360	218	4024	1382	250	3984	1425
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			289			222		447				191
Link Speed (k/h)		50			50			50				50
Link Distance (m)		347.0			285.9			280.4				353.6
Travel Time (s)		25.0			20.6			20.2				25.5
Confl. Peds. (#/hr)	34					34			14		14	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Adj. Flow (vph)	161	264	289	652	188	403	471	1649	965	191	1189	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	264	289	652	188	403	471	1649	965	191	1189	68
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)				7.2				3.6				3.6
Link Offset(m)				0.0				0.0				0.0
Crosswalk Width(m)				4.8				4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)				9.4				9.4				9.4
Detector 2 Size(m)				0.6				0.6				0.6
Detector 2 Type				Cl+Ex				Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)				0.0				0.0				0.0

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leigland Ave/Iroquois Shore Rd

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	11.0	25.0	25.0	11.0	43.0	43.0	11.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	11.0	33.0	33.0	21.0	43.0	43.0	32.0	53.0	53.0	13.0	34.0	34.0
Total Split (%)	9.2%	27.5%	27.5%	17.5%	35.8%	35.8%	26.7%	44.2%	44.2%	10.8%	28.3%	28.3%
Maximum Green (s)	7.0	26.0	26.0	16.0	36.0	36.0	28.0	46.0	46.0	9.0	27.0	27.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	33.7	26.7	26.7	46.7	36.7	36.7	64.3	49.0	49.0	41.3	30.0	30.0
Actuated g/C Ratio	0.28	0.22	0.22	0.39	0.31	0.31	0.54	0.41	0.41	0.34	0.25	0.25
v/c Ratio	0.49	0.69	0.53	1.05	0.36	0.71	1.01	1.00	1.17	0.90	1.19	0.14
Control Delay	32.4	52.8	8.1	80.7	34.1	23.1	78.1	58.8	106.9	70.8	136.9	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.4	52.8	8.1	80.7	34.1	23.1	78.1	58.8	106.9	70.8	136.9	0.6
LOS	C	D	A	F	C	C	E	E	F	E	F	F
Approach Delay		30.1			54.9			76.8			121.8	
Approach LOS		C			D			E			F	

Intersection Summary	
Area Type:	CBD
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	105.6 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	140
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.19
Intersection Signal Delay:	77.5
Intersection LOS:	E
Intersection Capacity Utilization:	101.2%
ICU Level of Service:	G
Analysis Period (min):	15
* User Entered Value	



Queues  
205: Trafalgar Rd & Leigland Ave/Iroquois Shore Rd

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	161	264	289	652	188	403	471	1649	965	191	1189	68
v/c Ratio	0.49	0.69	0.53	1.05	0.36	0.71	1.01	1.00	1.17	0.90	1.19	0.14
Control Delay	32.4	52.8	8.1	80.7	34.1	23.1	78.1	58.8	106.9	70.8	136.9	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.4	52.8	8.1	80.7	34.1	23.1	78.1	58.8	106.9	70.8	136.9	0.6
Queue Length 50th (m)	25.4	59.0	0.0	-64.2	35.2	38.7	-114.1	-169.2	-214.7	-34.2	-148.5	0.0
Queue Length 95th (m)	41.7	88.9	23.2	#96.3	56.1	77.9	#181.7	#213.2	#296.5	#83.5	#183.0	0.0
Internal Link Dist (m)		323.0			261.9			256.4			329.6	
Turn Bay Length (m)	60.0			165.0		25.0	145.0			95.0		90.0
Base Capacity (vph)	331	413	563	619	555	591	467	1643	828	213	996	499
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.64	0.51	1.05	0.34	0.68	1.01	1.00	1.17	0.90	1.19	0.14

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

HCM Signalized Intersection Capacity Analysis  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘	
Traffic Volume (vph)	155	253	277	626	180	387	452	1583	926	183	1141	65	
Future Volume (vph)	155	253	277	626	180	387	452	1583	926	183	1141	65	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.97	1.00	1.00	1.00	
Flpb, ped/bikes	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1598	1710	1425	3120	1710	1360	1608	4024	1382	1608	3984	1425	
Fit Permitted	0.64	1.00	1.00	0.24	1.00	1.00	0.13	1.00	1.00	0.15	1.00	1.00	
Satd. Flow (perm)	1075	1710	1425	796	1710	1360	218	4024	1382	251	3984	1425	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	161	264	289	652	188	403	471	1649	965	191	1189	68	
RTOR Reduction (vph)	0	0	225	0	0	154	0	0	264	0	0	51	
Lane Group Flow (vph)	161	264	64	652	188	249	471	1649	701	191	1189	17	
Confl. Peds. (#/hr)	34					34			14		14		
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4		4	8		8	2		2	6		6	
Actuated Green, G (s)	30.7	23.7	23.7	44.7	33.7	33.7	61.3	46.0	46.0	38.3	27.0	27.0	
Effective Green, g (s)	30.7	26.7	26.7	44.7	36.7	36.7	61.3	49.0	49.0	38.3	30.0	30.0	
Actuated g/C Ratio	0.26	0.22	0.22	0.37	0.31	0.31	0.51	0.41	0.41	0.32	0.25	0.25	
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	
Lane Grp Cap (vph)	305	380	317	606	522	415	462	1643	564	207	996	356	
v/s Ratio Prot	0.03	0.15		c0.14	0.11		c0.26	0.41		0.09	0.30		
v/s Ratio Perm	0.10		0.05	c0.26		0.18	0.26		c0.51	0.21		0.01	
v/c Ratio	0.53	0.69	0.20	1.08	0.36	0.60	1.02	1.00	1.24	0.92	1.19	0.05	
Uniform Delay, d1	37.1	42.9	38.0	33.0	32.5	35.4	35.6	35.5	35.5	33.7	45.0	34.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	6.9	0.7	58.7	0.9	3.5	46.9	23.1	123.4	41.4	97.2	0.3	
Delay (s)	38.8	49.8	38.6	91.6	33.4	38.9	82.5	58.6	158.9	75.1	142.2	34.4	
Level of Service	D	D	D	F	C	D	F	E	F	E	F	C	
Approach Delay (s)		42.8			65.7			93.6			128.3		
Approach LOS		D			E			F			F		
<b>Intersection Summary</b>													
HCM 2000 Control Delay	90.4			HCM 2000 Level of Service				F					
HCM 2000 Volume to Capacity ratio	1.16												
Actuated Cycle Length (s)	120.0			Sum of lost time (s)				17.0					
Intersection Capacity Utilization	101.2%			ICU Level of Service				G					
Analysis Period (min)	15												
c Critical Lane Group													

Lanes, Volumes, Timings  
206: North-South Local Rd & South Service Rd E

Background 10 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	15	28	0	68	0	0
Future Volume (vph)	15	28	0	68	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.912					
Fit Protected						
Satd. Flow (prot)	1699	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1699	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	63.8			243.0	106.8	
Travel Time (s)	4.6			17.5	7.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	30	0	74	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	46	0	0	74	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 6.9%	ICU Level of Service A					
Analysis Period (min) 15						



HCM Unsignalized Intersection Capacity Analysis  
206: North-South Local Rd & South Service Rd E

Background 10 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Traffic Volume (veh/h)	15	28	0	68	0	0
Future Volume (Veh/h)	15	28	0	68	0	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)	16	30	0	74	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			46		105	31
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			46		105	31
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1562		893	1043
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	46	74	0			
Volume Left	0	0	0			
Volume Right	30	0	0			
cSH	1700	1562	1700			
Volume to Capacity	0.03	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS				A		
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS				A		
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			6.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
207: Argus Rd & East-West Local Rd

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔		
Traffic Volume (vph)	0	0	0	104	465	80
Future Volume (vph)	0	0	0	104	465	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.980					
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1825	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1825	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	110.5		107.9		72.8	
Travel Time (s)	8.0		7.8		5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	113	505	87
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	0	113	592	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.3		3.3	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15		25	
Sign Control	Stop		Free		Free	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	32.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
207: Argus Rd & East-West Local Rd

Background 10 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			T	T	
Traffic Volume (veh/h)	0	0	0	104	465	80
Future Volume (Veh/h)	0	0	0	104	465	80
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	113	505	87
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				108		
pX, platoon unblocked						
vC, conflicting volume	662	548	592			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	662	548	592			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	427	536	984			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	113	592			
Volume Left	0	0	0			
Volume Right	0	0	87			
cSH	1700	984	1700			
Volume to Capacity	0.00	0.00	0.35			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			32.7%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
208: North-South Local Rd & East-West Local Rd

Background 10 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Volume (vph)	80	0	0	0	0	28
Future Volume (vph)	80	0	0	0	0	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Fit Protected	0.950					
Satd. Flow (prot)	1770	0	1863	0	0	1863
Fit Permitted	0.950					
Satd. Flow (perm)	1770	0	1863	0	0	1863
Link Speed (k/h)	50		50			50
Link Distance (m)	110.5		113.2			79.1
Travel Time (s)	8.0		8.2			5.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	0	0	0	0	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	87	0	0	0	0	30
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
208: North-South Local Rd & East-West Local Rd

Background 10 Year  
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Volume (veh/h)	80	0	0	0	0	28
Future Volume (Veh/h)	80	0	0	0	0	28
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	0	0	0	0	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)		113				
pX, platoon unblocked						
vC, conflicting volume	30	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	100			100	
cM capacity (veh/h)	984	1085			1623	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	87	0	30			
Volume Left	87	0	0			
Volume Right	0	0	0			
cSH	984	1700	1623			
Volume to Capacity	0.09	0.00	0.00			
Queue Length 95th (m)	2.3	0.0	0.0			
Control Delay (s)	9.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		6.7				
Intersection Capacity Utilization		14.4%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings  
209: GO Station West Access/North-South Local Rd & Cross Ave

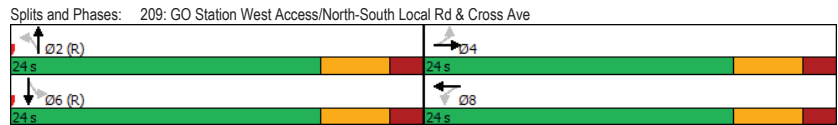
Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	34	445	0	156	454	50	0	0	734	85	55	37
Future Volume (vph)	34	445	0	156	454	50	0	0	734	85	55	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0
Storage Lanes	0	0	0	0	0	1	0	1	0	1	0	0
Taper Length (m)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.989			0.850			0.940	
Fit Protected		0.996			0.988					0.950		
Satd. Flow (prot)	0	3525	0	0	3458	0	1863	1583	0	1770	1751	0
Fit Permitted		0.872			0.703					0.187		
Satd. Flow (perm)	0	3086	0	0	2461	0	1863	1583	0	348	1751	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					21			240			40	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		258.2			115.8			76.5			113.2	
Travel Time (s)		18.6			8.3			5.5			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	484	0	170	493	54	0	0	798	92	60	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	521	0	0	717	0	0	798	0	92	100	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	25	15	25	25	15	25	25	15	25	25	15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases		4			8			2			6	

Lanes, Volumes, Timings Background 10 Year  
209: GO Station West Access/North-South Local Rd & Cross Ave PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	18.0	18.0		18.0	18.0		18.0	18.0		18.0	18.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		18.6			18.6			21.4			21.4	
Actuated g/C Ratio		0.39			0.39			0.45			0.45	
v/c Ratio		0.43			0.74			0.95			0.59	0.12
Control Delay		11.8			17.4			35.7			33.5	6.3
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		11.8			17.4			35.7			33.5	6.3
LOS		B			B			D			C	A
Approach Delay		11.8			17.4			35.7			19.4	
Approach LOS		B			B			D			B	

Intersection Summary	
Area Type:	Other
Cycle Length:	48
Actuated Cycle Length:	48
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.95
Intersection Signal Delay:	22.8
Intersection Capacity Utilization:	95.5%
Intersection LOS:	C
ICU Level of Service:	F
Analysis Period (min):	15



Queues Background 10 Year  
209: GO Station West Access/North-South Local Rd & Cross Ave PM Peak Hour

Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	521	717	798	92	100
v/c Ratio	0.43	0.74	0.95	0.59	0.12
Control Delay	11.8	17.4	35.7	33.5	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	17.4	35.7	33.5	6.3
Queue Length 50th (m)	16.1	25.1	48.7	6.1	3.1
Queue Length 95th (m)	26.0	41.3	#120.7	#26.1	9.7
Internal Link Dist (m)	234.2	91.8	52.5		89.2
Turn Bay Length (m)				15.0	
Base Capacity (vph)	1285	1037	837	155	801
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.69	0.95	0.59	0.12

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

HCM Signalized Intersection Capacity Analysis  
 209: GO Station West Access/North-South Local Rd & Cross Ave  
 Background 10 Year  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	34	445	0	156	454	50	0	0	734	85	55	37
Future Volume (vph)	34	445	0	156	454	50	0	0	734	85	55	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Fr <sub>t</sub>		1.00			0.99			0.85		1.00		0.94
Fit Protected		1.00			0.99			1.00		0.95		1.00
Satd. Flow (prot)		3527			3458			1583		1770		1751
Fit Permitted		0.87			0.70			1.00		0.19		1.00
Satd. Flow (perm)		3085			2459			1583		348		1751
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	484	0	170	493	54	0	0	798	92	60	40
RTOR Reduction (vph)	0	0	0	0	13	0	0	133	0	0	22	0
Lane Group Flow (vph)	0	521	0	0	704	0	0	665	0	92	78	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			2	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		16.6			16.6			19.4		19.4		19.4
Effective Green, g (s)		18.6			18.6			21.4		21.4		21.4
Actuated g/C Ratio		0.39			0.39			0.45		0.45		0.45
Clearance Time (s)		6.0			6.0			6.0		6.0		6.0
Vehicle Extension (s)		3.0			3.0			3.0		3.0		3.0
Lane Grp Cap (vph)		1195			952			705		155		780
v/s Ratio Prot								0.42				0.04
v/s Ratio Perm		0.17			0.29					0.26		
v/c Ratio		0.44			0.74			0.94		0.59		0.10
Uniform Delay, d1		10.8			12.6			12.7		10.0		7.7
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		0.3			3.0			22.5		15.6		0.3
Delay (s)		11.1			15.7			35.3		25.6		8.0
Level of Service		B			B			D		C		A
Approach Delay (s)		11.1			15.7			35.3				16.4
Approach LOS		B			B			D				B
<b>Intersection Summary</b>												
HCM 2000 Control Delay		21.7										C
HCM 2000 Volume to Capacity ratio		0.85										
Actuated Cycle Length (s)		48.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		95.5%			ICU Level of Service			F				
Analysis Period (min)		15										

c Critical Lane Group

Lanes, Volumes, Timings  
 303: North Access & South Service Rd E  
 Background 10 Year  
 PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	43	0	0	68	0	0
Future Volume (vph)	43	0	0	68	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>						
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	518.9			63.8	108.8	
Travel Time (s)	37.4			4.6	7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	0	0	74	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	0	74	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	6.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Background 10 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	43	0	0	68	0	0
Future Volume (Veh/h)	43	0	0	68	0	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)	47	0	0	74	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			47		121	47
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			47		121	47
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1560		874	1022
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	47	74	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1560	1700			
Volume to Capacity	0.03	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS				A		
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS				A		
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			6.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
304: North-South Local Rd & East Access

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔		↔	
Traffic Volume (vph)	0	0	0	0	28	0
Future Volume (vph)	0	0	0	0	28	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	42.7		79.1		106.8	
Travel Time (s)	3.1		5.7		7.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	30	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	30	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15		25	
Sign Control	Stop		Free		Free	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	6.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
304: North-South Local Rd & East Access

Background 10 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↕	↕	
Traffic Volume (veh/h)	0	0	0	0	28	0
Future Volume (Veh/h)	0	0	0	0	28	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	30	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)				192		
pX, platoon unblocked						
vC, conflicting volume	30	30	30			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30	30	30			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	984	1044	1583			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	0	30			
Volume Left	0	0	0			
Volume Right	0	0	0			
sSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.02			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	156.0	142.7	78.2	77.8	32.3	328.5	326.5	57.4	130.9	119.4	116.4
Average Queue (m)	122.3	146.7	59.6	69.3	37.3	31.2	318.5	310.5	48.1	76.9	74.8	80.1
95th Queue (m)	124.9	152.1	114.4	84.2	86.9	36.6	323.1	365.1	70.7	129.0	110.8	108.3
Link Distance (m)		123.0	123.0	51.4	51.4		313.2	313.2		128.0	128.0	128.0
Upstream Blk Time (%)	8	53	1	42	13		92	39		4	0	0
Queuing Penalty (veh)	0	469	9	366	111		0	0		25	1	0
Storage Bay Dist (m)	130.0						25.0			50.0		
Storage Blk Time (%)	8	53					69	44		33	10	
Queuing Penalty (veh)	53	364					253	133		155	32	

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	B34	SB	SB	SB	SB
Directions Served	T	T	T	L	T	T	TR
Maximum Queue (m)	13.7	22.7	18.4	32.3	253.5	252.8	251.6
Average Queue (m)	1.1	1.2	1.2	19.8	184.3	235.0	241.9
95th Queue (m)	9.7	15.5	18.1	36.8	302.0	267.3	248.7
Link Distance (m)	101.5	101.5	101.5		239.0	239.0	239.0
Upstream Blk Time (%)					2	16	48
Queuing Penalty (veh)					12	122	368
Storage Bay Dist (m)				25.0			
Storage Blk Time (%)				11	35		
Queuing Penalty (veh)				55	64		

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	B7	B7	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	27.3	108.4	112.8	27.4	82.9	73.2	39.0	24.1	85.2	84.9	22.4	91.8
Average Queue (m)	8.7	99.3	99.8	26.2	63.8	36.1	5.0	1.9	75.5	66.7	21.2	78.5
95th Queue (m)	26.1	104.9	114.5	28.9	82.3	70.1	24.3	13.1	91.6	102.5	25.7	108.7
Link Distance (m)		93.2	93.2		51.4	51.4	123.0	123.0	66.7	66.7		87.5
Upstream Blk Time (%)		66	49		34	5			67	40		29
Queuing Penalty (veh)		415	309		231	35			0	0		135
Storage Bay Dist (m)	20.0			20.0							15.0	
Storage Blk Time (%)	0	76		75	6						75	29
Queuing Penalty (veh)	1	48		221	13						179	83

Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	14.9	28.2	26.1	19.8	36.2	38.7	27.4	59.4	49.3	29.8
Average Queue (m)	3.2	20.5	16.8	4.1	18.2	18.2	25.5	52.5	16.3	9.9
95th Queue (m)	10.8	29.0	29.5	13.3	33.1	33.7	33.1	74.3	41.8	23.5
Link Distance (m)	21.8	21.8	21.8		236.4	236.4		54.8	56.7	56.7
Upstream Blk Time (%)		37	29					47	3	0
Queuing Penalty (veh)		37	29					0	0	0
Storage Bay Dist (m)				25.0				20.0		
Storage Blk Time (%)					3			29	42	
Queuing Penalty (veh)					1			87	111	

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.7	87.4	281.2	270.4	87.4	132.8	135.4	32.4	295.6	291.4	75.2	87.5
Average Queue (m)	83.1	87.2	270.0	256.9	27.6	123.6	127.2	32.1	277.3	256.9	38.7	42.7
95th Queue (m)	85.0	87.9	275.5	291.3	79.6	137.3	130.5	33.1	332.9	361.8	66.6	74.2
Link Distance (m)			264.0	264.0		122.1	122.1		286.8	286.8		101.5
Upstream Blk Time (%)			92	11		32	60		76	28		1
Queuing Penalty (veh)			0	0		0	0		0	0		4
Storage Bay Dist (m)	80.0	80.0			80.0				25.0			80.0
Storage Blk Time (%)	34	79	3		0	46			94	9		1
Queuing Penalty (veh)	140	320	18		0	28			263	16		2

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	79.4	36.4
Average Queue (m)	41.5	13.9
95th Queue (m)	74.4	28.2
Link Distance (m)	101.5	101.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	180.6	181.5	187.6	36.2	46.0	41.6	321.4	316.7	312.8
Average Queue (m)	90.4	177.4	181.5	28.4	32.5	30.1	296.8	306.3	305.0
95th Queue (m)	181.4	211.9	187.3	32.6	41.4	36.2	357.6	314.5	310.0
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	1	41	79	33	39	39	34	58	73
Queuing Penalty (veh)	0	0	0	339	394	398	323	561	698
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	57.4	122.4	178.2	179.0	177.0	101.8	124.7	142.0	268.6	268.1	262.6	277.0
Average Queue (m)	19.7	114.8	154.3	172.5	119.9	54.1	68.2	89.2	255.1	256.6	254.1	253.3
95th Queue (m)	61.9	150.7	214.1	179.1	249.5	88.2	111.8	131.7	261.4	263.3	258.8	352.9
Link Distance (m)		117.8	171.3	171.3	171.3	299.7	299.7	299.7	251.7	251.7	251.7	251.7
Upstream Blk Time (%)		88	53	92	41				57	65	66	87
Queuing Penalty (veh)		0	0	0	0				292	330	340	443
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)	0	91										
Queuing Penalty (veh)	0	24										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	121.4	128.4	122.5	128.1	131.3	124.4	117.1
Average Queue (m)	87.4	91.9	76.2	83.8	84.6	85.7	75.0
95th Queue (m)	118.0	122.2	110.2	120.7	119.8	118.3	107.3
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							



Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	77.0	89.5	84.6	113.5	96.7	91.5	98.3
Average Queue (m)	45.8	63.2	47.1	67.0	50.0	50.4	55.9
95th Queue (m)	71.1	84.4	72.2	101.8	86.6	82.6	87.6
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	40.6	31.3	58.2	44.6	25.6	30.6
Average Queue (m)	23.8	8.4	35.5	19.8	12.3	16.6
95th Queue (m)	36.0	20.8	53.9	38.5	22.3	26.8
Link Distance (m)	122.4	122.4	184.7	184.7	249.3	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	48.5	59.2	71.4	70.5	52.6	88.3	75.9	26.1	13.1	28.9	11.3	68.3
Average Queue (m)	15.2	33.0	36.5	32.4	21.6	48.7	36.1	3.7	4.0	8.4	2.8	32.8
95th Queue (m)	39.1	53.5	61.1	59.5	41.8	78.8	66.2	15.7	11.6	20.2	8.6	57.2
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0			70.0	15.0			
Storage Blk Time (%)							0		2	6		12
Queuing Penalty (veh)							0		1	1		59

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	SB
Directions Served	R
Maximum Queue (m)	34.9
Average Queue (m)	8.8
95th Queue (m)	26.9
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB	B24
Directions Served	L	T	T	T	TR	LR	T
Maximum Queue (m)	15.6	189.7	216.8	14.1	17.2	26.3	2.3
Average Queue (m)	1.3	50.2	78.6	0.8	1.0	9.1	0.1
95th Queue (m)	8.1	218.8	246.5	6.5	7.9	21.2	1.8
Link Distance (m)		274.2	274.2	21.8	21.8	19.1	136.2
Upstream Blk Time (%)		8	10	0	0	4	
Queuing Penalty (veh)		0	0	0	0	1	
Storage Bay Dist (m)	5.0						
Storage Blk Time (%)	1	0					
Queuing Penalty (veh)	1	0					

Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 202: Lyons Lane & South Service Rd E

Movement	SB
Directions Served	LR
Maximum Queue (m)	13.0
Average Queue (m)	3.8
95th Queue (m)	11.5
Link Distance (m)	21.6
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 203: Argus Rd & South Service Rd E

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (m)	9.2	4.8	13.6
Average Queue (m)	0.9	0.2	7.9
95th Queue (m)	5.3	2.5	13.7
Link Distance (m)	162.4	112.3	88.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	65.7	56.0	72.8	77.3	37.5	36.8	47.7
Average Queue (m)	26.0	29.3	37.7	44.4	6.9	20.5	31.7
95th Queue (m)	57.9	52.2	61.2	67.4	26.6	39.8	40.7
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)					1	5	40
Queuing Penalty (veh)					8	50	374
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	L
Maximum Queue (m)	67.4	333.0	335.2	172.5	276.8	279.8	32.5	81.7	92.9	98.3	161.1	102.5
Average Queue (m)	24.8	248.5	280.5	165.3	265.4	257.2	16.1	39.5	28.6	33.0	39.8	62.3
95th Queue (m)	61.2	456.6	435.4	187.5	304.1	328.2	38.8	71.3	66.7	73.2	98.0	143.9
Link Distance (m)		327.2	327.2		266.7	266.7			251.7	251.7	251.7	
Upstream Blk Time (%)		60	65		87	71						0
Queuing Penalty (veh)		0	0		0	0						0
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				95.0
Storage Blk Time (%)	1	9		39	94	6	8					0
Queuing Penalty (veh)	3	13		122	294	21	14					1

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB
Directions Served	T	T	T	R
Maximum Queue (m)	354.1	353.0	355.6	97.5
Average Queue (m)	338.3	336.4	334.4	32.5
95th Queue (m)	391.3	390.8	395.9	108.1
Link Distance (m)	339.8	339.8	339.8	
Upstream Blk Time (%)	83	77	80	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (m)				90.0
Storage Blk Time (%)	95		98	0
Queuing Penalty (veh)	174		64	0

Intersection: 206: North-South Local Rd & South Service Rd E

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 207: Argus Rd & East-West Local Rd

Movement	SB	B14
Directions Served	TR	T
Maximum Queue (m)	83.1	48.3
Average Queue (m)	25.9	5.6
95th Queue (m)	74.2	33.0
Link Distance (m)	54.8	162.4
Upstream Blk Time (%)	9	
Queuing Penalty (veh)	51	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 208: North-South Local Rd & East-West Local Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	13.8	4.3
Average Queue (m)	5.8	0.3
95th Queue (m)	13.5	3.9
Link Distance (m)	89.3	63.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 209: GO Station West Access/North-South Local Rd & Cross Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	TR	L	TR	L	TR
Maximum Queue (m)	244.8	249.4	41.2	41.1	72.5	75.7	22.4	72.1
Average Queue (m)	201.8	197.9	18.6	19.2	55.8	67.4	17.1	29.9
95th Queue (m)	302.4	308.9	36.2	34.1	92.7	72.7	26.4	73.4
Link Distance (m)	236.4	236.4	93.2	93.2	61.8	61.8		88.6
Upstream Blk Time (%)	28	31			51	98		2
Queuing Penalty (veh)	88	98			0	0		2
Storage Bay Dist (m)							15.0	
Storage Blk Time (%)							63	4
Queuing Penalty (veh)							58	3

Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 303: North Access & South Service Rd E

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 304: North-South Local Rd & East Access

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 10971
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Lanes, Volumes, Timings

101: Trafalgar Rd & Cross Ave/South Service Rd

Total Opening Year

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	837	111	164	49	115	139	179	840	62	324	938	521
Future Volume (vph)	837	111	164	49	115	139	179	840	62	324	938	521
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor	1.00	0.99		0.99		0.99		0.98		0.99		0.99
Frt		0.904				0.850		0.989			0.946	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2795	1388	0	1525	1583	1382	1428	4418	0	1525	4219	0
Fit Permitted	0.950			0.526			0.128			0.114		
Satd. Flow (perm)	2790	1388	0	840	1583	1362	192	4418	0	183	4219	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		70				181		9			111	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		151.2			330.4			150.2			270.2	
Travel Time (s)		10.9			23.8			10.8			19.5	
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Peak Hour Factor	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Adj. Flow (vph)	962	144	256	64	149	181	221	955	78	386	1117	628
Shared Lane Traffic (%)												
Lane Group Flow (vph)	962	400	0	64	149	181	221	1033	0	386	1745	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14		24		24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

101: Trafalgar Rd & Cross Ave/South Service Rd

Total Opening Year

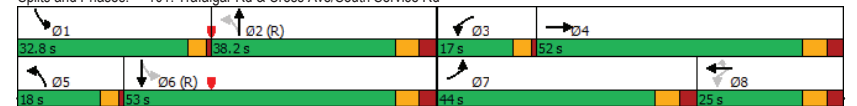
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		12.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		17.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	44.0	52.0		17.0	25.0	25.0	18.0	38.2		32.8	53.0	
Total Split (%)	31.4%	37.1%		12.1%	17.9%	17.9%	12.9%	27.3%		23.4%	37.9%	
Maximum Green (s)	37.0	45.0		13.0	18.0	18.0	14.0	31.2		28.8	46.0	
Yellow Time (s)	4.0	4.0		3.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		1.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	Min	C-Max		Min	C-Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	40.0	47.6		31.6	19.6	19.6	49.6	34.2		68.4	49.0	
Actuated g/C Ratio	0.29	0.34		0.23	0.14	0.14	0.35	0.24		0.49	0.35	
v/c Ratio	1.21	0.77		0.26	0.67	0.52	1.09	0.95		1.02	1.13	
Control Delay	147.0	44.9		28.0	72.6	12.9	103.7	77.4		85.4	111.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	147.0	44.9		28.0	72.6	12.9	103.7	77.4		85.4	111.9	
LOS	F	D		C	E	B	F	E		F	F	
Approach Delay		117.0			37.9			82.0			107.1	
Approach LOS		F			D			F			F	


Intersection Summary

Area Type:	CBD	
Cycle Length:	140	
Actuated Cycle Length:	140	
Offset:	128 (91%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle:	150	
Control Type:	Actuated-Coordinated	
Maximum v/c Ratio:	1.21	
Intersection Signal Delay:	98.3	Intersection LOS: F
Intersection Capacity Utilization	92.9%	ICU Level of Service F
Analysis Period (min)	15	

Splits and Phases: 101: Trafalgar Rd & Cross Ave/South Service Rd





Queues Total Opening Year  
 101: Trafalgar Rd & Cross Ave/South Service Rd AM Peak Hour

									
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	962	400	64	149	181	221	1033	386	1745
v/c Ratio	1.21	0.77	0.26	0.67	0.52	1.09	0.95	1.02	1.13
Control Delay	147.0	44.9	28.0	72.6	12.9	103.7	77.4	85.4	111.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	147.0	44.9	28.0	72.6	12.9	103.7	77.4	85.4	111.9
Queue Length 50th (m)	~175.4	86.2	10.3	41.3	0.0	-61.9	113.4	~109.2	~204.2
Queue Length 95th (m)	#206.5	100.0	16.6	55.2	11.7	m#73.2	m118.0	m#116.3	m#197.8
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	798	527	259	237	358	203	1086	378	1548
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.76	0.25	0.63	0.51	1.09	0.95	1.02	1.13

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

HCM Signalized Intersection Capacity Analysis Total Opening Year  
 101: Trafalgar Rd & Cross Ave/South Service Rd AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	837	111	164	49	115	139	179	840	62	324	938	521
Future Volume (vph)	837	111	164	49	115	139	179	840	62	324	938	521
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2795	1388		1521	1583	1362	1428	4417		1525	4219	
Flt Permitted	0.95	1.00		0.53	1.00	1.00	0.13	1.00		0.11	1.00	
Satd. Flow (perm)	2795	1388		843	1583	1362	193	4417		182	4219	
Peak-hour factor, PHF	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Adj. Flow (vph)	962	144	256	64	149	181	221	955	78	386	1117	628
RTOR Reduction (vph)	0	46	0	0	0	156	0	7	0	0	72	0
Lane Group Flow (vph)	962	354	0	64	149	25	221	1026	0	386	1673	0
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8			8	2			6	
Actuated Green, G (s)	37.0	44.6		28.6	16.6	16.6	46.6	31.2		65.4	46.0	
Effective Green, g (s)	40.0	47.6		28.6	19.6	19.6	46.6	34.2		65.4	49.0	
Actuated g/C Ratio	0.29	0.34		0.20	0.14	0.14	0.33	0.24		0.47	0.35	
Clearance Time (s)	7.0	7.0		4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	798	471		230	221	190	200	1079		374	1476	
v/s Ratio Prot	c0.34	c0.25		0.02	0.09		0.12	0.23		c0.22	c0.40	
v/s Ratio Perm				0.03		0.02	0.25			0.26		
v/c Ratio	1.21	0.75		0.28	0.67	0.13	1.10	0.95		1.03	1.13	
Uniform Delay, d1	50.0	41.0		46.3	57.2	52.8	40.2	52.1		43.4	45.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.03	1.34		1.10	1.29	
Incremental Delay, d2	104.2	7.1		0.8	8.6	0.4	71.9	9.1		45.3	65.9	
Delay (s)	154.2	48.0		47.1	65.7	53.2	113.3	78.9		93.2	124.8	
Level of Service	F	D		D	E	D	F	E		F	F	
Approach Delay (s)	123.0			56.9			85.0			119.1		
Approach LOS	F			E			F			F		

Intersection Summary	
HCM 2000 Control Delay	107.1 HCM 2000 Level of Service F
HCM 2000 Volume to Capacity ratio	1.11
Actuated Cycle Length (s)	140.0 Sum of lost time (s) 16.0
Intersection Capacity Utilization	92.9% ICU Level of Service F
Analysis Period (min)	15
c	Critical Lane Group

Lanes, Volumes, Timings

102: GO Bus Terminal/Argus Rd & Cross Ave

Total Opening Year

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↘	↔	↕	↘	↔	↕	↘	↔	↕	↘
Traffic Volume (vph)	37	513	15	43	695	44	22	0	53	374	18	561
Future Volume (vph)	37	513	15	43	695	44	22	0	53	374	18	561
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			0.96		0.98		0.99
Frt		0.994			0.990			0.850		0.857		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1570	3081	0	818	3172	0	805	734	0	1570	1387	0
Flt Permitted	0.334			0.265			0.142			0.708		
Satd. Flow (perm)	552	3081	0	228	3172	0	120	734	0	1146	1387	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			14			295			193	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		374.0			72.9			81.9			180.7	
Travel Time (s)		26.9			5.2			5.9			13.0	
Confl. Peds. (#/hr)	1		3	3		1	3		20	20		3
Peak Hour Factor	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%
Adj. Flow (vph)	71	590	23	51	790	56	42	0	76	479	29	630
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	613	0	51	846	0	42	76	0	479	659	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

102: GO Bus Terminal/Argus Rd & Cross Ave

Total Opening Year

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases			2		1	6			8			4
Permitted Phases					6			8			4	
Detector Phase		2			1	6		8		8		4
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	45.5	45.5		12.5	58.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.6%	50.6%		13.9%	64.4%		35.6%	35.6%		35.6%	35.6%	
Maximum Green (s)	39.5	39.5		8.5	52.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	26.6	26.6		38.8	38.8		28.1	28.1		28.1	28.1	
Actuated g/C Ratio	0.36	0.36		0.52	0.52		0.38	0.38		0.38	0.38	
v/c Ratio	0.36	0.56		0.28	0.51		0.93	0.17		1.12	1.03	
Control Delay	23.9	21.3		13.1	12.8		154.1	0.8		105.6	63.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.9	21.3		13.1	12.8		154.1	0.8		105.6	63.2	
LOS	C	C		B	B		F	A		F	E	
Approach Delay		21.6			12.8			55.4			81.1	
Approach LOS		C			B			E			F	
Intersection Summary												
Area Type:	CBD											
Cycle Length:	90											
Actuated Cycle Length:	74.9											
Natural Cycle:	100											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	1.12											
Intersection Signal Delay:	44.1						Intersection LOS: D					
Intersection Capacity Utilization:	86.3%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	102: GO Bus Terminal/Argus Rd & Cross Ave											

Queues

Total Opening Year  
AM Peak Hour

102: GO Bus Terminal/Argus Rd & Cross Ave

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	613	51	846	42	76	479	659
v/c Ratio	0.36	0.56	0.28	0.51	0.93	0.17	1.12	1.03
Control Delay	23.9	21.3	13.1	12.8	154.1	0.8	105.6	63.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	21.3	13.1	12.8	154.1	0.8	105.6	63.2
Queue Length 50th (m)	7.6	37.2	3.6	39.6	5.5	0.0	-78.3	-72.4
Queue Length 95th (m)	9.5	50.3	8.3	52.2	#13.7	0.0	#125.9	66.8
Internal Link Dist (m)		350.0		48.9		57.9		156.7
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	306	1714	185	2296	45	459	429	640
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	0.23	0.36	0.28	0.37	0.93	0.17	1.12	1.03

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total Opening Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔		↔	↔↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	37	513	15	43	695	44	22	0	53	374	18	561
Future Volume (vph)	37	513	15	43	695	44	22	0	53	374	18	561
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.98	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1570	3082		818	3172		805	737		1543	1387	
Flt Permitted	0.33	1.00		0.26	1.00		0.14	1.00		0.71	1.00	
Satd. Flow (perm)	552	3082		228	3172		121	737		1149	1387	
Peak-hour factor, PHF	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Adj. Flow (vph)	71	590	23	51	790	56	42	0	76	479	29	630
RTOR Reduction (vph)	0	4	0	0	7	0	0	47	0	0	121	0
Lane Group Flow (vph)	71	609	0	51	839	0	42	29	0	479	538	0
Confl. Peds. (#/hr)	1		3	3		1	3		20	20		3
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	24.6	24.6		36.8	36.8		26.1	26.1		26.1	26.1	
Effective Green, g (s)	26.6	26.6		36.8	38.8		28.1	28.1		28.1	28.1	
Actuated g/C Ratio	0.36	0.36		0.49	0.52		0.38	0.38		0.38	0.38	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	196	1094		176	1643		45	276		431	520	
v/s Ratio Prot		0.20		0.03	c0.26			0.04			0.39	
v/s Ratio Perm	0.13			0.11			0.35			c0.42		
v/c Ratio	0.36	0.56		0.29	0.51		0.93	0.10		1.11	1.04	
Uniform Delay, d1	17.9	19.4		11.2	11.8		22.5	15.2		23.4	23.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	1.0		0.7	0.5		109.0	0.2		77.2	48.9	
Delay (s)	20.3	20.5		11.9	12.4		131.5	15.4		100.6	72.3	
Level of Service	C	C		B	B		F	B		F	E	
Approach Delay (s)		20.4			12.3			56.8			84.2	
Approach LOS		C			B			E			F	

Intersection Summary

HCM 2000 Control Delay	45.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	74.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings

Total Opening Year  
AM Peak Hour

103: Lyons Lane/Commercial Driveway & Cross Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	62	259	213	237	203	6	19	3	14	18	25	44
Future Volume (vph)	62	259	213	237	203	6	19	3	14	18	25	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0	0.0	25.0		0.0	20.0		0.0	0.0		0.0	0.0
Storage Lanes	1	0	1		0	1		0	1		0	1
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		1.00	1.00		1.00	0.99	1.00	0.99		1.00
Frt	0.928			0.992			0.872			0.902		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1540	2821	0	1570	2727	0	1570	1471	0	1468	1497	0
Flt Permitted	0.585			0.337			0.706			0.740		
Satd. Flow (perm)	941	2821	0	557	2727	0	1163	1471	0	1139	1497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		292			12			23			51	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		40.1			374.0			69.1			70.9	
Travel Time (s)		2.9			26.9			5.0			5.1	
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3
Peak Hour Factor	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%
Adj. Flow (vph)	79	320	292	359	257	14	24	4	23	29	27	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	612	0	359	271	0	24	27	0	29	78	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

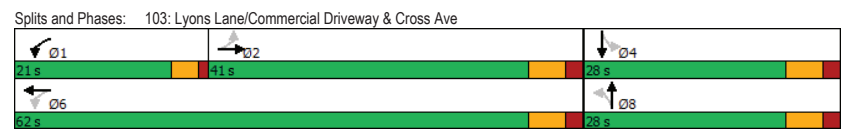
Lanes, Volumes, Timings

Total Opening Year  
AM Peak Hour

103: Lyons Lane/Commercial Driveway & Cross Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	NA
Protected Phases		2		1	6		8		8		4	4
Permitted Phases				6								4
Detector Phase		2		1	6		8		8		4	4
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.0	41.0		21.0	62.0		28.0	28.0		28.0	28.0	
Total Split (%)	45.6%	45.6%		23.3%	68.9%		31.1%	31.1%		31.1%	31.1%	
Maximum Green (s)	35.0	35.0		17.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.1	37.1		52.5	52.5		12.3	12.3		12.3	12.3	
Actuated g/C Ratio	0.51	0.51		0.72	0.72		0.17	0.17		0.17	0.17	
v/c Ratio	0.16	0.39		0.64	0.14		0.12	0.10		0.15	0.26	
Control Delay	11.8	6.6		9.4	3.2		28.6	14.3		29.1	15.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.8	6.6		9.4	3.2		28.6	14.3		29.1	15.8	
LOS	B	A		A	A		C	B		C	B	
Approach Delay		7.1			6.7			21.0			19.4	
Approach LOS		A			A			C			B	

Intersection Summary	
Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	72.8
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	8.3
Intersection LOS:	A
Intersection Capacity Utilization:	77.6%
ICU Level of Service:	D
Analysis Period (min):	15





Queues

103: Lyons Lane/Commercial Driveway & Cross Ave

Total Opening Year

AM Peak Hour

	↖	→	↘	←	↙	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	79	612	359	271	24	27	29	78
v/c Ratio	0.16	0.39	0.64	0.14	0.12	0.10	0.15	0.26
Control Delay	11.8	6.6	9.4	3.2	28.6	14.3	29.1	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	6.6	9.4	3.2	28.6	14.3	29.1	15.8
Queue Length 50th (m)	5.6	12.2	14.6	4.7	2.9	0.5	3.6	3.3
Queue Length 95th (m)	13.1	21.4	17.2	7.2	8.7	5.6	7.6	15.2
Internal Link Dist (m)		16.1		350.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	479	1580	638	2181	384	501	376	528
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.39	0.56	0.12	0.06	0.05	0.08	0.15

Intersection Summary

HCM Signalized Intersection Capacity Analysis

103: Lyons Lane/Commercial Driveway & Cross Ave

Total Opening Year

AM Peak Hour

	↖	→	↘	↙	←	↗	↖	↗	↑	↘	↙	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖		↖	↖	↖	
Traffic Volume (vph)	62	259	213	237	203	6	19	3	14	18	25	44	
Future Volume (vph)	62	259	213	237	203	6	19	3	14	18	25	44	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99		
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.93		1.00	0.99		1.00	0.87		1.00	0.90		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1531	2823		1570	2728		1566	1473		1463	1498		
Flt Permitted	0.58	1.00		0.34	1.00		0.71	1.00		0.74	1.00		
Satd. Flow (perm)	942	2823		557	2728		1164	1473		1139	1498		
Peak-hour factor, PHF	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86	
Adj. Flow (vph)	79	320	292	359	257	14	24	4	23	29	27	51	
RTOR Reduction (vph)	0	143	0	0	3	0	0	19	0	0	42	0	
Lane Group Flow (vph)	79	469	0	359	268	0	24	8	0	29	36	0	
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3	
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	6			8			4		
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	35.1	35.1		50.4	50.4		10.3	10.3		10.3	10.3		
Effective Green, g (s)	37.1	37.1		50.4	52.4		12.3	12.3		12.3	12.3		
Actuated g/C Ratio	0.51	0.51		0.69	0.72		0.17	0.17		0.17	0.17		
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0		
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0		
Lane Grp Cap (vph)	480	1440		543	1966		196	249		192	253		
v/s Ratio Prot		0.17		c0.10	0.10			0.01			0.02		
v/s Ratio Perm	0.08			c0.36			0.02			c0.03			
v/c Ratio	0.16	0.33		0.66	0.14		0.12	0.03		0.15	0.14		
Uniform Delay, d1	9.5	10.5		5.3	3.1		25.6	25.2		25.7	25.7		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.3	0.3		2.7	0.1		0.4	0.1		0.5	0.3		
Delay (s)	9.9	10.7		8.0	3.2		26.0	25.3		26.2	26.1		
Level of Service	A	B		A	A		C	C		C	C		
Approach Delay (s)		10.6			5.9			25.6			26.1		
Approach LOS		B			A			C			C		

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	72.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
 104: Trafalgar Rd & Cornwall Rd Total Opening Year  
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗	↖ ↗		↖ ↗	↖ ↗		↖ ↗	↖ ↗		↖ ↗	↖ ↗	↖ ↗
Traffic Volume (vph)	401	496	93	27	420	548	50	423	60	391	482	289
Future Volume (vph)	401	496	93	27	420	548	50	423	60	391	482	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0		0.0	80.0		0.0	25.0		0.0	80.0		0.0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	0.97		0.99	1.00		0.98		0.98
Frt		0.967			0.917			0.979				0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2987	3016	0	1481	2818	0	1540	3138	0	2929	1676	1356
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2964	3016	0	1472	2818	0	1531	3138	0	2877	1676	1324
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)		32			238			12				284
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.8			142.3			311.4				130.3
Travel Time (s)		20.6			10.2			22.4				9.4
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Peak Hour Factor	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Adj. Flow (vph)	431	545	155	36	488	609	83	492	80	465	560	361
Shared Lane Traffic (%)												
Lane Group Flow (vph)	431	700	0	36	1097	0	83	572	0	465	560	361
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			6.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

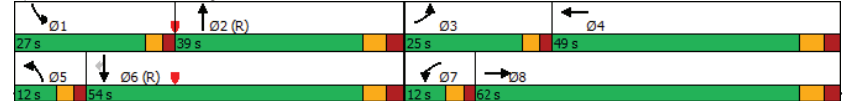
Lanes, Volumes, Timings  
 104: Trafalgar Rd & Cornwall Rd Total Opening Year  
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	25.0	62.0		12.0	49.0		12.0	39.0		27.0	54.0	54.0
Total Split (%)	17.9%	44.3%		8.6%	35.0%		8.6%	27.9%		19.3%	38.6%	38.6%
Maximum Green (s)	20.0	55.0		7.0	42.0		7.0	32.0		22.0	47.0	47.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	21.0	58.0		8.0	45.0		8.0	35.0		23.0	50.0	50.0
Actuated g/C Ratio	0.15	0.41		0.06	0.32		0.06	0.25		0.16	0.36	0.36
v/c Ratio	0.96	0.55		0.43	1.03		0.94	0.72		0.97	0.94	0.55
Control Delay	92.7	31.6		79.8	71.3		145.8	53.0		89.8	30.7	1.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	92.7	31.6		79.8	71.3		145.8	53.0		89.8	30.7	1.9
LOS	F	C		E	E		F	D		F	C	A
Approach Delay		54.9			71.5			64.8			43.0	
Approach LOS		D			E			D			D	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 57.0  
 Intersection LOS: E  
 Intersection Capacity Utilization 98.9%  
 ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 104: Trafalgar Rd & Cornwall Rd



Queues  
104: Trafalgar Rd & Cornwall Rd

Total Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	431	700	36	1097	83	572	465	560	361
v/c Ratio	0.96	0.55	0.43	1.03	0.94	0.72	0.97	0.94	0.55
Control Delay	92.7	31.6	79.8	71.3	145.8	53.0	89.8	30.7	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.7	31.6	79.8	71.3	145.8	53.0	89.8	30.7	1.9
Queue Length 50th (m)	65.2	77.0	10.3	~153.0	24.6	79.2	71.4	87.2	2.5
Queue Length 95th (m)	#99.7	97.3	19.0	#180.1	#30.8	95.6	m67.8	m74.5	m2.1
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	448	1268	84	1067	88	793	481	598	655
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.55	0.43	1.03	0.94	0.72	0.97	0.94	0.55

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

HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Total Opening Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕	↔	↔↔	↕↕	↔	↔↔	↕↕	↔	↔↔	↕↕	↔↔
Traffic Volume (vph)	401	496	93	27	420	548	50	423	60	391	482	289
Future Volume (vph)	401	496	93	27	420	548	50	423	60	391	482	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.97	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.97		1.00	1.00		1.00	1.00	0.98
Fipb, 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	0.92		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)	2987	3015		1481	2817		1540	3138		2929	1676	1324
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2987	3015		1481	2817		1540	3138		2929	1676	1324
Peak-hour factor, PHF	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Adj. Flow (vph)	431	545	155	36	488	609	83	492	80	465	560	361
RTOR Reduction (vph)	0	19	0	0	162	0	0	9	0	0	0	183
Lane Group Flow (vph)	431	681	0	36	936	0	83	563	0	465	560	178
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	20.0	55.0		7.0	42.0		7.0	32.0		22.0	47.0	47.0
Effective Green, g (s)	21.0	58.0		8.0	45.0		8.0	35.0		23.0	50.0	50.0
Actuated g/C Ratio	0.15	0.41		0.06	0.32		0.06	0.25		0.16	0.36	0.36
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	448	1249		84	905		88	784		481	598	472
v/s Ratio Prot	c0.14	0.23		0.02	c0.33		0.05	0.18		c0.16	c0.33	
v/s Ratio Perm												0.13
v/c Ratio	0.96	0.55		0.43	1.03		0.94	0.72		0.97	0.94	0.38
Uniform Delay, d1	59.1	31.0		63.8	47.5		65.8	48.0		58.1	43.5	33.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.47	0.59	0.20
Incremental Delay, d2	34.0	1.7		15.2	38.9		76.1	5.6		6.7	3.6	0.2
Delay (s)	93.1	32.7		79.0	86.4		141.9	53.6		92.4	29.3	6.9
Level of Service	F	C		E	F		F	D		F	C	A
Approach Delay (s)		55.8			86.2			64.8			44.6	
Approach LOS		E			F			E			D	

**Intersection Summary**  
 HCM 2000 Control Delay 61.6 HCM 2000 Level of Service E  
 HCM 2000 Volume to Capacity ratio 1.00  
 Actuated Cycle Length (s) 140.0 Sum of lost time (s) 16.0  
 Intersection Capacity Utilization 98.9% ICU Level of Service F  
 Analysis Period (min) 15  
 c Critical Lane Group

Lanes, Volumes, Timings

105: Trafalgar Rd & QEW EB-Off Ramp

Total Opening Year

AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕↕	↕↕↕	
Traffic Volume (vph)	903	792	0	1141	1536	0
Future Volume (vph)	903	792	0	1141	1536	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	2958	1423	0	4404	4489	0
Flt Permitted	0.950					
Satd. Flow (perm)	2958	1423	0	4404	4489	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		2				
Link Speed (k/h)	50			50	50	
Link Distance (m)	199.2			51.4	324.8	
Travel Time (s)	14.3			3.7	23.4	
Peak Hour Factor	0.98	0.92	0.25	0.91	0.90	0.25
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Adj. Flow (vph)	921	861	0	1254	1707	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	921	861	0	1254	1707	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	

Lanes, Volumes, Timings

105: Trafalgar Rd & QEW EB-Off Ramp

Total Opening Year

AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	83.0	83.0		57.0	57.0	
Total Split (%)	59.3%	59.3%		40.7%	40.7%	
Maximum Green (s)	76.0	76.0		50.0	50.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	79.0	79.0		53.0	53.0	
Actuated g/C Ratio	0.56	0.56		0.38	0.38	
v/c Ratio	0.55	1.07		0.75	1.00	
Control Delay	20.9	83.2		38.3	62.1	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	20.9	83.2		38.3	62.1	
LOS	C	F		D	E	
Approach Delay	51.0			38.3	62.1	
Approach LOS	D			D	E	
<b>Intersection Summary</b>						
Area Type:	CBD					
Cycle Length:	140					
Actuated Cycle Length:	140					
Offset:	133.6 (95%), Referenced to phase 2:NBSB and 6:, Start of Green					
Natural Cycle:	80					
Control Type:	Actuated-Coordinated					
Maximum v/c Ratio:	1.07					
Intersection Signal Delay:	51.7			Intersection LOS: D		
Intersection Capacity Utilization	94.1%			ICU Level of Service F		
Analysis Period (min)	15					
Splits and Phases:	105: Trafalgar Rd & QEW EB-Off Ramp					

Queues

105: Trafalgar Rd & QEW EB-Off Ramp

Total Opening Year

AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	921	861	1254	1707
v/c Ratio	0.55	1.07	0.75	1.00
Control Delay	20.9	83.2	38.3	62.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.9	83.2	38.3	62.1
Queue Length 50th (m)	84.2	~277.8	74.9	~188.8
Queue Length 95th (m)	103.7	#360.0	m72.6	#223.8
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1669	803	1667	1699
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	1.07	0.75	1.00

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

105: Trafalgar Rd & QEW EB-Off Ramp

Total Opening Year

AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	903	792	0	1141	1536	0
Future Volume (vph)	903	792	0	1141	1536	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Fr't	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Sat'd. Flow (prot)	2958	1423		4404	4489	
Flt Permitted	0.95	1.00		1.00	1.00	
Sat'd. Flow (perm)	2958	1423		4404	4489	
Peak-hour factor, PHF	0.98	0.92	0.25	0.91	0.90	0.25
Adj. Flow (vph)	921	861	0	1254	1707	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	921	860	0	1254	1707	0
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	76.0	76.0		50.0	50.0	
Effective Green, g (s)	79.0	79.0		53.0	53.0	
Actuated g/C Ratio	0.56	0.56		0.38	0.38	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1669	802		1667	1699	
v/s Ratio Prot	0.31			0.28	c0.38	
v/s Ratio Perm		c0.60				
v/c Ratio	0.55	1.07		0.75	1.00	
Uniform Delay, d1	19.3	30.5		37.8	43.5	
Progression Factor	1.00	1.00		1.00	0.95	
Incremental Delay, d2	0.4	53.0		0.3	21.0	
Delay (s)	19.7	83.5		38.0	62.3	
Level of Service	B	F		D	E	
Approach Delay (s)	50.5			38.0	62.3	
Approach LOS	D			D	E	

Intersection Summary

HCM 2000 Control Delay	51.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		


c Critical Lane Group

Lanes, Volumes, Timings

Total Opening Year

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

AM Peak Hour




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	221	485	36	276	0	1564	0	0	1361	7
Future Volume (vph)	1	0	221	485	36	276	0	1564	0	0	1361	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Lanes	1		1	1		1	0		0	0		1
Taper Length (m)	7.5		7.5		7.5		7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor												0.96
Frt			0.850			0.850						0.850
Flt Protected	0.950			0.950	0.960							
Satd. Flow (prot)	1570	0	1395	1421	1442	1356	0	4446	0	0	4532	1437
Flt Permitted	0.950			0.950	0.960							
Satd. Flow (perm)	1570	0	1395	1421	1442	1356	0	4446	0	0	4532	1380
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			31			245						70
Link Speed (k/h)		50			50			50				50
Link Distance (m)		142.1			192.6			324.8				275.1
Travel Time (s)		10.2			13.9			23.4				19.8
Confl. Peds. (#/hr)							8		5	5		8
Peak Hour Factor	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Adj. Flow (vph)	4	0	243	551	53	378	0	1682	0	0	1512	11
Shared Lane Traffic (%)			45%									
Lane Group Flow (vph)	4	0	243	303	301	378	0	1682	0	0	1512	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1		1		2				1
Detector Template	Left		Right	Left	Thru	Right		Thru			Thru	Right
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0			10.0	2.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6			0.6	2.0
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Detector 2 Position(m)						9.4		9.4			9.4	
Detector 2 Size(m)						0.6		0.6			0.6	
Detector 2 Type						Cl+Ex		Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

Total Opening Year

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

AM Peak Hour

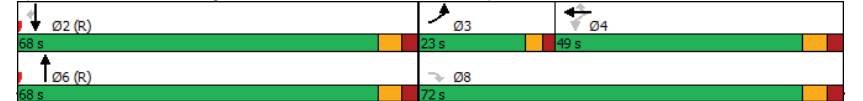


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	NA	Perm
Protected Phases	3					4		6			2	
Permitted Phases			8	4		4						2
Detector Phases	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		72.0	49.0	49.0	49.0		68.0			68.0	68.0
Total Split (%)	16.4%		51.4%	35.0%	35.0%	35.0%		48.6%			48.6%	48.6%
Maximum Green (s)	18.0		65.0	42.0	42.0	42.0		61.0			61.0	61.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)			7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (#/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	8.0		51.1	39.1	39.1	39.1		80.9			80.9	80.9
Actuated g/C Ratio	0.06		0.36	0.28	0.28	0.28		0.58			0.58	0.58
v/c Ratio	0.04		0.46	0.76	0.75	0.68		0.65			0.58	0.01
Control Delay	64.0		30.9	58.2	56.9	20.5		28.9			21.0	0.0
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	64.0		30.9	58.2	56.9	20.5		28.9			21.0	0.0
LOS	E		C	E	E	C		C			C	A
Approach Delay			31.4			43.3		28.9			20.9	
Approach LOS			C			D		C			C	

Intersection Summary

Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle:	100
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	29.5
Intersection Signal Delay:	Intersection LOS: C
Intersection Capacity Utilization:	70.4%
Intersection Capacity Utilization:	ICU Level of Service C
Analysis Period (min):	15

Splits and Phases: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total Opening Year

AM Peak Hour

	↖	↘	↙	←	↖	↑	↓	↘
Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	4	243	303	301	378	1682	1512	11
v/c Ratio	0.04	0.46	0.76	0.75	0.68	0.65	0.58	0.01
Control Delay	64.0	30.9	58.2	56.9	20.5	28.9	21.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	30.9	58.2	56.9	20.5	28.9	21.0	0.0
Queue Length 50th (m)	1.1	46.4	84.9	83.8	34.2	114.6	99.1	0.0
Queue Length 95th (m)	1.4	63.5	106.7	75.1	34.5	145.1	136.1	0.0
Internal Link Dist (m)				168.6		300.8	251.1	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	693	467	474	610	2568	2618	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.35	0.65	0.64	0.62	0.65	0.58	0.01

Intersection Summary

HCM Signalized Intersection Capacity Analysis

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total Opening Year

AM Peak Hour

	↖	→	↘	↙	←	↖	↘	↑	↙	↘	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↖	↖	↖	↖		↑↑↑			↑↑↑	↖
Traffic Volume (vph)	1	0	221	485	36	276	0	1564	0	0	1361	7
Future Volume (vph)	1	0	221	485	36	276	0	1564	0	0	1361	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		0.91			0.91	1.00
Frbp, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	0.96
Ftpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00		0.85	1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	0.96	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1570		1395	1421	1442	1356		4446			4532	1380
Flt Permitted	0.95		1.00	0.95	0.96	1.00		1.00			1.00	1.00
Satd. Flow (perm)	1570		1395	1421	1442	1356		4446			4532	1380
Peak-hour factor, PHF	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Adj. Flow (vph)	4	0	243	551	53	378	0	1682	0	0	1512	11
RTOR Reduction (vph)	0	0	20	0	0	177	0	0	0	0	0	5
Lane Group Flow (vph)	4	0	223	303	301	201	0	1682	0	0	1512	6
Confl. Peds. (#/hr)							8		5	5		8
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA			NA	Perm
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	7.0		48.1	36.1	36.1	36.1		77.9			77.9	77.9
Effective Green, g (s)	8.0		51.1	39.1	39.1	39.1		80.9			80.9	80.9
Actuated g/C Ratio	0.06		0.37	0.28	0.28	0.28		0.58			0.58	0.58
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Lane Grp Cap (vph)	89		509	396	402	378		2569			2618	797
v/s Ratio Prot	0.00							c0.38			0.33	
v/s Ratio Perm			c0.16	c0.21	0.21	0.15						0.00
v/c Ratio	0.04		0.44	0.77	0.75	0.53		0.65			0.58	0.01
Uniform Delay, d1	62.4		33.6	46.2	46.0	42.7		20.1			18.7	12.5
Progression Factor	1.00		1.00	1.00	1.00	1.00		1.29			1.00	1.00
Incremental Delay, d2	0.2		0.6	8.5	7.5	1.4		1.0			0.9	0.0
Delay (s)	62.6		34.2	54.8	53.4	44.2		26.9			19.7	12.6
Level of Service	E		C	D	D	D		C			B	B
Approach Delay (s)		34.7			50.3			26.9			19.6	
Approach LOS		C			D			C			B	

Intersection Summary

HCM 2000 Control Delay		30.0		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio		0.68				
Actuated Cycle Length (s)		140.0		Sum of lost time (s)		12.0
Intersection Capacity Utilization		70.4%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Total Opening Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↗	↕↕			↕↕
Traffic Volume (vph)	814	379	466	0	0	1300
Future Volume (vph)	814	379	466	0	0	1300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frt	0.993	0.850				
Flt Protected	0.954					
Satd. Flow (prot)	3423	1441	3539	0	0	3539
Flt Permitted	0.954					
Satd. Flow (perm)	3423	1441	3539	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	5	336				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	885	412	507	0	0	1413
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	926	371	507	0	0	1413
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp





Total Opening Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	49.0	49.0	71.0			71.0
Total Split (%)	40.8%	40.8%	59.2%			59.2%
Maximum Green (s)	43.0	43.0	65.0			65.0
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	41.2	41.2	67.1			67.1
Actuated g/C Ratio	0.35	0.35	0.58			0.58
v/c Ratio	0.76	0.51	0.25			0.69
Control Delay	37.6	6.8	13.0			20.2
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	37.6	6.8	13.0			20.2
LOS	D	A	B			C
Approach Delay	28.8		13.0			20.2
Approach LOS	C		B			C
Intersection Summary						
Area Type:	Other					
Cycle Length:	120					
Actuated Cycle Length:	116.3					
Natural Cycle:	60					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.76					
Intersection Signal Delay:	22.6			Intersection LOS: C		
Intersection Capacity Utilization:	69.8%			ICU Level of Service C		
Analysis Period (min):	15					
Splits and Phases:	107: Dorval Drive & QEW WB Off-Ramp					
















Queues  
107: Dorval Drive & QEW WB Off-Ramp

Total Opening Year  
AM Peak Hour

				
Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	926	371	507	1413
v/c Ratio	0.76	0.51	0.25	0.69
Control Delay	37.6	6.8	13.0	20.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	37.6	6.8	13.0	20.2
Queue Length 50th (m)	99.7	6.0	32.0	127.3
Queue Length 95th (m)	124.2	32.3	42.8	156.5
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1329	764	2041	2041
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.70	0.49	0.25	0.69
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Total Opening Year  
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	 		 			 
Traffic Volume (vph)	814	379	466	0	0	1300
Future Volume (vph)	814	379	466	0	0	1300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr't	0.99	0.85	1.00			1.00
Fit Protected	0.95	1.00	1.00			1.00
Sat'd. Flow (prot)	3426	1441	3539			3539
Fit Permitted	0.95	1.00	1.00			1.00
Sat'd. Flow (perm)	3426	1441	3539			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	885	412	507	0	0	1413
RTOR Reduction (vph)	3	217	0	0	0	0
Lane Group Flow (vph)	923	154	507	0	0	1413
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	39.2	39.2	65.1			65.1
Effective Green, g (s)	41.2	41.2	67.1			67.1
Actuated g/C Ratio	0.35	0.35	0.58			0.58
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1213	510	2041			2041
v/s Ratio Prot	c0.27		0.14			c0.40
v/s Ratio Perm		0.11				
v/c Ratio	0.76	0.30	0.25			0.69
Uniform Delay, d1	33.2	27.2	12.1			17.3
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	3.2	0.6	0.3			2.0
Delay (s)	36.4	27.7	12.4			19.3
Level of Service	D	C	B			B
Approach Delay (s)	33.9		12.4			19.3
Approach LOS	C		B			B
<b>Intersection Summary</b>						
HCM 2000 Control Delay			24.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			116.3		Sum of lost time (s)	8.0
Intersection Capacity Utilization			69.8%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Total Opening Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕	↕↕	
Traffic Volume (vph)	119	475	0	656	1404	0
Future Volume (vph)	119	475	0	656	1404	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr	0.900	0.850				
Flt Protected	0.984					
Satd. Flow (prot)	3200	1441	0	3539	3539	0
Flt Permitted	0.984					
Satd. Flow (perm)	3200	1441	0	3539	3539	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	43	43				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	516	0	713	1526	0
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	387	258	0	713	1526	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Total Opening Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	40.0	40.0		80.0	80.0	
Total Split (%)	33.3%	33.3%		66.7%	66.7%	
Maximum Green (s)	34.0	34.0		74.0	74.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	25.1	25.1		76.4	76.4	
Actuated g/C Ratio	0.23	0.23		0.70	0.70	
v/c Ratio	0.50	0.71		0.29	0.62	
Control Delay	34.2	43.0		7.4	11.3	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	34.2	43.0		7.4	11.3	
LOS	C	D		A	B	
Approach Delay	37.7			7.4	11.3	
Approach LOS	D			A	B	
Intersection Summary						
Area Type:	Other					
Cycle Length:	120					
Actuated Cycle Length:	109.5					
Natural Cycle:	60					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.71					
Intersection Signal Delay:	16.2			Intersection LOS: B		
Intersection Capacity Utilization:	69.8%			ICU Level of Service C		
Analysis Period (min):	15					
Splits and Phases:	108: Dorval Drive & QEW EB Off-Ramp					

Queues  
108: Dorval Drive & QEW EB Off-Ramp

Total Opening Year  
AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	387	258	713	1526
v/c Ratio	0.50	0.71	0.29	0.62
Control Delay	34.2	43.0	7.4	11.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.2	43.0	7.4	11.3
Queue Length 50th (m)	34.6	49.1	28.7	86.3
Queue Length 95th (m)	49.0	80.6	50.4	144.0
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1085	504	2467	2467
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.51	0.29	0.62
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Total Opening Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	119	475	0	656	1404	0
Future Volume (vph)	119	475	0	656	1404	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Fr't	0.90	0.85		1.00	1.00	
Fit Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3199	1441		3539	3539	
Fit Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3199	1441		3539	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	516	0	713	1526	0
RTOR Reduction (vph)	33	33	0	0	0	0
Lane Group Flow (vph)	354	225	0	713	1526	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	23.1	23.1		74.3	74.3	
Effective Green, g (s)	25.1	25.1		76.3	76.3	
Actuated g/C Ratio	0.23	0.23		0.70	0.70	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	733	330		2468	2468	
v/s Ratio Prot	0.11			0.20	c0.43	
v/s Ratio Perm		c0.16				
v/c Ratio	0.48	0.68		0.29	0.62	
Uniform Delay, d1	36.5	38.5		6.3	8.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	6.2		0.3	1.2	
Delay (s)	37.2	44.7		6.6	10.0	
Level of Service	D	D		A	A	
Approach Delay (s)	40.2			6.6	10.0	
Approach LOS	D			A	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			15.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.63			
Actuated Cycle Length (s)			109.4		Sum of lost time (s)	8.0
Intersection Capacity Utilization			69.8%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Total Opening Year  
AM Peak Hour

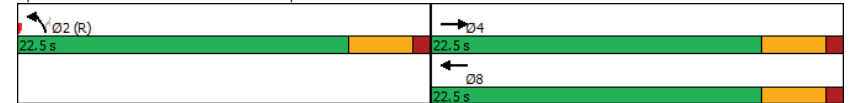
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↔	↔
Traffic Volume (vph)	435	0	0	264	232	258
Future Volume (vph)	435	0	0	264	232	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						233
Link Speed (k/h)	60			60	40	
Link Distance (m)	128.8			184.7	258.8	
Travel Time (s)	7.7			11.1	23.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	473	0	0	287	252	280
Shared Lane Traffic (%)						
Lane Group Flow (vph)	473	0	0	287	252	280
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
v/c Ratio	0.33			0.20	0.36	0.36

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Total Opening Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	10.2			9.3	11.3	4.1
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.2			9.3	11.3	4.1
LOS	B			A	B	A
Approach Delay	10.2			9.3	7.5	
Approach LOS	B			A	A	
<b>Intersection Summary</b>						
Area Type:	Other					
Cycle Length:	45					
Actuated Cycle Length:	45					
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green					
Natural Cycle:	45					
Control Type:	Pretimed					
Maximum v/c Ratio:	0.36					
Intersection Signal Delay:	8.9			Intersection LOS: A		
Intersection Capacity Utilization	35.5%			ICU Level of Service A		
Analysis Period (min)	15					

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street



Queues  
109: QEW WB Off-Ramp & Kerr Street

Total Opening Year  
AM Peak Hour

	→	←	↖	↗
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	473	287	252	280
v/c Ratio	0.33	0.20	0.36	0.36
Control Delay	10.2	9.3	11.3	4.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.2	9.3	11.3	4.1
Queue Length 50th (m)	13.4	7.6	13.7	2.3
Queue Length 95th (m)	22.0	13.7	27.1	13.2
Internal Link Dist (m)	104.8	160.7	234.8	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1415	1415	708	773
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.20	0.36	0.36
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Total Opening Year  
AM Peak Hour

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕	↕
Traffic Volume (vph)	435	0	0	264	232	258
Future Volume (vph)	435	0	0	264	232	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr't	1.00			1.00	1.00	0.85
Fit Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	1583
Fit Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	473	0	0	287	252	280
RTOR Reduction (vph)	0	0	0	0	0	140
Lane Group Flow (vph)	473	0	0	287	252	140
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1415			1415	708	633
v/s Ratio Prot	c0.13			0.08	c0.14	
v/s Ratio Perm						0.09
v/c Ratio	0.33			0.20	0.36	0.22
Uniform Delay, d1	9.4			8.8	9.4	8.9
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.6			0.3	1.4	0.8
Delay (s)	10.0			9.1	10.8	9.7
Level of Service	A			A	B	A
Approach Delay (s)	10.0			9.1	10.2	
Approach LOS	A			A	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			9.9		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.35			
Actuated Cycle Length (s)			45.0		Sum of lost time (s)	9.0
Intersection Capacity Utilization			35.5%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	41	508	28	83	500	7	2	8	46	3	19	26
Future Volume (vph)	41	508	28	83	500	7	2	8	46	3	19	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0	0.0	155.0		70.0	15.0			0.0	0.0		30.0
Storage Lanes	2	0	1		1	1			1	1		1
Taper Length (m)	7.5		7.5		7.5				7.5			7.5
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr		0.992				0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3300	0	1719	3139	1380	1805	1667	1468	1805	1792	1495
Fit Permitted	0.446			0.403			0.744			0.752		
Satd. Flow (perm)	1596	3300	0	729	3139	1380	1414	1667	1468	1429	1792	1495
Right Turn on Red			Yes			Yes			Yes		Yes	
Satd. Flow (RTOR)		6				94			99			99
Link Speed (k/h)	80			80			60					40
Link Distance (m)	324.5						158.7					215.5
Travel Time (s)	14.6						9.5					19.4
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Adj. Flow (vph)	45	558	31	91	549	8	2	9	51	3	21	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	589	0	91	549	8	2	9	51	3	21	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)	7.2			7.2			3.6					3.6
Link Offset(m)	0.0			0.0			0.0					0.0
Crosswalk Width(m)	4.8			4.8			4.8					4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

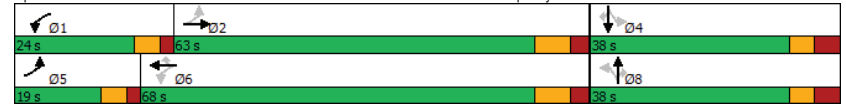
Lanes, Volumes, Timings  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	34.0		14.0	38.4	38.4	28.8	28.8	28.8	35.0	35.0	35.0
Total Split (s)	19.0	63.0		24.0	68.0	68.0	38.0	38.0	38.0	38.0	38.0	38.0
Total Split (%)	15.2%	50.4%		19.2%	54.4%	54.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%
Maximum Green (s)	13.0	54.6		18.0	59.6	59.6	30.2	30.2	30.2	30.2	30.2	30.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)	10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	0			0	0	0	0	0	0	0	0	0
Act Effct Green (s)	74.5	67.6		75.3	70.5	70.5	13.4	13.4	13.4	13.9	13.9	13.9
Actuated g/C Ratio	0.78	0.71		0.79	0.74	0.74	0.14	0.14	0.14	0.15	0.15	0.15
v/c Ratio	0.03	0.25		0.13	0.24	0.01	0.01	0.04	0.18	0.01	0.08	0.10
Control Delay	2.6	7.2		3.0	6.4	0.0	37.5	37.9	2.3	37.3	38.4	0.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.6	7.2		3.0	6.4	0.0	37.5	37.9	2.3	37.3	38.4	0.6
LOS	A	A		A	A	A	D	D	A	D	D	A
Approach Delay		6.9			5.8			8.6				17.7
Approach LOS		A			A			A				B


Intersection Summary

Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	95.4
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.25
Intersection Signal Delay:	6.9
Intersection Capacity Utilization:	50.0%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive




Queues Total Opening Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	45	589	91	549	8	2	9	51	3	21	29	
v/c Ratio	0.03	0.25	0.13	0.24	0.01	0.01	0.04	0.18	0.01	0.08	0.10	
Control Delay	2.6	7.2	3.0	6.4	0.0	37.5	37.9	2.3	37.3	38.4	0.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.6	7.2	3.0	6.4	0.0	37.5	37.9	2.3	37.3	38.4	0.6	
Queue Length 50th (m)	0.8	24.6	3.4	23.2	0.0	0.4	1.6	0.0	0.6	3.8	0.0	
Queue Length 95th (m)	1.8	33.4	6.5	31.5	0.0	2.5	6.4	2.0	3.3	10.9	0.0	
Internal Link Dist (m)	300.5			223.2			134.7			191.5		
Turn Bay Length (m)	150.0		155.0		70.0		15.0		30.0			
Base Capacity (vph)	1583	2341	801	2318	1044	506	596	589	511	641	598	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.03	0.25	0.11	0.24	0.01	0.00	0.02	0.09	0.01	0.03	0.05	

Intersection Summary

HCM Signalized Intersection Capacity Analysis Total Opening Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←		←	←	←	←	←	←	←	←	←
Traffic Volume (vph)	41	508	28	83	500	7	2	8	46	3	19	26
Future Volume (vph)	41	508	28	83	500	7	2	8	46	3	19	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3300		1719	3139	1380	1805	1667	1468	1805	1792	1495
Fit Permitted	0.45	1.00		0.40	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1595	3300		729	3139	1380	1413	1667	1468	1428	1792	1495
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)	45	558	31	91	549	8	2	9	51	3	21	29
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	45	0	0	26
Lane Group Flow (vph)	45	587	0	91	549	6	2	9	6	3	21	3
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	68.2	63.6		71.4	65.2	65.2	7.8	7.8	7.8	7.8	7.8	7.8
Effective Green, g (s)	72.2	68.0		75.4	69.6	69.6	11.6	11.6	11.6	11.6	11.6	11.6
Actuated g/C Ratio	0.72	0.68		0.76	0.70	0.70	0.12	0.12	0.12	0.12	0.12	0.12
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	1273	2248		632	2189	962	164	193	170	165	208	173
v/s Ratio Prot	0.00	c0.18		c0.01	0.17			0.01			c0.01	
v/s Ratio Perm	0.02			0.10		0.00	0.00		0.00	0.00		0.00
w/c Ratio	0.04	0.26		0.14	0.25	0.01	0.01	0.05	0.03	0.02	0.10	0.02
Uniform Delay, d1	3.9	6.2		3.3	5.5	4.6	39.0	39.2	39.1	39.1	39.4	39.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.3		0.1	0.3	0.0	0.0	0.1	0.1	0.1	0.3	0.1
Delay (s)	3.9	6.4		3.4	5.8	4.6	39.1	39.3	39.2	39.1	39.7	39.1
Level of Service	A	A		A	A	A	D	D	D	D	D	D
Approach Delay (s)	6.3				5.5		39.2				39.3	
Approach LOS	A				A		D				D	

Intersection Summary

HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
201: Cross Ave & Lyons Lane

Total Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↕	↕		↵	↵
Traffic Volume (vph)	36	464	219	67	60	42
Future Volume (vph)	36	464	219	67	60	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.948		0.937	
Flt Protected	0.950				0.974	
Satd. Flow (prot)	1624	3094	2790	0	1398	0
Flt Permitted	0.950				0.974	
Satd. Flow (perm)	1624	3094	2790	0	1398	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	4			4	7	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Heavy Vehicles (%)	0%	5%	16%	0%	0%	25%
Adj. Flow (vph)	52	800	249	134	97	84
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	800	383	0	181	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	CBD
Control Type:	Unsignalized
Intersection Capacity Utilization	29.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Total Opening Year  
AM Peak Hour


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↕	↕		↵	↵
Traffic Volume (veh/h)	36	464	219	67	60	42
Future Volume (Veh/h)	36	464	219	67	60	42
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Hourly flow rate (vph)	52	800	249	134	97	84
Pedestrians			7		4	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked	0.99				0.99	0.99
vC, conflicting volume	387				831	196
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	365				813	172
tC, single (s)	4.1				6.8	7.4
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.5
p0 queue free %	96				68	89
cM capacity (veh/h)	1191				301	765
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	52	400	400	166	217	181
Volume Left	52	0	0	0	0	97
Volume Right	0	0	0	0	134	84
eSH	1191	1700	1700	1700	1700	419
Volume to Capacity	0.04	0.24	0.24	0.10	0.13	0.43
Queue Length 95th (m)	1.1	0.0	0.0	0.0	0.0	17.0
Control Delay (s)	8.2	0.0	0.0	0.0	0.0	20.0
Lane LOS	A					C
Approach Delay (s)	0.5			0.0		20.0
Approach LOS						C

Intersection Summary	
Average Delay	2.9
Intersection Capacity Utilization	29.6%
ICU Level of Service	A
Analysis Period (min)	15



Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Total Opening Year  
AM Peak Hour




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	4	3	49	23	1
Future Volume (vph)	0	4	3	49	23	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.873		0.992	
Flt Protected					0.955	
Satd. Flow (prot)	0	1710	1493	0	1237	0
Flt Permitted					0.955	
Satd. Flow (perm)	0	1710	1493	0	1237	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		60.5	89.6		37.6	
Travel Time (s)		4.4	6.5		2.7	
Confl. Peds. (#/hr)	6			6	1	
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	33%	0%
Adj. Flow (vph)	0	8	4	65	61	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	8	69	0	65	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	CBD
Control Type:	Unsignalized
Intersection Capacity Utilization	15.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Total Opening Year  
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	4	3	49	23	1
Future Volume (Veh/h)	0	4	3	49	23	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Hourly flow rate (vph)	0	8	4	65	61	4
Pedestrians			1		6	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	75				52	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	75				52	42
tC, single (s)	4.1				6.7	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.3
p0 queue free %	100				93	100
cM capacity (veh/h)	1529				880	1029

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	8	69	65
Volume Left	0	0	61
Volume Right	0	65	4
eSH	1529	1700	887
Volume to Capacity	0.00	0.04	0.07
Queue Length 95th (m)	0.0	0.0	1.9
Control Delay (s)	0.0	0.0	9.4
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.4
Approach LOS			A

Intersection Summary	
Average Delay	4.3
Intersection Capacity Utilization	15.8%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Total Opening Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	78	690	200	63	122
Future Volume (vph)	1	78	690	200	63	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.965		0.911	
Flt Protected		0.999			0.983	
Satd. Flow (prot)	0	1673	1614	0	1531	0
Flt Permitted		0.999			0.983	
Satd. Flow (perm)	0	1673	1614	0	1531	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)	1			1	5	1
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Heavy Vehicles (%)	100%	0%	3%	0%	0%	0%
Adj. Flow (vph)	4	186	802	278	252	488
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	190	1080	0	740	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24		14		24	14
Sign Control		Free	Free		Stop	

Intersection Summary						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	72.9%		ICU Level of Service		C	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Total Opening Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	78	690	200	63	122
Future Volume (Veh/h)	1	78	690	200	63	122
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Hourly flow rate (vph)	4	186	802	278	252	488
Pedestrians		1	5		1	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	1081				1141	943
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1081				1141	943
tC, single (s)	5.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	3.1				3.5	3.3
p0 queue free %	99				0	0
cM capacity (veh/h)	386				221	321

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	190	1080	740
Volume Left	4	0	252
Volume Right	0	278	488
eSH	386	1700	278
Volume to Capacity	0.01	0.64	2.66
Queue Length 95th (m)	0.3	0.0	498.0
Control Delay (s)	0.5	0.0	787.3
Lane LOS	A		F
Approach Delay (s)	0.5	0.0	787.3
Approach LOS			F

Intersection Summary			
Average Delay	289.9		
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Total Opening Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	150	0	1799	1534	813
Future Volume (vph)	0	150	0	1799	1534	813
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Frt		0.865			0.942	
Fit Protected						
Satd. Flow (prot)	0	1367	0	4363	4260	0
Fit Permitted						
Satd. Flow (perm)	0	1367	0	4363	4260	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	145.7			270.2	51.4	
Travel Time (s)	10.5			19.5	3.7	
Confl. Peds. (#/hr)						11
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82
Heavy Vehicles (%)	0%	7%	0%	7%	4%	2%
Adj. Flow (vph)	0	278	0	1955	1581	991
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	278	0	1955	2572	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	70.5%		ICU Level of Service C			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Total Opening Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Volume (veh/h)	0	150	0	1799	1534	813	
Future Volume (Veh/h)	0	150	0	1799	1534	813	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82	
Hourly flow rate (vph)	0	278	0	1955	1581	991	
Pedestrians	11						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	1						
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.72	0.63	0.63				
vC, conflicting volume	2739	1034	2583				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	346	0	1450				
tC, single (s)	6.8	7.0	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	58	100				
cM capacity (veh/h)	449	665	295				
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>NB 3</b>	<b>SB 1</b>	<b>SB 2</b>	<b>SB 3</b>
Volume Total	278	652	652	652	632	632	1307
Volume Left	0	0	0	0	0	0	0
Volume Right	278	0	0	0	0	0	991
eSH	665	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.42	0.38	0.38	0.38	0.37	0.37	0.77
Queue Length 95th (m)	16.5	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	14.2	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	14.2	0.0			0.0		
Approach LOS	B						
<b>Intersection Summary</b>							
Average Delay				0.8			
Intersection Capacity Utilization	70.5%		ICU Level of Service		C		
Analysis Period (min)	15						

Lanes, Volumes, Timings

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total Opening Year

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	22	107	283	215	54	139	157	928	711	156	870	28
Future Volume (vph)	22	107	283	215	54	139	157	928	711	156	870	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0			25.0	145.0		0.0	95.0	90.0
Storage Lanes	1		1	1			1	1		1	1	1
Taper Length (m)	7.5			7.5			7.5	7.5		7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	0.99						0.98		0.97	1.00		
Frt			0.850				0.850		0.850			0.850
Fit Protected	0.950			0.950			0.950		0.950			
Satd. Flow (prot)	1624	1693	1425	3060	1676	1398	1425	4446	1398	1562	4532	1398
Fit Permitted	0.719			0.467			0.252		0.236			
Satd. Flow (perm)	1217	1693	1425	1504	1676	1366	378	4446	1363	387	4532	1398
Right Turn on Red			Yes	Yes		Yes	Yes		Yes		Yes	
Satd. Flow (RTOR)			290			149			662			145
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		285.9			293.8			275.1			252.7	
Travel Time (s)		20.6			21.2			19.8			18.2	
Confl. Peds. (#/hr)	11					11			10		10	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Adj. Flow (vph)	24	115	304	231	58	149	169	998	765	168	935	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	115	304	231	58	149	169	998	765	168	935	30
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25			15	25		15	25	15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total Opening Year

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		2	6	6
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	10.0	34.0	34.0	11.0	43.0	43.0	10.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	10.0	42.0	42.0	11.0	43.0	43.0	21.0	54.0	54.0	13.0	46.0	46.0
Total Split (%)	8.3%	35.0%	35.0%	9.2%	35.8%	35.8%	17.5%	45.0%	45.0%	10.8%	38.3%	38.3%
Maximum Green (s)	6.0	35.0	35.0	6.0	36.0	36.0	17.0	47.0	47.0	9.0	39.0	39.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	23.8	17.8	17.8	25.4	22.8	22.8	68.8	79.7	68.8	78.7	68.3	68.3
Actuated g/C Ratio	0.20	0.15	0.15	0.21	0.19	0.19	0.66	0.57	0.57	0.66	0.57	0.57
v/c Ratio	0.09	0.46	0.66	0.58	0.18	0.39	0.49	0.39	0.72	0.47	0.36	0.03
Control Delay	34.2	51.9	13.6	45.3	42.9	9.7	12.1	15.5	7.5	11.7	15.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	51.9	13.6	45.3	42.9	9.7	12.1	15.5	7.5	11.7	15.5	0.1
LOS	C	D	B	D	D	A	B	B	A	B	B	A
Approach Delay		24.7			32.9			12.0			14.5	
Approach LOS		C			C			B			B	
Intersection Summary												
Area Type: CBD												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 33.6 (28%), Referenced to phase 2:NBL and 6:SBTL, Start of Green												
Natural Cycle: 100												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.72												
Intersection Signal Delay: 16.5												
Intersection LOS: B												
Intersection Capacity Utilization 77.9%												
ICU Level of Service D												
Analysis Period (min) 15												
Splits and Phases: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd												

**Queues** **Total Opening Year**  
AM Peak Hour  
**205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd**

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	24	115	304	231	58	149	169	998	765	168	935	30
v/c Ratio	0.09	0.46	0.66	0.58	0.18	0.39	0.49	0.39	0.72	0.47	0.36	0.03
Control Delay	34.2	51.9	13.6	45.3	42.9	9.7	12.1	15.5	7.5	11.7	15.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	51.9	13.6	45.3	42.9	9.7	12.1	15.5	7.5	11.7	15.5	0.1
Queue Length 50th (m)	4.6	26.5	3.0	24.7	12.8	0.0	12.9	46.5	11.0	12.7	42.8	0.0
Queue Length 95th (m)	11.2	43.2	30.0	34.2	24.3	17.8	25.5	69.7	66.3	25.0	65.9	0.0
Internal Link Dist (m)		261.9			269.8			251.1				228.7
Turn Bay Length (m)	60.0			165.0		25.0	145.0			95.0		90.0
Base Capacity (vph)	261	536	649	395	544	409	2550	1064	360	2580	858	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.21	0.47	0.58	0.11	0.27	0.41	0.39	0.72	0.47	0.36	0.03

**Intersection Summary**

**HCM Signalized Intersection Capacity Analysis** **Total Opening Year**  
AM Peak Hour  
**205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd**

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	22	107	283	215	54	139	157	928	711	156	870	28
Future Volume (vph)	22	107	283	215	54	139	157	928	711	156	870	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00
Ftbp, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1613	1693	1425	3060	1676	1366	1425	4446	1363	1561	4532	1398
Flt Permitted	0.72	1.00	1.00	0.47	1.00	1.00	0.25	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	1221	1693	1425	1504	1676	1366	378	4446	1363	388	4532	1398
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	24	115	304	231	58	149	169	998	765	168	935	30
RTOR Reduction (vph)	0	0	243	0	0	121	0	0	291	0	0	13
Lane Group Flow (vph)	24	115	61	231	58	28	169	998	474	168	935	17
Conf. Peds. (#/hr)							11		10		10	
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	20.0	16.4	16.4	25.8	19.8	19.8	75.1	64.2	64.2	74.1	63.7	63.7
Effective Green, g (s)	20.0	19.4	19.4	25.8	22.8	22.8	75.1	67.2	67.2	74.1	66.7	66.7
Actuated g/C Ratio	0.17	0.16	0.16	0.22	0.19	0.19	0.63	0.56	0.56	0.62	0.56	0.56
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	215	273	230	401	318	259	331	2489	763	341	2519	777
v/s Ratio Prot	0.00	0.07		c0.03	0.03		c0.05	0.22		0.04	0.21	
v/s Ratio Perm	0.02		0.04	c0.10		0.02	0.27		c0.35	0.26		0.01
v/c Ratio	0.11	0.42	0.26	0.58	0.18	0.11	0.51	0.40	0.62	0.49	0.37	0.02
Uniform Delay, d1	42.3	45.2	44.1	41.4	40.8	40.2	10.1	15.0	17.8	10.4	14.9	12.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	1.4	0.8	2.0	0.4	0.3	1.3	0.5	3.8	1.1	0.4	0.1
Delay (s)	42.5	46.7	44.9	43.5	41.2	40.5	11.4	15.5	21.6	11.5	15.3	12.0
Level of Service	D	D	D	D	D	D	B	B	C	B	B	B
Approach Delay (s)		45.2			42.1			17.5			14.7	
Approach LOS		D			D			B			B	

<b>Intersection Summary</b>			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
303: North Access & South Service Rd E

Total Opening Year  
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↘	↗	↗
Traffic Volume (vph)	85	24	47	25	8	97
Future Volume (vph)	85	24	47	25	8	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.970				0.876	
Fit Protected				0.968	0.996	
Satd. Flow (prot)	1807	0	0	1803	1625	0
Fit Permitted				0.968	0.996	
Satd. Flow (perm)	1807	0	0	1803	1625	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	523.2			302.5	113.1	
Travel Time (s)	37.7			21.8	8.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	26	51	27	9	105
Shared Lane Traffic (%)						
Lane Group Flow (vph)	118	0	0	78	114	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.7%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Total Opening Year  
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↘	↗	↗
Traffic Volume (veh/h)	85	24	47	25	8	97
Future Volume (Veh/h)	85	24	47	25	8	97
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)	92	26	51	27	9	105
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			118		234	105
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			118		234	105
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		99	89
cM capacity (veh/h)			1470		728	949

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	118	78	114
Volume Left	0	51	9
Volume Right	26	0	105
eSH	1700	1470	927
Volume to Capacity	0.07	0.03	0.12
Queue Length 95th (m)	0.0	0.9	3.4
Control Delay (s)	0.0	5.0	9.4
Lane LOS	A	A	A
Approach Delay (s)	0.0	5.0	9.4
Approach LOS			A

Intersection Summary	
Average Delay	4.7
Intersection Capacity Utilization	23.7%
Analysis Period (min)	15
	ICU Level of Service A

Queuing and Blocking Report

Total Opening Year  
AM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	150.0	84.2	37.2	4.4	32.3	67.6	40.0	57.4	110.2	121.1	123.3
Average Queue (m)	96.9	104.7	41.4	3.1	0.1	13.7	32.6	17.4	46.2	69.4	79.1	88.7
95th Queue (m)	128.8	143.8	73.0	19.2	3.1	31.4	60.0	31.1	69.0	102.8	109.9	118.2
Link Distance (m)		123.0	123.0	51.4	51.4		313.2	313.2		128.0	128.0	128.0
Upstream Blk Time (%)	1	4		0						0	0	0
Queuing Penalty (veh)	0	17		0						0	0	1
Storage Bay Dist (m)	130.0					25.0			50.0			
Storage Blk Time (%)	1	4				1	23		8	21		
Queuing Penalty (veh)	2	15				1	11		22	38		

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	SB	SB	SB	SB
Directions Served	T	T	L	T	T	TR
Maximum Queue (m)	14.1	16.5	32.4	244.7	248.0	244.3
Average Queue (m)	0.5	0.5	31.7	171.8	181.7	201.1
95th Queue (m)	10.0	11.6	37.3	268.9	272.4	273.5
Link Distance (m)	101.5	101.5		239.0	239.0	239.0
Upstream Blk Time (%)				5	3	8
Queuing Penalty (veh)				29	18	43
Storage Bay Dist (m)			25.0			
Storage Blk Time (%)			62	25		
Queuing Penalty (veh)			192	82		

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	B14
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR	T
Maximum Queue (m)	27.3	73.3	60.7	27.3	52.8	49.7	30.1	44.1	22.4	188.3	94.7
Average Queue (m)	8.5	39.4	23.3	12.2	26.6	25.5	7.8	14.1	22.2	152.6	15.6
95th Queue (m)	23.5	65.1	45.3	29.2	47.0	43.7	23.2	31.5	23.3	204.7	64.7
Link Distance (m)		352.9	352.9		51.4	51.4	66.7	66.7		159.0	160.7
Upstream Blk Time (%)					0	0		0		24	0
Queuing Penalty (veh)					1	0		0		196	1
Storage Bay Dist (m)	20.0			20.0					15.0		
Storage Blk Time (%)	0	27		4	10				49	44	
Queuing Penalty (veh)	0	10		13	4				285	164	

Queuing and Blocking Report

Total Opening Year  
AM Peak Hour

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	21.7	24.4	26.7	31.2	31.0	25.2	14.2	10.1	22.0	26.8
Average Queue (m)	7.6	15.3	17.5	16.5	6.0	7.6	3.9	2.9	4.0	9.6
95th Queue (m)	17.5	25.7	27.5	28.8	19.8	18.7	11.3	9.7	13.5	20.3
Link Distance (m)	21.8	21.8	21.8		352.9	352.9		54.8	56.7	56.7
Upstream Blk Time (%)	0	5	5							
Queuing Penalty (veh)	1	8	9							
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)				2	0		0	0		
Queuing Penalty (veh)				2	1		0	0		

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	82.5	86.2	133.1	112.2	46.7	118.1	129.0	32.3	88.6	77.6	58.0	66.4
Average Queue (m)	55.7	64.9	54.3	53.1	8.4	62.4	64.6	16.1	49.7	40.4	34.8	38.8
95th Queue (m)	87.2	89.0	123.9	102.8	26.1	98.1	120.3	36.2	76.1	65.7	53.3	59.2
Link Distance (m)			266.8	266.8		122.1	122.1		289.9	289.9		101.5
Upstream Blk Time (%)						0	2					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (m)	80.0	80.0			80.0			25.0			80.0	
Storage Blk Time (%)	3	7	0			2		4	37			0
Queuing Penalty (veh)	7	18	1			1		9	19			0

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	71.2	21.9
Average Queue (m)	27.3	7.8
95th Queue (m)	55.1	18.7
Link Distance (m)	101.5	101.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total Opening Year  
AM Peak Hour

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	172.0	188.4	188.7	39.7	45.2	41.3	318.3	319.9	312.3
Average Queue (m)	75.2	156.0	177.1	29.0	31.4	30.7	295.9	307.3	305.4
95th Queue (m)	141.0	238.9	206.2	33.8	39.0	36.7	355.7	316.3	310.6
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	0	23	54	45	49	54	21	38	51
Queuing Penalty (veh)	0	0	0	269	295	325	142	259	351
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	12.8	126.3	161.8	166.7	108.2	166.2	210.8	232.5	260.1	265.9	263.2	276.0
Average Queue (m)	0.8	75.2	98.2	110.3	37.0	73.6	100.2	137.8	242.8	245.5	246.0	237.3
95th Queue (m)	11.7	137.6	185.1	193.2	154.4	135.3	186.0	229.0	294.7	294.4	286.5	372.8
Link Distance (m)	117.8		171.3	171.3	171.3	299.7	299.7	299.7	249.2	249.2	249.2	249.2
Upstream Blk Time (%)	18		12	23	7	0		0	49	59	65	83
Queuing Penalty (veh)	0		0	0	0	0		2	167	202	222	283
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)	51											
Queuing Penalty (veh)	1											

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	116.7	127.1	105.1	51.1	54.0	131.9	118.0
Average Queue (m)	79.9	78.0	53.8	23.5	24.1	80.3	69.4
95th Queue (m)	109.9	108.9	95.9	43.8	45.2	114.3	103.2
Link Distance (m)	312.1	312.1	294.6		294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	190.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Total Opening Year  
AM Peak Hour

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	60.4	75.9	68.0	67.0	62.2	93.2	92.4
Average Queue (m)	21.6	52.6	38.5	35.9	17.9	51.3	56.1
95th Queue (m)	53.8	72.4	65.4	59.6	44.7	83.6	86.5
Link Distance (m)	262.2		262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	42.1	28.6	31.2	15.4	38.8	38.6
Average Queue (m)	22.4	7.6	16.1	3.1	19.6	16.8
95th Queue (m)	35.8	19.8	26.9	11.0	35.1	29.6
Link Distance (m)	121.6	121.6	175.0	175.0	246.4	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	140.0					
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	4.3	15.5	38.9	26.4	21.4	35.7	23.7	4.1	7.9	11.5	6.0	11.2
Average Queue (m)	0.1	4.4	15.6	6.7	6.6	10.8	5.1	0.2	0.5	1.9	0.5	2.6
95th Queue (m)	1.8	11.2	34.1	19.0	15.2	28.7	16.7	2.2	3.5	7.7	3.1	8.3
Link Distance (m)			312.4		312.4	232.2		232.2	141.8		195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0	155.0				70.0		15.0			
Storage Blk Time (%)												
Queuing Penalty (veh)	0											



Queuing and Blocking Report

Total Opening Year  
AM Peak Hour

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	9.8	3.1	52.5	10.1	8.0	24.3
Average Queue (m)	2.3	0.2	10.6	0.5	0.3	12.0
95th Queue (m)	8.8	2.6	36.0	4.2	3.7	20.4
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)						1
Queuing Penalty (veh)						0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	1	0				
Queuing Penalty (veh)	2	0				

Intersection: 202: Lyons Lane & South Service Rd E

Movement	SB
Directions Served	LR
Maximum Queue (m)	22.3
Average Queue (m)	5.4
95th Queue (m)	16.7
Link Distance (m)	21.6
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 203: Argus Rd & South Service Rd E

Movement	EB	WB	SB	B17	B18
Directions Served	LT	TR	LR	T	T
Maximum Queue (m)	20.0	12.8	51.3	12.2	8.8
Average Queue (m)	1.4	0.8	19.1	1.3	0.7
95th Queue (m)	11.9	5.8	48.3	14.5	9.4
Link Distance (m)	160.7	112.3	88.3	39.8	290.0
Upstream Blk Time (%)			3	1	
Queuing Penalty (veh)			5	3	
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report

Total Opening Year  
AM Peak Hour

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	62.8	149.3	154.8	163.3	21.8	31.0	38.9
Average Queue (m)	24.1	81.9	90.5	101.7	4.5	6.7	14.4
95th Queue (m)	62.5	152.4	163.5	173.9	21.0	24.5	37.5
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)	3				2	1	5
Queuing Penalty (veh)	4				13	5	36
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	R
Maximum Queue (m)	14.2	269.7	280.0	172.4	271.6	232.0	32.4	60.1	73.4	77.5	218.4	150.8
Average Queue (m)	2.8	160.6	199.8	112.4	156.7	72.0	13.6	26.1	26.3	30.6	46.1	10.9
95th Queue (m)	9.6	362.1	367.8	215.5	312.6	253.8	28.2	52.0	62.4	68.0	133.9	92.7
Link Distance (m)		265.0	265.0		273.8	273.8		249.2	249.2	249.2	249.2	
Upstream Blk Time (%)		41	58		20	15						0
Queuing Penalty (veh)		0	0		0	0						1
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				
Storage Blk Time (%)		0		13	42	1	2					
Queuing Penalty (veh)		0		14	45	1	1					

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	R
Maximum Queue (m)	102.4	248.3	244.6	248.9	97.5
Average Queue (m)	62.8	194.9	193.1	190.0	18.6
95th Queue (m)	138.5	322.8	320.4	322.6	81.0
Link Distance (m)		234.2	234.2	234.2	
Upstream Blk Time (%)		62	57	63	
Queuing Penalty (veh)		0	0	0	
Storage Bay Dist (m)	95.0				90.0
Storage Blk Time (%)	0	74		78	0
Queuing Penalty (veh)	0	115		22	0

Queuing and Blocking Report

Total Opening Year  
AM Peak Hour

Intersection: 303: North Access & South Service Rd E

Movement	WB	NB
Directions Served	LT LR	
Maximum Queue (m)	9.3	15.6
Average Queue (m)	1.3	9.0
95th Queue (m)	6.4	13.4
Link Distance (m)	290.0	103.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 4009

Lanes, Volumes, Timings

Total Opening Year  
PM Peak Hour

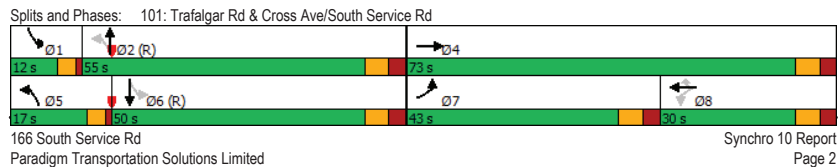
101: Trafalgar Rd & Cross Ave/South Service Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	1197	109	171	167	200	253	241	1546	45	155	1291	444
Future Volume (vph)	1197	109	171	167	200	253	241	1546	45	155	1291	444
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.97		0.98				0.99			0.99	
Frt		0.913				0.850		0.994			0.963	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2958	1399	0	1540	1644	1423	1496	4545	0	1570	4371	0
Fit Permitted	0.950			0.545			0.085			0.093		
Satd. Flow (perm)	2958	1399	0	865	1644	1423	134	4545	0	154	4371	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		71				148		5		63		
Link Speed (k/h)		50			50		50		50		50	
Link Distance (m)		151.2			330.4		150.2		270.2		19.5	
Travel Time (s)		10.9			23.8		10.8		19.5			
Confl. Peds. (#/hr)			15	15			18		70	70		18
Peak Hour Factor	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%
Adj. Flow (vph)	1425	151	211	204	247	309	284	1680	68	172	1451	477
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1425	362	0	204	247	309	284	1748	0	172	1928	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6		3.3			3.3		
Link Offset(m)		0.0			0.0		0.0			0.0		0.0
Crosswalk Width(m)		4.8			4.8		4.8			4.8		4.8
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1		1	2		2
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4		9.4			9.4		9.4
Detector 2 Size(m)		0.6			0.6		0.6			0.6		0.6
Detector 2 Type		Cl+Ex			Cl+Ex		Cl+Ex			Cl+Ex		Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings Total Opening Year  
PM Peak Hour  
101: Trafalgar Rd & Cross Ave/South Service Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		25.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	43.0	73.0		30.0	30.0	30.0	17.0	55.0		12.0	50.0	
Total Split (%)	30.7%	52.1%		21.4%	21.4%	21.4%	12.1%	39.3%		8.6%	35.7%	
Maximum Green (s)	36.0	66.0		23.0	23.0	23.0	13.0	48.0		8.0	43.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	C-Max			Min	C-Max	
Walk Time (s)		7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0	0	0		0			0	
Act Effct Green (s)	39.0	69.0		23.0	26.0	26.0	63.0	51.0		54.0	46.0	
Actuated g/C Ratio	0.28	0.49		0.16	0.19	0.19	0.45	0.36		0.39	0.33	
v/c Ratio	1.73	0.50		1.44	0.81	0.80	1.53	1.05		1.23	1.30	
Control Delay	364.8	21.5		272.7	75.4	44.7	279.7	79.7		176.0	180.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	364.8	21.5		272.7	75.4	44.7	279.7	79.7		176.0	180.7	
LOS	F	C		F	E	D	F	E		F	F	
Approach Delay		295.3			115.9			107.6			180.3	
Approach LOS		F			F			F			F	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 128 (91%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.73  
 Intersection Signal Delay: 181.6      Intersection LOS: F  
 Intersection Capacity Utilization 117.0%      ICU Level of Service H  
 Analysis Period (min) 15



Queues Total Opening Year  
PM Peak Hour  
101: Trafalgar Rd & Cross Ave/South Service Rd

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1425	362	204	247	309	284	1748	172	1928
v/c Ratio	1.73	0.50	1.44	0.81	0.80	1.53	1.05	1.23	1.30
Control Delay	364.8	21.5	272.7	75.4	44.7	279.7	79.7	176.0	180.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	364.8	21.5	272.7	75.4	44.7	279.7	79.7	176.0	180.7
Queue Length 50th (m)	~315.7	55.5	~80.4	69.8	46.9	~101.3	~200.1	~46.5	~255.6
Queue Length 95th (m)	#327.2	58.7	#117.3	#90.5	70.9 m	#100.0	m155.4	m#73.6	#282.3
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	824	725	142	305	384	186	1658	140	1478
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.73	0.50	1.44	0.81	0.80	1.53	1.05	1.23	1.30

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

HCM Signalized Intersection Capacity Analysis Total Opening Year  
101: Trafalgar Rd & Cross Ave/South Service Rd PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	1197	109	171	167	200	253	241	1546	45	155	1291	444	
Future Volume (vph)	1197	109	171	167	200	253	241	1546	45	155	1291	444	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6	
Total Lost time (s)	4.0	4.0	7.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.91	1.00	0.91	1.00	
Frbp, ped/bikes	1.00	0.97	1.00	1.00	1.00	1.00	0.99	1.00	0.99	1.00	0.99	1.00	
Ft	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.91	1.00	1.00	0.85	1.00	0.99	1.00	0.96	1.00	0.96	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	2958	1398	1507	1644	1423	1496	4546	1570	4371	1570	4371	1570	
Flt Permitted	0.95	1.00	0.55	1.00	1.00	0.09	1.00	0.09	1.00	0.09	1.00	1.00	
Satd. Flow (perm)	2958	1398	865	1644	1423	134	4546	154	4371	154	4371	154	
Peak-hour factor, PHF	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93	
Adj. Flow (vph)	1425	151	211	204	247	309	284	1680	68	172	1451	477	
RTOR Reduction (vph)	0	36	0	0	0	121	0	3	0	0	42	0	
Lane Group Flow (vph)	1425	326	0	204	247	188	284	1745	0	172	1886	0	
Confl. Peds. (#/hr)			15	15			18		70	70		18	
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%	
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA	pm+pt	NA			
Protected Phases	7	4		8		8	5	2	1	6			
Permitted Phases			8		8		2		6				
Actuated Green, G (s)	36.0	66.0		23.0	23.0	23.0	60.0	48.0	51.0	43.0			
Effective Green, g (s)	39.0	69.0		23.0	26.0	26.0	60.0	51.0	51.0	46.0			
Actuated g/C Ratio	0.28	0.49		0.16	0.19	0.19	0.43	0.36	0.36	0.33			
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	4.0	7.0	4.0	7.0			
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0	3.0	5.0			
Lane Grp Cap (vph)	824	689		142	305	264	183	1656	137	1436			
v/s Ratio Prot	c0.48	0.23		0.15			c0.14	0.38	0.07	0.43			
v/s Ratio Perm			c0.24		0.13		c0.52		0.39				
v/c Ratio	1.73	0.47		1.44	0.81	0.71	1.55	1.05	1.26	1.31			
Uniform Delay, d1	50.5	23.5		58.5	54.6	53.5	41.7	44.5	38.5	47.0			
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.15	1.14	1.39	1.10			
Incremental Delay, d2	333.3	0.7		231.8	15.3	9.4	259.8	31.3	151.4	144.7			
Delay (s)	383.8	24.2		290.3	70.0	62.9	307.8	82.1	205.1	196.6			
Level of Service	F	C		F	E	E	F	F	F	F			
Approach Delay (s)	311.0			126.3			113.7		197.3				
Approach LOS	F			F			F		F				
<b>Intersection Summary</b>													
HCM 2000 Control Delay	194.2		HCM 2000 Level of Service				F						
HCM 2000 Volume to Capacity ratio	1.54												
Actuated Cycle Length (s)	140.0												
Intersection Capacity Utilization	117.0%		ICU Level of Service				H						
Analysis Period (min)	15												
c Critical Lane Group													

Lanes, Volumes, Timings Total Opening Year  
102: GO Bus Terminal/Argus Rd & Cross Ave PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	33	992	18	40	470	105	17	2	51	322	21	180
Future Volume (vph)	33	992	18	40	470	105	17	2	51	322	21	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			7.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99	0.99	0.99	0.97	0.864	0.98	0.98	0.866
Frt	0.997				0.969		0.864			0.866		
Flt Protected	0.950			0.950		0.950			0.950			0.950
Satd. Flow (prot)	1570	3176	0	797	3124	0	785	715	0	1570	1306	0
Flt Permitted	0.415			0.093		0.466			0.702			0.702
Satd. Flow (perm)	681	3176	0	78	3124	0	382	715	0	1136	1306	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			65			76			231	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		374.0			72.9			81.9			180.7	
Travel Time (s)		26.9			5.2			5.9			13.0	
Confl. Peds. (#/hr)	9		4	4		9	12		20	20		12
Peak Hour Factor	0.66	0.81	0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75	0.78
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	100%	0%	100%
Adj. Flow (vph)	50	1225	24	43	495	130	24	8	76	374	28	231
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	50	1249	0	43	625	0	24	84	0	374	259	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Left
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	45.5	45.5		12.5	58.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.6%	50.6%		13.9%	64.4%		35.6%	35.6%		35.6%	35.6%	
Maximum Green (s)	39.5	39.5		8.5	52.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	40.8	40.8		52.9	52.9		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.46	0.46		0.60	0.60		0.31	0.31		0.31	0.31	
v/c Ratio	0.16	0.86		0.39	0.33		0.20	0.30		1.04	0.46	
Control Delay	15.8	28.8		20.3	8.6		28.0	10.1		92.7	7.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.8	28.8		20.3	8.6		28.0	10.1		92.7	7.6	
LOS	B	C		C	A		C	B		F	A	
Approach Delay		28.3			9.3			14.1			57.9	
Approach LOS		C			A			B			E	

**Intersection Summary**

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 88.9

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.04

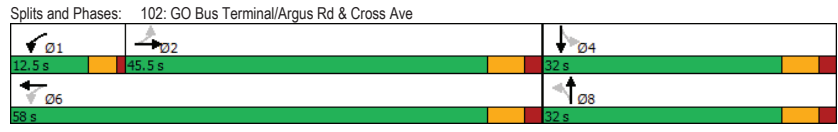
Intersection Signal Delay: 29.9

Intersection LOS: C

Intersection Capacity Utilization 70.1%

ICU Level of Service C

Analysis Period (min) 15



Queues  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	1249	43	625	24	84	374	259
v/c Ratio	0.16	0.86	0.39	0.33	0.20	0.30	1.04	0.46
Control Delay	15.8	28.8	20.3	8.6	28.0	10.1	92.7	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	28.8	20.3	8.6	28.0	10.1	92.7	7.6
Queue Length 50th (m)	5.0	101.0	3.1	24.0	3.2	1.0	~74.6	3.5
Queue Length 95th (m)	8.8	110.5	10.2	33.9	7.7	0.0	#121.7	11.9
Internal Link Dist (m)		350.0		48.9		57.9		156.7
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	318	1484	114	1923	120	277	358	569
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.84	0.38	0.33	0.20	0.30	1.04	0.46

**Intersection Summary**

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

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

### HCM Signalized Intersection Capacity Analysis

102: GO Bus Terminal/Argus Rd & Cross Ave

Total Opening Year  
PM Peak Hour

	↙	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↙	↕	↘	↙	↕	↘	↙	↕	↘	↙	↕	↘	
Traffic Volume (vph)	33	992	18	40	470	105	17	2	51	322	21	180	
Future Volume (vph)	33	992	18	40	470	105	17	2	51	322	21	180	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.98		
Fipb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.98	1.00		
Frt	1.00	1.00		1.00	0.97		1.00	0.86		1.00	0.87		
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1559	3177		797	3123		779	716		1538	1306		
Fit Permitted	0.41	1.00		0.09	1.00		0.47	1.00		0.70	1.00		
Satd. Flow (perm)	681	3177		78	3123		382	716		1137	1306		
Peak-hour factor, PHF	0.66	0.81	0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75	0.78	
Adj. Flow (vph)	50	1225	24	43	495	130	24	8	76	374	28	231	
RTOR Reduction (vph)	0	2	0	0	26	0	0	52	0	0	158	0	
Lane Group Flow (vph)	50	1247	0	43	599	0	24	32	0	374	101	0	
Confl. Peds. (#/hr)	9		4	4		9	12		20	20		12	
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	0%	100%	0%	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	6		8	8		4	4		
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	38.8	38.8		50.9	50.9		26.0	26.0		26.0	26.0		
Effective Green, g (s)	40.8	40.8		50.9	52.9		28.0	28.0		28.0	28.0		
Actuated g/C Ratio	0.46	0.46		0.57	0.60		0.31	0.31		0.31	0.31		
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0		
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0		
Lane Grp Cap (vph)	312	1458		110	1858		120	225		358	411		
v/s Ratio Prot		c0.39		c0.04	0.19		0.04	0.08					
v/s Ratio Perm	0.07			0.19			0.06			c0.33			
v/c Ratio	0.16	0.86		0.39	0.32		0.20	0.14		1.04	0.25		
Uniform Delay, d1	14.0	21.4		13.9	9.0		22.3	21.8		30.5	22.6		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.5	5.7		1.7	0.2		1.1	0.4		59.7	0.4		
Delay (s)	14.6	27.1		15.6	9.2		23.4	22.2		90.2	23.0		
Level of Service	B	C		B	A		C	C		F	C		
Approach Delay (s)		26.6			9.6			22.5			62.7		
Approach LOS		C			A			C			E		
Intersection Summary													
HCM 2000 Control Delay		30.7		HCM 2000 Level of Service				C					
HCM 2000 Volume to Capacity ratio		0.88											
Actuated Cycle Length (s)		88.9		Sum of lost time (s)				12.0					
Intersection Capacity Utilization		70.1%		ICU Level of Service				C					
Analysis Period (min)		15											
c Critical Lane Group													

### Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

Total Opening Year  
PM Peak Hour

	↙	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↕	↘	↙	↕	↘	↙	↕	↘	↙	↕	↘
Traffic Volume (vph)	41	231	14	15	452	13	253	4	171	17	2	68
Future Volume (vph)	41	231	14	15	452	13	253	4	171	17	2	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0		0.0	25.0		0.0	20.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Frt		0.990			0.993			0.858			0.855	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1525	2912	0	1570	3076	0	1570	1444	0	1570	1416	0
Fit Permitted	0.469			0.503			0.682			0.529		
Satd. Flow (perm)	750	2912	0	830	3076	0	1126	1444	0	872	1416	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			9			216			113	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		40.1			374.0			69.1			70.9	
Travel Time (s)		2.9			26.9			5.0			5.1	
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1
Peak Hour Factor	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	71	275	19	28	476	24	342	12	216	24	4	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	294	0	28	500	0	342	228	0	24	117	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

Total Opening Year

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.5	41.5		12.5	54.0		36.0	36.0		36.0	36.0	
Total Split (%)	46.1%	46.1%		13.9%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	35.5	35.5		8.5	48.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.0	37.0		49.0	49.0		30.3	30.3		30.3	30.3	
Actuated g/C Ratio	0.42	0.42		0.56	0.56		0.35	0.35		0.35	0.35	
v/c Ratio	0.22	0.24		0.05	0.29		0.88	0.36		0.08	0.21	
Control Delay	19.3	16.6		9.5	10.7		51.6	5.2		19.8	5.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.3	16.6		9.5	10.7		51.6	5.2		19.8	5.4	
LOS	B	B		A	B		D	A		B	A	
Approach Delay		17.1			10.7			33.0			7.8	
Approach LOS		B			B			C			A	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	87.4
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	19.8
Intersection Capacity Utilization:	66.8%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	C

Splits and Phases: 103: Lyons Lane/Commercial Driveway & Cross Ave



Queues

103: Lyons Lane/Commercial Driveway & Cross Ave

Total Opening Year

PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	71	294	28	500	342	228	24	117
v/c Ratio	0.22	0.24	0.05	0.29	0.88	0.36	0.08	0.21
Control Delay	19.3	16.6	9.5	10.7	51.6	5.2	19.8	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	16.6	9.5	10.7	51.6	5.2	19.8	5.4
Queue Length 50th (m)	8.0	16.9	2.2	23.2	55.7	1.4	2.8	0.5
Queue Length 95th (m)	10.7	24.1	3.5	32.9	69.3	0.0	6.4	0.3
Internal Link Dist (m)		16.1		350.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	322	1256	537	1765	412	665	319	590
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	0.22	0.23	0.05	0.28	0.83	0.34	0.08	0.20

Intersection Summary

**HCM Signalized Intersection Capacity Analysis**  
**103: Lyons Lane/Commercial Driveway & Cross Ave**

**Total Opening Year**  
**PM Peak Hour**

<b>Movement</b>	<b>EBL</b>	<b>EBT</b>	<b>EBR</b>	<b>WBL</b>	<b>WBT</b>	<b>WBR</b>	<b>NBL</b>	<b>NBT</b>	<b>NBR</b>	<b>SBL</b>	<b>SBR</b>	<b>SBR</b>	
Lane Configurations													
Traffic Volume (vph)	41	231	14	15	452	13	253	4	171	17	2	68	
Future Volume (vph)	41	231	14	15	452	13	253	4	171	17	2	68	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.3	3.3	3.6	3.6	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.99		1.00	0.99		1.00	0.86		1.00	0.86		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1520	2913		1569	3075		1569	1444		1565	1416		
Flt Permitted	0.47	1.00		0.50	1.00		0.68	1.00		0.53	1.00		
Satd. Flow (perm)	750	2913		831	3075		1126	1444		872	1416		
Peak-hour factor, PHF	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60	
Adj. Flow (vph)	71	275	19	28	476	24	342	12	216	24	4	113	
RTOR Reduction (vph)	0	6	0	0	4	0	0	141	0	0	74	0	
Lane Group Flow (vph)	71	288	0	28	496	0	342	87	0	24	43	0	
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1	
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	6			8			4		
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	35.1	35.1		47.1	47.1		28.4	28.4		28.4	28.4		
Effective Green, g (s)	37.1	37.1		47.1	49.1		30.4	30.4		30.4	30.4		
Actuated g/C Ratio	0.42	0.42		0.54	0.56		0.35	0.35		0.35	0.35		
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0		
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0		
Lane Grp Cap (vph)	318	1235		514	1725		391	501		302	491		
v/s Ratio Prot		0.10		0.00	c0.16			0.06			0.03		
v/s Ratio Perm	0.09			0.02			c0.30			0.03			
v/c Ratio	0.22	0.23		0.05	0.29		0.87	0.17		0.08	0.09		
Uniform Delay, d1	16.0	16.1		9.6	10.0		26.8	19.8		19.2	19.2		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.7	0.2		0.0	0.2		19.5	0.2		0.2	0.1		
Delay (s)	16.8	16.3		9.7	10.2		46.3	20.1		19.3	19.3		
Level of Service	B	B		A	B		D	C		B	B		
Approach Delay (s)	16.4				10.2		35.8				19.3		
Approach LOS	B				B		D				B		
<b>Intersection Summary</b>													
HCM 2000 Control Delay				21.5	HCM 2000 Level of Service						C		
HCM 2000 Volume to Capacity ratio				0.54									
Actuated Cycle Length (s)				87.5	Sum of lost time (s)						12.0		
Intersection Capacity Utilization				66.8%	ICU Level of Service						C		
Analysis Period (min)				15									
c Critical Lane Group													

**Lanes, Volumes, Timings**  
**104: Trafalgar Rd & Cornwall Rd**

**Total Opening Year**  
**PM Peak Hour**

<b>Lane Group</b>	<b>EBL</b>	<b>EBT</b>	<b>EBR</b>	<b>WBL</b>	<b>WBT</b>	<b>WBR</b>	<b>NBL</b>	<b>NBT</b>	<b>NBR</b>	<b>SBL</b>	<b>SBR</b>	<b>SBR</b>
Lane Configurations												
Traffic Volume (vph)	423	570	201	75	794	542	145	472	51	522	544	473
Future Volume (vph)	423	570	201	75	794	542	145	472	51	522	544	473
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0		0.0	80.0		0.0	25.0		0.0	80.0		0.0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00
Ped Bike Factor	1.00	0.99		0.99	0.98		0.99	1.00		0.99		0.97
Frt	0.958			0.943			0.983			0.850		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3016	2994	0	1570	2987	0	1540	3185	0	2987	1710	1409
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3006	2994	0	1557	2987	0	1525	3185	0	2958	1710	1361
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			49		103			10				190
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		285.8			142.3			311.4			130.3	
Travel Time (s)		20.6			10.2			22.4			9.4	
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Peak Hour Factor	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Adj. Flow (vph)	475	679	264	89	957	583	163	524	68	669	618	538
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	475	943	0	89	1540	0	163	592	0	669	618	538
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	6.6				6.6			6.6		6.6		6.6
Link Offset(m)	0.0				0.0			0.0		0.0		0.0
Crosswalk Width(m)	4.8				4.8			4.8		4.8		4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4			9.4			9.4		
Detector 2 Size(m)	0.6			0.6			0.6			0.6		0.6
Detector 2 Type	Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		Cl+Ex
<b>Detector 2 Channel</b>												

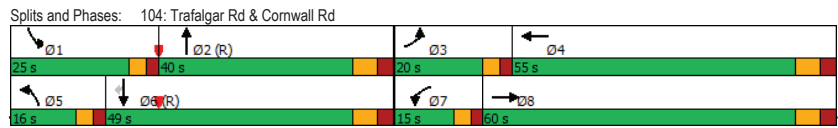


Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	20.0	60.0		15.0	55.0		16.0	40.0		25.0	49.0	49.0
Total Split (%)	14.3%	42.9%		10.7%	39.3%		11.4%	28.6%		17.9%	35.0%	35.0%
Maximum Green (s)	15.0	53.0		10.0	48.0		11.0	33.0		20.0	42.0	42.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	16.0	56.0		11.0	51.0		12.0	36.0		21.0	45.0	45.0
Actuated g/C Ratio	0.11	0.40		0.08	0.36		0.09	0.26		0.15	0.32	0.32
v/c Ratio	1.38	0.77		0.72	1.34		1.23	0.72		1.49	1.13	0.95
Control Delay	233.0	39.5		93.9	191.0		205.5	52.2		271.8	98.2	30.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	233.0	39.5		93.9	191.0		205.5	52.2		271.8	98.2	30.6
LOS	F	D		F	F		F	D		F	F	C
Approach Delay		104.3			185.7			85.3			141.9	
Approach LOS		F			F			F			F	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.49  
 Intersection Signal Delay: 137.5      Intersection LOS: F  
 Intersection Capacity Utilization 114.5%      ICU Level of Service H  
 Analysis Period (min) 15



Queues  
104: Trafalgar Rd & Cornwall Rd

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	475	943	89	1540	163	592	669	618	538
v/c Ratio	1.38	0.77	0.72	1.34	1.23	0.72	1.49	1.13	0.95
Control Delay	233.0	39.5	93.9	191.0	205.5	52.2	271.8	98.2	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	233.0	39.5	93.9	191.0	205.5	52.2	271.8	98.2	30.6
Queue Length 50th (m)	-94.3	118.6	25.8	-297.5	-58.7	81.8	-142.7	-201.0	52.3
Queue Length 95th (m)	#128.6	131.1	#48.0	#300.8	#104.6	104.3	m#97.7	m83.3	m35.0
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	344	1227	123	1153	132	826	448	549	566
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.38	0.77	0.72	1.34	1.23	0.72	1.49	1.13	0.95

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

HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Total Opening Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	423	570	201	75	794	542	145	472	51	522	544	473
Future Volume (vph)	423	570	201	75	794	542	145	472	51	522	544	473
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		0.97	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00		1.00	1.00	0.97
Fipb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.94		1.00	0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3016	2994		1570	2987		1540	3184		2987	1710	1361
Fit Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3016	2994		1570	2987		1540	3184		2987	1710	1361
Peak-hour factor, PHF	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Adj. Flow (vph)	475	679	264	89	957	583	163	524	68	669	618	538
RTOR Reduction (vph)	0	29	0	0	65	0	0	7	0	0	0	129
Lane Group Flow (vph)	475	914	0	89	1475	0	163	585	0	669	618	409
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	15.0	53.0		10.0	48.0		11.0	33.0		20.0	42.0	42.0
Effective Green, g (s)	16.0	56.0		11.0	51.0		12.0	36.0		21.0	45.0	45.0
Actuated g/C Ratio	0.11	0.40		0.08	0.36		0.09	0.26		0.15	0.32	0.32
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	344	1197		123	1088		132	818		448	549	437
v/s Ratio Prot	c0.16	0.31		0.06	c0.49		0.11	0.18		c0.22	c0.36	
v/s Ratio Perm												0.30
v/c Ratio	1.38	0.76		0.72	1.36		1.23	0.71		1.49	1.13	0.94
Uniform Delay, d1	62.0	36.3		63.0	44.5		64.0	47.3		59.5	47.5	46.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.33	0.88	0.85
Incremental Delay, d2	188.6	4.6		30.7	165.9		154.7	5.3		223.1	59.1	4.7
Delay (s)	250.6	40.9		93.7	210.4		218.7	52.6		302.2	101.0	43.8
Level of Service	F	D		F	F		F	D		F	F	D
Approach Delay (s)	111.2			204.1			88.5			157.9		
Approach LOS	F			F			F			F		

Intersection Summary			
HCM 2000 Control Delay	150.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	114.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	886	525	0	1857	1771	0
Future Volume (vph)	886	525	0	1857	1771	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor		0.99				
Frt		0.850				
Fit Protected	0.950					
Satd. Flow (prot)	3046	1423	0	4577	4577	0
Fit Permitted	0.950					
Satd. Flow (perm)	3046	1402	0	4577	4577	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		4				
Link Speed (k/h)	50			50	50	
Link Distance (m)	199.2			51.4	324.8	
Travel Time (s)	14.3			3.7	23.4	
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.87	0.93	0.25	0.97	0.94	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Adj. Flow (vph)	1018	565	0	1914	1884	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1018	565	0	1914	1884	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	70.0	70.0		70.0	70.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	63.0	63.0		63.0	63.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	62.8	62.8		69.2	69.2	
Actuated g/C Ratio	0.45	0.45		0.49	0.49	
v/c Ratio	0.75	0.90		0.85	0.83	
Control Delay	35.6	53.2		33.2	23.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	35.6	53.2		33.2	23.9	
LOS	D	D		C	C	
Approach Delay	41.9			33.2	23.9	
Approach LOS	D			C	C	

**Intersection Summary**

Area Type: CBD

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 133.6 (95%), Referenced to phase 2:NBSB and 6:, Start of Green

Natural Cycle: 80

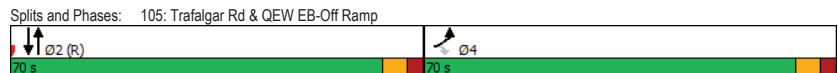
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 32.5      Intersection LOS: C

Intersection Capacity Utilization 81.0%      ICU Level of Service D

Analysis Period (min) 15



Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1018	565	1914	1884
v/c Ratio	0.75	0.90	0.85	0.83
Control Delay	35.6	53.2	33.2	23.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.6	53.2	33.2	23.9
Queue Length 50th (m)	119.1	141.9	160.7	145.0
Queue Length 95th (m)	137.4	#214.5	m102.8	181.5
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1435	663	2263	2263
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.85	0.85	0.83

**Intersection Summary**

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

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

HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Total Opening Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖ ↗	↗		↖ ↗ ↖ ↗	↖ ↗	
Traffic Volume (vph)	886	525	0	1857	1771	0
Future Volume (vph)	886	525	0	1857	1771	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Fr t	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3046	1402		4577	4577	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3046	1402		4577	4577	
Peak-hour factor, PHF	0.87	0.93	0.25	0.97	0.94	0.25
Adj. Flow (vph)	1018	565	0	1914	1884	0
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	1018	563	0	1914	1884	0
Confl. Peds. (#/hr)		2				
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	59.8	59.8		66.2	66.2	
Effective Green, g (s)	62.8	62.8		69.2	69.2	
Actuated g/C Ratio	0.45	0.45		0.49	0.49	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1366	628		2262	2262	
v/s Ratio Prot	0.33			0.42	0.41	
v/s Ratio Perm		0.40				
v/c Ratio	0.75	0.90		0.85	0.83	
Uniform Delay, d1	32.0	35.6		30.8	30.4	
Progression Factor	1.00	1.00		1.03	0.69	
Incremental Delay, d2	2.3	15.3		0.4	2.1	
Delay (s)	34.2	50.9		32.1	23.2	
Level of Service	C	D		C	C	
Approach Delay (s)	40.2			32.1	23.2	
Approach LOS	D			C	C	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			31.4		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.87			
Actuated Cycle Length (s)			140.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			81.0%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↗	↖	↗	↗		↖ ↗ ↖ ↗			↖ ↗	↖ ↗
Traffic Volume (vph)	21	0	201	537	92	197	0	2342	0	0	1692	12
Future Volume (vph)	21	0	201	537	92	197	0	2342	0	0	1692	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0
Storage Lanes	1		1	1		1	0	0	0	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	1.00					0.99						0.95
Fr t			0.850			0.850						0.850
Flt Protected	0.950			0.950	0.968							
Satd. Flow (prot)	1570	0	1437	1463	1547	1409	0	4577	0	0	3795	1437
Flt Permitted	0.950			0.950	0.968							
Satd. Flow (perm)	1568	0	1437	1463	1547	1389	0	4577	0	0	3795	1359
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			31			161						70
Link Speed (k/h)		50			50			50				50
Link Distance (m)		142.1			192.6			324.8				280.4
Travel Time (s)		10.2			13.9			23.4				20.2
Confl. Peds. (#/hr)	2					2	14		14	14		14
Peak Hour Factor	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Adj. Flow (vph)	34	0	212	639	130	243	0	2491	0	0	1763	19
Shared Lane Traffic (%)				40%								
Lane Group Flow (vph)	34	0	212	383	386	243	0	2491	0	0	1763	19
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1		1	1		1	1		1
Detector Template	Left		Right	Left	Thru	Right		Thru			Thru	Right
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0			10.0	2.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6			0.6	2.0
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total Opening Year

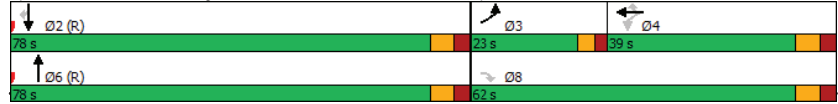
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Perm		Perm		NA		NA	NA	Perm
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Detector Phase	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		62.0	39.0	39.0	39.0		78.0			78.0	78.0
Total Split (%)	16.4%		44.3%	27.9%	27.9%	27.9%		55.7%			55.7%	55.7%
Maximum Green (s)	18.0		55.0	32.0	32.0	32.0		71.0			71.0	71.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)			7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (#/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	9.8		58.0	44.2	44.2	44.2		74.0			74.0	74.0
Actuated g/C Ratio	0.07		0.41	0.32	0.32	0.32		0.53			0.53	0.53
v/c Ratio	0.31		0.35	0.83	0.79	0.44		1.03			0.88	0.03
Control Delay	68.7		25.6	61.2	57.1	16.0		53.3			35.4	0.1
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	68.7		25.6	61.2	57.1	16.0		53.3			35.4	0.1
LOS	E		C	E	E	B		D			D	A
Approach Delay		31.5				48.8		53.3			35.1	
Approach LOS		C				D		D			D	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 45.6 Intersection LOS: D  
 Intersection Capacity Utilization 82.8% ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total Opening Year

PM Peak Hour

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	34	212	383	386	243	2491	1763	19
v/c Ratio	0.31	0.35	0.83	0.79	0.44	1.03	0.88	0.03
Control Delay	68.7	25.6	61.2	57.1	16.0	53.3	35.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	25.6	61.2	57.1	16.0	53.3	35.4	0.1
Queue Length 50th (m)	9.6	35.4	108.5	107.5	17.3	~279.7	160.8	0.0
Queue Length 95th (m)	14.2	56.9	#155.1	113.6	34.4	#309.1	186.3	0.0
Internal Link Dist (m)				168.6		300.8	256.4	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	613	461	488	548	2419	2005	751
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.35	0.83	0.79	0.44	1.03	0.88	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total Opening Year  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	0	201	537	92	197	0	2342	0	0	1692	12
Future Volume (vph)	21	0	201	537	92	197	0	2342	0	0	1692	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99		1.00			1.00	0.95
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	1.00
Fr	1.00		0.85	1.00	1.00	0.85		1.00			1.00	0.85
Fl	0.95		1.00	0.95	0.97	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1570		1437	1463	1547	1389		4577			3795	1359
Fl Permitted	0.95		1.00	0.95	0.97	1.00		1.00			1.00	1.00
Satd. Flow (perm)	1570		1437	1463	1547	1389		4577			3795	1359
Peak-hour factor, PHF	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Adj. Flow (vph)	34	0	212	639	130	243	0	2491	0	0	1762	19
RTOR Reduction (vph)	0	0	18	0	0	110	0	0	0	0	0	9
Lane Group Flow (vph)	34	0	194	383	386	133	0	2491	0	0	1763	10
Conf. Peds. (#/hr)	2					2	14		14	14		14
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA			NA	Perm
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	8.8		55.0	41.2	41.2	41.2		71.0			71.0	71.0
Effective Green, g (s)	9.8		58.0	44.2	44.2	44.2		74.0			74.0	74.0
Actuated g/C Ratio	0.07		0.41	0.32	0.32	0.32		0.53			0.53	0.53
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Lane Grp Cap (vph)	109		595	461	488	438		2419			2005	718
v/s Ratio Prot	0.02							c0.54			0.46	
v/s Ratio Perm			c0.13	c0.26	0.25	0.10						0.01
v/c Ratio	0.31		0.33	0.83	0.79	0.30		1.03			0.88	0.01
Uniform Delay, d1	61.9		27.8	44.4	43.7	36.2		33.0			29.1	15.7
Progression Factor	1.00		1.00	1.00	1.00	1.00		0.94			1.00	1.00
Incremental Delay, d2	1.6		0.3	12.1	8.5	0.4		22.3			5.9	0.0
Delay (s)	63.5		28.1	56.5	52.2	36.6		53.4			35.0	15.7
Level of Service	E		C	E	D	D		D			C	B
Approach Delay (s)		33.0				50.1		53.4			34.8	
Approach LOS		C				D		D			C	

Intersection Summary			
HCM 2000 Control Delay	45.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
 107: Dorval Drive & QEW WB Off-Ramp

Total Opening Year  
 PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	683	601	959	0	0	1019
Future Volume (vph)	683	601	959	0	0	1019
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Fr	0.966	0.850				
Fl	0.963					
Satd. Flow (prot)	3344	1455	3574	0	0	3539
Fl Permitted	0.963					
Satd. Flow (perm)	3344	1455	3574	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	43	58				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Adj. Flow (vph)	742	653	1042	0	0	1108
Shared Lane Traffic (%)		33%				
Lane Group Flow (vph)	957	438	1042	0	0	1108
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex			CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Total Opening Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	59.0	59.0	61.0			61.0
Total Split (%)	49.2%	49.2%	50.8%			50.8%
Maximum Green (s)	53.0	53.0	55.0			55.0
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	43.0	43.0	57.3			57.3
Actuated g/C Ratio	0.40	0.40	0.53			0.53
v/c Ratio	0.71	0.72	0.55			0.59
Control Delay	28.9	30.5	19.6			20.5
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	28.9	30.5	19.6			20.5
LOS	C	C	B			C
Approach Delay	29.4		19.6			20.5
Approach LOS	C		B			C

**Intersection Summary**

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 108.4

Natural Cycle: 50

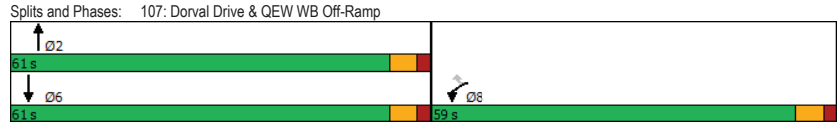
Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 23.7      Intersection LOS: C

Intersection Capacity Utilization 60.6%      ICU Level of Service B

Analysis Period (min) 15



Queues  
107: Dorval Drive & QEW WB Off-Ramp

Total Opening Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	957	438	1042	1108
v/c Ratio	0.71	0.72	0.55	0.59
Control Delay	28.9	30.5	19.6	20.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.9	30.5	19.6	20.5
Queue Length 50th (m)	86.0	77.1	76.7	84.1
Queue Length 95th (m)	107.9	117.8	120.4	131.6
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1727	770	1889	1871
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.55	0.57	0.55	0.59

**Intersection Summary**

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Total Opening Year  
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕	0	0	↕↕
Traffic Volume (vph)	683	601	959	0	0	1019
Future Volume (vph)	683	601	959	0	0	1019
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr	0.97	0.85	1.00			1.00
Fit Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3344	1455	3574			3539
Fit Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3344	1455	3574			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	742	653	1042	0	0	1108
RTOR Reduction (vph)	26	35	0	0	0	0
Lane Group Flow (vph)	931	403	1042	0	0	1108
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	41.0	41.0	55.3			55.3
Effective Green, g (s)	43.0	43.0	57.3			57.3
Actuated g/C Ratio	0.40	0.40	0.53			0.53
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1327	577	1890			1872
v/s Ratio Prot	c0.28		0.29			c0.31
v/s Ratio Perm		0.28				
v/c Ratio	0.70	0.70	0.55			0.59
Uniform Delay, d1	27.3	27.2	17.0			17.5
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	1.9	4.3	1.2			1.4
Delay (s)	29.2	31.5	18.1			18.9
Level of Service	C	C	B			B
Approach Delay (s)	29.9		18.1			18.9
Approach LOS	C		B			B
<b>Intersection Summary</b>						
HCM 2000 Control Delay			23.0		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.64			
Actuated Cycle Length (s)			108.3		Sum of lost time (s)	8.0
Intersection Capacity Utilization			60.6%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔	0	↕↕	↕↕	0
Traffic Volume (vph)	265	316	0	1152	1090	0
Future Volume (vph)	265	316	0	1152	1090	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr	0.950	0.850				
Fit Protected	0.968					
Satd. Flow (prot)	3302	1441	0	3539	3505	0
Fit Permitted	0.968					
Satd. Flow (perm)	3302	1441	0	3539	3505	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	75	100				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Adj. Flow (vph)	288	343	0	1252	1185	0
Shared Lane Traffic (%)		42%				
Lane Group Flow (vph)	432	199	0	1252	1185	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
<b>Detector 1 Channel</b>						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
<b>Detector 2 Channel</b>						
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
<b>Detector 2 Channel</b>						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	



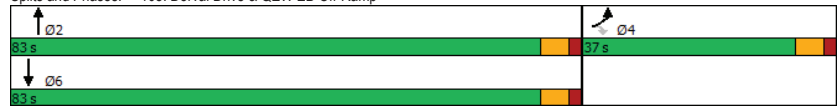
Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	37.0	37.0		83.0	83.0	
Total Split (%)	30.8%	30.8%		69.2%	69.2%	
Maximum Green (s)	31.0	31.0		77.0	77.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	20.6	20.6		79.1	79.1	
Actuated g/C Ratio	0.19	0.19		0.73	0.73	
v/c Ratio	0.63	0.56		0.48	0.46	
Control Delay	36.8	25.5		7.1	6.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	36.8	25.5		7.1	6.9	
LOS	D	C		A	A	
Approach Delay	33.3			7.1	6.9	
Approach LOS	C			A	A	

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	107.7
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.63
Intersection Signal Delay:	12.4
Intersection Capacity Utilization:	60.6%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	B

Splits and Phases: 108: Dorval Drive & QEW EB Off-Ramp



Queues  
108: Dorval Drive & QEW EB Off-Ramp

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	432	199	1252	1185
v/c Ratio	0.63	0.56	0.48	0.46
Control Delay	36.8	25.5	7.1	6.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	36.8	25.5	7.1	6.9
Queue Length 50th (m)	37.5	21.0	51.7	47.8
Queue Length 95th (m)	53.8	46.9	81.5	75.5
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1065	511	2599	2574
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.39	0.48	0.46

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Total Opening Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↗		↕↕	↕↕	
Traffic Volume (vph)	265	316	0	1152	1090	0
Future Volume (vph)	265	316	0	1152	1090	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Fr <sub>t</sub>	0.95	0.85		1.00	1.00	
Fl <sub>t</sub> Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3301	1441		3539	3505	
Fl <sub>t</sub> Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3301	1441		3539	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	288	343	0	1252	1185	0
RTOR Reduction (vph)	61	81	0	0	0	0
Lane Group Flow (vph)	371	118	0	1252	1185	0
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	18.6	18.6		77.1	77.1	
Effective Green, g (s)	20.6	20.6		79.1	79.1	
Actuated g/C Ratio	0.19	0.19		0.73	0.73	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	631	275		2599	2574	
v/s Ratio Prot	c0.11			c0.35	0.34	
v/s Ratio Perm		0.08				
v/c Ratio	0.59	0.43		0.48	0.46	
Uniform Delay, d1	39.7	38.4		5.9	5.7	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	1.5		0.6	0.6	
Delay (s)	41.4	39.8		6.5	6.3	
Level of Service	D	D		A	A	
Approach Delay (s)	40.9			6.5	6.3	
Approach LOS	D			A	A	

Intersection Summary	
HCM 2000 Control Delay	13.5 HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio	0.50
Actuated Cycle Length (s)	107.7 Sum of lost time (s) 8.0
Intersection Capacity Utilization	60.6% ICU Level of Service B
Analysis Period (min)	15
c Critical Lane Group	

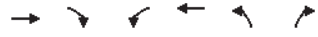
Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Total Opening Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕	↕
Traffic Volume (vph)	772	0	0	1267	213	480
Future Volume (vph)	772	0	0	1267	213	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Fr <sub>t</sub>						0.850
Fl <sub>t</sub> Protected					0.950	
Satd. Flow (prot)	3574	0	0	3574	1805	1599
Fl <sub>t</sub> Permitted					0.950	
Satd. Flow (perm)	3574	0	0	3574	1805	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						66
Link Speed (k/h)	60			60	40	
Link Distance (m)	130.3			194.2	262.1	
Travel Time (s)	7.8			11.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Adj. Flow (vph)	839	0	0	1377	232	522
Shared Lane Traffic (%)						
Lane Group Flow (vph)	839	0	0	1377	232	522
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Total Opening Year  
PM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
v/c Ratio	0.59			0.96	0.32	0.77
Control Delay	12.7			32.8	10.9	20.6
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	12.7			32.8	10.9	20.6
LOS	B			C	B	C
Approach Delay	12.7			32.8	17.6	
Approach LOS	B			C	B	

**Intersection Summary**

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green

Natural Cycle: 55

Control Type: Pretimed

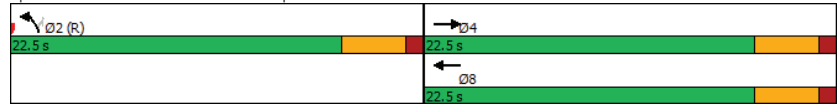
Maximum v/c Ratio: 0.96

Intersection Signal Delay: 23.2      Intersection LOS: C

Intersection Capacity Utilization 58.6%      ICU Level of Service B


Analysis Period (min) 15

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street



Queues  
109: QEW WB Off-Ramp & Kerr Street

Total Opening Year  
PM Peak Hour



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	839	1377	232	522
v/c Ratio	0.59	0.96	0.32	0.77
Control Delay	12.7	32.8	10.9	20.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.7	32.8	10.9	20.6
Queue Length 50th (m)	26.9	55.1	12.4	30.3
Queue Length 95th (m)	41.1	#97.5	24.8	#75.8
Internal Link Dist (m)	106.3	170.2	238.1	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1429	1429	722	679
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.96	0.32	0.77

**Intersection Summary**

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

HCM Signalized Intersection Capacity Analysis  
 109: QEW WB Off-Ramp & Kerr Street

Total Opening Year  
 PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	↑
Traffic Volume (vph)	772	0	0	1267	213	480
Future Volume (vph)	772	0	0	1267	213	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Friction	1.00			1.00	1.00	0.85
Fit Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3574			3574	1805	1599
Fit Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3574			3574	1805	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	839	0	0	1377	232	522
RTOR Reduction (vph)	0	0	0	0	0	40
Lane Group Flow (vph)	839	0	0	1377	232	482
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1429			1429	722	639
v/s Ratio Prot	0.23			c0.39	0.13	
v/s Ratio Perm						c0.30
v/c Ratio	0.59			0.96	0.32	0.75
Uniform Delay, d1	10.6			13.2	9.3	11.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	1.8			16.6	1.2	8.1
Delay (s)	12.4			29.8	10.5	19.7
Level of Service	B			C	B	B
Approach Delay (s)	12.4			29.8	16.9	
Approach LOS	B			C	B	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

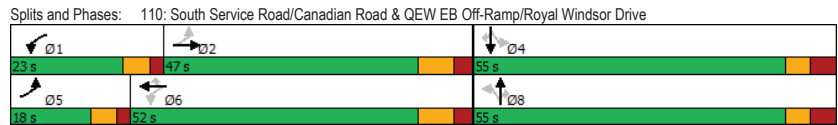
Total Opening Year  
 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑		↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑	↑↑
Traffic Volume (vph)	300	523	17	176	626	26	13	45	96	13	125	409
Future Volume (vph)	300	523	17	176	626	26	13	45	96	13	125	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0	0.0	155.0	70.0	15.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0
Storage Lanes	2	0	1	1	1	1	1	1	1	1	1	1
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Friction		0.995				0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	3395	0	1752	3505	1615	1805	1900	1615	1805	1900	1599
Fit Permitted	0.319			0.362			0.598			0.724		
Satd. Flow (perm)	1176	3395	0	668	3505	1615	1136	1900	1615	1376	1900	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				94			109			330
Link Speed (k/h)		80			80			60				40
Link Distance (m)		324.5			247.2			158.7				215.5
Travel Time (s)		14.6			11.1			9.5				19.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Adj. Flow (vph)	341	594	19	200	711	30	15	51	109	15	142	465
Shared Lane Traffic (%)												
Lane Group Flow (vph)	341	613	0	200	711	30	15	51	109	15	142	465
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	7.2			7.2			3.6			3.6		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	4.8			4.8			4.8			4.8		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	

Lanes, Volumes, Timings Total Opening Year  
**110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive** PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	29.4		14.0	38.4	38.4	28.8	28.8	28.8	28.8	28.8	28.8
Total Split (s)	18.0	47.0		23.0	52.0	52.0	55.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	14.4%	37.6%		18.4%	41.6%	41.6%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%
Maximum Green (s)	12.0	38.6		17.0	43.6	43.6	47.2	47.2	47.2	47.2	47.2	47.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	59.9	48.1		60.7	48.5	48.5	21.3	21.3	21.3	21.3	21.3	21.3
Actuated g/C Ratio	0.64	0.51		0.65	0.52	0.52	0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	0.33	0.35		0.35	0.39	0.03	0.06	0.12	0.24	0.05	0.33	0.75
Control Delay	7.1	15.9		8.3	16.0	0.1	27.5	28.3	6.8	27.2	31.7	18.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	15.9		8.3	16.0	0.1	27.5	28.3	6.8	27.2	31.7	18.0
LOS	A	B		A	B	A	C	C	A	C	C	B
Approach Delay		12.8			13.8			14.9			21.3	
Approach LOS		B			B			B			C	

Intersection Summary	
Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	93.7
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.75
Intersection Signal Delay:	15.3
Intersection Capacity Utilization:	67.0%
ICU Level of Service:	C
Intersection LOS:	B
Analysis Period (min):	15



Queues Total Opening Year  
**110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive** PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	341	613	200	711	30	15	51	109	15	142	465	
v/c Ratio	0.33	0.35	0.35	0.39	0.03	0.06	0.12	0.24	0.05	0.33	0.75	
Control Delay	7.1	15.9	8.3	16.0	0.1	27.5	28.3	6.8	27.2	31.7	18.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	7.1	15.9	8.3	16.0	0.1	27.5	28.3	6.8	27.2	31.7	18.0	
Queue Length 50th (m)	9.6	33.0	11.2	39.7	0.0	2.2	7.7	0.0	2.2	22.4	21.7	
Queue Length 95th (m)	21.9	63.8	28.9	71.5	0.0	7.3	16.8	11.7	7.2	38.4	55.0	
Internal Link Dist (m)		300.5		223.2			134.7			191.5		
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0	
Base Capacity (vph)	1131	1742	680	1812	880	624	1043	936	755	1043	1027	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.30	0.35	0.29	0.39	0.03	0.02	0.05	0.12	0.02	0.14	0.45	

**Intersection Summary**

Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	93.7
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.75
Intersection Signal Delay:	15.3
Intersection Capacity Utilization:	67.0%
ICU Level of Service:	C
Intersection LOS:	B
Analysis Period (min):	15

HCM Signalized Intersection Capacity Analysis  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Total Opening Year

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	523	17	176	626	26	13	45	96	13	125	409
Future Volume (vph)	300	523	17	176	626	26	13	45	96	13	125	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	3396		1752	3505	1615	1805	1900	1615	1805	1900	1599
Flt Permitted	0.32	1.00		0.36	1.00	1.00	0.60	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	1177	3396		668	3505	1615	1136	1900	1615	1375	1900	1599
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)	341	594	19	200	711	30	15	51	109	15	142	465
RTOR Reduction (vph)	0	1	0	0	0	14	0	0	84	0	0	255
Lane Group Flow (vph)	341	612	0	200	711	16	15	51	25	15	142	210
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	53.4	43.6		54.2	44.0	44.0	17.4	17.4	17.4	17.4	17.4	17.4
Effective Green, g (s)	57.4	48.0		58.2	48.4	48.4	21.2	21.2	21.2	21.2	21.2	21.2
Actuated g/C Ratio	0.61	0.51		0.62	0.52	0.52	0.23	0.23	0.23	0.23	0.23	0.23
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	1017	1745		557	1816	836	257	431	366	312	431	362
v/s Ratio Prot	0.04	0.18		c0.05	c0.20			0.03				0.07
v/s Ratio Perm	0.16			0.18		0.01	0.01		0.02	0.01		c0.13
v/c Ratio	0.34	0.35		0.36	0.39	0.02	0.06	0.12	0.07	0.05	0.33	0.58
Uniform Delay, d1	8.1	13.5		7.8	13.6	10.9	28.3	28.7	28.3	28.2	30.2	32.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.6		0.5	0.6	0.0	0.1	0.1	0.1	0.1	0.5	2.4
Delay (s)	8.3	14.0		8.2	14.2	11.0	28.4	28.8	28.4	28.3	30.7	34.6
Level of Service	A	B		A	B	B	C	C	C	C	C	C
Approach Delay (s)		12.0			12.9			28.5			33.5	
Approach LOS		B			B			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		18.3			HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		93.4			Sum of lost time (s)				12.0			
Intersection Capacity Utilization		67.0%			ICU Level of Service				C			
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings  
 201: Cross Ave & Lyons Lane

Total Opening Year  
 PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	45	245	654	115	36	61
Future Volume (vph)	45	245	654	115	36	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.970		0.913	
Flt Protected	0.950				0.983	
Satd. Flow (prot)	1388	2954	3078	0	1496	0
Flt Permitted	0.950				0.983	
Satd. Flow (perm)	1388	2954	3078	0	1496	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	1			1	9	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Heavy Vehicles (%)	17%	10%	3%	0%	0%	4%
Adj. Flow (vph)	90	266	779	198	82	149
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	90	266	977	0	231	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	3.6	3.6			3.6	
Link Offset(m)	0.0	0.0			0.0	
Crosswalk Width(m)	4.8	4.8			4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Total Opening Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↕
Traffic Volume (veh/h)	45	245	654	115	36	61
Future Volume (Veh/h)	45	245	654	115	36	61
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Hourly flow rate (vph)	90	266	779	198	82	149
Pedestrians			9		1	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked	0.92				0.92	0.92
vC, conflicting volume	978				1201	490
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	812				1053	283
tC, single (s)	4.4				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	86				54	77
cM capacity (veh/h)	665				178	654
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	90	133	133	519	458	231
Volume Left	90	0	0	0	0	82
Volume Right	0	0	0	0	198	149
eSH	665	1700	1700	1700	1700	336
Volume to Capacity	0.14	0.08	0.08	0.31	0.27	0.69
Queue Length 95th (m)	3.7	0.0	0.0	0.0	0.0	38.7
Control Delay (s)	11.3	0.0	0.0	0.0	0.0	36.4
Lane LOS	B					E
Approach Delay (s)	2.8			0.0		36.4
Approach LOS						E
<b>Intersection Summary</b>						
Average Delay			6.0			
Intersection Capacity Utilization			43.9%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	3	6	1	59	53	6
Future Volume (vph)	3	6	1	59	53	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.870		0.984	
Fit Protected		0.978			0.958	
Satd. Flow (prot)	0	1672	1228	0	1612	0
Fit Permitted		0.978			0.958	
Satd. Flow (perm)	0	1672	1228	0	1612	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		60.5	89.6		37.6	
Travel Time (s)		4.4	6.5		2.7	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Heavy Vehicles (%)	0%	0%	0%	22%	0%	0%
Adj. Flow (vph)	8	10	4	95	106	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	18	99	0	120	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 16.9%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Total Opening Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	3	6	1	59	53	6
Future Volume (Veh/h)	3	6	1	59	53	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Hourly flow rate (vph)	8	10	4	95	106	14
Pedestrians					7	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	106				84	58
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	106				84	58
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	99
cM capacity (veh/h)	1489				912	1007
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	18	99	120			
Volume Left	8	0	106			
Volume Right	0	95	14			
cSH	1489	1700	922			
Volume to Capacity	0.01	0.06	0.13			
Queue Length 95th (m)	0.1	0.0	3.6			
Control Delay (s)	3.3	0.0	9.5			
Lane LOS	A		A			
Approach Delay (s)	3.3	0.0	9.5			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			5.1			
Intersection Capacity Utilization		16.9%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	11	36	464	217	52	98
Future Volume (vph)	11	36	464	217	52	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.949		0.907	
Fit Protected		0.988			0.985	
Satd. Flow (prot)	0	1539	1527	0	1528	0
Fit Permitted		0.988			0.985	
Satd. Flow (perm)	0	1539	1527	0	1528	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)					5	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Heavy Vehicles (%)	0%	13%	10%	0%	0%	0%
Adj. Flow (vph)	24	72	533	319	69	151
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	96	852	0	220	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24		14		24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 58.4%					ICU Level of Service B	
Analysis Period (min) 15						



HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Total Opening Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (veh/h)	11	36	464	217	52	98
Future Volume (Veh/h)	11	36	464	217	52	98
Sign Control		Free	Free		Stop	Stop
Grade		0%	0%		0%	0%
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Hourly flow rate (vph)	24	72	533	319	69	151
Pedestrians			5			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.2			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	852				818	692
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	852				818	692
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				80	66
cM capacity (veh/h)	795				337	447
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	96	852	220			
Volume Left	24	0	69			
Volume Right	0	319	151			
eSH	795	1700	405			
Volume to Capacity	0.03	0.50	0.54			
Queue Length 95th (m)	0.7	0.0	25.1			
Control Delay (s)	2.6	0.0	23.9			
Lane LOS	A		C			
Approach Delay (s)	2.6	0.0	23.9			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			4.7			
Intersection Capacity Utilization		58.4%		ICU Level of Service		B
Analysis Period (min)		15				

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕↕	↕↕↕	↕
Traffic Volume (vph)	0	111	0	2777	1649	696
Future Volume (vph)	0	111	0	2777	1649	696
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Fr <sub>t</sub>		0.865			0.952	
Fit Protected						
Satd. Flow (prot)	0	1354	0	4577	4343	0
Fit Permitted						
Satd. Flow (perm)	0	1354	0	4577	4343	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	145.7			270.2	51.4	
Travel Time (s)	10.5			19.5	3.7	
Confl. Peds. (#/hr)						24
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87
Heavy Vehicles (%)	0%	8%	0%	2%	2%	3%
Adj. Flow (vph)	0	176	0	3086	1683	800
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	176	0	3086	2483	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	67.7%			ICU Level of Service C		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Total Opening Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations		↗		↖↖	↗↗		
Traffic Volume (veh/h)	0	111	0	2777	1649	696	
Future Volume (Veh/h)	0	111	0	2777	1649	696	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87	
Hourly flow rate (vph)	0	176	0	3086	1683	800	
Pedestrians	24						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	2						
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.81	0.65	0.65				
vC, conflicting volume	3136	985	2507				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	99	0	1425				
tC, single (s)	6.8	7.1	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	74	100				
cM capacity (veh/h)	712	677	307				
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	176	1029	1029	1029	673	673	1137
Volume Left	0	0	0	0	0	0	0
Volume Right	176	0	0	0	0	0	800
sSH	677	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.26	0.61	0.61	0.61	0.40	0.40	0.67
Queue Length 95th (m)	8.3	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	12.2	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	12.2	0.0			0.0		
Approach LOS	B						
<b>Intersection Summary</b>							
Average Delay				0.4			
Intersection Capacity Utilization				67.7%		ICU Level of Service	C
Analysis Period (min)				15			

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total Opening Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	131	107	229	429	157	247	409	1470	697	130	1046	74
Future Volume (vph)	131	107	229	429	157	247	409	1470	697	130	1046	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0		25.0	145.0		0.0	95.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	0.97					0.95			0.97	1.00		
Fr			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1710	1425	3120	1710	1425	1608	4577	1425	1608	4532	1425
Fit Permitted	0.580			0.454			0.110			0.157		
Satd. Flow (perm)	965	1710	1425	1491	1710	1360	186	4577	1382	265	4532	1425
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			239			217		656				145
Link Speed (k/h)		50			50			50				50
Link Distance (m)		347.0			285.9			280.4				353.6
Travel Time (s)		25.0			20.6			20.2				25.5
Confl. Peds. (#/hr)	34					34			14		14	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Adj. Flow (vph)	136	111	239	447	164	257	426	1531	726	135	1090	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	136	111	239	447	164	257	426	1531	726	135	1090	77
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)				7.2				3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total Opening Year

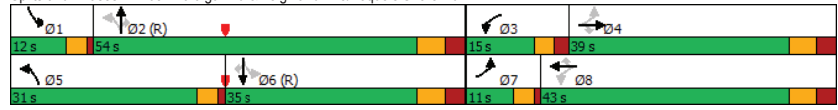
PM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4		4	8		8	2		2	6		6	
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6	
Switch Phase													
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0	
Minimum Split (s)	11.0	25.0	25.0	11.0	43.0	43.0	11.0	34.0	34.0	10.0	34.0	34.0	
Total Split (s)	11.0	39.0	39.0	15.0	43.0	43.0	31.0	54.0	54.0	12.0	35.0	35.0	
Total Split (%)	9.2%	32.5%	32.5%	12.5%	35.8%	35.8%	25.8%	45.0%	45.0%	10.0%	29.2%	29.2%	
Maximum Green (s)	7.0	32.0	32.0	10.0	36.0	36.0	27.0	47.0	47.0	8.0	28.0	28.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?													
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max	
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)					0	0		0	0		0	0	
Act Effct Green (s)	25.7	18.7	18.7	31.7	22.7	22.7	78.3	62.4	62.4	51.6	39.8	39.8	
Actuated g/C Ratio	0.21	0.16	0.16	0.26	0.19	0.19	0.65	0.52	0.52	0.43	0.33	0.33	
v/c Ratio	0.56	0.42	0.57	0.84	0.51	0.59	0.80	0.64	0.70	0.55	0.73	0.14	
Control Delay	44.0	49.4	10.7	53.4	48.4	14.6	39.7	23.7	7.3	27.7	40.0	0.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	44.0	49.4	10.7	53.4	48.4	14.6	39.7	23.7	7.3	27.7	40.0	0.5	
LOS	D	D	B	D	D	B	D	C	A	C	D	D	
Approach Delay		28.8			41.0			21.8			36.4		
Approach LOS		C			D			C			D		

Intersection Summary

Area Type: CBD  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 105.6 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 29.1 Intersection LOS: C  
 Intersection Capacity Utilization 92.3% ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd



Queues

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total Opening Year

PM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	136	111	239	447	164	257	426	1531	726	135	1090	77	
v/c Ratio	0.56	0.42	0.57	0.84	0.51	0.59	0.80	0.64	0.70	0.55	0.73	0.14	
Control Delay	44.0	49.4	10.7	53.4	48.4	14.6	39.7	23.7	7.3	27.7	40.0	0.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	44.0	49.4	10.7	53.4	48.4	14.6	39.7	23.7	7.3	27.7	40.0	0.5	
Queue Length 50th (m)	26.7	25.3	0.0	49.0	37.1	8.4	76.9	95.1	8.3	11.5	86.6	0.0	
Queue Length 95th (m)	40.9	40.8	21.9	59.9	55.3	32.9	#125.6	137.9	58.4	31.9	#125.2	0.0	
Internal Link Dist (m)		323.0			261.9		256.4			329.6			
Turn Bay Length (m)	60.0			165.0		25.0	145.0			95.0		90.0	
Base Capacity (vph)	245	498	584	529	555	588	530	2381	1033	247	1502	569	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.56	0.22	0.41	0.84	0.30	0.44	0.80	0.64	0.70	0.55	0.73	0.14	

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total Opening Year  
PM Peak Hour

	↖	→	↗	↙	←	↘	↖	↗	↙	↘	↖	↗	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↑	↗	↖	↗	↖	↖	↗	↖	↗	↖	↗		
Traffic Volume (vph)	131	107	229	429	157	247	409	1470	697	130	1046	74		
Future Volume (vph)	131	107	229	429	157	247	409	1470	697	130	1046	74		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00		
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.97	1.00	1.00	1.00		
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		
Satd. Flow (prot)	1601	1710	1425	3120	1710	1360	1608	4577	1382	1608	4532	1425		
Fit Permitted	0.58	1.00	1.00	0.45	1.00	1.00	0.11	1.00	1.00	0.16	1.00	1.00		
Satd. Flow (perm)	978	1710	1425	1491	1710	1360	186	4577	1382	266	4532	1425		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96		
Adj. Flow (vph)	136	111	239	447	164	257	426	1531	726	135	1090	77		
RTOR Reduction (vph)	0	0	202	0	0	176	0	0	315	0	0	51		
Lane Group Flow (vph)	136	111	37	447	164	81	426	1531	411	135	1090	26		
Confl. Peds. (#/hr)	34					34			14		14			
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%		
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm		
Protected Phases	7	4		3	8		5	2		1	6			
Permitted Phases	4		4	8		8	2		2	6		6		
Actuated Green, G (s)	22.7	15.7	15.7	29.7	19.7	19.7	75.3	59.4	59.4	48.7	36.8	36.8		
Effective Green, g (s)	22.7	18.7	18.7	29.7	22.7	22.7	75.3	62.4	62.4	48.7	39.8	39.8		
Actuated g/C Ratio	0.19	0.16	0.16	0.25	0.19	0.19	0.63	0.52	0.52	0.41	0.33	0.33		
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	4.0	7.0	7.0	7.0		
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0		
Lane Grp Cap (vph)	221	266	222	504	323	257	525	2380	718	241	1503	472		
v/s Ratio Prot	0.04	0.06		c0.07	0.10		c0.23	0.33		0.06	0.24			
v/s Ratio Perm	0.08		0.03	c0.15		0.06	c0.28		0.30	0.17		0.02		
v/c Ratio	0.62	0.42	0.17	0.89	0.51	0.32	0.81	0.64	0.57	0.56	0.73	0.05		
Uniform Delay, d1	43.6	45.7	43.9	42.3	43.6	41.9	29.4	20.8	19.7	23.1	35.3	27.3		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	5.0	2.2	0.8	17.0	2.6	1.5	9.3	1.4	3.3	3.0	3.1	0.2		
Delay (s)	48.6	47.9	44.7	59.3	46.3	43.4	38.6	22.1	23.0	26.1	38.4	27.5		
Level of Service	D	D	D	E	D	D	D	C	C	C	D	D		
Approach Delay (s)		46.5			52.1			25.0			36.5			
Approach LOS		D			D			C			D			

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
303: North Access & South Service Rd E

Total Opening Year  
PM Peak Hour

	→	↘	↙	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↖	
Traffic Volume (vph)	52	27	53	93	6	79
Future Volume (vph)	52	27	53	93	6	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.954				0.875	
Fit Protected				0.982	0.996	
Satd. Flow (prot)	1777	0	0	1829	1623	0
Fit Permitted				0.982	0.996	
Satd. Flow (perm)	1777	0	0	1829	1623	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	518.9			306.8	108.8	
Travel Time (s)	37.4			22.1	7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	29	58	101	7	86
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	0	0	159	93	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	26.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Total Opening Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	52	27	53	93	6	79
Future Volume (Veh/h)	52	27	53	93	6	79
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)	57	29	58	101	7	86
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			86		288 72	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			86		288 72	
tC, single (s)			4.1		6.4 6.2	
tC, 2 stage (s)						
tF (s)			2.2		3.5 3.3	
p0 queue free %			96		99 91	
cM capacity (veh/h)			1510		675 991	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	86	159	93			
Volume Left	0	58	7			
Volume Right	29	0	86			
cSH	1700	1510	957			
Volume to Capacity	0.05	0.04	0.10			
Queue Length 95th (m)	0.0	1.0	2.6			
Control Delay (s)	0.0	2.9	9.2			
Lane LOS	A		A			
Approach Delay (s)	0.0	2.9	9.2			
Approach LOS	A		A			
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization			26.4%		ICU Level of Service A	
Analysis Period (min)	15					

Queuing and Blocking Report

Total Opening Year  
PM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	153.3	101.8	78.2	70.5	32.3	312.6	218.8	57.4	131.0	137.9	144.0
Average Queue (m)	122.1	146.4	34.0	71.3	19.8	30.3	218.4	85.5	53.7	100.7	106.1	109.4
95th Queue (m)	127.2	151.0	82.5	83.5	61.6	38.6	361.8	257.7	68.5	133.4	140.3	145.5
Link Distance (m)	123.0		123.0	51.4	51.4	313.2		313.2	128.0		128.0	128.0
Upstream Blk Time (%)	5	50	1	42	3	15		4	1		2	5
Queuing Penalty (veh)	0	345	6	287	24	0		0	4		11	22
Storage Bay Dist (m)	130.0					25.0		50.0				
Storage Blk Time (%)	5	50				59		49	37		36	
Queuing Penalty (veh)	33	302				118		81	193		86	

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	SB	SB	SB	SB
Directions Served	T	T	L	T	T	TR
Maximum Queue (m)	4.8	9.8	32.3	248.0	249.0	246.9
Average Queue (m)	0.3	0.7	25.4	148.2	189.6	209.1
95th Queue (m)	3.8	6.9	40.4	267.4	285.8	274.2
Link Distance (m)	101.5	101.5	239.0		239.0	239.0
Upstream Blk Time (%)			1		6	20
Queuing Penalty (veh)			5		37	118
Storage Bay Dist (m)	25.0					
Storage Blk Time (%)			26		45	
Queuing Penalty (veh)			110		71	

Queuing and Blocking Report

Total Opening Year  
PM Peak Hour

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	B7	B7	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	27.0	266.0	264.2	27.3	59.4	54.9	1.2	3.4	33.0	65.0	22.4	195.0
Average Queue (m)	5.7	221.9	211.9	12.9	18.6	23.0	0.0	0.1	8.1	21.5	21.6	182.6
95th Queue (m)	20.8	253.2	251.8	29.3	44.7	45.6	0.8	2.4	26.0	47.2	24.3	209.5
Link Distance (m)		352.9	352.9		51.4	51.4	123.0	123.0	66.7	66.7		159.0
Upstream Blk Time (%)					1	1				0		83
Queuing Penalty (veh)					5	3				0		465
Storage Bay Dist (m)	20.0			20.0							15.0	
Storage Blk Time (%)	0	74		9	5						83	17
Queuing Penalty (veh)	0	24		21	2						167	55

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	B14
Directions Served	T
Maximum Queue (m)	165.1
Average Queue (m)	139.5
95th Queue (m)	219.1
Link Distance (m)	160.7
Upstream Blk Time (%)	39
Queuing Penalty (veh)	221
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	17.6	22.5	22.6	19.4	40.4	47.3	27.3	59.4	12.4	19.9
Average Queue (m)	6.2	15.4	12.0	2.0	13.0	18.0	25.0	39.8	2.7	9.5
95th Queue (m)	15.3	25.7	24.4	10.1	31.8	37.6	30.9	70.9	9.5	17.6
Link Distance (m)	21.8	21.8	21.8		352.9	352.9		54.8	56.7	56.7
Upstream Blk Time (%)	0	5	4					6		
Queuing Penalty (veh)	0	4	4					0		
Storage Bay Dist (m)				25.0				20.0		
Storage Blk Time (%)					2			34	2	
Queuing Penalty (veh)					0			59	5	

Queuing and Blocking Report

Total Opening Year  
PM Peak Hour

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.7	87.4	275.7	274.9	87.4	129.0	133.1	32.5	297.9	294.5	72.4	73.1
Average Queue (m)	82.4	87.0	240.0	221.4	41.8	121.6	126.3	32.2	272.1	256.3	39.0	42.8
95th Queue (m)	87.2	88.1	314.3	311.7	93.5	139.5	136.8	32.9	339.1	351.2	65.8	67.6
Link Distance (m)			266.8	266.8		122.1	122.1		289.9	289.9		101.5
Upstream Blk Time (%)			38	3		25	53		58	21		
Queuing Penalty (veh)			0	0		0	0		0	0		
Storage Bay Dist (m)	80.0	80.0			80.0				25.0			80.0
Storage Blk Time (%)	28	75	1		0	43			92	14		0
Queuing Penalty (veh)	80	215	6		0	32			216	20		0

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	86.5	51.4
Average Queue (m)	42.7	21.3
95th Queue (m)	71.8	42.0
Link Distance (m)	101.5	101.5
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	174.7	181.5	189.4	37.9	42.7	40.8	318.2	317.9	312.6
Average Queue (m)	76.8	132.4	156.3	29.3	31.3	30.5	298.3	303.1	302.1
95th Queue (m)	159.1	227.9	220.2	33.7	38.4	36.1	355.4	342.7	337.2
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	1	23	49	41	44	47	33	49	62
Queuing Penalty (veh)	0	0	0	380	408	437	263	400	503
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report

Total Opening Year  
PM Peak Hour

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	57.4	122.4	177.4	177.4	181.6	139.8	145.8	163.6	261.8	266.4	261.6	277.6
Average Queue (m)	20.0	102.0	147.6	163.2	105.6	87.7	95.0	107.3	243.2	245.2	243.9	227.7
95th Queue (m)	61.5	157.0	219.8	211.4	244.1	130.0	141.7	153.6	301.4	305.0	300.6	381.6
Link Distance (m)		117.8	171.3	171.3	171.3	299.7	299.7	299.7	251.7	251.7	251.7	251.7
Upstream Blk Time (%)		60	41	78	31				44	54	54	72
Queuing Penalty (veh)		0	0	0	0				187	229	231	305
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)	0	80										
Queuing Penalty (veh)	0	17										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	103.1	109.3	96.1	85.2	91.0	107.4	101.2
Average Queue (m)	66.5	71.4	55.7	49.2	54.2	70.5	60.3
95th Queue (m)	92.5	97.3	84.3	78.8	85.1	100.8	94.5
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	59.4	80.6	67.9	97.4	80.6	69.7	72.5
Average Queue (m)	35.5	53.7	34.8	54.3	36.2	37.1	41.6
95th Queue (m)	62.2	72.2	60.2	84.3	68.2	62.4	67.7
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Total Opening Year  
PM Peak Hour

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	60.1	48.0	109.2	108.1	36.6	52.6
Average Queue (m)	34.7	18.8	63.8	52.5	17.3	28.5
95th Queue (m)	51.4	38.7	99.1	91.1	30.1	46.7
Link Distance (m)	122.4	122.4	184.7	184.7	249.3	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	32.0	43.6	55.2	45.8	31.6	62.6	50.3	10.1	14.0	21.7	10.3	47.0
Average Queue (m)	6.4	23.4	24.7	20.5	16.1	32.8	22.1	2.5	3.5	7.4	2.3	22.8
95th Queue (m)	17.8	37.9	44.8	39.6	28.5	55.2	43.2	8.7	11.0	17.4	8.5	39.6
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0			70.0	15.0			
Storage Blk Time (%)									2	5		5
Queuing Penalty (veh)									1	1		19

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	SB
Directions Served	R
Maximum Queue (m)	25.7
Average Queue (m)	5.8
95th Queue (m)	18.8
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

Total Opening Year  
PM Peak Hour

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	16.4	18.1	27.9	11.0	18.2	21.5
Average Queue (m)	4.8	1.5	4.4	0.7	1.3	10.0
95th Queue (m)	13.8	9.1	19.2	6.0	8.4	17.9
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)				0	0	0
Queuing Penalty (veh)				0	0	0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	3	0				
Queuing Penalty (veh)	4	0				

Intersection: 202: Lyons Lane & South Service Rd E

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	1.8	14.8
Average Queue (m)	0.1	6.8
95th Queue (m)	1.3	14.5
Link Distance (m)	53.9	21.6
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 203: Argus Rd & South Service Rd E

Movement	EB	WB	SB	B17	B18
Directions Served	LT	TR	LR	T	T
Maximum Queue (m)	11.6	118.4	93.8	32.2	30.7
Average Queue (m)	1.3	67.4	47.2	5.3	4.8
95th Queue (m)	7.1	156.6	107.8	29.2	42.0
Link Distance (m)	160.7	112.3	88.3	39.8	294.4
Upstream Blk Time (%)		25	17	6	
Queuing Penalty (veh)		177	22	8	
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report

Total Opening Year  
PM Peak Hour

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	58.8	158.8	181.2	188.1	28.2	34.6	44.2
Average Queue (m)	20.8	82.4	97.6	104.3	5.1	16.0	29.6
95th Queue (m)	49.4	138.5	159.3	165.7	22.7	37.7	41.4
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)					0	3	36
Queuing Penalty (veh)					4	24	273
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	R
Maximum Queue (m)	50.6	333.3	334.3	172.5	273.9	273.9	32.5	122.3	175.1	144.0	226.8	147.1
Average Queue (m)	22.2	115.9	192.2	141.1	213.1	181.5	21.6	57.9	45.7	47.5	55.9	8.0
95th Queue (m)	43.5	344.6	409.0	222.9	354.0	364.8	43.0	103.3	118.2	109.7	140.0	79.1
Link Distance (m)		327.2	327.2		266.7	266.7		251.7	251.7	251.7	251.7	
Upstream Blk Time (%)		21	28		55	44					0	0
Queuing Penalty (veh)		0	0		0	0					1	0
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				
Storage Blk Time (%)	0	0		35	69	11	10	0				
Queuing Penalty (veh)	0	0		74	147	28	15	1				

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	R
Maximum Queue (m)	102.5	354.2	350.1	350.5	97.5
Average Queue (m)	60.5	290.0	288.3	284.8	33.6
95th Queue (m)	138.7	456.6	457.0	461.2	108.2
Link Distance (m)		339.8	339.8	339.8	
Upstream Blk Time (%)		55	63	69	
Queuing Penalty (veh)		0	0	0	
Storage Bay Dist (m)	95.0				90.0
Storage Blk Time (%)	0	81		81	0
Queuing Penalty (veh)	0	105		60	0



Queuing and Blocking Report

Total Opening Year  
PM Peak Hour

Intersection: 303: North Access & South Service Rd E

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	3.7	15.0
Average Queue (m)	0.2	8.3
95th Queue (m)	2.6	13.3
Link Distance (m)	294.4	99.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 7782

Lanes, Volumes, Timings

Total 5 Year  
AM Peak Hour

101: Trafalgar Rd & Cross Ave/South Service Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1109	264	188	69	251	162	204	900	543	390	1013	622
Future Volume (vph)	1109	264	188	69	251	162	204	900	543	390	1013	622
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor	1.00	0.99				0.99		0.91				0.99
Frt		0.931				0.850		0.940				0.943
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2795	1449	0	1525	1583	1382	1428	3935	0	1525	4201	0
Fit Permitted	0.950			0.200			0.095			0.087		
Satd. Flow (perm)	2791	1449	0	321	1583	1362	143	3935	0	140	4201	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		33				205		126		129		
Link Speed (k/h)		50			50		50			50		
Link Distance (m)		151.2			330.4		150.2			270.2		
Travel Time (s)		10.9			23.8		10.8			19.5		
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Peak Hour Factor	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Adj. Flow (vph)	1275	343	294	90	326	210	252	1023	679	464	1206	749
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1275	637	0	90	326	210	252	1702	0	464	1955	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6		3.3			3.3		
Link Offset(m)		0.0			0.0		0.0			0.0		
Crosswalk Width(m)		4.8			4.8		4.8			4.8		
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4		9.4			9.4		
Detector 2 Size(m)		0.6			0.6		0.6			0.6		
Detector 2 Type		Cl+Ex			Cl+Ex		Cl+Ex			Cl+Ex		Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings  
101: Trafalgar Rd & Cross Ave/South Service Rd

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		12.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		17.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	40.0	50.0		17.0	27.0	27.0	16.0	49.0		24.0	57.0	
Total Split (%)	28.6%	35.7%		12.1%	19.3%	19.3%	11.4%	35.0%		17.1%	40.7%	
Maximum Green (s)	33.0	43.0		13.0	20.0	20.0	12.0	42.0		20.0	50.0	
Yellow Time (s)	4.0	4.0		3.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		1.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	C-Max			Min	C-Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	36.0	46.8		35.2	23.0	23.0	57.0	45.0		69.0	53.0	
Actuated g/C Ratio	0.26	0.33		0.25	0.16	0.16	0.41	0.32		0.49	0.38	
v/c Ratio	1.78	1.26		0.48	1.25	0.53	1.50	1.33dr		1.74	1.24dr	
Control Delay	386.0	169.4		36.1	188.5	12.5	257.8	161.2		373.1	121.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	386.0	169.4		36.1	188.5	12.5	257.8	161.2		373.1	121.3	
LOS	F	F		D	F	B	F	F		F	F	
Approach Delay		313.8			107.5		173.7				169.6	
Approach LOS		F			F		F				F	

**Intersection Summary**

Area Type: CBD

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 128 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

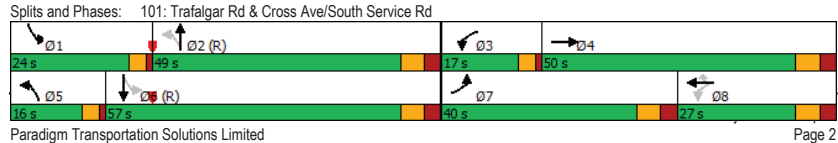
Maximum v/c Ratio: 1.78

Intersection Signal Delay: 205.0 Intersection LOS: F

Intersection Capacity Utilization 121.5% ICU Level of Service H

Analysis Period (min) 15

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



Queues  
101: Trafalgar Rd & Cross Ave/South Service Rd

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1275	637	90	326	210	252	1702	464	1955
v/c Ratio	1.78	1.26	0.48	1.25	0.53	1.50	1.33dr	1.74	1.24dr
Control Delay	386.0	169.4	36.1	188.5	12.5	257.8	161.2	373.1	121.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	386.0	169.4	36.1	188.5	12.5	257.8	161.2	373.1	121.3
Queue Length 50th (m)	~285.4	~225.8	15.1	~118.5	1.2	~88.0	~216.0	~187.8	~236.5
Queue Length 95th (m)	#314.6	#238.7	22.4	#143.3	12.8	m#79.3	m#178.5	m#179.3	m#200.0
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	718	506	194	260	395	168	1350	266	1670
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.78	1.26	0.46	1.25	0.53	1.50	1.26	1.74	1.17

**Intersection Summary**

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

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

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

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

HCM Signalized Intersection Capacity Analysis  
101: Trafalgar Rd & Cross Ave/South Service Rd

Total 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	↙	↘	←	↙	↘	←	↙	↘	←	↙	↘
Traffic Volume (vph)	1109	264	188	69	251	162	204	900	543	390	1013	622
Future Volume (vph)	1109	264	188	69	251	162	204	900	543	390	1013	622
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	0.91		1.00	0.99	
Fpbb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Fr	1.00	0.93		1.00	1.00	0.85	1.00	0.94		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2795	1449		1525	1583	1362	1428	3936		1525	4199	
Flt Permitted	0.95	1.00		0.20	1.00	1.00	0.10	1.00		0.09	1.00	
Satd. Flow (perm)	2795	1449		321	1583	1362	143	3936		140	4199	
Peak-hour factor, PHF	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Adj. Flow (vph)	1275	343	294	90	326	210	252	1023	679	464	1206	749
RTOR Reduction (vph)	0	22	0	0	0	171	0	86	0	0	80	0
Lane Group Flow (vph)	1275	615	0	90	326	39	252	1617	0	464	1875	0
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8			8	2		6		
Actuated Green, G (s)	33.0	43.8		32.2	20.0	20.0	54.0	42.0		66.0	50.0	
Effective Green, g (s)	36.0	46.8		32.2	23.0	23.0	54.0	45.0		66.0	53.0	
Actuated g/C Ratio	0.26	0.33		0.23	0.16	0.16	0.39	0.32		0.47	0.38	
Clearance Time (s)	7.0	7.0		4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	718	484		178	260	223	165	1265		263	1589	
v/s Ratio Prot	c0.46	c0.42		0.04	0.21		0.13	0.41		c0.25	0.45	
v/s Ratio Perm				0.07			0.03	0.46		c0.58		
v/c Ratio	1.78	1.27		0.51	1.25	0.17	1.53	1.33dr		1.76	1.24dr	
Uniform Delay, d1	52.0	46.6		45.1	58.5	50.3	39.5	47.5		45.0	43.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.03	1.24		1.08	1.13	
Incremental Delay, d2	354.7	137.3		2.7	141.8	0.5	240.1	125.6		353.0	85.1	
Delay (s)	406.7	183.9		47.7	200.3	50.8	280.7	184.4		401.5	134.1	
Level of Service	F	F		D	F	D	F	F		F	F	
Approach Delay (s)		332.5			128.2			196.8			185.4	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	224.1	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	1.69	F	
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	121.5%	ICU Level of Service	H
Analysis Period (min)	15		
dr Defacto Right Lane. Recode with 1 though lane as a right lane.			
c Critical Lane Group			

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 5 Year  
AM Peak Hour

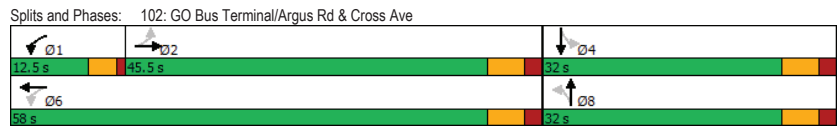
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	↙	↘	←	↙	↘	←	↙	↘	←	↙	↘
Traffic Volume (vph)	43	662	48	128	845	57	58	0	147	553	20	624
Future Volume (vph)	43	662	48	128	845	57	58	0	147	553	20	624
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95		1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			0.96		0.98		0.99
Fr		0.987			0.990			0.850				0.857
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1570	2915		818	3171		805	734		1570	1387	
Flt Permitted	0.278			0.190			0.142			0.555		
Satd. Flow (perm)	459	2915		163	3171		120	734		903	1387	
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)		15			15			229			131	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		374.0			72.9			81.9			180.7	
Travel Time (s)		26.9			5.2			5.9			13.0	
Confl. Peds. (#/hr)	1		3	3		1	3		20	20		3
Peak Hour Factor	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%
Adj. Flow (vph)	83	761	74	152	960	72	109	0	210	709	32	701
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	835	0	152	1032	0	109	210	0	709	733	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	45.5	45.5		12.5	58.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.6%	50.6%		13.9%	64.4%		35.6%	35.6%		35.6%	35.6%	
Maximum Green (s)	39.5	39.5		8.5	52.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	33.8	33.8		46.4	46.4		28.1	28.1		28.1	28.1	
Actuated g/C Ratio	0.41	0.41		0.56	0.56		0.34	0.34		0.34	0.34	
v/c Ratio	0.44	0.69		0.96	0.58		2.73	0.53		2.31	1.31	
Control Delay	25.7	22.9		78.9	12.8		847.7	8.0		618.5	176.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	25.7	22.9		78.9	12.8		847.7	8.0		618.5	176.6	
LOS	C	C		E	B		F	A		F	F	
Approach Delay		23.1			21.3			294.9			393.9	
Approach LOS		C			C			F			F	

Intersection Summary	
Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	82.6
Natural Cycle:	150
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	2.73
Intersection Signal Delay:	183.4
Intersection LOS:	F
Intersection Capacity Utilization:	112.4%
ICU Level of Service:	H
Analysis Period (min):	15



Queues  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	83	835	152	1032	109	210	709	733
v/c Ratio	0.44	0.69	0.96	0.58	2.73	0.53	2.31	1.31
Control Delay	25.7	22.9	78.9	12.8	847.7	8.0	618.5	176.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	22.9	78.9	12.8	847.7	8.0	618.5	176.6
Queue Length 50th (m)	9.6	57.0	12.5	52.7	~31.1	0.0	~195.0	~145.1
Queue Length 95th (m)	11.0	73.0	#39.7	67.0	#37.2	0.0	#240.4	#123.7
Internal Link Dist (m)		350.0		48.9		57.9		156.7
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	231	1479	159	2088	40	400	307	558
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	0.36	0.56	0.96	0.49	2.73	0.53	2.31	1.31

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

HCM Signalized Intersection Capacity Analysis  
 102: GO Bus Terminal/Argus Rd & Cross Ave

Total 5 Year  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↕↕	↔	↔	↕↕	↔	↔	↕	↔	↔	↕	↔	
Traffic Volume (vph)	43	662	48	128	845	57	58	0	147	553	20	624	
Future Volume (vph)	43	662	48	128	845	57	58	0	147	553	20	624	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.99		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00		
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.86		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1570	2914		818	3170		805	736		1547	1387		
Flt Permitted	0.28	1.00		0.19	1.00		0.14	1.00		0.56	1.00		
Satd. Flow (perm)	459	2914		163	3170		121	736		904	1387		
Peak-hour factor, PHF	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89	
Adj. Flow (vph)	83	761	74	152	960	72	109	0	210	709	32	701	
RTOR Reduction (vph)	0	9	0	0	7	0	0	138	0	0	86	0	
Lane Group Flow (vph)	83	826	0	152	1025	0	109	72	0	709	647	0	
Conf. Peds. (#/hr)	1		3	3		1	3		20	20		3	
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA		
Protected Phases		2		1	6		8		8		4		
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	31.9	31.9		44.4	44.4		26.1	26.1		26.1	26.1		
Effective Green, g (s)	33.9	33.9		44.4	46.4		28.1	28.1		28.1	28.1		
Actuated g/C Ratio	0.41	0.41		0.54	0.56		0.34	0.34		0.34	0.34		
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0		
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0		
Lane Grp Cap (vph)	188	1197		155	1782		41	250		307	472		
v/s Ratio Prot		0.28		c0.10	0.32			0.10			0.47		
v/s Ratio Perm	0.18			c0.42			c0.90			0.78			
v/c Ratio	0.44	0.69		0.98	0.58		2.66	0.29		2.31	1.37		
Uniform Delay, d1	17.5	20.0		14.3	11.7		27.2	19.9		27.2	27.2		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	3.4	2.2		66.2	0.7		811.1	0.9		599.4	179.6		
Delay (s)	20.9	22.2		80.5	12.4		838.3	20.7		626.6	206.8		
Level of Service	C	C		F	B		F	C		F	F		
Approach Delay (s)		22.1			21.1			300.1			413.2		
Approach LOS		C			C			F			F		
<b>Intersection Summary</b>													
HCM 2000 Control Delay		190.7		HCM 2000 Level of Service				F					
HCM 2000 Volume to Capacity ratio		1.65											
Actuated Cycle Length (s)		82.5		Sum of lost time (s)				12.0					
Intersection Capacity Utilization		112.4%		ICU Level of Service				H					
Analysis Period (min)		15											
c Critical Lane Group													

Lanes, Volumes, Timings  
 103: Lyons Lane/Commercial Driveway & Cross Ave

Total 5 Year  
 AM Peak Hour

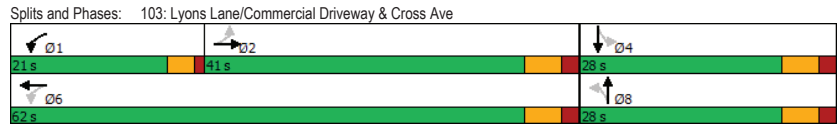
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↕	↔	↔	↕↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	63	378	177	256	290	15	37	3	61	56	26	59
Future Volume (vph)	63	378	177	256	290	15	37	3	61	56	26	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0		0.0	25.0		0.0	20.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		1.00	1.00		1.00	0.98		1.00	0.99	
Frt		0.949			0.987			0.856			0.893	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1540	2853	0	1570	2726	0	1570	1442	0	1468	1479	0
Flt Permitted	0.515			0.277			0.694			0.689		
Satd. Flow (perm)	830	2853	0	458	2726	0	1143	1442	0	1061	1479	0
Right Turn on Red	Yes		Yes				Yes		Yes			
Satd. Flow (RTOR)		125			23			102			69	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		40.1			374.0			69.1			70.9	
Travel Time (s)		2.9			26.9			5.0			5.1	
Conf. Peds. (#/hr)	5		1	1		5	3		3	3		3
Peak Hour Factor	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%
Adj. Flow (vph)	81	467	242	388	367	36	46	4	102	90	28	69
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	81	709	0	388	403	0	46	106	0	90	97	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.0	41.0		21.0	62.0		28.0	28.0		28.0	28.0	
Total Split (%)	45.6%	45.6%		23.3%	68.9%		31.1%	31.1%		31.1%	31.1%	
Maximum Green (s)	35.0	35.0		17.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.2	37.2		54.9	54.9		15.6	15.6		15.6	15.6	
Actuated g/C Ratio	0.47	0.47		0.70	0.70		0.20	0.20		0.20	0.20	
v/c Ratio	0.21	0.50		0.76	0.21		0.20	0.29		0.43	0.28	
Control Delay	16.0	14.0		17.2	4.6		29.1	8.8		35.0	13.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.0	14.0		17.2	4.6		29.1	8.8		35.0	13.3	
LOS	B	B		B	A		C	A		C	B	
Approach Delay		14.2			10.8			14.9			23.7	
Approach LOS		B			B			B			C	

Intersection Summary	
Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	78.5
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	13.8
Intersection LOS:	B
Intersection Capacity Utilization:	79.2%
ICU Level of Service:	D
Analysis Period (min):	15



Queues  
103: Lyons Lane/Commercial Driveway & Cross Ave

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	709	388	403	46	106	90	97
v/c Ratio	0.21	0.50	0.76	0.21	0.20	0.29	0.43	0.28
Control Delay	16.0	14.0	17.2	4.6	29.1	8.8	35.0	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	14.0	17.2	4.6	29.1	8.8	35.0	13.3
Queue Length 50th (m)	7.0	30.4	19.5	8.7	6.1	0.5	12.4	3.6
Queue Length 95th (m)	16.3	48.0	27.6	15.4	13.7	8.2	17.7	16.1
Internal Link Dist (m)		16.1		350.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	393	1418	562	2032	351	514	326	502
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	0.21	0.50	0.69	0.20	0.13	0.21	0.28	0.19

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
103: Lyons Lane/Commercial Driveway & Cross Ave

Total 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↶		↵	↶		↵	↶		↵	↶	
Traffic Volume (vph)	63	378	177	256	290	15	37	3	61	56	26	59
Future Volume (vph)	63	378	177	256	290	15	37	3	61	56	26	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Ftpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.99		1.00	0.86		1.00	0.89	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1532	2853		1570	2726		1566	1442		1464	1480	
Fit Permitted	0.51	1.00		0.28	1.00		0.69	1.00		0.69	1.00	
Satd. Flow (perm)	830	2853		458	2726		1144	1442		1061	1480	
Peak-hour factor, PHF	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Adj. Flow (vph)	81	467	242	388	367	36	46	4	102	90	28	69
RTOR Reduction (vph)	0	66	0	0	7	0	0	82	0	0	55	0
Lane Group Flow (vph)	81	643	0	388	396	0	46	24	0	90	42	0
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	6		8	8		4	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.3	35.3		52.9	52.9		13.6	13.6		13.6	13.6	
Effective Green, g (s)	37.3	37.3		52.9	54.9		15.6	15.6		15.6	15.6	
Actuated g/C Ratio	0.48	0.48		0.67	0.70		0.20	0.20		0.20	0.20	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	394	1355		501	1906		227	286		210	294	
v/s Ratio Prot		0.23		c0.13	0.15			0.02			0.03	
v/s Ratio Perm	0.10			c0.39			0.04			c0.08		
v/c Ratio	0.21	0.47		0.77	0.21		0.20	0.08		0.43	0.14	
Uniform Delay, d1	12.0	14.0		7.5	4.2		26.3	25.6		27.5	25.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.6		7.1	0.1		0.6	0.2		1.9	0.3	
Delay (s)	12.5	14.5		14.5	4.3		26.9	25.8		29.5	26.2	
Level of Service	B	B		B	A		C	C		C	C	
Approach Delay (s)		14.3			9.3			26.1			27.8	
Approach LOS		B			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.5			HCM 2000 Level of Service		B				
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			78.5		Sum of lost time (s)		12.0					
Intersection Capacity Utilization			79.2%		ICU Level of Service		D					
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↶		↵	↶		↵	↶		↵	↶	
Traffic Volume (vph)	505	565	105	27	490	629	62	538	66	535	540	346
Future Volume (vph)	505	565	105	27	490	629	62	538	66	535	540	346
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0		0.0	80.0		0.0	25.0		0.0	80.0		0.0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95		0.95	1.00	0.95	1.00	0.95		0.95	0.97	1.00
Ped Bike Factor	0.99	0.99		0.99	0.97		1.00	1.00		0.99		0.98
Frt		0.967			0.917			0.982				0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2987	3016	0	1481	2819	0	1540	3149	0	2929	1676	1356
Fit Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2969	3016	0	1473	2819	0	1532	3149	0	2887	1676	1324
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			230			11				309
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.8			142.3			311.4				130.3
Travel Time (s)		20.6			10.2			22.4				9.4
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Peak Hour Factor	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Adj. Flow (vph)	543	621	175	36	570	699	103	626	88	637	628	433
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	543	796	0	36	1269	0	103	714	0	637	628	433
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			6.6		6.6		6.6
Link Offset(m)		0.0			0.0			0.0		0.0		0.0
Crosswalk Width(m)		4.8			4.8			4.8		4.8		4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

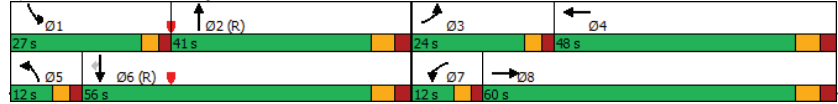
Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	24.0	60.0		12.0	48.0		12.0	41.0		27.0	56.0	56.0
Total Split (%)	17.1%	42.9%		8.6%	34.3%		8.6%	29.3%		19.3%	40.0%	40.0%
Maximum Green (s)	19.0	53.0		7.0	41.0		7.0	34.0		22.0	49.0	49.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	20.0	56.0		8.0	44.0		8.0	37.0		23.0	52.0	52.0
Actuated g/C Ratio	0.14	0.40		0.06	0.31		0.06	0.26		0.16	0.37	0.37
v/c Ratio	1.27	0.65		0.43	1.22		1.17	0.85		1.32	1.01	0.63
Control Delay	187.8	35.6		79.8	140.4		203.8	58.9		203.3	50.0	8.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	187.8	35.6		79.8	140.4		203.8	58.9		203.3	50.0	8.2
LOS	F	D		E	F		F	E		F	D	A
Approach Delay		97.3			138.7			77.2			96.9	
Approach LOS		F			F			E			F	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.32  
 Intersection Signal Delay: 104.5  
 Intersection LOS: F  
 Intersection Capacity Utilization 111.8%  
 ICU Level of Service H  
 Analysis Period (min) 15

Splits and Phases: 104: Trafalgar Rd & Cornwall Rd



Queues  
104: Trafalgar Rd & Cornwall Rd

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	543	796	36	1269	103	714	637	628	433
v/c Ratio	1.27	0.65	0.43	1.22	1.17	0.85	1.32	1.01	0.63
Control Delay	187.8	35.6	79.8	140.4	203.8	58.9	203.3	50.0	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	187.8	35.6	79.8	140.4	203.8	58.9	203.3	50.0	8.2
Queue Length 50th (m)	~102.7	94.5	10.3	~213.0	~35.7	103.1	~126.8	~155.3	17.9
Queue Length 95th (m)	#140.1	117.9	19.0	#238.1	#41.7	121.2 m	#101.4	m101.0	m12.9
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	426	1225	84	1043	88	840	481	622	686
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.27	0.65	0.43	1.22	1.17	0.85	1.32	1.01	0.63

Intersection Summary

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



HCM Signalized Intersection Capacity Analysis  
 104: Trafalgar Rd & Cornwall Rd

Total 5 Year  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	505	565	105	27	490	629	62	538	66	535	540	346
Future Volume (vph)	505	565	105	27	490	629	62	538	66	535	540	346
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.97		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.92		1.00	0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2987	3016		1481	2820		1540	3148		2929	1676	1324
Fit Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2987	3016		1481	2820		1540	3148		2929	1676	1324
Peak-hour factor, PHF	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Adj. Flow (vph)	543	621	175	36	570	699	103	626	88	637	628	432
RTOR Reduction (vph)	0	19	0	0	158	0	0	8	0	0	0	194
Lane Group Flow (vph)	543	777	0	36	1111	0	103	706	0	637	628	239
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	19.0	53.0		7.0	41.0		7.0	34.0		22.0	49.0	49.0
Effective Green, g (s)	20.0	56.0		8.0	44.0		8.0	37.0		23.0	52.0	52.0
Actuated g/C Ratio	0.14	0.40		0.06	0.31		0.06	0.26		0.16	0.37	0.37
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	426	1206		84	886		88	831		481	622	491
v/s Ratio Prot	c0.18	0.26		0.02	c0.39		0.07	0.22		c0.22	c0.37	
v/s Ratio Perm												0.18
v/c Ratio	1.27	0.64		0.43	1.25		1.17	0.85		1.32	1.01	0.49
Uniform Delay, d1	60.0	34.0		63.8	48.0		66.0	48.9		58.5	44.0	33.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.35	0.83	0.78
Incremental Delay, d2	140.8	2.7		15.2	123.7		149.0	10.6		147.3	13.3	0.3
Delay (s)	200.8	36.6		79.0	171.7		215.0	59.4		226.2	49.6	26.7
Level of Service	F	D		E	F		F	E		F	D	C
Approach Delay (s)	103.2			169.1			79.0			110.0		
Approach LOS	F			F			E			F		
<b>Intersection Summary</b>												
HCM 2000 Control Delay		118.3								F		
HCM 2000 Volume to Capacity ratio		1.22										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		111.8%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings  
 105: Trafalgar Rd & QEW EB-Off Ramp

Total 5 Year  
 AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↕		↕	↕	
Traffic Volume (vph)	996	906	0	1364	1629	0
Future Volume (vph)	996	906	0	1364	1629	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frt		0.850				
Fit Protected	0.950					
Satd. Flow (prot)	2958	1423	0	4404	4489	0
Fit Permitted	0.950					
Satd. Flow (perm)	2958	1423	0	4404	4489	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		1				
Link Speed (k/h)	50			50	50	
Link Distance (m)	199.2			51.4	324.8	
Travel Time (s)	14.3			3.7	23.4	
Peak Hour Factor	0.98	0.92	0.25	0.91	0.90	0.25
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Adj. Flow (vph)	1016	985	0	1499	1810	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1016	985	0	1499	1810	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	85.0	85.0		55.0	55.0	
Total Split (%)	60.7%	60.7%		39.3%	39.3%	
Maximum Green (s)	78.0	78.0		48.0	48.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	81.0	81.0		51.0	51.0	
Actuated g/C Ratio	0.58	0.58		0.36	0.36	
v/c Ratio	0.59	1.20		0.93	1.11	
Control Delay	20.7	129.1		54.4	90.8	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	20.7	129.1		54.4	90.8	
LOS	C	F		D	F	
Approach Delay	74.1			54.4	90.8	
Approach LOS	E			D	F	

Intersection Summary

Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	133.6 (95%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.20
Intersection Signal Delay:	74.2
Intersection LOS:	E
Intersection Capacity Utilization:	104.0%
ICU Level of Service:	G
Analysis Period (min):	15

Splits and Phases: 105: Trafalgar Rd & QEW EB-Off Ramp



Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1016	985	1499	1810
v/c Ratio	0.59	1.20	0.93	1.11
Control Delay	20.7	129.1	54.4	90.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.7	129.1	54.4	90.8
Queue Length 50th (m)	93.9	~347.8	145.6	~222.3
Queue Length 95th (m)	114.9	#431.9	m84.3	#249.5
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1711	823	1604	1635
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	1.20	0.93	1.11

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 5 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	996	906	0	1364	1629	0
Future Volume (vph)	996	906	0	1364	1629	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Fr't	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	2958	1423		4404	4489	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	2958	1423		4404	4489	
Peak-hour factor, PHF	0.98	0.92	0.25	0.91	0.90	0.25
Adj. Flow (vph)	1016	985	0	1499	1810	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1016	985	0	1499	1810	0
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases	4					
Actuated Green, G (s)	78.0	78.0		48.0	48.0	
Effective Green, g (s)	81.0	81.0		51.0	51.0	
Actuated g/C Ratio	0.58	0.58		0.36	0.36	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1711	823		1604	1635	
v/s Ratio Prot	0.34			0.34	c0.40	
v/s Ratio Perm		c0.69				
v/c Ratio	0.59	1.20		0.93	1.11	
Uniform Delay, d1	18.9	29.5		42.9	44.5	
Progression Factor	1.00	1.00		1.24	0.84	
Incremental Delay, d2	0.6	100.1		1.4	55.0	
Delay (s)	19.5	129.6		54.5	92.4	
Level of Service	B	F		D	F	
Approach Delay (s)	73.7			54.5	92.4	
Approach LOS	E			D	F	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		74.7		HCM 2000 Level of Service		E
HCM 2000 Volume to Capacity ratio		1.16				
Actuated Cycle Length (s)		140.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		104.0%		ICU Level of Service		G
Analysis Period (min)		15				

Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Traffic Volume (vph)	1	0	231	538	38	291	0	1789	0	0	1715	7			
Future Volume (vph)	1	0	231	538	38	291	0	1789	0	0	1715	7			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5			
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0			
Storage Lanes	1		1	1		1	0		0	0		1			
Taper Length (m)	7.5			7.5			7.5			7.5					
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00			
Ped Bike Factor												0.96			
Fr't			0.850			0.850						0.850			
Flt Protected	0.950		0.950	0.960											
Satd. Flow (prot)	1570	0	1395	1421	1444	1356	0	4446	0	0	4532	1437			
Flt Permitted	0.950		0.950	0.960											
Satd. Flow (perm)	1570	0	1395	1421	1444	1356	0	4446	0	0	4532	1380			
Right Turn on Red			Yes			Yes		Yes				Yes			
Satd. Flow (RTOR)			31			231						70			
Link Speed (k/h)		50			50			50				50			
Link Distance (m)		142.1			192.6			324.8				275.1			
Travel Time (s)		10.2			13.9			23.4				19.8			
Confl. Peds. (#/hr)							8		5		5				
Peak Hour Factor	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63			
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%			
Adj. Flow (vph)	4	0	254	611	56	399	0	1924	0	0	1906	11			
Shared Lane Traffic (%)				46%											
Lane Group Flow (vph)	4	0	254	330	337	399	0	1924	0	0	1906	11			
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No			
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right			
Median Width(m)		3.3			3.3			3.6				3.6			
Link Offset(m)		0.0			0.0			0.0				0.0			
Crosswalk Width(m)		4.8			4.8			4.8				4.8			
<b>Two way Left Turn Lane</b>															
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16			
Turning Speed (k/h)	24		14	24		14	24		14	24		14			
Number of Detectors	1		1	1	2	1						1			
Detector Template	Left		Right	Left	Thru	Right		Thru				Thru			
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0				10.0			
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0				0.0			
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0				0.0			
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6				0.6			
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex				CI+Ex			
<b>Detector 1 Channel</b>															
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0			
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0			
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0			
Detector 2 Position(m)					9.4			9.4				9.4			
Detector 2 Size(m)					0.6			0.6				0.6			
Detector 2 Type					CI+Ex			CI+Ex				CI+Ex			
<b>Detector 2 Channel</b>															

Lanes, Volumes, Timings

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 5 Year

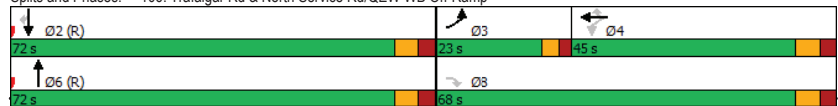
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	Perm	
Protected Phases	3			4	4			6			2	
Permitted Phases			8	4	4	4					2	
Detector Phase	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		68.0	45.0	45.0	45.0		72.0			72.0	72.0
Total Split (%)	16.4%		48.6%	32.1%	32.1%	32.1%		51.4%			51.4%	51.4%
Maximum Green (s)	18.0		61.0	38.0	38.0	38.0		65.0			65.0	65.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)	7.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	8.0		54.1	42.1	42.1	42.1		77.9			77.9	77.9
Actuated g/C Ratio	0.06		0.39	0.30	0.30	0.30		0.56			0.56	0.56
v/c Ratio	0.04		0.46	0.77	0.78	0.78		0.78			0.76	0.01
Control Delay	64.0		29.4	56.5	56.7	23.5		32.1			27.6	0.0
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	64.0		29.4	56.5	56.7	23.5		32.1			27.6	0.0
LOS	E		C	E	E	C		C			C	A
Approach Delay		29.9				44.2		32.1				27.4
Approach LOS		C				D		C				C

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 32.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 80.4%  
 ICU Level of Service D  
 Analysis Period (min) 15

Splits and Phases: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 5 Year

AM Peak Hour

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	4	254	330	337	399	1924	1906	11
v/c Ratio	0.04	0.46	0.77	0.78	0.70	0.78	0.76	0.01
Control Delay	64.0	29.4	56.5	56.7	23.5	32.1	27.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	29.4	56.5	56.7	23.5	32.1	27.6	0.0
Queue Length 50th (m)	1.1	47.6	91.8	94.0	43.9	137.3	151.6	0.0
Queue Length 95th (m)	1.4	65.2	116.0	82.9	43.3	m162.4	199.9	0.0
Internal Link Dist (m)				168.6		300.8	251.1	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	654	454	461	590	2473	2521	799
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.39	0.73	0.73	0.68	0.78	0.76	0.01

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 5 Year  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔		↔			↔	↔
Traffic Volume (vph)	1	0	231	538	38	291	0	1789	0	0	1715	7
Future Volume (vph)	1	0	231	538	38	291	0	1789	0	0	1715	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	0.96
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	1.00
Fr	1.00		0.85	1.00	1.00	0.85		1.00			1.00	0.85
Fl	0.95		1.00	0.95	0.96	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1570		1395	1421	1444	1356		4446			4532	1380
Fl Permitted	0.95		1.00	0.95	0.96	1.00		1.00			1.00	1.00
Satd. Flow (perm)	1570		1395	1421	1444	1356		4446			4532	1380
Peak-hour factor, PHF	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Adj. Flow (vph)	4	0	254	611	56	399	0	1924	0	0	1906	11
RTOR Reduction (vph)	0	0	19	0	0	162	0	0	0	0	0	5
Lane Group Flow (vph)	4	0	235	330	337	237	0	1924	0	0	1906	6
Confl. Peds. (#/hr)							8		5	5		8
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA			NA	Perm
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	7.0		51.1	39.1	39.1	39.1		74.9			74.9	74.9
Effective Green, g (s)	8.0		54.1	42.1	42.1	42.1		77.9			77.9	77.9
Actuated g/C Ratio	0.06		0.39	0.30	0.30	0.30		0.56			0.56	0.56
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Lane Grp Cap (vph)	89		539	427	434	407		2473			2521	767
v/s Ratio Prot	0.00							c0.43			0.42	
v/s Ratio Perm			c0.17	0.23	0.23	0.18						0.00
v/c Ratio	0.04		0.44	0.77	0.78	0.58		0.78			0.76	0.01
Uniform Delay, d1	62.4		31.7	44.6	44.7	41.5		24.3			23.8	13.8
Progression Factor	1.00		1.00	1.00	1.00	1.00		1.19			1.00	1.00
Incremental Delay, d2	0.2		0.6	8.5	8.5	2.1		1.5			2.2	0.0
Delay (s)	62.6		32.3	53.0	53.1	43.6		30.2			25.9	13.9
Level of Service	E		C	D	D	D		C			C	B
Approach Delay (s)		32.7				49.6		30.2			25.9	
Approach LOS		C				D		C			C	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
 107: Dorval Drive & QEW WB Off-Ramp

Total 5 Year  
 AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔			↔
Traffic Volume (vph)	898	418	514	0	0	1435
Future Volume (vph)	898	418	514	0	0	1435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Fr	0.993	0.850				
Fl	0.954					
Satd. Flow (prot)	3423	1441	3539	0	0	3539
Fl Permitted	0.954					
Satd. Flow (perm)	3423	1441	3539	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	4	297				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	976	454	559	0	0	1560
Shared Lane Traffic (%)		10%				
Lane Group Flow (vph)	1021	409	559	0	0	1560
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases			8			

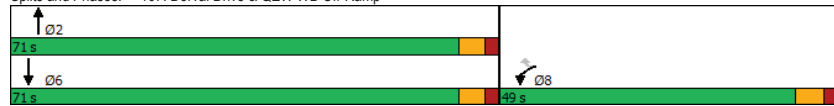
Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Total 5 Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	49.0	49.0	71.0			71.0
Total Split (%)	40.8%	40.8%	59.2%			59.2%
Maximum Green (s)	43.0	43.0	65.0			65.0
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	43.2	43.2	67.1			67.1
Actuated g/C Ratio	0.37	0.37	0.57			0.57
v/c Ratio	0.81	0.57	0.28			0.78
Control Delay	39.9	11.4	13.9			23.7
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	39.9	11.4	13.9			23.7
LOS	D	B	B			C
Approach Delay	31.8		13.9			23.7
Approach LOS	C		B			C

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	118.3
Natural Cycle:	60
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	25.4
Intersection LOS:	C
Intersection Capacity Utilization:	76.3%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 107: Dorval Drive & QEW WB Off-Ramp



Queues  
107: Dorval Drive & QEW WB Off-Ramp

Total 5 Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1021	409	559	1560
v/c Ratio	0.81	0.57	0.28	0.78
Control Delay	39.9	11.4	13.9	23.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.9	11.4	13.9	23.7
Queue Length 50th (m)	114.5	20.4	36.5	153.3
Queue Length 95th (m)	141.5	55.8	47.5	185.0
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1305	732	2005	2005
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.78	0.56	0.28	0.78

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEWB Off-Ramp

Total 5 Year  
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T			T
Traffic Volume (vph)	898	418	514	0	0	1435
Future Volume (vph)	898	418	514	0	0	1435
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr	0.99	0.85	1.00			1.00
Fit Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3426	1441	3539			3539
Fit Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3426	1441	3539			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	976	454	559	0	0	1560
RTOR Reduction (vph)	3	188	0	0	0	0
Lane Group Flow (vph)	1018	221	559	0	0	1560
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases	8					
Actuated Green, G (s)	41.2	41.2	65.0			65.0
Effective Green, g (s)	43.2	43.2	67.0			67.0
Actuated g/C Ratio	0.37	0.37	0.57			0.57
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1252	526	2006			2006
v/s Ratio Prot	c0.30		0.16			c0.44
v/s Ratio Perm		0.15				
v/c Ratio	0.81	0.42	0.28			0.78
Uniform Delay, d1	33.9	28.1	13.2			19.8
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	4.6	0.9	0.3			3.0
Delay (s)	38.5	29.0	13.5			22.9
Level of Service	D	C	B			C
Approach Delay (s)	35.8		13.5			22.9
Approach LOS	D		B			C

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	118.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
108: Dorval Drive & QEWE Off-Ramp

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W	W		T	T	
Traffic Volume (vph)	132	524	0	724	1551	0
Future Volume (vph)	132	524	0	724	1551	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr	0.900	0.850				
Fit Protected	0.984					
Satd. Flow (prot)	3200	1441	0	3539	3539	0
Fit Permitted	0.984					
Satd. Flow (perm)	3200	1441	0	3539	3539	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	30	30				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	570	0	787	1686	0
Shared Lane Traffic (%)	50%					
Lane Group Flow (vph)	428	285	0	787	1686	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases	4					

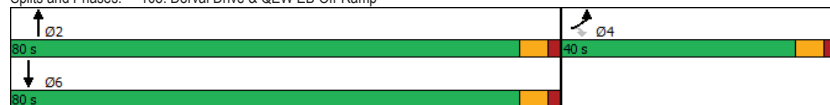
Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	40.0	40.0		80.0	80.0	
Total Split (%)	33.3%	33.3%		66.7%	66.7%	
Maximum Green (s)	34.0	34.0		74.0	74.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	28.2	28.2		76.3	76.3	
Actuated g/C Ratio	0.25	0.25		0.68	0.68	
v/c Ratio	0.52	0.74		0.33	0.70	
Control Delay	35.5	46.8		8.7	14.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	35.5	46.8		8.7	14.2	
LOS	D	D		A	B	
Approach Delay	40.0			8.7	14.2	
Approach LOS	D			A	B	

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	112.5
Natural Cycle:	60
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	18.6
Intersection LOS:	B
Intersection Capacity Utilization:	76.3%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 108: Dorval Drive & QEW EB Off-Ramp



Queues  
108: Dorval Drive & QEW EB Off-Ramp

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	428	285	787	1686
v/c Ratio	0.52	0.74	0.33	0.70
Control Delay	35.5	46.8	8.7	14.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.5	46.8	8.7	14.2
Queue Length 50th (m)	40.8	60.0	36.6	116.8
Queue Length 95th (m)	56.2	94.5	56.6	172.3
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1048	483	2400	2400
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.59	0.33	0.70

Intersection Summary



HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Total 5 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↗		↕↕	↕↕	
Traffic Volume (vph)	132	524	0	724	1551	0
Future Volume (vph)	132	524	0	724	1551	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Frt	0.90	0.85		1.00	1.00	
Flt Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3199	1441		3539	3539	
Flt Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3199	1441		3539	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	570	0	787	1686	0
RTOR Reduction (vph)	23	23	0	0	0	0
Lane Group Flow (vph)	406	263	0	787	1686	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	26.1	26.1		74.3	74.3	
Effective Green, g (s)	28.1	28.1		76.3	76.3	
Actuated g/C Ratio	0.25	0.25		0.68	0.68	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	799	360		2402	2402	
v/s Ratio Prot	0.13			0.22	c0.48	
v/s Ratio Perm		c0.18				
v/c Ratio	0.51	0.73		0.33	0.70	
Uniform Delay, d1	36.2	38.7		7.5	11.1	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	7.7		0.4	1.7	
Delay (s)	36.9	46.4		7.8	12.8	
Level of Service	D	D		A	B	
Approach Delay (s)	40.7			7.8	12.8	
Approach LOS	D			A	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			17.8	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			112.4	Sum of lost time (s)		8.0
Intersection Capacity Utilization			76.3%	ICU Level of Service		D
Analysis Period (min)			15			

c Critical Lane Group

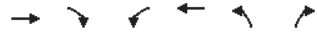
Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Total 5 Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕↕	↕↕
Traffic Volume (vph)	480	0	0	291	256	285
Future Volume (vph)	480	0	0	291	256	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						197
Link Speed (k/h)	60			60	40	
Link Distance (m)	128.8			184.7	258.8	
Travel Time (s)	7.7			11.1	23.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	522	0	0	316	278	310
Shared Lane Traffic (%)						
Lane Group Flow (vph)	522	0	0	316	278	310
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
v/c Ratio	0.37			0.22	0.39	0.41

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Total 5 Year  
AM Peak Hour






Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	10.5			9.4	11.7	5.8
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.5			9.4	11.7	5.8
LOS	B			A	B	A
Approach Delay	10.5			9.4	8.6	
Approach LOS	B			A	A	

**Intersection Summary**

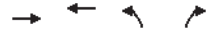
Area Type:	Other
Cycle Length:	45
Actuated Cycle Length:	45
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Natural Cycle:	45
Control Type:	Pretimed
Maximum v/c Ratio:	0.41
Intersection Signal Delay:	9.5
Intersection Capacity Utilization:	38.4%
ICU Level of Service:	A
Intersection LOS:	A
Analysis Period (min):	15

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street

 Ø2 (R) 22.5 s	 Ø4 22.5 s
	 Ø8 22.5 s

Queues  
109: QEW WB Off-Ramp & Kerr Street

Total 5 Year  
AM Peak Hour



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	522	316	278	310
v/c Ratio	0.37	0.22	0.39	0.41
Control Delay	10.5	9.4	11.7	5.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.5	9.4	11.7	5.8
Queue Length 50th (m)	15.0	8.5	15.4	5.7
Queue Length 95th (m)	24.3	15.0	30.0	18.4
Internal Link Dist (m)	104.8	160.7	234.8	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1415	1415	708	751
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.22	0.39	0.41

**Intersection Summary**

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Total 5 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↓	↑
Traffic Volume (vph)	480	0	0	291	256	285
Future Volume (vph)	480	0	0	291	256	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr <sub>t</sub>	1.00			1.00	1.00	0.85
Fit Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	1583
Fit Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	522	0	0	316	278	310
RTOR Reduction (vph)	0	0	0	0	0	118
Lane Group Flow (vph)	522	0	0	316	278	192
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1415			1415	708	633
v/s Ratio Prot	c0.15			0.09	c0.16	
v/s Ratio Perm						0.12
v/c Ratio	0.37			0.22	0.39	0.30
Uniform Delay, d1	9.5			8.9	9.6	9.2
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.7			0.4	1.6	1.2
Delay (s)	10.2			9.3	11.2	10.4
Level of Service	B			A	B	B
Approach Delay (s)	10.2			9.3	10.8	
Approach LOS	B			A	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			10.3		HCM 2000 Level of Service B	
HCM 2000 Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			45.0		Sum of lost time (s) 9.0	
Intersection Capacity Utilization			38.4%		ICU Level of Service A	
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings

110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

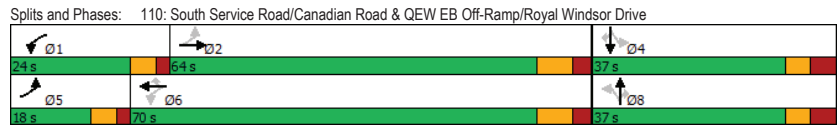
Total 5 Year

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↓	↑↑		↑↓	↑↑	↑	↑↓	↑	↑	↑↓	↑↓	↑
Traffic Volume (vph)	45	561	30	91	552	7	2	9	51	4	21	29
Future Volume (vph)	45	561	30	91	552	7	2	9	51	4	21	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0		0.0	155.0		70.0	15.0		0.0	0.0		30.0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>		0.992				0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3299	0	1719	3139	1380	1805	1667	1468	1805	1792	1495
Fit Permitted	0.415			0.371			0.742			0.751		
Satd. Flow (perm)	1485	3299	0	671	3139	1380	1410	1667	1468	1427	1792	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				94			99			99
Link Speed (k/h)		80			80			60				40
Link Distance (m)		324.5			247.2			158.7				215.5
Travel Time (s)		14.6			11.1			9.5				19.4
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Adj. Flow (vph)	49	616	33	100	607	8	2	10	56	4	23	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	649	0	100	607	8	2	10	56	4	23	32
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

Lanes, Volumes, Timings Total 5 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	34.0		14.0	38.4	38.4	28.8	28.8	28.8	35.0	35.0	35.0
Total Split (s)	18.0	64.0		24.0	70.0	70.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	14.4%	51.2%		19.2%	56.0%	56.0%	29.6%	29.6%	29.6%	29.6%	29.6%	29.6%
Maximum Green (s)	12.0	55.6		18.0	61.6	61.6	29.2	29.2	29.2	29.2	29.2	29.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	77.9	67.9		78.9	71.9	71.9	13.4	13.4	13.4	13.8	13.8	13.8
Actuated g/C Ratio	0.78	0.68		0.79	0.72	0.72	0.13	0.13	0.13	0.14	0.14	0.14
v/c Ratio	0.04	0.29		0.16	0.27	0.01	0.01	0.05	0.20	0.02	0.09	0.11
Control Delay	2.5	7.5		3.0	7.2	0.0	38.5	39.0	3.5	38.5	39.7	0.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	7.5		3.0	7.2	0.0	38.5	39.0	3.5	38.5	39.7	0.8
LOS	A	A		A	A	A	D	D	A	D	D	A
Approach Delay		7.1			6.5			9.7			18.5	
Approach LOS		A			A			A			B	

Intersection Summary	
Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	100
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.29
Intersection Signal Delay:	7.4
Intersection Capacity Utilization:	50.0%
Analysis Period (min):	15
Intersection LOS:	A
ICU Level of Service:	A



Queues Total 5 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	49	649	100	607	8	2	10	56	4	23	32
v/c Ratio	0.04	0.29	0.16	0.27	0.01	0.01	0.05	0.20	0.02	0.09	0.11
Control Delay	2.5	7.5	3.0	7.2	0.0	38.5	39.0	3.5	38.5	39.7	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	7.5	3.0	7.2	0.0	38.5	39.0	3.5	38.5	39.7	0.8
Queue Length 50th (m)	0.9	27.8	3.7	26.2	0.0	0.4	1.9	0.0	0.7	4.3	0.0
Queue Length 95th (m)	1.9	37.4	7.0	35.1	0.0	2.6	6.9	3.1	4.1	11.9	0.0
Internal Link Dist (m)		300.5		223.2			134.7			191.5	
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0
Base Capacity (vph)	1485	2242	760	2256	1018	466	550	550	471	591	560
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.29	0.13	0.27	0.01	0.00	0.02	0.10	0.01	0.04	0.06

Intersection Summary

Intersection Summary	
Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	100
Natural Cycle:	90
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.29
Intersection Signal Delay:	7.4
Intersection Capacity Utilization:	50.0%
Analysis Period (min):	15
Intersection LOS:	A
ICU Level of Service:	A

HCM Signalized Intersection Capacity Analysis  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Total 5 Year

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↕	↔	↕	↔	
Traffic Volume (vph)	45	561	30	91	552	7	2	9	51	4	21	29	
Future Volume (vph)	45	561	30	91	552	7	2	9	51	4	21	29	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Fr	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3400	3301		1719	3139	1380	1805	1667	1468	1805	1792	1495	
Flt Permitted	0.42	1.00		0.37	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00	
Satd. Flow (perm)	1486	3301		672	3139	1380	1410	1667	1468	1427	1792	1495	
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)	49	616	33	100	607	8	2	10	56	4	23	32	
RTOR Reduction (vph)	0	2	0	0	0	2	0	0	50	0	0	28	
Lane Group Flow (vph)	49	647	0	100	607	6	2	10	6	4	23	4	
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	
Protected Phases	5	2		1	6			8				4	
Permitted Phases	2			6		6	8		8	4		4	
Actuated Green, G (s)	71.1	64.8		74.7	66.6	66.6	7.9	7.9	7.9	7.9	7.9	7.9	
Effective Green, g (s)	75.1	69.2		78.7	71.0	71.0	11.7	11.7	11.7	11.7	11.7	11.7	
Actuated g/C Ratio	0.73	0.67		0.76	0.69	0.69	0.11	0.11	0.11	0.11	0.11	0.11	
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8	
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5	
Lane Grp Cap (vph)	1237	2217		616	2163	951	160	189	166	162	203	169	
v/s Ratio Prot	0.00	c0.20		c0.02	0.19			0.01			c0.01		
v/s Ratio Perm	0.03			0.11		0.00	0.00		0.00	0.00		0.00	
v/c Ratio	0.04	0.29		0.16	0.28	0.01	0.01	0.05	0.04	0.02	0.11	0.02	
Uniform Delay, d1	3.8	6.9		3.2	6.2	5.0	40.5	40.7	40.6	40.6	41.0	40.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.3	0.0	0.0	0.1	0.1	0.1	0.3	0.1	
Delay (s)	3.9	7.2		3.4	6.5	5.0	40.6	40.8	40.8	40.7	41.3	40.6	
Level of Service	A	A		A	A	A	D	D	D	D	D	D	
Approach Delay (s)		7.0			6.0			40.8			40.9		
Approach LOS		A			A			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay	9.3		HCM 2000 Level of Service					A					
HCM 2000 Volume to Capacity ratio	0.25												
Actuated Cycle Length (s)	103.0		Sum of lost time (s)					12.0					
Intersection Capacity Utilization	50.0%		ICU Level of Service					A					
Analysis Period (min)	15												
c Critical Lane Group													

Lanes, Volumes, Timings  
 201: Cross Ave & Lyons Lane

Total 5 Year  
 AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↕	↔	↔
Traffic Volume (vph)	43	547	328	79	60	35
Future Volume (vph)	43	547	328	79	60	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.955		0.943	
Flt Protected	0.950				0.972	
Satd. Flow (prot)	1624	3094	2789	0	1419	0
Flt Permitted	0.950				0.972	
Satd. Flow (perm)	1624	3094	2789	0	1419	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	4			4	7	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Heavy Vehicles (%)	0%	5%	16%	0%	0%	25%
Adj. Flow (vph)	62	943	373	158	97	70
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	62	943	531	0	167	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	32.4%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Total 5 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↕↕	
Traffic Volume (veh/h)	43	547	328	79	60	35
Future Volume (Veh/h)	43	547	328	79	60	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Hourly flow rate (vph)	62	943	373	158	97	70
Pedestrians			7		4	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	535				1058	270
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	457				997	183
tC, single (s)	4.1				6.8	7.4
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.5
p0 queue free %	94				56	90
cM capacity (veh/h)	1077				221	735
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	62	472	472	249	282	167
Volume Left	62	0	0	0	0	97
Volume Right	0	0	0	0	158	70
eSH	1077	1700	1700	1700	1700	313
Volume to Capacity	0.06	0.28	0.28	0.15	0.17	0.53
Queue Length 95th (m)	1.5	0.0	0.0	0.0	0.0	23.6
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	28.9
Lane LOS	A					D
Approach Delay (s)	0.5			0.0		28.9
Approach LOS						D
<b>Intersection Summary</b>						
Average Delay			3.1			
Intersection Capacity Utilization			32.4%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕↕	
Traffic Volume (vph)	0	5	4	66	41	1
Future Volume (vph)	0	5	4	66	41	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.872		0.995	
Fit Protected					0.954	
Satd. Flow (prot)	0	1710	1491	0	1231	0
Fit Permitted					0.954	
Satd. Flow (perm)	0	1710	1491	0	1231	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		60.5	89.6		37.6	
Travel Time (s)		4.4	6.5		2.7	
Confl. Peds. (#/hr)	6			6	1	
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	33%	0%
Adj. Flow (vph)	0	10	5	88	108	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	10	93	0	112	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 16.8%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Total 5 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	5	4	66	41	1
Future Volume (Veh/h)	0	5	4	66	41	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Hourly flow rate (vph)	0	10	5	88	108	4
Pedestrians			1		6	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	99				66	55
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	99				66	55
tC, single (s)	4.1				6.7	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.3
p0 queue free %	100				87	100
cM capacity (veh/h)	1499				863	1012
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	10	93	112			
Volume Left	0	0	108			
Volume Right	0	88	4			
cSH	1499	1700	867			
Volume to Capacity	0.00	0.05	0.13			
Queue Length 95th (m)	0.0	0.0	3.5			
Control Delay (s)	0.0	0.0	9.8			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			5.1			
Intersection Capacity Utilization		16.8%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	78	755	245	129	270
Future Volume (vph)	1	78	755	245	129	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.962		0.909	
Fit Protected		0.999			0.984	
Satd. Flow (prot)	0	1673	1610	0	1530	0
Fit Permitted		0.999			0.984	
Satd. Flow (perm)	0	1673	1610	0	1530	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)	1			1	5	1
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Heavy Vehicles (%)	100%	0%	3%	0%	0%	0%
Adj. Flow (vph)	4	186	878	340	516	1080
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	190	1218	0	1596	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	24	14	24	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 93.9%				ICU Level of Service F		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Total 5 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	78	755	245	129	270
Future Volume (Veh/h)	1	78	755	245	129	270
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Hourly flow rate (vph)	4	186	878	340	516	1080
Pedestrians		1	5		1	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	1219				1248	1050
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1219				1248	1050
tC, single (s)	5.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	3.1				3.5	3.3
p0 queue free %	99				0	0
cM capacity (veh/h)	333				190	278
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	190	1218	1596			
Volume Left	4	0	516			
Volume Right	0	340	1080			
eSH	333	1700	242			
Volume to Capacity	0.01	0.72	6.60			
Queue Length 95th (m)	0.3	0.0	Err			
Control Delay (s)	0.5	0.0	Err			
Lane LOS	A		F			
Approach Delay (s)	0.5	0.0	Err			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			5312.4			
Intersection Capacity Utilization			93.9%		ICU Level of Service	F
Analysis Period (min)			15			

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕↕	↕↕↕	
Traffic Volume (vph)	0	217	0	2054	1634	926
Future Volume (vph)	0	217	0	2054	1634	926
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)		3.6	3.5	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Frts		0.865			0.940	
Fit Protected						
Satd. Flow (prot)	0	1367	0	4363	4252	0
Fit Permitted						
Satd. Flow (perm)	0	1367	0	4363	4252	0
Link Speed (k/h)		50		50	50	
Link Distance (m)		145.7		270.2	51.4	
Travel Time (s)		10.5		19.5	3.7	
Confl. Peds. (#/hr)						11
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82
Heavy Vehicles (%)	0%	7%	0%	7%	4%	2%
Adj. Flow (vph)	0	402	0	2233	1685	1129
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	402	0	2233	2814	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment		Left Right		Left Left	Left Right	
Median Width(m)		0.0		3.3	3.3	
Link Offset(m)		0.0		0.0	0.0	
Crosswalk Width(m)		4.8		4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)		24	14	24		14
Sign Control		Stop		Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	80.1%			ICU Level of Service D		
Analysis Period (min)	15					



HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Total 5 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations		↗		↖↗	↖↗		
Traffic Volume (veh/h)	0	217	0	2054	1634	926	
Future Volume (Veh/h)	0	217	0	2054	1634	926	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82	
Hourly flow rate (vph)	0	402	0	2233	1685	1129	
Pedestrians	11						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	1						
Right turn flare (veh)							
Median type			None	None			
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.64	0.64	0.64				
vC, conflicting volume	3005	1137	2825				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	2174	0	1894				
tC, single (s)	6.8	7.0	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	41	100				
cM capacity (veh/h)	26	680	204				
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	402	744	744	744	674	674	1466
Volume Left	0	0	0	0	0	0	0
Volume Right	402	0	0	0	0	0	1129
sSH	680	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.59	0.44	0.44	0.44	0.40	0.40	0.86
Queue Length 95th (m)	31.2	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	17.6	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C						
Approach Delay (s)	17.6	0.0			0.0		
Approach LOS	C						
Intersection Summary							
Average Delay			1.3				
Intersection Capacity Utilization			80.1%		ICU Level of Service		D
Analysis Period (min)			15				

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	24	177	372	399	66	167	189	1079	887	163	963	27
Future Volume (vph)	24	177	372	399	66	167	189	1079	887	163	963	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0		25.0	145.0		0.0	95.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	0.99					0.98			0.97	1.00		
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1693	1425	3060	1676	1398	1425	4446	1398	1562	4532	1398
Fit Permitted	0.711			0.349			0.171			0.176		
Satd. Flow (perm)	1204	1693	1425	1124	1676	1366	256	4446	1363	289	4532	1398
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			347			180			507			191
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.9			293.8			275.1				252.7
Travel Time (s)		20.6			21.2			19.8				18.2
Confl. Peds. (#/hr)	11					11			10		10	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Adj. Flow (vph)	26	190	400	429	71	180	203	1160	954	175	1035	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	190	400	429	71	180	203	1160	954	175	1035	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings

205: Trafalgar Rd & Leighton Ave/Iroquois Shore Rd

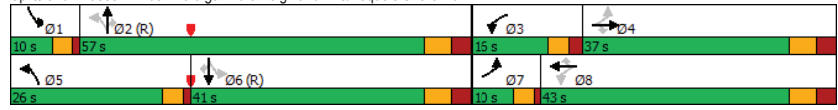
Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	10.0	34.0	34.0	11.0	43.0	43.0	10.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	10.0	37.0	37.0	16.0	43.0	43.0	26.0	57.0	57.0	10.0	41.0	41.0
Total Split (%)	8.3%	30.8%	30.8%	13.3%	35.8%	35.8%	21.7%	47.5%	47.5%	8.3%	34.2%	34.2%
Maximum Green (s)	6.0	30.0	30.0	11.0	36.0	36.0	22.0	50.0	50.0	6.0	34.0	34.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	29.4	23.4	23.4	38.4	33.4	33.4	69.9	56.9	56.9	64.3	52.7	52.7
Actuated g/C Ratio	0.24	0.20	0.20	0.32	0.28	0.28	0.58	0.47	0.47	0.54	0.44	0.44
v/c Ratio	0.08	0.58	0.72	0.80	0.15	0.35	0.67	0.55	1.04	0.63	0.52	0.04
Control Delay	26.0	49.8	14.9	44.3	33.2	6.6	25.1	24.4	58.6	27.9	27.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	49.8	14.9	44.3	33.2	6.6	25.1	24.4	58.6	27.9	27.7	0.1
LOS	C	D	B	D	C	A	C	C	E	C	C	A
Approach Delay	26.2			33.1			38.5			27.1		
Approach LOS	C			C			D			C		

Intersection Summary

Area Type:	CBD
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	33.6 (28%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	130
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.04
Intersection Signal Delay:	33.3
Intersection LOS:	C
Intersection Capacity Utilization:	92.4%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 205: Trafalgar Rd & Leighton Ave/Iroquois Shore Rd



Queues

205: Trafalgar Rd & Leighton Ave/Iroquois Shore Rd

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	26	190	400	429	71	180	203	1160	954	175	1035	29
v/c Ratio	0.08	0.58	0.72	0.80	0.15	0.35	0.67	0.55	1.04	0.63	0.52	0.04
Control Delay	26.0	49.8	14.9	44.3	33.2	6.6	25.1	24.4	58.6	27.9	27.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	49.8	14.9	44.3	33.2	6.6	25.1	24.4	58.6	27.9	27.7	0.1
Queue Length 50th (m)	4.4	43.1	11.1	43.1	13.9	0.0	21.8	76.2	~187.9	18.2	67.1	0.0
Queue Length 95th (m)	10.0	62.2	43.3	52.2	24.3	16.5	46.5	93.2	#270.2	#64.2	101.5	0.0
Internal Link Dist (m)	261.9			269.8			251.1			228.7		
Turn Bay Length (m)	60.0			165.0			25.0			145.0		
Base Capacity (vph)	316	465	643	537	544	565	371	2108	913	278	1990	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.41	0.62	0.80	0.13	0.32	0.55	0.55	1.04	0.63	0.52	0.04

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	24	177	372	399	66	167	189	1079	887	163	963	27
Future Volume (vph)	24	177	372	399	66	167	189	1079	887	163	963	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1613	1693	1425	3060	1676	1366	1425	4446	1363	1562	4532	1398
Fit Permitted	0.71	1.00	1.00	0.35	1.00	1.00	0.17	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1207	1693	1425	1125	1676	1366	257	4446	1363	289	4532	1398
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	26	190	400	429	71	180	203	1160	954	175	1035	29
RTOR Reduction (vph)	0	0	275	0	0	130	0	0	273	0	0	17
Lane Group Flow (vph)	26	190	125	429	71	50	203	1160	681	175	1035	12
Confl. Peds. (#/hr)	11				11				10		10	
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	25.6	22.0	22.0	38.0	30.4	30.4	68.0	52.4	52.4	59.7	48.1	48.1
Effective Green, g (s)	25.6	25.0	25.0	38.0	33.4	33.4	68.0	55.4	55.4	59.7	51.1	51.1
Actuated g/C Ratio	0.21	0.21	0.21	0.32	0.28	0.28	0.57	0.46	0.46	0.50	0.43	0.43
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	269	352	296	533	466	380	300	2052	629	266	1929	595
v/s Ratio Prot	0.00	0.11		c0.07	0.04		c0.09	0.26		0.06	0.23	
v/s Ratio Perm	0.02		0.09	c0.18		0.04	0.29		c0.50	0.26		0.01
v/c Ratio	0.10	0.54	0.42	0.80	0.15	0.13	0.68	0.57	1.08	0.66	0.54	0.02
Uniform Delay, d1	37.7	42.4	41.2	35.3	32.6	32.4	16.0	23.5	32.3	18.1	25.6	20.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	2.0	1.3	8.6	0.2	0.2	5.9	1.1	60.4	5.8	1.1	0.1
Delay (s)	37.9	44.4	42.6	44.0	32.8	32.7	22.0	24.7	92.7	23.9	26.7	20.0
Level of Service	D	D	D	D	C	C	C	C	F	C	C	C
Approach Delay (s)		42.9				39.8			52.4			26.2
Approach LOS		D				D			D			C

Intersection Summary			
HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
303: North Access & South Service Rd E

Total 5 Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	86	40	78	26	25	308
Future Volume (vph)	86	40	78	26	25	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.957				0.875	
Fit Protected				0.964	0.996	
Satd. Flow (prot)	1783	0	0	1796	1623	0
Fit Permitted				0.964	0.996	
Satd. Flow (perm)	1783	0	0	1796	1623	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	523.2			302.5	113.1	
Travel Time (s)	37.7			21.8	8.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	43	85	28	27	335
Shared Lane Traffic (%)						
Lane Group Flow (vph)	136	0	0	113	362	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	43.1%
Analysis Period (min)	15
ICU Level of Service	A

HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Total 5 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	86	40	78	26	25	308
Future Volume (Veh/h)	86	40	78	26	25	308
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)	93	43	85	28	27	335
<b>Pedestrians</b>						
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			136		312	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			136		312	114
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		96	64
cM capacity (veh/h)			1448		640	938
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	136	113	362			
Volume Left	0	85	27			
Volume Right	43	0	335			
sSH	1700	1448	907			
Volume to Capacity	0.08	0.06	0.40			
Queue Length 95th (m)	0.0	1.5	15.5			
Control Delay (s)	0.0	5.9	11.6			
Lane LOS	A		B			
Approach Delay (s)	0.0	5.9	11.6			
Approach LOS	A		B			
<b>Intersection Summary</b>						
Average Delay			7.9			
Intersection Capacity Utilization			43.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Queuing and Blocking Report

Total 5 Year  
AM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	158.4	132.8	78.2	77.0	32.3	298.6	264.4	57.4	132.8	150.8	151.9
Average Queue (m)	121.1	148.6	58.5	71.3	38.4	20.3	209.6	105.0	45.5	91.2	108.9	148.8
95th Queue (m)	129.6	155.2	110.4	84.3	89.0	38.9	375.8	324.6	69.8	132.7	154.1	151.0
Link Distance (m)	123.0		123.0	51.4	51.4	313.2		313.2	128.0		128.0	128.0
Upstream Blk Time (%)	4	56	2	50	16	26		7	1		6	84
Queuing Penalty (veh)	0	381	13	340	107	0		0	6		31	466
Storage Bay Dist (m)	130.0					25.0				50.0		
Storage Blk Time (%)	4	56			6	77				6	35	
Queuing Penalty (veh)	20	310			14	53				18	70	

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	B34	SB	SB	SB	SB
Directions Served	T	T	T	L	T	T	TR
Maximum Queue (m)	100.4	108.0	136.4	32.3	183.0	139.2	126.7
Average Queue (m)	26.1	87.5	112.1	26.5	57.2	39.1	52.7
95th Queue (m)	87.3	131.0	162.1	40.2	136.7	94.5	106.8
Link Distance (m)	101.5	101.5	101.5	239.0		239.0	239.0
Upstream Blk Time (%)	0	2	53				
Queuing Penalty (veh)	0	13	295				
Storage Bay Dist (m)	25.0						
Storage Blk Time (%)			33	13			
Queuing Penalty (veh)			110	49			

Queuing and Blocking Report

Total 5 Year  
AM Peak Hour

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	B7	B7	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	27.4	276.5	274.1	27.4	83.7	69.8	44.9	26.3	79.2	85.1	22.4	189.9
Average Queue (m)	11.1	206.6	202.4	23.9	49.7	34.3	4.2	1.8	33.7	61.2	21.4	182.5
95th Queue (m)	30.0	283.1	287.0	32.7	88.8	65.5	23.1	15.5	70.9	99.5	24.7	187.9
Link Distance (m)		352.9	352.9		51.4	51.4	123.0	123.0	66.7	66.7		159.0
Upstream Blk Time (%)						21		3		7		34
Queuing Penalty (veh)						111		19		0		0
Storage Bay Dist (m)	20.0			20.0							15.0	
Storage Blk Time (%)	1	78		49	9						88	20
Queuing Penalty (veh)	3	34		206	11						565	110

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	B14
Directions Served	T
Maximum Queue (m)	165.0
Average Queue (m)	162.5
95th Queue (m)	164.9
Link Distance (m)	160.7
Upstream Blk Time (%)	72
Queuing Penalty (veh)	735
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	20.3	28.9	29.0	30.6	29.4	30.0	20.2	18.6	27.5	27.3
Average Queue (m)	7.5	18.8	19.4	13.1	4.9	8.9	7.5	7.7	11.0	11.7
95th Queue (m)	17.2	28.4	28.2	26.5	18.3	22.8	17.0	14.9	22.8	22.9
Link Distance (m)	21.8	21.8	21.8		352.9	352.9		54.8	56.7	56.7
Upstream Blk Time (%)	1	10	10							
Queuing Penalty (veh)	1	20	19							
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)				1	1		1	0		
Queuing Penalty (veh)				2	1		1	0		

Queuing and Blocking Report

Total 5 Year  
AM Peak Hour

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.7	87.4	283.4	274.0	87.3	131.1	140.0	32.3	209.8	210.0	63.9	74.6
Average Queue (m)	82.5	87.2	269.1	245.2	11.1	114.7	126.9	19.6	119.0	133.1	32.9	35.1
95th Queue (m)	89.5	87.7	302.1	323.6	45.9	150.9	147.8	39.3	216.4	228.3	56.9	63.0
Link Distance (m)			266.8	266.8		122.1	122.1		289.9	289.9		101.5
Upstream Blk Time (%)			82	5		15	74		0			1
Queuing Penalty (veh)			0	0		0	0		0			2
Storage Bay Dist (m)	80.0	80.0			80.0			25.0			80.0	
Storage Blk Time (%)	9	77	1		0	16		10	51		0	1
Queuing Penalty (veh)	26	217	5		0	4		26	32		0	2

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	62.5	31.1
Average Queue (m)	29.9	6.9
95th Queue (m)	56.0	19.4
Link Distance (m)	101.5	101.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	137.8	186.1	186.4	36.6	38.8	42.0	312.9	318.8	314.9
Average Queue (m)	24.7	161.0	179.8	28.6	29.9	30.9	294.0	305.4	303.8
95th Queue (m)	91.7	246.9	186.8	31.9	35.1	38.1	357.2	313.3	310.4
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	0	58	87	41	44	51	44	66	80
Queuing Penalty (veh)	0	0	0	280	302	348	363	548	660
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report

Total 5 Year  
AM Peak Hour

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	34.4	131.7	178.2	185.2	178.3	65.7	81.2	110.0	262.1	265.0	259.4	270.8
Average Queue (m)	1.2	120.1	154.9	168.5	122.2	25.4	33.4	63.3	251.7	253.3	251.8	259.1
95th Queue (m)	14.4	135.5	197.4	197.2	252.2	52.1	66.6	102.0	257.2	261.7	257.3	320.6
Link Distance (m)		117.8	171.3	171.3	171.3	299.7	299.7	299.7	249.2	249.2	249.2	249.2
Upstream Blk Time (%)		96	26	79	58				74	77	81	96
Queuing Penalty (veh)		0	0	0	0				322	333	350	416
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)		98										
Queuing Penalty (veh)		1										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	145.2	139.9	122.6	52.9	54.6	132.8	125.5
Average Queue (m)	91.2	89.0	66.6	28.1	27.2	91.6	83.9
95th Queue (m)	128.0	124.6	106.7	49.0	48.8	122.6	117.1
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	66.6	84.1	69.9	64.8	54.3	99.3	106.1
Average Queue (m)	29.3	56.9	45.8	38.4	20.1	61.0	67.5
95th Queue (m)	62.4	76.1	67.7	60.9	46.5	94.2	100.5
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Total 5 Year  
AM Peak Hour

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	40.8	23.6	34.2	20.4	47.7	32.7
Average Queue (m)	22.3	8.6	17.2	5.1	21.3	16.9
95th Queue (m)	34.9	20.1	27.4	14.4	36.0	27.3
Link Distance (m)	121.6	121.6	175.0	175.0	246.4	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	5.7	15.3	48.0	37.2	21.4	42.2	32.0	5.3	8.0	10.1	6.2	20.6
Average Queue (m)	0.4	4.7	17.4	8.7	6.6	10.9	5.0	0.4	0.5	1.7	0.6	4.1
95th Queue (m)	3.1	11.6	37.4	23.3	14.6	28.8	18.3	3.0	3.6	7.1	3.6	12.5
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0			70.0	15.0			
Storage Blk Time (%)									0	1		
Queuing Penalty (veh)									0	0		

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	SB
Directions Served	R
Maximum Queue (m)	4.5
Average Queue (m)	0.2
95th Queue (m)	3.2
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Total 5 Year  
AM Peak Hour

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	10.2	12.1	61.1	9.0	15.9	25.0
Average Queue (m)	2.3	0.5	17.7	0.3	1.0	11.4
95th Queue (m)	8.9	5.1	47.8	3.1	7.2	20.0
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)					0	1
Queuing Penalty (veh)					0	0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	1	0				
Queuing Penalty (veh)	3	0				

Intersection: 202: Lyons Lane & South Service Rd E

Movement	WB	SB
Directions Served	TR	LR
Maximum Queue (m)	1.8	22.7
Average Queue (m)	0.1	6.8
95th Queue (m)	1.3	19.4
Link Distance (m)	70.8	21.6
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 203: Argus Rd & South Service Rd E

Movement	WB	SB	B17	B18
Directions Served	TR	LR	T	T
Maximum Queue (m)	120.3	108.4	59.4	294.1
Average Queue (m)	116.8	102.4	54.1	285.1
95th Queue (m)	120.5	105.8	58.8	342.1
Link Distance (m)	112.3	88.3	39.8	290.0
Upstream Blk Time (%)	72	100	99	85
Queuing Penalty (veh)	663	394	392	334
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Total 5 Year  
AM Peak Hour

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	T	T	T	T	TR
Maximum Queue (m)	24.7	97.0	111.3	122.9	32.6	41.6
Average Queue (m)	10.9	56.2	66.4	74.5	11.4	30.0
95th Queue (m)	20.8	89.1	98.8	109.8	32.8	36.9
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8
Upstream Blk Time (%)					1	61
Queuing Penalty (veh)					11	516
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	L
Maximum Queue (m)	10.4	269.6	269.6	172.5	282.5	282.1	29.9	43.4	46.3	52.4	136.9	102.5
Average Queue (m)	1.1	193.3	253.1	155.4	258.3	234.0	6.8	14.1	15.7	16.1	24.4	45.9
95th Queue (m)	5.6	377.0	332.7	194.5	340.5	384.4	23.0	33.4	37.0	40.9	84.3	126.9
Link Distance (m)		265.0	265.0		273.8	273.8		249.2	249.2	249.2		
Upstream Blk Time (%)		60	88		80	69						0
Queuing Penalty (veh)		0	0		0	0						0
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				95.0
Storage Blk Time (%)		0		28	89	2	1					0
Queuing Penalty (veh)		0		56	177	3	1					0

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB
Directions Served	T	T	T	R
Maximum Queue (m)	244.1	246.8	243.4	97.5
Average Queue (m)	227.1	226.0	224.4	10.5
95th Queue (m)	287.6	289.7	293.0	60.0
Link Distance (m)	234.2	234.2	234.2	
Upstream Blk Time (%)	83	79	82	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (m)				90.0
Storage Blk Time (%)	92		94	0
Queuing Penalty (veh)	150		25	0

Queuing and Blocking Report

Total 5 Year  
AM Peak Hour

Intersection: 303: North Access & South Service Rd E

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	256.3	6.7	108.4
Average Queue (m)	126.6	0.3	97.7
95th Queue (m)	294.7	3.4	139.1
Link Distance (m)	505.0	290.0	103.8
Upstream Blk Time (%)			87
Queuing Penalty (veh)			0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 12095

Lanes, Volumes, Timings

Total 5 Year  
PM Peak Hour

101: Trafalgar Rd & Cross Ave/South Service Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1371	266	203	233	298	314	325	1550	122	177	1419	566
Future Volume (vph)	1371	266	203	233	298	314	325	1550	122	177	1419	566
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Ped Bike Factor		0.98		0.99				0.97				0.99
Frt		0.939				0.850		0.985				0.959
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2958	1453	0	1540	1644	1423	1496	4428	0	1570	4344	0
Fit Permitted	0.950			0.430			0.091			0.100		
Satd. Flow (perm)	2958	1453	0	687	1644	1423	143	4428	0	165	4344	0
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)		36				148		14			71	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		151.2			330.4			150.2			270.2	
Travel Time (s)		10.9			23.8			10.8			19.5	
Confl. Peds. (#/hr)			15	15			18		70	70		18
Peak Hour Factor	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%
Adj. Flow (vph)	1632	369	251	284	368	383	382	1685	185	197	1594	609
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1632	620	0	284	368	383	382	1870	0	197	2203	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lanes, Volumes, Timings

101: Trafalgar Rd & Cross Ave/South Service Rd

Total 5 Year

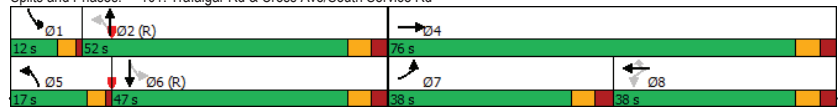
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		25.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	38.0	76.0		38.0	38.0	38.0	17.0	52.0		12.0	47.0	
Total Split (%)	27.1%	54.3%		27.1%	27.1%	27.1%	12.1%	37.1%		8.6%	33.6%	
Maximum Green (s)	31.0	69.0		31.0	31.0	31.0	13.0	45.0		8.0	40.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	C-Max			Min	C-Max	
Walk Time (s)		7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0	0	0		0			0	
Act Effct Green (s)	34.0	72.0		31.0	34.0	34.0	60.0	48.0		51.0	43.0	
Actuated g/C Ratio	0.24	0.51		0.22	0.24	0.24	0.43	0.34		0.36	0.31	
v/c Ratio	2.27	0.81		1.87	0.92	0.84	2.05	1.22		1.41	1.59	
Control Delay	602.3	36.7		445.3	81.0	47.5	500.6	147.2		238.6	304.7	
Queue Delay	0.0	2.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	602.3	38.7		445.3	81.0	47.5	500.6	147.2		238.6	304.7	
LOS	F	D		F	F	D	F	F		F	F	
Approach Delay		447.1			168.6			207.1			299.3	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	128 (91%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	2.27
Intersection Signal Delay:	298.0
Intersection LOS:	F
Intersection Capacity Utilization:	139.2%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 101: Trafalgar Rd & Cross Ave/South Service Rd



Queues

101: Trafalgar Rd & Cross Ave/South Service Rd

Total 5 Year

PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1632	620	284	368	383	382	1870	197	2203
v/c Ratio	2.27	0.81	1.87	0.92	0.84	2.05	1.22	1.41	1.59
Control Delay	602.3	36.7	445.3	81.0	47.5	500.6	147.2	238.6	304.7
Queue Delay	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	602.3	38.7	445.3	81.0	47.5	500.6	147.2	238.6	304.7
Queue Length 50th (m)	~396.7	139.6	~125.7	105.4	68.8	~161.3	~242.8	~61.8	~328.4
Queue Length 95th (m)	#403.6	130.1	#165.1	#138.1	94.5 m	#120.9	m148.0	m#72.8	m#332.3
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	718	764	152	399	457	186	1527	140	1383
Starvation Cap Reductn	0	56	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	2.27	0.88	1.87	0.92	0.84	2.05	1.22	1.41	1.59

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
101: Trafalgar Rd & Cross Ave/South Service Rd

Total 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1371	266	203	233	298	314	325	1550	122	177	1419	566
Future Volume (vph)	1371	266	203	233	298	314	325	1550	122	177	1419	566
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	0.97		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00		1.00	1.00	
Fr t	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2958	1454		1517	1644	1423	1496	4429		1570	4342	
Flt Permitted	0.95	1.00		0.43	1.00	1.00	0.09	1.00		0.10	1.00	
Satd. Flow (perm)	2958	1454		686	1644	1423	143	4429		165	4342	
Peak-hour factor, PHF	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93
Adj. Flow (vph)	1632	369	251	284	368	383	382	1685	185	197	1594	609
RTOR Reduction (vph)	0	17	0	0	0	112	0	9	0	0	49	0
Lane Group Flow (vph)	1632	603	0	284	368	271	382	1861	0	197	2154	0
Confl. Peds. (#/hr)			15	15			18		70	70		18
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		8		5	2			1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)	31.0	69.0		31.0	31.0	31.0	57.0	45.0		48.0	40.0	
Effective Green, g (s)	34.0	72.0		31.0	34.0	34.0	57.0	48.0		48.0	43.0	
Actuated g/C Ratio	0.24	0.51		0.22	0.24	0.24	0.41	0.34		0.34	0.31	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	718	747		151	399	345	183	1518		136	1333	
v/s Ratio Prot	c0.55	0.41		0.22		c0.19	0.42			0.08	0.50	
v/s Ratio Perm				c0.41		0.19	c0.65			0.41		
v/c Ratio	2.27	0.81		1.88	0.92	0.79	2.09	1.23		1.45	1.62	
Uniform Delay, d1	53.0	28.2		54.5	51.7	49.6	41.0	46.0		40.3	48.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.17	1.20		1.45	1.21	
Incremental Delay, d2	577.3	6.7		420.4	26.9	11.8	491.0	102.2		223.8	279.1	
Delay (s)	630.3	34.9		474.9	78.6	61.4	538.8	157.5		282.1	337.7	
Level of Service	F	C		F	E	E	F	F		F	F	
Approach Delay (s)	466.4			181.0			222.2				333.2	
Approach LOS	F			F			F				F	

Intersection Summary			
HCM 2000 Control Delay	319.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	139.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	1135	45	119	601	138	92	2	108	410	23	236
Future Volume (vph)	48	1135	45	119	601	138	92	2	108	410	23	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95		0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99	0.95	0.99	0.97		0.98	0.98	
Fr t		0.994			0.968			0.857			0.864	
Flt Protected	0.950			0.950		0.950				0.950		
Satd. Flow (prot)	1570	3099	0	797	3120	0	785	708	0	1570	1320	0
Flt Permitted	0.348			0.092			0.357			0.594		
Satd. Flow (perm)	572	3099	0	77	3120	0	293	708	0	965	1320	0
Right Turn on Red			Yes		Yes		Yes		Yes			Yes
Satd. Flow (RTOR)		6			67			139			265	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		374.0			72.9			81.9			180.7	
Travel Time (s)		26.9			5.2			5.9			13.0	
Confl. Peds. (#/hr)	9		4	4		9	12		20	20		12
Peak Hour Factor	0.66	0.81		0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	100%	0%	100%
Adj. Flow (vph)	73	1401	60	127	633	170	131	8	161	477	31	303
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	1461	0	127	803	0	131	169	0	477	334	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

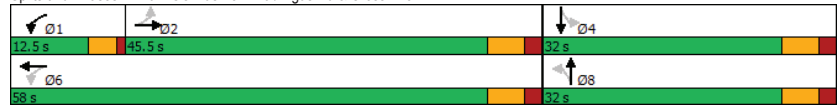
Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	45.5	45.5		12.5	58.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.6%	50.6%		13.9%	64.4%		35.6%	35.6%		35.6%	35.6%	
Maximum Green (s)	39.5	39.5		8.5	52.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	41.5	41.5		54.0	54.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.46	0.46		0.60	0.60		0.31	0.31		0.31	0.31	
v/c Ratio	0.28	1.02		1.11	0.42		1.44	0.53		1.59	0.56	
Control Delay	18.6	54.4		143.7	9.5		278.3	13.7		307.0	10.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.6	54.4		143.7	9.5		278.3	13.7		307.0	10.3	
LOS	B	D		F	A		F	B		F	B	
Approach Delay		52.7			27.9			129.2			184.8	
Approach LOS		D			C			F			F	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	90
Natural Cycle:	100
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	1.59
Intersection Signal Delay:	82.6
Intersection LOS:	F
Intersection Capacity Utilization:	96.5%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 102: GO Bus Terminal/Argus Rd & Cross Ave



Queues  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	1461	127	803	131	169	477	334
v/c Ratio	0.28	1.02	1.11	0.42	1.44	0.53	1.59	0.56
Control Delay	18.6	54.4	143.7	9.5	278.3	13.7	307.0	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	54.4	143.7	9.5	278.3	13.7	307.0	10.3
Queue Length 50th (m)	7.9	~142.7	~19.1	34.2	~32.7	3.9	~125.0	9.1
Queue Length 95th (m)	12.4	#159.0	#55.5	46.5	#49.5	0.0	#174.0	17.7
Internal Link Dist (m)		350.0		48.9		57.9		156.7
Turn Bay Length (m)	20.0		20.0					15.0
Base Capacity (vph)	263	1432	114	1898	91	316	300	593
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	0.28	1.02	1.11	0.42	1.44	0.53	1.59	0.56

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 5 Year  
PM Peak Hour

	↖	→	↗	↙	←	↘	↖	↗	↙	↘	↖	↗	↙	↘	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖		↖	↖		↖	↖	
Traffic Volume (vph)	48	1135	45	119	601	138	92	2	108	410	23	236			
Future Volume (vph)	48	1135	45	119	601	138	92	2	108	410	23	236			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.3	3.6	3.3	3.6	3.6	3.6	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0				
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00				
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.98				
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.98	1.00				
Frt	1.00	0.99		1.00	0.97		1.00	0.86		1.00	0.86				
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00				
Satd. Flow (prot)	1561	3098		797	3121		780	708		1543	1320				
Flt Permitted	0.35	1.00		0.09	1.00		0.36	1.00		0.59	1.00				
Satd. Flow (perm)	572	3098		77	3121		293	708		965	1320				
Peak-hour factor, PHF	0.66	0.81	0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75	0.78			
Adj. Flow (vph)	73	1401	60	127	633	170	131	8	161	477	31	303			
RTOR Reduction (vph)	0	3	0	0	27	0	0	96	0	0	183	0			
Lane Group Flow (vph)	73	1458	0	127	776	0	131	73	0	477	151	0			
Confl. Peds. (#/hr)	9		4	4		9	12		20	20		12			
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	0%	100%	0%			
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA				
Protected Phases		2		1	6		8		8		4				
Permitted Phases	2			6			8			4					
Actuated Green, G (s)	39.5	39.5		52.0	52.0		26.0	26.0		26.0	26.0				
Effective Green, g (s)	41.5	41.5		52.0	54.0		28.0	28.0		28.0	28.0				
Actuated g/C Ratio	0.46	0.46		0.58	0.60		0.31	0.31		0.31	0.31				
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0				
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0				
Lane Grp Cap (vph)	263	1428		112	1872		91	220		300	410				
v/s Ratio Prot		0.47		c0.11	0.25			0.10			0.11				
v/s Ratio Perm	0.13			c0.54			0.45			c0.49					
v/c Ratio	0.28	1.02		1.13	0.41		1.44	0.33		1.59	0.37				
Uniform Delay, d1	15.0	24.2		25.4	9.6		31.0	23.8		31.0	24.1				
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00				
Incremental Delay, d2	1.2	29.2		125.6	0.3		249.2	1.2		280.8	0.8				
Delay (s)	16.2	53.5		151.0	9.9		280.2	25.0		311.8	24.9				
Level of Service	B	D		F	A		F	C		F	C				
Approach Delay (s)		51.7			29.2			136.5			193.6				
Approach LOS		D			C			F			F				
Intersection Summary															
HCM 2000 Control Delay			85.1	HCM 2000 Level of Service						F					
HCM 2000 Volume to Capacity ratio			1.30												
Actuated Cycle Length (s)			90.0	Sum of lost time (s)						12.0					
Intersection Capacity Utilization			96.5%	ICU Level of Service						F					
Analysis Period (min)			15												
c Critical Lane Group															

Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave

Total 5 Year  
PM Peak Hour

	↖	→	↗	↙	←	↘	↖	↗	↙	↘	↖	↗	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖		↖	↖		↖	↖
Traffic Volume (vph)	30	269	8	24	578	47	257	4	233	32	2	71		
Future Volume (vph)	30	269	8	24	578	47	257	4	233	32	2	71		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.3	3.6	3.3	3.6	3.6	3.6
Storage Length (m)	0.0	0.0	25.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	0	1	0
Taper Length (m)	7.5			7.5			7.5			7.5			7.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99		1.00	0.99
Frt		0.995			0.982			0.856			0.855			
Flt Protected	0.950			0.950			0.950			0.950			0.950	
Satd. Flow (prot)	1525	2920	0	1570	3047	0	1570	1440	0	1570	1416	0		
Flt Permitted	0.388			0.475			0.675			0.429				
Satd. Flow (perm)	621	2920	0	784	3047	0	1115	1440	0	707	1416	0		
Right Turn on Red			Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			27			295			118			
Link Speed (k/h)		50			50			50			50			
Link Distance (m)		40.1			374.0			69.1			70.9			
Travel Time (s)		2.9			26.9			5.0			5.1			
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1		
Peak Hour Factor	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60		
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%		
Adj. Flow (vph)	52	320	11	44	608	85	347	12	295	46	4	118		
Shared Lane Traffic (%)														
Lane Group Flow (vph)	52	331	0	44	693	0	347	307	0	46	122	0		
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No		
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right		
Median Width(m)		3.3			3.3			3.3			3.3			
Link Offset(m)		0.0			0.0			0.0			0.0			
Crosswalk Width(m)		4.8			4.8			4.8			4.8			
Two way Left Turn Lane														
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14		14
Number of Detectors	1	2		1	2		1	2		1	2		1	2
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru		Left	Thru
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel														
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4			9.4
Detector 2 Size(m)		0.6			0.6			0.6			0.6			0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex
Detector 2 Channel														

Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

Total 5 Year

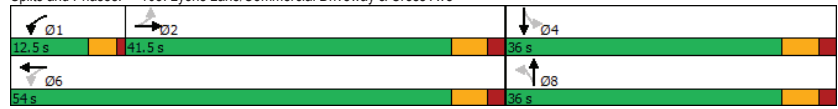
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.5	41.5		12.5	54.0		36.0	36.0		36.0	36.0	
Total Split (%)	46.1%	46.1%		13.9%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	35.5	35.5		8.5	48.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.0	37.0		49.1	49.1		30.6	30.6		30.6	30.6	
Actuated g/C Ratio	0.42	0.42		0.56	0.56		0.35	0.35		0.35	0.35	
v/c Ratio	0.20	0.27		0.09	0.40		0.89	0.44		0.19	0.21	
Control Delay	19.2	17.3		9.8	11.6		54.2	5.2		22.1	5.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.2	17.3		9.8	11.6		54.2	5.2		22.1	5.3	
LOS	B	B		A	B		D	A		C	A	
Approach Delay		17.6			11.5			31.2			9.9	
Approach LOS		B			B			C			A	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	87.7
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.89
Intersection Signal Delay:	19.2
Intersection LOS:	B
Intersection Capacity Utilization:	64.4%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 103: Lyons Lane/Commercial Driveway & Cross Ave



Queues

103: Lyons Lane/Commercial Driveway & Cross Ave

Total 5 Year

PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	331	44	693	347	307	46	122
v/c Ratio	0.20	0.27	0.09	0.40	0.89	0.44	0.19	0.21
Control Delay	19.2	17.3	9.8	11.6	54.2	5.2	22.1	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	17.3	9.8	11.6	54.2	5.2	22.1	5.3
Queue Length 50th (m)	5.8	19.7	3.4	34.0	57.1	1.4	5.6	0.5
Queue Length 95th (m)	8.6	27.3	4.8	46.7	#71.1	0.0	10.5	0.1
Internal Link Dist (m)		16.1		350.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	265	1253	514	1750	407	713	258	592
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	0.20	0.26	0.09	0.40	0.85	0.43	0.18	0.21

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
 103: Lyons Lane/Commercial Driveway & Cross Ave

Total 5 Year  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	30	269	8	24	578	47	257	4	233	32	2	71
Future Volume (vph)	30	269	8	24	578	47	257	4	233	32	2	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.86		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1521	2920		1570	3046		1569	1440		1566	1416	
Flt Permitted	0.39	1.00		0.48	1.00		0.68	1.00		0.43	1.00	
Satd. Flow (perm)	621	2920		785	3046		1115	1440		707	1416	
Peak-hour factor, PHF	0.82	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60
Adj. Flow (vph)	52	320	11	44	608	85	347	12	295	46	4	118
RTOR Reduction (vph)	0	3	0	0	12	0	0	192	0	0	77	0
Lane Group Flow (vph)	52	328	0	44	681	0	347	115	0	46	45	0
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6		8			4		4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		47.0	47.0		28.6	28.6		28.6	28.6	
Effective Green, g (s)	37.0	37.0		47.0	49.0		30.6	30.6		30.6	30.6	
Actuated g/C Ratio	0.42	0.42		0.54	0.56		0.35	0.35		0.35	0.35	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	262	1233		492	1703		389	503		246	494	
v/s Ratio Prot		0.11		0.01	c0.22			0.08			0.03	
v/s Ratio Perm	0.08			0.04			c0.31			0.07		
v/c Ratio	0.20	0.27		0.09	0.40		0.89	0.23		0.19	0.09	
Uniform Delay, d1	16.0	16.5		9.9	11.0		26.9	20.2		19.8	19.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.2		0.1	0.3		22.2	0.3		0.5	0.1	
Delay (s)	16.7	16.7		9.9	11.3		49.1	20.5		20.3	19.3	
Level of Service	B	B		A	B		D	C		C	B	
Approach Delay (s)		16.7			11.2			35.7			19.6	
Approach LOS		B			B			D			B	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	87.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings  
 104: Trafalgar Rd & Cornwall Rd

Total 5 Year  
 PM Peak Hour

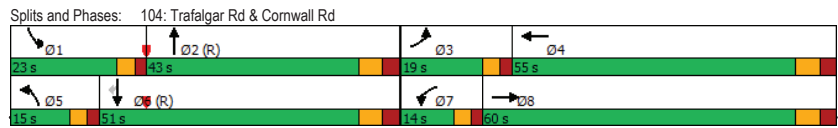
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	532	691	224	67	941	728	164	541	51	620	702	539
Future Volume (vph)	532	691	224	67	941	728	164	541	51	620	702	539
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0		0.0	80.0		0.0	25.0		0.0	80.0		0.0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00
Ped Bike Factor	1.00	0.99		0.99	0.98		0.99	1.00		0.99	0.97	0.97
Frt		0.960			0.939			0.985				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3016	3002	0	1570	2970	0	1540	3192	0	2987	1710	1409
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3010	3002	0	1559	2970	0	1528	3192	0	2961	1710	1361
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		43			140			9				163
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.8			142.3			311.4				130.3
Travel Time (s)		20.6			10.2			22.4				9.4
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Peak Hour Factor	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Adj. Flow (vph)	598	823	295	80	1134	783	184	601	68	795	798	613
Shared Lane Traffic (%)												
Lane Group Flow (vph)	598	1118	0	80	1917	0	184	669	0	795	798	613
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			6.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	19.0	60.0		14.0	55.0		15.0	43.0		23.0	51.0	51.0
Total Split (%)	13.6%	42.9%		10.0%	39.3%		10.7%	30.7%		16.4%	36.4%	36.4%
Maximum Green (s)	14.0	53.0		9.0	48.0		10.0	36.0		18.0	44.0	44.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	15.0	56.0		10.0	51.0		11.0	39.0		19.0	47.0	47.0
Actuated g/C Ratio	0.11	0.40		0.07	0.36		0.08	0.28		0.14	0.34	0.34
v/c Ratio	1.85	0.91		0.71	1.64		1.52	0.75		1.96	1.39	1.08
Control Delay	428.0	50.1		95.9	320.1		313.0	51.5		469.3	206.7	64.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	428.0	50.1		95.9	320.1		313.0	51.5		469.3	206.7	64.9
LOS	F	D		F	F		F	D		F	F	E
Approach Delay		181.8			311.1			107.9			261.9	
Approach LOS		F			F			F			F	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.96  
 Intersection Signal Delay: 236.7      Intersection LOS: F  
 Intersection Capacity Utilization 137.1%      ICU Level of Service H  
 Analysis Period (min) 15



Queues  
104: Trafalgar Rd & Cornwall Rd

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	598	1118	80	1917	184	669	795	798	613
v/c Ratio	1.85	0.91	0.71	1.64	1.52	0.75	1.96	1.39	1.08
Control Delay	428.0	50.1	95.9	320.1	313.0	51.5	469.3	206.7	64.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	428.0	50.1	95.9	320.1	313.0	51.5	469.3	206.7	64.9
Queue Length 50th (m)	~136.0	155.8	23.2	~412.6	~74.7	92.7	~189.9	~302.7	~77.6
Queue Length 95th (m)	#172.1	168.7	#44.7	#405.2	#123.1	116.6	#106.5	m85.5	m33.1
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	323	1226	112	1170	121	895	405	574	565
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.85	0.91	0.71	1.64	1.52	0.75	1.96	1.39	1.08

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

HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Total 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	532	691	224	67	941	728	164	541	51	620	702	539
Future Volume (vph)	532	691	224	67	941	728	164	541	51	620	702	539
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		0.97	1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00		1.00	1.00	0.97
Ftp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.94		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)	3016	3003		1570	2969		1540	3191		2987	1710	1361
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3016	3003		1570	2969		1540	3191		2987	1710	1361
Peak-hour factor, PHF	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Adj. Flow (vph)	598	823	295	80	1134	783	184	601	68	795	798	612
RTOR Reduction (vph)	0	26	0	0	89	0	0	6	0	0	0	108
Lane Group Flow (vph)	598	1092	0	80	1828	0	184	663	0	795	798	505
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	14.0	53.0		9.0	48.0		10.0	36.0		18.0	44.0	44.0
Effective Green, g (s)	15.0	56.0		10.0	51.0		11.0	39.0		19.0	47.0	47.0
Actuated g/C Ratio	0.11	0.40		0.07	0.36		0.08	0.28		0.14	0.34	0.34
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	323	1201		112	1081		121	888		405	574	456
v/s Ratio Prot	c0.20	0.36		0.05	c0.62		0.12	0.21		c0.27	c0.47	
v/s Ratio Perm												0.37
v/c Ratio	1.85	0.91		0.71	1.69		1.52	0.75		1.96	1.39	1.11
Uniform Delay, d1	62.5	39.6		63.6	44.5		64.5	46.0		60.5	46.5	46.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.29	0.75	0.65
Incremental Delay, d2	394.9	11.7		32.1	315.0		271.8	5.7		434.1	176.6	51.5
Delay (s)	457.4	51.3		95.7	359.5		336.3	51.7		512.0	211.3	81.5
Level of Service	F	D		F	F		F	D		F	F	F
Approach Delay (s)		192.8			348.9			113.1			283.6	
Approach LOS		F			F			F			F	

Intersection Summary		
HCM 2000 Control Delay	258.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.68	F
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	137.1%	ICU Level of Service
Analysis Period (min)	15	H
c Critical Lane Group		

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↕		↕↕	↕↕	
Traffic Volume (vph)	987	613	0	2062	2080	0
Future Volume (vph)	987	613	0	2062	2080	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor		0.99				
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3046	1423	0	4577	4577	0
Flt Permitted	0.950					
Satd. Flow (perm)	3046	1402	0	4577	4577	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		2				
Link Speed (k/h)		50		50	50	
Link Distance (m)		199.2		51.4	324.8	
Travel Time (s)		14.3		3.7	23.4	
Confl. Peds. (#/hr)		2				
Peak Hour Factor	0.87	0.93	0.25	0.97	0.94	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Adj. Flow (vph)	1134	659	0	2126	2213	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1134	659	0	2126	2213	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	

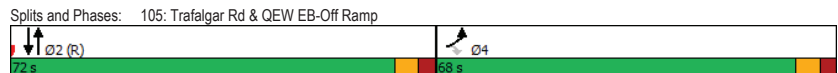


Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	68.0	68.0		72.0	72.0	
Total Split (%)	48.6%	48.6%		51.4%	51.4%	
Maximum Green (s)	61.0	61.0		65.0	65.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	64.0	64.0		68.0	68.0	
Actuated g/C Ratio	0.46	0.46		0.49	0.49	
v/c Ratio	0.81	1.03		0.96	1.00	
Control Delay	38.7	79.9		38.9	37.1	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	38.7	79.9		38.9	37.1	
LOS	D	E		D	D	
Approach Delay	53.9			38.9	37.1	
Approach LOS	D			D	D	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 133.6 (95%), Referenced to phase 2:NBSB and 6:, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 42.6  
 Intersection Capacity Utilization 93.7%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service F



Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1134	659	2126	2213
v/c Ratio	0.81	1.03	0.96	1.00
Control Delay	38.7	79.9	38.9	37.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	38.7	79.9	38.9	37.1
Queue Length 50th (m)	144.8	~204.2	201.8	213.0
Queue Length 95th (m)	165.7	#282.1	m88.4 m#229.1	
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1392	642	2223	2223
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.81	1.03	0.96	1.00

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

HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 5 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔		↑↑↑	↑↑↑	
Traffic Volume (vph)	987	613	0	2062	2080	0
Future Volume (vph)	987	613	0	2062	2080	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		0.91	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Fr	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3046	1402		4577	4577	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3046	1402		4577	4577	
Peak-hour factor, PHF	0.87	0.93	0.25	0.97	0.94	0.25
Adj. Flow (vph)	1134	659	0	2126	2213	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	1134	658	0	2126	2213	0
Confl. Peds. (#/hr)		2				
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	61.0	61.0		65.0	65.0	
Effective Green, g (s)	64.0	64.0		68.0	68.0	
Actuated g/C Ratio	0.46	0.46		0.49	0.49	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1392	640		2223	2223	
v/s Ratio Prot	0.37			0.46	0.48	
v/s Ratio Perm		c0.47				
v/c Ratio	0.81	1.03		0.96	1.00	
Uniform Delay, d1	32.9	38.0		34.6	35.8	
Progression Factor	1.00	1.00		1.08	0.73	
Incremental Delay, d2	3.8	42.9		1.5	10.4	
Delay (s)	36.7	80.9		38.8	36.6	
Level of Service	D	F		D	D	
Approach Delay (s)	52.9			38.8	36.6	
Approach LOS	D			D	D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			42.1			HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			1.01			
Actuated Cycle Length (s)			140.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			93.7%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔		↑↑↑		↔	↔	↔
Traffic Volume (vph)	23	0	228	608	105	213	0	2587	0	0	1915	12
Future Volume (vph)	23	0	228	608	105	213	0	2587	0	0	1915	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	1.00					0.99						0.95
Fr			0.850			0.850						0.850
Flt Protected	0.950			0.950	0.968							
Satd. Flow (prot)	1570	0	1437	1463	1547	1409	0	4577	0	0	3795	1437
Flt Permitted	0.950			0.950	0.968							
Satd. Flow (perm)	1568	0	1437	1463	1547	1389	0	4577	0	0	3795	1359
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			31			157						70
Link Speed (k/h)		50			50			50				50
Link Distance (m)		142.1			192.6			324.8				280.4
Travel Time (s)		10.2			13.9			23.4				20.2
Confl. Peds. (#/hr)	2					2	14		14	14		14
Peak Hour Factor	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Adj. Flow (vph)	38	0	240	724	148	263	0	2752	0	0	1995	19
Shared Lane Traffic (%)				40%								
Lane Group Flow (vph)	38	0	240	434	438	263	0	2752	0	0	1995	19
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1		1		2		2		1
Detector Template	Left		Right	Left	Thru	Right		Thru		Thru		Right
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0		10.0		2.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6		0.6		2.0
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

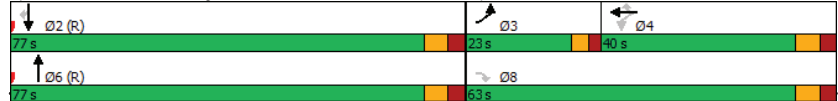
Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	Perm	
Protected Phases	3			4	4			6			2	
Permitted Phases			8	4		4						2
Detector Phase	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		63.0	40.0	40.0	40.0		77.0			77.0	77.0
Total Split (%)	16.4%		45.0%	28.6%	28.6%	28.6%		55.0%			55.0%	55.0%
Maximum Green (s)	18.0		56.0	33.0	33.0	33.0		70.0			70.0	70.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)			7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (#/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	10.1		59.0	44.9	44.9	44.9		73.0			73.0	73.0
Actuated g/C Ratio	0.07		0.42	0.32	0.32	0.32		0.52			0.52	0.52
v/c Ratio	0.34		0.39	0.93	0.88	0.48		1.15			1.01	0.03
Control Delay	69.0		26.3	73.2	65.9	18.3		103.8			55.7	0.1
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	69.0		26.3	73.2	65.9	18.3		103.8			55.7	0.1
LOS	E		C	E	E	B		F			E	A
Approach Delay		32.1				57.7		103.8			55.2	
Approach LOS		C				E		F			E	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.15  
 Intersection Signal Delay: 76.3  
 Intersection LOS: E  
 Intersection Capacity Utilization 90.6%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	38	240	434	438	263	2752	1995	19
v/c Ratio	0.34	0.39	0.93	0.88	0.48	1.15	1.01	0.03
Control Delay	69.0	26.3	73.2	65.9	18.3	103.8	55.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.0	26.3	73.2	65.9	18.3	103.8	55.7	0.1
Queue Length 50th (m)	10.8	41.3	128.2	126.9	23.2	~342.9	~212.5	0.0
Queue Length 95th (m)	15.0	64.7	#186.5	130.7	41.4	#370.1	#252.8	0.0
Internal Link Dist (m)				168.6		300.8	256.4	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	623	468	495	551	2386	1978	742
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.39	0.93	0.88	0.48	1.15	1.01	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	0	228	608	105	213	0	2587	0	0	1915	12
Future Volume (vph)	23	0	228	608	105	213	0	2587	0	0	1915	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		0.91			0.91	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99		1.00			1.00	0.95
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00		0.85	1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	0.97	1.00		1.00			1.00	1.00
Satd. Flow (prot)	1570		1437	1463	1547	1389		4577			3795	1359
Flt Permitted	0.95		1.00	0.95	0.97	1.00		1.00			1.00	1.00
Satd. Flow (perm)	1570		1437	1463	1547	1389		4577			3795	1359
Peak-hour factor, PHF	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Adj. Flow (vph)	38	0	240	724	148	263	0	2752	0	0	1995	19
RTOR Reduction (vph)	0	0	18	0	0	107	0	0	0	0	0	9
Lane Group Flow (vph)	38	0	222	434	438	156	0	2752	0	0	1995	10
Confl. Peds. (#/hr)	2					2	14		14	14		14
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA			NA	Perm
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	9.1		56.0	41.9	41.9	41.9		70.0			70.0	70.0
Effective Green, g (s)	10.1		59.0	44.9	44.9	44.9		73.0			73.0	73.0
Actuated g/C Ratio	0.07		0.42	0.32	0.32	0.32		0.52			0.52	0.52
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Lane Grp Cap (vph)	113		605	469	496	445		2386			1978	708
v/s Ratio Prot	0.02							c0.60			0.53	
v/s Ratio Perm			c0.15	c0.30	0.28	0.11						0.01
v/c Ratio	0.34		0.37	0.93	0.88	0.35		1.15			1.01	0.01
Uniform Delay, d1	61.8		27.7	45.9	45.1	36.4		33.5			33.5	16.1
Progression Factor	1.00		1.00	1.00	1.00	1.00		1.02			1.00	1.00
Incremental Delay, d2	1.8		0.4	24.1	16.8	0.5		71.2			22.3	0.0
Delay (s)	63.5		28.1	70.1	61.8	36.9		105.4			55.8	16.2
Level of Service	E		C	E	E	D		F			E	B
Approach Delay (s)		32.9				59.2		105.4			55.5	
Approach LOS		C				E		F			E	

Intersection Summary			
HCM 2000 Control Delay	77.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Total 5 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	755	663	1059	0	0	1125
Future Volume (vph)	755	663	1059	0	0	1125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frt	0.966	0.850				
Flt Protected	0.963					
Satd. Flow (prot)	3344	1455	3574	0	0	3539
Flt Permitted	0.963					
Satd. Flow (perm)	3344	1455	3574	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	42	42				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Adj. Flow (vph)	821	721	1151	0	0	1223
Shared Lane Traffic (%)		33%				
Lane Group Flow (vph)	1059	483	1151	0	0	1223
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex			CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

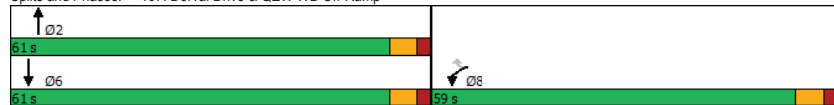
Total 5 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	59.0	59.0	61.0			61.0
Total Split (%)	49.2%	49.2%	50.8%			50.8%
Maximum Green (s)	53.0	53.0	55.0			55.0
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	47.3	47.3	57.2			57.2
Actuated g/C Ratio	0.42	0.42	0.51			0.51
v/c Ratio	0.74	0.76	0.63			0.68
Control Delay	29.6	33.7	23.1			24.3
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	29.6	33.7	23.1			24.3
LOS	C	C	C			C
Approach Delay	30.9		23.1			24.3
Approach LOS	C		C			C

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	112.6
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	26.6
Intersection Capacity Utilization:	66.2%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	C

Splits and Phases: 107: Dorval Drive & QEW WB Off-Ramp



Queues  
107: Dorval Drive & QEW WB Off-Ramp

Total 5 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1059	483	1151	1223
v/c Ratio	0.74	0.76	0.63	0.68
Control Delay	29.6	33.7	23.1	24.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.6	33.7	23.1	24.3
Queue Length 50th (m)	100.3	94.2	102.3	112.6
Queue Length 95th (m)	124.4	141.2	138.1	151.5
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1662	735	1817	1799
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.66	0.63	0.68

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Total 5 Year  
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕			↕↕
Traffic Volume (vph)	755	663	1059	0	0	1125
Future Volume (vph)	755	663	1059	0	0	1125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr	0.97	0.85	1.00			1.00
Fit Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3344	1455	3574			3539
Fit Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3344	1455	3574			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	821	721	1151	0	0	1223
RTOR Reduction (vph)	24	24	0	0	0	0
Lane Group Flow (vph)	1035	459	1151	0	0	1223
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	45.3	45.3	55.2			55.2
Effective Green, g (s)	47.3	47.3	57.2			57.2
Actuated g/C Ratio	0.42	0.42	0.51			0.51
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1405	611	1817			1799
v/s Ratio Prot	0.31		0.32			c0.35
v/s Ratio Perm		c0.32				
v/c Ratio	0.74	0.75	0.63			0.68
Uniform Delay, d1	27.4	27.6	20.0			20.8
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	2.3	5.8	1.7			2.1
Delay (s)	29.7	33.4	21.7			22.9
Level of Service	C	C	C			C
Approach Delay (s)	30.9		21.7			22.9
Approach LOS	C		C			C
<b>Intersection Summary</b>						
HCM 2000 Control Delay			25.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.71			
Actuated Cycle Length (s)			112.5		Sum of lost time (s)	8.0
Intersection Capacity Utilization			66.2%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕	↕↕	
Traffic Volume (vph)	293	349	0	1271	1203	0
Future Volume (vph)	293	349	0	1271	1203	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr	0.950	0.850				
Fit Protected	0.968					
Satd. Flow (prot)	3302	1441	0	3539	3505	0
Fit Permitted	0.968					
Satd. Flow (perm)	3302	1441	0	3539	3505	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	76	77				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Adj. Flow (vph)	318	379	0	1382	1308	0
Shared Lane Traffic (%)		42%				
Lane Group Flow (vph)	477	220	0	1382	1308	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
<b>Detector 1 Channel</b>						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
<b>Detector 2 Channel</b>						
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
<b>Detector 2 Channel</b>						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	

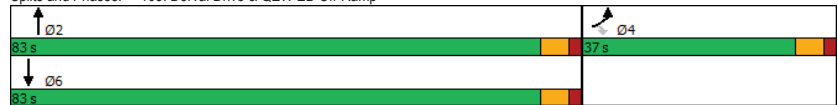
Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	37.0	37.0		83.0	83.0	
Total Split (%)	30.8%	30.8%		69.2%	69.2%	
Maximum Green (s)	31.0	31.0		77.0	77.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	22.5	22.5		79.1	79.1	
Actuated g/C Ratio	0.21	0.21		0.72	0.72	
v/c Ratio	0.65	0.62		0.54	0.52	
Control Delay	37.4	33.0		8.5	8.2	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	37.4	33.0		8.5	8.2	
LOS	D	C		A	A	
Approach Delay	36.0			8.5	8.2	
Approach LOS	D			A	A	

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	109.6
Natural Cycle:	55
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.65
Intersection Signal Delay:	14.1
Intersection Capacity Utilization:	66.2%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	C

Splits and Phases: 108: Dorval Drive & QEW EB Off-Ramp



Queues  
108: Dorval Drive & QEW EB Off-Ramp

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	477	220	1382	1308
v/c Ratio	0.65	0.62	0.54	0.52
Control Delay	37.4	33.0	8.5	8.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	37.4	33.0	8.5	8.2
Queue Length 50th (m)	42.8	31.9	64.7	59.5
Queue Length 95th (m)	59.8	60.3	105.2	97.2
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1049	488	2555	2530
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.45	0.45	0.54	0.52

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Total 5 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↗		↕↕	↕↕	
Traffic Volume (vph)	293	349	0	1271	1203	0
Future Volume (vph)	293	349	0	1271	1203	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Fr	0.95	0.85		1.00	1.00	
Flt Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3301	1441		3539	3505	
Flt Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3301	1441		3539	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	318	379	0	1382	1308	0
RTOR Reduction (vph)	60	61	0	0	0	0
Lane Group Flow (vph)	417	159	0	1382	1308	0
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	20.5	20.5		77.2	77.2	
Effective Green, g (s)	22.5	22.5		79.2	79.2	
Actuated g/C Ratio	0.21	0.21		0.72	0.72	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	677	295		2555	2530	
v/s Ratio Prot	c0.13			c0.39	0.37	
v/s Ratio Perm		0.11				
v/c Ratio	0.62	0.54		0.54	0.52	
Uniform Delay, d1	39.7	39.0		7.0	6.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	2.4		0.8	0.8	
Delay (s)	41.6	41.4		7.8	7.5	
Level of Service	D	D		A	A	
Approach Delay (s)	41.5			7.8	7.5	
Approach LOS	D			A	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		14.6		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.56				
Actuated Cycle Length (s)		109.7		Sum of lost time (s)		8.0
Intersection Capacity Utilization		66.2%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

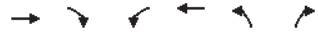
Total 5 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕↕	↕↕
Traffic Volume (vph)	814	0	0	1336	224	506
Future Volume (vph)	814	0	0	1336	224	506
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Fr						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3574	0	0	3574	1805	1599
Flt Permitted					0.950	
Satd. Flow (perm)	3574	0	0	3574	1805	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						56
Link Speed (k/h)	60			60	40	
Link Distance (m)	130.3			194.2	262.1	
Travel Time (s)	7.8			11.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Adj. Flow (vph)	885	0	0	1452	243	550
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	885	0	0	1452	243	550
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
<b>Lead/Lag</b>						
<b>Lead-Lag Optimize?</b>						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40



Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Total 5 Year  
PM Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
v/c Ratio	0.62			1.02	0.34	0.82
Control Delay	13.1			45.0	11.0	24.1
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	13.1			45.0	11.0	24.1
LOS	B			D	B	C
Approach Delay	13.1			45.0	20.1	
Approach LOS	B			D	C	

**Intersection Summary**

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green

Natural Cycle: 60

Control Type: Pretimed

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 29.7




Intersection LOS: C

Intersection Capacity Utilization 61.3%

ICU Level of Service B


Analysis Period (min) 15

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street

 Ø2 (R) 22.5 s	 Ø4 22.5 s
 Ø8 22.5 s	

Queues  
109: QEW WB Off-Ramp & Kerr Street

Total 5 Year  
PM Peak Hour



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	885	1452	243	550
v/c Ratio	0.62	1.02	0.34	0.82
Control Delay	13.1	45.0	11.0	24.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.1	45.0	11.0	24.1
Queue Length 50th (m)	28.9	~61.8	13.2	34.1
Queue Length 95th (m)	43.8	#105.3	26.0	#83.5
Internal Link Dist (m)	106.3	170.2	238.1	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1429	1429	722	673
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	1.02	0.34	0.82

**Intersection Summary**

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

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

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Total 5 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↓	↑
Traffic Volume (vph)	814	0	0	1336	224	506
Future Volume (vph)	814	0	0	1336	224	506
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr't	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3574			3574	1805	1599
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3574			3574	1805	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	885	0	0	1452	243	550
RTOR Reduction (vph)	0	0	0	0	0	34
Lane Group Flow (vph)	885	0	0	1452	243	516
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1429			1429	722	639
v/s Ratio Prot	0.25			c0.41	0.13	
v/s Ratio Perm						c0.32
v/c Ratio	0.62			1.02	0.34	0.81
Uniform Delay, d1	10.8			13.5	9.4	12.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	2.0			27.9	1.3	10.6
Delay (s)	12.8			41.4	10.6	22.5
Level of Service	B			D	B	C
Approach Delay (s)	12.8			41.4	18.9	
Approach LOS	B			D	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			27.6	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.91			
Actuated Cycle Length (s)			45.0	Sum of lost time (s)		9.0
Intersection Capacity Utilization			61.3%	ICU Level of Service		B
Analysis Period (min)			15			

c Critical Lane Group

Lanes, Volumes, Timings

110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

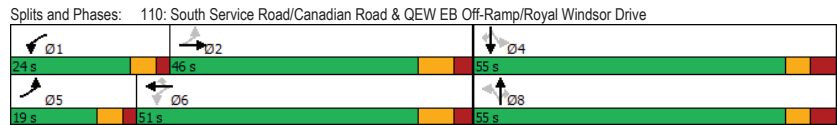
Total 5 Year

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↓	↑↑		↑↓	↑↑	↑↓	↑↓	↑	↑	↑↓	↑↓	↑↓
Traffic Volume (vph)	332	578	18	194	691	29	15	50	106	15	138	451
Future Volume (vph)	332	578	18	194	691	29	15	50	106	15	138	451
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0		0.0	155.0		70.0	15.0		0.0	0.0		30.0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't		0.996				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950		0.950			0.950
Satd. Flow (prot)	3502	3398	0	1752	3505	1615	1805	1900	1615	1805	1900	1599
Flt Permitted	0.274			0.314			0.582		0.720			
Satd. Flow (perm)	1010	3398	0	579	3505	1615	1106	1900	1615	1368	1900	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			3			94			120			330
Link Speed (k/h)		80			80			60				40
Link Distance (m)		324.5			247.2			158.7				215.5
Travel Time (s)		14.6			11.1			9.5				19.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Adj. Flow (vph)	377	657	20	220	785	33	17	57	120	17	157	513
Shared Lane Traffic (%)												
Lane Group Flow (vph)	377	677	0	220	785	33	17	57	120	17	157	513
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

Lanes, Volumes, Timings Total 5 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	29.4		14.0	38.4	38.4	28.8	28.8	28.8	28.8	28.8	28.8
Total Split (s)	19.0	46.0		24.0	51.0	51.0	55.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	15.2%	36.8%		19.2%	40.8%	40.8%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%
Maximum Green (s)	13.0	37.6		18.0	42.6	42.6	47.2	47.2	47.2	47.2	47.2	47.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	59.6	47.0		60.9	47.6	47.6	25.2	25.2	25.2	25.2	25.2	25.2
Actuated g/C Ratio	0.61	0.48		0.62	0.49	0.49	0.26	0.26	0.26	0.26	0.26	0.26
v/c Ratio	0.40	0.41		0.42	0.46	0.04	0.06	0.12	0.24	0.05	0.32	0.78
Control Delay	9.4	19.8		11.0	19.6	0.1	26.1	26.9	6.0	25.8	30.2	20.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	19.8		11.0	19.6	0.1	26.1	26.9	6.0	25.8	30.2	20.1
LOS	A	B		B	B	A	C	C	A	C	C	C
Approach Delay		16.1			17.2			13.9			22.5	
Approach LOS		B			B			B			C	

Intersection Summary	
Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	97.7
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	17.8
Intersection Capacity Utilization:	69.6%
Intersection LOS:	B
ICU Level of Service:	C
Analysis Period (min):	15



Queues Total 5 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	377	677	220	785	33	17	57	120	17	157	513	
v/c Ratio	0.40	0.41	0.42	0.46	0.04	0.06	0.12	0.24	0.05	0.32	0.78	
Control Delay	9.4	19.8	11.0	19.6	0.1	26.1	26.9	6.0	25.8	30.2	20.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.4	19.8	11.0	19.6	0.1	26.1	26.9	6.0	25.8	30.2	20.1	
Queue Length 50th (m)	12.7	42.2	14.8	50.8	0.0	2.5	8.6	0.0	2.5	25.0	32.9	
Queue Length 95th (m)	28.6	82.6	37.3	91.5	0.0	7.6	17.8	11.7	7.5	41.4	69.0	
Internal Link Dist (m)		300.5		223.2			134.7			191.5		
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0	
Base Capacity (vph)	1028	1634	624	1708	835	585	1005	910	723	1005	1001	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.37	0.41	0.35	0.46	0.04	0.03	0.06	0.13	0.02	0.16	0.51	

Intersection Summary

Intersection Summary	
Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	97.7
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	17.8
Intersection Capacity Utilization:	69.6%
Intersection LOS:	B
ICU Level of Service:	C
Analysis Period (min):	15

HCM Signalized Intersection Capacity Analysis  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive PM Peak Hour

Total 5 Year

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕	↕	↔	↕	↕	↔	↕	↕
Traffic Volume (vph)	332	578	18	194	691	29	15	50	106	15	138	451
Future Volume (vph)	332	578	18	194	691	29	15	50	106	15	138	451
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	3396		1752	3505	1615	1805	1900	1615	1805	1900	1599
Flt Permitted	0.27	1.00		0.31	1.00	1.00	0.58	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	1009	3396		580	3505	1615	1105	1900	1615	1368	1900	1599
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)	377	657	20	220	785	33	17	57	120	17	157	512
RTOR Reduction (vph)	0	2	0	0	0	17	0	0	89	0	0	245
Lane Group Flow (vph)	377	675	0	220	785	16	17	57	31	17	157	268
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	53.1	42.5		54.5	43.2	43.2	21.4	21.4	21.4	21.4	21.4	21.4
Effective Green, g (s)	57.1	46.9		58.5	47.6	47.6	25.2	25.2	25.2	25.2	25.2	25.2
Actuated g/C Ratio	0.59	0.48		0.60	0.49	0.49	0.26	0.26	0.26	0.26	0.26	0.26
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	914	1635		508	1712	789	285	491	417	353	491	413
v/s Ratio Prot	0.05	0.20		c0.06	c0.22			0.03			0.08	
v/s Ratio Perm	0.19			0.20		0.01	0.02		0.02	0.01		c0.17
v/c Ratio	0.41	0.41		0.43	0.46	0.02	0.06	0.12	0.07	0.05	0.32	0.65
Uniform Delay, d1	10.1	16.3		9.5	16.4	12.9	27.2	27.6	27.3	27.1	29.2	32.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.8		0.7	0.9	0.0	0.1	0.1	0.1	0.1	0.4	3.7
Delay (s)	10.4	17.1		10.2	17.3	12.9	27.3	27.7	27.4	27.2	29.6	35.8
Level of Service	B	B		B	B	B	C	C	C	C	C	D
Approach Delay (s)		14.7			15.7			27.5			34.2	
Approach LOS		B			B			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.4	HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			97.4	Sum of lost time (s)				12.0				
Intersection Capacity Utilization			69.6%	ICU Level of Service				C				
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
 201: Cross Ave & Lyons Lane

Total 5 Year  
 PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕		↕	↕
Traffic Volume (vph)	58	264	663	164	37	72
Future Volume (vph)	58	264	663	164	37	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.960		0.909	
Fr						
Flt Protected	0.950				0.984	
Satd. Flow (prot)	1388	2954	3052	0	1489	0
Flt Permitted	0.950				0.984	
Satd. Flow (perm)	1388	2954	3052	0	1489	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	1			1	9	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Heavy Vehicles (%)	17%	10%	3%	0%	0%	4%
Adj. Flow (vph)	116	287	789	283	84	176
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	116	287	1072	0	260	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15		25	15
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.0%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Total 5 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	58	264	663	164	37	72
Future Volume (Veh/h)	58	264	663	164	37	72
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Hourly flow rate (vph)	116	287	789	283	84	176
Pedestrians			9		1	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked	0.88				0.88	0.88
vC, conflicting volume	1073				1316	537
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	819				1094	213
tC, single (s)	4.4				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	82				44	75
cM capacity (veh/h)	632				151	694
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	116	144	144	526	546	260
Volume Left	116	0	0	0	0	84
Volume Right	0	0	0	0	283	176
cSH	632	1700	1700	1700	1700	322
Volume to Capacity	0.18	0.08	0.08	0.31	0.32	0.81
Queue Length 95th (m)	5.3	0.0	0.0	0.0	0.0	54.0
Control Delay (s)	12.0	0.0	0.0	0.0	0.0	50.1
Lane LOS	B					F
Approach Delay (s)	3.4			0.0		50.1
Approach LOS						F
<b>Intersection Summary</b>						
Average Delay			8.3			
Intersection Capacity Utilization			47.0%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	4	6	1	120	63	6
Future Volume (vph)	4	6	1	120	63	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.868		0.986	
Fit Protected		0.974			0.957	
Satd. Flow (prot)	0	1666	1221	0	1614	0
Fit Permitted		0.974			0.957	
Satd. Flow (perm)	0	1666	1221	0	1614	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		60.5	89.6		37.6	
Travel Time (s)		4.4	6.5		2.7	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Heavy Vehicles (%)	0%	0%	0%	22%	0%	0%
Adj. Flow (vph)	11	10	4	194	126	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	21	198	0	140	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 20.9%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Total 5 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	4	6	1	120	63	6
Future Volume (Veh/h)	4	6	1	120	63	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Hourly flow rate (vph)	11	10	4	194	126	14
Pedestrians					7	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	205				140	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	205				140	108
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				85	99
cM capacity (veh/h)	1370				846	946
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	21	198	140			
Volume Left	11	0	126			
Volume Right	0	194	14			
cSH	1370	1700	855			
Volume to Capacity	0.01	0.12	0.16			
Queue Length 95th (m)	0.2	0.0	4.7			
Control Delay (s)	4.0	0.0	10.0			
Lane LOS	A		B			
Approach Delay (s)	4.0	0.0	10.0			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			4.1			
Intersection Capacity Utilization		20.9%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	12	37	496	342	81	163
Future Volume (vph)	12	37	496	342	81	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.937		0.906	
Fit Protected		0.987			0.985	
Satd. Flow (prot)	0	1541	1521	0	1526	0
Fit Permitted		0.987			0.985	
Satd. Flow (perm)	0	1541	1521	0	1526	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)					5	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Heavy Vehicles (%)	0%	13%	10%	0%	0%	0%
Adj. Flow (vph)	27	74	570	503	108	251
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	101	1073	0	359	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 75.0%				ICU Level of Service D		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Total 5 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	12	37	496	342	81	163
Future Volume (Veh/h)	12	37	496	342	81	163
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Hourly flow rate (vph)	27	74	570	503	108	251
Pedestrians			5			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.2			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	1073				954	822
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1073				954	822
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				61	33
cM capacity (veh/h)	657				276	377
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	101	1073	359			
Volume Left	27	0	108			
Volume Right	0	503	251			
eSH	657	1700	340			
Volume to Capacity	0.04	0.63	1.06			
Queue Length 95th (m)	1.0	0.0	102.9			
Control Delay (s)	3.2	0.0	100.3			
Lane LOS	A		F			
Approach Delay (s)	3.2	0.0	100.3			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			23.7			
Intersection Capacity Utilization			75.0%		ICU Level of Service	D
Analysis Period (min)			15			

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕↕	↕↕↕	
Traffic Volume (vph)	0	143	0	2960	1942	855
Future Volume (vph)	0	143	0	2960	1942	855
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91
Ped Bike Factor						
Fr <sub>t</sub>		0.865			0.950	
Fit Protected						
Satd. Flow (prot)	0	1354	0	4577	4334	0
Fit Permitted						
Satd. Flow (perm)	0	1354	0	4577	4334	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	145.7			270.2	51.4	
Travel Time (s)	10.5			19.5	3.7	
Confl. Peds. (#/hr)						24
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87
Heavy Vehicles (%)	0%	8%	0%	2%	2%	3%
Adj. Flow (vph)	0	227	0	3289	1982	983
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	227	0	3289	2965	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 80.1%	ICU Level of Service D					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Total 5 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations		↗		↖↖	↗↗		
Traffic Volume (veh/h)	0	143	0	2960	1942	855	
Future Volume (Veh/h)	0	143	0	2960	1942	855	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87	
Hourly flow rate (vph)	0	227	0	3289	1982	983	
Pedestrians	24						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	2						
Right turn flare (veh)							
Median type				None	None		
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.68	0.52	0.52				
vC, conflicting volume	3594	1176	2989				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	63	0	1609				
tC, single (s)	6.8	7.1	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	58	100				
cM capacity (veh/h)	626	546	211				
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	227	1096	1096	1096	793	793	1379
Volume Left	0	0	0	0	0	0	0
Volume Right	227	0	0	0	0	0	983
sSH	546	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.42	0.64	0.64	0.64	0.47	0.47	0.81
Queue Length 95th (m)	16.3	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	16.2	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C						
Approach Delay (s)	16.2	0.0			0.0		
Approach LOS	C						
Intersection Summary							
Average Delay			0.6				
Intersection Capacity Utilization			80.1%		ICU Level of Service		D
Analysis Period (min)			15				

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 5 Year  
PM Peak Hour

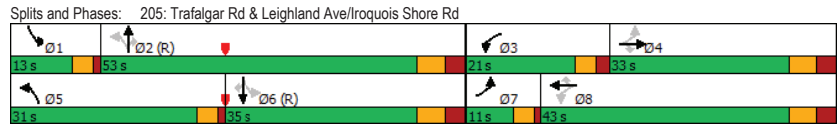
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	143	179	301	597	168	316	428	1549	806	156	1110	70
Future Volume (vph)	143	179	301	597	168	316	428	1549	806	156	1110	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0		25.0	145.0		0.0	95.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Ped Bike Factor	0.97					0.95			0.97	1.00		
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1710	1425	3120	1710	1425	1608	4577	1425	1608	4532	1425
Fit Permitted	0.647			0.334			0.125			0.143		
Satd. Flow (perm)	1077	1710	1425	1097	1710	1360	212	4577	1382	242	4532	1425
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			314			227		534				191
Link Speed (k/h)		50			50			50				50
Link Distance (m)		347.0			285.9			280.4				353.6
Travel Time (s)		25.0			20.6			20.2				25.5
Confl. Peds. (#/hr)	34					34			14	14		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Adj. Flow (vph)	149	186	314	622	175	329	446	1614	840	163	1156	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	186	314	622	175	329	446	1614	840	163	1156	73
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)				7.2				3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0



Lanes, Volumes, Timings Total 5 Year  
PM Peak Hour  
205: Trafalgar Rd & Leighton Ave/Iroquois Shore Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	11.0	25.0	25.0	11.0	43.0	43.0	11.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	11.0	33.0	33.0	21.0	43.0	43.0	31.0	53.0	53.0	13.0	35.0	35.0
Total Split (%)	9.2%	27.5%	27.5%	17.5%	35.8%	35.8%	25.8%	44.2%	44.2%	10.8%	29.2%	29.2%
Maximum Green (s)	7.0	26.0	26.0	16.0	36.0	36.0	27.0	46.0	46.0	9.0	28.0	28.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	30.4	23.4	23.4	43.4	33.4	33.4	67.6	52.3	52.3	42.3	31.0	31.0
Actuated g/C Ratio	0.25	0.20	0.20	0.36	0.28	0.28	0.56	0.44	0.44	0.35	0.26	0.26
v/c Ratio	0.49	0.56	0.59	0.93	0.37	0.61	0.90	0.81	0.93	0.77	0.99	0.14
Control Delay	34.1	49.4	9.1	53.5	36.2	16.0	53.3	34.3	30.0	50.3	68.1	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	49.4	9.1	53.5	36.2	16.0	53.3	34.3	30.0	50.3	68.1	0.6
LOS	C	D	A	D	D	B	D	C	C	D	E	A
Approach Delay		26.4			39.8			36.0			62.5	
Approach LOS		C			D			D			E	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 105.6 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 41.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 95.8%  
 ICU Level of Service F  
 Analysis Period (min) 15



Queues Total 5 Year  
PM Peak Hour  
205: Trafalgar Rd & Leighton Ave/Iroquois Shore Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	186	314	622	175	329	446	1614	840	163	1156	73
v/c Ratio	0.49	0.56	0.59	0.93	0.37	0.61	0.90	0.81	0.93	0.77	0.99	0.14
Control Delay	34.1	49.4	9.1	53.5	36.2	16.0	53.3	34.3	30.0	50.3	68.1	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	49.4	9.1	53.5	36.2	16.0	53.3	34.3	30.0	50.3	68.1	0.6
Queue Length 50th (m)	25.2	41.8	0.0	62.3	34.7	20.0	89.5	131.9	94.5	21.4	104.8	0.0
Queue Length 95th (m)	38.7	62.8	24.5	#82.4	52.3	48.9	#170.6	153.9	#200.9	#65.7	#138.0	0.0
Internal Link Dist (m)		323.0			261.9		256.4				329.6	
Turn Bay Length (m)	60.0			165.0		25.0	145.0			95.0		90.0
Base Capacity (vph)	305	413	582	667	555	595	498	1994	903	213	1170	509
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.45	0.54	0.93	0.32	0.55	0.90	0.81	0.93	0.77	0.99	0.14

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

HCM Signalized Intersection Capacity Analysis  
 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 5 Year  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	143	179	301	597	168	316	428	1549	806	156	1110	70
Future Volume (vph)	143	179	301	597	168	316	428	1549	806	156	1110	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1597	1710	1425	3120	1710	1360	1608	4577	1382	1608	4532	1425
Fit Permitted	0.65	1.00	1.00	0.33	1.00	1.00	0.12	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	1087	1710	1425	1099	1710	1360	212	4577	1382	242	4532	1425
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	149	186	314	622	175	329	446	1614	840	162	1156	73
RTOR Reduction (vph)	0	0	253	0	0	164	0	0	301	0	0	54
Lane Group Flow (vph)	149	186	61	622	175	165	446	1614	539	163	1156	19
Confl. Peds. (#/hr)	34				34				14	14		
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	27.4	20.4	20.4	41.4	30.4	30.4	64.6	49.3	49.3	39.3	28.0	28.0
Effective Green, g (s)	27.4	23.4	23.4	41.4	33.4	33.4	64.6	52.3	52.3	39.3	31.0	31.0
Actuated g/C Ratio	0.23	0.19	0.19	0.34	0.28	0.28	0.54	0.44	0.44	0.33	0.26	0.26
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	277	333	277	648	475	378	493	1994	602	207	1170	368
v/s Ratio Prot	0.03	0.11		c0.13	0.10		c0.25	0.35		0.07	c0.26	
v/s Ratio Perm	0.09		0.04	c0.20		0.12	0.24		0.39	0.18		0.01
v/c Ratio	0.54	0.56	0.22	0.96	0.37	0.44	0.90	0.81	0.89	0.79	0.99	0.05
Uniform Delay, d1	39.5	43.6	40.6	35.2	34.8	35.6	32.9	29.5	31.3	30.7	44.3	33.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	3.4	0.8	25.4	1.0	1.7	19.9	3.7	18.3	17.7	23.6	0.3
Delay (s)	41.6	47.1	41.5	60.6	35.8	37.3	52.7	33.2	49.7	48.4	67.9	33.7
Level of Service	D	D	D	E	D	D	D	C	D	D	E	C
Approach Delay (s)		43.1			49.9			41.0			63.8	
Approach LOS		D			D			D			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			48.1	HCM 2000 Level of Service				D				
HCM 2000 Volume to Capacity ratio	0.96											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			17.0					
Intersection Capacity Utilization	95.8%		ICU Level of Service				F					
Analysis Period (min)	15											

Lanes, Volumes, Timings  
 303: North Access & South Service Rd E

Total 5 Year  
 PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	53	88	169	95	14	168
Future Volume (vph)	53	88	169	95	14	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.916				0.875	
Fit Protected				0.969	0.996	
Satd. Flow (prot)	1706	0	0	1805	1623	0
Fit Permitted				0.969	0.996	
Satd. Flow (perm)	1706	0	0	1805	1623	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	518.9			306.8	108.8	
Travel Time (s)	37.4			22.1	7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	96	184	103	15	183
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	154	0	0	287	198	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.7%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Total 5 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	53	88	169	95	14	168
Future Volume (Veh/h)	53	88	169	95	14	168
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)	58	96	184	103	15	183
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			154		577	106
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			154		577	106
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		96	81
cM capacity (veh/h)			1426		417	948
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	154	287	198			
Volume Left	0	184	15			
Volume Right	96	0	183			
cSH	1700	1426	865			
Volume to Capacity	0.09	0.13	0.23			
Queue Length 95th (m)	0.0	3.5	7.1			
Control Delay (s)	0.0	5.5	10.4			
Lane LOS	A		B			
Approach Delay (s)	0.0	5.5	10.4			
Approach LOS	A		B			
Intersection Summary						
Average Delay			5.7			
Intersection Capacity Utilization			43.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Queuing and Blocking Report

Total 5 Year  
PM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	156.1	116.4	78.1	77.1	32.3	330.3	323.5	57.4	139.6	135.4	142.7
Average Queue (m)	121.4	146.8	40.8	71.7	33.0	30.7	316.6	295.5	54.6	102.3	99.5	99.8
95th Queue (m)	127.9	151.8	83.6	84.1	81.4	37.1	338.4	407.2	67.0	144.9	138.5	137.6
Link Distance (m)	123.0		123.0	51.4	51.4	313.2		313.2	128.0		128.0	128.0
Upstream Blk Time (%)	4	55	1	46	11	84		31	6		1	2
Queuing Penalty (veh)	0	453	9	382	92	0		0	38		9	15
Storage Bay Dist (m)	130.0					25.0		50.0				
Storage Blk Time (%)	4		55	55		54	48		21			
Queuing Penalty (veh)	28	375	163		125	250		68				

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	B34	SB	SB	SB	SB
Directions Served	T	T	T	L	T	T	TR
Maximum Queue (m)	20.1	5.6	4.1	32.3	232.8	249.1	243.9
Average Queue (m)	1.6	0.2	0.3	18.4	70.8	92.8	113.6
95th Queue (m)	13.9	3.9	3.2	37.5	185.9	220.2	234.3
Link Distance (m)	101.5	101.5	101.5	239.0		239.0	239.0
Upstream Blk Time (%)	0			2		6	
Queuing Penalty (veh)	3			17		39	
Storage Bay Dist (m)	25.0						
Storage Blk Time (%)	10		30				
Queuing Penalty (veh)	45			54			

Queuing and Blocking Report

Total 5 Year  
PM Peak Hour

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	B7	B7	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	27.3	292.1	289.4	27.4	79.0	60.8	28.8	19.0	82.3	82.6	22.4	194.9
Average Queue (m)	9.2	240.9	233.7	24.0	40.3	30.7	2.9	1.7	49.0	42.0	21.1	185.1
95th Queue (m)	27.2	283.8	284.5	32.1	78.6	60.9	20.9	15.5	86.4	81.3	25.8	192.6
Link Distance (m)		352.9	352.9		51.4	51.4	123.0	123.0	66.7	66.7		159.0
Upstream Blk Time (%)					13	3			14	11		96
Queuing Penalty (veh)					74	18			0	0		631
Storage Bay Dist (m)	20.0			20.0							15.0	
Storage Blk Time (%)	0	76		44	7						85	16
Queuing Penalty (veh)	1	37		133	8						221	67

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	B14
Directions Served	T
Maximum Queue (m)	165.3
Average Queue (m)	161.1
95th Queue (m)	180.7
Link Distance (m)	160.7
Upstream Blk Time (%)	70
Queuing Penalty (veh)	461
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	17.3	24.3	23.7	14.7	37.0	43.7	27.3	59.4	20.3	23.1
Average Queue (m)	4.5	16.5	13.5	2.1	12.0	17.6	25.4	45.2	6.9	9.3
95th Queue (m)	13.2	26.2	25.6	9.5	29.4	35.8	29.9	72.9	16.4	18.4
Link Distance (m)	21.8	21.8	21.8		352.9	352.9		54.8	56.7	56.7
Upstream Blk Time (%)	0	7	4					10		
Queuing Penalty (veh)	0	7	4					0		
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)				0	1		34	5		
Queuing Penalty (veh)				0	0		81	12		

Queuing and Blocking Report

Total 5 Year  
PM Peak Hour

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.7	87.4	283.2	275.7	87.4	129.4	134.0	32.5	299.0	294.5	66.9	73.6
Average Queue (m)	82.8	87.2	272.7	254.1	27.6	120.8	127.3	32.0	288.8	270.1	31.0	36.1
95th Queue (m)	85.7	87.8	277.7	327.5	78.1	139.2	130.4	34.5	319.6	362.6	58.0	63.0
Link Distance (m)			266.8	266.8		122.1	122.1		289.9	289.9		101.5
Upstream Blk Time (%)			91	11		22	58		83	28		0
Queuing Penalty (veh)			0	0		0	0		0	0		0
Storage Bay Dist (m)	80.0	80.0			80.0			25.0			80.0	
Storage Blk Time (%)	21	80	1		0	42		93	10		0	0
Queuing Penalty (veh)	73	277	6		0	28		250	17		0	1

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	71.5	31.2
Average Queue (m)	32.4	11.0
95th Queue (m)	61.4	24.1
Link Distance (m)	101.5	101.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	161.3	183.0	184.2	34.4	42.3	44.7	317.1	314.9	314.8
Average Queue (m)	43.2	143.4	177.8	28.6	31.0	30.0	294.3	304.2	303.8
95th Queue (m)	142.6	255.8	193.5	32.2	37.6	37.1	348.2	312.9	310.3
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	4	52	92	33	38	41	47	62	77
Queuing Penalty (veh)	0	0	0	328	373	409	432	568	704
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Queuing and Blocking Report

Total 5 Year  
PM Peak Hour

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	57.4	122.4	177.1	175.9	179.1	89.4	112.4	121.6	265.9	265.3	261.8	273.9
Average Queue (m)	14.5	116.1	155.3	172.1	139.1	44.6	51.7	69.7	254.0	254.6	253.7	262.7
95th Queue (m)	53.7	142.8	228.0	181.8	249.3	78.4	90.0	104.7	259.7	260.5	258.5	317.0
Link Distance (m)		117.8	171.3	171.3	171.3	299.7	299.7	299.7	251.7	251.7	251.7	251.7
Upstream Blk Time (%)		86	69	91	57				72	78	82	94
Queuing Penalty (veh)		0	0	0	0				362	391	413	474
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)	0	95										
Queuing Penalty (veh)	0	22										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	126.6	123.6	103.0	114.8	108.8	112.6	102.4
Average Queue (m)	76.3	78.3	62.6	72.7	72.9	75.6	64.2
95th Queue (m)	107.9	109.6	93.1	108.4	105.1	105.7	94.4
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	67.7	81.2	73.6	115.9	93.7	81.7	85.2
Average Queue (m)	40.2	57.7	39.4	58.3	42.3	42.8	48.5
95th Queue (m)	67.3	76.9	66.3	91.8	77.7	72.4	76.9
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Total 5 Year  
PM Peak Hour

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	62.9	56.0	115.7	110.2	38.5	59.3
Average Queue (m)	36.6	21.8	75.4	62.5	18.9	31.5
95th Queue (m)	55.9	45.6	108.0	97.7	32.3	51.3
Link Distance (m)	122.4	122.4	184.7	184.7	249.3	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	46.2	54.6	61.1	54.9	44.4	75.2	63.0	10.4	14.3	21.4	11.3	57.6
Average Queue (m)	10.1	27.8	31.5	26.7	19.0	39.8	29.4	3.2	3.7	8.2	2.9	26.3
95th Queue (m)	29.0	44.9	54.9	47.9	35.8	66.7	54.7	9.8	11.2	18.1	8.9	45.7
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0			70.0	15.0			
Storage Blk Time (%)								0	2	5		7
Queuing Penalty (veh)								0	1	1		31

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	SB
Directions Served	R
Maximum Queue (m)	24.1
Average Queue (m)	5.8
95th Queue (m)	18.8
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Queuing and Blocking Report

Total 5 Year  
PM Peak Hour

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	17.9	20.2	45.1	12.3	17.4	20.1
Average Queue (m)	6.5	2.7	6.4	0.6	1.2	9.7
95th Queue (m)	16.0	12.8	27.6	5.5	7.6	17.0
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)				0	0	0
Queuing Penalty (veh)				0	0	0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	4	0				
Queuing Penalty (veh)	6	0				

Intersection: 202: Lyons Lane & South Service Rd E

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	5.3	9.2
Average Queue (m)	0.2	4.2
95th Queue (m)	2.5	11.5
Link Distance (m)	53.9	21.6
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 203: Argus Rd & South Service Rd E

Movement	EB	WB	SB	B17	B18
Directions Served	LT	TR	LR	T	T
Maximum Queue (m)	3.6	121.2	111.6	62.9	255.6
Average Queue (m)	0.2	110.7	94.2	42.1	114.0
95th Queue (m)	2.6	147.4	131.4	79.6	297.0
Link Distance (m)	160.7	112.3	88.3	39.8	294.4
Upstream Blk Time (%)		69	80	70	9
Queuing Penalty (veh)		591	177	155	21
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report

Total 5 Year  
PM Peak Hour

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	71.8	65.5	79.0	84.6	28.0	34.6	42.4
Average Queue (m)	20.1	31.5	41.6	48.1	2.0	11.1	30.8
95th Queue (m)	54.7	55.1	66.1	73.0	13.1	32.9	39.0
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)	0				0	1	67
Queuing Penalty (veh)	0				2	9	605
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	L
Maximum Queue (m)	53.0	331.8	335.9	172.4	273.6	274.3	32.5	88.7	88.2	92.9	163.4	102.4
Average Queue (m)	13.7	259.1	289.5	163.4	265.6	237.8	11.1	29.4	25.3	31.2	37.3	49.1
95th Queue (m)	41.3	463.1	420.5	177.7	288.9	369.8	33.8	62.5	63.6	69.9	97.0	132.5
Link Distance (m)		327.2	327.2		266.7	266.7		251.7	251.7	251.7		
Upstream Blk Time (%)		69	72		86	69						0
Queuing Penalty (veh)		0	0		0	0						0
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				95.0
Storage Blk Time (%)	1	1		32	95	4	5					0
Queuing Penalty (veh)	2	1		95	285	13	9					0

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB
Directions Served	T	T	T	R
Maximum Queue (m)	353.0	349.4	347.8	97.5
Average Queue (m)	333.1	331.8	330.2	25.4
95th Queue (m)	392.8	394.2	402.0	95.8
Link Distance (m)	339.8	339.8	339.8	
Upstream Blk Time (%)	74	77	86	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (m)				90.0
Storage Blk Time (%)	96		98	0
Queuing Penalty (veh)	150		69	0

Queuing and Blocking Report

Total 5 Year  
PM Peak Hour

Intersection: 303: North Access & South Service Rd E

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	30.8	12.0	70.2
Average Queue (m)	2.0	1.2	17.3
95th Queue (m)	15.2	6.9	52.5
Link Distance (m)	500.5	294.4	99.4
Upstream Blk Time (%)			2
Queuing Penalty (veh)			0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 11272

Lanes, Volumes, Timings

Total 10 Year  
AM Peak Hour

101: Trafalgar Rd & Cross Ave/South Service Rd

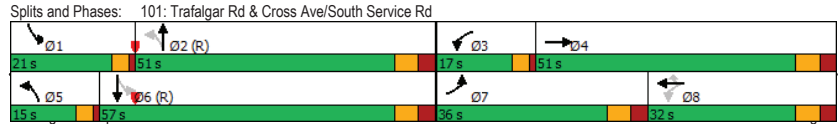
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1238	417	213	89	384	186	220	724	1025	435	1099	724
Future Volume (vph)	1238	417	213	89	384	186	220	724	1025	435	1099	724
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	0.91	1.00	*0.80	0.91
Ped Bike Factor	1.00	0.99				0.99		0.87				0.99
Frt		0.943				0.850		0.909				0.940
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2795	1477	0	1525	1583	1382	1428	3197	0	1525	3679	0
Fit Permitted	0.950			0.160			0.091			0.083		
Satd. Flow (perm)	2792	1477	0	257	1583	1362	137	3197	0	133	3679	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		24				179		300				138
Link Speed (k/h)		50			50			50				50
Link Distance (m)		151.2			330.4			150.2				270.2
Travel Time (s)		10.9			23.8			10.8				19.5
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Peak Hour Factor	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Adj. Flow (vph)	1423	542	333	116	499	242	272	823	1281	518	1308	872
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1423	875	0	116	499	242	272	2104	0	518	2180	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.3				3.3
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
101: Trafalgar Rd & Cross Ave/South Service Rd

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		12.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		17.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	36.0	51.0		17.0	32.0	32.0	15.0	51.0		21.0	57.0	
Total Split (%)	25.7%	36.4%		12.1%	22.9%	22.9%	10.7%	36.4%		15.0%	40.7%	
Maximum Green (s)	29.0	44.0		13.0	25.0	25.0	11.0	44.0		17.0	50.0	
Yellow Time (s)	4.0	4.0		3.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		1.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	C-Max			Min	C-Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0			11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0			0	0		0			0	
Act Effct Green (s)	32.0	47.6		40.4	28.0	28.0	58.0	47.0		68.0	53.0	
Actuated g/C Ratio	0.23	0.34		0.29	0.20	0.20	0.41	0.34		0.49	0.38	
v/c Ratio	2.23	1.69		0.62	1.58	0.58	1.72	2.39dr		2.22	1.74dr	
Control Delay	584.4	349.5		44.1	311.7	20.4	353.6	325.9		575.0	248.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	584.4	349.5		44.1	311.7	20.4	353.6	325.9		575.0	248.0	
LOS	F	F		D	F	C	F	F		F	F	
Approach Delay		495.0			193.2			329.1			310.8	
Approach LOS		F			F			F			F	

**Intersection Summary**  
 Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 128 (91%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 2.23  
 Intersection Signal Delay: 355.3 Intersection LOS: F  
 Intersection Capacity Utilization 145.4% ICU Level of Service H  
 Analysis Period (min) 15  
 \* User Entered Value  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Queues  
101: Trafalgar Rd & Cross Ave/South Service Rd

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1423	875	116	499	242	272	2104	518	2180
v/c Ratio	2.23	1.69	0.62	1.58	0.58	1.72	2.39dr	2.22	1.74dr
Control Delay	584.4	349.5	44.1	311.7	20.4	353.6	325.9	575.0	248.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	584.4	349.5	44.1	311.7	20.4	353.6	325.9	575.0	248.0
Queue Length 50th (m)	~343.9	~370.1	19.5	~206.0	15.6	~103.3	~364.4	~231.9	~350.8
Queue Length 95th (m)	#371.7	#365.8	29.7	#222.9	28.9	m#66.4	m#200.1	m#158.0	m#208.7
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0			50.0		25.0	
Base Capacity (vph)	638	517	193	316	415	158	1272	233	1478
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	2.23	1.69	0.60	1.58	0.58	1.72	1.65	2.22	1.47

**Intersection Summary**  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.  
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.



### HCM Signalized Intersection Capacity Analysis 101: Trafalgar Rd & Cross Ave/South Service Rd

Total 10 Year  
AM Peak Hour

	←	→	↖	↗	←	→	↖	↗	←	→	↖	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	→	↗	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	1238	417	213	89	384	186	220	724	1025	435	1099	724
Future Volume (vph)	1238	417	213	89	384	186	220	724	1025	435	1099	724
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.80		1.00	0.80	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	0.87		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.91		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2795	1477		1525	1583	1362	1428	3196		1525	3679	
Flt Permitted	0.95	1.00		0.16	1.00	1.00	0.09	1.00		0.08	1.00	
Satd. Flow (perm)	2795	1477		257	1583	1362	137	3196		134	3679	
Peak-hour factor, PHF	0.87	0.77	0.64	0.77	0.77	0.77	0.81	0.88	0.80	0.84	0.84	0.83
Adj. Flow (vph)	1423	542	333	116	499	242	272	823	1281	518	1308	872
RTOR Reduction (vph)	0	16	0	0	0	143	0	199	0	0	86	0
Lane Group Flow (vph)	1423	859	0	116	499	99	272	1905	0	518	2094	0
Confl. Peds. (#/hr)	1		4	4		1	10		52	52		10
Heavy Vehicles (%)	9%	6%	12%	3%	8%	4%	10%	3%	0%	3%	3%	4%
Turn Type	Prot	NA		pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8			8	2		6		
Actuated Green, G (s)	29.0	44.6		37.4	25.0	25.0	55.0	44.0		65.0	50.0	
Effective Green, g (s)	32.0	47.6		37.4	28.0	28.0	55.0	47.0		65.0	53.0	
Actuated g/C Ratio	0.23	0.34		0.27	0.20	0.20	0.39	0.34		0.46	0.38	
Clearance Time (s)	7.0	7.0		4.0	7.0	7.0	4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	4.0		3.5	4.0	4.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	638	502		180	316	272	155	1072		231	1392	
v/s Ratio Prot	c0.51	c0.58		0.06	0.32		0.14	0.60		c0.27	0.57	
v/s Ratio Perm				0.11		0.07	0.55			c0.77		
v/c Ratio	2.23	1.71		0.64	1.58	0.36	1.75	2.39dr		2.24	1.74dr	
Uniform Delay, d1	54.0	46.2		42.4	56.0	48.3	38.9	46.5		44.5	43.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.30		1.07	1.15	
Incremental Delay, d2	558.8	328.6		8.0	275.3	1.1	342.1	349.9		560.4	227.4	
Delay (s)	612.8	374.8		50.4	331.3	49.4	381.1	410.5		607.8	277.3	
Level of Service	F	F		D	F	D	F	F		F	F	
Approach Delay (s)	522.1			213.7			407.1			340.8		
Approach LOS	F			F			F			F		

Intersection Summary			
HCM 2000 Control Delay	397.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.15		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	145.4%	ICU Level of Service	H
Analysis Period (min)	15		
dr	Defacto Right Lane. Recode with 1 though lane as a right lane.		
c	Critical Lane Group		

### Lanes, Volumes, Timings 102: GO Bus Terminal/Argus Rd & Cross Ave

Total 10 Year  
AM Peak Hour

	←	→	↖	↗	←	→	↖	↗	←	→	↖	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	50	1029	82	212	982	70	95	0	240	320	22	142
Future Volume (vph)	50	1029	82	212	982	70	95	0	240	320	22	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		1.00	0.96		0.99	0.99	
Frt		0.986			0.989			0.850			0.877	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1570	2891	0	818	3167	0	805	734	0	1570	1269	0
Flt Permitted	0.222			0.091			0.549			0.332		
Satd. Flow (perm)	367	2891	0	78	3167	0	464	734	0	543	1269	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			17			163			96	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		106.1			72.9			81.9			104.4	
Travel Time (s)		7.6			5.2			5.9			7.5	
Confl. Peds. (#/hr)	1		3	3			1	3		20	20	3
Peak Hour Factor	0.52	0.87	0.65	0.84	0.88	0.79	0.53	0.25	0.70	0.78	0.62	0.89
Heavy Vehicles (%)	0%	1%	100%	92%	1%	5%	95%	0%	91%	0%	93%	0%
Adj. Flow (vph)	96	1183	126	252	1116	89	179	0	343	410	35	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	1309	0	252	1205	0	179	343	0	410	195	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	46.0	46.0		13.0	59.0		31.0	31.0		31.0	31.0	
Total Split (%)	51.1%	51.1%		14.4%	65.6%		34.4%	34.4%		34.4%	34.4%	
Maximum Green (s)	40.0	40.0		9.0	53.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	42.0	42.0		55.0	55.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio	0.47	0.47		0.61	0.61		0.30	0.30		0.30	0.30	
v/c Ratio	0.56	0.96		2.08	0.62		1.29	1.03		2.53	0.44	
Control Delay	33.0	41.4		533.9	12.5		203.7	75.9		726.0	16.4	
Queue Delay	0.0	42.6		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	33.0	84.0		533.9	12.5		203.7	75.9		726.0	16.4	
LOS	C	F		F	B		F	E		F	B	
Approach Delay		80.5			102.7			119.7			497.3	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	90
Natural Cycle:	110
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	2.53
Intersection Signal Delay:	157.0
Intersection LOS:	F
Intersection Capacity Utilization:	102.8%
ICU Level of Service:	G
Analysis Period (min):	15

Splits and Phases: 102: GO Bus Terminal/Argus Rd & Cross Ave



Queues  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	96	1309	252	1205	179	343	410	195
v/c Ratio	0.56	0.96	2.08	0.62	1.29	1.03	2.53	0.44
Control Delay	33.0	41.4	533.9	12.5	203.7	75.9	726.0	16.4
Queue Delay	0.0	42.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	84.0	533.9	12.5	203.7	75.9	726.0	16.4
Queue Length 50th (m)	12.2	115.9	~66.3	64.7	~41.8	~44.5	~125.7	13.6
Queue Length 95th (m)	13.4	#157.9	#104.6	81.7	#38.0	0.0	#154.0	16.0
Internal Link Dist (m)		82.1		48.9		57.9		80.4
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	171	1358	121	1942	139	334	162	447
Starvation Cap Reductn	0	282	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	0.56	1.22	2.08	0.62	1.29	1.03	2.53	0.44

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 10 Year  
AM Peak Hour

Diagram showing lane configurations and a detailed table with 14 columns (EBL, EBT, EBR, WBL, WBT, WBR, NBL, NBT, NBR, SBL, SBT, SBR) and 100+ rows of performance metrics including Lane Configurations, Traffic Volume, Future Volume, Ideal Flow, Lane Width, Total Lost time, Lane Util. Factor, Frpb, Fpb, Frt, Fit Protected, Satd. Flow, Peak-hour factor, Adj. Flow, RTOR Reduction, Lane Group Flow, Conf. Peds., Heavy Vehicles, Turn Type, Protected Phases, Permitted Phases, Actuated Green, Effective Green, Actuated g/C Ratio, Clearance Time, Vehicle Extension, Lane Grp Cap, v/s Ratio Prot, v/s Ratio Perm, v/c Ratio, Uniform Delay, Progression Factor, Incremental Delay, Delay, Level of Service, Approach Delay, and Approach LOS.

Lanes, Volumes, Timings  
103: Lyons Lane/Commercial Driveway & Cross Ave

Total 10 Year  
AM Peak Hour

Diagram showing lane configurations and a detailed table with 14 columns (EBL, EBT, EBR, WBL, WBT, WBR, NBL, NBT, NBR, SBL, SBT, SBR) and 100+ rows of performance metrics similar to the first table, including Lane Configurations, Traffic Volume, Future Volume, Ideal Flow, Lane Width, Total Lost time, Lane Util. Factor, Frpb, Fpb, Frt, Fit Protected, Satd. Flow, Peak-hour factor, Adj. Flow, RTOR Reduction, Lane Group Flow, Conf. Peds., Heavy Vehicles, Turn Type, Protected Phases, Permitted Phases, Actuated Green, Effective Green, Actuated g/C Ratio, Clearance Time, Vehicle Extension, Lane Grp Cap, v/s Ratio Prot, v/s Ratio Perm, v/c Ratio, Uniform Delay, Progression Factor, Incremental Delay, Delay, Level of Service, Approach Delay, and Approach LOS.

Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

Total 10 Year

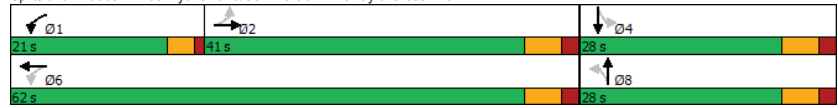
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases		2		6			8			4		
Detector Phase	2	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.0	41.0		21.0	62.0		28.0	28.0		28.0	28.0	
Total Split (%)	45.6%	45.6%		23.3%	68.9%		31.1%	31.1%		31.1%	31.1%	
Maximum Green (s)	35.0	35.0		17.0	56.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.2	37.2		57.3	57.3		20.9	20.9		20.9	20.9	
Actuated g/C Ratio	0.43	0.43		0.66	0.66		0.24	0.24		0.24	0.24	
v/c Ratio	0.26	0.60		0.88	0.28		0.26	0.38		0.76	0.28	
Control Delay	20.1	20.2		33.6	6.4		29.2	7.1		55.1	11.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.1	20.2		33.6	6.4		29.2	7.1		55.1	11.3	
LOS	C	C		C	A		C	A		E	B	
Approach Delay		20.2			18.7			13.1			36.1	
Approach LOS		C			B			B			D	

Intersection Summary

Area Type:	CBD
Cycle Length:	90
Actuated Cycle Length:	86.2
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	20.7
Intersection LOS:	C
Intersection Capacity Utilization:	81.3%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 103: Lyons Lane/Commercial Driveway & Cross Ave



Queues

103: Lyons Lane/Commercial Driveway & Cross Ave

Total 10 Year

AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	83	760	420	506	69	182	152	116
v/c Ratio	0.26	0.60	0.88	0.28	0.26	0.38	0.76	0.28
Control Delay	20.1	20.2	33.6	6.4	29.2	7.1	55.1	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	20.2	33.6	6.4	29.2	7.1	55.1	11.3
Queue Length 50th (m)	9.8	51.4	37.2	17.4	9.8	0.6	24.8	4.1
Queue Length 95th (m)	17.9	60.4	36.8	21.1	18.7	9.0	29.3	17.3
Internal Link Dist (m)		16.1		244.0		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	323	1275	491	1851	306	529	232	473
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.60	0.86	0.27	0.23	0.34	0.66	0.25

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
103: Lyons Lane/Commercial Driveway & Cross Ave

Total 10 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	65	457	143	277	352	25	55	3	107	94	28	74
Future Volume (vph)	65	457	143	277	352	25	55	3	107	94	28	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Fr	1.00	0.96		1.00	0.98		1.00	0.85		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1532	2871		1570	2724		1566	1437		1464	1470	
Flt Permitted	0.47	1.00		0.23	1.00		0.67	1.00		0.54	1.00	
Satd. Flow (perm)	751	2871		386	2724		1098	1437		832	1470	
Peak-hour factor, PHF	0.78	0.81	0.73	0.66	0.79	0.42	0.80	0.75	0.60	0.62	0.92	0.86
Adj. Flow (vph)	83	564	196	420	446	60	69	4	178	152	30	86
RTOR Reduction (vph)	0	37	0	0	11	0	0	135	0	0	65	0
Lane Group Flow (vph)	83	723	0	420	495	0	69	47	0	152	51	0
Confl. Peds. (#/hr)	5		1	1		5	3		3	3		3
Heavy Vehicles (%)	2%	11%	0%	0%	19%	0%	0%	0%	0%	7%	0%	3%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	2	2		1	6		8	8		4	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.2	35.2		55.3	55.3		18.9	18.9		18.9	18.9	
Effective Green, g (s)	37.2	37.2		55.3	57.3		20.9	20.9		20.9	20.9	
Actuated g/C Ratio	0.43	0.43		0.64	0.66		0.24	0.24		0.24	0.24	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	324	1238		468	1810		266	348		201	356	
v/s Ratio Prot		0.25		c0.17	0.18			0.03			0.03	
v/s Ratio Perm	0.11			c0.41			0.06			c0.18		
v/c Ratio	0.26	0.58		0.90	0.27		0.26	0.14		0.76	0.14	
Uniform Delay, d1	15.7	18.6		12.8	5.9		26.4	25.6		30.3	25.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	1.1		19.5	0.2		0.7	0.2		15.8	0.3	
Delay (s)	16.5	19.7		32.2	6.1		27.1	25.8		46.1	25.9	
Level of Service	B	B		C	A		C	C		D	C	
Approach Delay (s)		19.4			17.9			26.2			37.3	
Approach LOS		B			B			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		21.7			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		86.2			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		81.3%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	635	710	113	27	613	711	83	653	71	525	558	407
Future Volume (vph)	635	710	113	27	613	711	83	653	71	525	558	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0		0.0	80.0		0.0	25.0		0.0	80.0		0.0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	*0.80	0.95	0.97	*0.80	1.00
Ped Bike Factor	1.00	0.99		1.00	0.98		1.00	1.00		0.99		0.98
Fr		0.971			0.921			0.983				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2987	3029	0	1481	2834	0	1540	2655	0	2929	1341	1356
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2974	3029	0	1475	2834	0	1532	2655	0	2894	1341	1324
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			211			8				262
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.8			142.3			311.4				130.3
Travel Time (s)		20.6			10.2			22.4				9.4
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Peak Hour Factor	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Adj. Flow (vph)	683	780	188	36	713	790	138	759	95	625	649	509
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	683	968	0	36	1503	0	138	854	0	625	649	509
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	6.6				6.6			6.6				6.6
Link Offset(m)	0.0				0.0			0.0				0.0
Crosswalk Width(m)	4.8				4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
<b>Detector 2 Channel</b>												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	23.0	60.0		12.0	49.0		14.0	46.0		22.0	54.0	54.0
Total Split (%)	16.4%	42.9%		8.6%	35.0%		10.0%	32.9%		15.7%	38.6%	38.6%
Maximum Green (s)	18.0	53.0		7.0	42.0		9.0	39.0		17.0	47.0	47.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	19.0	56.0		8.0	45.0		10.0	42.0		18.0	50.0	50.0
Actuated g/C Ratio	0.14	0.40		0.06	0.32		0.07	0.30		0.13	0.36	0.36
v/c Ratio	1.69	0.79		0.43	1.43		1.25	1.06		1.66	1.36	0.79
Control Delay	355.2	41.5		79.8	228.5		219.7	96.5		342.0	192.8	13.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	355.2	41.5		79.8	228.5		219.7	96.5		342.0	192.8	13.1
LOS	F	D		E	F		F	F		F	F	B
Approach Delay		171.3			225.0			113.6			193.8	
Approach LOS		F			F			F			F	

**Intersection Summary**

Area Type: CBD

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.69

Intersection Signal Delay: 182.3

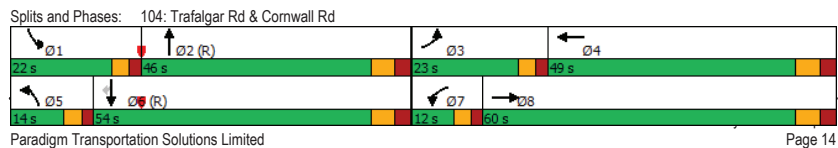
Intersection LOS: F

Intersection Capacity Utilization 122.2%

ICU Level of Service H

Analysis Period (min) 15

\* User Entered Value



Queues  
104: Trafalgar Rd & Cornwall Rd

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	683	968	36	1503	138	854	625	649	509
v/c Ratio	1.69	0.79	0.43	1.43	1.25	1.06	1.66	1.36	0.79
Control Delay	355.2	41.5	79.8	228.5	219.7	96.5	342.0	192.8	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	355.2	41.5	79.8	228.5	219.7	96.5	342.0	192.8	13.1
Queue Length 50th (m)	~149.6	126.2	10.3	~289.2	~50.2	~170.3	~139.7	~305.2	26.2
Queue Length 95th (m)	#189.5	154.8	19.0	#310.8	#52.6	#204.8	m#79.2	m123.7	m8.8
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	405	1226	84	1054	110	802	376	478	641
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.69	0.79	0.43	1.43	1.25	1.06	1.66	1.36	0.79

**Intersection Summary**

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

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

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

HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Total 10 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↗	↔	↕	↗	↔	↕	↗	↔	↕	↗
Traffic Volume (vph)	635	710	113	27	613	711	83	653	71	525	558	407
Future Volume (vph)	635	710	113	27	613	711	83	653	71	525	558	407
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	*0.80		0.97	*0.80	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00		1.00	1.00	0.98
Fpb, 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	0.92		1.00	0.98		1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2987	3029		1481	2835		1540	2656		2929	1341	1324
Fit Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2987	3029		1481	2835		1540	2656		2929	1341	1324
Peak-hour factor, PHF	0.93	0.91	0.60	0.75	0.86	0.90	0.60	0.86	0.75	0.84	0.86	0.80
Adj. Flow (vph)	683	780	188	36	713	790	138	759	95	625	649	509
RTOR Reduction (vph)	0	15	0	0	143	0	0	6	0	0	0	168
Lane Group Flow (vph)	683	953	0	36	1360	0	138	848	0	625	649	341
Confl. Peds. (#/hr)	25		7	7		25	9		18	18		9
Heavy Vehicles (%)	2%	4%	1%	6%	3%	3%	2%	1%	0%	4%	2%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	18.0	53.0		7.0	42.0		9.0	39.0		17.0	47.0	47.0
Effective Green, g (s)	19.0	56.0		8.0	45.0		10.0	42.0		18.0	50.0	50.0
Actuated g/C Ratio	0.14	0.40		0.06	0.32		0.07	0.30		0.13	0.36	0.36
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	405	1211		84	911		110	796		376	478	472
v/s Ratio Prot	c0.23	0.31		0.02	c0.48		0.09	0.32		c0.21	c0.48	
v/s Ratio Perm												0.26
v/c Ratio	1.69	0.79		0.43	1.49		1.25	1.07		1.66	1.36	0.72
Uniform Delay, d1	60.5	36.8		63.8	47.5		65.0	49.0		61.0	45.0	39.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.30	0.78	0.61
Incremental Delay, d2	319.4	5.2		15.2	227.5		169.2	50.9		299.1	162.3	0.9
Delay (s)	379.9	42.0		79.0	275.0		234.2	99.9		378.1	197.2	24.8
Level of Service	F	D		E	F		F	F		F	F	C
Approach Delay (s)	181.8			270.4			118.6			211.4		
Approach LOS	F			F			F			F		

Intersection Summary			
HCM 2000 Control Delay	203.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.53		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	122.2%	ICU Level of Service	H
Analysis Period (min)	15		

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↕	↕
Traffic Volume (vph)	1101	1012	0	1759	2123	0
Future Volume (vph)	1101	1012	0	1759	2123	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	*0.80	*0.80	1.00
Frt		0.850				
Fit Protected	0.950					
Satd. Flow (prot)	2958	1423	0	3872	3946	0
Fit Permitted	0.950					
Satd. Flow (perm)	2958	1423	0	3872	3946	0
Right Turn on Red						Yes
Satd. Flow (RTOR)						Yes
Link Speed (k/h)	50			50	50	
Link Distance (m)	199.2			51.4	324.8	
Travel Time (s)	14.3			3.7	23.4	
Peak Hour Factor	0.98	0.92	0.25	0.91	0.90	0.25
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Adj. Flow (vph)	1123	1100	0	1933	2359	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1123	1100	0	1933	2359	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	6.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Detector Phase	4	4		2	2	

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

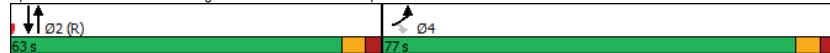
Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	77.0	77.0		63.0	63.0	
Total Split (%)	55.0%	55.0%		45.0%	45.0%	
Maximum Green (s)	70.0	70.0		56.0	56.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	73.0	73.0		59.0	59.0	
Actuated g/C Ratio	0.52	0.52		0.42	0.42	
v/c Ratio	0.73	1.48		1.19	1.42	
Control Delay	29.3	253.6		132.3	219.5	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	29.3	253.6		132.3	219.5	
LOS	C	F		F	F	
Approach Delay	140.3			132.3	219.5	
Approach LOS	F			F	F	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 133.6 (95%), Referenced to phase 2:NBSB and 6:, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.48  
 Intersection Signal Delay: 166.6 Intersection LOS: F  
 Intersection Capacity Utilization 121.9% ICU Level of Service H  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 105: Trafalgar Rd & QEW EB-Off Ramp



Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1123	1100	1933	2359
v/c Ratio	0.73	1.48	1.19	1.42
Control Delay	29.3	253.6	132.3	219.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	29.3	253.6	132.3	219.5
Queue Length 50th (m)	126.5	~440.8	~283.7	~384.9
Queue Length 95th (m)	154.1	#524.9	m114.3 m#361.5	
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1542	741	1631	1662
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	1.48	1.19	1.42

Intersection Summary

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



HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 10 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔		↑↑↑	↑↑↑	
Traffic Volume (vph)	1101	1012	0	1759	2123	0
Future Volume (vph)	1101	1012	0	1759	2123	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		*0.80	*0.80	
Fr	1.00	0.85		1.00	1.00	
Fit Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	2958	1423		3872	3946	
Fit Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	2958	1423		3872	3946	
Peak-hour factor, PHF	0.98	0.92	0.25	0.91	0.90	0.25
Adj. Flow (vph)	1123	1100	0	1933	2359	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1123	1100	0	1933	2359	0
Heavy Vehicles (%)	3%	1%	0%	6%	4%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases	4					
Actuated Green, G (s)	70.0	70.0		56.0	56.0	
Effective Green, g (s)	73.0	73.0		59.0	59.0	
Actuated g/C Ratio	0.52	0.52		0.42	0.42	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1542	741		1631	1662	
v/s Ratio Prot	0.38			0.50	c0.60	
v/s Ratio Perm		c0.77				
v/c Ratio	0.73	1.48		1.19	1.42	
Uniform Delay, d1	25.8	33.5		40.5	40.5	
Progression Factor	1.00	1.00		1.40	0.86	
Incremental Delay, d2	1.8	225.2		84.0	189.7	
Delay (s)	27.6	258.7		140.8	224.6	
Level of Service	C	F		F	F	
Approach Delay (s)	142.0			140.8	224.6	
Approach LOS	F			F	F	
<b>Intersection Summary</b>						
HCM 2000 Control Delay		171.5		HCM 2000 Level of Service		F
HCM 2000 Volume to Capacity ratio		1.45				
Actuated Cycle Length (s)		140.0		Sum of lost time (s)	8.0	
Intersection Capacity Utilization		121.9%		ICU Level of Service	H	
Analysis Period (min)		15				

Lanes, Volumes, Timings  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔		↑↑↑		↔	↔	↔
Traffic Volume (vph)	1	0	244	591	40	308	0	2041	0	0	2082	8
Future Volume (vph)	1	0	244	591	40	308	0	2041	0	0	2082	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Lanes	1		1	1		1	0	0	0	0	0	1
Taper Length (m)	7.5		7.5			7.5		7.5		7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor												0.96
Fr			0.850			0.850						0.850
Fit Protected	0.950		0.950	0.960								
Satd. Flow (prot)	1570	0	1395	1421	1446	1356	0	3909	0	0	3984	1437
Fit Permitted	0.950		0.950	0.960								
Satd. Flow (perm)	1570	0	1395	1421	1446	1356	0	3909	0	0	3984	1380
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)			31			213						70
Link Speed (k/h)		50			50			50				50
Link Distance (m)		142.1			192.6			324.8				275.1
Travel Time (s)		10.2			13.9			23.4				19.8
Confl. Peds. (#/hr)							8		5	5		8
Peak Hour Factor	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%
Adj. Flow (vph)	4	0	268	672	59	422	0	2195	0	0	2313	13
Shared Lane Traffic (%)				46%								
Lane Group Flow (vph)	4	0	268	363	368	422	0	2195	0	0	2313	13
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1	2	1						1
Detector Template	Left		Right	Left	Thru	Right		Thru				Thru
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0				10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6				0.6
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex				CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												

Lanes, Volumes, Timings

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 10 Year

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type	Prot		Perm	Perm		Perm		NA		NA	NA	Perm
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Detector Phase	3		8	4	4	4		6			2	2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0			28.0	28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0			35.0	35.0
Total Split (s)	23.0		61.0	38.0	38.0	38.0		79.0			79.0	79.0
Total Split (%)	16.4%		43.6%	27.1%	27.1%	27.1%		56.4%			56.4%	56.4%
Maximum Green (s)	18.0		54.0	31.0	31.0	31.0		72.0			72.0	72.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0			-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min			C-Min	C-Min
Walk Time (s)			7.0	7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0			21.0	21.0
Pedestrian Calls (#/hr)			0	0	0	0		0			0	0
Act Effct Green (s)	8.0		57.0	45.0	45.0	45.0		75.0			75.0	75.0
Actuated g/C Ratio	0.06		0.41	0.32	0.32	0.32		0.54			0.54	0.54
v/c Ratio	0.04		0.46	0.80	0.79	0.73		1.05			1.08	0.02
Control Delay	64.0		29.5	57.6	57.1	28.4		56.2			78.5	0.0
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	64.0		29.5	57.6	57.1	28.4		56.2			78.5	0.0
LOS	E		C	E	E	C		E			E	A
Approach Delay		30.0				46.8		56.2			78.0	
Approach LOS		C				D		E			E	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.08  
 Intersection Signal Delay: 61.7  
 Intersection LOS: E  
 Intersection Capacity Utilization 90.8%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 10 Year

AM Peak Hour

Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	4	268	363	368	422	2195	2313	13
v/c Ratio	0.04	0.46	0.80	0.79	0.73	1.05	1.08	0.02
Control Delay	64.0	29.5	57.6	57.1	28.4	56.2	78.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.0	29.5	57.6	57.1	28.4	56.2	78.5	0.0
Queue Length 50th (m)	1.1	49.7	101.4	102.8	55.9	~285.9	~313.8	0.0
Queue Length 95th (m)	1.4	76.9	#142.3	99.3	59.8	m168.5	#346.6	0.0
Internal Link Dist (m)				168.6		300.8	251.1	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	586	456	464	580	2094	2134	771
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.46	0.80	0.79	0.73	1.05	1.08	0.02

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 10 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	→	↗	↖	↗	↗	↖	↖	↗	↖	↗	↗	
Traffic Volume (vph)	1	0	244	591	40	308	0	2041	0	0	2082	8	
Future Volume (vph)	1	0	244	591	40	308	0	2041	0	0	2082	8	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5	
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0		4.0	4.0		
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		*0.80		*0.80	1.00		
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00		1.00	0.96		
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00		1.00	1.00		
Frt	1.00		0.85	1.00	1.00	0.85		1.00		1.00	0.85		
Fit Protected	0.95		1.00	0.95	0.96	1.00		1.00		1.00	1.00		
Satd. Flow (prot)	1570		1395	1421	1445	1356		3909		3984	1380		
Fit Permitted	0.95		1.00	0.95	0.96	1.00		1.00		1.00	1.00		
Satd. Flow (perm)	1570		1395	1421	1445	1356		3909		3984	1380		
Peak-hour factor, PHF	0.25	0.25	0.91	0.88	0.68	0.73	0.25	0.93	0.97	0.25	0.90	0.63	
Adj. Flow (vph)	4	0	268	672	59	422	0	2195	0	0	2313	13	
RTOR Reduction (vph)	0	0	18	0	0	145	0	0	0	0	0	6	
Lane Group Flow (vph)	4	0	250	363	368	277	0	2195	0	0	2313	7	
Confl. Peds. (#/hr)							8		5	5		8	
Heavy Vehicles (%)	0%	0%	3%	5%	23%	6%	0%	5%	5%	0%	3%	0%	
Turn Type	Prot		Perm	Perm	NA	Perm		NA			NA	Perm	
Protected Phases	3				4			6			2		
Permitted Phases			8	4		4						2	
Actuated Green, G (s)	7.0		54.0	42.0	42.0	42.0		72.0			72.0	72.0	
Effective Green, g (s)	8.0		57.0	45.0	45.0	45.0		75.0			75.0	75.0	
Actuated g/C Ratio	0.06		0.41	0.32	0.32	0.32		0.54			0.54	0.54	
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5	
Lane Grp Cap (vph)	89		567	456	464	435		2094			2134	739	
v/s Ratio Prot	0.00							0.56			c0.58		
v/s Ratio Perm			c0.18	c0.26	0.25	0.20						0.01	
v/c Ratio	0.04		0.44	0.80	0.79	0.64		1.05			1.08	0.01	
Uniform Delay, d1	62.4		30.0	43.3	43.3	40.5		32.5			32.5	15.2	
Progression Factor	1.00		1.00	1.00	1.00	1.00		1.03			1.00	1.00	
Incremental Delay, d2	0.2		0.5	9.3	9.0	3.1		23.3			46.6	0.0	
Delay (s)	62.6		30.5	52.6	52.3	43.6		56.7			79.1	15.2	
Level of Service	E		C	D	D	D		E			E	B	
Approach Delay (s)		31.0				49.2		56.7			78.7		
Approach LOS		C				D		E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			62.7	HCM 2000 Level of Service								E	
HCM 2000 Volume to Capacity ratio			0.95										
Actuated Cycle Length (s)			140.0	Sum of lost time (s)								12.0	
Intersection Capacity Utilization			90.8%	ICU Level of Service								E	
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Total 10 Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	992	462	568	0	0	1584
Future Volume (vph)	992	462	568	0	0	1584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frt	0.993	0.850				
Fit Protected	0.954					
Satd. Flow (prot)	3423	1441	3539	0	0	3539
Fit Permitted	0.954					
Satd. Flow (perm)	3423	1441	3539	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	5	258				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1078	502	617	0	0	1722
Shared Lane Traffic (%)	10%					
Lane Group Flow (vph)	1128	452	617	0	0	1722
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0		0.0	0.0
Link Offset(m)	0.0		0.0		0.0	0.0
Crosswalk Width(m)	4.8		4.8		4.8	4.8
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex
<b>Detector 1 Channel</b>						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
<b>Detector 2 Channel</b>						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases	8					

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

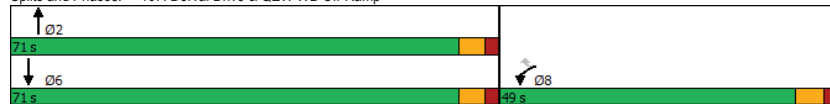
Total 10 Year  
AM Peak Hour

	↖	↗	↑	↘	↙	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	49.0	49.0	71.0			71.0
Total Split (%)	40.8%	40.8%	59.2%			59.2%
Maximum Green (s)	43.0	43.0	65.0			65.0
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	44.5	44.5	67.0			67.0
Actuated g/C Ratio	0.37	0.37	0.56			0.56
v/c Ratio	0.88	0.65	0.31			0.87
Control Delay	44.4	17.4	14.6			28.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	44.4	17.4	14.6			28.6
LOS	D	B	B			C
Approach Delay	36.7		14.6			28.6
Approach LOS	D		B			C

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 119.5  
 Natural Cycle: 70  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 29.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 83.6%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 107: Dorval Drive & QEW WB Off-Ramp



Queues  
107: Dorval Drive & QEW WB Off-Ramp

Total 10 Year  
AM Peak Hour

	↖	↗	↑	↓
Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1128	452	617	1722
v/c Ratio	0.88	0.65	0.31	0.87
Control Delay	44.4	17.4	14.6	28.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	44.4	17.4	14.6	28.6
Queue Length 50th (m)	132.3	42.1	41.1	184.5
Queue Length 95th (m)	#162.9	84.5	53.0	222.0
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1291	703	1983	1983
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.87	0.64	0.31	0.87

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Total 10 Year  
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕			↕↕
Traffic Volume (vph)	992	462	568	0	0	1584
Future Volume (vph)	992	462	568	0	0	1584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr't	0.99	0.85	1.00			1.00
Fit Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3426	1441	3539			3539
Fit Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3426	1441	3539			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1078	502	617	0	0	1722
RTOR Reduction (vph)	3	162	0	0	0	0
Lane Group Flow (vph)	1125	290	617	0	0	1722
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases	8					
Actuated Green, G (s)	42.5	42.5	65.0			65.0
Effective Green, g (s)	44.5	44.5	67.0			67.0
Actuated g/C Ratio	0.37	0.37	0.56			0.56
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1275	536	1984			1984
v/s Ratio Prot	c0.33		0.17			c0.49
v/s Ratio Perm		0.20				
v/c Ratio	0.88	0.54	0.31			0.87
Uniform Delay, d1	35.1	29.5	14.0			22.5
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	7.9	1.7	0.4			5.5
Delay (s)	42.9	31.2	14.4			27.9
Level of Service	D	C	B			C
Approach Delay (s)	39.6		14.4			27.9
Approach LOS	D		B			C

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	119.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↕↕	↕↕	
Traffic Volume (vph)	145	579	0	799	1712	0
Future Volume (vph)	145	579	0	799	1712	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Fr't	0.900	0.850				
Fit Protected	0.984					
Satd. Flow (prot)	3200	1441	0	3539	3539	0
Fit Permitted	0.984					
Satd. Flow (perm)	3200	1441	0	3539	3539	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	20	20				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	629	0	868	1861	0
Shared Lane Traffic (%)	50%					
Lane Group Flow (vph)	473	314	0	868	1861	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases	4					

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

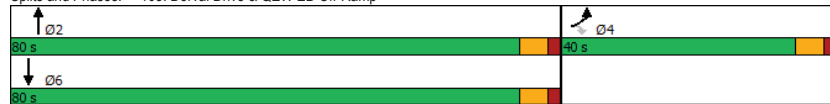
Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	40.0	40.0		80.0	80.0	
Total Split (%)	33.3%	33.3%		66.7%	66.7%	
Maximum Green (s)	34.0	34.0		74.0	74.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	30.3	30.3		76.2	76.2	
Actuated g/C Ratio	0.26	0.26		0.67	0.67	
v/c Ratio	0.55	0.79		0.37	0.79	
Control Delay	36.8	51.8		9.7	17.8	
Queue Delay	0.0	0.0		0.0	0.2	
Total Delay	36.8	51.8		9.7	17.9	
LOS	D	D		A	B	
Approach Delay	42.8			9.7	17.9	
Approach LOS	D			A	B	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 114.5  
 Natural Cycle: 60  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 21.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 83.6%  
 ICU Level of Service E  
 Analysis Period (min) 15

Splits and Phases: 108: Dorval Drive & QEW EB Off-Ramp



Queues  
108: Dorval Drive & QEW EB Off-Ramp

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	473	314	868	1861
v/c Ratio	0.55	0.79	0.37	0.79
Control Delay	36.8	51.8	9.7	17.8
Queue Delay	0.0	0.0	0.0	0.2
Total Delay	36.8	51.8	9.7	17.9
Queue Length 50th (m)	47.3	71.2	46.4	158.5
Queue Length 95th (m)	63.9	109.7	63.7	210.4
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1022	467	2354	2354
Starvation Cap Reductn	0	0	0	64
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.46	0.67	0.37	0.81

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Total 10 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↗		↕↕	↕↕	
Traffic Volume (vph)	145	579	0	799	1712	0
Future Volume (vph)	145	579	0	799	1712	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Fr <sub>t</sub>	0.90	0.85		1.00	1.00	
Fit Protected	0.98	1.00		1.00	1.00	
Satd. Flow (prot)	3199	1441		3539	3539	
Fit Permitted	0.98	1.00		1.00	1.00	
Satd. Flow (perm)	3199	1441		3539	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	629	0	868	1861	0
RTOR Reduction (vph)	15	15	0	0	0	0
Lane Group Flow (vph)	458	299	0	868	1861	0
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	28.3	28.3		74.2	74.2	
Effective Green, g (s)	30.3	30.3		76.2	76.2	
Actuated g/C Ratio	0.26	0.26		0.67	0.67	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	846	381		2355	2355	
v/s Ratio Prot	0.14			0.25	c0.53	
v/s Ratio Perm		c0.21				
v/c Ratio	0.54	0.79		0.37	0.79	
Uniform Delay, d <sub>1</sub>	36.1	39.1		8.5	13.5	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d <sub>2</sub>	0.9	10.8		0.4	2.8	
Delay (s)	37.0	49.9		8.9	16.3	
Level of Service	D	D		A	B	
Approach Delay (s)	42.1			8.9	16.3	
Approach LOS	D			A	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			20.3	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			114.5	Sum of lost time (s)		8.0
Intersection Capacity Utilization			83.6%	ICU Level of Service		E
Analysis Period (min)			15			

c Critical Lane Group

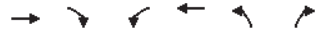
Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Total 10 Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕↕	↕↕
Traffic Volume (vph)	530	0	0	322	283	315
Future Volume (vph)	530	0	0	322	283	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Fr <sub>t</sub>						0.850
Fit Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	1770	1583
Fit Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						164
Link Speed (k/h)	60			60	40	
Link Distance (m)	128.8			184.7	258.8	
Travel Time (s)	7.7			11.1	23.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	576	0	0	350	308	342
Shared Lane Traffic (%)						
Lane Group Flow (vph)	576	0	0	350	308	342
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
v/c Ratio	0.41			0.25	0.44	0.47

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Total 10 Year  
AM Peak Hour






Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	10.8			9.6	12.2	7.7
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.8			9.6	12.2	7.7
LOS	B			A	B	A
Approach Delay	10.8			9.6	9.8	
Approach LOS	B			A	A	

**Intersection Summary**


Area Type:	Other
Cycle Length:	45
Actuated Cycle Length:	45
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Natural Cycle:	45
Control Type:	Pretimed
Maximum v/c Ratio:	0.47
Intersection Signal Delay:	10.1
Intersection LOS:	B
Intersection Capacity Utilization:	41.7%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street

 Ø2 (R) 22.5 s	 Ø4 22.5 s
	 Ø8 22.5 s

Queues  
109: QEW WB Off-Ramp & Kerr Street

Total 10 Year  
AM Peak Hour



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	576	350	308	342
v/c Ratio	0.41	0.25	0.44	0.47
Control Delay	10.8	9.6	12.2	7.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.8	9.6	12.2	7.7
Queue Length 50th (m)	16.9	9.5	17.4	9.4
Queue Length 95th (m)	26.9	16.5	33.3	24.5
Internal Link Dist (m)	104.8	160.7	234.8	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1415	1415	708	731
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.25	0.44	0.47

**Intersection Summary**



HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Total 10 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑	↑
Traffic Volume (vph)	530	0	0	322	283	315
Future Volume (vph)	530	0	0	322	283	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr't	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	1583
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	576	0	0	350	308	342
RTOR Reduction (vph)	0	0	0	0	0	98
Lane Group Flow (vph)	576	0	0	350	308	244
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1415			1415	708	633
v/s Ratio Prot	c0.16			0.10	c0.17	
v/s Ratio Perm						0.15
v/c Ratio	0.41			0.25	0.44	0.38
Uniform Delay, d1	9.7			9.0	9.8	9.6
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.9			0.4	1.9	1.8
Delay (s)	10.5			9.4	11.7	11.3
Level of Service	B			A	B	B
Approach Delay (s)	10.5			9.4	11.5	
Approach LOS	B			A	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			10.7		HCM 2000 Level of Service B	
HCM 2000 Volume to Capacity ratio			0.42			
Actuated Cycle Length (s)			45.0		Sum of lost time (s) 9.0	
Intersection Capacity Utilization			41.7%		ICU Level of Service A	
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings

110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Total 10 Year

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑		↑	↑↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	50	619	34	101	610	8	3	9	57	4	23	32
Future Volume (vph)	50	619	34	101	610	8	3	9	57	4	23	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0		0.0	155.0		70.0	15.0		0.0	0.0		30.0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr't		0.992				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3299	0	1719	3139	1380	1805	1667	1468	1805	1792	1495
Flt Permitted	0.385			0.341			0.741			0.751		
Satd. Flow (perm)	1378	3299	0	617	3139	1380	1408	1667	1468	1427	1792	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				94			99			99
Link Speed (k/h)		80			80			60				40
Link Distance (m)		324.5			247.2			158.7				215.5
Travel Time (s)		14.6			11.1			9.5				19.4
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%
Adj. Flow (vph)	55	680	37	111	670	9	3	10	63	4	25	35
<b>Shared Lane Traffic (%)</b>												
Lane Group Flow (vph)	55	717	0	111	670	9	3	10	63	4	25	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
<b>Two way Left Turn Lane</b>												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
<b>Detector 1 Channel</b>												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
<b>Detector 2 Channel</b>												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

Lanes, Volumes, Timings Total 10 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	8.0	20.0		8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0	10.0
Minimum Split (s)	14.0	34.0		14.0	38.4	38.4	28.8	28.8	28.8	35.0	35.0	35.0
Total Split (s)	19.0	64.0		23.0	68.0	68.0	38.0	38.0	38.0	38.0	38.0	38.0
Total Split (%)	15.2%	51.2%		18.4%	54.4%	54.4%	30.4%	30.4%	30.4%	30.4%	30.4%	30.4%
Maximum Green (s)	13.0	55.6		17.0	59.6	59.6	30.2	30.2	30.2	30.2	30.2	30.2
Yellow Time (s)	4.0	5.4		4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0		2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4		-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max		None	Max	Max	None	None	None	None	None	None
Walk Time (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	76.3	66.3		77.3	70.2	70.2	13.4	13.4	13.4	13.8	13.8	13.8
Actuated g/C Ratio	0.78	0.67		0.79	0.71	0.71	0.14	0.14	0.14	0.14	0.14	0.14
v/c Ratio	0.04	0.32		0.19	0.30	0.01	0.02	0.04	0.22	0.02	0.10	0.12
Control Delay	2.6	7.9		3.2	7.6	0.0	37.3	38.0	4.8	37.5	38.8	0.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.6	7.9		3.2	7.6	0.0	37.3	38.0	4.8	37.5	38.8	0.8
LOS	A	A		A	A	A	D	D	A	D	D	A
Approach Delay		7.5			6.9			10.5			18.0	
Approach LOS		A			A			B			B	

**Intersection Summary**

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 98.4

Natural Cycle: 90

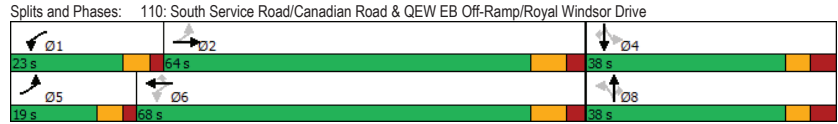
Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.32

Intersection Signal Delay: 7.7      Intersection LOS: A

Intersection Capacity Utilization 50.0%      ICU Level of Service A

Analysis Period (min) 15



Queues Total 10 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	55	717	111	670	9	3	10	63	4	25	35	
v/c Ratio	0.04	0.32	0.19	0.30	0.01	0.02	0.04	0.22	0.02	0.10	0.12	
Control Delay	2.6	7.9	3.2	7.6	0.0	37.3	38.0	4.8	37.5	38.8	0.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.6	7.9	3.2	7.6	0.0	37.3	38.0	4.8	37.5	38.8	0.8	
Queue Length 50th (m)	1.0	31.6	4.2	29.7	0.0	0.6	1.8	0.0	0.7	4.5	0.0	
Queue Length 95th (m)	2.1	42.4	7.7	39.6	0.0	3.3	6.7	5.1	4.0	12.4	0.0	
Internal Link Dist (m)		300.5		223.2			134.7			191.5		
Turn Bay Length (m)	150.0		155.0		70.0	15.0					30.0	
Base Capacity (vph)	1433	2223	717	2237	1010	486	575	572	493	619	581	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.32	0.15	0.30	0.01	0.01	0.02	0.11	0.01	0.04	0.06	

**Intersection Summary**

HCM Signalized Intersection Capacity Analysis  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive AM Peak Hour

Total 10 Year

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↕	↔	↕	↔	
Traffic Volume (vph)	50	619	34	101	610	8	3	9	57	4	23	32	
Future Volume (vph)	50	619	34	101	610	8	3	9	57	4	23	32	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Fr	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3400	3300		1719	3139	1380	1805	1667	1468	1805	1792	1495	
Flt Permitted	0.38	1.00		0.34	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00	
Satd. Flow (perm)	1377	3300		617	3139	1380	1408	1667	1468	1427	1792	1495	
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)	55	680	37	111	670	9	3	10	63	4	25	35	
RTOR Reduction (vph)	0	2	0	0	0	3	0	0	56	0	0	31	
Lane Group Flow (vph)	55	715	0	111	670	6	3	10	7	4	25	4	
Heavy Vehicles (%)	3%	9%	0%	5%	15%	17%	0%	14%	10%	0%	6%	8%	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	
Protected Phases	5	2		1	6			8			4		
Permitted Phases	2			6		6	8		8	4		4	
Actuated Green, G (s)	69.4	63.1		73.0	64.9	64.9	7.9	7.9	7.9	7.9	7.9	7.9	
Effective Green, g (s)	73.4	67.5		77.0	69.3	69.3	11.7	11.7	11.7	11.7	11.7	11.7	
Actuated g/C Ratio	0.72	0.67		0.76	0.68	0.68	0.12	0.12	0.12	0.12	0.12	0.12	
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8	
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5	
Lane Grp Cap (vph)	1163	2198		578	2147	944	162	192	169	164	206	172	
v/s Ratio Prot	0.00	c0.22		c0.02	0.21			0.01			c0.01		
v/s Ratio Perm	0.03			0.13		0.00	0.00		0.00	0.00		0.00	
v/c Ratio	0.05	0.33		0.19	0.31	0.01	0.02	0.05	0.04	0.02	0.12	0.02	
Uniform Delay, d1	3.9	7.2		3.4	6.4	5.1	39.7	39.9	39.8	39.7	40.2	39.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.4		0.2	0.4	0.0	0.1	0.1	0.1	0.1	0.3	0.1	
Delay (s)	3.9	7.6		3.6	6.8	5.1	39.8	40.0	39.9	39.8	40.5	39.8	
Level of Service	A	A		A	A	A	D	D	D	D	D	D	
Approach Delay (s)		7.3			6.3			39.9			40.1		
Approach LOS		A			A			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			9.6	HCM 2000 Level of Service				A					
HCM 2000 Volume to Capacity ratio			0.28										
Actuated Cycle Length (s)			101.3	Sum of lost time (s)				12.0					
Intersection Capacity Utilization			50.0%	ICU Level of Service				A					
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings  
 201: Cross Ave & Lyons Lane

Total 10 Year  
 AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕
Traffic Volume (vph)	32	639	449	41	10	8
Future Volume (vph)	32	639	449	41	10	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.979		0.932	
Flt Protected	0.950				0.976	
Satd. Flow (prot)	1624	3094	2795	0	1383	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1624	3094	2795	0	1383	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	4			4	7	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Heavy Vehicles (%)	0%	5%	16%	0%	0%	25%
Adj. Flow (vph)	46	1102	510	82	16	16
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	46	1102	592	0	32	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15		25	15
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	31.9%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Total 10 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	639	449	41	10	8
Future Volume (Veh/h)	32	639	449	41	10	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.69	0.58	0.88	0.50	0.62	0.50
Hourly flow rate (vph)	46	1102	510	82	16	16
Pedestrians			7		4	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked	0.95				0.95	0.95
vC, conflicting volume	596				1205	300
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	460				1103	147
tC, single (s)	4.1				6.8	7.4
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.5
p0 queue free %	96				91	98
cM capacity (veh/h)	1049				187	760
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>EB 3</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>
Volume Total	46	551	551	340	252	32
Volume Left	46	0	0	0	0	16
Volume Right	0	0	0	0	82	16
eSH	1049	1700	1700	1700	1700	300
Volume to Capacity	0.04	0.32	0.32	0.20	0.15	0.11
Queue Length 95th (m)	1.1	0.0	0.0	0.0	0.0	2.8
Control Delay (s)	8.6	0.0	0.0	0.0	0.0	18.4
Lane LOS	A					C
Approach Delay (s)	0.3			0.0		18.4
Approach LOS						C
<b>Intersection Summary</b>						
Average Delay			0.6			
Intersection Capacity Utilization			31.9%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	5	4	18	16	1
Future Volume (vph)	0	5	4	18	16	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.888		0.988	
Fit Protected					0.956	
Satd. Flow (prot)	0	1710	1518	0	1241	0
Fit Permitted					0.956	
Satd. Flow (perm)	0	1710	1518	0	1241	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		60.5	89.6		37.6	
Travel Time (s)		4.4	6.5		2.7	
Confl. Peds. (#/hr)	6			6	1	
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Heavy Vehicles (%)	0%	0%	0%	0%	33%	0%
Adj. Flow (vph)	0	10	5	24	42	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	10	29	0	46	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 15.1%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Total 10 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	5	4	18	16	1
Future Volume (Veh/h)	0	5	4	18	16	1
Sign Control	Free		Free	Stop		
Grade	0%		0%	0%		
Peak Hour Factor	0.25	0.50	0.75	0.75	0.38	0.25
Hourly flow rate (vph)	0	10	5	24	42	4
Pedestrians			1	6		
Lane Width (m)			3.6	3.6		
Walking Speed (m/s)			1.2	1.2		
Percent Blockage			0	1		
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	35				34	23
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	35				34	23
tC, single (s)	4.1				6.7	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.8	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1581				900	1054
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	10	29	46			
Volume Left	0	0	42			
Volume Right	0	24	4			
cSH	1581	1700	912			
Volume to Capacity	0.00	0.02	0.05			
Queue Length 95th (m)	0.0	0.0	1.3			
Control Delay (s)	0.0	0.0	9.2			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			5.0			
Intersection Capacity Utilization			15.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	79	828	255	114	4
Future Volume (vph)	1	79	828	255	114	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.964			0.995		
Fit Protected	0.999			0.954		
Satd. Flow (prot)	0	1673	1613	0	1623	0
Fit Permitted	0.999					
Satd. Flow (perm)	0	1673	1613	0	1623	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	177.7		145.7		103.5	
Travel Time (s)	12.8		10.5		7.5	
Confl. Peds. (#/hr)	1				1	5
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Heavy Vehicles (%)	100%	0%	3%	0%	0%	0%
Adj. Flow (vph)	4	188	963	354	456	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	192	1317	0	472	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24		14		24	
Sign Control	Free		Free	Stop		
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization 79.8%				ICU Level of Service D		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Total 10 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	79	828	255	114	4
Future Volume (Veh/h)	1	79	828	255	114	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.42	0.86	0.72	0.25	0.25
Hourly flow rate (vph)	4	188	963	354	456	16
Pedestrians		1	5		1	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		358				
pX, platoon unblocked						
vC, conflicting volume	1318				1342	1142
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1318				1342	1142
tC, single (s)	5.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	3.1				3.5	3.3
p0 queue free %	99				0	93
cM capacity (veh/h)	300				166	246
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	192	1317	472			
Volume Left	4	0	456			
Volume Right	0	354	16			
eSH	300	1700	168			
Volume to Capacity	0.01	0.77	2.81			
Queue Length 95th (m)	0.3	0.0	337.4			
Control Delay (s)	0.6	0.0	871.2			
Lane LOS	A		F			
Approach Delay (s)	0.6	0.0	871.2			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			207.6			
Intersection Capacity Utilization			79.8%		ICU Level of Service	D
Analysis Period (min)			15			

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕↕↕	↕↕↕	
Traffic Volume (vph)	0	204	0	2362	2256	1011
Future Volume (vph)	0	204	0	2362	2256	1011
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)		3.6	3.5	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	*0.80	*0.80	0.91
Ped Bike Factor						
Frts		0.865			0.948	
Fit Protected						
Satd. Flow (prot)	0	1367	0	3836	3766	0
Fit Permitted						
Satd. Flow (perm)	0	1367	0	3836	3766	0
Link Speed (k/h)		50		50	50	
Link Distance (m)		145.7		270.2	51.4	
Travel Time (s)		10.5		19.5	3.7	
Confl. Peds. (#/hr)						11
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82
Heavy Vehicles (%)	0%	7%	0%	7%	4%	2%
Adj. Flow (vph)	0	378	0	2567	2326	1233
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	378	0	2567	3559	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment		Left Right		Left Left	Left Right	
Median Width(m)		0.0		3.3	3.3	
Link Offset(m)		0.0		0.0	0.0	
Crosswalk Width(m)		4.8		4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)		24		24		14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	94.6%			ICU Level of Service F		
Analysis Period (min)	15					
* User Entered Value						

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Total 10 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations		↗		↖↖	↗↗		
Traffic Volume (veh/h)	0	204	0	2362	2256	1011	
Future Volume (Veh/h)	0	204	0	2362	2256	1011	
Sign Control	Stop			Free	Free		
Grade	0%			0%	0%		
Peak Hour Factor	0.25	0.54	0.25	0.92	0.97	0.82	
Hourly flow rate (vph)	0	378	0	2567	2326	1233	
Pedestrians	11						
Lane Width (m)	3.5						
Walking Speed (m/s)	1.2						
Percent Blockage	1						
Right turn flare (veh)							
Median type			None	None			
Median storage (veh)							
Upstream signal (m)				270	52		
pX, platoon unblocked	0.59	0.59	0.59				
vC, conflicting volume	3809	1403	3570				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	3329	0	2924				
tC, single (s)	6.8	7.0	4.1				
tC, 2 stage (s)							
tF (s)	3.5	3.4	2.2				
p0 queue free %	100	39	100				
cM capacity (veh/h)	4	625	74				
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	378	856	856	856	930	930	1698
Volume Left	0	0	0	0	0	0	0
Volume Right	378	0	0	0	0	0	1233
sSH	625	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.61	0.50	0.50	0.50	0.55	0.55	1.00
Queue Length 95th (m)	32.5	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	19.2	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C						
Approach Delay (s)	19.2	0.0			0.0		
Approach LOS	C						
Intersection Summary							
Average Delay			1.1				
Intersection Capacity Utilization			94.6%		ICU Level of Service		F
Analysis Period (min)			15				

Lanes, Volumes, Timings  
205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	26	249	417	445	78	197	223	1249	872	171	1210	27
Future Volume (vph)	26	249	417	445	78	197	223	1249	872	171	1210	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0		25.0	145.0		0.0	95.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	0.99					0.98			0.97	1.00		
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1693	1425	3060	1676	1398	1425	3909	1398	1562	3984	1398
Fit Permitted	0.702			0.291			0.091			0.100		
Satd. Flow (perm)	1189	1693	1425	937	1676	1366	136	3909	1363	164	3984	1398
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			211			212				412		191
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.9			293.8			275.1				252.7
Travel Time (s)		20.6			21.2			19.8				18.2
Confl. Peds. (#/hr)	11					11			10		10	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%
Adj. Flow (vph)	28	268	448	478	84	212	240	1343	938	184	1301	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	268	448	478	84	212	240	1343	938	184	1301	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)				7.2					3.6			3.6
Link Offset(m)				0.0		0.0			0.0			0.0
Crosswalk Width(m)				4.8		4.8			4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4			9.4			9.4
Detector 2 Size(m)			0.6			0.6			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0			0.0			0.0

Lanes, Volumes, Timings

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 10 Year

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	10.0	34.0	34.0	11.0	43.0	43.0	10.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	10.0	36.0	36.0	17.0	43.0	43.0	19.0	57.0	57.0	10.0	48.0	48.0
Total Split (%)	8.3%	30.0%	30.0%	14.2%	35.8%	35.8%	15.8%	47.5%	47.5%	8.3%	40.0%	40.0%
Maximum Green (s)	6.0	29.0	29.0	12.0	36.0	36.0	15.0	50.0	50.0	6.0	41.0	41.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	35.0	29.0	29.0	45.0	40.0	40.0	66.0	53.0	53.0	53.7	44.7	44.7
Actuated g/C Ratio	0.29	0.24	0.24	0.38	0.33	0.33	0.55	0.44	0.44	0.45	0.37	0.37
v/c Ratio	0.08	0.66	0.89	0.85	0.15	0.36	0.92	0.78	1.13	1.03	0.88	0.05
Control Delay	22.7	48.7	43.3	43.6	29.2	5.7	70.9	32.4	92.0	107.2	43.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	48.7	43.3	43.6	29.2	5.7	70.9	32.4	92.0	107.2	43.3	0.1
LOS	C	D	D	D	C	A	E	C	F	F	D	A
Approach Delay	44.5			31.7			58.2			50.3		
Approach LOS	D			C			E			D		

Intersection Summary

Area Type:	CBD
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	33.6 (28%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	140
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.13
Intersection Signal Delay:	50.5
Intersection LOS:	D
Intersection Capacity Utilization:	96.1%
ICU Level of Service:	F
Analysis Period (min):	15

\* User Entered Value

Splits and Phases: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd



Queues

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 10 Year

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	28	268	448	478	84	212	240	1343	938	184	1301	29
v/c Ratio	0.08	0.66	0.89	0.85	0.15	0.36	0.92	0.78	1.13	1.03	0.88	0.05
Control Delay	22.7	48.7	43.3	43.6	29.2	5.7	70.9	32.4	92.0	107.2	43.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	48.7	43.3	43.6	29.2	5.7	70.9	32.4	92.0	107.2	43.3	0.1
Queue Length 50th (m)	4.1	58.1	59.0	42.8	14.7	0.0	-49.4	115.5	-208.8	-43.6	125.2	0.0
Queue Length 95th (m)	10.3	87.5	#117.8	#60.6	27.5	17.4	#102.9	138.4	#290.1	#91.4	#150.3	0.0
Internal Link Dist (m)	261.9			269.8			251.1			228.7		
Turn Bay Length (m)	60.0	165.0			25.0	145.0	95.0			90.0		
Base Capacity (vph)	368	451	534	563	600	261	1726	832	178	1483	640	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.08	0.59	0.84	0.85	0.15	0.35	0.92	0.78	1.13	1.03	0.88	0.05

Intersection Summary

~	Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.



HCM Signalized Intersection Capacity Analysis  
 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 10 Year  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↑	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	
Traffic Volume (vph)	26	249	417	445	78	197	223	1249	872	171	1210	27	
Future Volume (vph)	26	249	417	445	78	197	223	1249	872	171	1210	27	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Fr t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1614	1693	1425	3060	1676	1366	1425	3909	1363	1562	3984	1398	
Fit Permitted	0.70	1.00	1.00	0.29	1.00	1.00	0.09	1.00	1.00	0.10	1.00	1.00	
Satd. Flow (perm)	1193	1693	1425	937	1676	1366	136	3909	1363	164	3984	1398	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	28	268	448	478	84	212	240	1343	938	184	1301	29	
RTOR Reduction (vph)	0	0	157	0	0	141	0	0	236	0	0	19	
Lane Group Flow (vph)	28	268	291	478	84	71	240	1343	702	184	1301	10	
Confl. Peds. (#/hr)	11				11				10	10			
Heavy Vehicles (%)	0%	1%	2%	3%	2%	4%	14%	5%	4%	4%	3%	4%	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4		4	8		8	2		2	6		6	
Actuated Green, G (s)	31.2	27.6	27.6	44.6	37.0	37.0	61.4	48.4	48.4	49.1	40.1	40.1	
Effective Green, g (s)	31.2	30.6	30.6	44.6	40.0	40.0	61.4	51.4	51.4	49.1	43.1	43.1	
Actuated g/C Ratio	0.26	0.26	0.26	0.37	0.33	0.33	0.51	0.43	0.43	0.41	0.36	0.36	
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	4.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0	
Lane Grp Cap (vph)	322	431	363	560	558	455	255	1674	583	171	1430	502	
v/s Ratio Prot	0.00	0.16		c0.09	0.05		c0.14	0.34		0.08	0.33		
v/s Ratio Perm	0.02		0.20	c0.23		0.05	0.35		c0.52	0.36		0.01	
v/c Ratio	0.09	0.62	0.80	0.85	0.15	0.16	0.94	0.80	1.20	1.08	0.91	0.02	
Uniform Delay, d1	33.4	39.6	41.9	31.6	28.1	28.1	35.7	29.9	34.3	27.9	36.6	24.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	3.2	12.6	12.0	0.2	0.2	40.4	4.2	107.8	90.5	10.2	0.1	
Delay (s)	33.6	42.7	54.5	43.7	28.2	28.3	76.1	34.0	142.1	118.4	46.8	24.9	
Level of Service	C	D	D	D	C	C	E	C	F	F	D	C	
Approach Delay (s)		49.4			37.8			78.2			55.0		
Approach LOS		D			D			E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			62.4		HCM 2000 Level of Service					E			
HCM 2000 Volume to Capacity ratio			1.05										
Actuated Cycle Length (s)			120.0		Sum of lost time (s)					17.0			
Intersection Capacity Utilization			96.1%		ICU Level of Service					F			
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings  
 206: North-South Local Rd & South Service Rd E

Total 10 Year  
 AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	113	51	0	98	0	0
Future Volume (vph)	113	51	0	98	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr t	0.958					
Fit Protected						
Satd. Flow (prot)	1785	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1785	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	59.5			243.2	108.4	
Travel Time (s)	4.3			17.5	7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	55	0	107	0	0
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	178	0	0	107	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	12.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
206: North-South Local Rd & South Service Rd E

Total 10 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↔	
Traffic Volume (veh/h)	113	51	0	98	0	0
Future Volume (Veh/h)	113	51	0	98	0	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)	123	55	0	107	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			178		258	150
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			178		258	150
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1398		731	896
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	178	107	0			
Volume Left	0	0	0			
Volume Right	55	0	0			
sSH	1700	1700	1700			
Volume to Capacity	0.10	0.06	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			12.4%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
207: Argus Rd & East-West Local Rd

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↑	↑	
Traffic Volume (vph)	0	0	0	145	266	550
Future Volume (vph)	0	0	0	145	266	550
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>					0.909	
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1693	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1693	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	103.5			104.4	76.3	
Travel Time (s)	7.5			7.5	5.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	158	289	598
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	158	887	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		25	15	25		15
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	51.1%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
207: Argus Rd & East-West Local Rd

Total 10 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			T	T	
Traffic Volume (veh/h)	0	0	0	145	266	550
Future Volume (Veh/h)	0	0	0	145	266	550
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	158	289	598
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				105		
pX, platoon unblocked						
vC, conflicting volume	746	588	887			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	746	588	887			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	381	509	763			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	158	887			
Volume Left	0	0	0			
Volume Right	0	0	598			
eSH	1700	763	1700			
Volume to Capacity	0.00	0.00	0.52			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization		51.1%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
208: North-South Local Rd & East-West Local Rd

Total 10 Year  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Volume (vph)	550	0	40	0	0	291
Future Volume (vph)	550	0	40	0	0	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Fit Protected	0.950					
Satd. Flow (prot)	1770	0	1863	0	0	1863
Fit Permitted	0.950					
Satd. Flow (perm)	1770	0	1863	0	0	1863
Link Speed (k/h)	50		50			50
Link Distance (m)	103.5		120.8			67.8
Travel Time (s)	7.5		8.7			4.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	598	0	43	0	0	316
Shared Lane Traffic (%)						
Lane Group Flow (vph)	598	0	43	0	0	316
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	52.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
208: North-South Local Rd & East-West Local Rd

Total 10 Year  
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	550	0	40	0	0	291
Future Volume (Veh/h)	550	0	40	0	0	291
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)	598	0	43	0	0	316
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)		121				
pX, platoon unblocked						
vC, conflicting volume	359	43			43	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359	43			43	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	7	100			100	
cM capacity (veh/h)	640	1027			1566	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	598	43	316			
Volume Left	598	0	0			
Volume Right	0	0	0			
cSH	640	1700	1566			
Volume to Capacity	0.93	0.03	0.00			
Queue Length 95th (m)	100.8	0.0	0.0			
Control Delay (s)	46.8	0.0	0.0			
Lane LOS	E					
Approach Delay (s)	46.8	0.0	0.0			
Approach LOS	E					
Intersection Summary						
Average Delay		29.2				
Intersection Capacity Utilization		52.5%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings  
209: GO Station West Access/North-South Local Rd & Cross Ave

Total 10 Year  
AM Peak Hour

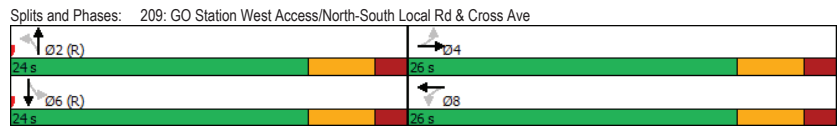
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	22	636	0	482	596	50	0	0	302	307	542	52
Future Volume (vph)	22	636	0	482	596	50	0	0	302	307	542	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0
Storage Lanes	0	0	0	0	0	1	0	1	0	1	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.993			0.850			0.987	
Fit Protected		0.998			0.979					0.950		
Satd. Flow (prot)	0	3532	0	0	3441	0	1863	1583	0	1770	1839	0
Fit Permitted		0.847			0.574					0.487		
Satd. Flow (perm)	0	2998	0	0	2017	0	1863	1583	0	907	1839	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					12			138			12	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		268.0			106.1			82.9			120.8	
Travel Time (s)		19.3			7.6			6.0			8.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	691	0	524	648	54	0	0	328	334	589	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	715	0	0	1226	0	0	328	0	334	646	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	25	15	25	25	15	25	25	15	25	25	15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases		4			8			2			6	

Lanes, Volumes, Timings  
 209: GO Station West Access/North-South Local Rd & Cross Ave

Total 10 Year  
 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0	
Total Split (s)	26.0	26.0		26.0	26.0		24.0	24.0		24.0	24.0	
Total Split (%)	52.0%	52.0%		52.0%	52.0%		48.0%	48.0%		48.0%	48.0%	
Maximum Green (s)	20.0	20.0		20.0	20.0		18.0	18.0		18.0	18.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		22.0			22.0			20.0			20.0	
Actuated g/C Ratio		0.44			0.44			0.40			0.40	
v/c Ratio		0.54			1.95dl			0.46			0.92	0.87
Control Delay		12.2			193.6			8.7			51.4	29.7
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		12.2			193.6			8.7			51.4	29.7
LOS		B			F			A			D	C
Approach Delay		12.2			193.6			8.7			37.1	
Approach LOS		B			F			A			D	

**Intersection Summary**  
 Area Type: Other  
 Cycle Length: 50  
 Actuated Cycle Length: 50  
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.37  
 Intersection Signal Delay: 87.8      Intersection LOS: F  
 Intersection Capacity Utilization 99.5%      ICU Level of Service F  
 Analysis Period (min) 15  
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.



Queues  
 209: GO Station West Access/North-South Local Rd & Cross Ave

Total 10 Year  
 AM Peak Hour

Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	715	1226	328	334	646
v/c Ratio	0.54	1.95dl	0.46	0.92	0.87
Control Delay	12.2	193.6	8.7	51.4	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	193.6	8.7	51.4	29.7
Queue Length 50th (m)	24.1	~85.0	11.6	28.2	52.0
Queue Length 95th (m)	37.3	#120.7	28.0	#71.4	#109.0
Internal Link Dist (m)	244.0	82.1	58.9		96.8
Turn Bay Length (m)				15.0	
Base Capacity (vph)	1319	894	716	362	742
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	0.54	1.37	0.46	0.92	0.87

**Intersection Summary**  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM Signalized Intersection Capacity Analysis  
 209: GO Station West Access/North-South Local Rd & Cross Ave

Total 10 Year  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	22	636	0	482	596	50	0	0	302	307	542	52
Future Volume (vph)	22	636	0	482	596	50	0	0	302	307	542	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0											
Lane Util. Factor	0.95											
Fr't	1.00											
Flt Protected	1.00											
Satd. Flow (prot)	3533											
Flt Permitted	0.85											
Satd. Flow (perm)	2999											
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	691	0	524	648	54	0	0	328	334	589	57
RTOR Reduction (vph)	0	0	0	0	7	0	0	83	0	0	7	0
Lane Group Flow (vph)	0	715	0	0	1219	0	0	245	0	334	639	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	4											
Permitted Phases	8											
Actuated Green, G (s)	20.0											
Effective Green, g (s)	22.0											
Actuated g/C Ratio	0.44											
Clearance Time (s)	6.0											
Vehicle Extension (s)	3.0											
Lane Grp Cap (vph)	1319											
v/s Ratio Prot	0.15											
v/s Ratio Perm	0.24											
v/c Ratio	0.54											
Uniform Delay, d1	10.3											
Progression Factor	1.00											
Incremental Delay, d2	0.5											
Delay (s)	10.8											
Level of Service	B											
Approach Delay (s)	10.8											
Approach LOS	B											

**Intersection Summary**

HCM 2000 Control Delay	85.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		

d) Defacto Left Lane. Recode with 1 though lane as a left lane.  
 c) Critical Lane Group

Lanes, Volumes, Timings  
 303: North Access & South Service Rd E

Total 10 Year  
 AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Volume (vph)	71	0	78	20	0	93
Future Volume (vph)	71	0	78	20	0	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr't	0.865					
Flt Protected	0.962					
Satd. Flow (prot)	1863	0	0	1792	1611	0
Flt Permitted	0.962					
Satd. Flow (perm)	1863	0	0	1792	1611	0
Link Speed (k/h)	50					
Link Distance (m)	523.2					
Travel Time (s)	37.7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	0	85	22	0	101
Shared Lane Traffic (%)						
Lane Group Flow (vph)	77	0	0	107	101	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0					
Link Offset(m)	0.0					
Crosswalk Width(m)	4.8					
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	15					
Sign Control	Free					

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	24.5%
Analysis Period (min)	15
ICU Level of Service	A

HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Total 10 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	71	0	78	20	0	93
Future Volume (Veh/h)	71	0	78	20	0	93
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)	77	0	85	22	0	101
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			77		269	77
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			77		269	77
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		100	90
cM capacity (veh/h)			1522		680	984
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	77	107	101			
Volume Left	0	85	0			
Volume Right	0	0	101			
cSH	1700	1522	984			
Volume to Capacity	0.05	0.06	0.10			
Queue Length 95th (m)	0.0	1.4	2.7			
Control Delay (s)	0.0	6.0	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	6.0	9.1			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			5.5			
Intersection Capacity Utilization		24.5%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
304: North-South Local Rd & East Access

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	0	240	40	0	51	0
Future Volume (vph)	0	240	40	0	51	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.865					
Fit Protected				0.950		
Satd. Flow (prot)	1611	0	0	1770	1863	0
Fit Permitted				0.950		
Satd. Flow (perm)	1611	0	0	1770	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	42.8			67.8	108.4	
Travel Time (s)	3.1			4.9	7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	261	43	0	55	0
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	261	0	0	43	55	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	30.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
304: North-South Local Rd & East Access

Total 10 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	240	40	0	51	0
Future Volume (Veh/h)	0	240	40	0	51	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	261	43	0	55	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)			189			
pX, platoon unblocked						
vC, conflicting volume	141	55	55			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	141	55	55			
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	74	97			
cM capacity (veh/h)	828	1012	1550			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	261	43	55			
Volume Left	0	43	0			
Volume Right	261	0	0			
eSH	1012	1550	1700			
Volume to Capacity	0.26	0.03	0.03			
Queue Length 95th (m)	8.3	0.7	0.0			
Control Delay (s)	9.8	7.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.8	7.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			8.0			
Intersection Capacity Utilization		30.4%		ICU Level of Service	A	
Analysis Period (min)		15				

Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	157.7	142.5	78.9	77.6	32.3	330.4	328.2	56.9	121.0	130.1	151.3
Average Queue (m)	121.9	148.5	72.5	70.2	45.6	18.0	319.7	316.2	28.3	43.3	63.9	148.8
95th Queue (m)	126.9	154.7	135.1	84.5	95.2	36.8	325.3	340.8	53.5	84.4	121.4	150.3
Link Distance (m)		123.0	123.0	51.4	51.4		313.2	313.2		128.0	128.0	128.0
Upstream Blk Time (%)	7	58	5	49	21		95	53		0	1	82
Queueing Penalty (veh)	0	459	39	390	164		0	0		0	4	549
Storage Bay Dist (m)	130.0						25.0			50.0		
Storage Blk Time (%)	7	58					4	79		2	4	
Queueing Penalty (veh)	42	358					15	71		5	8	

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	B34	SB	SB	SB	SB
Directions Served	T	T	T	L	T	T	TR
Maximum Queue (m)	84.0	110.9	133.4	32.3	224.4	236.9	197.3
Average Queue (m)	9.2	99.7	127.0	13.3	43.4	35.0	34.7
95th Queue (m)	47.8	111.1	133.4	35.9	169.1	150.2	134.2
Link Distance (m)	101.5	101.5	101.5		239.0	239.0	239.0
Upstream Blk Time (%)	0	4	80		3	0	0
Queueing Penalty (veh)	0	27	535		27	3	4
Storage Bay Dist (m)				25.0			
Storage Blk Time (%)				20	3		
Queueing Penalty (veh)				75	15		

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	B7	B7	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	27.4	97.7	100.8	27.4	88.4	79.5	108.0	104.1	80.1	85.9	22.4	72.1
Average Queue (m)	8.4	88.6	89.9	24.7	73.7	34.9	31.7	16.6	53.9	79.3	21.2	51.5
95th Queue (m)	25.7	94.5	97.4	34.6	90.8	76.2	87.8	70.0	94.4	93.9	24.6	66.5
Link Distance (m)		83.8	83.8		51.4	51.4	123.0	123.0	66.7	66.7		84.8
Upstream Blk Time (%)		61	53		53	8	1	0	26	86		1
Queueing Penalty (veh)		381	330		353	52	4	2	0	0		3
Storage Bay Dist (m)	20.0			20.0							15.0	
Storage Blk Time (%)	0	77		55	30						93	20
Queueing Penalty (veh)	1	39		269	65						152	64



Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	21.8	33.3	36.9	29.6	29.6	33.3	27.3	57.0	67.1	42.4
Average Queue (m)	6.7	22.5	22.2	11.5	9.8	10.4	12.9	24.1	41.1	14.6
95th Queue (m)	17.8	29.7	33.3	26.9	26.4	25.4	27.8	52.7	72.7	31.5
Link Distance (m)	21.8	21.8	21.8		246.0	246.0		54.8	56.7	56.7
Upstream Blk Time (%)	1	60	48					3	30	0
Queuing Penalty (veh)	2	130	104					0	0	0
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)				1		1		3		20
Queuing Penalty (veh)				1		3		3		11

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.7	87.4	279.7	271.3	56.5	133.0	138.6	32.4	294.9	296.8	64.1	66.6
Average Queue (m)	80.6	87.2	269.8	221.5	6.0	115.9	129.0	16.4	288.4	290.9	18.5	20.0
95th Queue (m)	103.1	88.0	274.9	355.0	25.8	155.6	134.7	36.1	310.0	298.1	45.6	48.8
Link Distance (m)			264.0	264.0		122.1	122.1		286.8	286.8		101.5
Upstream Blk Time (%)		96	13		18	94		53	89			
Queuing Penalty (veh)		0	0		0	0		0	0			
Storage Bay Dist (m)	80.0	80.0			80.0			25.0			80.0	
Storage Blk Time (%)	2	85	3		10			11	32		1	1
Queuing Penalty (veh)	6	301	16		3			35	26		1	1

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	49.8	21.1
Average Queue (m)	18.6	6.0
95th Queue (m)	39.9	15.7
Link Distance (m)	101.5	101.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	130.4	181.5	186.0	35.9	43.2	37.2	311.3	318.4	308.5
Average Queue (m)	9.9	146.6	177.5	28.5	30.6	29.6	302.3	304.3	300.9
95th Queue (m)	57.9	254.9	183.6	31.5	37.4	34.0	310.7	312.7	304.9
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	0	63	99	38	39	41	86	83	95
Queuing Penalty (veh)	0	0	0	298	308	324	835	808	919
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	123.5	169.5	178.7	142.9	46.6	55.1	70.9	260.7	259.1	258.5	269.3
Average Queue (m)	115.3	158.4	168.8	70.6	11.1	12.8	30.6	250.5	250.6	250.1	261.0
95th Queue (m)	136.4	193.9	189.3	209.4	32.4	35.5	59.5	254.9	255.4	254.0	296.5
Link Distance (m)	117.8	171.3	171.3	171.3	299.7	299.7	299.7	249.2	249.2	249.2	249.2
Upstream Blk Time (%)	89	65	91	37				90	91	96	98
Queuing Penalty (veh)	0	0	0	0				467	469	496	509
Storage Bay Dist (m)											
Storage Blk Time (%)	97										
Queuing Penalty (veh)	1										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	162.9	164.4	144.1	67.1	67.3	157.0	145.1
Average Queue (m)	111.7	110.3	84.8	34.6	34.2	102.8	91.5
95th Queue (m)	153.3	151.0	129.2	59.9	57.7	141.9	129.3
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)				190.0			
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	82.4	102.2	89.9	81.0	71.0	112.8	120.3
Average Queue (m)	34.0	65.3	53.5	44.1	27.2	74.9	81.2
95th Queue (m)	73.6	88.9	77.3	69.8	55.3	111.1	114.4
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	48.1	37.0	34.8	15.9	42.0	38.4
Average Queue (m)	25.8	10.8	18.0	4.7	24.2	19.1
95th Queue (m)	40.9	24.7	29.0	13.7	38.1	31.7
Link Distance (m)	121.6	121.6	175.0	175.0	246.4	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	4.3	16.6	50.8	40.9	25.2	45.9	42.4	8.5	7.0	17.3	7.5	17.1
Average Queue (m)	0.1	6.7	19.9	12.0	8.3	17.1	9.8	0.5	0.5	2.5	0.7	4.0
95th Queue (m)	1.8	14.5	41.6	29.3	18.0	40.0	28.8	3.7	3.7	10.0	4.2	11.4
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0			70.0	15.0			
Storage Blk Time (%)									0	2		
Queuing Penalty (veh)									0	0		

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	SB
Directions Served	R
Maximum Queue (m)	5.3
Average Queue (m)	0.2
95th Queue (m)	3.7
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	9.7	287.1	288.2	8.0	12.1	18.1
Average Queue (m)	1.5	198.3	219.2	0.6	0.6	3.0
95th Queue (m)	7.0	400.5	380.9	5.4	5.3	12.2
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)		49	64	0	0	0
Queuing Penalty (veh)		0	0	0	0	0
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	1	0				
Queuing Penalty (veh)	2	0				

Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 202: Lyons Lane & South Service Rd E

Movement	SB
Directions Served	LR
Maximum Queue (m)	17.7
Average Queue (m)	2.9
95th Queue (m)	13.1
Link Distance (m)	21.6
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 203: Argus Rd & South Service Rd E

Movement	EB	WB	SB	B17	B18
Directions Served	LT	TR	LR	T	T
Maximum Queue (m)	69.2	120.7	100.0	41.2	138.5
Average Queue (m)	12.3	110.7	57.1	21.5	58.4
95th Queue (m)	62.9	144.0	128.2	63.2	205.0
Link Distance (m)	162.3	112.3	88.3	39.8	230.6
Upstream Blk Time (%)	0	92	44	38	13
Queuing Penalty (veh)	1	927	50	43	14
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	115.5	87.4	89.1	92.7	27.8	37.3	45.6
Average Queue (m)	50.8	53.0	53.2	58.5	2.8	7.9	30.3
95th Queue (m)	124.0	82.0	78.9	83.9	16.2	30.0	38.8
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)	20				1	4	89
Queuing Penalty (veh)	38				13	46	928
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	L
Maximum Queue (m)	32.2	271.4	269.6	172.0	280.7	277.7	24.1	40.1	38.6	45.4	55.7	102.4
Average Queue (m)	1.4	199.3	256.0	156.1	262.9	213.6	2.3	12.9	10.7	12.9	15.7	15.1
95th Queue (m)	14.7	381.6	315.1	177.3	322.8	396.2	12.9	33.8	29.9	35.8	43.2	74.8
Link Distance (m)		265.0	265.0		273.8	273.8			249.2	249.2	249.2	
Upstream Blk Time (%)		70	92		87	71						
Queuing Penalty (veh)		0	0		0	0						
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				95.0
Storage Blk Time (%)		1		38	93	0	0					0
Queuing Penalty (veh)		0		84	206	1	0					0

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB
Directions Served	T	T	T	R
Maximum Queue (m)	242.2	242.2	241.2	78.0
Average Queue (m)	233.3	232.6	232.5	3.9
95th Queue (m)	241.4	244.1	251.3	35.2
Link Distance (m)	234.2	234.2	234.2	
Upstream Blk Time (%)	95	81	86	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (m)				90.0
Storage Blk Time (%)	99		100	0
Queuing Penalty (veh)	169		27	0

Intersection: 206: North-South Local Rd & South Service Rd E

Movement	EB
Directions Served	TR
Maximum Queue (m)	25.0
Average Queue (m)	5.9
95th Queue (m)	29.9
Link Distance (m)	42.8
Upstream Blk Time (%)	11
Queuing Penalty (veh)	17
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 207: Argus Rd & East-West Local Rd

Movement	SB	B14
Directions Served	TR	T
Maximum Queue (m)	82.6	166.3
Average Queue (m)	74.7	159.0
95th Queue (m)	89.6	198.8
Link Distance (m)	57.6	162.3
Upstream Blk Time (%)	98	91
Queuing Penalty (veh)	814	758
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 208: North-South Local Rd & East-West Local Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	86.2	57.1
Average Queue (m)	82.9	54.0
95th Queue (m)	90.8	59.3
Link Distance (m)	82.8	53.4
Upstream Blk Time (%)	95	76
Queuing Penalty (veh)	525	222
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 209: GO Station West Access/North-South Local Rd & Cross Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	TR	L	TR	L	TR
Maximum Queue (m)	256.4	257.2	91.1	92.3	75.8	80.4	22.5	100.2
Average Queue (m)	241.4	240.6	61.8	24.9	48.9	71.2	21.3	97.5
95th Queue (m)	281.5	283.9	102.2	68.7	102.0	84.5	24.8	99.8
Link Distance (m)	246.0	246.0	83.8	83.8	68.0	68.0		95.6
Upstream Blk Time (%)	48	45	15	1	37	84		80
Queuing Penalty (veh)	159	147	90	9	0	0		670
Storage Bay Dist (m)								15.0
Storage Blk Time (%)								94
Queuing Penalty (veh)								556
								47

Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 303: North Access & South Service Rd E

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	39.5	1.8	47.7
Average Queue (m)	6.7	0.1	15.4
95th Queue (m)	42.2	1.3	50.4
Link Distance (m)	504.8	42.8	86.5
Upstream Blk Time (%)			6
Queuing Penalty (veh)			0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 304: North-South Local Rd & East Access

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (m)	48.7	5.4	47.6
Average Queue (m)	36.5	0.3	16.1
95th Queue (m)	46.3	2.9	48.0
Link Distance (m)	32.9	53.4	90.0
Upstream Blk Time (%)	92		1
Queuing Penalty (veh)	0		0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 17144

Lanes, Volumes, Timings

101: Trafalgar Rd & Cross Ave/South Service Rd

Total 10 Year

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1480	421	237	302	376	378	370	1420	199	194	1492	674
Future Volume (vph)	1480	421	237	302	376	378	370	1420	199	194	1492	674
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	130.0		0.0	25.0		0.0	50.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.91	1.00	0.80	0.91
Ped Bike Factor		0.98						0.95			0.98	
Frt		0.950				0.850		0.975			0.955	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	2958	1476	0	1540	1644	1423	1496	3782	0	1570	3796	0
Flt Permitted	0.950			0.113			0.095			0.103		
Satd. Flow (perm)	2958	1476	0	183	1644	1423	150	3782	0	170	3796	0
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)		28				125		25			80	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		151.2			330.4			150.2			270.2	
Travel Time (s)		10.9			23.8			10.8			19.5	
Confl. Peds. (#/hr)			15	15			18		70	70		18
Peak Hour Factor	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%
Adj. Flow (vph)	1762	585	293	368	464	461	435	1543	302	216	1676	725
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1762	878	0	368	464	461	435	1845	0	216	2401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.16	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

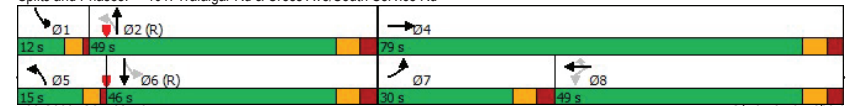
Lanes, Volumes, Timings

101: Trafalgar Rd & Cross Ave/South Service Rd

Total 10 Year

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8	2			6		
Detector Phase	7	4		8	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	7.0	27.0		7.0	27.0	
Minimum Split (s)	17.0	25.0		25.0	25.0	25.0	11.5	34.0		11.5	34.0	
Total Split (s)	30.0	79.0		49.0	49.0	49.0	15.0	49.0		12.0	46.0	
Total Split (%)	21.4%	56.4%		35.0%	35.0%	35.0%	10.7%	35.0%		8.6%	32.9%	
Maximum Green (s)	23.0	72.0		42.0	42.0	42.0	11.0	42.0		8.0	39.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	1.0	3.0		1.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		0.0	-3.0	-3.0	0.0	-3.0		0.0	-3.0	
Total Lost Time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0	5.0	
Recall Mode	Min	Min		Min	Min	Min	Min	C-Max		Min	C-Max	
Walk Time (s)		7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0	11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0	0	0		0			0	
Act Effct Green (s)	26.0	75.0		42.0	45.0	45.0	56.0	45.0		50.0	42.0	
Actuated g/C Ratio	0.19	0.54		0.30	0.32	0.32	0.40	0.32		0.36	0.30	
v/c Ratio	3.21	1.09		6.81	0.88	0.85	2.64	1.50		1.54	2.01	
Control Delay	1017.4	91.2		2663.7	63.9	47.9	757.8	262.8		283.9	484.3	
Queue Delay	0.0	3.1		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	1017.4	94.3		2663.7	63.9	47.9	757.8	262.8		283.9	484.3	
LOS	F	F		F	E	D	F	F		F	F	
Approach Delay		710.4			798.1			357.2			467.8	
Approach LOS		F			F			F			F	
Intersection Summary												
Area Type:	CBD											
Cycle Length:	140											
Actuated Cycle Length:	140											
Offset:	128 (91%), Referenced to phase 2:NRTL and 6:SBTL, Start of Green											
Natural Cycle:	110											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	6.81											
Intersection Signal Delay:	560.1						Intersection LOS: F					
Intersection Capacity Utilization:	154.3%						ICU Level of Service H					
Analysis Period (min):	15											
* User Entered Value												
Split and Phases:	101: Trafalgar Rd & Cross Ave/South Service Rd											



Queues

101: Trafalgar Rd & Cross Ave/South Service Rd

Total 10 Year

PM Peak Hour

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1762	878	368	464	461	435	1845	216	2401
v/c Ratio	3.21	1.09	6.81	0.88	0.85	2.64	1.50	1.54	2.01
Control Delay	1017.4	91.2	2663.7	63.9	47.9	757.8	262.8	283.9	484.3
Queue Delay	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1017.4	94.3	2663.7	63.9	47.9	757.8	262.8	283.9	484.3
Queue Length 50th (m)	~463.6	~284.5	~193.2	127.9	95.9	~200.5	~308.8	~74.0	~448.0
Queue Length 95th (m)	#467.3	#230.9	#233.1	151.2	122.8 m	#126.3 m	#159.3 m	#66.0 m	#375.2
Internal Link Dist (m)		127.2		306.4			126.2		246.2
Turn Bay Length (m)	130.0		25.0		50.0		25.0		
Base Capacity (vph)	549	803	54	528	542	165	1232	140	1194
Starvation Cap Reductn	0	53	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	3.21	1.17	6.81	0.88	0.85	2.64	1.50	1.54	2.01

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

101: Trafalgar Rd & Cross Ave/South Service Rd

Total 10 Year

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1480	421	237	302	376	378	370	1420	199	194	1492	674
Future Volume (vph)	1480	421	237	302	376	378	370	1420	199	194	1492	674
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.5	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.80		1.00	0.80	
Frbp, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	0.95		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2958	1476		1540	1644	1423	1496	3784		1570	3794	
Flt Permitted	0.95	1.00		0.11	1.00	1.00	0.10	1.00		0.10	1.00	
Satd. Flow (perm)	2958	1476		184	1644	1423	150	3784		170	3794	
Peak-hour factor, PHF	0.84	0.72	0.81	0.82	0.81	0.82	0.85	0.92	0.66	0.90	0.89	0.93
Adj. Flow (vph)	1762	585	293	368	464	461	435	1543	302	216	1676	725
RTOR Reduction (vph)	0	13	0	0	0	85	0	17	0	0	56	0
Lane Group Flow (vph)	1762	865	0	368	464	376	435	1828	0	216	2345	0
Confl. Peds. (#/hr)			15	15			18		70	70		18
Heavy Vehicles (%)	3%	8%	9%	2%	4%	1%	5%	1%	0%	0%	1%	3%
Turn Type	Prot	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		8	8	5	2	1		6	6	
Permitted Phases				8	8	2		6				
Actuated Green, G (s)	23.0	72.0		42.0	42.0	53.0	42.0	47.0		39.0		
Effective Green, g (s)	26.0	75.0		42.0	45.0	53.0	45.0	47.0		42.0		
Actuated g/C Ratio	0.19	0.54		0.30	0.32	0.38	0.32	0.34		0.30		
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		
Vehicle Extension (s)	3.0	4.0		4.0	4.0	4.0	3.0	5.0		3.0		
Lane Grp Cap (vph)	549	790		55	528	457	162	1216		137	1138	
v/s Ratio Prot	c0.60	0.59		0.28		c0.21	0.48	0.09		0.62		
v/s Ratio Perm				c2.00		0.26	c0.80	0.44				
v/c Ratio	3.21	1.09		6.69	0.88	0.82	2.69	1.50		1.58	2.06	
Uniform Delay, d1	57.0	32.5		49.0	44.9	43.8	38.2	47.5		41.1	49.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.24	1.22		1.41	1.21	
Incremental Delay, d2	999.0	61.1		2598.8	15.7	11.9	759.9	226.9		268.4	478.1	
Delay (s)	1056.0	93.6		2647.8	60.6	55.8	807.3	284.6		326.4	537.3	
Level of Service	F	F		F	E	E	F	F		F	F	
Approach Delay (s)		735.9			795.2			384.3			519.9	
Approach LOS		F			F			F			F	

Intersection Summary

- c Critical Lane Group
- HCM 2000 Control Delay: 589.8, HCM 2000 Level of Service: F
- HCM 2000 Volume to Capacity ratio: 4.06
- Actuated Cycle Length (s): 140.0, Sum of lost time (s): 16.0
- Intersection Capacity Utilization: 154.3%, ICU Level of Service: H
- Analysis Period (min): 15

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	1417	72	198	658	171	167	3	166	291	26	213
Future Volume (vph)	63	1417	72	198	658	171	167	3	166	291	26	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	20.0		0.0	20.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			0.99		0.99	0.97		0.99	0.98	
Frt		0.992			0.965			0.857			0.867	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1570	3059	0	797	3108	0	785	708	0	1570	1301	0
Flt Permitted	0.315			0.090			0.382			0.451		
Satd. Flow (perm)	518	3059	0	76	3108	0	313	708	0	735	1301	0
Right Turn on Red			Yes		Yes			Yes				Yes
Satd. Flow (RTOR)		8			82			128			239	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		115.8			72.9			81.9			107.9	
Travel Time (s)		8.3			5.2			5.9			7.8	
Conf. Peds. (#/hr)	9		4	4		9	12		20	20		12
Peak Hour Factor	0.66	0.81	0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75	0.78
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	0%	100%	0%
Adj. Flow (vph)	95	1749	96	211	693	211	239	12	248	338	35	273
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	1845	0	211	904	0	239	260	0	338	308	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2			1	6		8			4	
Permitted Phases		2			6			8			4	
Detector Phase		2	2		1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	22.0	22.0		8.0	22.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	45.0	45.0		12.5	29.0		29.0	29.0		29.0	29.0	
Total Split (s)	46.5	46.5		12.5	59.0		31.0	31.0		31.0	31.0	
Total Split (%)	51.7%	51.7%		13.9%	65.6%		34.4%	34.4%		34.4%	34.4%	
Maximum Green (s)	40.5	40.5		8.5	53.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	42.5	42.5		55.0	55.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio	0.47	0.47		0.61	0.61		0.30	0.30		0.30	0.30	
v/c Ratio	0.39	1.27		1.85	0.47		2.57	0.86		1.54	0.55	
Control Delay	21.4	153.6		435.3	9.5		755.8	43.6		290.1	11.0	
Queue Delay	0.0	0.6		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	21.4	154.1		435.3	9.5		755.8	43.6		290.1	11.0	
LOS	C	F		F	A		F	D		F	B	
Approach Delay		147.6			90.1			384.7			157.0	
Approach LOS		F			F			F			F	
Intersection Summary												
Area Type:	CBD											
Cycle Length:	90											
Actuated Cycle Length:	90											
Natural Cycle:	100											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	2.57											
Intersection Signal Delay:	162.0											
Intersection LOS:	F											
Intersection Capacity Utilization:	105.8%											
ICU Level of Service:	G											
Analysis Period (min):	15											
Split and Phases:	102: GO Bus Terminal/Argus Rd & Cross Ave											

Queues  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 10 Year  
PM Peak Hour

	↖	→	↗	←	↖	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	95	1845	211	904	239	260	338	308
v/c Ratio	0.39	1.27	1.85	0.47	2.57	0.86	1.54	0.55
Control Delay	21.4	153.6	435.3	9.5	755.8	43.6	290.1	11.0
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	154.1	435.3	9.5	755.8	43.6	290.1	11.0
Queue Length 50th (m)	10.8	~226.9	~51.8	38.5	~73.5	23.7	~87.1	9.2
Queue Length 95th (m)	15.8	#229.4	#96.8	52.3	#89.1	0.0	#131.9	18.4
Internal Link Dist (m)		91.8		48.9		57.9		83.9
Turn Bay Length (m)	20.0		20.0				15.0	
Base Capacity (vph)	244	1448	114	1931	93	302	220	557
Starvation Cap Reductn	0	202	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	1.48	1.85	0.47	2.57	0.86	1.54	0.55

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
102: GO Bus Terminal/Argus Rd & Cross Ave

Total 10 Year  
PM Peak Hour

	↖	→	↗	↖	←	↖	↗	↑	↖	↗	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖		↖	↖	↖
Traffic Volume (vph)	63	1417	72	198	658	171	167	3	166	291	26	213
Future Volume (vph)	63	1417	72	198	658	171	167	3	166	291	26	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.86		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1562	3060		797	3108		779	708		1548	1301	
Flt Permitted	0.32	1.00		0.09	1.00		0.38	1.00		0.45	1.00	
Satd. Flow (perm)	518	3060		75	3108		313	708		736	1301	
Peak-hour factor, PHF	0.66	0.81	0.75	0.94	0.95	0.81	0.70	0.25	0.67	0.86	0.75	0.78
Adj. Flow (vph)	95	1749	96	211	693	211	239	12	248	338	35	273
RTOR Reduction (vph)	0	4	0	0	32	0	0	90	0	0	167	0
Lane Group Flow (vph)	95	1841	0	211	872	0	239	170	0	338	141	0
Confl. Peds. (#/hr)	9		4	4			9	12		20	20	12
Heavy Vehicles (%)	0%	0%	100%	97%	0%	0%	100%	100%	100%	0%	100%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	40.5	40.5		53.0	53.0		25.0	25.0		25.0	25.0	
Effective Green, g (s)	42.5	42.5		53.0	55.0		27.0	27.0		27.0	27.0	
Actuated g/C Ratio	0.47	0.47		0.59	0.61		0.30	0.30		0.30	0.30	
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	244	1445		112	1899		93	212		220	390	
v/s Ratio Prot		0.60		c0.18	0.28			0.24			0.11	
v/s Ratio Perm	0.18			c0.92			c0.76			0.46		
v/c Ratio	0.39	1.27		1.88	0.46		2.57	0.80		1.54	0.36	
Uniform Delay, d1	15.4	23.8		26.3	9.5		31.5	29.1		31.5	24.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	128.8		429.5	0.4		736.8	20.4		262.9	0.8	
Delay (s)	17.5	152.5		455.8	9.8		768.3	49.4		294.4	25.5	
Level of Service	B	F		F	A		F	D		F	C	
Approach Delay (s)		145.9			94.2			393.7			166.2	
Approach LOS		F			F			F			F	

Intersection Summary

HCM 2000 Control Delay	164.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.12		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

Total 10 Year

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↘	↖	↖↗	↘	↖	↖↗	↘	↖	↖↗	↘
Traffic Volume (vph)	20	311	2	33	575	81	264	3	296	47	2	88
Future Volume (vph)	20	311	2	33	575	81	264	3	296	47	2	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6
Storage Length (m)	0.0	0.0	25.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.99	
Frt		0.999			0.971			0.854			0.854	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1525	2926	0	1570	3017	0	1570	1436	0	1570	1414	0
Flt Permitted	0.366			0.443			0.636			0.343		
Satd. Flow (perm)	586	2926	0	732	3017	0	1050	1436	0	566	1414	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			53			375			147	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		40.1			258.2			69.1			70.9	
Travel Time (s)		2.9			18.6			5.0			5.1	
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1
Peak Hour Factor	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	2%
Adj. Flow (vph)	34	370	3	61	605	147	357	9	375	67	4	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	373	0	61	752	0	357	384	0	67	151	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lanes, Volumes, Timings

103: Lyons Lane/Commercial Driveway & Cross Ave

Total 10 Year

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6		8		8		4	
Permitted Phases		2		6			8		8		4	
Detector Phase		2		1	6		8		8		4	
Switch Phase												
Minimum Initial (s)	35.0	35.0		8.0	35.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	41.0	41.0		12.5	41.0		28.0	28.0		28.0	28.0	
Total Split (s)	41.5	41.5		12.5	54.0		36.0	36.0		36.0	36.0	
Total Split (%)	46.1%	46.1%		13.9%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	35.5	35.5		8.5	48.0		30.0	30.0		30.0	30.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		1.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		0.0	-2.0		-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0	
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	37.0	37.0		49.1	49.1		32.0	32.0		32.0	32.0	
Actuated g/C Ratio	0.42	0.42		0.55	0.55		0.36	0.36		0.36	0.36	
v/c Ratio	0.14	0.31		0.13	0.45		0.95	0.51		0.33	0.25	
Control Delay	18.2	18.3		10.1	12.0		65.3	5.2		26.6	5.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	18.2	18.3		10.1	12.0		65.3	5.2		26.6	5.0	
LOS	B	B		B	B		E	A		C	A	
Approach Delay		18.3			11.8			34.1			11.6	
Approach LOS		B			B			C			B	

Intersection Summary

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 89.1

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 20.6

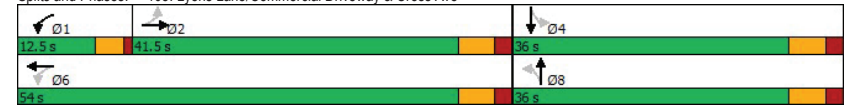
Intersection LOS: C

Intersection Capacity Utilization 69.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 103: Lyons Lane/Commercial Driveway & Cross Ave



Queues  
103: Lyons Lane/Commercial Driveway & Cross Ave

Total 10 Year  
PM Peak Hour

	↖	→	↘	←	↙	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	373	61	752	357	384	67	151
v/c Ratio	0.14	0.31	0.13	0.45	0.95	0.51	0.33	0.25
Control Delay	18.2	18.3	10.1	12.0	65.3	5.2	26.6	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	18.3	10.1	12.0	65.3	5.2	26.6	5.0
Queue Length 50th (m)	3.7	22.8	4.8	36.5	61.4	1.0	8.6	0.5
Queue Length 95th (m)	6.3	31.3	6.1	50.3	#84.4	0.0	14.9	0.0
Internal Link Dist (m)		16.1		234.2		45.1		46.9
Turn Bay Length (m)			25.0		20.0			
Base Capacity (vph)	246	1232	483	1716	377	756	203	602
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	0.14	0.30	0.13	0.44	0.95	0.51	0.33	0.25

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
103: Lyons Lane/Commercial Driveway & Cross Ave

Total 10 Year  
PM Peak Hour

	↖	→	↘	↙	←	↗	↖	↗	↑	↘	↙	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	20	311	2	33	575	81	264	3	296	47	2	88	
Future Volume (vph)	20	311	2	33	575	81	264	3	296	47	2	88	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.99		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt	1.00	1.00		1.00	0.97		1.00	0.85		1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		0.95
Satd. Flow (prot)	1521	2925		1570	3016		1569	1436		1567	1414		1567
Flt Permitted	0.37	1.00		0.44	1.00		0.64	1.00		0.34	1.00		0.34
Satd. Flow (perm)	587	2925		733	3016		1050	1436		565	1414		565
Peak-hour factor, PHF	0.58	0.84	0.75	0.54	0.95	0.55	0.74	0.33	0.79	0.70	0.50	0.60	0.70
Adj. Flow (vph)	34	370	3	61	605	147	357	9	375	67	4	147	147
RTOR Reduction (vph)	0	1	0	0	24	0	0	240	0	0	94	0	0
Lane Group Flow (vph)	34	372	0	61	728	0	357	144	0	67	57	0	0
Confl. Peds. (#/hr)	3		1	1		3	1		4	4		1	
Heavy Vehicles (%)	3%	11%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	2%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA		NA
Protected Phases		2		1	6			8			4		4
Permitted Phases	2			6			8			4			
Actuated Green, G (s)	35.0	35.0		47.1	47.1		30.0	30.0		30.0	30.0		30.0
Effective Green, g (s)	37.0	37.0		47.1	49.1		32.0	32.0		32.0	32.0		32.0
Actuated g/C Ratio	0.42	0.42		0.53	0.55		0.36	0.36		0.36	0.36		0.36
Clearance Time (s)	6.0	6.0		4.0	6.0		6.0	6.0		6.0	6.0		6.0
Vehicle Extension (s)	5.0	5.0		2.5	5.0		4.0	4.0		4.0	4.0		4.0
Lane Grp Cap (vph)	243	1214		463	1662		377	515		202	507		507
v/s Ratio Prot		0.13		0.01	c0.24			0.10			0.04		0.04
v/s Ratio Perm	0.06			0.06			c0.34			0.12			
v/c Ratio	0.14	0.31		0.13	0.44		0.95	0.28		0.33	0.11		0.11
Uniform Delay, d1	16.2	17.5		10.5	11.8		27.7	20.3		20.8	19.1		19.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2	0.6	0.3		0.1	0.4		32.9	0.4		1.3	0.1		0.1
Delay (s)	16.7	17.8		10.6	12.2		60.6	20.7		22.1	19.2		19.2
Level of Service	B	B		B	B		E	C		C	B		B
Approach Delay (s)		17.7			12.1			39.9			20.1		20.1
Approach LOS		B			B			D			C		C

Intersection Summary

HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	596	816	248	60	1093	795	177	578	51	689	785	586
Future Volume (vph)	596	816	248	60	1093	795	177	578	51	689	785	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	80.0		0.0	80.0		0.0	25.0		0.0	80.0		0.0
Storage Lanes	2		0	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	0.95	1.00	*0.80	0.95	0.97	*0.80	1.00
Ped Bike Factor	1.00	0.99		0.99	0.98		0.99	1.00		0.99		0.97
Frt		0.962			0.941			0.986				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3016	3010	0	1570	2978	0	1540	2691	0	2987	1368	1409
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3012	3010	0	1562	2978	0	1530	2691	0	2962	1368	1361
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			117			7				148
Link Speed (k/h)		50			50			50				50
Link Distance (m)		285.8			142.3			311.4				130.3
Travel Time (s)		20.6			10.2			22.4				9.4
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Peak Hour Factor	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Adj. Flow (vph)	670	971	326	71	1317	855	199	642	68	883	892	666
Shared Lane Traffic (%)												
Lane Group Flow (vph)	670	1297	0	71	2172	0	199	710	0	883	892	666
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			6.6				6.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.14	1.19	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings  
104: Trafalgar Rd & Cornwall Rd

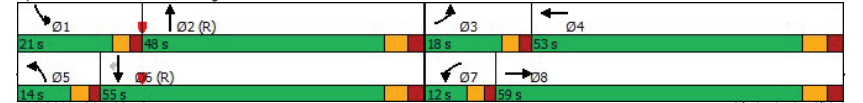
Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Detector Phase	3	8		7	4		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	20.0		7.0	20.0	20.0
Minimum Split (s)	12.0	37.0		12.0	37.0		12.0	39.0		12.0	39.0	39.0
Total Split (s)	18.0	59.0		12.0	53.0		14.0	48.0		21.0	55.0	55.0
Total Split (%)	12.9%	42.1%		8.6%	37.9%		10.0%	34.3%		15.0%	39.3%	39.3%
Maximum Green (s)	13.0	52.0		7.0	46.0		9.0	41.0		16.0	48.0	48.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Recall Mode	Max	Max		Max	Max		None	C-Max		Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		23.0			23.0			25.0			25.0	25.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	14.0	55.0		8.0	49.0		10.0	44.0		17.0	51.0	51.0
Actuated g/C Ratio	0.10	0.39		0.06	0.35		0.07	0.31		0.12	0.36	0.36
v/c Ratio	2.23	1.08		0.80	1.94		1.81	0.84		2.44	1.79	1.13
Control Delay	589.9	88.1		115.8	453.3		432.3	54.2		675.7	379.8	80.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	589.9	88.1		115.8	453.3		432.3	54.2		675.7	379.8	80.0
LOS	F	F		F	F		F	D		F	F	F
Approach Delay		259.0			442.6			136.9			405.1	
Approach LOS		F			F			F			F	

Intersection Summary


Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green, Master Intersection	
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	2.44
Intersection Signal Delay:	346.0
Intersection LOS:	F
Intersection Capacity Utilization:	151.8%
ICU Level of Service:	H
Analysis Period (min):	15
* User Entered Value	

Splits and Phases: 104: Trafalgar Rd & Cornwall Rd



Queues  
104: Trafalgar Rd & Cornwall Rd

Total 10 Year  
PM Peak Hour




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	670	1297	71	2172	199	710	883	892	666
v/c Ratio	2.23	1.08	0.80	1.94	1.81	0.84	2.44	1.79	1.13
Control Delay	589.9	88.1	115.8	453.3	432.3	54.2	675.7	379.8	80.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	589.9	88.1	115.8	453.3	432.3	54.2	675.7	379.8	80.0
Queue Length 50th (m)	~161.8	~217.3	20.8	~505.6	~87.1	119.3	~225.7	~480.3	~190.9
Queue Length 95th (m)	#198.9	#231.5	#44.2	#490.8	#137.3	151.0	m#88.6	m78.3	m17.9
Internal Link Dist (m)		261.8		118.3		287.4		106.3	
Turn Bay Length (m)	80.0		80.0		25.0		80.0		
Base Capacity (vph)	301	1206	89	1118	110	850	362	498	589
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	2.23	1.08	0.80	1.94	1.81	0.84	2.44	1.79	1.13

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

HCM Signalized Intersection Capacity Analysis  
104: Trafalgar Rd & Cornwall Rd

Total 10 Year  
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕		↔	↕		↔	↕	↔
Traffic Volume (vph)	596	816	248	60	1093	795	177	578	51	689	785	586
Future Volume (vph)	596	816	248	60	1093	795	177	578	51	689	785	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.6	3.3	3.6	3.5
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.80		0.97	0.80	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.94		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)	3016	3010		1570	2978		1540	2690		2987	1368	1361
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3016	3010		1570	2978		1540	2690		2987	1368	1361
Peak-hour factor, PHF	0.89	0.84	0.76	0.84	0.83	0.93	0.89	0.90	0.75	0.78	0.88	0.88
Adj. Flow (vph)	670	971	326	71	1317	855	199	642	68	883	892	666
RTOR Reduction (vph)	0	24	0	0	76	0	0	5	0	0	0	94
Lane Group Flow (vph)	670	1273	0	71	2096	0	199	705	0	883	892	572
Confl. Peds. (#/hr)	21		14	14		21	17		10	10		17
Heavy Vehicles (%)	1%	3%	1%	0%	1%	1%	2%	0%	0%	2%	0%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	13.0	52.0		7.0	46.0		9.0	41.0		16.0	48.0	48.0
Effective Green, g (s)	14.0	55.0		8.0	49.0		10.0	44.0		17.0	51.0	51.0
Actuated g/C Ratio	0.10	0.39		0.06	0.35		0.07	0.31		0.12	0.36	0.36
Clearance Time (s)	5.0	7.0		5.0	7.0		5.0	7.0		5.0	7.0	7.0
Vehicle Extension (s)	0.2	0.2		0.2	0.2		0.2	0.2		0.2	0.2	0.2
Lane Grp Cap (vph)	301	1182		89	1042		110	845		362	498	495
v/s Ratio Prot	c0.22	0.42		0.05	c0.70		0.13	0.26		c0.30	c0.65	
v/s Ratio Perm												0.42
v/c Ratio	2.23	1.08		0.80	2.01		1.81	0.83		2.44	1.79	1.16
Uniform Delay, d1	63.0	42.5		65.2	45.5		65.0	44.6		61.5	44.5	44.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.24	0.59	0.46
Incremental Delay, d2	562.3	49.6		51.1	458.6		397.6	9.5		648.4	356.8	72.3
Delay (s)	625.3	92.1		116.3	504.1		462.6	54.1		724.7	383.2	92.7
Level of Service	F	F		F	F		F	D		F	F	F
Approach Delay (s)		273.7			491.8			143.6			427.5	
Approach LOS		F			F			F			F	

**Intersection Summary**  
 HCM 2000 Control Delay 372.4 HCM 2000 Level of Service F  
 HCM 2000 Volume to Capacity ratio 2.05  
 Actuated Cycle Length (s) 140.0 Sum of lost time (s) 16.0  
 Intersection Capacity Utilization 151.8% ICU Level of Service H  
 Analysis Period (min) 15  
 c Critical Lane Group

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔		↑↑↑	↑↑↑	
Traffic Volume (vph)	1100	667	0	2416	2304	0
Future Volume (vph)	1100	667	0	2416	2304	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	0.97	1.00	1.00	*0.80	*0.80	1.00
Ped Bike Factor	0.99					
Frt	0.850					
Fit Protected	0.950					
Satd. Flow (prot)	3046	1423	0	4024	4024	0
Fit Permitted	0.950					
Satd. Flow (perm)	3046	1402	0	4024	4024	0
Right Turn on Red	Yes		Yes			
Satd. Flow (RTOR)	1					
Link Speed (k/h)	50		50		50	
Link Distance (m)	199.2		51.4		324.8	
Travel Time (s)	14.3		3.7		23.4	
Confl. Peds. (#/hr)	2					
Peak Hour Factor	0.87	0.93	0.25	0.97	0.94	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Adj. Flow (vph)	1264	717	0	2491	2451	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1264	717	0	2491	2451	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	
Median Width(m)	6.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.19	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24		14		14	
Number of Detectors	1		1		2	
Detector Template	Left	Right	Thru	Thru		
Leading Detector (m)	2.0		2.0		10.0	
Trailing Detector (m)	0.0		0.0		0.0	
Detector 1 Position(m)	0.0		0.0		0.0	
Detector 1 Size(m)	2.0		2.0		0.6	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex		
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	
Detector 1 Queue (s)	0.0		0.0		0.0	
Detector 1 Delay (s)	0.0		0.0		0.0	
Detector 2 Position(m)			9.4		9.4	
Detector 2 Size(m)			0.6		0.6	
Detector 2 Type			CI+Ex		CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)			0.0		0.0	
Turn Type	Prot	Perm	NA	NA		
Protected Phases	4		2		2	

Lanes, Volumes, Timings  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases	4					
Detector Phase	4	4		2	2	
Switch Phase						
Minimum Initial (s)	10.0	10.0		29.0	29.0	
Minimum Split (s)	38.0	38.0		36.0	36.0	
Total Split (s)	63.0	63.0		77.0	77.0	
Total Split (%)	45.0%	45.0%		55.0%	55.0%	
Maximum Green (s)	56.0	56.0		70.0	70.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	24.0	24.0		22.0	22.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Efect Green (s)	59.0	59.0		73.0	73.0	
Actuated g/C Ratio	0.42	0.42		0.52	0.52	
v/c Ratio	0.99	1.21		1.19	1.17	
Control Delay	61.8	147.0		118.3	100.6	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	61.8	147.0		118.3	100.6	
LOS	E	F		F	F	
Approach Delay	92.7			118.3	100.6	
Approach LOS	F			F	F	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 133.6 (95%), Referenced to phase 2:NBSB and 6:, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.21  
 Intersection Signal Delay: 104.7  
 Intersection Capacity Utilization 102.2%  
 Intersection LOS: F  
 ICU Level of Service G  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 105: Trafalgar Rd & QEW EB-Off Ramp



Queues  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	1264	717	2491	2451
v/c Ratio	0.99	1.21	1.19	1.17
Control Delay	61.8	147.0	118.3	100.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	61.8	147.0	118.3	100.6
Queue Length 50th (m)	185.7	~255.7	~351.0	~351.8
Queue Length 95th (m)	#223.2	#334.8	m73.2 m#250.3	
Internal Link Dist (m)	175.2		27.4	300.8
Turn Bay Length (m)				
Base Capacity (vph)	1283	591	2098	2098
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.99	1.21	1.19	1.17

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
105: Trafalgar Rd & QEW EB-Off Ramp

Total 10 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1100	667	0	2416	2304	0
Future Volume (vph)	1100	667	0	2416	2304	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.5	3.6	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	1.00		*0.80	*0.80	
Frbp, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3046	1402		4024	4024	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3046	1402		4024	4024	
Peak-hour factor, PHF	0.87	0.93	0.25	0.97	0.94	0.25
Adj. Flow (vph)	1264	717	0	2491	2451	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	1264	716	0	2491	2451	0
Confl. Peds. (#/hr)		2				
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4				
Actuated Green, G (s)	56.0	56.0		70.0	70.0	
Effective Green, g (s)	59.0	59.0		73.0	73.0	
Actuated g/C Ratio	0.42	0.42		0.52	0.52	
Clearance Time (s)	7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1283	590		2098	2098	
v/s Ratio Prot	0.41			c0.62	0.61	
v/s Ratio Perm		c0.51				
v/c Ratio	0.99	1.21		1.19	1.17	
Uniform Delay, d1	40.1	40.5		33.5	33.5	
Progression Factor	1.00	1.00		1.08	0.69	
Incremental Delay, d2	21.4	111.4		84.8	76.2	
Delay (s)	61.5	151.9		120.8	99.4	
Level of Service	E	F		F	F	
Approach Delay (s)	94.2			120.8	99.4	
Approach LOS	F			F	F	

Intersection Summary

- HCM 2000 Control Delay 105.6 HCM 2000 Level of Service F
- HCM 2000 Volume to Capacity ratio 1.20
- Actuated Cycle Length (s) 140.0 Sum of lost time (s) 8.0
- Intersection Capacity Utilization 102.2% ICU Level of Service G
- Analysis Period (min) 15
- c Critical Lane Group

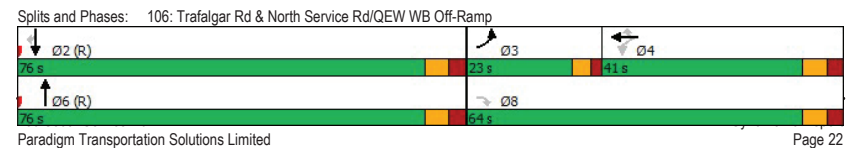
Lanes, Volumes, Timings  
 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp  
 Total 10 Year  
 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	26	0	258	660	120	232	0	2818	0	0	2080	14
Future Volume (vph)	26	0	258	660	120	232	0	2818	0	0	2080	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Storage Length (m)	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Storage Lanes	1		1	1		1	0		0	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	1.00					0.99						0.95
Frt			0.850			0.850						0.850
Flt Protected	0.950			0.950	0.969							
Satd. Flow (prot)	1570	0	1437	1463	1549	1409	0	4024	0	0	3337	1437
Flt Permitted	0.950			0.950	0.969							
Satd. Flow (perm)	1568	0	1437	1463	1549	1389	0	4024	0	0	3337	1359
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			31			151						70
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		142.1			192.6			324.8			280.4	
Travel Time (s)		10.2			13.9			23.4			20.2	
Confl. Peds. (#/hr)	2					2	14		14	14		14
Peak Hour Factor	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Adj. Flow (vph)	43	0	272	786	169	286	0	2998	0	0	2167	22
Shared Lane Traffic (%)				40%								
Lane Group Flow (vph)	43	0	272	472	483	286	0	2998	0	0	2167	22
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.19	1.14	1.16	1.19	1.14	1.16	1.14	1.14	1.14	1.14	1.14	1.16
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1		1	1	2	1		2		2		1
Detector Template	Left		Right	Left	Thru	Right		Thru		Thru		Right
Leading Detector (m)	2.0		2.0	2.0	10.0	2.0		10.0		10.0		2.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Size(m)	2.0		2.0	2.0	0.6	2.0		0.6		0.6		2.0
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0		0.0		0.0		0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings  
 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp  
 Total 10 Year  
 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0				0.0
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA		Perm
Protected Phases	3				4			6				2
Permitted Phases			8	4		4						2
Detector Phase	3			8	4	4		6				2
Switch Phase												
Minimum Initial (s)	7.0		10.0	10.0	10.0	10.0		5.0				28.0
Minimum Split (s)	23.0		38.0	38.0	38.0	38.0		35.0				35.0
Total Split (s)	23.0		64.0	41.0	41.0	41.0		76.0				76.0
Total Split (%)	16.4%		45.7%	29.3%	29.3%	29.3%		54.3%				54.3%
Maximum Green (s)	18.0		57.0	34.0	34.0	34.0		69.0				69.0
Yellow Time (s)	3.0		4.0	4.0	4.0	4.0		4.0				4.0
All-Red Time (s)	2.0		3.0	3.0	3.0	3.0		3.0				3.0
Lost Time Adjust (s)	-1.0		-3.0	-3.0	-3.0	-3.0		-3.0				-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0		4.0				4.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5				4.5
Recall Mode	Min		Min	Min	Min	Min		C-Min				C-Min
Walk Time (s)			7.0	7.0	7.0	7.0		7.0				7.0
Flash Dont Walk (s)			24.0	24.0	24.0	24.0		21.0				21.0
Pedestrian Calls (#/hr)			0	0	0	0		0				0
Act Effct Green (s)	10.5		60.0	45.5	45.5	45.5		72.0				72.0
Actuated g/C Ratio	0.08		0.43	0.32	0.32	0.32		0.51				0.51
v/c Ratio	0.36		0.43	0.99	0.96	0.52		1.45				1.26
Control Delay	69.5		27.1	86.9	78.0	21.5		232.4				154.3
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0				0.0
Total Delay	69.5		27.1	86.9	78.0	21.5		232.4				154.3
LOS	E		C	F	E	C		F				A
Approach Delay		32.9			68.4			232.4				152.8
Approach LOS		C			E			F				F

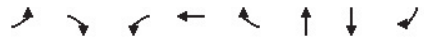
Intersection Summary	
Area Type:	CBD
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	115.4 (82%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.45
Intersection Signal Delay:	167.0
Intersection LOS:	F
Intersection Capacity Utilization:	97.6%
ICU Level of Service:	F
Analysis Period (min):	15
* User Entered Value	



Queues

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 10 Year  
PM Peak Hour



Lane Group	EBL	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	43	272	472	483	286	2998	2167	22
v/c Ratio	0.36	0.43	0.99	0.96	0.52	1.45	1.26	0.03
Control Delay	69.5	27.1	86.9	78.0	21.5	232.4	154.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	27.1	86.9	78.0	21.5	232.4	154.3	0.1
Queue Length 50th (m)	12.2	48.4	143.7	144.8	30.8	~495.2	~329.7	0.0
Queue Length 95th (m)	16.7	74.2	#209.7	#153.1	50.4 m	#419.3	#363.2	0.0
Internal Link Dist (m)				168.6		300.8	256.4	
Turn Bay Length (m)	50.0							
Base Capacity (vph)	213	633	475	503	553	2069	1716	732
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	0.20	0.43	0.99	0.96	0.52	1.45	1.26	0.03

**Intersection Summary**

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


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

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

HCM Signalized Intersection Capacity Analysis

106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Total 10 Year  
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	0	258	660	120	232	0	2818	0	0	2080	14
Future Volume (vph)	26	0	258	660	120	232	0	2818	0	0	2080	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.3	3.6	3.5	3.3	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.5
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0		4.0		4.0		4.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00		*0.80		*0.80		1.00
Frbp, ped/bikes	1.00		1.00	1.00	1.00	0.99		1.00		1.00		0.95
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00		1.00		1.00		1.00
Frt	1.00		0.85	1.00	1.00	0.85		1.00		1.00		0.85
Flt Protected	0.95		1.00	0.95	0.97	1.00		1.00		1.00		1.00
Satd. Flow (prot)	1570		1437	1463	1548	1389		4024		3337		1359
Flt Permitted	0.95		1.00	0.95	0.97	1.00		1.00		1.00		1.00
Satd. Flow (perm)	1570		1437	1463	1548	1389		4024		3337		1359
Peak-hour factor, PHF	0.61	0.25	0.95	0.84	0.71	0.81	0.25	0.94	0.93	0.25	0.96	0.63
Adj. Flow (vph)	43	0	272	786	169	286	0	2998	0	0	2167	22
RTOR Reduction (vph)	0	0	18	0	0	102	0	0	0	0	0	11
Lane Group Flow (vph)	43	0	254	472	483	184	0	2998	0	0	2167	11
Confl. Peds. (#/hr)	2						2	14		14	14	14
Heavy Vehicles (%)	0%	0%	0%	2%	1%	2%	0%	2%	1%	0%	23%	0%
Turn Type	Prot		Perm	Perm	NA	Perm		NA		NA	Perm	
Protected Phases	3				4			6			2	
Permitted Phases			8	4		4						2
Actuated Green, G (s)	9.5		57.0	42.5	42.5	42.5		69.0			69.0	69.0
Effective Green, g (s)	10.5		60.0	45.5	45.5	45.5		72.0			72.0	72.0
Actuated g/C Ratio	0.08		0.43	0.32	0.32	0.32		0.51			0.51	0.51
Clearance Time (s)	5.0		7.0	7.0	7.0	7.0		7.0			7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		4.5			4.5	4.5
Lane Grp Cap (vph)	117		615	475	503	451		2069			1716	698
v/s Ratio Prot	0.03							c0.75			0.65	
v/s Ratio Perm			c0.18	c0.32	0.31	0.13						0.01
v/c Ratio	0.37		0.41	0.99	0.96	0.41		1.45			1.26	0.02
Uniform Delay, d1	61.6		27.8	47.1	46.4	36.8		34.0			34.0	16.7
Progression Factor	1.00		1.00	1.00	1.00	1.00		1.07			1.00	1.00
Incremental Delay, d2	2.0		0.5	39.4	30.1	0.6		202.3			123.1	0.0
Delay (s)	63.5		28.2	86.5	76.5	37.4		238.5			157.1	16.7
Level of Service	E		C	F	E	D		F			F	B
Approach Delay (s)		33.1			71.3			238.5			155.7	
Approach LOS		C			E			F			F	

**Intersection Summary**

HCM 2000 Control Delay: 171.3, HCM 2000 Level of Service: F

HCM 2000 Volume to Capacity ratio: 1.21

Actuated Cycle Length (s): 140.0, Sum of lost time (s): 12.0

Intersection Capacity Utilization: 97.6%, ICU Level of Service: F

Analysis Period (min): 15

c Critical Lane Group



Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

Total 10 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↑↑			↑↑
Traffic Volume (vph)	833	732	1170	0	0	1242
Future Volume (vph)	833	732	1170	0	0	1242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	190.0		0.0	0.0	
Storage Lanes	2	1		0	0	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	0.97	0.91	0.95	1.00	1.00	0.95
Frt	0.966	0.850				
Flt Protected	0.963					
Satd. Flow (prot)	3344	1455	3574	0	0	3539
Flt Permitted	0.963					
Satd. Flow (perm)	3344	1455	3574	0	0	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	29	29				
Link Speed (k/h)	40		60			60
Link Distance (m)	325.1		310.2			266.9
Travel Time (s)	29.3		18.6			16.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Adj. Flow (vph)	905	796	1272	0	0	1350
Shared Lane Traffic (%)		33%				
Lane Group Flow (vph)	1168	533	1272	0	0	1350
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	7.2		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2			2
Detector Template	Left	Right	Thru			Thru
Leading Detector (m)	2.0	2.0	10.0			10.0
Trailing Detector (m)	0.0	0.0	0.0			0.0
Detector 1 Position(m)	0.0	0.0	0.0			0.0
Detector 1 Size(m)	2.0	2.0	0.6			0.6
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex			CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			0.0
Detector 1 Queue (s)	0.0	0.0	0.0			0.0
Detector 1 Delay (s)	0.0	0.0	0.0			0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6

Lanes, Volumes, Timings  
107: Dorval Drive & QEW WB Off-Ramp

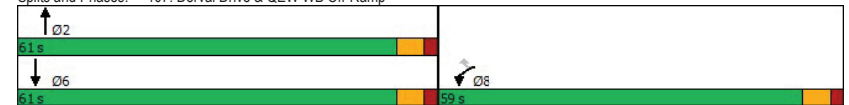
Total 10 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8				
Detector Phase	8	8	2			6
Switch Phase						
Minimum Initial (s)	10.0	10.0	20.0			20.0
Minimum Split (s)	24.0	24.0	26.0			26.0
Total Split (s)	59.0	59.0	61.0			61.0
Total Split (%)	49.2%	49.2%	50.8%			50.8%
Maximum Green (s)	53.0	53.0	55.0			55.0
Yellow Time (s)	4.0	4.0	4.0			4.0
All-Red Time (s)	2.0	2.0	2.0			2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0			-2.0
Total Lost Time (s)	4.0	4.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Recall Mode	None	None	Max			Max
Walk Time (s)	5.0	5.0	7.0			7.0
Flash Dont Walk (s)	7.0	7.0	11.0			11.0
Pedestrian Calls (#/hr)	0	0	0			0
Act Effct Green (s)	51.0	51.0	57.1			57.1
Actuated g/C Ratio	0.44	0.44	0.49			0.49
v/c Ratio	0.79	0.81	0.72			0.78
Control Delay	31.5	38.1	27.0			28.8
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	31.5	38.1	27.0			28.8
LOS	C	D	C			C
Approach Delay	33.6		27.0			28.8
Approach LOS	C		C			C

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	116.1
Natural Cycle:	55
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	30.2
Intersection Capacity Utilization:	72.4%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	C

Splits and Phases: 107: Dorval Drive & QEW WB Off-Ramp



Queues  
107: Dorval Drive & QEW WB Off-Ramp

Total 10 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	1168	533	1272	1350
v/c Ratio	0.79	0.81	0.72	0.78
Control Delay	31.5	38.1	27.0	28.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.5	38.1	27.0	28.8
Queue Length 50th (m)	118.0	114.0	131.7	145.5
Queue Length 95th (m)	145.3	168.9	159.7	176.1
Internal Link Dist (m)	301.1		286.2	242.9
Turn Bay Length (m)		190.0		
Base Capacity (vph)	1603	706	1758	1741
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.75	0.72	0.78
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
107: Dorval Drive & QEW WB Off-Ramp

Total 10 Year  
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	833	732	1170	0	0	1242
Future Volume (vph)	833	732	1170	0	0	1242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	0.97	0.91	0.95			0.95
Fr	0.97	0.85	1.00			1.00
Flt Protected	0.96	1.00	1.00			1.00
Satd. Flow (prot)	3343	1455	3574			3539
Flt Permitted	0.96	1.00	1.00			1.00
Satd. Flow (perm)	3343	1455	3574			3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	905	796	1272	0	0	1350
RTOR Reduction (vph)	16	16	0	0	0	0
Lane Group Flow (vph)	1152	517	1272	0	0	1350
Heavy Vehicles (%)	3%	1%	1%	0%	0%	2%
Turn Type	Prot	Perm	NA			NA
Protected Phases	8		2			6
Permitted Phases		8				
Actuated Green, G (s)	49.0	49.0	55.1			55.1
Effective Green, g (s)	51.0	51.0	57.1			57.1
Actuated g/C Ratio	0.44	0.44	0.49			0.49
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	4.5	4.5	5.0			5.0
Lane Grp Cap (vph)	1468	639	1757			1740
v/s Ratio Prot	0.34		0.36			c0.38
v/s Ratio Perm		c0.36				
v/c Ratio	0.78	0.81	0.72			0.78
Uniform Delay, d1	27.8	28.3	23.3			24.2
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	3.2	8.3	2.6			3.5
Delay (s)	31.0	36.6	25.9			27.7
Level of Service	C	D	C			C
Approach Delay (s)	32.8		25.9			27.7
Approach LOS	C		C			C
<b>Intersection Summary</b>						
HCM 2000 Control Delay			29.2		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			116.1		Sum of lost time (s)	8.0
Intersection Capacity Utilization			72.4%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	323	385	0	1404	1328	0
Future Volume (vph)	323	385	0	1404	1328	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	175.0	0.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	0.97	0.91	1.00	0.95	0.95	1.00
Frt	0.950	0.850				
Flt Protected	0.968					
Satd. Flow (prot)	3302	1441	0	3539	3505	0
Flt Permitted	0.968					
Satd. Flow (perm)	3302	1441	0	3539	3505	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	56	56				
Link Speed (k/h)	40			60	60	
Link Distance (m)	275.5			164.3	310.2	
Travel Time (s)	24.8			9.9	18.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Adj. Flow (vph)	351	418	0	1526	1443	0
Shared Lane Traffic (%)		42%				
Lane Group Flow (vph)	527	242	0	1526	1443	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	
Median Width(m)	7.2			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1		2	2	
Detector Template	Left	Right		Thru	Thru	
Leading Detector (m)	2.0	2.0		10.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	2.0		0.6	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	





Lanes, Volumes, Timings  
108: Dorval Drive & QEW EB Off-Ramp

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	10.0	10.0		20.0	20.0	
Minimum Split (s)	24.0	24.0		26.0	26.0	
Total Split (s)	38.0	38.0		82.0	82.0	
Total Split (%)	31.7%	31.7%		68.3%	68.3%	
Maximum Green (s)	32.0	32.0		76.0	76.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Recall Mode	None	None		Max	Max	
Walk Time (s)	0.0	0.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Efect Green (s)	25.4	25.4		78.2	78.2	
Actuated g/C Ratio	0.23	0.23		0.70	0.70	
v/c Ratio	0.66	0.65		0.62	0.59	
Control Delay	39.0	38.3		10.9	10.4	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	39.0	38.3		10.9	10.4	
LOS	D	D		B	B	
Approach Delay	38.7			10.9	10.4	
Approach LOS	D			B	B	
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 111.6						
Natural Cycle: 60						
Control Type: Semi Act-Uncoord						
Maximum v/c Ratio: 0.66						
Intersection Signal Delay: 16.4	Intersection LOS: B					
Intersection Capacity Utilization 72.4%	ICU Level of Service C					
Analysis Period (min) 15						
Split and Phases: 108: Dorval Drive & QEW EB Off-Ramp						














Queues  
108: Dorval Drive & QEW EB Off-Ramp

Total 10 Year  
PM Peak Hour

				
Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	527	242	1526	1443
v/c Ratio	0.66	0.65	0.62	0.59
Control Delay	39.0	38.3	10.9	10.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.0	38.3	10.9	10.4
Queue Length 50th (m)	50.8	42.7	84.1	76.8
Queue Length 95th (m)	68.8	72.7	136.2	125.1
Internal Link Dist (m)	251.5		140.3	286.2
Turn Bay Length (m)	175.0			
Base Capacity (vph)	1047	479	2480	2456
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.51	0.62	0.59
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
108: Dorval Drive & QEW EB Off-Ramp

Total 10 Year  
PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	 			 	 	
Traffic Volume (vph)	323	385	0	1404	1328	0
Future Volume (vph)	323	385	0	1404	1328	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.97	0.91		0.95	0.95	
Fr <sub>t</sub>	0.95	0.85		1.00	1.00	
Fit Protected	0.97	1.00		1.00	1.00	
Satd. Flow (prot)	3301	1441		3539	3505	
Fit Permitted	0.97	1.00		1.00	1.00	
Satd. Flow (perm)	3301	1441		3539	3505	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	351	418	0	1526	1443	0
RTOR Reduction (vph)	43	43	0	0	0	0
Lane Group Flow (vph)	484	199	0	1526	1443	0
Heavy Vehicles (%)	3%	2%	0%	2%	3%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	23.4	23.4		76.2	76.2	
Effective Green, g (s)	25.4	25.4		78.2	78.2	
Actuated g/C Ratio	0.23	0.23		0.70	0.70	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	4.0		5.0	5.0	
Lane Grp Cap (vph)	751	327		2479	2456	
v/s Ratio Prot	c0.15			c0.43	0.41	
v/s Ratio Perm		0.14				
v/c Ratio	0.64	0.61		0.62	0.59	
Uniform Delay, d1	39.0	38.6		8.8	8.5	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	3.7		1.2	1.0	
Delay (s)	41.1	42.3		9.9	9.5	
Level of Service	D	D		A	A	
Approach Delay (s)	41.5			9.9	9.5	
Approach LOS	D			A	A	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			16.3	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.62			
Actuated Cycle Length (s)			111.6	Sum of lost time (s)		8.0
Intersection Capacity Utilization			72.4%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Total 10 Year  
PM Peak Hour

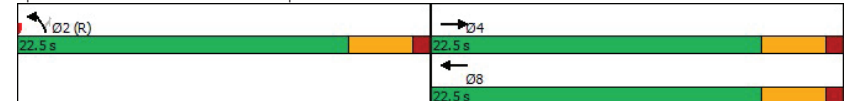
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔			↔↔	↔↔	↔↔
Traffic Volume (vph)	494	0	0	810	136	307
Future Volume (vph)	494	0	0	810	136	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	0.0		0.0	140.0
Storage Lanes		0	0		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3574	0	0	3574	1805	1599
Flt Permitted					0.950	
Satd. Flow (perm)	3574	0	0	3574	1805	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						188
Link Speed (k/h)	60			60	40	
Link Distance (m)	130.3			194.2	262.1	
Travel Time (s)	7.8			11.7	23.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Adj. Flow (vph)	537	0	0	880	148	334
Shared Lane Traffic (%)						
Lane Group Flow (vph)	537	0	0	880	148	334
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40

Lanes, Volumes, Timings  
109: QEW WB Off-Ramp & Kerr Street

Total 10 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
v/c Ratio	0.38			0.62	0.20	0.44
Control Delay	10.5			13.1	9.8	6.6
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	10.5			13.1	9.8	6.6
LOS	B			B	A	A
Approach Delay	10.5			13.1	7.6	
Approach LOS	B			B	A	
<b>Intersection Summary</b>						
Area Type:	Other					
Cycle Length:	45					
Actuated Cycle Length:	45					
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green					
Natural Cycle:	45					
Control Type:	Pretimed					
Maximum v/c Ratio:	0.62					
Intersection Signal Delay:	11.0			Intersection LOS: B		
Intersection Capacity Utilization:	40.2%			ICU Level of Service A		
Analysis Period (min)	15					

Splits and Phases: 109: QEW WB Off-Ramp & Kerr Street



Queues  
109: QEW WB Off-Ramp & Kerr Street

Total 10 Year  
PM Peak Hour

	→	←	↶	↷
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	537	880	148	334
v/c Ratio	0.38	0.62	0.20	0.44
Control Delay	10.5	13.1	9.8	6.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.5	13.1	9.8	6.6
Queue Length 50th (m)	15.5	28.7	7.6	7.5
Queue Length 95th (m)	24.8	43.5	16.4	21.4
Internal Link Dist (m)	106.3	170.2	238.1	
Turn Bay Length (m)				140.0
Base Capacity (vph)	1429	1429	722	752
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.38	0.62	0.20	0.44
<b>Intersection Summary</b>				

HCM Signalized Intersection Capacity Analysis  
109: QEW WB Off-Ramp & Kerr Street

Total 10 Year  
PM Peak Hour

	→	↶	↷	←	↶	↷
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶↷			↶↷	↶↷	↶↷
Traffic Volume (vph)	494	0	0	810	136	307
Future Volume (vph)	494	0	0	810	136	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	4.5
Lane Util. Factor	0.95			0.95	1.00	1.00
Fr	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3574			3574	1805	1599
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3574			3574	1805	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	537	0	0	880	148	334
RTOR Reduction (vph)	0	0	0	0	0	113
Lane Group Flow (vph)	537	0	0	880	148	221
Heavy Vehicles (%)	1%	0%	0%	1%	0%	1%
Turn Type	NA			NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases						2
Actuated Green, G (s)	18.0			18.0	18.0	18.0
Effective Green, g (s)	18.0			18.0	18.0	18.0
Actuated g/C Ratio	0.40			0.40	0.40	0.40
Clearance Time (s)	4.5			4.5	4.5	4.5
Lane Grp Cap (vph)	1429			1429	722	639
v/s Ratio Prot	0.15			c0.25	0.08	
v/s Ratio Perm						c0.14
v/c Ratio	0.38			0.62	0.20	0.35
Uniform Delay, d1	9.5			10.7	8.8	9.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.8			2.0	0.6	1.5
Delay (s)	10.3			12.7	9.5	10.9
Level of Service	B			B	A	B
Approach Delay (s)	10.3			12.7	10.4	
Approach LOS	B			B	B	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			11.5		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			45.0		Sum of lost time (s)	9.0
Intersection Capacity Utilization			40.2%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive<sup>PM Peak Hour</sup>

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	366	638	20	214	763	32	16	55	117	16	152	498
Future Volume (vph)	366	638	20	214	763	32	16	55	117	16	152	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	150.0		0.0	155.0		70.0	15.0		0.0	0.0		30.0
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	3395	0	1752	3505	1615	1805	1900	1615	1805	1900	1599
Flt Permitted	0.227			0.260			0.569			0.716		
Satd. Flow (perm)	837	3395	0	480	3505	1615	1081	1900	1615	1360	1900	1599
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				94			133			304
Link Speed (k/h)		80			80			60				40
Link Distance (m)		324.5			247.2			158.7				215.5
Travel Time (s)		14.6			11.1			9.5				19.4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Adj. Flow (vph)	416	725	23	243	867	36	18	63	133	18	173	566
Shared Lane Traffic (%)												
Lane Group Flow (vph)	416	748	0	243	867	36	18	63	133	18	173	566
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4

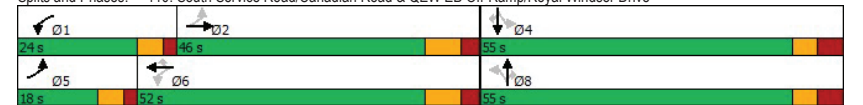
Lanes, Volumes, Timings  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive<sup>PM Peak Hour</sup>

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2				6				6		8	4
Detector Phase	5	2			1	6			6	8	8	4
Switch Phase												
Minimum Initial (s)	8.0	20.0			8.0	30.0	30.0	8.0	8.0	8.0	10.0	10.0
Minimum Split (s)	14.0	29.4			14.0	38.4	38.4	28.8	28.8	28.8	28.8	28.8
Total Split (s)	18.0	46.0			24.0	52.0	52.0	55.0	55.0	55.0	55.0	55.0
Total Split (%)	14.4%	36.8%			19.2%	41.6%	41.6%	44.0%	44.0%	44.0%	44.0%	44.0%
Maximum Green (s)	12.0	37.6			18.0	43.6	43.6	47.2	47.2	47.2	47.2	47.2
Yellow Time (s)	4.0	5.4			4.0	5.4	5.4	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.0	3.0			2.0	3.0	3.0	4.1	4.1	4.1	4.1	4.1
Lost Time Adjust (s)	-2.0	-4.4			-2.0	-4.4	-4.4	-3.8	-3.8	-3.8	-3.8	-3.8
Total Lost Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag			Lead	Lag	Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	4.5			3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5
Recall Mode	None	Max			None	Max	Max	None	None	None	None	None
Walk Time (s)		10.0				10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)		10.0				10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0				0	0	0	0	0	0	0
Act Effct Green (s)	60.5	47.4			62.9	48.8	48.8	31.5	31.5	31.5	31.5	31.5
Actuated g/C Ratio	0.57	0.45			0.60	0.46	0.46	0.30	0.30	0.30	0.30	0.30
v/c Ratio	0.51	0.49			0.53	0.54	0.05	0.06	0.11	0.23	0.04	0.31
Control Delay	13.1	25.0			15.4	24.1	0.1	24.6	25.6	5.1	24.4	28.8
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	25.0			15.4	24.1	0.1	24.6	25.6	5.1	24.4	28.8
LOS	B	C			B	C	A	C	C	A	C	C
Approach Delay		20.7				21.5			12.8			26.1
Approach LOS		C				C			B			C

Intersection Summary

Area Type:	Other
Cycle Length:	125
Actuated Cycle Length:	105.6
Natural Cycle:	85
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.82
Intersection Signal Delay:	21.7
Intersection Capacity Utilization:	72.5%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive



Queues Total 10 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive<sup>PM</sup> Peak Hour

	↖	→	↘	←	↙	↑	↗	↘	↓	↙	
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	416	748	243	867	36	18	63	133	18	173	566
v/c Ratio	0.51	0.49	0.53	0.54	0.05	0.06	0.11	0.23	0.04	0.31	0.82
Control Delay	13.1	25.0	15.4	24.1	0.1	24.6	25.6	5.1	24.4	28.8	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	25.0	15.4	24.1	0.1	24.6	25.6	5.1	24.4	28.8	25.3
Queue Length 50th (m)	17.8	57.3	20.8	68.8	0.0	2.8	9.9	0.0	2.8	28.8	55.1
Queue Length 95th (m)	37.4	104.8	48.8	114.9	0.0	7.6	18.8	11.7	7.5	44.4	93.1
Internal Link Dist (m)	300.5		223.2		134.7		191.5				
Turn Bay Length (m)	150.0	155.0	155.0	70.0	15.0						30.0
Base Capacity (vph)	847	1525	544	1618	796	530	931	860	667	931	939
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.49	0.45	0.54	0.05	0.03	0.07	0.15	0.03	0.19	0.60

Intersection Summary

Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			8				4
Permitted Phases	2		6		6	8		8	4		4
Actuated Green, G (s)	54.0	42.9	56.8	44.3	44.3	27.6	27.6	27.6	27.6	27.6	27.6
Effective Green, g (s)	58.0	47.3	60.8	48.7	48.7	31.4	31.4	31.4	31.4	31.4	31.4
Actuated g/C Ratio	0.55	0.45	0.58	0.46	0.46	0.30	0.30	0.30	0.30	0.30	0.30
Clearance Time (s)	6.0	8.4	6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5	3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	792	1526	452	1622	747	322	567	482	405	567	477
v/s Ratio Prot	0.07	0.22	c0.07	c0.25			0.03				0.09
v/s Ratio Perm	0.22		0.24		0.01	0.02		0.02	0.01		c0.22
v/c Ratio	0.53	0.49	0.54	0.53	0.02	0.06	0.11	0.08	0.04	0.31	0.74
Uniform Delay, d1	13.4	20.4	12.2	20.2	15.3	26.3	26.8	26.5	26.2	28.5	33.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	1.1	1.4	1.3	0.1	0.1	0.1	0.1	0.1	0.4	6.1
Delay (s)	14.1	21.5	13.6	21.4	15.4	26.4	26.9	26.6	26.3	28.8	39.3
Level of Service	B	C	B	C	B	C	C	C	C	C	D
Approach Delay (s)	18.9		19.6		26.7		36.6				
Approach LOS	B		B		C		D				

Intersection Summary

HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	105.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Total 10 Year  
 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive<sup>PM</sup> Peak Hour

	↖	→	↘	←	↙	↑	↗	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗	↖ ↗		↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗
Traffic Volume (vph)	366	638	20	214	763	32	16	55	117	16	152	498
Future Volume (vph)	366	638	20	214	763	32	16	55	117	16	152	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502	3396		1752	3505	1615	1805	1900	1615	1805	1900	1599
Fit Permitted	0.23	1.00		0.26	1.00	1.00	0.57	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	835	3396		479	3505	1615	1080	1900	1615	1360	1900	1599
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)	416	725	23	243	867	36	18	62	133	18	173	566
RTOR Reduction (vph)	0	2	0	0	0	19	0	0	93	0	0	213
Lane Group Flow (vph)	416	746	0	243	867	17	18	63	40	18	173	353
Heavy Vehicles (%)	0%	6%	0%	3%	3%	0%	0%	0%	0%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6		6	8		8	4		4
Actuated Green, G (s)	54.0	42.9		56.8	44.3	44.3	27.6	27.6	27.6	27.6	27.6	27.6
Effective Green, g (s)	58.0	47.3		60.8	48.7	48.7	31.4	31.4	31.4	31.4	31.4	31.4
Actuated g/C Ratio	0.55	0.45		0.58	0.46	0.46	0.30	0.30	0.30	0.30	0.30	0.30
Clearance Time (s)	6.0	8.4		6.0	8.4	8.4	7.8	7.8	7.8	7.8	7.8	7.8
Vehicle Extension (s)	3.5	4.5		3.5	6.0	6.0	3.5	3.5	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	792	1526		452	1622	747	322	567	482	405	567	477
v/s Ratio Prot	0.07	0.22		c0.07	c0.25			0.03				0.09
v/s Ratio Perm	0.22			0.24		0.01	0.02		0.02	0.01		c0.22
v/c Ratio	0.53	0.49		0.54	0.53	0.02	0.06	0.11	0.08	0.04	0.31	0.74
Uniform Delay, d1	13.4	20.4		12.2	20.2	15.3	26.3	26.8	26.5	26.2	28.5	33.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	1.1		1.4	1.3	0.1	0.1	0.1	0.1	0.1	0.4	6.1
Delay (s)	14.1	21.5		13.6	21.4	15.4	26.4	26.9	26.6	26.3	28.8	39.3
Level of Service	B	C		B	C	B	C	C	C	C	C	D
Approach Delay (s)	18.9		19.6		26.7		36.6					
Approach LOS	B		B		C		D					

Intersection Summary


HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	105.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lanes, Volumes, Timings  
201: Cross Ave & Lyons Lane

Total 10 Year  
PM Peak Hour




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↕↕	
Traffic Volume (vph)	11	304	692	65	22	40
Future Volume (vph)	11	304	692	65	22	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	5.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.982		0.911	
Fit Protected	0.950				0.983	
Satd. Flow (prot)	1388	2954	3108	0	1492	0
Fit Permitted	0.950				0.983	
Satd. Flow (perm)	1388	2954	3108	0	1492	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		281.3	40.1		41.7	
Travel Time (s)		20.3	2.9		3.0	
Confl. Peds. (#/hr)	1			1	9	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Heavy Vehicles (%)	17%	10%	3%	0%	0%	4%
Adj. Flow (vph)	22	330	824	112	50	98
Shared Lane Traffic (%)						
Lane Group Flow (vph)	22	330	936	0	148	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	CBD
Control Type:	Unsignalized
Intersection Capacity Utilization	34.3%
ICU Level of Service A	
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
201: Cross Ave & Lyons Lane

Total 10 Year  
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↕↕	
Traffic Volume (veh/h)	11	304	692	65	22	40
Future Volume (Veh/h)	11	304	692	65	22	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.50	0.92	0.84	0.58	0.44	0.41
Hourly flow rate (vph)	22	330	824	112	50	98
Pedestrians			9		1	
Lane Width (m)			3.6		3.6	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			40			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	937				1099	469
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	708				888	188
tC, single (s)	4.4				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.4				3.5	3.3
p0 queue free %	97				80	87
cM capacity (veh/h)	714				248	733

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	22	165	165	549	387	148
Volume Left	22	0	0	0	0	50
Volume Right	0	0	0	0	112	98
sSH	714	1700	1700	1700	1700	442
Volume to Capacity	0.03	0.10	0.10	0.32	0.23	0.34
Queue Length 95th (m)	0.8	0.0	0.0	0.0	0.0	11.6
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	17.2
Lane LOS	B					C
Approach Delay (s)	0.6			0.0		17.2
Approach LOS						C

Intersection Summary	
Average Delay	1.9
Intersection Capacity Utilization	34.3%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings  
202: Lyons Lane & South Service Rd E

Total 10 Year  
PM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	4	7	0	44	25	7
Future Volume (vph)	4	7	0	44	25	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.865		0.966	
Flt Protected		0.976			0.964	
Satd. Flow (prot)	0	1669	1212	0	1592	0
Flt Permitted		0.976			0.964	
Satd. Flow (perm)	0	1669	1212	0	1592	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		60.5	89.6		37.6	
Travel Time (s)		4.4	6.5		2.7	
Confl. Peds. (#/hr)	7			7		
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Heavy Vehicles (%)	0%	0%	0%	22%	0%	0%
Adj. Flow (vph)	11	11	0	71	50	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	22	71	0	67	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.8%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
202: Lyons Lane & South Service Rd E

Total 10 Year  
PM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	4	7	0	44	25	7
Future Volume (Veh/h)	4	7	0	44	25	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.38	0.62	0.25	0.62	0.50	0.42
Hourly flow rate (vph)	11	11	0	71	50	17
Pedestrians					7	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	78				76	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	78				76	42
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				95	98
cM capacity (veh/h)	1524				921	1028
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	22	71	67			
Volume Left	11	0	50			
Volume Right	0	71	17			
cSH	1524	1700	946			
Volume to Capacity	0.01	0.04	0.07			
Queue Length 95th (m)	0.2	0.0	1.8			
Control Delay (s)	3.7	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	3.7	0.0	9.1			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			4.3			
Intersection Capacity Utilization	15.8%		ICU Level of Service	A		
Analysis Period (min)	15					

Lanes, Volumes, Timings  
203: Argus Rd & South Service Rd E

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	13	38	531	367	89	19
Future Volume (vph)	13	38	531	367	89	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.937			0.974	
Flt Protected		0.986			0.961	
Satd. Flow (prot)	0	1541	1522	0	1601	0
Flt Permitted		0.986			0.961	
Satd. Flow (perm)	0	1541	1522	0	1601	0
Link Speed (k/h)		50			50	
Link Distance (m)		177.7	145.7		103.5	
Travel Time (s)		12.8	10.5		7.5	
Confl. Peds. (#/hr)					5	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Heavy Vehicles (%)	0%	13%	10%	0%	0%	0%
Adj. Flow (vph)	29	76	610	540	119	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	105	1150	0	148	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0			3.6	
Link Offset(m)		0.0			0.0	
Crosswalk Width(m)		4.8			4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24		14		24	14
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	CBD
Control Type:	Unsignalized
Intersection Capacity Utilization	69.4%
Analysis Period (min)	15
	ICU Level of Service C

HCM Unsignalized Intersection Capacity Analysis  
203: Argus Rd & South Service Rd E

Total 10 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (veh/h)	13	38	531	367	89	19
Future Volume (Veh/h)	13	38	531	367	89	19
Sign Control		Free	Free		Stop	
Grade		0%			0%	
Peak Hour Factor	0.45	0.50	0.87	0.68	0.75	0.65
Hourly flow rate (vph)	29	76	610	540	119	29
Pedestrians		5			5	
Lane Width (m)		3.6			3.6	
Walking Speed (m/s)		1.2			1.2	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)		358				
Upstream signal (m)						
pX, platoon unblocked					1019	880
vC, conflicting volume	1150				1019	880
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1150				1019	880
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				53	92
cM capacity (veh/h)	615				251	349

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	105	1150	148
Volume Left	29	0	119
Volume Right	0	540	29
cSH	615	1700	266
Volume to Capacity	0.05	0.68	0.56
Queue Length 95th (m)	1.2	0.0	24.9
Control Delay (s)	3.5	0.0	34.3
Lane LOS	A		D
Approach Delay (s)	3.5	0.0	34.3
Approach LOS			D

Intersection Summary	
Average Delay	3.9
Intersection Capacity Utilization	69.4%
Analysis Period (min)	15
	ICU Level of Service C

Lanes, Volumes, Timings  
204: Trafalgar Rd & Argus Rd

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	145	0	3158	2188	874
Future Volume (vph)	0	145	0	3158	2188	874
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.6	3.5	3.6	3.6	3.6	3.6
Lane Util. Factor	1.00	1.00	1.00	*0.80	*0.80	0.91
Ped Bike Factor						
Fr <sub>t</sub>		0.865			0.953	
Fit Protected						
Satd. Flow (prot)	0	1354	0	4024	3823	0
Fit Permitted						
Satd. Flow (perm)	0	1354	0	4024	3823	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	145.7			270.2	51.4	
Travel Time (s)	10.5			19.5	3.7	
Confl. Peds. (#/hr)						24
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87
Heavy Vehicles (%)	0%	8%	0%	2%	2%	3%
Adj. Flow (vph)	0	230	0	3509	2233	1005
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	230	0	3509	3238	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.14	1.16	1.14	1.14	1.14	1.14
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	CBD					
Control Type:	Unsignalized					
Intersection Capacity Utilization	86.0%		ICU Level of Service E			
Analysis Period (min)	15					
* User Entered Value						

HCM Unsignalized Intersection Capacity Analysis  
204: Trafalgar Rd & Argus Rd

Total 10 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	145	0	3158	2188	874
Future Volume (Veh/h)	0	145	0	3158	2188	874
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.63	0.25	0.90	0.98	0.87
Hourly flow rate (vph)	0	230	0	3509	2233	1005
Pedestrians	24					
Lane Width (m)	3.5					
Walking Speed (m/s)	1.2					
Percent Blockage	2					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			270		52	
pX, platoon unblocked	0.62	0.49	0.49			
vC, conflicting volume	3929	1271	3262			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	680	0	1970			
tC, single (s)	6.8	7.1	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.2			
p0 queue free %	100	55	100			
cM capacity (veh/h)	238	511	143			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2 SB 3
Volume Total	230	1170	1170	1170	893	893 1452
Volume Left	0	0	0	0	0	0 0
Volume Right	230	0	0	0	0	0 1005
eSH	511	1700	1700	1700	1700	1700 1700
Volume to Capacity	0.45	0.69	0.69	0.69	0.53	0.53 0.85
Queue Length 95th (m)	18.4	0.0	0.0	0.0	0.0	0.0 0.0
Control Delay (s)	17.7	0.0	0.0	0.0	0.0	0.0 0.0
Lane LOS	C					
Approach Delay (s)	17.7	0.0	0.0			
Approach LOS	C					
<b>Intersection Summary</b>						
Average Delay			0.6			
Intersection Capacity Utilization	86.0%		ICU Level of Service		E	
Analysis Period (min)	15					

Lanes, Volumes, Timings

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 10 Year

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	155	253	277	626	180	387	452	1583	926	183	1141	65
Future Volume (vph)	155	253	277	626	180	387	452	1583	926	183	1141	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		0.0	165.0			25.0	145.0		0.0	95.0	90.0
Storage Lanes	1		1	1			1	1		1	1	1
Taper Length (m)	7.5			7.5			7.5	7.5		7.5	7.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Ped Bike Factor	0.97						0.95	0.97		1.00		
Frt			0.850				0.850			0.850		0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1624	1710	1425	3120	1710	1425	1608	4024	1425	1608	3984	1425
Fit Permitted	0.639			0.212			0.114			0.129		
Satd. Flow (perm)	1064	1710	1425	696	1710	1360	193	4024	1382	218	3984	1425
Right Turn on Red			Yes			Yes		Yes		Yes		
Satd. Flow (RTOR)			289			163		496				191
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		347.0			285.9			280.4			353.6	
Travel Time (s)		25.0			20.6			20.2			25.5	
Confl. Peds. (#/hr)	34				34			14		14		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Adj. Flow (vph)	161	264	289	652	188	403	471	1649	965	191	1189	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	264	289	652	188	403	471	1649	965	191	1189	68
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25			15	25		15	25	15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

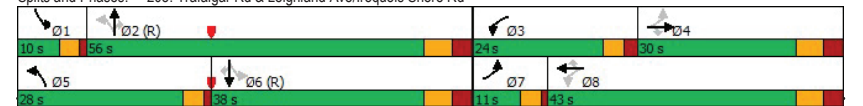
Lanes, Volumes, Timings

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 10 Year

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		2	6	6
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	10.0	6.0	15.0	15.0	6.0	15.0	15.0
Minimum Split (s)	11.0	25.0	25.0	11.0	43.0	43.0	11.0	34.0	34.0	10.0	34.0	34.0
Total Split (s)	11.0	30.0	30.0	24.0	43.0	43.0	28.0	56.0	56.0	10.0	38.0	38.0
Total Split (%)	9.2%	25.0%	25.0%	20.0%	35.8%	35.8%	23.3%	46.7%	46.7%	8.3%	31.7%	31.7%
Maximum Green (s)	7.0	23.0	23.0	19.0	36.0	36.0	24.0	49.0	49.0	6.0	31.0	31.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0	0.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					29.0	29.0		20.0	20.0		20.0	20.0
Pedestrian Calls (#/hr)					0	0		0	0		0	0
Act Effct Green (s)	31.9	24.9	24.9	47.9	37.9	37.9	63.1	52.0	52.0	41.1	34.0	34.0
Actuated g/C Ratio	0.27	0.21	0.21	0.40	0.32	0.32	0.53	0.43	0.43	0.34	0.28	0.28
v/c Ratio	0.51	0.74	0.55	0.98	0.35	0.74	1.19	0.95	1.10	1.22	1.05	1.13
Control Delay	33.6	58.1	8.8	60.6	33.4	30.6	139.7	45.1	78.1	171.8	84.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	58.1	8.8	60.6	33.4	30.6	139.7	45.1	78.1	171.8	84.0	0.5
LOS	C	E	A	E	C	C	F	D	E	F	F	A
Approach Delay		32.6			46.8		69.9			91.6		
Approach LOS		C			D		E			F		
Intersection Summary												
Area Type:	CBD											
Cycle Length:	120											
Actuated Cycle Length:	120											
Offset:	105.6 (88%), Referenced to phase 2:NBL and 6:SBTL, Start of Green											
Natural Cycle:	140											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.22											
Intersection Signal Delay:	66.2						Intersection LOS: E					
Intersection Capacity Utilization:	101.2%						ICU Level of Service G					
Analysis Period (min):	15											
* User Entered Value												
Splits and Phases:	205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd											



Queues

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 10 Year

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	161	264	289	652	188	403	471	1649	965	191	1189	68
v/c Ratio	0.51	0.74	0.55	0.98	0.35	0.74	1.19	0.95	1.10	1.22	1.05	0.13
Control Delay	33.6	58.1	8.8	60.6	33.4	30.6	139.7	45.1	78.1	171.8	84.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	58.1	8.8	60.6	33.4	30.6	139.7	45.1	78.1	171.8	84.0	0.5
Queue Length 50th (m)	25.4	61.0	0.0	61.3	35.2	53.8	~128.7	160.5	~196.6	~44.6	~134.2	0.0
Queue Length 95th (m)	41.7	92.1	24.2	#98.9	56.1	95.2	#196.4	#202.4	#278.4	#94.6	#168.8	0.0
Internal Link Dist (m)		323.0		261.9			256.4				329.6	
Turn Bay Length (m)	60.0			165.0		25.0	145.0			95.0		90.0
Base Capacity (vph)	316	370	535	662	555	552	396	1743	879	156	1128	540
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.71	0.54	0.98	0.34	0.73	1.19	0.95	1.10	1.22	1.05	0.13

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Total 10 Year

PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	155	253	277	626	180	387	452	1583	926	183	1141	65
Future Volume (vph)	155	253	277	626	180	387	452	1583	926	183	1141	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.97	1.00	1.00	1.00
Ftbp, ped/bikes	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1598	1710	1425	3120	1710	1360	1608	4024	1382	1608	3984	1425
Fit Permitted	0.64	1.00	1.00	0.21	1.00	1.00	0.11	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	1075	1710	1425	696	1710	1360	193	4024	1382	218	3984	1425
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	161	264	289	652	188	403	471	1649	965	191	1189	68
RTOR Reduction (vph)	0	0	229	0	0	112	0	0	281	0	0	49
Lane Group Flow (vph)	161	264	60	652	188	291	471	1649	684	191	1189	19
Confl. Peds. (#/hr)	34					34			14		14	
Heavy Vehicles (%)	0%	0%	2%	1%	0%	2%	1%	2%	2%	1%	3%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	28.9	21.9	21.9	45.9	34.9	34.9	60.1	49.0	49.0	38.1	31.0	31.0
Effective Green, g (s)	28.9	24.9	24.9	45.9	37.9	37.9	60.1	52.0	52.0	38.1	34.0	34.0
Actuated g/C Ratio	0.24	0.21	0.21	0.38	0.32	0.32	0.50	0.43	0.43	0.32	0.28	0.28
Clearance Time (s)	4.0	7.0	7.0	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	289	354	295	650	540	429	392	1743	598	151	1128	403
v/s Ratio Prot	0.03	0.15		c0.16	0.11		c0.25	0.41		0.07	0.30	
v/s Ratio Perm	0.10		0.04	c0.22		0.21	0.35		c0.49	0.33		0.01
v/c Ratio	0.56	0.75	0.20	1.00	0.35	0.68	1.20	0.95	1.14	1.26	1.05	0.05
Uniform Delay, d1	38.7	44.6	39.3	31.2	31.6	35.8	36.7	32.7	34.0	36.2	43.0	31.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	9.9	0.7	36.1	0.8	5.5	112.7	12.1	83.3	161.3	42.3	0.2
Delay (s)	41.0	54.5	40.1	67.2	32.4	41.3	149.4	44.7	117.3	197.4	85.3	31.5
Level of Service	D	D	D	E	C	D	F	D	F	F	F	C
Approach Delay (s)		45.6				53.5		83.4			97.5	
Approach LOS		D				D		F			F	

Intersection Summary

- HCM 2000 Control Delay: 76.7, HCM 2000 Level of Service: E
- HCM 2000 Volume to Capacity ratio: 1.13
- Actuated Cycle Length (s): 120.0, Sum of lost time (s): 17.0
- Intersection Capacity Utilization: 101.2%, ICU Level of Service: G
- Analysis Period (min): 15
- c Critical Lane Group

Lanes, Volumes, Timings  
206: North-South Local Rd & South Service Rd E

Total 10 Year  
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↘	↗	
Traffic Volume (vph)	65	28	0	237	0	0
Future Volume (vph)	65	28	0	237	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr	0.960					
Fit Protected						
Satd. Flow (prot)	1788	0	0	1863	1863	0
Fit Permitted						
Satd. Flow (perm)	1788	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	63.8			243.0	106.8	
Travel Time (s)	4.6			17.5	7.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	30	0	258	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	0	0	258	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
206: North-South Local Rd & South Service Rd E

Total 10 Year  
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↘	↗	
Traffic Volume (veh/h)	65	28	0	237	0	0
Future Volume (Veh/h)	65	28	0	237	0	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)	71	30	0	258	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			101		344	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			101		344	86
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1491		652	973
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	101	258	0			
Volume Left	0	0	0			
Volume Right	30	0	0			
sSH	1700	1491	1700			
Volume to Capacity	0.06	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			15.8%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
207: Argus Rd & East-West Local Rd

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	104	465	80
Future Volume (vph)	0	0	0	104	465	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr				0.980		
Fit Protected						
Satd. Flow (prot)	1863	0	0	1863	1825	0
Fit Permitted						
Satd. Flow (perm)	1863	0	0	1863	1825	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	110.5			107.9	72.8	
Travel Time (s)	8.0			7.8	5.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	113	505	87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	113	592	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	32.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
207: Argus Rd & East-West Local Rd

Total 10 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	104	465	80
Future Volume (Veh/h)	0	0	0	104	465	80
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	113	505	87
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				108		
pX, platoon unblocked						
vC, conflicting volume	662	548	592			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	662	548	592			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	427	536	984			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	113	592			
Volume Left	0	0	0			
Volume Right	0	0	87			
sSH	1700	984	1700			
Volume to Capacity	0.00	0.00	0.35			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization		32.7%		ICU Level of Service	A	
Analysis Period (min)		15				



Lanes, Volumes, Timings  
208: North-South Local Rd & East-West Local Rd

Total 10 Year  
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	80	0	88	0	0	160
Future Volume (vph)	80	0	88	0	0	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
<b>Fr</b>						
Fit Protected	0.950					
Satd. Flow (prot)	1770	0	1863	0	0	1863
Fit Permitted	0.950					
Satd. Flow (perm)	1770	0	1863	0	0	1863
Link Speed (k/h)	50		50			50
Link Distance (m)	110.5		113.2			79.1
Travel Time (s)	8.0		8.2			5.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	0	96	0	0	174
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	87	0	96	0	0	174
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	19.5%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
208: North-South Local Rd & East-West Local Rd

Total 10 Year  
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	80	0	88	0	0	160
Future Volume (Veh/h)	80	0	88	0	0	160
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	0	96	0	0	174
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			113			
<b>pX, platoon unblocked</b>						
vC, conflicting volume	270	96			96	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	270	96			96	
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	100			100	
cM capacity (veh/h)	719	960			1498	
<b>Direction, Lane #</b>						
	WB 1	NB 1	SB 1			
Volume Total	87	96	174			
Volume Left	87	0	0			
Volume Right	0	0	0			
cSH	719	1700	1498			
Volume to Capacity	0.12	0.06	0.00			
Queue Length 95th (m)	3.3	0.0	0.0			
Control Delay (s)	10.7	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	10.7	0.0	0.0			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			2.6			
Intersection Capacity Utilization	19.5%		ICU Level of Service		A	
Analysis Period (min)	15					

Lanes, Volumes, Timings  
 209: GO Station West Access/North-South Local Rd & Cross Ave  
 Total 10 Year  
 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔	↔		↔	↔	
Traffic Volume (vph)	53	445	0	156	454	119	0	0	734	203	55	51
Future Volume (vph)	53	445	0	156	454	119	0	0	734	203	55	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	15.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ft				0.976			0.850			0.928		
Flt Protected		0.995			0.989				0.950			
Satd. Flow (prot)	0	3522	0	0	3416	0	1863	1583	0	1770	1729	0
Flt Permitted		0.802			0.706				0.190			
Satd. Flow (perm)	0	2838	0	0	2439	0	1863	1583	0	354	1729	0
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)				58			240			55		
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		258.2			115.8			76.5			113.2	
Travel Time (s)		18.6			8.3			5.5			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	484	0	170	493	129	0	0	798	221	60	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	542	0	0	792	0	0	798	0	221	115	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases		4			8			2			6	

Lanes, Volumes, Timings  
 209: GO Station West Access/North-South Local Rd & Cross Ave  
 Total 10 Year  
 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4			8	8		2	2		6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0		5.0	5.0		5.0	5.0
Minimum Split (s)	24.0	24.0			24.0	24.0		24.0	24.0		24.0	24.0
Total Split (s)	24.0	24.0			24.0	24.0		24.0	24.0		24.0	24.0
Total Split (%)	50.0%	50.0%			50.0%	50.0%		50.0%	50.0%		50.0%	50.0%
Maximum Green (s)	18.0	18.0			18.0	18.0		18.0	18.0		18.0	18.0
Yellow Time (s)	4.0	4.0			4.0	4.0		4.0	4.0		4.0	4.0
All-Red Time (s)	2.0	2.0			2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)		-2.0				-2.0			-2.0			-2.0
Total Lost Time (s)		4.0				4.0			4.0			4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	None	None			None	None		C-Max	C-Max		C-Max	C-Max
Walk Time (s)	7.0	7.0			7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0			11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0			0	0		0	0		0	0
Act Effct Green (s)		19.0				19.0			21.0			21.0
Actuated g/C Ratio		0.40				0.40			0.44			0.44
v/c Ratio		0.48				0.79			0.97			1.44
Control Delay		12.3				18.8			38.1			250.6
Queue Delay		0.0				0.0			0.0			0.0
Total Delay		12.3				18.8			38.1			250.6
LOS		B				B			D			F
Approach Delay		12.3				18.8			38.1			166.9
Approach LOS		B				B			D			F
Intersection Summary												
Area Type:	Other											
Cycle Length:	48											
Actuated Cycle Length:	48											
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green											
Natural Cycle:	50											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.44											
Intersection Signal Delay:	43.8						Intersection LOS: D					
Intersection Capacity Utilization:	104.7%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases:	209: GO Station West Access/North-South Local Rd & Cross Ave											

Queues

209: GO Station West Access/North-South Local Rd & Cross Ave

Total 10 Year  
PM Peak Hour

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	542	792	798	221	115
v/c Ratio	0.48	0.79	0.97	1.44	0.15
Control Delay	12.3	18.8	38.1	250.6	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	18.8	38.1	250.6	5.9
Queue Length 50th (m)	17.2	27.3	48.7	~28.8	3.1
Queue Length 95th (m)	28.0	#48.4	#120.7	#51.4	10.2
Internal Link Dist (m)	234.2	91.8	52.5		89.2
Turn Bay Length (m)				15.0	
Base Capacity (vph)	1182	1050	826	154	786
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	0.46	0.75	0.97	1.44	0.15

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

209: GO Station West Access/North-South Local Rd & Cross Ave

Total 10 Year  
PM Peak Hour



	↘	→	↙	↗	←	↖	↘	↑	↗	↙	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	53	445	0	156	454	119	0	0	734	203	55	51
Future Volume (vph)	53	445	0	156	454	119	0	0	734	203	55	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Fr		1.00			0.98			0.85		1.00		0.93
Flt Protected		0.99			0.99			1.00		0.95		1.00
Satd. Flow (prot)		3520			3416			1583		1770		1729
Flt Permitted		0.80			0.71			1.00		0.19		1.00
Satd. Flow (perm)		2840			2437			1583		355		1729
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	484	0	170	493	129	0	0	798	221	60	55
RTOR Reduction (vph)	0	0	0	0	35	0	0	135	0	0	31	0
Lane Group Flow (vph)	0	542	0	0	757	0	0	663	0	221	84	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		17.0			17.0			19.0		19.0		19.0
Effective Green, g (s)		19.0			19.0			21.0		21.0		21.0
Actuated g/C Ratio		0.40			0.40			0.44		0.44		0.44
Clearance Time (s)		6.0			6.0			6.0		6.0		6.0
Vehicle Extension (s)		3.0			3.0			3.0		3.0		3.0
Lane Grp Cap (vph)		1124			964			692		155		756
v/s Ratio Prot								0.42				0.05
v/s Ratio Perm		0.19			0.31					0.62		
v/c Ratio		0.48			0.79			0.96		1.43		0.11
Uniform Delay, d1		10.8			12.7			13.1		13.5		8.0
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		0.3			4.3			25.4		224.8		0.3
Delay (s)		11.2			17.0			38.4		238.3		8.3
Level of Service		B			B			D		F		A
Approach Delay (s)		11.2			17.0			38.4		159.5		
Approach LOS		B			B			D		F		

Intersection Summary

- HCM 2000 Control Delay: 42.0
- HCM 2000 Volume to Capacity ratio: 1.12
- Actuated Cycle Length (s): 48.0
- Intersection Capacity Utilization: 104.7%
- Analysis Period (min): 15
- HCM 2000 Level of Service: D
- Sum of lost time (s): 8.0
- ICU Level of Service: G
- c Critical Lane Group

Lanes, Volumes, Timings  
303: North Access & South Service Rd E



Total 10 Year  
PM Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	43	0	169	68	0	50
Future Volume (vph)	43	0	169	68	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.865
Fit Protected						0.966
Satd. Flow (prot)	1863	0	0	1799	1611	0
Fit Permitted						0.966
Satd. Flow (perm)	1863	0	0	1799	1611	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	518.9		63.8		108.8	
Travel Time (s)	37.4		4.6		7.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	0	184	74	0	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	0	258	54	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	15		25		15	
Sign Control	Free		Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.6% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
303: North Access & South Service Rd E

Total 10 Year  
PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	43	0	169	68	0	50
Future Volume (Veh/h)	43	0	169	68	0	50
Sign Control	Free			Free Stop		
Grade	0%					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	0	184	74	0	54
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			47		489 47	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			47		489 47	
tC, single (s)			4.1		6.4 6.2	
tC, 2 stage (s)						
tF (s)			2.2		3.5 3.3	
p0 queue free %			88		100 95	
cM capacity (veh/h)			1560		475 1022	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	47	258	54			
Volume Left	0		184		0	
Volume Right	0		0		54	
cSH	1700	1560	1022			
Volume to Capacity	0.03	0.12	0.05			
Queue Length 95th (m)	0.0		3.2		1.3	
Control Delay (s)	0.0		5.7		8.7	
Lane LOS	A		A			
Approach Delay (s)	0.0		5.7		8.7	
Approach LOS	A		A			

Intersection Summary			
Average Delay			5.4
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings  
304: North-South Local Rd & East Access

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	132	88	0	28	0
Future Volume (vph)	0	132	88	0	28	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr	0.865					
Fit Protected				0.950		
Satd. Flow (prot)	1611	0	0	1770	1863	0
Fit Permitted				0.950		
Satd. Flow (perm)	1611	0	0	1770	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	42.7			79.1	106.8	
Travel Time (s)	3.1			5.7	7.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	143	96	0	30	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	143	0	0	96	30	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	26.4%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
304: North-South Local Rd & East Access

Total 10 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	132	88	0	28	0
Future Volume (Veh/h)	0	132	88	0	28	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	143	96	0	30	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)				192		
pX, platoon unblocked						
vC, conflicting volume	222	30	30			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	222	30	30			
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	94			
cM capacity (veh/h)	720	1044	1583			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	143	96	30			
Volume Left	0	96	0			
Volume Right	143	0	0			
cSH	1044	1583	1700			
Volume to Capacity	0.14	0.06	0.02			
Queue Length 95th (m)	3.8	1.5	0.0			
Control Delay (s)	9.0	7.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	7.4	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		7.4				
Intersection Capacity Utilization	26.4%		ICU Level of Service		A	
Analysis Period (min)	15					

Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	EB	EB	EB	B7	B7	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	TR	T	T	L	T	R	L	T	T	TR
Maximum Queue (m)	122.9	155.8	115.9	77.9	77.0	32.4	330.4	324.3	57.4	148.6	133.0	125.7
Average Queue (m)	121.7	146.2	44.8	72.2	38.0	30.4	319.2	316.2	52.3	94.1	80.2	81.3
95th Queue (m)	127.3	150.8	91.8	84.2	85.2	38.0	324.7	327.0	69.9	154.7	127.6	117.6
Link Distance (m)		123.0	123.0	51.4	51.4		313.2	313.2		128.0	128.0	128.0
Upstream Blk Time (%)	6	65	1	55	16		85	37		9	1	1
Queuing Penalty (veh)	0	605	11	517	148		0	0		56	5	5
Storage Bay Dist (m)	130.0					25.0			50.0			
Storage Blk Time (%)	6	65				54	45		53	8		
Queuing Penalty (veh)	47	478				203	137		252	31		

Intersection: 101: Trafalgar Rd & Cross Ave/South Service Rd

Movement	B34	B34	B34	SB	SB	SB	SB
Directions Served	T	T	T	L	T	T	TR
Maximum Queue (m)	11.8	19.3	18.7	32.3	245.0	254.5	245.7
Average Queue (m)	0.9	0.6	0.6	18.0	136.9	181.4	199.2
95th Queue (m)	7.4	10.9	10.8	37.3	290.5	334.2	338.2
Link Distance (m)	101.5	101.5	101.5		239.0	239.0	239.0
Upstream Blk Time (%)					1	10	37
Queuing Penalty (veh)					8	75	291
Storage Bay Dist (m)				25.0			
Storage Blk Time (%)				9	31		
Queuing Penalty (veh)				45	61		

Intersection: 102: GO Bus Terminal/Argus Rd & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	B7	B7	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	27.3	105.3	111.0	27.4	86.0	76.0	67.2	68.9	84.6	85.1	22.4	92.0
Average Queue (m)	6.8	98.6	99.3	26.1	66.0	37.5	10.8	5.0	75.2	56.9	19.5	73.3
95th Queue (m)	23.5	104.1	112.3	29.9	90.9	70.7	42.6	32.2	88.1	102.9	28.1	114.0
Link Distance (m)		93.2	93.2		51.4	51.4	123.0	123.0	66.7	66.7		87.5
Upstream Blk Time (%)		69	54		45	5			78	34		47
Queuing Penalty (veh)		479	371		317	37			0	0		218
Storage Bay Dist (m)	20.0			20.0							15.0	
Storage Blk Time (%)	0	80		75	7						76	27
Queuing Penalty (veh)	0	50		247	14						181	78

Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 103: Lyons Lane/Commercial Driveway & Cross Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	14.0	31.0	32.6	15.0	38.4	40.0	27.4	59.4	54.5	26.5
Average Queue (m)	2.7	21.8	18.2	2.7	16.7	17.9	24.5	56.9	29.6	8.4
95th Queue (m)	10.6	27.8	31.7	10.2	33.1	33.7	36.5	70.9	62.9	20.7
Link Distance (m)	21.8	21.8	21.8		236.4	236.4		54.8	56.7	56.7
Upstream Blk Time (%)	0	68	39					74	23	
Queuing Penalty (veh)	0	74	42					0	0	
Storage Bay Dist (m)				25.0			20.0			
Storage Blk Time (%)				0	2			23	67	
Queuing Penalty (veh)	0	1			1			68	176	

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	TR	L	T	TR	L	L
Maximum Queue (m)	83.7	87.4	280.1	271.2	83.6	128.2	129.4	32.4	298.1	291.4	78.9	98.3
Average Queue (m)	82.8	87.2	269.9	254.1	23.9	123.2	126.9	32.0	289.5	275.9	42.1	48.3
95th Queue (m)	85.7	87.9	275.2	320.3	72.4	136.9	128.4	33.5	310.7	346.5	79.6	93.2
Link Distance (m)			264.0	264.0		122.1	122.1		286.8	286.8		101.5
Upstream Blk Time (%)			93	12		29	60		91	34		2
Queuing Penalty (veh)			0	0		0	0		0	0		17
Storage Bay Dist (m)	80.0	80.0			80.0			25.0			80.0	
Storage Blk Time (%)	40	81	2		0	48		94	5		2	7
Queuing Penalty (veh)	165	331	13		0	29		273	9		5	23

Intersection: 104: Trafalgar Rd & Cornwall Rd

Movement	SB	SB	B34
Directions Served	T	R	T
Maximum Queue (m)	72.0	30.4	12.9
Average Queue (m)	35.2	11.6	1.1
95th Queue (m)	63.9	24.3	10.6
Link Distance (m)	101.5	101.5	128.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 105: Trafalgar Rd & QEW EB-Off Ramp

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	T	T	T	T	T	T
Maximum Queue (m)	176.7	183.8	184.4	33.9	43.1	39.9	317.1	318.6	311.3
Average Queue (m)	52.3	159.0	180.6	27.2	30.7	30.1	293.6	305.9	303.7
95th Queue (m)	150.1	243.6	184.4	33.3	39.2	35.7	357.7	314.7	309.1
Link Distance (m)	176.9	176.9	176.9	27.8	27.8	27.8	299.7	299.7	299.7
Upstream Blk Time (%)	1	39	89	28	35	39	46	69	76
Queuing Penalty (veh)	0	0	0	290	369	410	458	687	760
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 106: Trafalgar Rd & North Service Rd/QEW WB Off-Ramp

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	LT	R	T	T	T	T	T	T	R
Maximum Queue (m)	57.4	122.4	175.9	179.3	177.1	78.5	98.5	113.3	262.4	266.5	260.9	277.3
Average Queue (m)	20.5	121.5	146.2	171.9	105.9	37.4	46.1	64.9	254.3	255.8	253.6	258.6
95th Queue (m)	64.3	126.2	232.1	178.4	244.7	65.9	82.5	103.2	259.1	262.3	257.8	333.5
Link Distance (m)		117.8	171.3	171.3	171.3	299.7	299.7	299.7	251.7	251.7	251.7	251.7
Upstream Blk Time (%)		98	53	95	49				66	71	74	89
Queuing Penalty (veh)		0	0	0	0				336	365	378	453
Storage Bay Dist (m)	50.0											
Storage Blk Time (%)		0	99									
Queuing Penalty (veh)	0	26										

Intersection: 107: Dorval Drive & QEW WB Off-Ramp

Movement	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	131.1	173.8	132.1	132.7	132.4	133.4	121.4
Average Queue (m)	93.9	99.5	80.7	74.2	76.7	88.9	77.9
95th Queue (m)	122.9	143.6	115.7	119.6	118.3	120.8	112.2
Link Distance (m)	312.1	312.1		294.6	294.6	253.9	253.9
Upstream Blk Time (%)		0					
Queuing Penalty (veh)		0					
Storage Bay Dist (m)			190.0				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 108: Dorval Drive & QEW EB Off-Ramp

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	L	LR	R	T	T	T	T
Maximum Queue (m)	77.1	96.7	83.3	118.9	103.8	82.6	92.5
Average Queue (m)	45.5	64.8	46.3	68.9	55.1	44.5	51.5
95th Queue (m)	71.9	87.2	73.6	103.4	91.1	73.0	80.5
Link Distance (m)		262.2	262.2	151.0	151.0	294.6	294.6
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)	175.0						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 109: QEW WB Off-Ramp & Kerr Street

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (m)	40.5	28.5	57.1	50.2	27.8	31.5
Average Queue (m)	24.0	8.9	34.9	20.5	14.0	17.5
95th Queue (m)	36.2	19.9	50.5	38.6	24.4	28.2
Link Distance (m)	122.4	122.4	184.7	184.7	249.3	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)					140.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	L	T	TR	L	T	T	R	L	T	L	T
Maximum Queue (m)	49.3	56.6	64.8	70.1	45.5	89.7	79.9	11.5	17.4	26.7	12.6	74.9
Average Queue (m)	16.2	34.7	34.8	31.4	19.5	47.0	34.1	2.8	3.4	9.1	2.8	31.4
95th Queue (m)	40.1	52.1	56.9	56.8	36.4	76.5	60.7	9.6	11.5	20.5	8.8	60.7
Link Distance (m)			312.4	312.4		232.2	232.2			141.8	195.2	195.2
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	150.0	150.0			155.0		70.0	15.0				
Storage Blk Time (%)						0		1	8			10
Queuing Penalty (veh)						0		1	1			48

Intersection: 110: South Service Road/Canadian Road & QEW EB Off-Ramp/Royal Windsor Drive

Movement	SB
Directions Served	R
Maximum Queue (m)	37.2
Average Queue (m)	7.5
95th Queue (m)	25.9
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	30.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 201: Cross Ave & Lyons Lane

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	T	T	TR	LR
Maximum Queue (m)	9.5	285.6	290.3	11.7	10.6	23.5
Average Queue (m)	1.2	171.8	193.9	0.7	0.8	9.9
95th Queue (m)	6.4	386.9	377.9	5.4	5.6	20.0
Link Distance (m)		274.2	274.2	21.8	21.8	19.1
Upstream Blk Time (%)		46	51	0	0	5
Queuing Penalty (veh)		0	0	0	0	2
Storage Bay Dist (m)	5.0					
Storage Blk Time (%)	1	0				
Queuing Penalty (veh)	1	0				

Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 202: Lyons Lane & South Service Rd E

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	2.1
95th Queue (m)	8.4
Link Distance (m)	21.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 203: Argus Rd & South Service Rd E

Movement	EB	WB	SB	B17	B18
Directions Served	LT	TR	LR	T	T
Maximum Queue (m)	19.6	120.3	79.9	14.7	23.4
Average Queue (m)	4.8	61.5	29.8	3.4	2.8
95th Queue (m)	24.3	152.2	79.5	24.4	26.8
Link Distance (m)	162.4	112.3	88.3	39.8	230.6
Upstream Blk Time (%)		34	9	5	
Queuing Penalty (veh)		296	6	3	
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 204: Trafalgar Rd & Argus Rd

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	T	T	TR
Maximum Queue (m)	106.9	47.0	56.6	62.2	36.7	41.6	43.1
Average Queue (m)	64.5	16.9	26.6	33.9	3.8	15.2	30.6
95th Queue (m)	130.2	39.3	50.9	57.0	19.9	38.4	37.3
Link Distance (m)	112.3	239.0	239.0	239.0	27.8	27.8	27.8
Upstream Blk Time (%)	21				1	4	59
Queuing Penalty (veh)	27				6	43	589
Storage Bay Dist (m)							
Storage Blk Time (%)							
Queuing Penalty (veh)							



Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	L	L	T	R	L	T	T	T	L
Maximum Queue (m)	63.0	332.7	339.8	172.4	274.7	274.8	32.5	76.8	62.8	105.6	112.2	102.5
Average Queue (m)	21.2	264.2	292.8	165.4	266.0	254.0	13.8	31.1	22.5	27.0	30.2	53.1
95th Queue (m)	56.8	453.8	418.1	179.0	295.0	345.9	37.1	61.8	52.9	70.3	77.0	136.1
Link Distance (m)		327.2	327.2		266.7	266.7			251.7	251.7	251.7	
Upstream Blk Time (%)		64	69		87	70				0		
Queuing Penalty (veh)		0	0		0	0				0		
Storage Bay Dist (m)	60.0			165.0			25.0	145.0				95.0
Storage Blk Time (%)	0	7		40	95	7	6					0
Queuing Penalty (veh)	1	11		126	297	26	11					0

Intersection: 205: Trafalgar Rd & Leighland Ave/Iroquois Shore Rd

Movement	SB	SB	SB	SB
Directions Served	T	T	T	R
Maximum Queue (m)	354.2	350.5	353.5	97.5
Average Queue (m)	338.5	337.0	335.8	24.0
95th Queue (m)	381.6	383.5	388.9	93.3
Link Distance (m)	339.8	339.8	339.8	
Upstream Blk Time (%)	86	83	88	
Queuing Penalty (veh)	0	0	0	
Storage Bay Dist (m)				90.0
Storage Blk Time (%)	96		99	0
Queuing Penalty (veh)	175		64	0

Intersection: 206: North-South Local Rd & South Service Rd E

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 207: Argus Rd & East-West Local Rd

Movement	SB	B14
Directions Served	TR	T
Maximum Queue (m)	84.1	166.7
Average Queue (m)	63.5	107.1
95th Queue (m)	105.0	228.2
Link Distance (m)	54.8	162.4
Upstream Blk Time (%)	69	46
Queuing Penalty (veh)	380	253
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 208: North-South Local Rd & East-West Local Rd

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	92.1	69.1
Average Queue (m)	59.6	62.5
95th Queue (m)	108.8	83.5
Link Distance (m)	89.3	63.8
Upstream Blk Time (%)	34	83
Queuing Penalty (veh)	27	133
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 209: GO Station West Access/North-South Local Rd & Cross Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	LT	TR	L	TR	L	TR
Maximum Queue (m)	247.3	251.2	48.0	43.6	68.7	74.3	22.4	92.9
Average Queue (m)	231.4	232.1	17.5	20.6	54.4	66.6	20.7	90.1
95th Queue (m)	276.5	282.3	37.0	36.7	92.9	70.3	25.1	94.0
Link Distance (m)	236.4	236.4	93.2	93.2	61.8	61.8		88.6
Upstream Blk Time (%)	56	53			50	99		87
Queuing Penalty (veh)	184	175			0	0		208
Storage Bay Dist (m)							15.0	
Storage Blk Time (%)							98	5
Queuing Penalty (veh)							104	9

Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 303: North Access & South Service Rd E

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	6.8	16.0
Average Queue (m)	0.3	7.2
95th Queue (m)	3.3	13.4
Link Distance (m)	46.5	99.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 304: North-South Local Rd & East Access

Movement	EB	SB
Directions Served	LR	TR
Maximum Queue (m)	44.9	33.0
Average Queue (m)	34.0	10.3
95th Queue (m)	46.7	28.6
Link Distance (m)	32.8	87.7
Upstream Blk Time (%)	88	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 13932
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