CITY OF OTTAWA

# 2571 LANCASTER ROAD TRANSPORTATION IMPACT ASSESSMENT

## FINAL REPORT

FEBRUARY 24, 2022

DRAFT

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CITY OF OTTAWA

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PROJECT NO.: OUR REF. NO. 211-06996-00
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# TABLE OF CONTENTS

# TABLES

## *FIGURES*



## *APPENDICES*

# 1 SCREENING

This Transportation Impact Assessment (TIA) has been prepared to support the Site Plan Control Application for the development at 2571 Lancaster Road in Ottawa. The TIA follows the City of Ottawa guidelines which potentially includes five steps:

1 Screening
2 Scoping
3 Forecasting
4 Analysis
5 TIA Report

The Screening Step determines the need to continue with a TIA Study. The development is assessed against three triggers: trip generation, location, and safety to identify the next step of the study. If one or more of the triggers is satisfied, the Scoping Step must be completed. If none of the triggers are satisfied, the TIA is deemed complete. If one or more triggers are satisfied, specific TIA components are required to be carried out depending on the combination of triggers (**Table 1-1**) that have been satisfied.

The proposed development at 2571 Lancaster Road **satisfied the Trip Generation trigger** indicating that, as part of Steps Two through Five of the TIA process, the Design Review and Network Impact components should be completed. For reference, the completed Screening Form is provided in **Appendix B**.

**Table 1-1. Transportation Impact Assessment (TIA) Screening Triggers**

| | TIA TRIGGERS SATISFIED | | |
|---|---|---|---|
| **Next Step of the TIA Process** | **Trip Generation** | **Location** | **Safety** |
| *Design Review and Network Impact* | **Yes** | **No** | **No** |

# 2 SCOPING

## 2.1 SCREENING FORM

The completed Screening Form is provided in **Appendix B**.

## 2.2 DESCRIPTION OF PROPOSED DEVELOPMENT

This Transportation Impact Assessment (TIA) has been prepared in support of the Site Plan Control Application for the proposed development at 2571 Lancaster Road at the Enbridge Ottawa Operation Centre.

The 2571 Lancaster Road site is a currently developed skating rink (The Minto Skating Centre) in the Alta Vista area of the city. The skating rink is slated to be demolished starting in the fall of 2021. It is located mid block on Lancaster Road. The property consists of approximately 16,663 m² of land which is currently zoned as a Light Industrial Zone (IL). **Figure 2-1** illustrates the Study Area Context.

The draft site plan, attached as **Appendix C**, includes 3,598 $m^2$ of office/operation centre space, 689 $m^2$ of warehouse space, and 528 $m^2$ of shop space for a total building gross floor area of 5,704 $m^2$. It is noted that the proposed Shop space is not intended for typical commercial use, but will be used by Enbridge field staff primarily for the storage of tools, equipment and parts needed for work in the filed; staff would typically access this space at the start of their shift in the morning prior to leaving for the field and return at the end of the day. Compared with the 189 parking spaces currently available on site for the Skating Centre, a total of 289 parking spaces is being proposed on site consisting of 98 spots for staff parking, among which 6 are barrier-free spots, and 191 spots for equipment and fleet vehicles. The existing two site accesses on Lancaster Road will remain as the access/egress points to the proposed development. No additional new access is being proposed.

The facility will be built as a single phase with an estimated date of completion in 2022 and full occupancy in mid 2023.

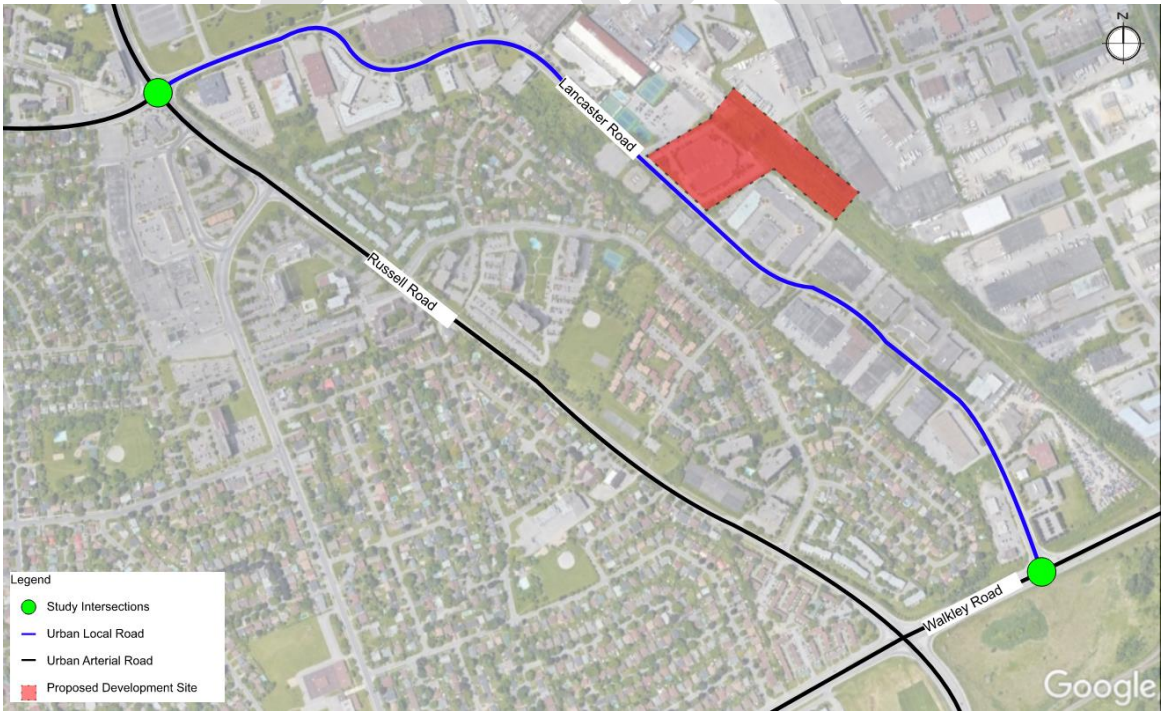



**Figure 2-1. Area Context Plan**

# 2.3 EXISTING CONDITIONS

## 2.3.1 ROADWAYS AND PEDESTRIAN / CYCLING FACILITIES

The five existing roadways that the TIA will consider are Lancaster Road, Russell Road, Walkley Road, St. Laurent Boulevard, and Smyth Road. These roads are all designated Full Loads urban truck routes identified on the Ottawa Urban Truck Routes map (March 2017) under the jurisdiction of the City of Ottawa. The road classification for City of Ottawa roadways are defined in the City of Ottawa Official Plan, 2013, Volume 1, Section 7, Annex 1 Road Classifications and Rights-of-Way.

**Lancaster Road** is an urban collector road that generally runs in a north-south alignment with a posted speed limit of 50 km/h. It has one traffic lane in each direction. The right-of-way adjacent to the proposed development is approximately 18 metres. Street parking is prohibited on both sides of the road expect for a short section on the west side adjacent to the subject development site where parking restriction is only in effect during December 1 to March 21.

**Russell Road** is an urban arterial road that runs north-south with a posted speed limit of 50 km/h. Russel Road is a four-lane road on the section between Smyth Road and St. Laurent Boulevard, transitions to a two-lane configuration from St. Laurent Boulevard to Lancaster Road and widens to four-lane when approaching Walkley Road. The existing right-of-way width varies along the section between Smyth Road and Walkley Road, ranging from approximately 22 meters to 27 metres. The Official Plan reserves a 37.5 metre right-of-way in the study area.

**Walkley Road** is an urban arterial road that runs east-west with two traffic lanes in each direction for a total of four lanes throughout the study area. The posted speed limit transitions from 50 km/h to 80km/h eastbound between Russell Road and Lancaster Road, while the westbound remains as 50 km/h on this section of road. The existing right-of-way width is approximately 30 metres. The Official Plan reserves a 44.5 metre right-of-way in the study area.

**St. Laurent Boulevard** is an urban arterial road that runs north-south with a posted speed limit of 50 km/h. It has two traffic lanes in each direction. The existing right-of-way in the study area is approximately 27 metres, with no right-of-way protection south of Smyth Road.

**Smyth Road** is an urban arterial that runs east-west with a posted speed limit of 50 km/h. It has two traffic lanes in each direction for a total of four lanes throughout the study area. The existing Right-of-Way in the study area is approximately 26 metres, which is the same as the reserved amount in the Official Plan.

The existing pedestrian and cycling facilities providing direct connections to the proposed development are shown in **Figure 2-2**. In addition to multiple pathways linking Lancaster Road to Southvale Crescent, the available pedestrian and cycling facilities in the vicinity of the development site along Lancaster Road include:

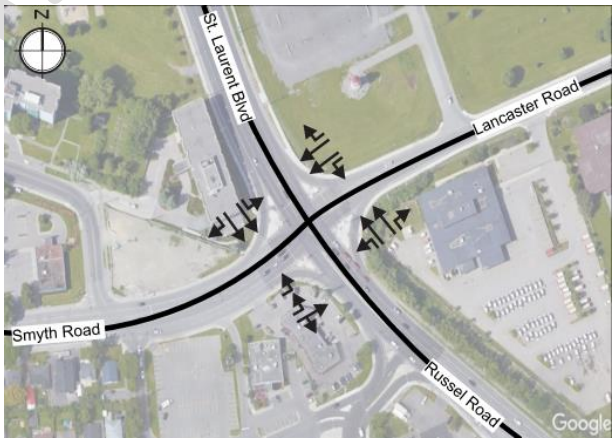
- 1.6 metres concrete sidewalk on both sides of the road
- 1.5 metres curb cycle track on both sides of the road starting Walkley Road and terminating near 2500 Lancaster Road
- The northern section does not have a sidewalk on the northern curb for about a 620m section

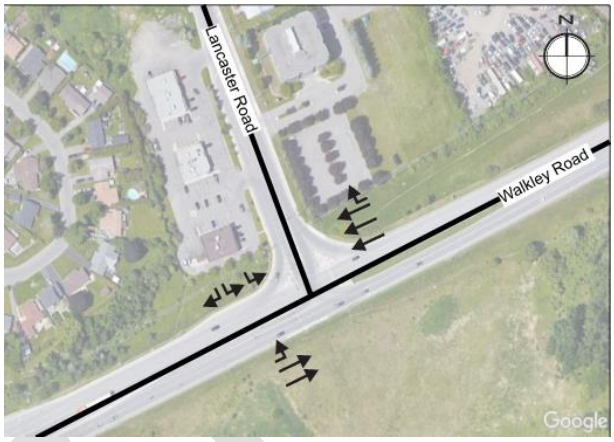

**Figure 2-2: Bicycle and Pedestrian Facilities**

### 2.3.2 INTERSECTIONS

The TIA will consider two (2) intersections as described in **Table 2-1**.

**Table 2-1. Description of Study Area Intersections**

| INTERSECTION (DESCRIPTION) | LANE CONFIGURATION |
|---|---|
| **Lancaster Road/Smyth Road and Russell Road/St. Laurent Boulevard** is a signalized intersection.<br>North Approach: One left turn lane, two through lanes, one channelized right turn lane<br>East Approach: One left turn lane, two through lanes, one channelized right turn lane<br>South Approach: One left turn lane, two through lanes, one channelized right turn lane<br>West Approach: Two left turn lanes, one through lane, one channelized right turn lane<br>Pedestrian/Bicycle: Bicycle lanes and pedestrian crossings on all legs |  |

| INTERSECTION (DESCRIPTION) | LANE CONFIGURATION |
|---|---|
| **Walkley Road and Lancaster Road** is a signalized intersection.<br>North Approach: Two left turn lanes, one channelized right turn lane<br>East Approach: three through lanes, one channelized right turn lane<br>West Approach: One left turn lane, two through lanes<br>Pedestrian/Bicycle: Pedestrian crossings on all legs |  |

## 2.3.3 DRIVEWAYS

There are several private accesses existing along Lancaster Road within 200 m from the development site.

- Three accesses to 2525 Lancaster Road (Ottawa Athletic Club) north of the development site. The south access to this property is approximately 15 m from the proposed northern access of the subject development site.
- Four accesses to the IL site at 2615 Lancaster Road south of the development site. The north access to this property is approximately 45 metres from the proposed southern access of the subject development site.
- One access to a surface parking lot at 2510 Lancaster Road across street from the development site.
- One access to 2540 Lancaster Road (Canada Blood Services) on the opposite side of Lancaster Road from the development site.
- Two accesses to 2600 Lancaster Road (mobility equipment supplier) across Lancaster Road from the development site.
- Four accesses to a general employment site at 2620 Lancaster Road south of the development site across Lancaster Road.

## 2.3.4 TRANSIT FACILITIES

OC Transpo does not provide transit service along Lancaster Road. The nearest transit stops are on Southvale Crescent servicing Route #46 which goes to Hurdman O-Train Station and Billings Bridge Station, and connects to the SE Transitway. Route 46 is a Local Route that operates seven days a week with a 15-minute frequency during peak hours. There is an existing walkway connecting the proposed development at 2571 Lancaster Road to the bus stops on Southvale Crescent (i.e. Stop #0642, #7299 etc.). There are four bus stops within 400 metres of the proposed development that all service Route #46 and are on Southvale Crescent:

- Bus Stop #0642 and Bus Stop #7299 are both within approximately 250 metres of the proposed site,
- Bus Stop #7298 and Bus Stop #0641 are both within approximately 400 metres of the proposed site.

There Additional Local Routes are available on the adjacent roadways of the proposed development site, including

- Route #46 and Route #48 on Russell Road:
- Northbound Transit Stop #7294, #7293, #7295, #8281
- Southbound Transit Stop #7297, #7296
- Route #47 Walkley Road:
- Eastbound Transit Stop #6899
- Westbound Transit Stop #6898

Route #47 is a local route that operates from Hawthorne to St-Laurent O-Train Station, while Route #48 (also local) runs between Elmvale S.C. and Hurdman O-Train Station, and like Route #46, also connects with the SE Transitway.

Route #40 runs along St Laurent Boulevard that provides 15-minute service from 6 am to 6 pm on weekdays and operates seven days per week.

**Figure 2-3** highlights all OC Transpo bus routes on adjacent roadways in close proximity of the proposed development.


**Figure 2-3: OC Transpo Bus Routes** (Source: OC Transpo Map Network Map)

## 2.3.5 AREA TRAFFIC MANAGEMENT MEASURES

The existing area traffic management measures identified adjacent to the proposed development site include:

- Centre medians near the intersections with Walkley Road and St. Laurent Boulevard as well as where the road curves near 2400 Lancaster Road.
- Sidewalks are on both sides of Lancaster Road.
- Lancaster Road has curbside bike lanes on both sides of the southern section with painted bike sharrows on the northern section.
- Pedestrian crossings on all study intersections.

### 2.3.6 PEAK HOUR TRAVEL DEMANDS

The TRANS Committee was established to co-ordinate transportation planning efforts among various planning agencies located within the National Capital Region. In the most recent TRANS Trip Generation Manual, an employment mode share by district was developed. For this analysis, the employment mode share of the Alta Vista district was taken as the existing mode share. A map of the district area is provided in **Appendix D**. The TRANS mode share for the Alta Vista Area is summarized in **Table 2-2.**

**Table 2-2. Existing Employment Mode Share – Alta Vista District**

| TRAVEL MODE | AM PEAK PERIOD (7:00 A.M. – 9:30 A.M.) | PM PEAK PERIOD (3:30 P.M. – 6:00 P.M.) |
|---|---|---|
| Auto-Driver | 69% | 69% |
| Auto-Passenger | 7% | 7% |
| Transit | 18% | 18% |
| Bicycle | 3% | 3% |
| Walk | 3% | 3% |

*Source: 2021 TRANS Trip Generation Manual*

Reviewing the mode share for the new development, the majority of users are expected to use their personal vehicles to commute. During both AM and PM peak hour periods, auto-driver and auto-passenger modes account for between 76% of the total vehicles that are travelling to and from the aforementioned TAZs . The remaining 24% are split between transit, bicycle, walk, or other modes of transportation.

### 2.3.7 FIVE-YEAR COLLISION HISTORY

The boundary road for the proposed development is Lancaster Road between Walkley Road and Russell Road. Using the collision history from the City of Ottawa Open Data, WSP reviewed the number and types of collisions (January 1, 2015 through December 31, 2019) on the boundary road. More recent and detailed five-year collision data will be requested from the City in support of a more thorough collision review. **Table 2-3** summarizes the five-year collision history on the boundary road.

**Table 2-3. Five Year Collision History Summary**

| LOCATION | SUMMARY | TRENDS |
|---|---|---|
| **Segment**: Lancaster Road between Walkley Road and Russell Road | 17 crashes on Lancaster Road segment between northern intersection with Russell Road to the southern intersection with Walkley Road. | There were no trends for the collision on the segments as they varied in location throughout the road segment and impact type. |
| **Intersection**: Lancaster Road & Walkley Road | 41 crashes at this location with no fatalities. Out of the 41 collisions, 34 were classified as Property Damage Only while the remaining 7 were classified as Non-Fatal Injury. | More than half of the collisions were rear-end collisions. In addition, majority of the collisions occurred in daylight with dry surface condition and clear environment. |
| **Intersection:** Smyth Road/Lancaster Road & St. Laurent Boulevard/Russell Road | 96 crashes at this location with no fatalities. Out of the 96 collisions, 82 were classified as Property Damage Only while the remaining 14 were classified as Non-Fatal Injury. | |

## 2.4 PLANNED CONDITIONS

### 2.4.1 CHANGES TO THE STUDY AREA TRANSPORTATION NETWORK

Based on the City of Ottawa's Construction and Infrastructure projects, the only major project near the adjacent roads expected to commence within three to five years is the resurfacing of **Walkley Road**. This may impact the traffic entering and existing Lancaster Road. However, this will be dependent on the expected build-out of the proposed development and should be further reviewed.

The City of Ottawa's Transportation Master Plan (2013) includes proposed transit improvements as part of the 2031 Network Concept of Rapid Transit and Transit Priority Network. They include:

- **Walkley Road** and **Russell Road** have a proposed at-grade BRT service connecting Bayshore Station to St. Laurent Station
- **St. Laurent Boulevar**d is proposed as a designated transit priority corridor with transit signal priority and queue jump lanes implemented at locations between Russell Road and Walkley Road

### 2.4.2 OTHER STUDY AREA DEVELOPMENTS

Two developments are noted in the City of Ottawa's Development Application Search tool that could have an influence on the study area:

- 2790 Lancaster Road (App# D07-12-20-0177): The City of Ottawa received a site plan control application for the construction of a 1-storey light industrial building.
- 2380 Walkley Road (App# D07-12-19-0164): The City of Ottawa received a site plan control application for the renovation of an existing building and construction of a new parking area.

## 2.5 STUDY AREA

The limits for the Transportation Impact Assessment (TIA) study area are shown in **Figure 2-4**.


**Figure 2-4: Study Area**

## 2.6 TIME PERIOD

The time periods identified for the traffic analysis are:

- Weekday AM Peak Hour: 7:15 a.m. to 8:15 a.m.
- Weekday PM Peak Hour: 4:00 p.m. to 5:00 p.m.

These are consistent with the AM and PM peak hours identified in the turning movement counts that were collected at the two study intersections dated between 2018 and 2020.

## 2.7 HORIZON YEARS

The proposed facility is expected to be completed in one phase with a target build-out year of 2022 and full occupancy in mid 2023. In accordance with the TIA Guidelines, the following horizons will be considered for analysis:

- 2023, which represents the anticipated buildout horizon,
- 2028, which represents the buildout year plus five years.

## 2.8 EXEMPTIONS REVIEW

Based on the review of the development and network conditions, the following elements shown in **Table 2-4** qualify for an exemption from this Transportation Impact Assessment.

**Table 2-4. Exemptions Summary**

| MODULE | ELEMENT | EXEMPTIONS |
|---|---|---|
| **DESIGN REVIEW COMPONENT** | | |
| 4.1 Development Design | 4.1.2 Circulation and Access | **Not Exempted.**<br>This element is only required for site plans. |
| | 4.1.3 New Street Networks | **Exempted**<br>This element is only required for plans of subdivision. |
| 4.2 Parking | 4.2.1 Parking Supply | **Not Exempted.**<br>This element is required for site plans. |
| | 4.2.2 Spillover Parking | **Exempted**<br>This element is only required for site plans where parking supply is 15% below unconstrained demand. |
| **NETWORK IMPACT COMPONENT** | | |
| 4.5 Transportation Demand Management | All Elements | **Not Exempted**<br>Required for site plans expected to have more than 60 employees on location at any given time. |
| 4.6 Neighborhood Traffic Management | 4.6.1 Adjacent Neighbourhoods | **Not Exempted**<br>Required when the development relies on local or collector access and total volumes exceed ATM capacity threshold. |

| MODULE | ELEMENT | EXEMPTIONS |
|---|---|---|
| 4.8 Network Concept | | **Exempted**<br>Required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning. |

# 3 FORECASTING

## 3.1 DEVELOPMENT-GENERATED TRAVEL DEMAND

### 3.1.1 TRIP GENERATION

**Select Base Trip Generation.** Due to the nature of operations at the Enbridge Ottawa Operation Centre, the following base principals were assumed, through discussion with Enbridge about daily operations and head counts.

AM Peak Hour:

- 98 staff (field and office staff) arrive
- 54 field staff depart (heavy vehicles)

PM Peak Hour:

- 54 field staff arrive (heavy vehicles)
- 98 staff (field and office staff) depart

**Estimate Total Development-Generated Person-Trips.** Based on the base principal's trip generation estimates presented above, the peak hour person-trips generated by this development are summarized in **Table 3-1**.

**Table 3-1: Estimate Total Development-Generated Person-Trips Generated**

| BUILDING | TIME PERIOD | TOTAL PERSON-TRIPS GENERATED | DIRECTIONAL DISTRIBUTION | | | |
|---|---|---|---|---|---|---|
| | | | % ENTER | % EXIT | ENTER | EXIT |
| Enbridge Ottawa Operation Centre | AM Peak Hour | 152 | 67 | 33 | 98 | 54 |
| | PM Peak Hour | 152 | 33 | 67 | 54 | 98 |

**Identify Existing Mode Share**. The existing peak hour mode share at a place of employment was identified from the most recent TRANS Origin-Destination Survey (2011) and is shown in **Table 3-2**.

**Table 3-2: Existing Mode Share (Trans O-D Survey)**

| PEAK HOUR | AUTO-DRIVER | AUTO-PASSENGER | TRANSIT | BICYCLE | WALK |
|---|---|---|---|---|---|
| AM Peak Hour | 69% | 7% | 18% | 3% | 3% |
| PM Peak Hour | 69% | 7% | 18% | 3% | 3% |

**Future Mode Share Targets.** The future mode share targets are provided in **Table 3-3**.

**Table 3-3: Future Travel Mode Share Targets**

| TRAVEL MODE | COMMUTER TARGET MODE SHARE | RATIONALE |
|---|---|---|
| **Transit** | 10% | **Staff Trips**: The future mode share considers the most conservative approach and assumes that most trips generated by employees will be by vehicle (auto driver) and that it is noticeably higher than the district average for employee auto driver mode share.<br><br>**Fleet Trips**: All trips generated by field staff will be in fleet vehicles by nature. |
| **Walking** | 0% | |
| **Cycling** | 0% | |
| **Auto-Passenger** | 5% | |
| **Auto-Driver** | 85% | |
| **Other** | 0% | |

**Project Development Trips by Mode.** Based on the estimated future employment mode share, the number of person trips to and from the development at 2571 Lancaster Road are shown in **Table 3-4.**

**Table 3-4: Trips Generated by Mode**

| MODE | TRIPS GENERATED | |
|---|---|---|
| | **AM Peak Hour** | **PM Peak Hour** |
| **Auto Driver** | 137 | 137 |
| **Auto Passenger** | 5 | 5 |
| **Transit** | 10 | 10 |
| **Bicycle** | 0 | 0 |
| **Walk** | 0 | 0 |

**Trip Reduction Factors**. No trip reduction factors were considered for this development based on the existing operations at the Minto Skate Centre. This will increase volumes conservatively and account for a scenario where all field and office staff enter and exit during the peak hour.

### 3.1.2 TRIP DISTRIBUTION

Currently, there are two vehicle accesses to the development, both from Lancaster Road. Vehicles will approach and depart from the proposed development following existing travel patterns. The trip distribution for the proposed development is presented as follows:

**Table 3-5: Trip Distribution**

| DIRECTION | DIRECTIONAL SPLIT (%) | | | |
|---|---|---|---|---|
| | AM Peak Hour – Inbound | AM Peak Hour – Outbound | PM Peak Hour – Inbound | PM Peak Hour - Outbound |
| North | 14% | 24% | 17% | 27% |
| West | 63% | 50% | 55% | 16% |
| East | 6% | 13% | 5% | 42% |
| South | 17% | 13% | 23% | 15% |

### 3.1.3 TRIP ASSIGNMENT

Trips were assigned to adjacent the transportation network and have been based upon a good understanding of existing travel patterns as identified from a review of intersection turning movement counts; including those at the following locations:

- Lancaster Rd/Smyth Rd/St. Laurent Blvd.
- Lancaster Rd/Walkley Rd
- The distribution of generated vehicle trips from the development at 2571 Lancaster Road is shown in **Table 3-6**.

**Table 3-6: Trip Assignment by Intersection and Peak Hour**

| INTERSECTION | TRIP ASSIGNMENT (%) | | | |
|---|---|---|---|---|
| | AM Peak Hour – Inbound | AM Peak Hour – Outbound | PM Peak Hour – Inbound | PM Peak Hour - Outbound |
| Lancaster/Smyth/St. Laurent | 29% | 62% | 64% | 40% |
| Lancaster/Walkley | 71% | 38% | 36% | 60% |

The overall development-generated demand at the two nearby intersections is shown in **Figure 3-1**.

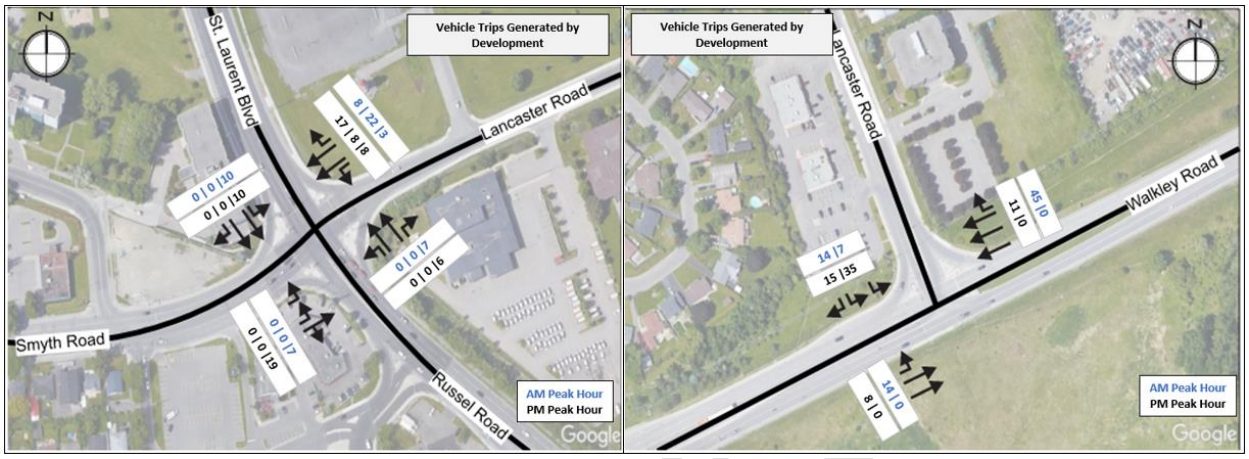



**Figure 3-1: Vehicle Trips Generated by Development**

# 3.2 BACKGROUND NETWORK TRAFFIC

## 3.2.1 CHANGES TO THE BACKGROUND TRANSPORTATION NETWORK

There are no road projects identified along the border streets in the study area. Furthermore, neither the Ottawa Pedestrian Plan (2013) nor the Ottawa Cycling Plan (2013) nor the Ottawa Cycling Plan (2013) identify connectivity or infrastructure improvements along Lancaster Road.

## 3.2.2 GENERAL BACKGROUND GROWTH RATES

A 0.6% background growth rate was calculated based on a review of the 10-year historical screenline data across Screenline #54 (Alta Vista Hydro). For a more conservative approach, a background growth rate of 1% was applied for 2023 and 2028. Data from the 2031 TRANS model was acquired from the City of Ottawa to confirm the growth rate. The trip growth from the 2011 O-D Survey to the 2031 TRANS model indicated a similar growth rate.

The background traffic volumes for 2023 and 2028 are provided in **Figure 3-2**.

## 3.2.3 OTHER AREA DEVELOPMENTS

As noted in Section 2.4.2, there are two active development applications near the proposed development at 2571 Lancaster Road. The trips generated from these developments are expected to be accounted for through application of the background traffic growth rate and through the any trips captured in the 2020 traffic counts that were generated by the Minto Skating Centre. Therefore, specific trips were not added for these two developments.

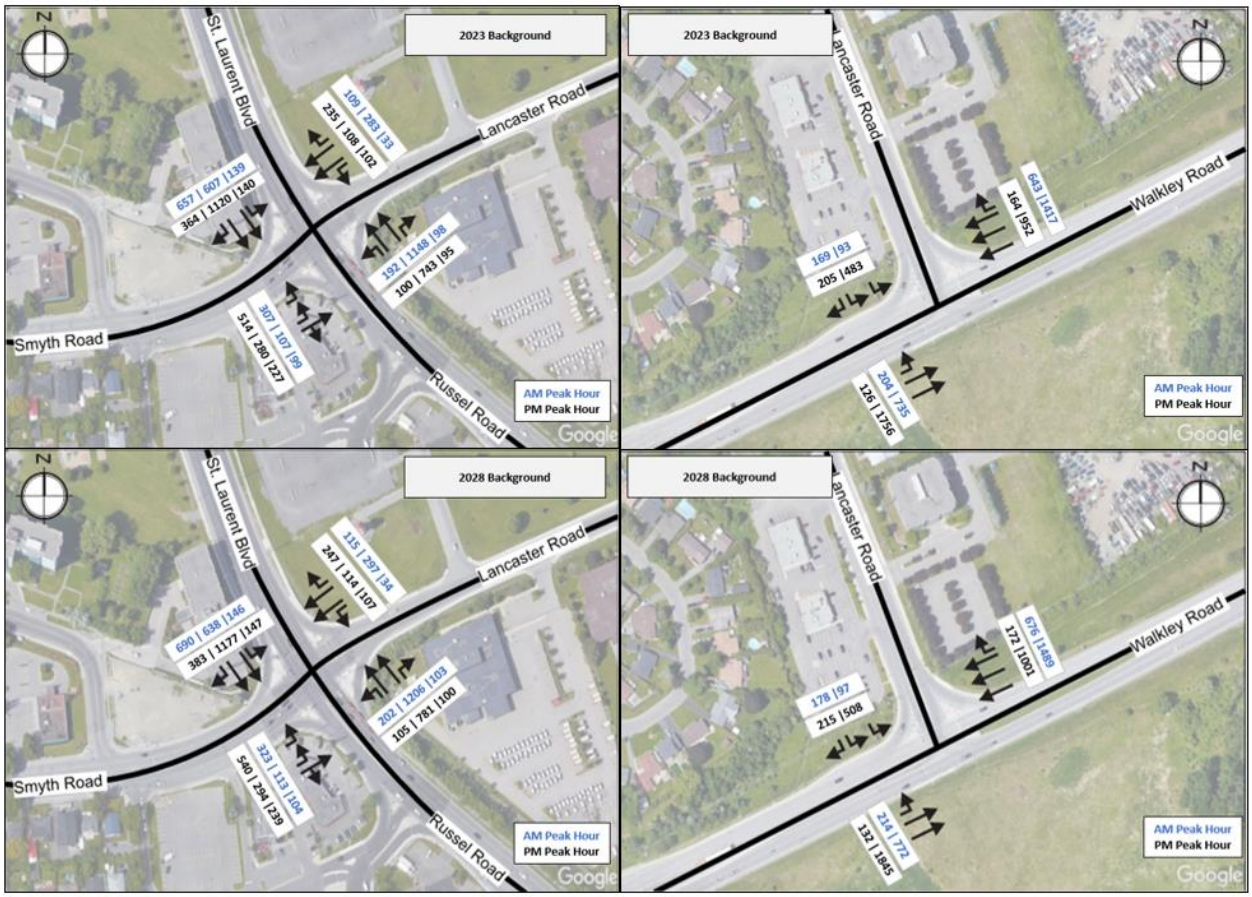



**Figure 3-2: 2023 and 2028 Background Volumes**

# 3.3 DEMAND RATIONALIZATION

## 3.3.1 DESCRIPTION OF CAPACITY ISSUES

Total traffic volumes for the 2023 and 2028 planning horizons were estimated by and adding trips generated by the proposed development and other area developments to the background traffic. The estimated total traffic volumes are shown in **Figure 3-3**.


**Figure 3-3: 2023 and 2028 Total Volumes**

Recent studies in this area have noted that the intersections at the boundary roads are operating well and under capacity. It is anticipated that similar results will be observed as part of this Transportation Impact Assessment.

## 3.3.2 ADJUSTMENTS TO DEVELOPMENT GENERATED DEMANDS

There are no proposed adjustments to development generated demands.

## 3.3.3 ADJUSTMENTS TO BACKGROUND NETWORK DEMANDS

There are no proposed adjustments to background network demands.

# 4 STRATEGY

## 4.1 DEVELOPMENT DESIGN

### 4.1.1 DESIGN FOR SUSTAINABLE MODES

The TDM-supportive Development Design and Infrastructure Checklist includes two checklists, one for non-residential developments and one for residential developments. The non-residential development checklist was completed to assess the opportunity to implement facilities that are supportive of sustainable modes. The completed checklist is attached as **Appendix E**.

### 4.1.2 CIRCULATION AND ACCESS

The proposed site plan (**Appendix C**) provides a continuous drive movement through the property between the two access points for service vehicles and delivery trucks. Turning movements in and out of the property are also provided in **Appendix F**. Additionally, the layout of the site successfully separates passenger vehicles (via the south entrance) and operational vehicles (via the north entrance). The site circulation was assessed to confirm suitability of the layout for a variety of design vehicles. The results are provided in the following table.

**Table 4-1. Swept Path Assessment**

| DESIGN VEHICLE | VEHICLE REPRESENTING | FINDINGS |
|---|---|---|
| MSU (*TAC 1999*) | Dump Truck | The north proposed entrance configuration on Lancaster Road accommodates the movements of an MSU design vehicle without impacting any built features or parking spaces |
| WB-20M (*ASSHTOM 2011*) | Delivery Vehicle | To enter the site at the north access making a northbound right turning movement, the WB-20M design vehicle will encroach completely into the opposite lane to complete the maneuver. |
| 53-foot with Axles Pulled-Up (*Custom*) | Delivery Vehicle Moving Truck | **Circulation:** The north proposed entrance configuration on Lancaster Road accommodates the movements of the custom truck without impacting any built features or parking spaces<br>**Access to Loading Dock:** A custom 53-foot truck with axles pulled-up will be able to maneuver to and from the loading dock without conflicting with nearby parking spaces. |
| LZ RAS-K-EAE (*DE*) | Equipment Truck | The proposed configuration of the parking lot accommodates the movements of the equipment trucks that are anticipated to park towards the back of the parking lot. |
| Enbridge F-350 (*Custom*) | Fleet Pick-Up Truck | The proposed configuration of the parking lot accommodates the movements of the fleet pick-up trucks that are anticipated to park in the parking lot overnight. |

### 4.1.3 NEW STREET NETWORKS

This section was exempted in the Transportation Impact Assessment Scoping Report submitted on July 13, 2021 and approved by the City of Ottawa on July 28, 2021. The approved exemptions table is found in **Section 2.8.**

## 4.2 PARKING

### 4.2.1 PARKING SUPPLY

The proposed development parking requirements, based on its location, will be assessed in accordance with the Suburban Area (Area 'C') for minimum parking requirements as part of Schedule 1A to the City of Ottawa's Zoning By-Law 2008-250. The Zoning By-Law requires an office space in Area 'C', provide a minimum parking rate of 2.4 spaces per 100 $m^2$ of gross floor area (*Table 101, Row N59, Column IV)*. The Zoning By-Law indicates that the warehouse requires a minimum parking rate of 0.8 spaces per 100 $m^2$ of gross floor area (*Table 101, Row N95, Column IV)*. The Zoning By-Law further requires a minimum bicycle parking rate of 1 space per 1,500 $m^2$ of gross floor area (*Table 111A, i, II)*.

As stated in Section 2.2, a total of 288 parking spaces are planned. However, 191 spaces are for equipment and fleet vehicles:

- Backhoe/Mini Excavator 15'x25': 24 spaces
- Small Equipment – Attachment 12'x20': 15 spaces
- Small Equipment – Trailer 12'x20': 23 spaces
- Large International / Dump Truck 15'x25': 32 spaces
- Fleet Car / Van / Pickup Truck 12'x20': 96 spaces

The remaining 98 spaces are planned for staff parking which includes 6 barrier free parking spots. The minimum parking supply requirements for this development compared wit the proposed parking supply are highlighted in the following table.

**Table 4-2. Minimum Bylaw Requirements for Parking and Proposed Parking Supply**

| TYPE | REQUIRED | CALCULATION | SITE PLAN | COMPLIANCE WITH BY-LAW |
|---|---|---|---|---|
| Vehicle: Office | 92 | 3,828 $m^2$ * 2.4 spaces per 100 $m^2$ of gross floor area | 98 | Meets the minimum requirements of the Zoning By-Law |
| Vehicle: Warehouse | 6 | 710 $m^2$ * 0.8 spaces per 100 $m^2$ of gross floor area | | |
| Bicycle | 3 | 4,123 $m^2$ * 1 space per 1,500 $m^2$ of gross floor area | 3 | Meets the minimum requirements of the Zoning By-Law |

### 4.2.2 SPILLOVER PARKING

This section was exempted in the Transportation Impact Assessment Scoping Report submitted on July 13, 2021 and approved by the City of Ottawa on July 28, 2021. The approved exemptions table is found in **Section 2.8.**

# 4.3 BOUNDARY STREETS

## 4.3.1 LANCASTER ROAD

**Lancaster Road** is a collector with an existing 20-metre protected right-of-way in the study area adjacent to the proposed development site. The existing cross-section (**Figure 4-1**) includes a paved area approximately 11m wide with sidewalks in each direction with no median. The right-of-way allocation does not meet the minimum width requirements of 22m for a neighbourhood collector street as per the City of Ottawa's Designing Neighbourhood Collector Streets (2019) document.

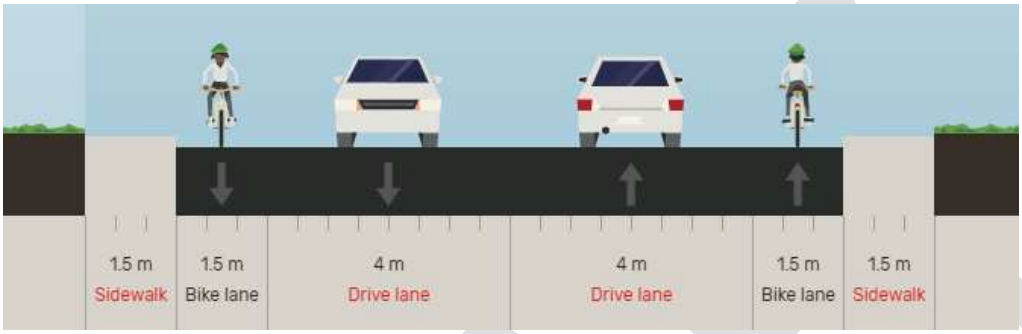



**Figure 4-1. Lancaster Road - Existing Cross-Section**

### 4.3.1.1 MOBILITY

The segment of Lancaster Road within the study area is identified as an Urban Employment Area in the City of Ottawa's Official Plan (2013), Schedule B (Urban Policy Plan). The development is not proposing any changes to the boundary street. The resulting MMLOS targets and segment scores are indicated in **Table 4-3**.

**Table 4-3. Segment MMLOS**

| | PLOS | BLOS | TLOS | TKLOS | VLOS |
|---|---|---|---|---|---|
| Target | **C** | **E** | **D** | **B** | VLOS Not Reported for Segments |
| Status Quo | E | B | - | B | |

The PLOS 'C' is not achieved, in part, because of the width of the sidewalks are narrow. If the sidewalks were widened to 2m, a PLOS 'C' could be attained.

### 4.3.1.2 SAFETY

Historical crash records for the study area were obtained from the City of Ottawa for the five years between January 2015 and December 2019. The TIA Guidelines indicate that patterns with six or more crashes should be identified. In this timeframe, here were three collisions along the roadway segment on Lancaster Road, and thus do not meet the TIA Guideline criteria.

# 4.4 ACCESS INTERSECTION

## 4.4.1 LOCATION AND DESIGN OF ACCESS

There are two access points proposed for this development and are indicated in the Site Plan (**Appendix C**), both on Lancaster Road.

Both entrances are proposed as full movements access intersections. While both entrances have been tested for large delivery trucks, it is anticipated that the north access will be the preferred access point for large delivery trucks while the south access will be the preferred access point for staff parking.

A design compliance check was carried out for each of the two accesses following guidelines prepared by the City of Ottawa and the Transportation Association of Canada's Geometric Design Guidelines for Canadian Roads (2017). The design compliance check is summarized in **Table 4-4** with elements not in compliance with the requirements in red.

**Table 4-4. Access Intersection Design Elements**

| DESIGN ELEMENTS | MINIMUM REQUIRED | SOUTH ACCESS | NORTH ACCESS |
|---|---|---|---|
| Access Type | - | Full Movement | Full Movement |
| One-way vs. Two-way | <25 vpd = one-way driveway<br><750 vpd = two-way driveway | <200 peak hour trips<br>250-300 daily trips<br>Two-Way | <200 peak hour trips<br>250-300 daily trips<br>Two-Way |
| Entrance Width | 9.0 – 15.0 (TAC 2017) | 9.0m | 9.0m |
| Corner Clearance | 70m to traffic signals (TAC 2017) | >70m | >70m |
| Right Turn Radius | 9.0m – 15.0m | 5.0m | 5.0 |
| Sight Distance (Intersection with No Control) | Left turn:130m (TAC 2017) | No obstruction | No obstruction |
| | Right turn: 110m (TAC 2017) | No obstruction | No obstruction |
| Throat Length | 15m (TAC 2017) | 10m | 15m+ |
| Angle of Intersection | At or near 90° | Access to Lancaster at intersection is 90° | Access to Lancaster at intersection is 90° |
| Proximity to Adjacent Driveways | 3m between driveways (TAC 2017) | Private driveway 10 m north of access | Private driveway 35 m south of access |

| DESIGN ELEMENTS | MINIMUM REQUIRED | SOUTH ACCESS | NORTH ACCESS |
|---|---|---|---|
| Pedestrian Crossing Consideration | Ottawa Standard Drawing SC7.1 (Curb Return Private Entrance - Unsignalized) | 12.0m pedestrian crossing Ottawa Standard SC7.1 (Curb Return at a Private Entrance) | 12.0m pedestrian crossing Ottawa Standard SC7.1 (Curb Return at a Private Entrance) |
| Cycling Crossing Consideration | Large curb return radii with narrow driveway to minimize crossing distance | 12.0m cycling crossing | 12.0m cycling crossing |

### 4.4.2 INTERSECTION CONTROL

An all-way stop minimum volume warrant for the minor road was conducted in accordance with the Ontario Traffic Manual (OTM) Book 5 for both proposed accesses under the future total planning horizon. Both of the following conditions must be met to warrant a stop at the two access points:

**Table 4-5. All-Way Stop (Minor Road) Requirements**

| CONDITION | FUTURE TOTAL PLANNING HORIZON | |
|---|---|---|
| | North Access | South Access |
| Total vehicle volume on all intersection approaches exceeds 350 for the highest hour recorded | Estimated Volumes: AM: 460; PM: 460 | |
| Volume split does not exceed 75/25 for three-way control or 65/35 for four-way control. Volume is defined as vehicles only | Volume Splits: AM: 89/11; PM: 90/10 | |

While the total vehicle volume is expected to exceed 350 for the highest hour recorded, the volume split is anticipated to greatly exceed 75/25 for a three-way control intersection. Therefore, a stop control on the minor road was not warranted, and accordingly a traffic signal warrant was not analyzed.

Pedestrian accommodations at the accesses should follow the City of Ottawa's Standard Drawing SC7.1 for Curb Return Entrances utilizing the Private / Unsignalized entrance option which includes a continuous depressed sidewalk across the access as shown below.

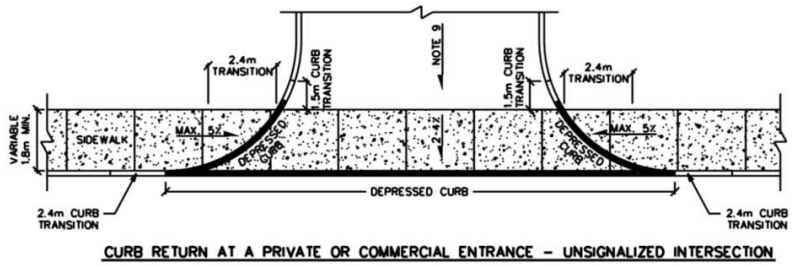



**Figure 4-2. City of Ottawa, Standard Drawing SC7.1 Curb Return Entrances, Private / Unsignalized (March 2017)**

Signage options for the two driveways are provided below:

**North Access:** Wayfinding signage indicating that this is the entrance nearest the delivery truck entrance.

**South Access:** Wayfinding signage indicating that this is the entrance with immediate access to the employee and visitor parking.

### 4.4.3 INTERSECTION DESIGN

The City of Ottawa's Multi-Modal Level of Service (MMLOS) Guidelines (2015) are to be applied at signalized intersections only. The proposed site accesses are both uncontrolled and do not warrant an MMLOS evaluation.

## 4.5 TRANSPORTATION DEMAND MANAGEMENT

### 4.5.1 CONTEXT FOR TDM

Transportation Demand Management (TDM) describes a broad range of policies, programs and services designed to reduce the demand for vehicle use by influencing individual travel behaviour and providing expanded options. As mentioned in Section 3.1.1, the forecasted commuter mode share is: 85% auto driver, 10% transit and 5% auto passenger.

The forecasted auto driver mode share is much greater than the existing and target mode share set out in the City's Official Plan as well as the existing employment mode share to the Alta Vista district.

### 4.5.2 NEED AND OPPORTUNITY

The existing road network has available capacity should the mode share targets not be met. The anticipated Vehicle Level of Service (VLOS) in the area is provided in the Multi-Modal Level of Service (MMLOS) analysis (**Section 4.9.2.2**).

### 4.5.3 TDM PROGRAM

The TDM-supportive Development Design and Infrastructure Checklist was completed to assess the opportunity to implement facilities that are supportive of sustainable modes. The completed checklist is attached to this report as **Appendix G**.

The sustainable mode share at the proposed development can be maximized by including the following TDM measures and amenities:

- Exterior bicycle rack under cover near main entrance
- Subsidize or reimburse monthly transit pass purchases by employees
- Provide emergency ride home service to non-driving commuters
- Provide a dedicated ride-matching portal at ottawaridematch.com

# 4.6 NEIGBOURHOOD TRAFFIC MANAGEMENT

## 4.6.1 ADJACENT NEIGHBOURHOODS

The development will increase traffic traveling along Lancaster Road, which is classified as a collector road in the City of Ottawa's Official Plan (2013). The traffic volume threshold provided in the TIA Guidelines (2017) for the various classifications of road are:

- Local Road: 1,000 vehicles per day or 120 vehicles per peak hour
- Collector Road: 2,500 vehicles per day or 300 vehicles per peak hour
- Major Collector Road: 5,000 vehicles per day or 600 vehicles per peak hour

As shown in **Table 4-6,** the Collector Road thresholds are exceeded for existing conditions. Additionally, both future background and future total exceed the Collector Road threshold. Thus, while the thresholds are exceeded for all scenarios, it is not anticipated that the new trips generated from the proposed development will change the results.

**Table 4-6. Collector Traffic Volume Thresholds**

| PLANNING HORIZON | DAILY THRESHOLD 2,500 VPD | PEAK HOUR THRESHOLD 300 VPH |
|---|---|---|
| 2021 Existing | 3,200 | 460 |
| 2023 Background | 3,264 | 469 |
| 2028 Background | 3,430 | 493 |
| 2023 Total | 3,401 | 606 |
| 2028 Total | 3,567 | 630 |

# 4.7 TRANSIT

## 4.7.1 ROUTE CAPACITY

The trip generation estimates have assumed a 10% transit mode share given the nature of the employment and services provided at the new development. From **Section 3.1.1**, 10 transit trips are expected during each of the peak hours.

The nearest bus station to the development is located on Southvale Crescent (200m walking distance). Route 46 passes four times in each direction during the peak hours and connects to the Hurdman LRT Station. The next closest transit route to the development is located at the intersection of Southvale Crescent and Russell Road (650m walking distance). Route 48 passes twice an hour in each direction during the peak hours and, like Route 46, connects to the Hurdman LRT Station. All other bus routes along St. Laurent Boulevard and Walkley Road are located at a walking distance at or greater than one kilometre.

Given the frequency of the nearby routes and the number of trips expected from the new development, the capacity of the existing transit routes is likely sufficient.

## 4.7.2 TRANSIT PRIORITY

Neither Lancaster Road nor Southvale Crescent have been identified as a Transit Priority Corridor in the City's Transportation Master Plan (2013). As mentioned in **Section 4.7.1**, with the minimal amount of additional transit users, it is not anticipated that additional transit measures would be required.

However, St. Laurent Boulevard, which is located just over one kilometre from the new development, was identified as a Transit Priority Corridor (Isolated Measures) with a 44.5m protected right-of-way. Improvements, such as a complete street concept could prove beneficial for transit users willing to walk over a kilometre to the routes available on St. Laurent Boulevard.

# 4.8 REVIEW OF NETWORK CONCEPT

This section was exempted in the Transportation Impact Assessment Scoping Report submitted on July 13, 2021 and approved by the City of Ottawa on July 28, 2021. The approved exemptions table is found in **Section 2.8.**

# 4.9 INTERSECTION DESIGN

## 4.9.1 INTERSECTION CONTROL

The identification of appropriate intersection controls to serve future background and future total travel demands included an all-way stop control warrant, and a cursory review of transit priority measures. For this assessment we reviewed the 2028 total traffic volumes which would provide the worst-case scenario in terms of area traffic demands. The results are provided in **Table 4-7**.

The **all-way stop control warrant** was carried out in accordance with the Ontario Traffic Manual Book 5 (2000) methodology for all-way stop minimum volume warrant (minor roads) for the two accesses into the new development. Based on 2028 total traffic volumes, the warrant was not met for the unsignalized intersections analyzed.

While there is no transit service along Lancaster Road, there is service nearby on Russell Road and Southvale Crescent. Additionally, St. Laurent Boulevard has been identified in the City of Ottawa's Transportation Master Plan (2013) as a candidate for transit priority measures as part of the 2031 Ultimate Network. However, at this time, the intersections within the study area are not considered as immediate candidates for **transit priority measures**.

**Table 4-7. Intersection Control Summary (2028 Total)**

| INTERSECTION | EXISTING CONTROL | TAC STOP WARRANT | ISOLATED TRANSIT PRIORITY | FUTURE CONTROL |
|---|---|---|---|---|
| North Access | Unsignalized | Not Warranted | Not Warranted | No change |
| South Access | Unsignalized | Not Warranted | Not Warranted | No change |
| Lancaster/Smyth/St. Laurent | Signalized | - | Not at this Time | No change |
| Lancaster/Walkley | Signalized | - | Not Warranted | No charge |

## 4.9.2 INTERSECTION DESIGN

### 4.9.2.1 MULTI-MODAL LEVEL OF SERVICE ANALYSIS

A Multi-Modal Level of Service (MMLOS) analysis was carried in accordance with the methodology outlined in the City of Ottawa's MMLOS Guidelines (2015). The Guidelines state that intersection LOS measures are to be evaluated at signalized intersections. We have prepared a MMLOS analysis for the existing conditions (2021) and future total (2028) time horizon to provide a comparison between the baseline and future condition (beyond the development period). An intersection MMLOS analysis was completed for the two intersections within the study area, and a segment MMLOS was completed for Lancaster Road.

From Schedule B and E of the City's Official Plan, Lancaster Road is a collector road within an Urban Employment Area. However, the two intersections within the study area are both bordering different land uses:

- Lancaster Road/ Smyth Road /St. Laurent Boulevard:
- Lancaster Road: Collector road within an Urban Employment
- Smyth Road: Arterial road within a General Urban Area

- St. Laurent Boulevard: Arterial Mainstreet
- Lancaster Rd/Walkley Rd:
- Lancaster Road: Collector road within an Urban Employment
- Walkley Road: Arterial road within a General Urban Area

For the intersection MMLOS analysis, the recommended targets for the intersections will be based on the leg of the intersection with the most rigorous evaluation criteria.

The intersection MMLOS results for the existing and future total conditions at the Lancaster/Smyth/St. Laurent intersection (**Table 4-8**) and the Lancaster/Walkley intersection (**Table 4-9**) indicate that pedestrian, bicycle and transit modes do not meet their target LOS for both intersections with the exception of transit LOS at Lancaster/Walkley in future total conditions.

**Table 4-8. Intersection MMLOS Existing and Future Conditions (Lancaster/Smyth/St. Laurent)**

| | PLOS | BLOS | TLOS | TKLOS | VLOS |
|---|---|---|---|---|---|
| **Time Horizon** | **C** | **C** | **B** | **B** | **D** |
| Existing (2021) | F | E | F | A | C |
| Future Total (2028) | F | E | F | A | D |

**Table 4-9. Intersection MMLOS Existing and Future Conditions (Lancaster/Walkley)**

| | PLOS | BLOS | TLOS | TKLOS | VLOS |
|---|---|---|---|---|---|
| **Time Horizon** | **C** | **C** | **D** | **B** | **D** |
| Existing (2021) | F | E | E | A | C |
| Future Total (2028) | F | E | D | A | C |

The **Pedestrian Level of Service** (PLOS) targets were not met. Following, the City of Ottawa's MMLOS Guidelines, the reported PLOS is governed by the worst of the PETSI (Pedestrian Exposure to Traffic) LOS and average pedestrian delay LOS which are reporting the same LOS 'F' for both intersections.

The **Bicycle Level of Service** (BLOS) target of 'C' could be met if separated bicycle facilities were provided on St. Laurent Boulevard and Walkley Road.

The **Transit Level of Service** (TLOS) target of 'D' was not met for the Lancaster/Smyth/St. Laurent intersection. However, the TLOS is met for the future total scenario at the Lancaster/Smyth intersection. This is a result of the change in Peak Hour Factor (PHF) that the City's TIA Guidelines prescribe for existing conditions (0.9) and future conditions (1.0).

The **Truck Level of Service** (TKLOS) target of 'B' and the **Vehicle Level of Service** (VLOS) targets of 'D' were met for both intersections. The detailed VLOS intersection performance analysis is provided in **Section 4.9.2.2.**

#### 4.9.2.2 *DETAILED INTERSECTION PERFORMANCE ANALYSIS*

The existing and future conditions were analyzed based upon the peak hour traffic volumes presented in **Section 3**. The City of Ottawa's MMLOS Guidelines assigns the vehicle level of service (VLOS) based on ranges of volume to capacity ratio, as indicated in **Table 4-10**. The City's MMLOS Guidelines recommend targets for the VLOS based on their Official Plan Policy/Designation and Road Class and is a LOS D for the two intersections in the study area.

**Table 4-10. City of Ottawa MMLOS Guidelines, V/C Criteria**

| VLOS | VOLUME TO CAPACITY RATIO |
|---|---|
| **A** | 0 – 0.60 |
| **B** | 0.61 – 0.70 |
| **C** | 0.71 – 0.80 |
| **D** | 0.81 – 0.90 |
| **E** | 0.91 – 1.00 |
| **F** | >1.00 |

The intersections were analyzed using Synchro v. 11 following the analysis parameters in the TIA Guidelines. **Appendix H** contains the detailed Synchro analysis sheets.

**EXISTING CONDITIONS**

The existing (2021) intersection capacity analysis results are summarized in **Table 4-11**. Under existing conditions, all intersections operate with a VLOS that does not exceed the VLOS of 'D'.

**Table 4-11. Intersection Capacity Summary for Existing Conditions (2021)**

| INTERSECTION | INTERSECTION CONTROL | AM PEAK HOUR | | | PM PEAK HOUR | | |
|---|---|---|---|---|---|---|---|
| | | V/C Ratio | VLOS | Critical Movement | V/C Ratio | VLOS | Critical Movement |
| Lancaster/Smyth/St. Laurent | Signalized | 0.78 | C | - | 0.79 | C | EBL = 1.01 |
| Lancaster/Walkley | Signalized | 0.63 | B | - | 0.74 | C | - |

**FUTURE BACKGROUND CONDITIONS**

The 2023 future background intersection VLOS remain largely unchanged when compared to the existing conditions with the exception of the critical EBL turning movement from the existing conditions no longer being over capacity. As mentioned in **Section 4.9.2.1**, this is a result of the Peak Hour Factor (PHF) that the City's TIA Guidelines prescribes for existing conditions (0.9) and future conditions (1.0). When volumes do not significantly change, the future VLOS can be reported as improving since the PHF of 1.0 assumes peak spreading.

Overall, the intersections continue to operate below the target VLOS. The intersection capacity results are summarized in **Table 4-12**.

**Table 4-12. Intersection Capacity Summary for Future Background Conditions (2023)**

| INTERSECTION | INTERSECTION CONTROL | AM PEAK HOUR | | | PM PEAK HOUR | | |
|---|---|---|---|---|---|---|---|
| | | V/C Ratio | VLOS | Critical Movement | V/C Ratio | VLOS | Critical Movement |
| Lancaster/Smyth/St. Laurent | Signalized | 0.78 | C | - | 0.79 | C | - |
| Lancaster/Walkley | Signalized | 0.64 | B | - | 0.76 | C | - |

The intersection capacity results for the 2028 future background conditions are summarized in **Table 4-13.** The background growth does cause the VLOS of the Lancaster/Smyth/St. Laurent intersection to decrease from a LOS 'C' to LOS 'D'. However, the intersection continues to operate at or below the target VLOS of LOS 'D'.

**Table 4-13. Intersection Capacity Summary for Future Background Conditions (2028)**

| INTERSECTION | INTERSECTION CONTROL | AM PEAK HOUR | | | PM PEAK HOUR | | |
|---|---|---|---|---|---|---|---|
| | | V/C Ratio | VLOS | Critical Movement | V/C Ratio | VLOS | Critical Movement |
| Lancaster/Smyth/St. Laurent | Signalized | 0.81 | D | - | 0.82 | D | - |
| Lancaster/Walkley | Signalized | 0.67 | B | - | 0.79 | C | - |

## FUTURE TOTAL CONDITIONS

The traffic operation results for the 2023 future total are unchanged from the 2023 future background scenario with all intersections below the target VLOS 'D'. The intersection capacity results are summarized in **Table 4-14**.

**Table 4-14. Intersection Capacity Summary for Future Total Conditions (2023)**

| INTERSECTION | INTERSECTION CONTROL | AM PEAK HOUR | | | PM PEAK HOUR | | |
|---|---|---|---|---|---|---|---|
| | | V/C Ratio | VLOS | Critical Movement | V/C Ratio | VLOS | Critical Movement |
| Lancaster/Smyth/St. Laurent | Signalized | 0.78 | C | - | 0.79 | C | - |
| Lancaster/Walkley | Signalized | 0.64 | B | - | 0.76 | C | - |

The intersection results for the 2028 future total conditions are summarized in **Table 4-15**. The traffic operation results for the 2028 future total are unchanged from the 2028 future background scenario with all intersections at or below the target VLOS 'D'.

**Table 4-15. Intersection Capacity Summary for Future Total Conditions (2028)**

| INTERSECTION | INTERSECTION CONTROL | AM PEAK HOUR | | | PM PEAK HOUR | | |
|---|---|---|---|---|---|---|---|
| | | V/C Ratio | VLOS | Critical Movement | V/C Ratio | VLOS | Critical Movement |
| Lancaster/Smyth/St. Laurent | Signalized | 0.81 | D | - | 0.82 | D | - |
| Lancaster/Walkley | Signalized | 0.67 | B | - | 0.79 | C | - |

## 4.10 SUMMARY OF IMPROVEMENTS INDICATED AND MODIFICATION OPTIONS

A summary of transportation improvements proposed as part of this Transportation Impact Assessment are presented as follows:

**Development Design**

a) Provisions for sustainable modes on-site have been identified through the development design checklist. The proposed site plan could be improved to provide direct pedestrian access from the public sidewalk and potentially consider assigned parking spaces for carpools to encourage carpooling.

b) A review of the design vehicle turning templates indicated that vehicles will be able to circulate around the site without impacting on built features.

c) A review of the WB-20M design vehicle making a northbound right from Lancaster Road into the north access indicates that the WB-20M will encroach entirely into the oncoming southbound lane to complete the turning maneuvre.

**Reference: Section 4.1**

**Parking**

a) The 98 proposed staff parking spaces satisfies the requirements of the Zoning By-Law (2018-250).

b) Six of the 98 proposed staff parking spaces are barrier-free (three Type A and three Type B) which exceed the requirement of 4 barrier-free parking spaces.

**Reference: Section 4.2**

**Boundary Street Design**

a) There are no proposed changes to the cross-section of Lancaster Road adjacent to the proposed development.

b) The status quo MMLOS assessment of Lancaster Road resulted in the BLOS and TKLOS meeting the MMLOS targets for the Urban Employment policy area; while the PLOS did not achieve the target because of the narrow width of the existing sidewalks.

**Reference: Section 4.3**

**Access Intersections**

a) North Access: The north access is proposed as full movement with unimpeded traffic flow along Lancaster Road. It provides gated access to the fleet parking area for Enbridge fleet vehicles. Generally, the access design meets the minimum requirements provided by the TAC Geometric Design Guide for Canadian Roads, however the right turn radius of 5.0m may not easily accommodate the larger fleet vehicles.

b) South Access: The south access is proposed as full movement with unimpeded traffic flow along Lancaster Road. It provides public access to the staff parking area south of the main building. Generally, the access design meets the minimum requires provided by the TAC Geometric Design Guide for Canadian Roads, however the right turn radius of 5.0m may not accommodate the occasional heavy vehicle.

**Reference: Section 4.4**

**Transportation Demand Management**

a) The existing road network has available capacity should the anticipated mode share targets not be met.

**Reference: Section 4.5**

**Neighborhood Traffic Management**

a) The existing traffic volumes along Lancaster Road exceed the volume thresholds for both the collector road and major collector road designations. It is not anticipated that traffic volumes along Lancaster Road will decrease in the future planning horizons.

**Reference: Section 4.6**

**Transit**

a) The development is forecasted to generate a low number of transit trips during the peak periods. These trips can be accommodated by the existing transit service.

**Reference: Section 4.7**

**Intersection Design**

a) Lancaster/Smyth/St. Laurent: No modifications are proposed. The Synchro analysis indicates that the intersection has reserve capacity during the existing and future planning horizons. The level of service for pedestrians, bicycles and transit were not achieved considering the existing or future traffic conditions.

b) Lancaster/Walkley: No modifications are proposed. The Synchro analysis indicates that the intersection has reserve capacity during the existing and future planning horizons. The level of service for pedestrians, bicycles and transit were not achieved considering the existing or future traffic conditions.

**Reference: Section 4.9**

# APPENDIX

# A CIRCULATION COMMENT / RESPONSE

# COMMENT AND RESPONSE LOG

**TO:** File

**FROM:** Jordan Papazoglou, P. Eng., ing.

**SUBJECT:** **2571 Lancaster Road Transportation Impact Assessment (current to February 16, 2022)**

**DATE:** **February 16, 2022**

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## SCOPING REPORT COMMENT / RESPONSE

WSP Submission July 13, 2021
City Comments Received July 28, 2021

**Section 2.3.1 Roadways and Pedestrian/Cycling Facilities**

1 Correct the section about Russell Road, the four-lane configuration changes south of St. Laurent, and it is unclear where the existing 18m ROW has been measured, as it is wider in the four-lane portion.
Corrected in TIA Forecasting submission.

2 Walkley's speed limit transitions from 50 km/h to 80 km/h between Russell Road and Lancaster.
Corrected in TIA Forecasting submission.

3 There is no ROW protection for St. Laurent Boulevard south of Smyth.
Corrected in TIA Forecasting submission.

4 Smyth's existing ROW is approximately 26m.
Corrected in TIA Forecasting submission.

**Section 2.3.2 Intersections**

5 Include the through lanes on the north approach of the Walkley/Lancaster intersection.
Walkley / Lancaster is a T-intersection with no south leg.

**Section 2.3.6 Peak Hour Travel Demands**

6 Note that a new TRANS Trip Generation Report is now available to be used for employment uses (office), see attached. I've also attached a calculator for your use should you wish to use it.
Thank you for this information, we have incorporated it in to the TIA report

**Section 2.8 Exemptions Review**

7 If employee count is expected to be below 60, consider including the TDM checklist from section 4.5 alongside the TDM-supportive development design and infrastructure checklist review in section 4.1.
Corrected in TIA Forecasting submission. The anticipated daily employee count is 98.

**Next Steps**

8 **Please proceed to the forecasting report.**
Thank you. Forecasting Report completed and submitted for comment on August 24, 2021.

---

## FORECASTING REPORT COMMENT / RESPONSE

WSP Submission August 24, 2021
City Comments Received September 20, 2021

**Section 3.1.1 Trip Generation**

1 While a conservative approach is understandable and it is appreciated that transit service to the site isn't robust, having 0% targets for all other modes other than auto driver is not supported. Consider at least a nominal amount for transit and auto passenger as these can and should both be incentivized through TDM measures. Feel free to contact myself the City's TDM Officer at travelwise@ottawa.ca for strategies to improve these metrics.

Consider using ITE rates to reduce development travel demand in the case that demand rationalization is required. This would also allow for quantified inclusion of the other area development traffic in section 3.2.3.
The mode share targets were revised to include 10% transit and 5% auto passenger for staff trips and several TDM measures were discussed in the Strategy Report completed and submitted for comment on October 15, 2021.

**Next Steps**

2 Please proceed to the strategy report.
Thank you. Strategy Report completed and submitted for comment on October 15, 2021.

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## STRATEGY REPORT COMMENT / RESPONSE

WSP Submission October 15, 2021

City Comments Received January 28, 2022

1 Provide truck turning movements for egress and access at site access points onto Lancaster Road. Illustrate largest vehicle and a template for a more frequently used vehicle (list was provided on site plan).
Truck turning template has been incorporated in to the TIA report.

2 Pedestrian Facilities should be included between the main entrance of the building and the sidewalk on Lancaster to facilitate access to the building for transit customers. (Required item 1.2.2 in TDM-Supportive Development Design and Infrastructure Checklist)
Pedestrian facilities have been added to updated Site Plan and thus have been updated in TDM-Supportive Development Design and Infrastructure Checklist.

3 Related to item 3.3.1 in the TDM Checklist - Please clarify needs for enhanced transit service. The TIA indicates that existing transit service is sufficient in accommodating the anticipated transit trips.
TDM Checklist has been updated to reflect previous comments in TIA regarding existing transit services.

4 Section 2.3.4:
a) Proposed development is incorrectly shown on Transit Network Map.
b) To clarify: Route 46 operates between Billings Bridge Station and Hurdman Station. Route 48 operates between Elmvale S.C. and Hurdman Station.
c) The connection of routes 46 and 48 to the SE Transitway could also be mentioned.
Wording has been updated in TIA Report.

5 Wording in section 4.7.1 could be reworked slightly for clarity.
a) Nearest bus stops (not transit station) located on Southvale.
b) Next closest transit route (not transit stop) located on Russell.
Wording has been updated in TIA Report.

Prepared by:

**Jordan Papazoglou, P.Eng., ing.**
**Engineer, Transportation Planning and Science**

# APPENDIX

# B SCREENING FORM

# City of Ottawa 2017 TIA Guidelines Screening Form

## 1. Description of Proposed Development

| | |
|---|---|
| Municipal Address | 2571 Lancaster Road |
| Description of Location | Lancaster Road - Mid-block between Russell Road and Walkley Road |
| Land Use Classification | Mixed - Office/operation space, warehouse and shop spaces |
| Development Size (units) | |
| Development Size ($m^2$) | 4403 square metres |
| Number of Accesses and Locations | 2 existing accesses on Lancaster Road; No new proposed accesses |
| Phase of Development | Single Phase |
| Buildout Year | TBD |

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

## 2. Trip Generation Trigger

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

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

- Office /Operation Centre: 3,828 m2
- Shop: 536 m2
- Warehouse: 710 m2

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

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

Land Use:
150 - Warehouse (710 sq m - 7,641 sq ft)
710 - General Office Building (3,828 sq m - 41,215 sq ft)

AM Peak Hour:
- Warehouse: 26 (Enter: 77%; Exit: 23%)
- Office: 91 (Enter: 87%; Exit: 13%)

PM Peak Hour:
- Warehouse: 29 (Enter: 27%; Exit: 73%)
-Office: 97 (Enter: 15%; Exit: 85%)

## 3. Location Triggers

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

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

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

## 4. Safety Triggers

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

Safety Trigger Note: No new driveway is being proposed

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

## 5. Summary

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

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

# APPENDIX

# C DRAFT SITE PLAN


## PARKING COUNTS

| | |
|---|---|
| Staff Parking | 92 |
| Staff Barier-Free Parking | 6 |
| Small Equipmet - Attachment 12'x20' | 14 |
| Small Equiment - Trailer 12'x20' | 23 |
| Large International / Dump Truck 15'x25' | 32 |
| Fleet Car / Van / Pickup Truck 12'x20' | 96 |
| Backhoe / Mini Excavator 15'x25' | 24 |
| Grand total: 287 | |

## LEGEND

- EX. FH — EXISTING FIRE HYDRANT
- EX. CB — EXISTING CATCH BASIN
- EX. MH — EXISTING MAN HOLE
- 200mm DIA. CONCRETE FILLED STEEL PIPE BOLLARD, PAINTED YELLOW
- MD — MAN DOOR
- OD — OVERHEAD DOOR
- EV — ELECTRICAL VEHICLE CHARGING STATION C/W TWO 150mm DIA. X 1000mm HIGH CONCRETE FILLED STEEL BOLLARDS
- BH — VEHICLE BLOCK HEATER
- ACCESSIBLE PARKING PERMIT - RB-93
- NO PARKING FIRE ROUTE DOUBLE ARROW - FRR 1
- ELECTRIC VEHICLE PARKING - EV 1
- LIGHT DUTY ASPHALT
- HEAVY DUTY ASPHALT
- REINFORCED CONCRETE
- RIVERSTONE
- SODDED AREA

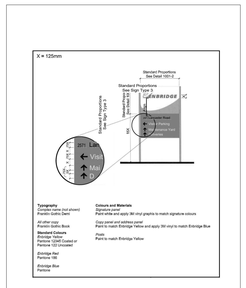
| SITE STATISTICS | | |
|---|---|---|
| **Site Description:** | Part of Lot 25, Concession 3 (Ottawa Front) and Part of Block "B" Registered Plan 4M-121 | |
| **Assigned Address** | 2571 Lancaster Rd, Ottawa, Ontario | |
| **Zoning By-Law** | Ottawa Zoning By-law 2008-250 | |
| **Permitted Use** | **Proposed** | **Required** |
| **Zoning Category** | IL Light Industrial and IH Heavy | Office / Warehouse Use is Permitted |
| **Definition: Utility** | ...an entity operating within a regulated industry that has been given the express right or subsequent legal duty to supply the general public with a product, commodity, or service such as natural gas, electricity, water, waste water, sewer, rail service, or communications service. (service public) (By-law 2013- |
| **Definition: Storage yard:** | means land used for outdoor storage, including: the storage of vehicles...the storage of road maintenance material such as gravel or sand; ... and the storage of heavy vehicles or construction equipment, and includes an accessory maintenance garage used for the service and repair of the stored vehicles and equipment. |
| **Permitted Uses** | Office / Storage | Permitted |
| **Outdoor Storage** | Utility Service Yard with Equipment Storage | Permitted at Rear of Site in IH Zone. Zone Change will be apprequired for storage in IL portion of the site. |
| **Areas** | **Proposed** | **Required** |
| **Lot Area** | 3.30 | 0.8 ha |
| **Building Area** | 5109 | |
| Industrial Area | 557 | |
| Warehouse Area | 723 | |
| Office Area | 3829 | |
| **Parking** | **Proposed** | **Required** |
| Shops / Warehouse | 10 | 5 |
| Office Area | 98 | 92 |
| **Parking total** | 108 | 97 |
| **Accessible** Parking (Min) | 6 | 4 |
| Type A - | 3 | 2 |
| Type B - | 3 | 2 |
| **Bicycle Parking** (Min) | 6 | 4 |
| **Loading Spaces** (Min) | 2 | 2 |
| **Site Coverage** | **Proposed** | **Required** |
| Lot Coverage (Max) | 16% | 65% |
| % Landscape area (Min) | 12% | 10% |
| Landspaced Buffer to Street (Min) | 7.5 | 1.5 |
| % Outdoor Storage | 3% | 0% in IL, Permitted in IH |
| % Utility Service Yard | 72% | N/A |
| Floor Space Index | 0.16 | 2 |
| **Setbacks** | **Proposed** | **Required** |
| Front Yard | 7.5 | 7.5 |
| Interior Side Yard | 17.4 & 58.2 | 7.5 |
| Exterior Side Yard | N/A | 7.5 |
| Rear Yard | 7.5 | 7.5 |
| Open Storage | 3 | 0 |
| Canopy Front Yard Setback | N/A | 3.75 |
| **Height** | **Proposed** | **Required** |
| Max Principal Bldg (m) | 10.5 | 18 |
| Max Accessory Bldg (m) | 6 | 6 |
| **Parking Dim's** | **Proposed** | **Required** |
| Standard (m) | 5.8m x 2.75m | 5.5m x 2.7m |
| Type A - | 5.8m x 3.4m | 5.2m x 3.4m |
| Type B - | 5.8m x 3.4m | 5.2m x 2.4m |
| Loading Space Dim's | 12m x 3.5mx4.2 | 12m x 3.5mx4.2 |
| Bicycle Space | 1.8m x 0.6m | 1.8m x 0.6m |

**Conservation Authority**

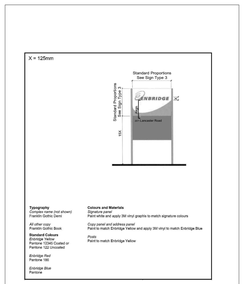
Rideau River Conservation Authority — Not a Regulated Zone



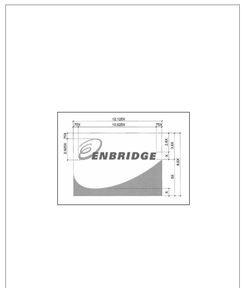

2 BIKE RACK DETAIL
SCALE: NOT TO SCALE




3 SIGN - TYPE 1
SCALE: 1NOT TO SCALE




4 SIGN - TYPE 2
SCALE: NOT TO SCALE



5 SIGN - TYPE 3
SCALE: NOT TO SCALE

**City of Ottawa File No. D07-12-21-0144**
**City of Ottawa Plan No. 18602**

CLIENT LOGO

ENBRIDGE

TRUE NORTH — PROJECT NORTH

| No. | ISSUANCE | DATE |
|---|---|---|
| 1 | ISSUED FOR SITE PLAN CONTROL | 2021-08-25 |
| 2 | ISSUED FOR OWNER REVIEW | 2021-11-22 |
| 3 | ISSUED FOR MASS TIMBER BID | 2021-11-26 |
| 4 | ISSUED FOR OWNER REVIEW | 2021-12-13 |
| 5 | 60% OWNER REVIEW SET | 2022-01-20 |
| 6 | 90% OWNER REVIEW SET | 2022-02-02 |

CLIENT
ENBRIDGE GAS
500 CONSUMERS ROAD, NORTH YORK, ON. M2J 1P8
Tel: 1-877-362-7434

PROJECT
OTTAWA OPERATIONS CENTRE
2571 LANCASTER ROAD, OTTAWA, ON. K1B 4L5

TITLE
ARCHITECTURAL SITE PLAN

WALTERFEDY
KITCHENER HAMILTON 800.685.1378 walterfedy.com

SEAL



| | |
|---|---|
| SCALE : | As indicated |
| DATE : | 2021.08.25 |
| PROJECT NO : | 2020-0566-10 |
| FILE : | |
| DRAWN BY : | NRC, CE |
| CHECKED BY : | SL, NRC |

SHEET NO :
A102

# APPENDIX

# D TRANS O-D SURVEY

# Alta Vista

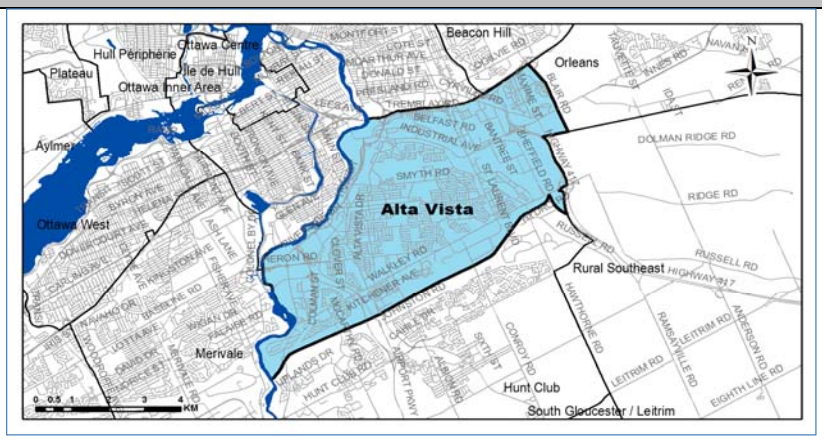
## Demographic Characteristics

| | | | |
|---|---|---|---|
| Population | 74,770 | Actively Travelled | 59,190 |
| Employed Population | 32,910 | Number of Vehicles | 37,270 |
| Households | 32,590 | Area (km$^2$) | 38.5 |

| Occupation Status (age 5+) | Male | Female | Total |
|---|---|---|---|
| Full Time Employed | 15,840 | 12,940 | 28,780 |
| Part Time Employed | 1,660 | 2,470 | 4,130 |
| Student | 8,130 | 8,750 | 16,870 |
| Retiree | 6,200 | 8,840 | 15,030 |
| Unemployed | 1,200 | 950 | 2,150 |
| Homemaker | 50 | 2,150 | 2,200 |
| Other | 630 | 900 | 1,530 |
| Total: | 33,700 | 36,990 | 70,700 |

| Traveller Characteristics | Male | Female | Total |
|---|---|---|---|
| Transit Pass Holders | 7,620 | 9,140 | 16,760 |
| Licensed Drivers | 25,060 | 24,810 | 49,870 |
| Telecommuters | 140 | 60 | 200 |
| Trips made by residents | 92,440 | 98,770 | 191,210 |

| Selected Indicators | |
|---|---|
| Daily Trips per Person (age 5+) | 2.70 |
| Vehicles per Person | 0.50 |
| Number of Persons per Household | 2.29 |
| Daily Trips per Household | 5.87 |
| Vehicles per Household | 1.14 |
| Workers per Household | 1.01 |
| Population Density (Pop/km2) | 1940 |

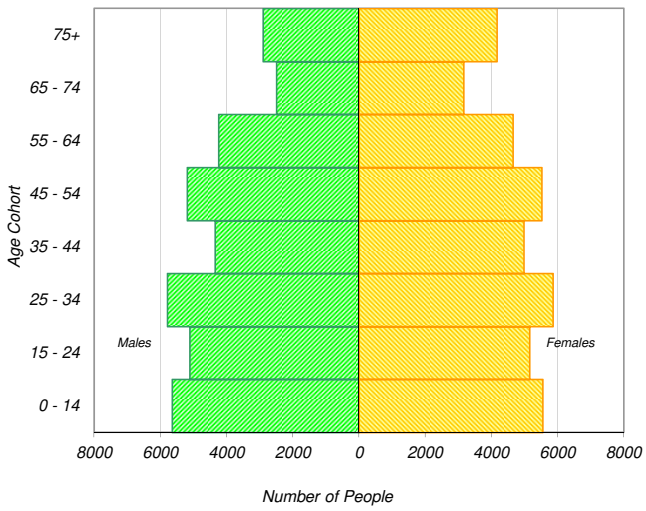



| Household Size | | |
|---|---|---|
| 1 person | 10,780 | 33% |
| 2 persons | 11,010 | 34% |
| 3 persons | 4,790 | 15% |
| 4 persons | 3,880 | 12% |
| 5+ persons | 2,130 | 7% |
| Total: | 32,590 | 100% |

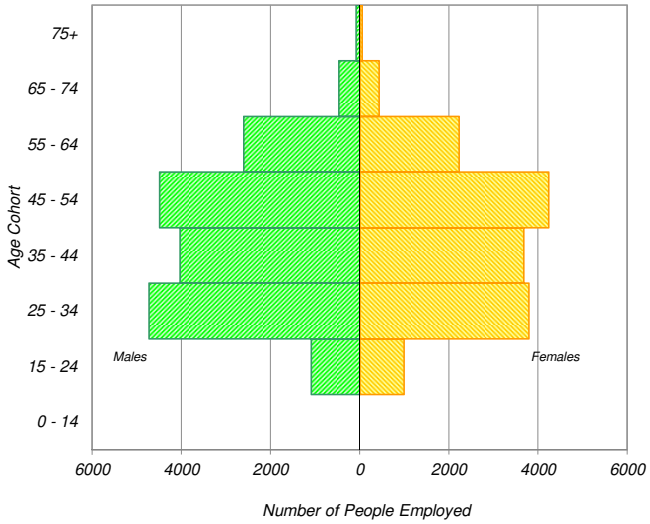
| Households by Vehicle Availability | | |
|---|---|---|
| 0 vehicles | 6,320 | 19% |
| 1 vehicle | 16,930 | 52% |
| 2 vehicles | 8,030 | 25% |
| 3 vehicles | 1,030 | 3% |
| 4+ vehicles | 290 | 1% |
| Total: | 32,590 | 100% |

| Households by Dwelling Type | | |
|---|---|---|
| Single-detached | 12,320 | 38% |
| Semi-detached | 1,790 | 5% |
| Townhouse | 4,700 | 14% |
| Apartment/Condo | 13,780 | 42% |
| Total: | 32,590 | 100% |

*Population*




*Employed Population*

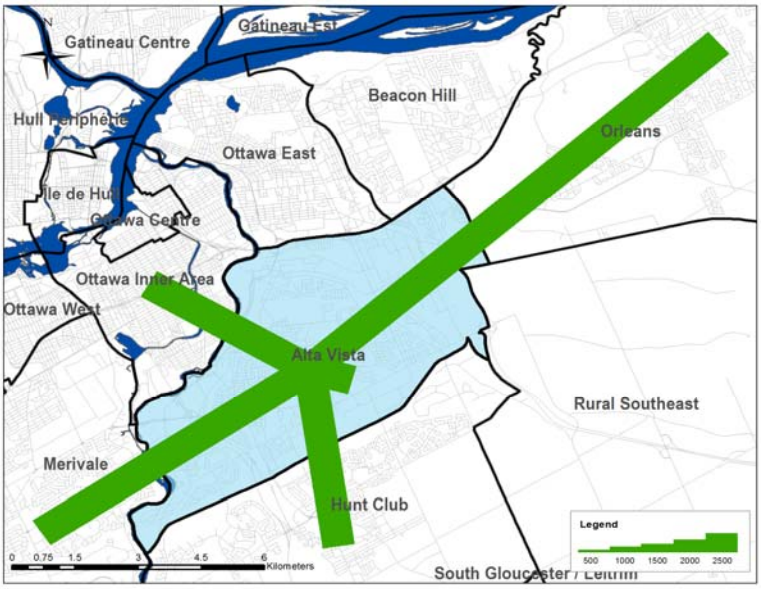



* In 2005 data was only collected for household members aged 11+ therefore these results cannot be compared to the 2011 data.

# Travel Patterns

## Top Five Origins of Trips to Alta Vista

**AM Peak Period**




## Summary of Trips to and from Alta Vista

| AM Peak Period (6:30 - 8:59) | Destinations of Trips From District | % Total | Origins of Trips To District | % Total |
|---|---|---|---|---|
| Districts | | | | |
| Ottawa Centre | 4,180 | 10% | 680 | 1% |
| Ottawa Inner Area | 4,970 | 12% | 4,270 | 7% |
| Ottawa East | 1,940 | 5% | 2,370 | 4% |
| Beacon Hill | 2,690 | 7% | 1,850 | 3% |
| Alta Vista | 16,220 | 39% | 16,220 | 27% |
| Hunt Club | 1,980 | 5% | 7,990 | 13% |
| Merivale | 3,010 | 7% | 3,690 | 6% |
| Ottawa West | 1,160 | 3% | 1,550 | 3% |
| Bayshore / Cedarview | 830 | 2% | 2,330 | 4% |
| Orléans | 1,050 | 3% | 5,890 | 10% |
| Rural East | 110 | 0% | 430 | 1% |
| Rural Southeast | 140 | 0% | 1,550 | 3% |
| South Gloucester / Leitrim | 160 | 0% | 1,970 | 3% |
| South Nepean | 460 | 1% | 2,360 | 4% |
| Rural Southwest | 160 | 0% | 690 | 1% |
| Kanata / Stittsvile | 660 | 2% | 1,810 | 3% |
| Rural West | 20 | 0% | 180 | 0% |
| Île de Hull | 710 | 2% | 190 | 0% |
| Hull Périphérie | 360 | 1% | 420 | 1% |
| Plateau | 0 | 0% | 680 | 1% |
| Aylmer | 40 | 0% | 480 | 1% |
| Rural Northwest | 40 | 0% | 300 | 1% |
| Pointe Gatineau | 20 | 0% | 740 | 1% |
| Gatineau Est | 220 | 1% | 270 | 0% |
| Rural Northeast | 10 | 0% | 320 | 1% |
| Buckingham / Masson-Angers | 10 | 0% | 70 | 0% |
| Ontario Sub-Total: | 39,740 | 97% | 55,830 | 94% |
| Québec Sub-Total: | 1,410 | 3% | 3,470 | 6% |
| Total: | 41,150 | 100% | 59,300 | 100% |

## Trips by Trip Purpose

| 24 Hours | From District | | To District | | Within District | |
|---|---|---|---|---|---|---|
| Work or related | 22,370 | 15% | 46,540 | 31% | 10,770 | 13% |
| School | 8,550 | 6% | 8,090 | 5% | 6,440 | 8% |
| Shopping | 16,500 | 11% | 16,600 | 11% | 14,550 | 17% |
| Leisure | 11,940 | 8% | 13,340 | 9% | 7,720 | 9% |
| Medical | 2,990 | 2% | 7,860 | 5% | 2,380 | 3% |
| Pick-up / drive passenger | 9,390 | 6% | 9,900 | 6% | 6,990 | 8% |
| Return Home | 75,570 | 50% | 44,070 | 29% | 33,060 | 39% |
| Other | 4,870 | 3% | 6,050 | 4% | 3,240 | 4% |
| Total: | 152,180 | 100% | 152,450 | 100% | 85,150 | 100% |

| AM Peak (06:30 - 08:59) | From District | | To District | | Within District | |
|---|---|---|---|---|---|---|
| Work or related | 13,920 | 56% | 28,300 | 66% | 5,390 | 33% |
| School | 5,340 | 21% | 7,330 | 17% | 5,600 | 35% |
| Shopping | 510 | 2% | 530 | 1% | 320 | 2% |
| Leisure | 570 | 2% | 990 | 2% | 480 | 3% |
| Medical | 500 | 2% | 1,760 | 4% | 460 | 3% |
| Pick-up / drive passenger | 1,790 | 7% | 2,490 | 6% | 2,110 | 13% |
| Return Home | 1,380 | 6% | 730 | 2% | 910 | 6% |
| Other | 910 | 4% | 940 | 2% | 930 | 6% |
| Total: | 24,920 | 100% | 43,070 | 100% | 16,200 | 100% |

| PM Peak (15:30 - 17:59) | From District | | To District | | Within District | |
|---|---|---|---|---|---|---|
| Work or related | 820 | 2% | 1,340 | 5% | 740 | 4% |
| School | 550 | 1% | 90 | 0% | 70 | 0% |
| Shopping | 3,920 | 9% | 3,630 | 13% | 2,830 | 14% |
| Leisure | 2,550 | 6% | 2,440 | 9% | 1,580 | 8% |
| Medical | 260 | 1% | 670 | 2% | 300 | 2% |
| Pick-up / drive passenger | 3,310 | 7% | 2,550 | 9% | 2,390 | 12% |
| Return Home | 31,900 | 72% | 15,950 | 57% | 11,310 | 58% |
| Other | 1,270 | 3% | 1,230 | 4% | 440 | 2% |
| Total: | 44,580 | 100% | 27,900 | 100% | 19,660 | 100% |

| Peak Period (%) | Total: | % of 24 Hours | Within District (%) |
|---|---|---|---|
| 24 Hours | 389,780 | | 22% |
| AM Peak Period | 84,190 | 22% | 19% |
| PM Peak Period | 92,140 | 24% | 21% |

## Trips by Primary Travel Mode

| 24 Hours | From District | | To District | | Within District | |
|---|---|---|---|---|---|---|
| Auto Driver | 92,240 | 61% | 92,670 | 61% | 43,390 | 51% |
| Auto Passenger | 24,030 | 16% | 24,040 | 16% | 13,430 | 16% |
| Transit | 27,890 | 18% | 27,220 | 18% | 6,520 | 8% |
| Bicycle | 2,180 | 1% | 2,110 | 1% | 1,390 | 2% |
| Walk | 1,440 | 1% | 1,510 | 1% | 15,170 | 18% |
| Other | 4,420 | 3% | 4,890 | 3% | 5,260 | 6% |
| Total: | 152,200 | 100% | 152,440 | 100% | 85,160 | 100% |

| AM Peak (06:30 - 08:59) | From District | | To District | | Within District | |
|---|---|---|---|---|---|---|
| Auto Driver | 12,430 | 50% | 26,810 | 62% | 6,330 | 39% |
| Auto Passenger | 3,040 | 12% | 5,100 | 12% | 2,500 | 15% |
| Transit | 7,540 | 30% | 7,300 | 17% | 1,700 | 10% |
| Bicycle | 750 | 3% | 750 | 2% | 340 | 2% |
| Walk | 280 | 1% | 280 | 1% | 3,210 | 20% |
| Other | 880 | 4% | 2,850 | 7% | 2,140 | 13% |
| Total: | 24,920 | 100% | 43,090 | 100% | 16,220 | 100% |

| PM Peak (15:30 - 17:59) | From District | | To District | | Within District | |
|---|---|---|---|---|---|---|
| Auto Driver | 28,570 | 64% | 15,990 | 57% | 9,640 | 49% |
| Auto Passenger | 5,930 | 13% | 4,230 | 15% | 3,570 | 18% |
| Transit | 7,460 | 17% | 6,420 | 23% | 1,500 | 8% |
| Bicycle | 630 | 1% | 610 | 2% | 470 | 2% |
| Walk | 340 | 1% | 310 | 1% | 3,280 | 17% |
| Other | 1,660 | 4% | 340 | 1% | 1,210 | 6% |
| Total: | 44,590 | 100% | 27,900 | 100% | 19,670 | 100% |

| Avg Vehicle Occupancy | From District | To District | Within District |
|---|---|---|---|
| 24 Hours | 1.26 | 1.26 | 1.31 |
| AM Peak Period | 1.24 | 1.19 | 1.39 |
| PM Peak Period | 1.21 | 1.26 | 1.37 |

| Transit Modal Split | From District | To District | Within District |
|---|---|---|---|
| 24 Hours | 19% | 19% | 10% |
| AM Peak Period | 33% | 19% | 16% |
| PM Peak Period | 18% | 24% | 10% |

# APPENDIX

# E DEVELOPMENT DESIGN CHECKLIST

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

***Legend***

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

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

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

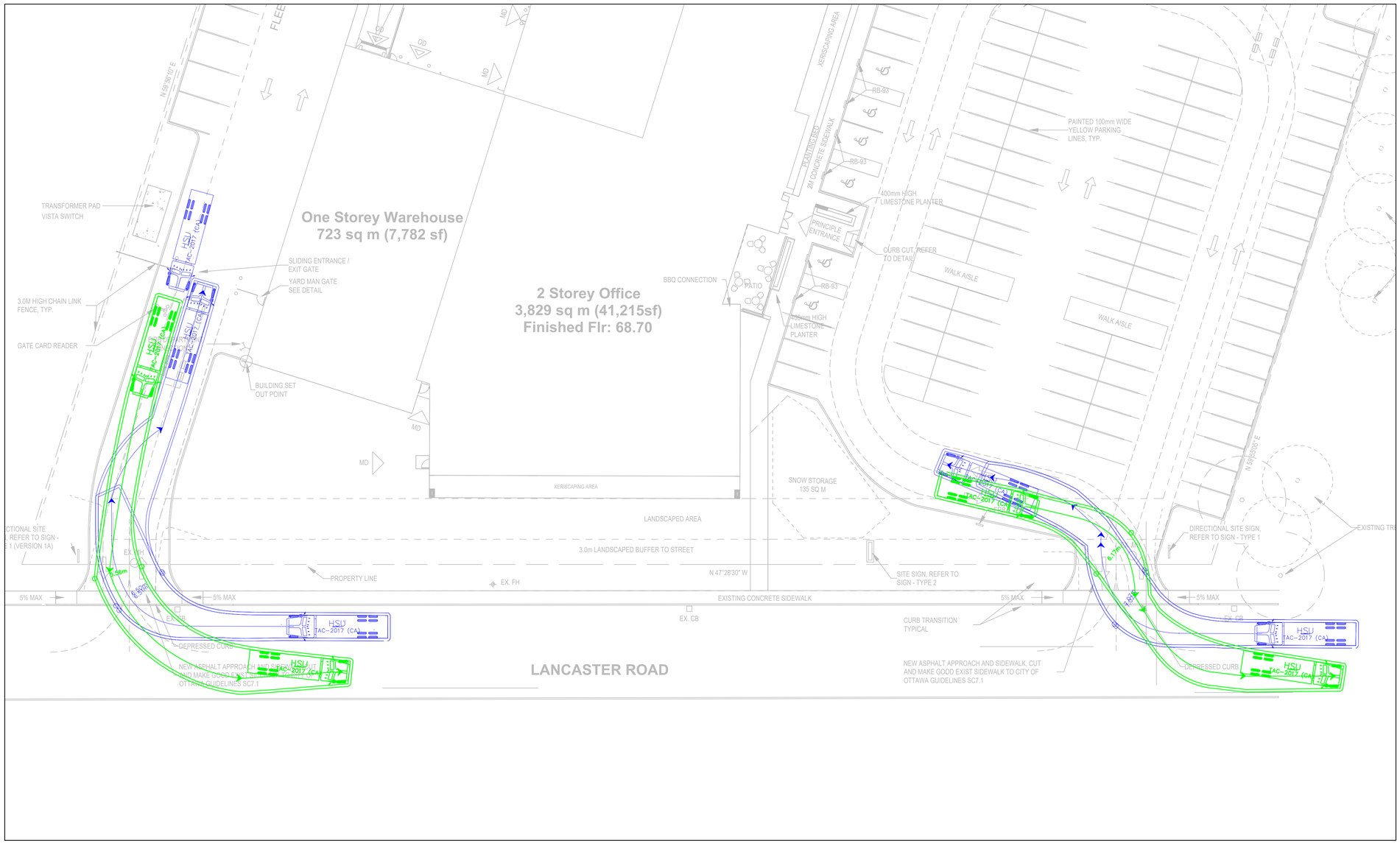
| | | TDM-supportive design & infrastructure measures: *Non-residential developments* | Check if completed & add descriptions, explanations or plan/drawing references |
|---|---|---|---|
| | **2.** | **WALKING & CYCLING: END-OF-TRIP FACILITIES** | |
| | **2.1** | **Bicycle parking** | |
| REQUIRED |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

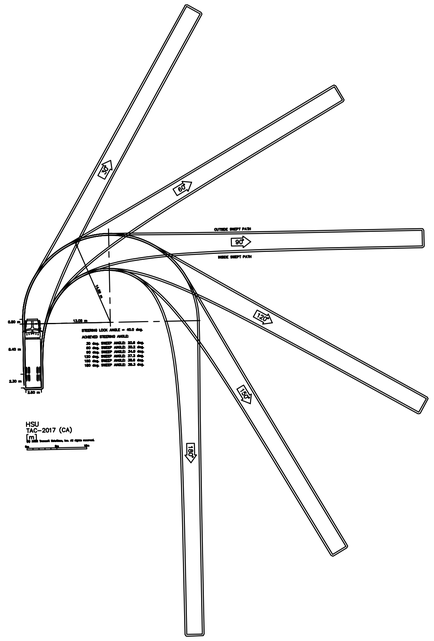
| | | TDM-supportive design & infrastructure measures: *Non-residential developments* | Check if completed & add descriptions, explanations or plan/drawing references |
|---|---|---|---|
| | **3.** | **TRANSIT** | |
| | **3.1** | **Customer amenities** | |
| BASIC | 3.1.1 | Provide shelters, lighting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

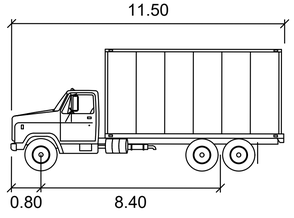
| | | TDM-supportive design & infrastructure measures: *Non-residential developments* | Check if completed & add descriptions, explanations or plan/drawing references |
|---|---|---|---|
| | **6.** | **PARKING** | |
| | **6.1** | **Number of parking spaces** | |
| REQUIRED | 6.1.1 | Do not provide more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

# APPENDIX

# F TURNING TEMPLATE




## HSU

| | meters |
|---|---|
| Width | : 2.60 |
| Track | : 2.60 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 40.0 |

NEW CONSTRUCTION

$DATE$ $TIME$ $FILEL$ $MODELNAME$

| | | | | |
|---|---|---|---|---|
| wsp | | | DWG NO. 01 | TURNING TEMPLATES HSU GETTING IN AND OUT |
| Des: MB | Chkd: JP | Date: FEB., 2022 | Scale: 1:250 | |
| Dwn: MB | Chkd: JP | | | |

# APPENDIX

# G TDM CHECKLIST

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

***Legend***

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

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

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

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

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

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

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

# APPENDIX

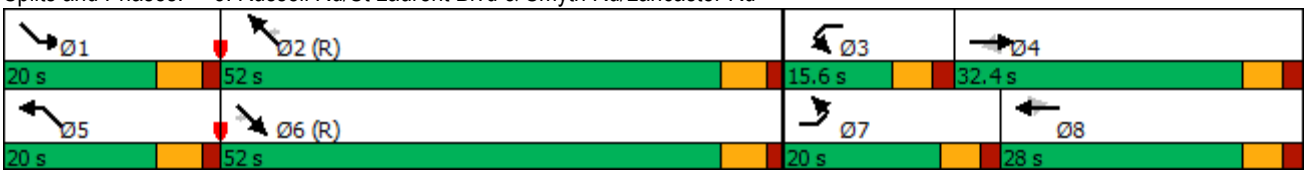
# H SYNCHRO

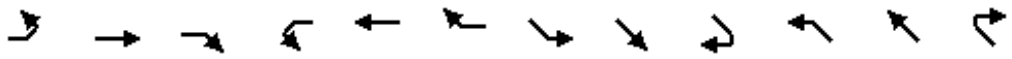
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 304 | 106 | 98 | 32 | 280 | 108 | 137 | 601 | 650 | 190 | 1136 | 97 |
| Future Volume (vph) | 304 | 106 | 98 | 32 | 280 | 108 | 137 | 601 | 650 | 190 | 1136 | 97 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 85.0 | | 85.0 | 55.0 | | 30.0 | 130.0 | | 115.0 | 185.0 | | 35.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 132 | | | 132 | | | 323 | | | 130 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 211.6 | | | 125.1 | | | 192.6 | | | 164.4 | |
| Travel Time (s) | | 15.2 | | | 9.0 | | | 13.9 | | | 11.8 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 2% | 3% | 13% | 19% | 2% | 13% | 4% | 6% | 1% | 14% | 7% | 6% |
| Adj. Flow (vph) | 338 | 118 | 109 | 36 | 311 | 120 | 152 | 668 | 722 | 211 | 1262 | 108 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 338 | 118 | 109 | 36 | 311 | 120 | 152 | 668 | 722 | 211 | 1262 | 108 |
| 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 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| 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 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 1 | 6 | 6 | 5 | 2 | 2 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Split (s) | 10.6 | 32.4 | 32.4 | 10.6 | 28.0 | 28.0 | 11.0 | 27.9 | 27.9 | 11.0 | 27.9 | 27.9 |
| Total Split (s) | 20.0 | 32.4 | 32.4 | 15.6 | 28.0 | 28.0 | 20.0 | 52.0 | 52.0 | 20.0 | 52.0 | 52.0 |
| Total Split (%) | 16.7% | 27.0% | 27.0% | 13.0% | 23.3% | 23.3% | 16.7% | 43.3% | 43.3% | 16.7% | 43.3% | 43.3% |
| Maximum Green (s) | 14.4 | 26.7 | 26.7 | 10.0 | 22.3 | 22.3 | 14.0 | 46.1 | 46.1 | 14.0 | 46.1 | 46.1 |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| All-Red Time (s) | 1.9 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 1.8 | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 |
| Lost Time Adjust (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 |
| Total Lost Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | 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 | | 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) | 14.3 | 27.3 | 27.3 | 8.1 | 16.4 | 16.4 | 15.4 | 46.1 | 46.1 | 20.0 | 50.7 | 50.7 |
| Actuated g/C Ratio | 0.12 | 0.23 | 0.23 | 0.07 | 0.14 | 0.14 | 0.13 | 0.38 | 0.38 | 0.17 | 0.42 | 0.42 |
| v/c Ratio | 0.87 | 0.30 | 0.27 | 0.37 | 0.68 | 0.40 | 0.72 | 0.54 | 0.93 | 0.84 | 0.93 | 0.16 |
| Control Delay | 75.1 | 42.3 | 5.7 | 63.8 | 56.9 | 10.1 | 69.5 | 30.7 | 38.5 | 77.7 | 47.5 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 75.1 | 42.3 | 5.7 | 63.8 | 56.9 | 10.1 | 69.5 | 30.7 | 38.5 | 77.7 | 47.5 | 3.1 |
| LOS | E | D | A | E | E | B | E | C | D | E | D | A |
| Approach Delay | | 54.8 | | | 45.4 | | | 38.2 | | | 48.5 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.93 | | | |
| Intersection Signal Delay: 45.2 | | Intersection LOS: D | |
| Intersection Capacity Utilization 77.8% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

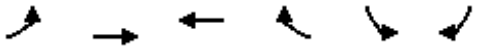
Splits and Phases: 3: Russell Rd/St Laurent Blvd & Smyth Rd/Lancaster Rd





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 304 | 106 | 98 | 32 | 280 | 108 | 137 | 601 | 650 | 190 | 1136 | 97 |
| Future Volume (vph) | 304 | 106 | 98 | 32 | 280 | 108 | 137 | 601 | 650 | 190 | 1136 | 97 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 338 | 118 | 109 | 36 | 311 | 120 | 152 | 668 | 722 | 211 | 1262 | 108 |
| RTOR Reduction (vph) | 0 | 0 | 84 | 0 | 0 | 101 | 0 | 0 | 205 | 0 | 0 | 64 |
| Lane Group Flow (vph) | 338 | 118 | 25 | 36 | 311 | 19 | 152 | 668 | 517 | 211 | 1262 | 44 |
| Heavy Vehicles (%) | 2% | 3% | 13% | 19% | 2% | 13% | 4% | 6% | 1% | 14% | 7% | 6% |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Actuated Green, G (s) | 14.3 | 27.3 | 27.3 | 5.6 | 18.6 | 18.6 | 15.4 | 43.9 | 43.9 | 20.0 | 48.5 | 48.5 |
| Effective Green, g (s) | 14.3 | 27.3 | 27.3 | 5.6 | 18.6 | 18.6 | 15.4 | 43.9 | 43.9 | 20.0 | 48.5 | 48.5 |
| Actuated g/C Ratio | 0.12 | 0.23 | 0.23 | 0.05 | 0.16 | 0.16 | 0.13 | 0.37 | 0.37 | 0.17 | 0.40 | 0.40 |
| Clearance Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 387 | 397 | 308 | 67 | 519 | 209 | 210 | 1180 | 554 | 250 | 1291 | 583 |
| v/s Ratio Prot | c0.10 | 0.07 | | 0.03 | c0.09 | | 0.09 | 0.21 | | c0.14 | c0.39 | |
| v/s Ratio Perm | | | 0.02 | | | 0.01 | | | 0.34 | | | 0.03 |
| v/c Ratio | 0.87 | 0.30 | 0.08 | 0.54 | 0.60 | 0.09 | 0.72 | 0.57 | 0.93 | 0.84 | 0.98 | 0.07 |
| Uniform Delay, d1 | 52.0 | 38.4 | 36.5 | 55.9 | 47.2 | 43.4 | 50.3 | 30.4 | 36.6 | 48.5 | 35.2 | 22.0 |
| 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 | 19.0 | 0.4 | 0.1 | 8.1 | 1.9 | 0.2 | 11.7 | 2.0 | 24.9 | 22.1 | 20.2 | 0.2 |
| Delay (s) | 71.0 | 38.8 | 36.6 | 64.0 | 49.1 | 43.6 | 61.9 | 32.4 | 61.5 | 70.5 | 55.4 | 22.2 |
| Level of Service | E | D | D | E | D | D | E | C | E | E | E | C |
| Approach Delay (s) | | 57.6 | | | 48.8 | | | 49.0 | | | 55.2 | |
| Approach LOS | | E | | | D | | | D | | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 52.5 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 23.2 |
| Intersection Capacity Utilization | 77.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

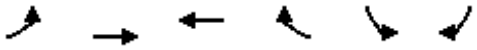


| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 200 | 720 | 1389 | 630 | 91 | 166 |
| Future Volume (vph) | 200 | 720 | 1389 | 630 | 91 | 166 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 120.0 | | | 25.0 | 75.0 | 150.0 |
| Storage Lanes | 1 | | | 1 | 1 | 1 |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1613 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Flt Permitted | 0.085 | | | | 0.950 | |
| Satd. Flow (perm) | 144 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | 316 | | 184 |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 246.9 | 393.2 | | 187.8 | |
| Travel Time (s) | | 17.8 | 28.3 | | 13.5 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 6% | 16% | 7% | 2% | 8% | 10% |
| Adj. Flow (vph) | 222 | 800 | 1543 | 700 | 101 | 184 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 222 | 800 | 1543 | 700 | 101 | 184 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 3.6 | 3.6 | | 7.2 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (k/h) | 25 | | | 15 | 25 | 15 |
| Number of Detectors | 1 | 2 | 2 | 1 | 1 | 1 |
| Detector Template | Left | Thru | Thru | Right | Left | Right |
| Leading Detector (m) | 2.0 | 10.0 | 10.0 | 2.0 | 2.0 | 2.0 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 2.0 | 0.6 | 0.6 | 2.0 | 2.0 | 2.0 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 9.4 | 9.4 | | | |
| Detector 2 Size(m) | | 0.6 | 0.6 | | | |
| Detector 2 Type | | Cl+Ex | Cl+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Minimum Split (s) | 11.2 | 24.2 | 37.2 | 37.2 | 27.7 | 27.7 |
| Total Split (s) | 24.0 | 122.0 | 98.0 | 98.0 | 28.0 | 28.0 |
| Total Split (%) | 16.0% | 81.3% | 65.3% | 65.3% | 18.7% | 18.7% |
| Maximum Green (s) | 17.8 | 115.8 | 91.8 | 91.8 | 22.3 | 22.3 |
| Yellow Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 3.3 | 3.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 2.4 | 2.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | C-Max | C-Max |
| Walk Time (s) | | | 20.0 | 20.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | | | 7.0 | 7.0 | 15.0 | 15.0 |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 96.1 | 96.1 | 72.5 | 72.5 | 42.0 | 42.0 |
| Actuated g/C Ratio | 0.64 | 0.64 | 0.48 | 0.48 | 0.28 | 0.28 |
| v/c Ratio | 0.85 | 0.42 | 0.69 | 0.79 | 0.12 | 0.35 |
| Control Delay | 58.7 | 13.6 | 31.4 | 22.6 | 45.0 | 8.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 58.7 | 13.6 | 31.4 | 22.6 | 45.0 | 8.8 |
| LOS | E | B | C | C | D | A |
| Approach Delay | | 23.4 | 28.7 | | 21.7 | |
| Approach LOS | | C | C | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 150 | | | |
| Actuated Cycle Length: 150 | | | |
| Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.85 | | | |
| Intersection Signal Delay: 26.6 | | Intersection LOS: C | |
| Intersection Capacity Utilization 63.2% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 14: Walkley Rd & Lancaster Rd



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 200 | 720 | 1389 | 630 | 91 | 166 |
| Future Volume (vph) | 200 | 720 | 1389 | 630 | 91 | 166 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1613 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Flt Permitted | 0.09 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 144 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 222 | 800 | 1543 | 700 | 101 | 184 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 163 | 0 | 132 |
| Lane Group Flow (vph) | 222 | 800 | 1543 | 537 | 101 | 52 |
| Heavy Vehicles (%) | 6% | 16% | 7% | 2% | 8% | 10% |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Actuated Green, G (s) | 96.1 | 96.1 | 72.5 | 72.5 | 42.0 | 42.0 |
| Effective Green, g (s) | 96.1 | 96.1 | 72.5 | 72.5 | 42.0 | 42.0 |
| Actuated g/C Ratio | 0.64 | 0.64 | 0.48 | 0.48 | 0.28 | 0.28 |
| Clearance Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 262 | 1888 | 2219 | 725 | 860 | 389 |
| v/s Ratio Prot | c0.10 | 0.27 | 0.34 | | 0.03 | |
| v/s Ratio Perm | c0.44 | | | 0.36 | | c0.04 |
| v/c Ratio | 0.85 | 0.42 | 0.70 | 0.74 | 0.12 | 0.13 |
| Uniform Delay, d1 | 36.4 | 13.3 | 30.2 | 31.2 | 40.2 | 40.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 21.6 | 0.2 | 1.0 | 4.1 | 0.3 | 0.7 |
| Delay (s) | 57.9 | 13.4 | 31.1 | 35.3 | 40.5 | 41.1 |
| Level of Service | E | B | C | D | D | D |
| Approach Delay (s) | | 23.1 | 32.4 | | 40.9 | |
| Approach LOS | | C | C | | D | |

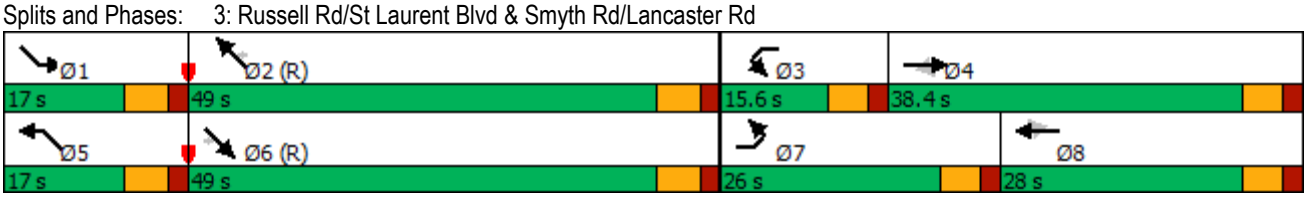
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 30.4 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.64 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 63.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 509 | 277 | 225 | 101 | 107 | 232 | 138 | 1109 | 361 | 99 | 735 | 94 |
| Future Volume (vph) | 509 | 277 | 225 | 101 | 107 | 232 | 138 | 1109 | 361 | 99 | 735 | 94 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 85.0 | | 85.0 | 55.0 | | 30.0 | 130.0 | | 115.0 | 185.0 | | 35.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 223 | | | 209 | | | 401 | | | 181 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 211.6 | | | 125.1 | | | 192.6 | | | 164.4 | |
| Travel Time (s) | | 15.2 | | | 9.0 | | | 13.9 | | | 11.8 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 1% | 1% | 3% | 3% | 1% | 1% | 2% | 2% | 1% | 10% | 4% | 1% |
| Adj. Flow (vph) | 566 | 308 | 250 | 112 | 119 | 258 | 153 | 1232 | 401 | 110 | 817 | 104 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 566 | 308 | 250 | 112 | 119 | 258 | 153 | 1232 | 401 | 110 | 817 | 104 |
| 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 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| 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 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 1 | 6 | 6 | 5 | 2 | 2 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Split (s) | 10.6 | 32.4 | 32.4 | 10.6 | 28.0 | 28.0 | 11.0 | 27.9 | 27.9 | 11.0 | 27.9 | 27.9 |
| Total Split (s) | 26.0 | 38.4 | 38.4 | 15.6 | 28.0 | 28.0 | 17.0 | 49.0 | 49.0 | 17.0 | 49.0 | 49.0 |
| Total Split (%) | 21.7% | 32.0% | 32.0% | 13.0% | 23.3% | 23.3% | 14.2% | 40.8% | 40.8% | 14.2% | 40.8% | 40.8% |
| Maximum Green (s) | 20.4 | 32.7 | 32.7 | 10.0 | 22.3 | 22.3 | 11.0 | 43.1 | 43.1 | 11.0 | 43.1 | 43.1 |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| All-Red Time (s) | 1.9 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 1.8 | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 |
| Lost Time Adjust (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 |
| Total Lost Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | 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 | | 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) | 20.4 | 25.7 | 25.7 | 9.9 | 15.2 | 15.2 | 15.5 | 48.8 | 48.8 | 12.4 | 45.7 | 45.7 |
| Actuated g/C Ratio | 0.17 | 0.21 | 0.21 | 0.08 | 0.13 | 0.13 | 0.13 | 0.41 | 0.41 | 0.10 | 0.38 | 0.38 |
| v/c Ratio | 1.01 | 0.81 | 0.51 | 0.82 | 0.28 | 0.69 | 0.71 | 0.90 | 0.47 | 0.69 | 0.65 | 0.15 |
| Control Delay | 91.1 | 60.8 | 10.5 | 95.1 | 47.3 | 21.0 | 69.2 | 44.9 | 4.6 | 73.9 | 34.3 | 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 | 91.1 | 60.8 | 10.5 | 95.1 | 47.3 | 21.0 | 69.2 | 44.9 | 4.6 | 73.9 | 34.3 | 0.5 |
| LOS | F | E | B | F | D | C | E | D | A | E | C | A |
| Approach Delay | | 64.9 | | | 44.4 | | | 37.9 | | | 35.1 | |
| Approach LOS | | E | | | D | | | D | | | D | |

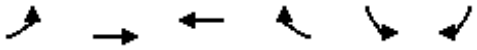
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 120 | | | |
| Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green | | | |
| Natural Cycle: 115 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 1.01 | | | |
| Intersection Signal Delay: 44.8 | | Intersection LOS: D | |
| Intersection Capacity Utilization 78.8% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Russell Rd/St Laurent Blvd & Smyth Rd/Lancaster Rd

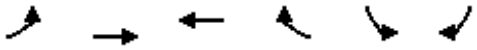


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 509 | 277 | 225 | 101 | 107 | 232 | 138 | 1109 | 361 | 99 | 735 | 94 |
| Future Volume (vph) | 509 | 277 | 225 | 101 | 107 | 232 | 138 | 1109 | 361 | 99 | 735 | 94 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 566 | 308 | 250 | 112 | 119 | 258 | 153 | 1232 | 401 | 110 | 817 | 104 |
| RTOR Reduction (vph) | 0 | 0 | 175 | 0 | 0 | 183 | 0 | 0 | 238 | 0 | 0 | 64 |
| Lane Group Flow (vph) | 566 | 308 | 75 | 112 | 119 | 75 | 153 | 1232 | 163 | 110 | 817 | 40 |
| Heavy Vehicles (%) | 1% | 1% | 3% | 3% | 1% | 1% | 2% | 2% | 1% | 10% | 4% | 1% |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Actuated Green, G (s) | 20.4 | 25.7 | 25.7 | 9.9 | 15.2 | 15.2 | 15.5 | 48.8 | 48.8 | 12.4 | 45.7 | 45.7 |
| Effective Green, g (s) | 20.4 | 25.7 | 25.7 | 9.9 | 15.2 | 15.2 | 15.5 | 48.8 | 48.8 | 12.4 | 45.7 | 45.7 |
| Actuated g/C Ratio | 0.17 | 0.21 | 0.21 | 0.08 | 0.13 | 0.13 | 0.13 | 0.41 | 0.41 | 0.10 | 0.38 | 0.38 |
| Clearance Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 558 | 381 | 318 | 136 | 428 | 191 | 216 | 1363 | 616 | 160 | 1252 | 576 |
| v/s Ratio Prot | c0.17 | c0.17 | | 0.07 | 0.04 | | c0.09 | c0.37 | | 0.07 | 0.25 | |
| v/s Ratio Perm | | | 0.05 | | | 0.05 | | | 0.11 | | | 0.03 |
| v/c Ratio | 1.01 | 0.81 | 0.24 | 0.82 | 0.28 | 0.40 | 0.71 | 0.90 | 0.26 | 0.69 | 0.65 | 0.07 |
| Uniform Delay, d1 | 49.8 | 44.8 | 39.0 | 54.2 | 47.4 | 48.2 | 50.1 | 33.4 | 23.7 | 51.9 | 30.6 | 23.6 |
| 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 | 41.7 | 11.9 | 0.4 | 31.5 | 0.4 | 1.3 | 10.1 | 10.1 | 1.0 | 11.6 | 2.7 | 0.2 |
| Delay (s) | 91.5 | 56.7 | 39.4 | 85.7 | 47.8 | 49.5 | 60.2 | 43.5 | 24.7 | 63.5 | 33.3 | 23.9 |
| Level of Service | F | E | D | F | D | D | E | D | C | E | C | C |
| Approach Delay (s) | | 70.4 | | | 57.4 | | | 40.7 | | | 35.5 | |
| Approach LOS | | E | | | E | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 48.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.93 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 23.2 |
| Intersection Capacity Utilization | 78.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



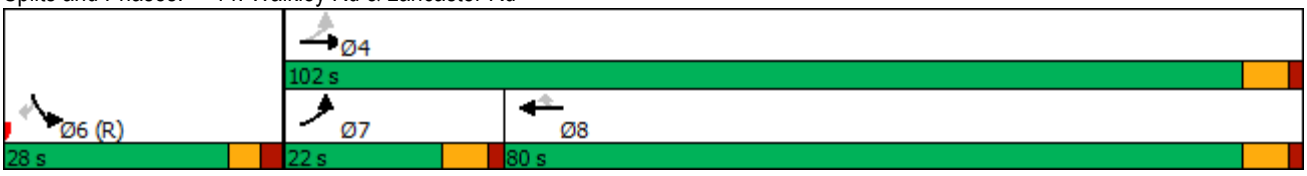
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 123 | 1721 | 933 | 161 | 474 | 201 |
| Future Volume (vph) | 123 | 1721 | 933 | 161 | 474 | 201 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 120.0 | | | 25.0 | 75.0 | 150.0 |
| Storage Lanes | 1 | | | 1 | 1 | 1 |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1676 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Flt Permitted | 0.224 | | | | 0.950 | |
| Satd. Flow (perm) | 395 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | 124 | | 223 |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 246.9 | 393.2 | | 187.8 | |
| Travel Time (s) | | 17.8 | 28.3 | | 13.5 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 2% | 5% | 9% | 9% | 2% | 3% |
| Adj. Flow (vph) | 137 | 1912 | 1037 | 179 | 527 | 223 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 137 | 1912 | 1037 | 179 | 527 | 223 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 3.6 | 3.6 | | 7.2 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (k/h) | 25 | | | 15 | 25 | 15 |
| Number of Detectors | 1 | 2 | 2 | 1 | 1 | 1 |
| Detector Template | Left | Thru | Thru | Right | Left | Right |
| Leading Detector (m) | 2.0 | 10.0 | 10.0 | 2.0 | 2.0 | 2.0 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 2.0 | 0.6 | 0.6 | 2.0 | 2.0 | 2.0 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 9.4 | 9.4 | | | |
| Detector 2 Size(m) | | 0.6 | 0.6 | | | |
| Detector 2 Type | | Cl+Ex | Cl+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

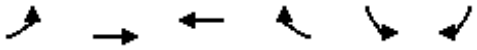


| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Minimum Split (s) | 11.2 | 24.2 | 37.2 | 37.2 | 27.7 | 27.7 |
| Total Split (s) | 22.0 | 102.0 | 80.0 | 80.0 | 28.0 | 28.0 |
| Total Split (%) | 16.9% | 78.5% | 61.5% | 61.5% | 21.5% | 21.5% |
| Maximum Green (s) | 15.8 | 95.8 | 73.8 | 73.8 | 22.3 | 22.3 |
| Yellow Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 3.3 | 3.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 2.4 | 2.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | C-Max | C-Max |
| Walk Time (s) | | | 20.0 | 20.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | | | 7.0 | 7.0 | 15.0 | 15.0 |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 95.8 | 95.8 | 81.1 | 81.1 | 22.3 | 22.3 |
| Actuated g/C Ratio | 0.74 | 0.74 | 0.62 | 0.62 | 0.17 | 0.17 |
| v/c Ratio | 0.37 | 0.80 | 0.37 | 0.19 | 0.95 | 0.51 |
| Control Delay | 7.7 | 14.2 | 12.6 | 4.1 | 80.2 | 10.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 7.7 | 14.2 | 12.6 | 4.1 | 80.2 | 10.2 |
| LOS | A | B | B | A | F | B |
| Approach Delay | | 13.7 | 11.3 | | 59.4 | |
| Approach LOS | | B | B | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 130 | | | |
| Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.95 | | | |
| Intersection Signal Delay: 21.5 | | Intersection LOS: C | |
| Intersection Capacity Utilization 74.4% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 14: Walkley Rd & Lancaster Rd





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 123 | 1721 | 933 | 161 | 474 | 201 |
| Future Volume (vph) | 123 | 1721 | 933 | 161 | 474 | 201 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1676 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Flt Permitted | 0.22 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 396 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 137 | 1912 | 1037 | 179 | 527 | 223 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 47 | 0 | 185 |
| Lane Group Flow (vph) | 137 | 1912 | 1037 | 132 | 527 | 38 |
| Heavy Vehicles (%) | 2% | 5% | 9% | 9% | 2% | 3% |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Actuated Green, G (s) | 95.8 | 95.8 | 81.1 | 81.1 | 22.3 | 22.3 |
| Effective Green, g (s) | 95.8 | 95.8 | 81.1 | 81.1 | 22.3 | 22.3 |
| Actuated g/C Ratio | 0.74 | 0.74 | 0.62 | 0.62 | 0.17 | 0.17 |
| Clearance Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 375 | 2400 | 2812 | 875 | 557 | 254 |
| v/s Ratio Prot | 0.02 | c0.59 | 0.23 | | c0.16 | |
| v/s Ratio Perm | 0.24 | | | 0.09 | | 0.03 |
| v/c Ratio | 0.37 | 0.80 | 0.37 | 0.15 | 0.95 | 0.15 |
| Uniform Delay, d1 | 5.8 | 10.9 | 11.9 | 10.2 | 53.3 | 45.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.6 | 1.9 | 0.1 | 0.1 | 26.9 | 1.3 |
| Delay (s) | 6.4 | 12.8 | 12.0 | 10.2 | 80.2 | 47.0 |
| Level of Service | A | B | B | B | F | D |
| Approach Delay (s) | | 12.4 | 11.8 | | 70.3 | |
| Approach LOS | | B | B | | E | |

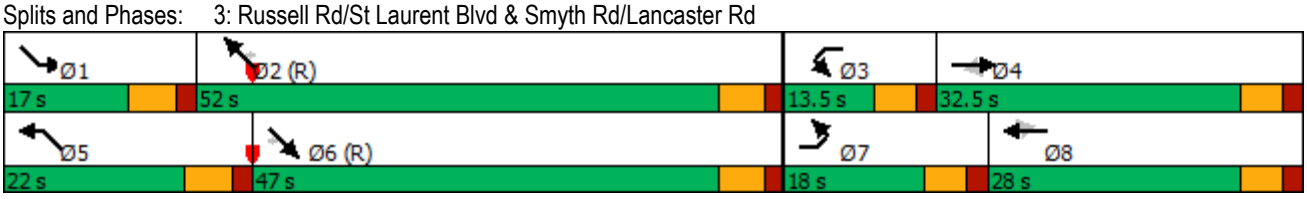
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 23.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.87 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 74.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| Future Volume (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 85.0 | | 85.0 | 55.0 | | 30.0 | 130.0 | | 115.0 | 185.0 | | 35.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 138 | | | 138 | | | 343 | | | 136 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 211.6 | | | 125.1 | | | 192.6 | | | 164.4 | |
| Travel Time (s) | | 15.2 | | | 9.0 | | | 13.9 | | | 11.8 | |
| Peak Hour 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 |
| Heavy Vehicles (%) | 2% | 3% | 13% | 19% | 2% | 13% | 4% | 6% | 1% | 14% | 7% | 6% |
| Adj. Flow (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| 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 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| 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 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 1 | 6 | 6 | 5 | 2 | 2 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Split (s) | 10.6 | 32.4 | 32.4 | 10.6 | 28.0 | 28.0 | 11.0 | 27.9 | 27.9 | 11.0 | 27.9 | 27.9 |
| Total Split (s) | 18.0 | 32.5 | 32.5 | 13.5 | 28.0 | 28.0 | 17.0 | 47.0 | 47.0 | 22.0 | 52.0 | 52.0 |
| Total Split (%) | 15.7% | 28.3% | 28.3% | 11.7% | 24.3% | 24.3% | 14.8% | 40.9% | 40.9% | 19.1% | 45.2% | 45.2% |
| Maximum Green (s) | 12.4 | 26.8 | 26.8 | 7.9 | 22.3 | 22.3 | 11.0 | 41.1 | 41.1 | 16.0 | 46.1 | 46.1 |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| All-Red Time (s) | 1.9 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 1.8 | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 |
| Lost Time Adjust (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 |
| Total Lost Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | 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 | | 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) | 12.4 | 24.9 | 24.9 | 7.2 | 15.0 | 15.0 | 14.8 | 44.5 | 44.5 | 19.9 | 49.6 | 49.6 |
| Actuated g/C Ratio | 0.11 | 0.22 | 0.22 | 0.06 | 0.13 | 0.13 | 0.13 | 0.39 | 0.39 | 0.17 | 0.43 | 0.43 |
| v/c Ratio | 0.88 | 0.28 | 0.25 | 0.37 | 0.65 | 0.37 | 0.66 | 0.49 | 0.83 | 0.74 | 0.83 | 0.14 |
| Control Delay | 76.2 | 41.3 | 3.9 | 63.4 | 54.4 | 7.2 | 63.1 | 29.0 | 25.5 | 62.9 | 36.4 | 1.8 |
| 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 | 76.2 | 41.3 | 3.9 | 63.4 | 54.4 | 7.2 | 63.1 | 29.0 | 25.5 | 62.9 | 36.4 | 1.8 |
| LOS | E | D | A | E | D | A | E | C | C | E | D | A |
| Approach Delay | | 55.0 | | | 43.0 | | | 30.8 | | | 37.5 | |
| Approach LOS | | D | | | D | | | C | | | D | |

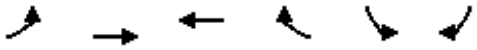
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 115 | | | |
| Actuated Cycle Length: 115 | | | |
| Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green | | | |
| Natural Cycle: 95 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay: 38.0 | | Intersection LOS: D | |
| Intersection Capacity Utilization 78.5% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Russell Rd/St Laurent Blvd & Smyth Rd/Lancaster Rd

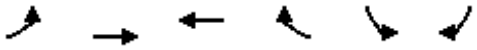


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| Future Volume (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| RTOR Reduction (vph) | 0 | 0 | 78 | 0 | 0 | 93 | 0 | 0 | 217 | 0 | 0 | 58 |
| Lane Group Flow (vph) | 307 | 107 | 21 | 33 | 283 | 16 | 139 | 607 | 440 | 192 | 1148 | 40 |
| Heavy Vehicles (%) | 2% | 3% | 13% | 19% | 2% | 13% | 4% | 6% | 1% | 14% | 7% | 6% |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Actuated Green, G (s) | 12.4 | 24.9 | 24.9 | 4.7 | 17.2 | 17.2 | 14.8 | 42.3 | 42.3 | 19.9 | 47.4 | 47.4 |
| Effective Green, g (s) | 12.4 | 24.9 | 24.9 | 4.7 | 17.2 | 17.2 | 14.8 | 42.3 | 42.3 | 19.9 | 47.4 | 47.4 |
| Actuated g/C Ratio | 0.11 | 0.22 | 0.22 | 0.04 | 0.15 | 0.15 | 0.13 | 0.37 | 0.37 | 0.17 | 0.41 | 0.41 |
| Clearance Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 350 | 378 | 293 | 58 | 501 | 202 | 211 | 1186 | 557 | 259 | 1317 | 594 |
| v/s Ratio Prot | c0.09 | 0.06 | | 0.02 | c0.08 | | 0.08 | 0.19 | | c0.13 | c0.36 | |
| v/s Ratio Perm | | | 0.02 | | | 0.01 | | | 0.29 | | | 0.03 |
| v/c Ratio | 0.88 | 0.28 | 0.07 | 0.57 | 0.56 | 0.08 | 0.66 | 0.51 | 0.79 | 0.74 | 0.87 | 0.07 |
| Uniform Delay, d1 | 50.5 | 37.6 | 35.9 | 54.2 | 45.4 | 42.1 | 47.7 | 28.3 | 32.4 | 45.1 | 31.0 | 20.4 |
| 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 | 21.1 | 0.4 | 0.1 | 12.2 | 1.5 | 0.2 | 7.2 | 1.6 | 10.9 | 10.9 | 8.1 | 0.2 |
| Delay (s) | 71.6 | 38.0 | 36.0 | 66.3 | 46.9 | 42.3 | 54.9 | 29.9 | 43.3 | 56.0 | 39.1 | 20.7 |
| Level of Service | E | D | D | E | D | D | D | C | D | E | D | C |
| Approach Delay (s) | | 57.7 | | | 47.2 | | | 38.7 | | | 40.1 | |
| Approach LOS | | E | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 42.8 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.82 | | |
| Actuated Cycle Length (s) | 115.0 | Sum of lost time (s) | 23.2 |
| Intersection Capacity Utilization | 78.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



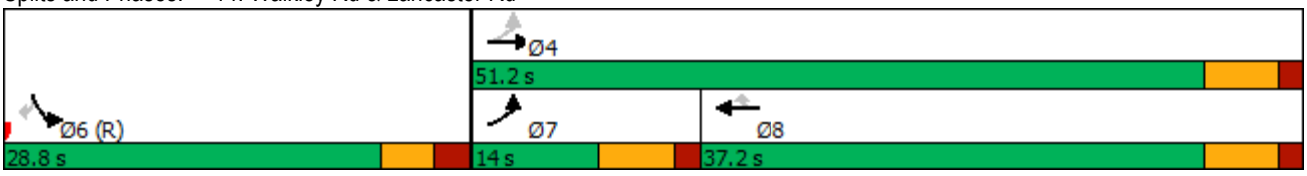
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Future Volume (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 120.0 | | | 25.0 | 75.0 | 150.0 |
| Storage Lanes | 1 | | | 1 | 1 | 1 |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1613 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Flt Permitted | 0.109 | | | | 0.950 | |
| Satd. Flow (perm) | 185 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | 375 | | 169 |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 246.9 | 393.2 | | 187.8 | |
| Travel Time (s) | | 17.8 | 28.3 | | 13.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 6% | 16% | 7% | 2% | 8% | 10% |
| Adj. Flow (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 3.6 | 3.6 | | 7.2 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (k/h) | 25 | | | 15 | 25 | 15 |
| Number of Detectors | 1 | 2 | 2 | 1 | 1 | 1 |
| Detector Template | Left | Thru | Thru | Right | Left | Right |
| Leading Detector (m) | 2.0 | 10.0 | 10.0 | 2.0 | 2.0 | 2.0 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 2.0 | 0.6 | 0.6 | 2.0 | 2.0 | 2.0 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 9.4 | 9.4 | | | |
| Detector 2 Size(m) | | 0.6 | 0.6 | | | |
| Detector 2 Type | | Cl+Ex | Cl+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

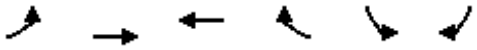


| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Minimum Split (s) | 11.2 | 24.2 | 37.2 | 37.2 | 27.7 | 27.7 |
| Total Split (s) | 14.0 | 51.2 | 37.2 | 37.2 | 28.8 | 28.8 |
| Total Split (%) | 17.5% | 64.0% | 46.5% | 46.5% | 36.0% | 36.0% |
| Maximum Green (s) | 7.8 | 45.0 | 31.0 | 31.0 | 23.1 | 23.1 |
| Yellow Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 3.3 | 3.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 2.4 | 2.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | C-Max | C-Max |
| Walk Time (s) | | | 20.0 | 20.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | | | 7.0 | 7.0 | 15.0 | 15.0 |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 44.4 | 44.4 | 30.4 | 30.4 | 23.7 | 23.7 |
| Actuated g/C Ratio | 0.56 | 0.56 | 0.38 | 0.38 | 0.30 | 0.30 |
| v/c Ratio | 0.84 | 0.45 | 0.81 | 0.80 | 0.10 | 0.32 |
| Control Delay | 46.0 | 11.5 | 26.7 | 17.9 | 21.3 | 5.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 46.0 | 11.5 | 26.7 | 17.9 | 21.3 | 5.7 |
| LOS | D | B | C | B | C | A |
| Approach Delay | | 19.0 | 24.0 | | 11.2 | |
| Approach LOS | | B | C | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.84 | | | |
| Intersection Signal Delay: 21.5 | | Intersection LOS: C | |
| Intersection Capacity Utilization 64.3% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 14: Walkley Rd & Lancaster Rd





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Future Volume (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1613 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Flt Permitted | 0.11 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 186 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 233 | 0 | 119 |
| Lane Group Flow (vph) | 204 | 735 | 1417 | 411 | 93 | 50 |
| Heavy Vehicles (%) | 6% | 16% | 7% | 2% | 8% | 10% |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Actuated Green, G (s) | 44.4 | 44.4 | 30.4 | 30.4 | 23.7 | 23.7 |
| Effective Green, g (s) | 44.4 | 44.4 | 30.4 | 30.4 | 23.7 | 23.7 |
| Actuated g/C Ratio | 0.55 | 0.55 | 0.38 | 0.38 | 0.30 | 0.30 |
| Clearance Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 242 | 1636 | 1745 | 570 | 910 | 412 |
| v/s Ratio Prot | c0.08 | 0.25 | 0.31 | | 0.03 | |
| v/s Ratio Perm | c0.39 | | | 0.27 | | c0.04 |
| v/c Ratio | 0.84 | 0.45 | 0.81 | 0.72 | 0.10 | 0.12 |
| Uniform Delay, d1 | 15.7 | 10.6 | 22.2 | 21.2 | 20.4 | 20.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 22.5 | 0.2 | 3.0 | 4.5 | 0.2 | 0.6 |
| Delay (s) | 38.2 | 10.7 | 25.2 | 25.6 | 20.7 | 21.2 |
| Level of Service | D | B | C | C | C | C |
| Approach Delay (s) | | 16.7 | 25.4 | | 21.0 | |
| Approach LOS | | B | C | | C | |

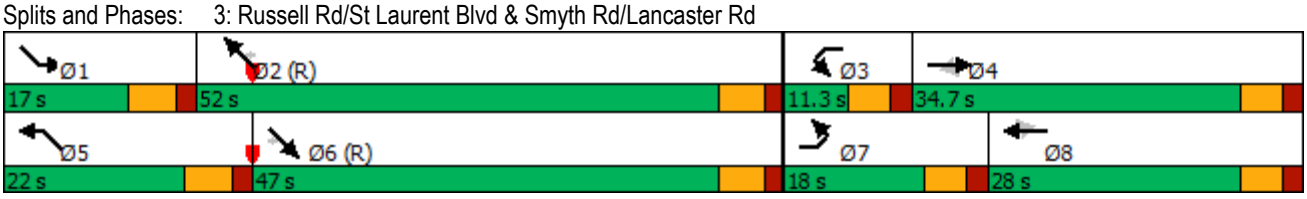
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 22.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 64.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

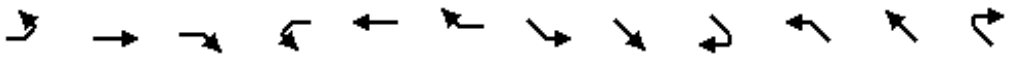
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| Future Volume (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 85.0 | | 85.0 | 55.0 | | 30.0 | 130.0 | | 115.0 | 185.0 | | 35.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 1651 | 1354 | 1346 | 3109 | 1275 | 1527 | 3226 | 1515 | 1500 | 3196 | 1354 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 1651 | 1354 | 1346 | 3109 | 1275 | 1527 | 3226 | 1515 | 1500 | 3196 | 1354 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 138 | | | 191 | | | 322 | | | 189 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 211.6 | | | 125.1 | | | 192.6 | | | 164.4 | |
| Travel Time (s) | | 15.2 | | | 9.0 | | | 13.9 | | | 11.8 | |
| Peak Hour 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 |
| Heavy Vehicles (%) | 2% | 9% | 13% | 27% | 10% | 20% | 12% | 6% | 1% | 14% | 7% | 13% |
| Adj. Flow (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| 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 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| 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 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 1 | 6 | 6 | 5 | 2 | 2 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Split (s) | 10.6 | 32.4 | 32.4 | 10.6 | 28.0 | 28.0 | 11.0 | 27.9 | 27.9 | 11.0 | 27.9 | 27.9 |
| Total Split (s) | 18.0 | 34.7 | 34.7 | 11.3 | 28.0 | 28.0 | 17.0 | 47.0 | 47.0 | 22.0 | 52.0 | 52.0 |
| Total Split (%) | 15.7% | 30.2% | 30.2% | 9.8% | 24.3% | 24.3% | 14.8% | 40.9% | 40.9% | 19.1% | 45.2% | 45.2% |
| Maximum Green (s) | 12.4 | 29.0 | 29.0 | 5.7 | 22.3 | 22.3 | 11.0 | 41.1 | 41.1 | 16.0 | 46.1 | 46.1 |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| All-Red Time (s) | 1.9 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 1.8 | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 |
| Lost Time Adjust (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 |
| Total Lost Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | 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 | | 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) | 12.4 | 26.9 | 26.9 | 5.7 | 15.7 | 15.7 | 15.4 | 44.2 | 44.2 | 19.5 | 48.3 | 48.3 |
| Actuated g/C Ratio | 0.11 | 0.23 | 0.23 | 0.05 | 0.14 | 0.14 | 0.13 | 0.38 | 0.38 | 0.17 | 0.42 | 0.42 |
| v/c Ratio | 0.88 | 0.28 | 0.23 | 0.50 | 0.67 | 0.32 | 0.68 | 0.49 | 0.84 | 0.76 | 0.86 | 0.14 |
| Control Delay | 76.2 | 39.1 | 3.5 | 79.0 | 54.8 | 2.5 | 65.3 | 29.3 | 28.1 | 64.9 | 38.5 | 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 | 0.0 |
| Total Delay | 76.2 | 39.1 | 3.5 | 79.0 | 54.8 | 2.5 | 65.3 | 29.3 | 28.1 | 64.9 | 38.5 | 0.4 |
| LOS | E | D | A | E | D | A | E | C | C | E | D | A |
| Approach Delay | | 54.5 | | | 43.3 | | | 32.3 | | | 39.4 | |
| Approach LOS | | D | | | D | | | C | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 115 | | | |
| Actuated Cycle Length: 115 | | | |
| Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green | | | |
| Natural Cycle: 95 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay: 39.3 | | Intersection LOS: D | |
| Intersection Capacity Utilization 78.5% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

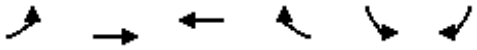
Splits and Phases: 3: Russell Rd/St Laurent Blvd & Smyth Rd/Lancaster Rd



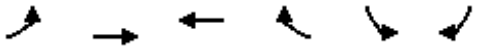


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| Future Volume (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3252 | 1651 | 1354 | 1346 | 3109 | 1275 | 1527 | 3226 | 1515 | 1500 | 3196 | 1354 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3252 | 1651 | 1354 | 1346 | 3109 | 1275 | 1527 | 3226 | 1515 | 1500 | 3196 | 1354 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 307 | 107 | 99 | 33 | 283 | 109 | 139 | 607 | 657 | 192 | 1148 | 98 |
| RTOR Reduction (vph) | 0 | 0 | 76 | 0 | 0 | 92 | 0 | 0 | 204 | 0 | 0 | 59 |
| Lane Group Flow (vph) | 307 | 107 | 23 | 33 | 283 | 17 | 139 | 607 | 453 | 192 | 1148 | 39 |
| Heavy Vehicles (%) | 2% | 9% | 13% | 27% | 10% | 20% | 12% | 6% | 1% | 14% | 7% | 13% |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Actuated Green, G (s) | 12.4 | 26.9 | 26.9 | 3.4 | 17.9 | 17.9 | 15.4 | 42.0 | 42.0 | 19.5 | 46.1 | 46.1 |
| Effective Green, g (s) | 12.4 | 26.9 | 26.9 | 3.4 | 17.9 | 17.9 | 15.4 | 42.0 | 42.0 | 19.5 | 46.1 | 46.1 |
| Actuated g/C Ratio | 0.11 | 0.23 | 0.23 | 0.03 | 0.16 | 0.16 | 0.13 | 0.37 | 0.37 | 0.17 | 0.40 | 0.40 |
| Clearance Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 350 | 386 | 316 | 39 | 483 | 198 | 204 | 1178 | 553 | 254 | 1281 | 542 |
| v/s Ratio Prot | c0.09 | 0.06 | | 0.02 | c0.09 | | 0.09 | 0.19 | | c0.13 | c0.36 | |
| v/s Ratio Perm | | | 0.02 | | | 0.01 | | | 0.30 | | | 0.03 |
| v/c Ratio | 0.88 | 0.28 | 0.07 | 0.85 | 0.59 | 0.09 | 0.68 | 0.52 | 0.82 | 0.76 | 0.90 | 0.07 |
| Uniform Delay, d1 | 50.5 | 36.1 | 34.3 | 55.5 | 45.1 | 41.5 | 47.5 | 28.5 | 33.0 | 45.5 | 32.2 | 21.3 |
| 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 | 21.1 | 0.4 | 0.1 | 84.9 | 1.8 | 0.2 | 9.0 | 1.6 | 12.7 | 12.1 | 10.0 | 0.3 |
| Delay (s) | 71.6 | 36.5 | 34.4 | 140.4 | 46.9 | 41.7 | 56.5 | 30.2 | 45.7 | 57.5 | 42.2 | 21.5 |
| Level of Service | E | D | C | F | D | D | E | C | D | E | D | C |
| Approach Delay (s) | | 57.1 | | | 52.9 | | | 40.1 | | | 42.8 | |
| Approach LOS | | E | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 44.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.84 | | |
| Actuated Cycle Length (s) | 115.0 | Sum of lost time (s) | 23.2 |
| Intersection Capacity Utilization | 78.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



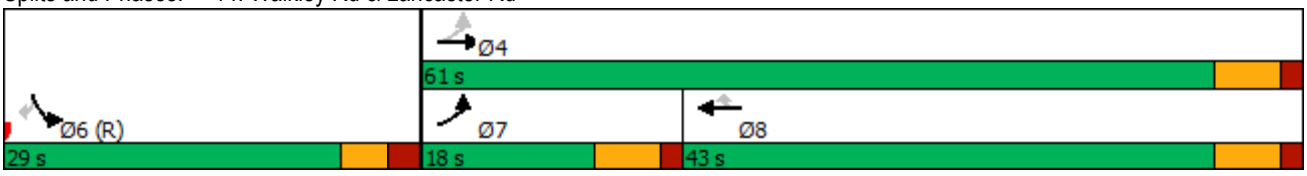
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Future Volume (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 120.0 | | | 25.0 | 75.0 | 150.0 |
| Storage Lanes | 1 | | | 1 | 1 | 1 |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1527 | 2974 | 4636 | 1404 | 2885 | 1297 |
| Flt Permitted | 0.096 | | | | 0.950 | |
| Satd. Flow (perm) | 154 | 2974 | 4636 | 1404 | 2885 | 1297 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | 346 | | 169 |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 246.9 | 393.2 | | 187.8 | |
| Travel Time (s) | | 17.8 | 28.3 | | 13.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 12% | 15% | 6% | 9% | 15% | 18% |
| Adj. Flow (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 3.6 | 3.6 | | 7.2 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (k/h) | 25 | | | 15 | 25 | 15 |
| Number of Detectors | 1 | 2 | 2 | 1 | 1 | 1 |
| Detector Template | Left | Thru | Thru | Right | Left | Right |
| Leading Detector (m) | 2.0 | 10.0 | 10.0 | 2.0 | 2.0 | 2.0 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 2.0 | 0.6 | 0.6 | 2.0 | 2.0 | 2.0 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 9.4 | 9.4 | | | |
| Detector 2 Size(m) | | 0.6 | 0.6 | | | |
| Detector 2 Type | | Cl+Ex | Cl+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

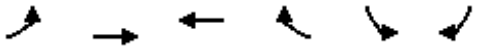


| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Minimum Split (s) | 11.2 | 24.2 | 37.2 | 37.2 | 27.7 | 27.7 |
| Total Split (s) | 18.0 | 61.0 | 43.0 | 43.0 | 29.0 | 29.0 |
| Total Split (%) | 20.0% | 67.8% | 47.8% | 47.8% | 32.2% | 32.2% |
| Maximum Green (s) | 11.8 | 54.8 | 36.8 | 36.8 | 23.3 | 23.3 |
| Yellow Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 3.3 | 3.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 2.4 | 2.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | C-Max | C-Max |
| Walk Time (s) | | | 20.0 | 20.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | | | 7.0 | 7.0 | 15.0 | 15.0 |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 53.2 | 53.2 | 35.4 | 35.4 | 24.9 | 24.9 |
| Actuated g/C Ratio | 0.59 | 0.59 | 0.39 | 0.39 | 0.28 | 0.28 |
| v/c Ratio | 0.76 | 0.42 | 0.78 | 0.84 | 0.12 | 0.35 |
| Control Delay | 37.6 | 10.7 | 27.2 | 22.9 | 25.8 | 6.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 37.6 | 10.7 | 27.2 | 22.9 | 25.8 | 6.7 |
| LOS | D | B | C | C | C | A |
| Approach Delay | | 16.5 | 25.9 | | 13.5 | |
| Approach LOS | | B | C | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.84 | | | |
| Intersection Signal Delay: 22.2 | | Intersection LOS: C | |
| Intersection Capacity Utilization 64.3% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 14: Walkley Rd & Lancaster Rd





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Future Volume (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1527 | 2974 | 4636 | 1404 | 2885 | 1297 |
| Flt Permitted | 0.10 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 155 | 2974 | 4636 | 1404 | 2885 | 1297 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 204 | 735 | 1417 | 643 | 93 | 169 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 210 | 0 | 122 |
| Lane Group Flow (vph) | 204 | 735 | 1417 | 433 | 93 | 47 |
| Heavy Vehicles (%) | 12% | 15% | 6% | 9% | 15% | 18% |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Actuated Green, G (s) | 53.2 | 53.2 | 35.4 | 35.4 | 24.9 | 24.9 |
| Effective Green, g (s) | 53.2 | 53.2 | 35.4 | 35.4 | 24.9 | 24.9 |
| Actuated g/C Ratio | 0.59 | 0.59 | 0.39 | 0.39 | 0.28 | 0.28 |
| Clearance Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 268 | 1757 | 1823 | 552 | 798 | 358 |
| v/s Ratio Prot | c0.10 | 0.25 | 0.31 | | 0.03 | |
| v/s Ratio Perm | c0.35 | | | 0.31 | | c0.04 |
| v/c Ratio | 0.76 | 0.42 | 0.78 | 0.78 | 0.12 | 0.13 |
| Uniform Delay, d1 | 19.7 | 10.0 | 23.9 | 24.0 | 24.3 | 24.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 12.0 | 0.2 | 2.2 | 7.2 | 0.3 | 0.8 |
| Delay (s) | 31.8 | 10.2 | 26.0 | 31.2 | 24.6 | 25.2 |
| Level of Service | C | B | C | C | C | C |
| Approach Delay (s) | | 14.8 | 27.6 | | 25.0 | |
| Approach LOS | | B | C | | C | |

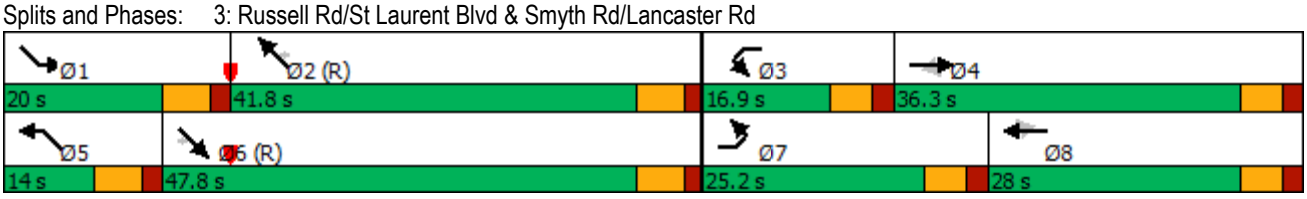
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 23.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.57 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 64.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| Future Volume (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 85.0 | | 85.0 | 55.0 | | 30.0 | 130.0 | | 115.0 | 185.0 | | 35.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 227 | | | 191 | | | 364 | | | 189 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 211.6 | | | 125.1 | | | 192.6 | | | 164.4 | |
| Travel Time (s) | | 15.2 | | | 9.0 | | | 13.9 | | | 11.8 | |
| Peak Hour 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 |
| Heavy Vehicles (%) | 1% | 1% | 3% | 3% | 1% | 1% | 2% | 2% | 1% | 10% | 4% | 1% |
| Adj. Flow (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| 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 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| 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 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 1 | 6 | 6 | 5 | 2 | 2 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Split (s) | 10.6 | 32.4 | 32.4 | 10.6 | 28.0 | 28.0 | 11.0 | 27.9 | 27.9 | 11.0 | 27.9 | 27.9 |
| Total Split (s) | 25.2 | 36.3 | 36.3 | 16.9 | 28.0 | 28.0 | 20.0 | 47.8 | 47.8 | 14.0 | 41.8 | 41.8 |
| Total Split (%) | 21.9% | 31.6% | 31.6% | 14.7% | 24.3% | 24.3% | 17.4% | 41.6% | 41.6% | 12.2% | 36.3% | 36.3% |
| Maximum Green (s) | 19.6 | 30.6 | 30.6 | 11.3 | 22.3 | 22.3 | 14.0 | 41.9 | 41.9 | 8.0 | 35.9 | 35.9 |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| All-Red Time (s) | 1.9 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 1.8 | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 |
| Lost Time Adjust (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 |
| Total Lost Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | 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 | | 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) | 19.5 | 23.7 | 23.7 | 10.4 | 14.6 | 14.6 | 13.8 | 46.0 | 46.0 | 11.7 | 43.9 | 43.9 |
| Actuated g/C Ratio | 0.17 | 0.21 | 0.21 | 0.09 | 0.13 | 0.13 | 0.12 | 0.40 | 0.40 | 0.10 | 0.38 | 0.38 |
| v/c Ratio | 0.92 | 0.76 | 0.47 | 0.68 | 0.25 | 0.66 | 0.70 | 0.84 | 0.44 | 0.63 | 0.59 | 0.14 |
| Control Delay | 70.8 | 56.4 | 7.8 | 73.0 | 44.7 | 19.6 | 66.9 | 39.0 | 4.5 | 68.5 | 32.5 | 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 | 0.0 |
| Total Delay | 70.8 | 56.4 | 7.8 | 73.0 | 44.7 | 19.6 | 66.9 | 39.0 | 4.5 | 68.5 | 32.5 | 0.4 |
| LOS | E | E | A | E | D | B | E | D | A | E | C | A |
| Approach Delay | | 52.9 | | | 37.9 | | | 33.6 | | | 33.1 | |
| Approach LOS | | D | | | D | | | C | | | C | |

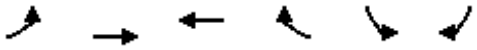
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 115 | | | |
| Actuated Cycle Length: 115 | | | |
| Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green | | | |
| Natural Cycle: 105 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.92 | | | |
| Intersection Signal Delay: 38.9 | | Intersection LOS: D | |
| Intersection Capacity Utilization 79.4% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Russell Rd/St Laurent Blvd & Smyth Rd/Lancaster Rd

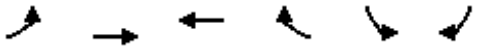


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| Future Volume (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| RTOR Reduction (vph) | 0 | 0 | 180 | 0 | 0 | 167 | 0 | 0 | 218 | 0 | 0 | 59 |
| Lane Group Flow (vph) | 514 | 280 | 47 | 102 | 108 | 68 | 140 | 1120 | 146 | 100 | 743 | 36 |
| Heavy Vehicles (%) | 1% | 1% | 3% | 3% | 1% | 1% | 2% | 2% | 1% | 10% | 4% | 1% |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Actuated Green, G (s) | 19.5 | 23.7 | 23.7 | 10.4 | 14.6 | 14.6 | 13.8 | 46.0 | 46.0 | 11.7 | 43.9 | 43.9 |
| Effective Green, g (s) | 19.5 | 23.7 | 23.7 | 10.4 | 14.6 | 14.6 | 13.8 | 46.0 | 46.0 | 11.7 | 43.9 | 43.9 |
| Actuated g/C Ratio | 0.17 | 0.21 | 0.21 | 0.09 | 0.13 | 0.13 | 0.12 | 0.40 | 0.40 | 0.10 | 0.38 | 0.38 |
| Clearance Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 557 | 367 | 306 | 150 | 429 | 192 | 201 | 1341 | 606 | 158 | 1255 | 578 |
| v/s Ratio Prot | c0.16 | c0.16 | | 0.06 | 0.03 | | c0.08 | c0.33 | | 0.06 | 0.23 | |
| v/s Ratio Perm | | | 0.03 | | | 0.05 | | | 0.10 | | | 0.02 |
| v/c Ratio | 0.92 | 0.76 | 0.15 | 0.68 | 0.25 | 0.36 | 0.70 | 0.84 | 0.24 | 0.63 | 0.59 | 0.06 |
| Uniform Delay, d1 | 47.0 | 43.0 | 37.4 | 50.7 | 45.3 | 45.9 | 48.6 | 31.1 | 22.9 | 49.6 | 28.4 | 22.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 21.0 | 9.1 | 0.2 | 12.0 | 0.3 | 1.1 | 10.0 | 6.3 | 0.9 | 8.0 | 2.1 | 0.2 |
| Delay (s) | 68.0 | 52.1 | 37.7 | 62.6 | 45.6 | 47.0 | 58.6 | 37.4 | 23.8 | 57.6 | 30.5 | 22.7 |
| Level of Service | E | D | D | E | D | D | E | D | C | E | C | C |
| Approach Delay (s) | | 56.9 | | | 50.3 | | | 36.2 | | | 32.6 | |
| Approach LOS | | E | | | D | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 42.1 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.86 | | |
| Actuated Cycle Length (s) | 115.0 | Sum of lost time (s) | 23.2 |
| Intersection Capacity Utilization | 79.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



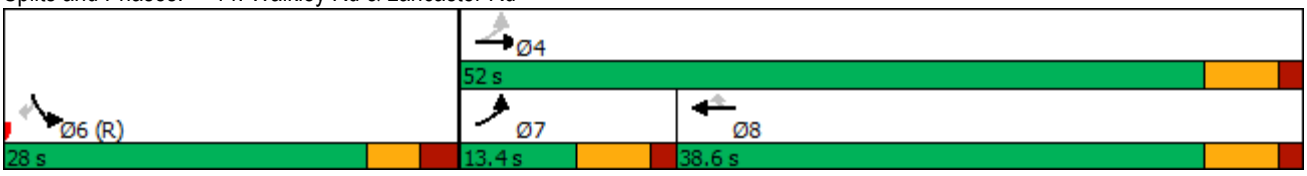
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Future Volume (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 120.0 | | | 25.0 | 75.0 | 150.0 |
| Storage Lanes | 1 | | | 1 | 1 | 1 |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1676 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Flt Permitted | 0.212 | | | | 0.950 | |
| Satd. Flow (perm) | 374 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | 147 | | 205 |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 246.9 | 393.2 | | 187.8 | |
| Travel Time (s) | | 17.8 | 28.3 | | 13.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 5% | 9% | 9% | 2% | 3% |
| Adj. Flow (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 3.6 | 3.6 | | 7.2 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (k/h) | 25 | | | 15 | 25 | 15 |
| Number of Detectors | 1 | 2 | 2 | 1 | 1 | 1 |
| Detector Template | Left | Thru | Thru | Right | Left | Right |
| Leading Detector (m) | 2.0 | 10.0 | 10.0 | 2.0 | 2.0 | 2.0 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 2.0 | 0.6 | 0.6 | 2.0 | 2.0 | 2.0 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 9.4 | 9.4 | | | |
| Detector 2 Size(m) | | 0.6 | 0.6 | | | |
| Detector 2 Type | | Cl+Ex | Cl+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

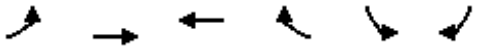


| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Minimum Split (s) | 11.2 | 24.2 | 37.2 | 37.2 | 27.7 | 27.7 |
| Total Split (s) | 13.4 | 52.0 | 38.6 | 38.6 | 28.0 | 28.0 |
| Total Split (%) | 16.8% | 65.0% | 48.3% | 48.3% | 35.0% | 35.0% |
| Maximum Green (s) | 7.2 | 45.8 | 32.4 | 32.4 | 22.3 | 22.3 |
| Yellow Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 3.3 | 3.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 2.4 | 2.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | C-Max | C-Max |
| Walk Time (s) | | | 20.0 | 20.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | | | 7.0 | 7.0 | 15.0 | 15.0 |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 45.6 | 45.6 | 34.8 | 34.8 | 22.5 | 22.5 |
| Actuated g/C Ratio | 0.57 | 0.57 | 0.44 | 0.44 | 0.28 | 0.28 |
| v/c Ratio | 0.39 | 0.95 | 0.48 | 0.24 | 0.53 | 0.36 |
| Control Delay | 11.5 | 28.9 | 17.9 | 4.7 | 26.8 | 5.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 11.5 | 28.9 | 17.9 | 4.7 | 26.8 | 5.6 |
| LOS | B | C | B | A | C | A |
| Approach Delay | | 27.7 | 16.0 | | 20.5 | |
| Approach LOS | | C | B | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.95 | | | |
| Intersection Signal Delay: 22.8 | | Intersection LOS: C | |
| Intersection Capacity Utilization 75.7% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 14: Walkley Rd & Lancaster Rd





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Future Volume (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1676 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Flt Permitted | 0.21 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 374 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 83 | 0 | 150 |
| Lane Group Flow (vph) | 126 | 1756 | 952 | 81 | 483 | 55 |
| Heavy Vehicles (%) | 2% | 5% | 9% | 9% | 2% | 3% |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Actuated Green, G (s) | 46.8 | 46.8 | 34.8 | 34.8 | 21.3 | 21.3 |
| Effective Green, g (s) | 46.8 | 46.8 | 34.8 | 34.8 | 21.3 | 21.3 |
| Actuated g/C Ratio | 0.58 | 0.58 | 0.43 | 0.43 | 0.27 | 0.27 |
| Clearance Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 313 | 1905 | 1960 | 610 | 865 | 395 |
| v/s Ratio Prot | 0.03 | c0.54 | 0.21 | | c0.15 | |
| v/s Ratio Perm | 0.21 | | | 0.06 | | 0.04 |
| v/c Ratio | 0.40 | 0.92 | 0.49 | 0.13 | 0.56 | 0.14 |
| Uniform Delay, d1 | 8.4 | 15.0 | 16.2 | 13.6 | 25.3 | 22.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.8 | 7.9 | 0.2 | 0.1 | 2.6 | 0.7 |
| Delay (s) | 9.3 | 22.9 | 16.4 | 13.7 | 27.9 | 23.1 |
| Level of Service | A | C | B | B | C | C |
| Approach Delay (s) | | 22.0 | 16.0 | | 26.5 | |
| Approach LOS | | C | B | | C | |

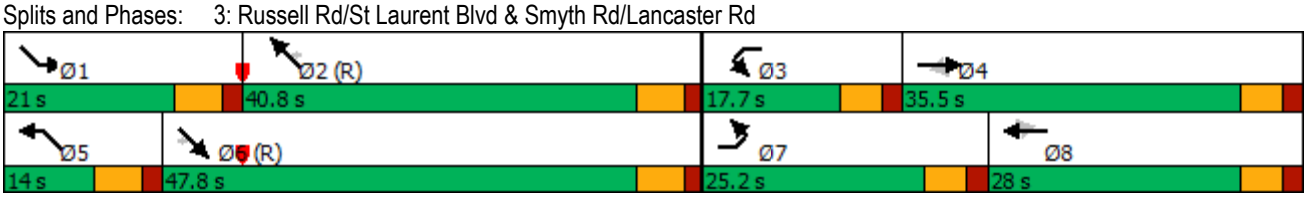
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 21.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.89 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 75.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

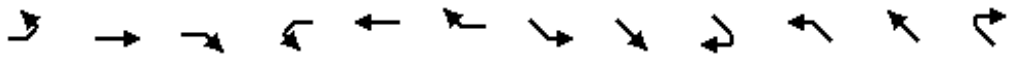
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| Future Volume (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 85.0 | | 85.0 | 55.0 | | 30.0 | 130.0 | | 115.0 | 185.0 | | 35.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3285 | 1667 | 1485 | 1541 | 3167 | 1404 | 1569 | 3353 | 1515 | 1555 | 3320 | 1430 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3285 | 1667 | 1485 | 1541 | 3167 | 1404 | 1569 | 3353 | 1515 | 1555 | 3320 | 1430 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 227 | | | 248 | | | 364 | | | 246 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 211.6 | | | 125.1 | | | 192.6 | | | 164.4 | |
| Travel Time (s) | | 15.2 | | | 9.0 | | | 13.9 | | | 11.8 | |
| Peak Hour 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 |
| Heavy Vehicles (%) | 1% | 8% | 3% | 11% | 8% | 9% | 9% | 2% | 1% | 10% | 3% | 7% |
| Adj. Flow (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| 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 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| 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 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 1 | 6 | 6 | 5 | 2 | 2 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Split (s) | 10.6 | 32.4 | 32.4 | 10.6 | 28.0 | 28.0 | 11.0 | 27.9 | 27.9 | 11.0 | 27.9 | 27.9 |
| Total Split (s) | 25.2 | 35.5 | 35.5 | 17.7 | 28.0 | 28.0 | 21.0 | 47.8 | 47.8 | 14.0 | 40.8 | 40.8 |
| Total Split (%) | 21.9% | 30.9% | 30.9% | 15.4% | 24.3% | 24.3% | 18.3% | 41.6% | 41.6% | 12.2% | 35.5% | 35.5% |
| Maximum Green (s) | 19.6 | 29.8 | 29.8 | 12.1 | 22.3 | 22.3 | 15.0 | 41.9 | 41.9 | 8.0 | 34.9 | 34.9 |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| All-Red Time (s) | 1.9 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 1.8 | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 |
| Lost Time Adjust (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 |
| Total Lost Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | 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 | | 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) | 19.5 | 24.2 | 24.2 | 11.0 | 15.7 | 15.7 | 14.2 | 45.5 | 45.5 | 11.0 | 42.4 | 42.4 |
| Actuated g/C Ratio | 0.17 | 0.21 | 0.21 | 0.10 | 0.14 | 0.14 | 0.12 | 0.40 | 0.40 | 0.10 | 0.37 | 0.37 |
| v/c Ratio | 0.92 | 0.80 | 0.46 | 0.69 | 0.25 | 0.58 | 0.73 | 0.84 | 0.44 | 0.67 | 0.61 | 0.14 |
| Control Delay | 70.8 | 59.8 | 7.7 | 74.0 | 43.8 | 10.4 | 69.6 | 39.7 | 4.5 | 73.3 | 33.9 | 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 | 0.0 |
| Total Delay | 70.8 | 59.8 | 7.7 | 74.0 | 43.8 | 10.4 | 69.6 | 39.7 | 4.5 | 73.3 | 33.9 | 0.4 |
| LOS | E | E | A | E | D | B | E | D | A | E | C | A |
| Approach Delay | | 53.8 | | | 33.1 | | | 34.4 | | | 34.7 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 115 | | | |
| Actuated Cycle Length: 115 | | | |
| Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green | | | |
| Natural Cycle: 105 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.92 | | | |
| Intersection Signal Delay: 39.2 | | Intersection LOS: D | |
| Intersection Capacity Utilization 79.4% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

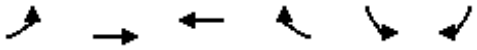
Splits and Phases: 3: Russell Rd/St Laurent Blvd & Smyth Rd/Lancaster Rd





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| Future Volume (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3285 | 1667 | 1485 | 1541 | 3167 | 1404 | 1569 | 3353 | 1515 | 1555 | 3320 | 1430 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3285 | 1667 | 1485 | 1541 | 3167 | 1404 | 1569 | 3353 | 1515 | 1555 | 3320 | 1430 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 514 | 280 | 227 | 102 | 108 | 235 | 140 | 1120 | 364 | 100 | 743 | 95 |
| RTOR Reduction (vph) | 0 | 0 | 179 | 0 | 0 | 203 | 0 | 0 | 220 | 0 | 0 | 60 |
| Lane Group Flow (vph) | 514 | 280 | 48 | 102 | 108 | 32 | 140 | 1120 | 144 | 100 | 743 | 35 |
| Heavy Vehicles (%) | 1% | 8% | 3% | 11% | 8% | 9% | 9% | 2% | 1% | 10% | 3% | 7% |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Actuated Green, G (s) | 19.5 | 24.2 | 24.2 | 11.0 | 15.7 | 15.7 | 14.2 | 45.6 | 45.6 | 11.0 | 42.4 | 42.4 |
| Effective Green, g (s) | 19.5 | 24.2 | 24.2 | 11.0 | 15.7 | 15.7 | 14.2 | 45.6 | 45.6 | 11.0 | 42.4 | 42.4 |
| Actuated g/C Ratio | 0.17 | 0.21 | 0.21 | 0.10 | 0.14 | 0.14 | 0.12 | 0.40 | 0.40 | 0.10 | 0.37 | 0.37 |
| Clearance Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 557 | 350 | 312 | 147 | 432 | 191 | 193 | 1329 | 600 | 148 | 1224 | 527 |
| v/s Ratio Prot | c0.16 | c0.17 | | 0.07 | 0.03 | | c0.09 | c0.33 | | 0.06 | 0.22 | |
| v/s Ratio Perm | | | 0.03 | | | 0.02 | | | 0.10 | | | 0.02 |
| v/c Ratio | 0.92 | 0.80 | 0.15 | 0.69 | 0.25 | 0.17 | 0.73 | 0.84 | 0.24 | 0.68 | 0.61 | 0.07 |
| Uniform Delay, d1 | 47.0 | 43.1 | 37.0 | 50.4 | 44.4 | 43.9 | 48.5 | 31.5 | 23.1 | 50.3 | 29.5 | 23.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 21.0 | 12.3 | 0.2 | 13.3 | 0.3 | 0.4 | 12.7 | 6.6 | 0.9 | 11.6 | 2.2 | 0.2 |
| Delay (s) | 68.0 | 55.4 | 37.3 | 63.6 | 44.7 | 44.3 | 61.2 | 38.1 | 24.1 | 61.8 | 31.8 | 23.7 |
| Level of Service | E | E | D | E | D | D | E | D | C | E | C | C |
| Approach Delay (s) | | 57.7 | | | 48.8 | | | 36.9 | | | 34.2 | |
| Approach LOS | | E | | | D | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 42.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 115.0 | Sum of lost time (s) | 23.2 |
| Intersection Capacity Utilization | 79.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

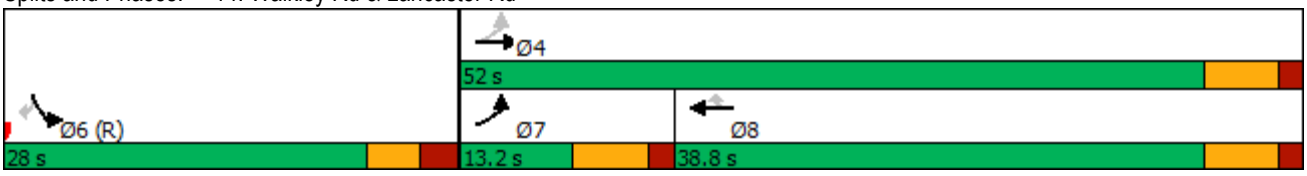


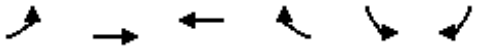
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Future Volume (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 120.0 | | | 25.0 | 75.0 | 150.0 |
| Storage Lanes | 1 | | | 1 | 1 | 1 |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1583 | 3257 | 4550 | 1330 | 3043 | 1391 |
| Flt Permitted | 0.213 | | | | 0.950 | |
| Satd. Flow (perm) | 355 | 3257 | 4550 | 1330 | 3043 | 1391 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | 147 | | 205 |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 246.9 | 393.2 | | 187.8 | |
| Travel Time (s) | | 17.8 | 28.3 | | 13.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 8% | 5% | 8% | 15% | 9% | 10% |
| Adj. Flow (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 3.6 | 3.6 | | 7.2 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (k/h) | 25 | | | 15 | 25 | 15 |
| Number of Detectors | 1 | 2 | 2 | 1 | 1 | 1 |
| Detector Template | Left | Thru | Thru | Right | Left | Right |
| Leading Detector (m) | 2.0 | 10.0 | 10.0 | 2.0 | 2.0 | 2.0 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 2.0 | 0.6 | 0.6 | 2.0 | 2.0 | 2.0 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 9.4 | 9.4 | | | |
| Detector 2 Size(m) | | 0.6 | 0.6 | | | |
| Detector 2 Type | | Cl+Ex | Cl+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Minimum Split (s) | 11.2 | 24.2 | 37.2 | 37.2 | 27.7 | 27.7 |
| Total Split (s) | 13.2 | 52.0 | 38.8 | 38.8 | 28.0 | 28.0 |
| Total Split (%) | 16.5% | 65.0% | 48.5% | 48.5% | 35.0% | 35.0% |
| Maximum Green (s) | 7.0 | 45.8 | 32.6 | 32.6 | 22.3 | 22.3 |
| Yellow Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 3.3 | 3.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 2.4 | 2.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | C-Max | C-Max |
| Walk Time (s) | | | 20.0 | 20.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | | | 7.0 | 7.0 | 15.0 | 15.0 |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 45.6 | 45.6 | 35.0 | 35.0 | 22.5 | 22.5 |
| Actuated g/C Ratio | 0.57 | 0.57 | 0.44 | 0.44 | 0.28 | 0.28 |
| v/c Ratio | 0.41 | 0.95 | 0.48 | 0.25 | 0.56 | 0.38 |
| Control Delay | 12.2 | 28.9 | 17.7 | 4.7 | 27.7 | 5.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.2 | 28.9 | 17.7 | 4.7 | 27.7 | 5.9 |
| LOS | B | C | B | A | C | A |
| Approach Delay | | 27.8 | 15.8 | | 21.2 | |
| Approach LOS | | C | B | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.95 | | | |
| Intersection Signal Delay: 22.9 | | Intersection LOS: C | |
| Intersection Capacity Utilization 75.7% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 14: Walkley Rd & Lancaster Rd





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Future Volume (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1583 | 3257 | 4550 | 1330 | 3043 | 1391 |
| Flt Permitted | 0.21 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 354 | 3257 | 4550 | 1330 | 3043 | 1391 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 126 | 1756 | 952 | 164 | 483 | 205 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 83 | 0 | 150 |
| Lane Group Flow (vph) | 126 | 1756 | 952 | 81 | 483 | 55 |
| Heavy Vehicles (%) | 8% | 5% | 8% | 15% | 9% | 10% |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Actuated Green, G (s) | 46.8 | 46.8 | 35.0 | 35.0 | 21.3 | 21.3 |
| Effective Green, g (s) | 46.8 | 46.8 | 35.0 | 35.0 | 21.3 | 21.3 |
| Actuated g/C Ratio | 0.58 | 0.58 | 0.44 | 0.44 | 0.27 | 0.27 |
| Clearance Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 293 | 1905 | 1990 | 581 | 810 | 370 |
| v/s Ratio Prot | 0.03 | c0.54 | 0.21 | | c0.16 | |
| v/s Ratio Perm | 0.22 | | | 0.06 | | 0.04 |
| v/c Ratio | 0.43 | 0.92 | 0.48 | 0.14 | 0.60 | 0.15 |
| Uniform Delay, d1 | 8.5 | 15.0 | 16.0 | 13.5 | 25.6 | 22.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.0 | 7.9 | 0.2 | 0.1 | 3.2 | 0.8 |
| Delay (s) | 9.5 | 22.9 | 16.2 | 13.6 | 28.8 | 23.3 |
| Level of Service | A | C | B | B | C | C |
| Approach Delay (s) | | 22.0 | 15.8 | | 27.2 | |
| Approach LOS | | C | B | | C | |

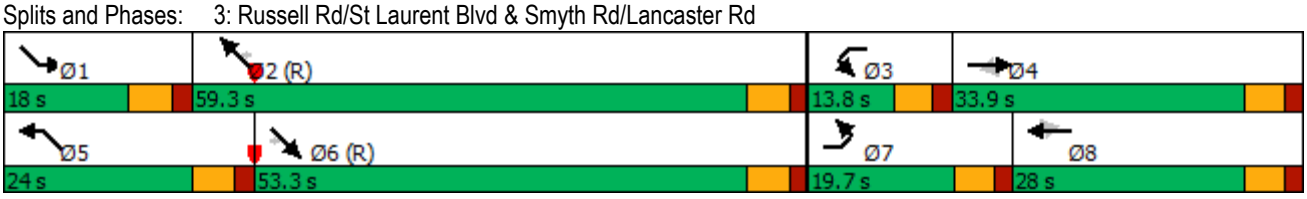
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 21.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 75.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| Future Volume (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 85.0 | | 85.0 | 55.0 | | 30.0 | 130.0 | | 115.0 | 185.0 | | 35.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 127 | | | 175 | | | 328 | | | 174 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 211.6 | | | 125.1 | | | 192.6 | | | 164.4 | |
| Travel Time (s) | | 15.2 | | | 9.0 | | | 13.9 | | | 11.8 | |
| Peak Hour 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 |
| Heavy Vehicles (%) | 2% | 3% | 13% | 19% | 2% | 13% | 4% | 6% | 1% | 14% | 7% | 6% |
| Adj. Flow (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| 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 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| 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 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 1 | 6 | 6 | 5 | 2 | 2 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Split (s) | 10.6 | 32.4 | 32.4 | 10.6 | 28.0 | 28.0 | 11.0 | 27.9 | 27.9 | 11.0 | 27.9 | 27.9 |
| Total Split (s) | 19.7 | 33.9 | 33.9 | 13.8 | 28.0 | 28.0 | 18.0 | 53.3 | 53.3 | 24.0 | 59.3 | 59.3 |
| Total Split (%) | 15.8% | 27.1% | 27.1% | 11.0% | 22.4% | 22.4% | 14.4% | 42.6% | 42.6% | 19.2% | 47.4% | 47.4% |
| Maximum Green (s) | 14.1 | 28.2 | 28.2 | 8.2 | 22.3 | 22.3 | 12.0 | 47.4 | 47.4 | 18.0 | 53.4 | 53.4 |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| All-Red Time (s) | 1.9 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 1.8 | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 |
| Lost Time Adjust (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 |
| Total Lost Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | 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 | | 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) | 14.1 | 27.7 | 27.7 | 7.4 | 16.3 | 16.3 | 15.6 | 50.1 | 50.1 | 21.3 | 55.8 | 55.8 |
| Actuated g/C Ratio | 0.11 | 0.22 | 0.22 | 0.06 | 0.13 | 0.13 | 0.12 | 0.40 | 0.40 | 0.17 | 0.45 | 0.45 |
| v/c Ratio | 0.88 | 0.29 | 0.26 | 0.40 | 0.68 | 0.35 | 0.71 | 0.49 | 0.86 | 0.79 | 0.85 | 0.14 |
| Control Delay | 79.9 | 44.1 | 5.7 | 70.2 | 59.7 | 4.0 | 72.0 | 30.2 | 30.2 | 72.0 | 38.2 | 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 | 0.0 |
| Total Delay | 79.9 | 44.1 | 5.7 | 70.2 | 59.7 | 4.0 | 72.0 | 30.2 | 30.2 | 72.0 | 38.2 | 0.4 |
| LOS | E | D | A | E | E | A | E | C | C | E | D | A |
| Approach Delay | | 58.1 | | | 46.2 | | | 34.4 | | | 40.2 | |
| Approach LOS | | E | | | D | | | C | | | D | |

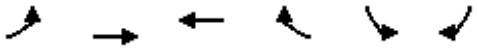
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 125 | | | |
| Actuated Cycle Length: 125 | | | |
| Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green | | | |
| Natural Cycle: 105 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay: 41.1 | | Intersection LOS: D | |
| Intersection Capacity Utilization 81.5% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Russell Rd/St Laurent Blvd & Smyth Rd/Lancaster Rd



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| Future Volume (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3252 | 1748 | 1354 | 1437 | 3353 | 1354 | 1644 | 3226 | 1515 | 1500 | 3196 | 1443 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| RTOR Reduction (vph) | 0 | 0 | 81 | 0 | 0 | 98 | 0 | 0 | 202 | 0 | 0 | 59 |
| Lane Group Flow (vph) | 323 | 113 | 23 | 34 | 297 | 17 | 146 | 638 | 488 | 202 | 1206 | 44 |
| Heavy Vehicles (%) | 2% | 3% | 13% | 19% | 2% | 13% | 4% | 6% | 1% | 14% | 7% | 6% |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Actuated Green, G (s) | 14.1 | 27.7 | 27.7 | 4.9 | 18.5 | 18.5 | 15.6 | 47.9 | 47.9 | 21.3 | 53.6 | 53.6 |
| Effective Green, g (s) | 14.1 | 27.7 | 27.7 | 4.9 | 18.5 | 18.5 | 15.6 | 47.9 | 47.9 | 21.3 | 53.6 | 53.6 |
| Actuated g/C Ratio | 0.11 | 0.22 | 0.22 | 0.04 | 0.15 | 0.15 | 0.12 | 0.38 | 0.38 | 0.17 | 0.43 | 0.43 |
| Clearance Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 366 | 387 | 300 | 56 | 496 | 200 | 205 | 1236 | 580 | 255 | 1370 | 618 |
| v/s Ratio Prot | c0.10 | 0.06 | | 0.02 | c0.09 | | 0.09 | 0.20 | | c0.13 | c0.38 | |
| v/s Ratio Perm | | | 0.02 | | | 0.01 | | | 0.32 | | | 0.03 |
| v/c Ratio | 0.88 | 0.29 | 0.08 | 0.61 | 0.60 | 0.09 | 0.71 | 0.52 | 0.84 | 0.79 | 0.88 | 0.07 |
| Uniform Delay, d1 | 54.6 | 40.5 | 38.5 | 59.1 | 49.8 | 45.9 | 52.5 | 29.6 | 35.1 | 49.7 | 32.8 | 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 | 21.3 | 0.4 | 0.1 | 17.2 | 2.0 | 0.2 | 11.1 | 1.5 | 13.8 | 15.4 | 8.4 | 0.2 |
| Delay (s) | 75.9 | 40.9 | 38.6 | 76.3 | 51.7 | 46.1 | 63.6 | 31.2 | 48.8 | 65.1 | 41.1 | 21.3 |
| Level of Service | E | D | D | E | D | D | E | C | D | E | D | C |
| Approach Delay (s) | | 61.4 | | | 52.2 | | | 42.7 | | | 43.0 | |
| Approach LOS | | E | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 46.4 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.84 | | |
| Actuated Cycle Length (s) | 125.0 | Sum of lost time (s) | 23.2 |
| Intersection Capacity Utilization | 81.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

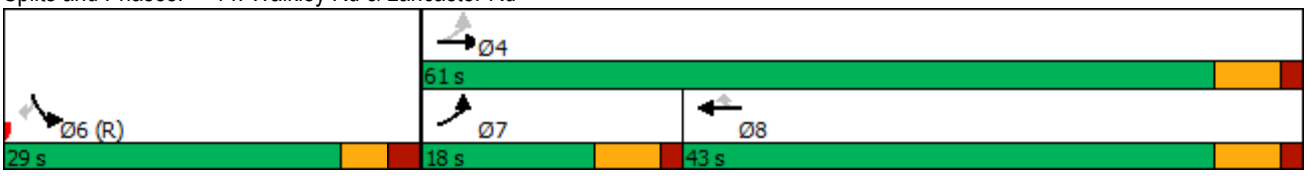


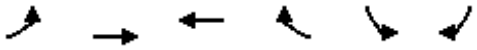
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Future Volume (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 120.0 | | | 25.0 | 75.0 | 150.0 |
| Storage Lanes | 1 | | | 1 | 1 | 1 |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1613 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Flt Permitted | 0.095 | | | | 0.950 | |
| Satd. Flow (perm) | 161 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | 346 | | 178 |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 246.9 | 393.2 | | 187.8 | |
| Travel Time (s) | | 17.8 | 28.3 | | 13.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 6% | 16% | 7% | 2% | 8% | 10% |
| Adj. Flow (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 3.6 | 3.6 | | 7.2 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (k/h) | 25 | | | 15 | 25 | 15 |
| Number of Detectors | 1 | 2 | 2 | 1 | 1 | 1 |
| Detector Template | Left | Thru | Thru | Right | Left | Right |
| Leading Detector (m) | 2.0 | 10.0 | 10.0 | 2.0 | 2.0 | 2.0 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 2.0 | 0.6 | 0.6 | 2.0 | 2.0 | 2.0 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 9.4 | 9.4 | | | |
| Detector 2 Size(m) | | 0.6 | 0.6 | | | |
| Detector 2 Type | | Cl+Ex | Cl+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Minimum Split (s) | 11.2 | 24.2 | 37.2 | 37.2 | 27.7 | 27.7 |
| Total Split (s) | 18.0 | 61.0 | 43.0 | 43.0 | 29.0 | 29.0 |
| Total Split (%) | 20.0% | 67.8% | 47.8% | 47.8% | 32.2% | 32.2% |
| Maximum Green (s) | 11.8 | 54.8 | 36.8 | 36.8 | 23.3 | 23.3 |
| Yellow Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 3.3 | 3.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 2.4 | 2.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | C-Max | C-Max |
| Walk Time (s) | | | 20.0 | 20.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | | | 7.0 | 7.0 | 15.0 | 15.0 |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 53.8 | 53.8 | 36.0 | 36.0 | 24.3 | 24.3 |
| Actuated g/C Ratio | 0.60 | 0.60 | 0.40 | 0.40 | 0.27 | 0.27 |
| v/c Ratio | 0.77 | 0.42 | 0.81 | 0.84 | 0.12 | 0.35 |
| Control Delay | 37.1 | 10.4 | 28.1 | 22.4 | 25.9 | 6.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 37.1 | 10.4 | 28.1 | 22.4 | 25.9 | 6.5 |
| LOS | D | B | C | C | C | A |
| Approach Delay | | 16.5 | 26.3 | | 13.3 | |
| Approach LOS | | B | C | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.84 | | | |
| Intersection Signal Delay: 22.5 | | Intersection LOS: C | |
| Intersection Capacity Utilization 67.3% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 14: Walkley Rd & Lancaster Rd





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Future Volume (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1613 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Flt Permitted | 0.09 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 161 | 2948 | 4593 | 1500 | 3072 | 1391 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 208 | 0 | 130 |
| Lane Group Flow (vph) | 218 | 735 | 1489 | 468 | 97 | 48 |
| Heavy Vehicles (%) | 6% | 16% | 7% | 2% | 8% | 10% |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Actuated Green, G (s) | 53.8 | 53.8 | 36.0 | 36.0 | 24.3 | 24.3 |
| Effective Green, g (s) | 53.8 | 53.8 | 36.0 | 36.0 | 24.3 | 24.3 |
| Actuated g/C Ratio | 0.60 | 0.60 | 0.40 | 0.40 | 0.27 | 0.27 |
| Clearance Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 283 | 1762 | 1837 | 600 | 829 | 375 |
| v/s Ratio Prot | c0.10 | 0.25 | 0.32 | | 0.03 | |
| v/s Ratio Perm | c0.36 | | | 0.31 | | c0.03 |
| v/c Ratio | 0.77 | 0.42 | 0.81 | 0.78 | 0.12 | 0.13 |
| Uniform Delay, d1 | 20.3 | 9.7 | 24.0 | 23.6 | 24.8 | 24.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 12.2 | 0.2 | 2.8 | 6.5 | 0.3 | 0.7 |
| Delay (s) | 32.5 | 9.9 | 26.8 | 30.1 | 25.1 | 25.5 |
| Level of Service | C | A | C | C | C | C |
| Approach Delay (s) | | 15.0 | 27.8 | | 25.4 | |
| Approach LOS | | B | C | | C | |

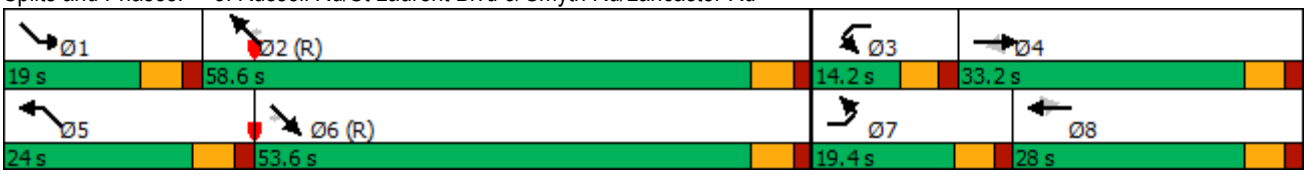
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 24.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 67.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

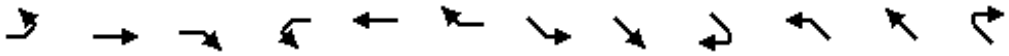
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| Future Volume (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 85.0 | | 85.0 | 55.0 | | 30.0 | 130.0 | | 115.0 | 185.0 | | 35.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3252 | 1651 | 1354 | 1357 | 3138 | 1286 | 1541 | 3257 | 1515 | 1513 | 3196 | 1354 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3252 | 1651 | 1354 | 1357 | 3138 | 1286 | 1541 | 3257 | 1515 | 1513 | 3196 | 1354 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 127 | | | 127 | | | 326 | | | 125 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 211.6 | | | 125.1 | | | 192.6 | | | 164.4 | |
| Travel Time (s) | | 15.2 | | | 9.0 | | | 13.9 | | | 11.8 | |
| Peak Hour 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 |
| Heavy Vehicles (%) | 2% | 9% | 13% | 26% | 9% | 19% | 11% | 5% | 1% | 13% | 7% | 13% |
| Adj. Flow (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| 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 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| 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 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 1 | 6 | 6 | 5 | 2 | 2 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Split (s) | 10.6 | 32.4 | 32.4 | 10.6 | 28.0 | 28.0 | 11.0 | 27.9 | 27.9 | 11.0 | 27.9 | 27.9 |
| Total Split (s) | 19.4 | 33.2 | 33.2 | 14.2 | 28.0 | 28.0 | 19.0 | 53.6 | 53.6 | 24.0 | 58.6 | 58.6 |
| Total Split (%) | 15.5% | 26.6% | 26.6% | 11.4% | 22.4% | 22.4% | 15.2% | 42.9% | 42.9% | 19.2% | 46.9% | 46.9% |
| Maximum Green (s) | 13.8 | 27.5 | 27.5 | 8.6 | 22.3 | 22.3 | 13.0 | 47.7 | 47.7 | 18.0 | 52.7 | 52.7 |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| All-Red Time (s) | 1.9 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 1.8 | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 |
| Lost Time Adjust (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 |
| Total Lost Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | 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 | | 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) | 13.8 | 27.9 | 27.9 | 7.7 | 17.0 | 17.0 | 15.8 | 50.3 | 50.3 | 20.6 | 55.2 | 55.2 |
| Actuated g/C Ratio | 0.11 | 0.22 | 0.22 | 0.06 | 0.14 | 0.14 | 0.13 | 0.40 | 0.40 | 0.16 | 0.44 | 0.44 |
| v/c Ratio | 0.90 | 0.31 | 0.26 | 0.41 | 0.70 | 0.40 | 0.75 | 0.49 | 0.86 | 0.81 | 0.86 | 0.15 |
| Control Delay | 82.9 | 44.3 | 5.7 | 70.9 | 60.1 | 10.5 | 76.5 | 29.9 | 30.2 | 74.9 | 39.3 | 2.8 |
| 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 | 82.9 | 44.3 | 5.7 | 70.9 | 60.1 | 10.5 | 76.5 | 29.9 | 30.2 | 74.9 | 39.3 | 2.8 |
| LOS | F | D | A | E | E | B | E | C | C | E | D | A |
| Approach Delay | | 60.0 | | | 48.1 | | | 34.7 | | | 41.6 | |
| Approach LOS | | E | | | D | | | C | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 125 | | | |
| Actuated Cycle Length: 125 | | | |
| Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green | | | |
| Natural Cycle: 105 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.90 | | | |
| Intersection Signal Delay: 42.2 | | Intersection LOS: D | |
| Intersection Capacity Utilization 81.5% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

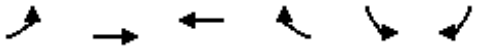
Splits and Phases: 3: Russell Rd/St Laurent Blvd & Smyth Rd/Lancaster Rd



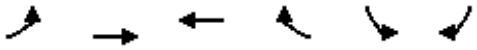


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| Future Volume (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3252 | 1651 | 1354 | 1357 | 3138 | 1286 | 1541 | 3257 | 1515 | 1513 | 3196 | 1354 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3252 | 1651 | 1354 | 1357 | 3138 | 1286 | 1541 | 3257 | 1515 | 1513 | 3196 | 1354 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 323 | 113 | 104 | 34 | 297 | 115 | 146 | 638 | 690 | 202 | 1206 | 103 |
| RTOR Reduction (vph) | 0 | 0 | 81 | 0 | 0 | 97 | 0 | 0 | 200 | 0 | 0 | 59 |
| Lane Group Flow (vph) | 323 | 113 | 23 | 34 | 297 | 18 | 146 | 638 | 490 | 202 | 1206 | 44 |
| Heavy Vehicles (%) | 2% | 9% | 13% | 26% | 9% | 19% | 11% | 5% | 1% | 13% | 7% | 13% |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Actuated Green, G (s) | 13.8 | 27.9 | 27.9 | 5.1 | 19.2 | 19.2 | 15.8 | 48.2 | 48.2 | 20.6 | 53.0 | 53.0 |
| Effective Green, g (s) | 13.8 | 27.9 | 27.9 | 5.1 | 19.2 | 19.2 | 15.8 | 48.2 | 48.2 | 20.6 | 53.0 | 53.0 |
| Actuated g/C Ratio | 0.11 | 0.22 | 0.22 | 0.04 | 0.15 | 0.15 | 0.13 | 0.39 | 0.39 | 0.16 | 0.42 | 0.42 |
| Clearance Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 359 | 368 | 302 | 55 | 481 | 197 | 194 | 1255 | 584 | 249 | 1355 | 574 |
| v/s Ratio Prot | c0.10 | 0.07 | | 0.03 | c0.09 | | 0.09 | 0.20 | | c0.13 | c0.38 | |
| v/s Ratio Perm | | | 0.02 | | | 0.01 | | | 0.32 | | | 0.03 |
| v/c Ratio | 0.90 | 0.31 | 0.08 | 0.62 | 0.62 | 0.09 | 0.75 | 0.51 | 0.84 | 0.81 | 0.89 | 0.08 |
| Uniform Delay, d1 | 54.9 | 40.5 | 38.4 | 59.0 | 49.5 | 45.4 | 52.7 | 29.3 | 34.9 | 50.3 | 33.3 | 21.4 |
| 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 | 24.1 | 0.5 | 0.1 | 18.9 | 2.4 | 0.2 | 15.2 | 1.5 | 13.5 | 17.9 | 9.1 | 0.3 |
| Delay (s) | 79.1 | 41.0 | 38.5 | 77.9 | 51.8 | 45.6 | 67.9 | 30.8 | 48.4 | 68.2 | 42.4 | 21.7 |
| Level of Service | E | D | D | E | D | D | E | C | D | E | D | C |
| Approach Delay (s) | | 63.3 | | | 52.2 | | | 42.7 | | | 44.4 | |
| Approach LOS | | E | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 47.2 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.86 | | |
| Actuated Cycle Length (s) | 125.0 | Sum of lost time (s) | 23.2 |
| Intersection Capacity Utilization | 81.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



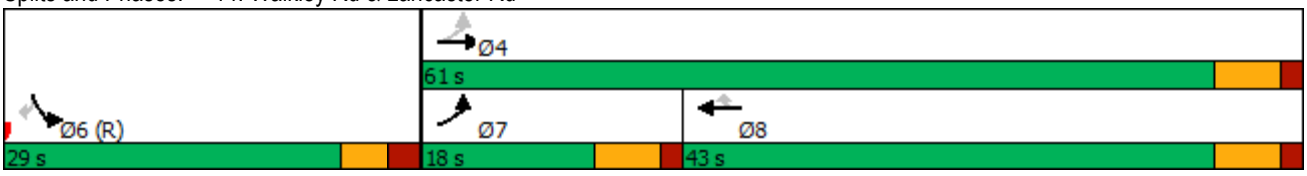
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Future Volume (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 120.0 | | | 25.0 | 75.0 | 150.0 |
| Storage Lanes | 1 | | | 1 | 1 | 1 |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1527 | 2974 | 4636 | 1404 | 2910 | 1308 |
| Flt Permitted | 0.095 | | | | 0.950 | |
| Satd. Flow (perm) | 153 | 2974 | 4636 | 1404 | 2910 | 1308 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | 346 | | 178 |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 246.9 | 393.2 | | 187.8 | |
| Travel Time (s) | | 17.8 | 28.3 | | 13.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 12% | 15% | 6% | 9% | 14% | 17% |
| Adj. Flow (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 3.6 | 3.6 | | 7.2 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (k/h) | 25 | | | 15 | 25 | 15 |
| Number of Detectors | 1 | 2 | 2 | 1 | 1 | 1 |
| Detector Template | Left | Thru | Thru | Right | Left | Right |
| Leading Detector (m) | 2.0 | 10.0 | 10.0 | 2.0 | 2.0 | 2.0 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 2.0 | 0.6 | 0.6 | 2.0 | 2.0 | 2.0 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 9.4 | 9.4 | | | |
| Detector 2 Size(m) | | 0.6 | 0.6 | | | |
| Detector 2 Type | | Cl+Ex | Cl+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

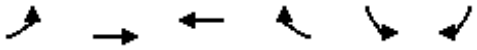


| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Minimum Split (s) | 11.2 | 24.2 | 37.2 | 37.2 | 27.7 | 27.7 |
| Total Split (s) | 18.0 | 61.0 | 43.0 | 43.0 | 29.0 | 29.0 |
| Total Split (%) | 20.0% | 67.8% | 47.8% | 47.8% | 32.2% | 32.2% |
| Maximum Green (s) | 11.8 | 54.8 | 36.8 | 36.8 | 23.3 | 23.3 |
| Yellow Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 3.3 | 3.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 2.4 | 2.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | C-Max | C-Max |
| Walk Time (s) | | | 20.0 | 20.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | | | 7.0 | 7.0 | 15.0 | 15.0 |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 54.0 | 54.0 | 36.0 | 36.0 | 24.1 | 24.1 |
| Actuated g/C Ratio | 0.60 | 0.60 | 0.40 | 0.40 | 0.27 | 0.27 |
| v/c Ratio | 0.80 | 0.41 | 0.80 | 0.88 | 0.12 | 0.37 |
| Control Delay | 42.0 | 10.3 | 27.9 | 26.7 | 26.1 | 6.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.0 | 10.3 | 27.9 | 26.7 | 26.1 | 6.8 |
| LOS | D | B | C | C | C | A |
| Approach Delay | | 17.6 | 27.5 | | 13.6 | |
| Approach LOS | | B | C | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay: 23.6 | | Intersection LOS: C | |
| Intersection Capacity Utilization 67.3% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 14: Walkley Rd & Lancaster Rd





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Future Volume (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1527 | 2974 | 4636 | 1404 | 2910 | 1308 |
| Flt Permitted | 0.09 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 152 | 2974 | 4636 | 1404 | 2910 | 1308 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 218 | 735 | 1489 | 676 | 97 | 178 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 208 | 0 | 130 |
| Lane Group Flow (vph) | 218 | 735 | 1489 | 468 | 97 | 48 |
| Heavy Vehicles (%) | 12% | 15% | 6% | 9% | 14% | 17% |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Actuated Green, G (s) | 54.0 | 54.0 | 36.0 | 36.0 | 24.1 | 24.1 |
| Effective Green, g (s) | 54.0 | 54.0 | 36.0 | 36.0 | 24.1 | 24.1 |
| Actuated g/C Ratio | 0.60 | 0.60 | 0.40 | 0.40 | 0.27 | 0.27 |
| Clearance Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 271 | 1784 | 1854 | 561 | 779 | 350 |
| v/s Ratio Prot | c0.11 | 0.25 | 0.32 | | 0.03 | |
| v/s Ratio Perm | c0.38 | | | 0.33 | | c0.04 |
| v/c Ratio | 0.80 | 0.41 | 0.80 | 0.83 | 0.12 | 0.14 |
| Uniform Delay, d1 | 21.3 | 9.6 | 23.9 | 24.3 | 25.0 | 25.0 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 15.8 | 0.2 | 2.6 | 10.4 | 0.3 | 0.8 |
| Delay (s) | 37.1 | 9.7 | 26.5 | 34.7 | 25.3 | 25.8 |
| Level of Service | D | A | C | C | C | C |
| Approach Delay (s) | | 16.0 | 29.0 | | 25.7 | |
| Approach LOS | | B | C | | C | |

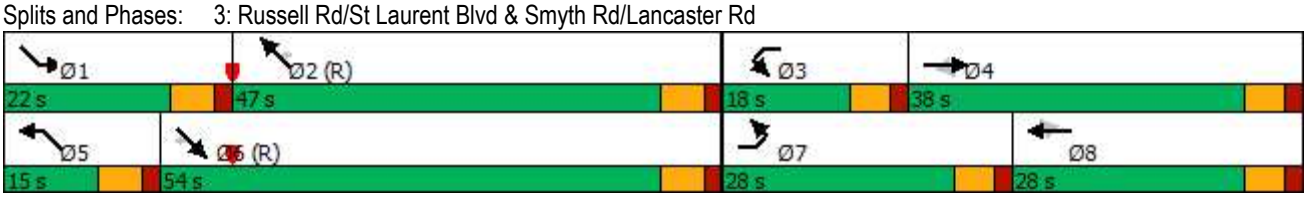
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 25.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 67.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| Future Volume (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 85.0 | | 85.0 | 55.0 | | 30.0 | 130.0 | | 115.0 | 185.0 | | 35.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 218 | | | 228 | | | 383 | | | 226 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 211.6 | | | 125.1 | | | 192.6 | | | 164.4 | |
| Travel Time (s) | | 15.2 | | | 9.0 | | | 13.9 | | | 11.8 | |
| Peak Hour 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 |
| Heavy Vehicles (%) | 1% | 1% | 3% | 3% | 1% | 1% | 2% | 2% | 1% | 10% | 4% | 1% |
| Adj. Flow (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| 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 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| 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 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 1 | 6 | 6 | 5 | 2 | 2 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Split (s) | 10.6 | 32.4 | 32.4 | 10.6 | 28.0 | 28.0 | 11.0 | 27.9 | 27.9 | 11.0 | 27.9 | 27.9 |
| Total Split (s) | 28.0 | 38.0 | 38.0 | 18.0 | 28.0 | 28.0 | 22.0 | 54.0 | 54.0 | 15.0 | 47.0 | 47.0 |
| Total Split (%) | 22.4% | 30.4% | 30.4% | 14.4% | 22.4% | 22.4% | 17.6% | 43.2% | 43.2% | 12.0% | 37.6% | 37.6% |
| Maximum Green (s) | 22.4 | 32.3 | 32.3 | 12.4 | 22.3 | 22.3 | 16.0 | 48.1 | 48.1 | 9.0 | 41.1 | 41.1 |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| All-Red Time (s) | 1.9 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 1.8 | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 |
| Lost Time Adjust (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 |
| Total Lost Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | 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 | | 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) | 22.2 | 25.9 | 25.9 | 11.4 | 15.2 | 15.2 | 15.1 | 51.8 | 51.8 | 12.7 | 49.3 | 49.3 |
| Actuated g/C Ratio | 0.18 | 0.21 | 0.21 | 0.09 | 0.12 | 0.12 | 0.12 | 0.41 | 0.41 | 0.10 | 0.39 | 0.39 |
| v/c Ratio | 0.93 | 0.80 | 0.50 | 0.71 | 0.28 | 0.64 | 0.73 | 0.85 | 0.45 | 0.67 | 0.60 | 0.14 |
| Control Delay | 74.0 | 62.9 | 10.5 | 79.7 | 49.9 | 16.0 | 73.1 | 40.9 | 4.3 | 75.4 | 34.2 | 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 | 0.0 |
| Total Delay | 74.0 | 62.9 | 10.5 | 79.7 | 49.9 | 16.0 | 73.1 | 40.9 | 4.3 | 75.4 | 34.2 | 0.4 |
| LOS | E | E | B | E | D | B | E | D | A | E | C | A |
| Approach Delay | | 56.8 | | | 38.8 | | | 35.5 | | | 35.1 | |
| Approach LOS | | E | | | D | | | D | | | D | |

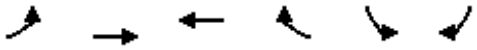
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 125 | | | |
| Actuated Cycle Length: 125 | | | |
| Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green | | | |
| Natural Cycle: 105 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.93 | | | |
| Intersection Signal Delay: 41.2 | | Intersection LOS: D | |
| Intersection Capacity Utilization 82.4% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Russell Rd/St Laurent Blvd & Smyth Rd/Lancaster Rd



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| Future Volume (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3285 | 1782 | 1485 | 1660 | 3386 | 1515 | 1676 | 3353 | 1515 | 1555 | 3288 | 1515 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| RTOR Reduction (vph) | 0 | 0 | 173 | 0 | 0 | 200 | 0 | 0 | 225 | 0 | 0 | 61 |
| Lane Group Flow (vph) | 540 | 294 | 66 | 107 | 114 | 47 | 147 | 1177 | 158 | 105 | 781 | 39 |
| Heavy Vehicles (%) | 1% | 1% | 3% | 3% | 1% | 1% | 2% | 2% | 1% | 10% | 4% | 1% |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Actuated Green, G (s) | 22.2 | 26.0 | 26.0 | 11.4 | 15.2 | 15.2 | 15.1 | 51.7 | 51.7 | 12.7 | 49.3 | 49.3 |
| Effective Green, g (s) | 22.2 | 26.0 | 26.0 | 11.4 | 15.2 | 15.2 | 15.1 | 51.7 | 51.7 | 12.7 | 49.3 | 49.3 |
| Actuated g/C Ratio | 0.18 | 0.21 | 0.21 | 0.09 | 0.12 | 0.12 | 0.12 | 0.41 | 0.41 | 0.10 | 0.39 | 0.39 |
| Clearance Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 583 | 370 | 308 | 151 | 411 | 184 | 202 | 1386 | 626 | 157 | 1296 | 597 |
| v/s Ratio Prot | c0.16 | c0.16 | | 0.06 | 0.03 | | c0.09 | c0.35 | | 0.07 | 0.24 | |
| v/s Ratio Perm | | | 0.04 | | | 0.03 | | | 0.10 | | | 0.03 |
| v/c Ratio | 0.93 | 0.79 | 0.22 | 0.71 | 0.28 | 0.25 | 0.73 | 0.85 | 0.25 | 0.67 | 0.60 | 0.07 |
| Uniform Delay, d1 | 50.6 | 47.0 | 41.0 | 55.2 | 49.9 | 49.8 | 53.0 | 33.1 | 24.0 | 54.1 | 30.1 | 23.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 20.8 | 11.2 | 0.4 | 14.1 | 0.4 | 0.7 | 12.3 | 6.7 | 1.0 | 10.3 | 2.1 | 0.2 |
| Delay (s) | 71.4 | 58.1 | 41.4 | 69.3 | 50.3 | 50.5 | 65.3 | 39.8 | 25.0 | 64.4 | 32.2 | 23.7 |
| Level of Service | E | E | D | E | D | D | E | D | C | E | C | C |
| Approach Delay (s) | | 61.1 | | | 54.7 | | | 38.7 | | | 34.7 | |
| Approach LOS | | E | | | D | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 45.2 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 125.0 | Sum of lost time (s) | 23.2 |
| Intersection Capacity Utilization | 82.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

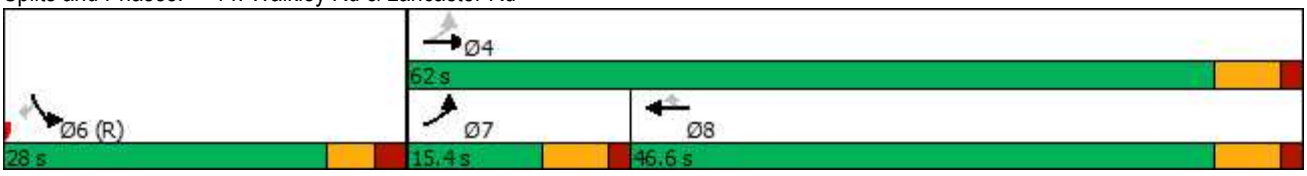


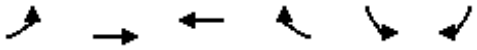
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Future Volume (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 120.0 | | | 25.0 | 75.0 | 150.0 |
| Storage Lanes | 1 | | | 1 | 1 | 1 |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1676 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Flt Permitted | 0.202 | | | | 0.950 | |
| Satd. Flow (perm) | 356 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | 140 | | 215 |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 246.9 | 393.2 | | 187.8 | |
| Travel Time (s) | | 17.8 | 28.3 | | 13.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 5% | 9% | 9% | 2% | 3% |
| Adj. Flow (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 3.6 | 3.6 | | 7.2 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (k/h) | 25 | | | 15 | 25 | 15 |
| Number of Detectors | 1 | 2 | 2 | 1 | 1 | 1 |
| Detector Template | Left | Thru | Thru | Right | Left | Right |
| Leading Detector (m) | 2.0 | 10.0 | 10.0 | 2.0 | 2.0 | 2.0 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 2.0 | 0.6 | 0.6 | 2.0 | 2.0 | 2.0 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 9.4 | 9.4 | | | |
| Detector 2 Size(m) | | 0.6 | 0.6 | | | |
| Detector 2 Type | | Cl+Ex | Cl+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Minimum Split (s) | 11.2 | 24.2 | 37.2 | 37.2 | 27.7 | 27.7 |
| Total Split (s) | 15.4 | 62.0 | 46.6 | 46.6 | 28.0 | 28.0 |
| Total Split (%) | 17.1% | 68.9% | 51.8% | 51.8% | 31.1% | 31.1% |
| Maximum Green (s) | 9.2 | 55.8 | 40.4 | 40.4 | 22.3 | 22.3 |
| Yellow Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 3.3 | 3.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 2.4 | 2.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | C-Max | C-Max |
| Walk Time (s) | | | 20.0 | 20.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | | | 7.0 | 7.0 | 15.0 | 15.0 |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 55.5 | 55.5 | 41.1 | 41.1 | 22.6 | 22.6 |
| Actuated g/C Ratio | 0.62 | 0.62 | 0.46 | 0.46 | 0.25 | 0.25 |
| v/c Ratio | 0.39 | 0.92 | 0.49 | 0.24 | 0.62 | 0.40 |
| Control Delay | 10.6 | 24.4 | 18.1 | 5.0 | 33.9 | 6.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 10.6 | 24.4 | 18.1 | 5.0 | 33.9 | 6.6 |
| LOS | B | C | B | A | C | A |
| Approach Delay | | 23.5 | 16.2 | | 25.8 | |
| Approach LOS | | C | B | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.92 | | | |
| Intersection Signal Delay: 21.7 | | Intersection LOS: C | |
| Intersection Capacity Utilization 79.0% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 14: Walkley Rd & Lancaster Rd





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Future Volume (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1676 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Flt Permitted | 0.20 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 356 | 3257 | 4508 | 1404 | 3252 | 1485 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 76 | 0 | 161 |
| Lane Group Flow (vph) | 132 | 1845 | 1001 | 96 | 508 | 54 |
| Heavy Vehicles (%) | 2% | 5% | 9% | 9% | 2% | 3% |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Actuated Green, G (s) | 55.5 | 55.5 | 41.2 | 41.2 | 22.6 | 22.6 |
| Effective Green, g (s) | 55.5 | 55.5 | 41.2 | 41.2 | 22.6 | 22.6 |
| Actuated g/C Ratio | 0.62 | 0.62 | 0.46 | 0.46 | 0.25 | 0.25 |
| Clearance Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 338 | 2008 | 2063 | 642 | 816 | 372 |
| v/s Ratio Prot | 0.04 | c0.57 | 0.22 | | c0.16 | |
| v/s Ratio Perm | 0.21 | | | 0.07 | | 0.04 |
| v/c Ratio | 0.39 | 0.92 | 0.49 | 0.15 | 0.62 | 0.15 |
| Uniform Delay, d1 | 8.4 | 15.3 | 17.0 | 14.2 | 29.9 | 26.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.7 | 7.2 | 0.2 | 0.1 | 3.6 | 0.8 |
| Delay (s) | 9.1 | 22.5 | 17.2 | 14.3 | 33.5 | 27.0 |
| Level of Service | A | C | B | B | C | C |
| Approach Delay (s) | | 21.6 | 16.8 | | 31.6 | |
| Approach LOS | | C | B | | C | |

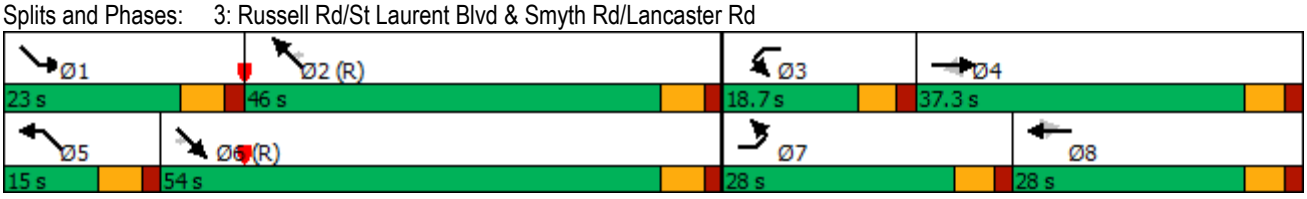
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 22.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 79.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

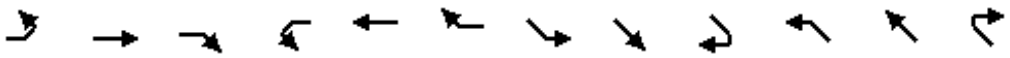
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| Future Volume (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 85.0 | | 85.0 | 55.0 | | 30.0 | 130.0 | | 115.0 | 185.0 | | 35.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3285 | 1682 | 1485 | 1555 | 3167 | 1404 | 1569 | 3353 | 1515 | 1555 | 3320 | 1430 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3285 | 1682 | 1485 | 1555 | 3167 | 1404 | 1569 | 3353 | 1515 | 1555 | 3320 | 1430 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 223 | | | 228 | | | 383 | | | 226 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 211.6 | | | 125.1 | | | 192.6 | | | 164.4 | |
| Travel Time (s) | | 15.2 | | | 9.0 | | | 13.9 | | | 11.8 | |
| Peak Hour 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 |
| Heavy Vehicles (%) | 1% | 7% | 3% | 10% | 8% | 9% | 9% | 2% | 1% | 10% | 3% | 7% |
| Adj. Flow (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| 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 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| 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 | |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 1 | 6 | 6 | 5 | 2 | 2 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Split (s) | 10.6 | 32.4 | 32.4 | 10.6 | 28.0 | 28.0 | 11.0 | 27.9 | 27.9 | 11.0 | 27.9 | 27.9 |
| Total Split (s) | 28.0 | 37.3 | 37.3 | 18.7 | 28.0 | 28.0 | 23.0 | 54.0 | 54.0 | 15.0 | 46.0 | 46.0 |
| Total Split (%) | 22.4% | 29.8% | 29.8% | 15.0% | 22.4% | 22.4% | 18.4% | 43.2% | 43.2% | 12.0% | 36.8% | 36.8% |
| Maximum Green (s) | 22.4 | 31.6 | 31.6 | 13.1 | 22.3 | 22.3 | 17.0 | 48.1 | 48.1 | 9.0 | 40.1 | 40.1 |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| All-Red Time (s) | 1.9 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 1.8 | 1.7 | 1.7 | 1.8 | 1.7 | 1.7 |
| Lost Time Adjust (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 |
| Total Lost Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | 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 | | 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) | 22.2 | 26.4 | 26.4 | 12.0 | 16.2 | 16.2 | 15.6 | 51.5 | 51.5 | 11.9 | 47.9 | 47.9 |
| Actuated g/C Ratio | 0.18 | 0.21 | 0.21 | 0.10 | 0.13 | 0.13 | 0.12 | 0.41 | 0.41 | 0.10 | 0.38 | 0.38 |
| v/c Ratio | 0.93 | 0.83 | 0.49 | 0.72 | 0.28 | 0.65 | 0.75 | 0.85 | 0.45 | 0.71 | 0.61 | 0.15 |
| Control Delay | 74.0 | 66.2 | 9.8 | 81.2 | 49.0 | 16.3 | 76.2 | 41.4 | 4.3 | 81.2 | 35.4 | 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 | 74.0 | 66.2 | 9.8 | 81.2 | 49.0 | 16.3 | 76.2 | 41.4 | 4.3 | 81.2 | 35.4 | 0.5 |
| LOS | E | E | A | F | D | B | E | D | A | F | D | A |
| Approach Delay | | 57.6 | | | 39.1 | | | 36.1 | | | 36.8 | |
| Approach LOS | | E | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 125 | | | |
| Actuated Cycle Length: 125 | | | |
| Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green | | | |
| Natural Cycle: 105 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.93 | | | |
| Intersection Signal Delay: 42.0 | | Intersection LOS: D | |
| Intersection Capacity Utilization 82.4% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

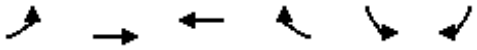
Splits and Phases: 3: Russell Rd/St Laurent Blvd & Smyth Rd/Lancaster Rd



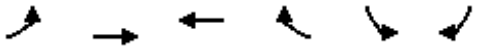


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| Future Volume (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3285 | 1682 | 1485 | 1555 | 3167 | 1404 | 1569 | 3353 | 1515 | 1555 | 3320 | 1430 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3285 | 1682 | 1485 | 1555 | 3167 | 1404 | 1569 | 3353 | 1515 | 1555 | 3320 | 1430 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 540 | 294 | 239 | 107 | 114 | 247 | 147 | 1177 | 383 | 105 | 781 | 100 |
| RTOR Reduction (vph) | 0 | 0 | 176 | 0 | 0 | 198 | 0 | 0 | 225 | 0 | 0 | 62 |
| Lane Group Flow (vph) | 540 | 294 | 63 | 107 | 114 | 49 | 147 | 1177 | 158 | 105 | 781 | 38 |
| Heavy Vehicles (%) | 1% | 7% | 3% | 10% | 8% | 9% | 9% | 2% | 1% | 10% | 3% | 7% |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | 4 | | | 8 | | | 6 | | | 2 |
| Actuated Green, G (s) | 22.2 | 26.4 | 26.4 | 12.0 | 16.2 | 16.2 | 15.6 | 51.5 | 51.5 | 11.9 | 47.8 | 47.8 |
| Effective Green, g (s) | 22.2 | 26.4 | 26.4 | 12.0 | 16.2 | 16.2 | 15.6 | 51.5 | 51.5 | 11.9 | 47.8 | 47.8 |
| Actuated g/C Ratio | 0.18 | 0.21 | 0.21 | 0.10 | 0.13 | 0.13 | 0.12 | 0.41 | 0.41 | 0.10 | 0.38 | 0.38 |
| Clearance Time (s) | 5.6 | 5.7 | 5.7 | 5.6 | 5.7 | 5.7 | 6.0 | 5.9 | 5.9 | 6.0 | 5.9 | 5.9 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 583 | 355 | 313 | 149 | 410 | 181 | 195 | 1381 | 624 | 148 | 1269 | 546 |
| v/s Ratio Prot | c0.16 | c0.17 | | 0.07 | 0.04 | | c0.09 | c0.35 | | 0.07 | 0.24 | |
| v/s Ratio Perm | | | 0.04 | | | 0.03 | | | 0.10 | | | 0.03 |
| v/c Ratio | 0.93 | 0.83 | 0.20 | 0.72 | 0.28 | 0.27 | 0.75 | 0.85 | 0.25 | 0.71 | 0.62 | 0.07 |
| Uniform Delay, d1 | 50.6 | 47.1 | 40.6 | 54.9 | 49.1 | 49.1 | 52.8 | 33.3 | 24.1 | 54.9 | 31.2 | 24.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 20.8 | 14.6 | 0.3 | 15.2 | 0.4 | 0.8 | 15.2 | 6.8 | 1.0 | 14.4 | 2.2 | 0.2 |
| Delay (s) | 71.4 | 61.8 | 40.9 | 70.1 | 49.5 | 49.9 | 68.0 | 40.1 | 25.1 | 69.3 | 33.4 | 24.7 |
| Level of Service | E | E | D | E | D | D | E | D | C | E | C | C |
| Approach Delay (s) | | 62.0 | | | 54.4 | | | 39.2 | | | 36.4 | |
| Approach LOS | | E | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 46.0 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 125.0 | Sum of lost time (s) | 23.2 |
| Intersection Capacity Utilization | 82.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



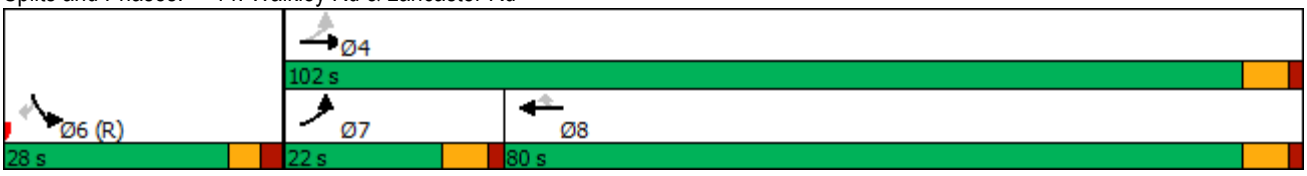
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Future Volume (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 120.0 | | | 25.0 | 75.0 | 150.0 |
| Storage Lanes | 1 | | | 1 | 1 | 1 |
| Taper Length (m) | 7.5 | | | | 7.5 | |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1583 | 3257 | 4550 | 1330 | 3043 | 1391 |
| Flt Permitted | 0.235 | | | | 0.950 | |
| Satd. Flow (perm) | 392 | 3257 | 4550 | 1330 | 3043 | 1391 |
| Right Turn on Red | | | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | 124 | | 215 |
| Link Speed (k/h) | | 50 | 50 | | 50 | |
| Link Distance (m) | | 246.9 | 393.2 | | 187.8 | |
| Travel Time (s) | | 17.8 | 28.3 | | 13.5 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 8% | 5% | 8% | 15% | 9% | 10% |
| Adj. Flow (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(m) | | 3.6 | 3.6 | | 7.2 | |
| Link Offset(m) | | 0.0 | 0.0 | | 0.0 | |
| Crosswalk Width(m) | | 4.8 | 4.8 | | 4.8 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 | 1.07 |
| Turning Speed (k/h) | 25 | | | 15 | 25 | 15 |
| Number of Detectors | 1 | 2 | 2 | 1 | 1 | 1 |
| Detector Template | Left | Thru | Thru | Right | Left | Right |
| Leading Detector (m) | 2.0 | 10.0 | 10.0 | 2.0 | 2.0 | 2.0 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Size(m) | 2.0 | 0.6 | 0.6 | 2.0 | 2.0 | 2.0 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(m) | | 9.4 | 9.4 | | | |
| Detector 2 Size(m) | | 0.6 | 0.6 | | | |
| Detector 2 Type | | Cl+Ex | Cl+Ex | | | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | 0.0 | 0.0 | | | |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Detector Phase | 7 | 4 | 8 | 8 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |

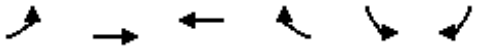


| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Minimum Split (s) | 11.2 | 24.2 | 37.2 | 37.2 | 27.7 | 27.7 |
| Total Split (s) | 22.0 | 102.0 | 80.0 | 80.0 | 28.0 | 28.0 |
| Total Split (%) | 16.9% | 78.5% | 61.5% | 61.5% | 21.5% | 21.5% |
| Maximum Green (s) | 15.8 | 95.8 | 73.8 | 73.8 | 22.3 | 22.3 |
| Yellow Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 3.3 | 3.3 |
| All-Red Time (s) | 1.6 | 1.6 | 1.6 | 1.6 | 2.4 | 2.4 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lead/Lag | Lead | | Lag | Lag | | |
| Lead-Lag Optimize? | Yes | | Yes | Yes | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | C-Max | C-Max |
| Walk Time (s) | | | 20.0 | 20.0 | 7.0 | 7.0 |
| Flash Dont Walk (s) | | | 7.0 | 7.0 | 15.0 | 15.0 |
| Pedestrian Calls (#/hr) | | | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 95.8 | 95.8 | 81.0 | 81.0 | 22.3 | 22.3 |
| Actuated g/C Ratio | 0.74 | 0.74 | 0.62 | 0.62 | 0.17 | 0.17 |
| v/c Ratio | 0.36 | 0.77 | 0.35 | 0.20 | 0.98 | 0.52 |
| Control Delay | 7.7 | 13.2 | 12.4 | 4.0 | 87.2 | 10.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 7.7 | 13.2 | 12.4 | 4.0 | 87.2 | 10.8 |
| LOS | A | B | B | A | F | B |
| Approach Delay | | 12.8 | 11.2 | | 64.5 | |
| Approach LOS | | B | B | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 130 | | | |
| Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.98 | | | |
| Intersection Signal Delay: 22.0 | | Intersection LOS: C | |
| Intersection Capacity Utilization 79.0% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 14: Walkley Rd & Lancaster Rd





| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Future Volume (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Total Lost time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Lane Util. Factor | 1.00 | 0.95 | 0.91 | 1.00 | 0.97 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1583 | 3257 | 4550 | 1330 | 3043 | 1391 |
| Flt Permitted | 0.23 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 391 | 3257 | 4550 | 1330 | 3043 | 1391 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 132 | 1845 | 1001 | 172 | 508 | 215 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 47 | 0 | 178 |
| Lane Group Flow (vph) | 132 | 1845 | 1001 | 125 | 508 | 37 |
| Heavy Vehicles (%) | 8% | 5% | 8% | 15% | 9% | 10% |
| Turn Type | pm+pt | NA | NA | Perm | Prot | Perm |
| Protected Phases | 7 | 4 | 8 | | 6 | |
| Permitted Phases | 4 | | | 8 | | 6 |
| Actuated Green, G (s) | 95.8 | 95.8 | 81.0 | 81.0 | 22.3 | 22.3 |
| Effective Green, g (s) | 95.8 | 95.8 | 81.0 | 81.0 | 22.3 | 22.3 |
| Actuated g/C Ratio | 0.74 | 0.74 | 0.62 | 0.62 | 0.17 | 0.17 |
| Clearance Time (s) | 6.2 | 6.2 | 6.2 | 6.2 | 5.7 | 5.7 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 366 | 2400 | 2835 | 828 | 521 | 238 |
| v/s Ratio Prot | 0.02 | c0.57 | 0.22 | | c0.17 | |
| v/s Ratio Perm | 0.24 | | | 0.09 | | 0.03 |
| v/c Ratio | 0.36 | 0.77 | 0.35 | 0.15 | 0.98 | 0.15 |
| Uniform Delay, d1 | 5.8 | 10.4 | 11.8 | 10.2 | 53.6 | 45.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.6 | 1.5 | 0.1 | 0.1 | 33.7 | 1.4 |
| Delay (s) | 6.4 | 11.9 | 11.9 | 10.3 | 87.3 | 47.2 |
| Level of Service | A | B | B | B | F | D |
| Approach Delay (s) | | 11.5 | 11.7 | | 75.4 | |
| Approach LOS | | B | B | | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 23.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.85 | | |
| Actuated Cycle Length (s) | 130.0 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 79.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |