# 2809 Townline Road Industrial/Commercial Development

## Traffic Impact Study

Fieldgate Properties

18 February 2026

→ The Power of Commitment

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# Executive Summary

GHD Limited was retained to prepare a Traffic Study in support of the proposed development at 2809 Townline Road in Puslinch, with two potential options: one for an industrial development and the other for a mixed industrial and commercial development.

As per the agreed Terms of Reference the following intersections were included in the study area:

- Highway 401 EB off-ramp and Townline Road
- Highway 401 WB off-ramp and Townline Road
- Townline Road and Site Access 1
- Townline Road and Jamieson Parkway/Site Access 2
- Townline Road and Ellis Road/Sideroad 10N

A site plan prepared by Ware Malcomb presents two conceptual site plans for the development, referred to as Site Plan A and Site Plan B.

Both conceptual site plans feature six industrial buildings on the northern portion of the site, located to the north of the intersection of Jamieson Parkway and Townline Road. The Gross Floor Area (GFA) breakdown of each building is:

- Building 1: 174,375 $ft^2$
- Building 2: 174,375 $ft^2$
- Building 3: 174,375 $ft^2$
- Building 4: 112,236 $ft^2$
- Building 5: 112,236 $ft^2$
- Building 6: 105,636 $ft^2$

Site Plan A consists of six industrial buildings located on the northern portion of the site along with a big box retail component on the southern portion of the lot. The retail space has a GFA of 162,428 ft², as well as a gas station featuring 24 fueling stations. The total GFA for Site Plan A is 1,015,662 ft².

In contrast, Site Plan B retains the six industrial buildings on the northern portion of the lot but replaces the box retail component and gas station with two additional industrial buildings, labeled Building 7 and Building 8, on the southern portion of the lot. Each of these buildings has a GFA of 210,000 ft², bringing the total GFA for Site Plan B to 1,273,234 ft².

The difference between the two Site Plans is limited to the southern portion of the site: Site Plan A includes retail and gas station facilities, while Site Plan B features additional industrial buildings.

Accesses to the subject site are proposed via a two full-moves driveway. Site Access 1 is the north most access, Site Access 2 is located opposite Jamieson Parkway

Site Plan A is expected to generate a total of 739 two-way site trips during the a.m. peak hour consisting of 531 inbound and 208 outbound trips. During the p.m. peak hour, it is expected to generate 1052 new two-way site trips consisting of 415 inbound and 637 outbound trips. During the Saturday peak hour, it is expected to generate 1,365 new two-way site trips consisting of 665 inbound and 700 outbound trips.

Site Plan B development is expected to generate a total of 586 two-way site trips during the a.m. peak hour consisting of 453 inbound and 133 outbound trips. During the p.m. peak hour, it is expected to generate 598 new two-way site

trips consisting of 168 inbound and 430 outbound trips. During the Saturday peak hour, it is expected to generate 247 new two-way site trips consisting of 96 inbound and 151 outbound trips.

Under existing traffic conditions, all intersections are operating at acceptable v/c ratios and levels of service during the a.m. peak and p.m. peak hours with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound Right with a v/c of 0.86 during the a.m. peak hour
- Eastbound Right with a v/c of 0.85 during the p.m. peak hour

Under the 2028 future total scenario for Site Plan A, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline Road all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 0.89 during the a.m. peak hour
- Eastbound Right with a v/c of 0.93 during the a.m. peak hour
- Eastbound left with a v/c of 0.80 during the p.m. peak hour
- Eastbound Right with a v/c of 0.88 during the p.m. peak hour
- Eastbound left with a v/c of 0.77 during the Saturday peak hour
- Eastbound Right with a v/c of 0.82 during the Saturday peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Northbound through-right with a V/C of 0.96 during the p.m. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.07 during the p.m. peak hour

Under the 2028 future total scenario for Site Plan B, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline Road all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 0.95 during the a.m. peak hour
- Eastbound Right with a v/c of 0.87 during the a.m. peak hour
- Eastbound left with a v/c of 0.77 during the p.m. peak hour
- Eastbound Right with a v/c of 0.88 during the p.m. peak hour
- Eastbound Right with a v/c of 0.82 during the Saturday peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Northbound through-right with a V/C of 0.90 during the p.m. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.04 during the p.m. peak hour

Under the 2033 future total scenario for Site Plan A, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline Road all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 0.92 during the a.m. peak hour
- Eastbound Right with a v/c of 1.02 during the a.m. peak hour
- Eastbound left with a v/c of 0.81 during the p.m. peak hour
- Eastbound Right with a v/c of 0.92 during the p.m. peak hour
- Southbound through with a v/c of 0.93 during the p.m. peak hour
- Eastbound left with a v/c of 0.77 during the Saturday peak hour
- Eastbound Right with a v/c of 0.87 during the Saturday peak hour

Highway 401 Westbound Off-Ramp

- Westbound left with a v/c of 0.75 during the a.m. peak hour
- Northbound through with a v/c of 0.91 during the p.m. peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Southbound through-right with a v/c of 0.87 during the a.m. peak hour
- Northbound left with a v/c of 0.92 during the p.m. peak hour
- Northbound through-right with a v/c of 1.05 during the p.m. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.17 during the p.m. peak hour

Under the 2033 future total scenario for Site Plan B, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline Road all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 1.01 during the a.m. peak hour
- Eastbound Right with a v/c of 0.99 during the a.m. peak hour
- Eastbound left with a v/c of 0.78 during the p.m. peak hour
- Eastbound Right with a v/c of 0.92 during the p.m. peak hour
- Southbound through with a v/c of 0.89 during the p.m. peak hour
- Eastbound Right with a v/c of 0.86 during the Saturday peak hour

Highway 401 Westbound Off-Ramp

- Northbound through with a v/c of 0.85 during the p.m. peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Southbound through-right with a v/c of 1.01 during the a.m. peak hour
- Northbound through-right with a v/c of 0.95 during the p.m. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.16 during the p.m. peak hour

Under the 2038 future total scenario for Site Plan A, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline Road all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 0.98 during the a.m. peak hour
- Eastbound Right with a v/c of 1.13 during the a.m. peak hour
- Southbound through with a v/c of 0.86 during the a.m. peak hour
- Eastbound left with a v/c of 0.83 during the p.m. peak hour
- Eastbound Right with a v/c of 0.96 during the p.m. peak hour
- Southbound through with a v/c of 1.04 during the p.m. peak hour
- Eastbound left with a v/c of 0.84 during the Saturday peak hour
- Eastbound Right with a v/c of 1.03 during the Saturday peak hour

Highway 401 Westbound Off-Ramp

- Westbound left with a v/c of 0.78 during the a.m. peak hour
- Westbound right with a v/c of 0.75 during the p.m. peak hour
- Northbound through with a V/C of 0.99 during the p.m. peak hour

Townline Road and Jamieson Parkway/Site Access 2

- Eastbound through right with a v/c of 0.92 during the p.m. peak hour
- Westbound left with a v/c of 0.90 during the p.m. peak hour
- Northbound left with a v/c of 0.91 during the p.m. peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Southbound through-right with a V/C of 1.01 during the a.m. peak hour
- Northbound left with a V/C of 1.14 during the p.m. peak hour
- Northbound through-right with a V/C of 1.16 during the p.m. peak hour
- Southbound through-right with a V/C of 0.91 during the a.m. peak hour
- Northbound through-right with a V/C of 0.91 during the Saturday. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.28 during the p.m. peak hour

Under the 2038 future total scenario for Site Plan B, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline line all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 1.09 during the a.m. peak hour
- Eastbound Right with a v/c of 1.13 during the a.m. peak hour
- Southbound through with a v/c of 0.85 during the a.m. peak hour

- Eastbound left with a v/c of 0.81 during the p.m. peak hour
- Eastbound Right with a v/c of 0.97 during the p.m. peak hour
- Southbound through with a v/c of 1.03 during the p.m. peak hour
- Eastbound Right with a v/c of 0.92 during the Saturday peak hour

Highway 401 Westbound Off-Ramp

- Westbound left with a v/c of 0.77 during the a.m. peak hour
- Northbound through with a V/C of 0.95 during the p.m. peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Southbound through-right with a V/C of 1.00 during the a.m. peak hour
- Northbound left with a V/C of 1.05 during the p.m. peak hour
- Northbound through-right with a V/C of 1.11 during the p.m. peak hour
- Southbound through-right with a V/C of 0.86 during the a.m. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.29 during the p.m. peak hour

Upon comparison of both Site Plans with the recommended intersection improvements both Site Plans operate similarly however Site Plan B requires less improvements for the intersection of Jamieson Parkway/Site Access 2 and Townline Road whereas Site Plan A will require additional lanes in the northbound direction to operate under capacity until the future 2038 scenario and below a v/c of 1. From the perspective of project buildout, the Site Plan B slightly outperforms Site Plan A as this Site Plan generates less traffic due to the nature of the buildings to be implemented.

A review of loading and parking requirements was undertaken and confirmed that the proposed concept plans for both Site Plans would satisfy the Zoning By-law requirements.

The proposed site accesses will meet OPSD 350.010 design standard.

The proposed site driveways meet the minimum intersection sight distance requirements for a 70 km/h design speed on Townline Road based on the TAC manual.

Recommended improvements include but are not limited to the following:

**Jamieson Parkway/Site Access 2 and Townline Road for Site Plan A**

- Protected phase for the westbound left and permitted protected for the eastbound left and southbound left.
- Eastbound right lane converted to a through-right
- A double left-turn lane and an exclusive through and right lane on the westbound approach.
- Exclusive right turn lane added in the northbound direction
- A left-turn lane added on the southbound approach.
- Optimized signal timings

**Jamieson Parkway/Site Access 2 and Townline Road for Site Plan B**

- Permitted protected for the eastbound left, westbound left and southbound left.
- Eastbound right lane converted to a through-right
- A left-turn lane and a shared through-right lane on the westbound approach.

- A left-turn lane added on the southbound approach.
- Optimized signal timings

**Townline Road and Site Access 1**

- Signalization of the intersection
- Exclusive westbound right-lane and left-lane
- Addition of a northbound through/right-lane
- Exclusive Southbound left-lane
- Optimized signal timings

**Highway 401 Eastbound off-ramp and Townline Road**

- Addition of an eastbound shared left/right turn lane

**Townline Road and Ellis Road and Sideroad 10N**

- Addition of a northbound and southbound through lane

Sincerely,

GHD

[redacted]

[redacted]

Vincenzo Costantino

Transportation Planner

William Maria, P. Eng.

Transportation Planning Lead

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# 1. Introduction

## 1.1 Retainer and Objective

GHD Limited was retained to prepare a Traffic Impact Study for a proposed industrial development located on land with municipal address of 2809 Townline Road in the Township of Puslinch.

The site location is illustrated in **Figure 1**.

The purpose of this study is to:

- Establish baseline traffic conditions for the study area in 2025 and determine future background operating conditions for a future planning horizon in 2028 and 2033.
- Estimate the site trips generated by the proposed development and distribute the traffic to the adjacent road network.
- Determine future operating traffic conditions during the weekday peak periods through intersection capacity analysis.
- Review sightlines for the proposed site access.

## 1.2 Study Team

The GHD team involved in the preparation of the study are:

- William Maria, P. Eng., Transportation Planning Lead
- Yueqi Wang, Transportation Engineering Co-op
- Vincenzo Costantino, B.Eng., Transportation Planner

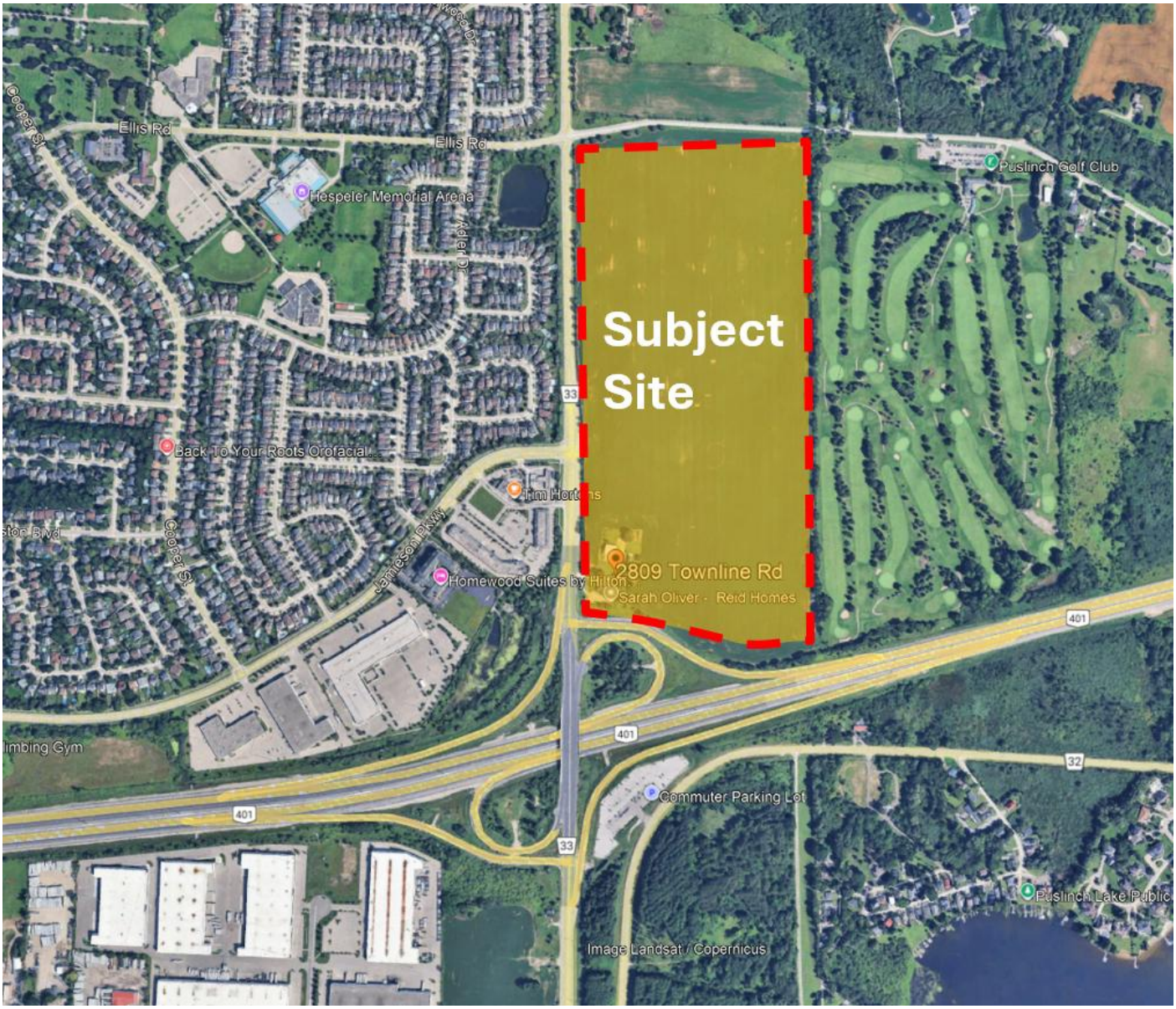


*Figure 1 Site Location*

# 2. Site Characteristics

## 2.1 Study Area

As per the agreed Terms of Reference for the study attached in **Appendix A**, the following intersections were included in the study area:

- Hwy 401 EB off-ramp and Townline Road
- Hwy 401 WB off-ramp and Townline Road
- Townline Road and Site Access 1
- Townline Road and Jamieson Parkway/Site Access 2

- Townline Road and Ellis Road/Sideroad 10N

## 2.2 Proposed Development Content

A site plan prepared by Ware Malcomb is provided in **Figure 2** and **Appendix B**., presenting two conceptual site plans for the development, labeled as Site Plan A and Site Plan B.

Both conceptual site plans feature six industrial buildings situated on the northern portion of the site, near the intersection of Site Access 2, Jamieson Parkway, and Townline Road. The gross floor area (GFA) breakdown for the six buildings is as follows:

- Building 1: 174,375 ft²
- Building 2: 174,375 ft²
- Building 3: 174,375 ft²
- Building 4: 112,236 ft²
- Building 5: 112,236 ft²
- Building 6: 105,636 ft²

Site Plan A includes the six industrial buildings listed above, as well as a big box retail component with a GFA of 162,428 ft² and a gas station featuring 24 fueling stations, located on the southern portion of the lot. The total GFA for Site Plan A is 1,015,662 ft² (94,358 m²). The site plan for Site Plan A is shown in **Figure 2** below.

***Figure 2 Proposed Site Plan – Site Plan A***

Similar to Site Plan A, Site Plan B consists of the 6 industrial buildings on the northern portion of the lot mentioned above where instead of a box retail component and gas station, two industrial buildings are proposed on the southern portion of the lot noted as building 7 and 8. Both buildings 7 and 8 have a GFA of 210,000 $ft^2$ which equate to a total GFA of 1,273,234 $ft^2$ (118,287$m^2$) for Site Plan B. The site plan for Site Plan B is shown in **Figure 3** below.

*Figure 3 Proposed Site Plan – Site Plan B*

Accesses to the subject site are proposed via a two full-moves driveway on Townline Road. Site Access 1 is the north most access, Site Access 2 is located opposite Jamieson Parkway.

# 3. Existing Conditions

## 3.1 Existing Road Network

**Highway 401** is an east/west provincial highway under the jurisdiction of the MTO. Its intersection with Townline road has two off-ramps. The eastbound off-ramp has a two-lane cross-section with exclusive left-turn and right-turn lanes. The westbound off-ramp has a three-lane cross-section with a dual left-turn lane and an exclusive right-turn lane.

**Townline Road** is a north/south regional road under the jurisdiction of the Region of Waterloo. Within the study area it has a four-lane cross-section at the signalized intersections of the Highway 401 westbound and eastbound off-ramps. Its intersection with Jamieson Parkway is also signalized with a 6-lane cross-section on the south approach which includes a dual left-turn lane. At the signalized intersection with Ellis Road, Townline Road becomes a 3-lane cross-section which includes a two-way left-turn lane in both the North and South direction. The posted speed limit along Townline Road is 60 km/h.

**Jamieson Parkway** operates as east/west collector road under the jurisdiction of the City of Cambridge. Within the study area it has a four-lane cross-section including an exclusive left-turn and right-turn lane in the eastbound direction. Its intersection with Townline Road is signalized. The posted speed limit along Jamieson Parkway is 50 km/h.

**Ellis Road** is an east/west collector road under the jurisdiction of the City of Cambridge. Within the study area it has a two-lane cross-section. Its intersection with Townline Road is a signalized intersection including an auxiliary left turn. The assumed speed limit is 50 km/h.

**Sideroad 10N** is an east/west collector road under the jurisdiction of the Township of Puslinch. Within the study area it has a two-lane cross-section. Its intersection with Townline Road is signalized including an auxiliary left turn. The assumed speed limit is 50 km/h.

The existing lane configurations and intersection control are shown in the figure below.

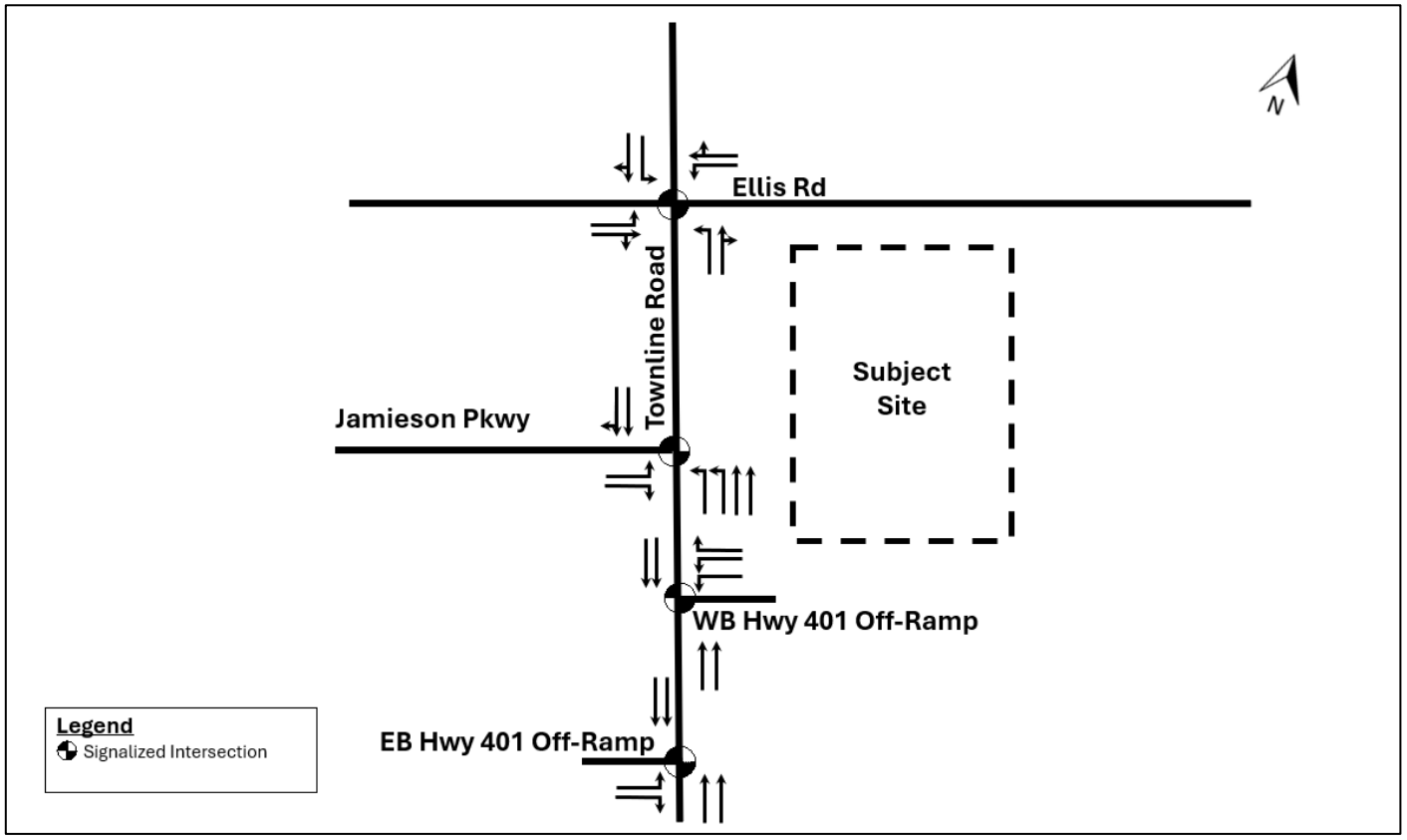


*Figure 4 Existing Lane Configuration and Traffic Controls*

# 3.2 Pedestrian and Bicycle Facilities

Within the study area, pedestrian infrastructures such as sidewalks or multi-use paths are provided along at least one side of all study area roads as summarized in the following table.

*Table 1 Existing Pedestrian and Bicycle Facilities*

| Road Name | Pedestrian Sidewalk | Bicycle Lane | Multi-Use Pathway (MUP) |
|---|---|---|---|
| Townline Road | West side only | Both sides | Not present |
| Jamieson Pkwy | Both sides | Both sides | Not present |
| Ellis Road | Both sides | Both Side | Not present |
| Side Road 10N | Not present | Not present | Not present |
| Hwy401 off-ramps | Not present | Not present | Not present |

The pedestrian and bicycle routes are illustrated in **Figure 4** below.

*Figure 5 Existing Active Transportation Facilities*

## 3.3 Transit Services

Grand River Transit (GRT) operates the following transit route within the study area.

GRT Route 51 (**Hespeler**) operates in a general east/west and north/south direction along Jamieson Pkwy, Townline Road, Ellis Street within the study area from Monday to Sunday. From Monday to Saturday, Route 51 operates with

headways of 30 minutes during peak hours. On Sundays, Route 51 operates with headways of 1 hour during peak hours.

There are in total 5 transit stations nearby the study intersections.

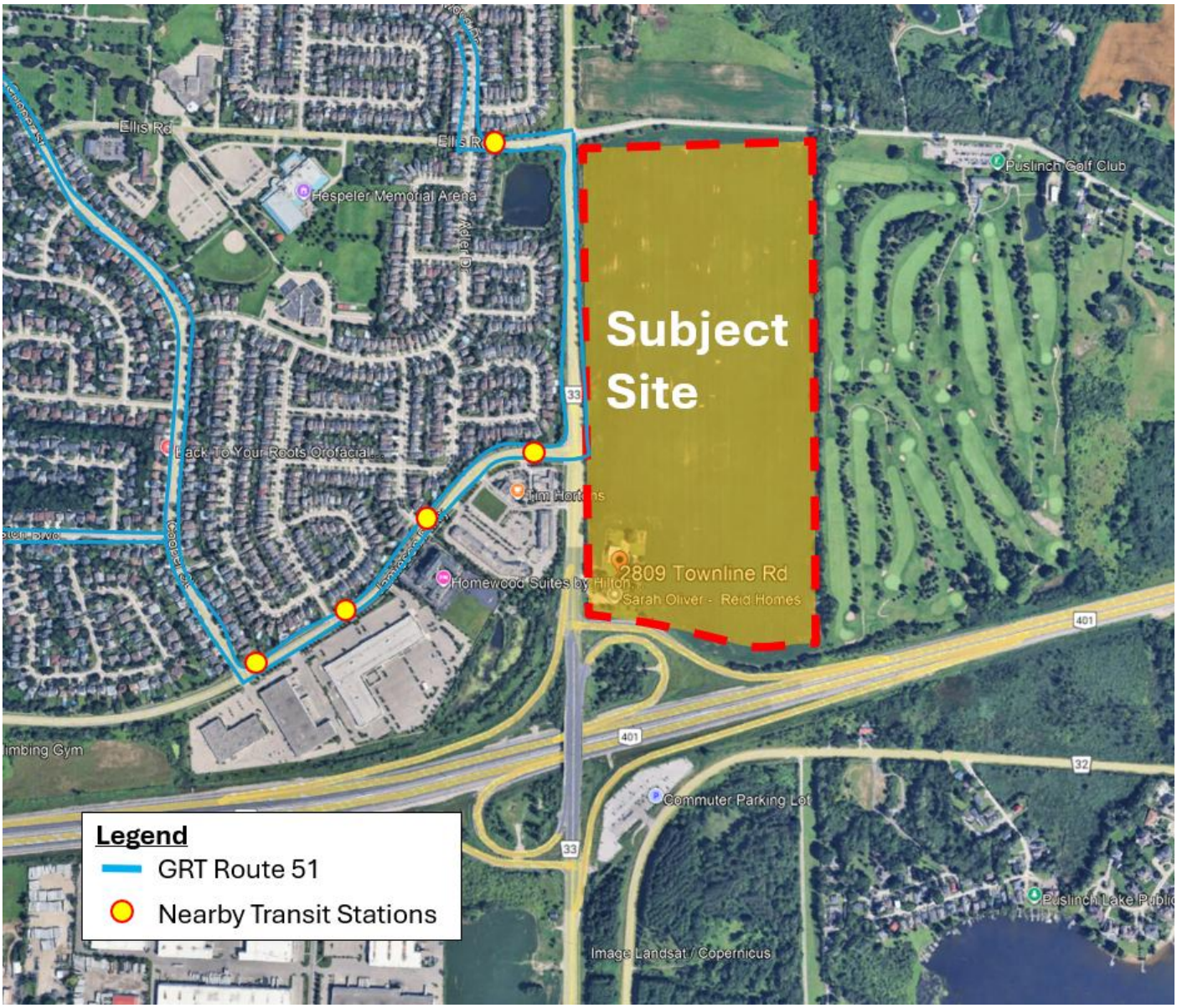


*Figure 6 Existing Transit Routes and Transit Stops*

# 3.4 Existing Traffic Data

GHD contracted Spectrum Inc. to conduct updated turning movement counts at all the study intersections in October and November 2025 for the a.m., p.m. and Saturday peak hour volumes. The baseline 2025 traffic volumes for the a.m., p.m. and weekend peak hours are summarized in **Figure 7** below with the full turning movement counts provided in **Appendix C.**

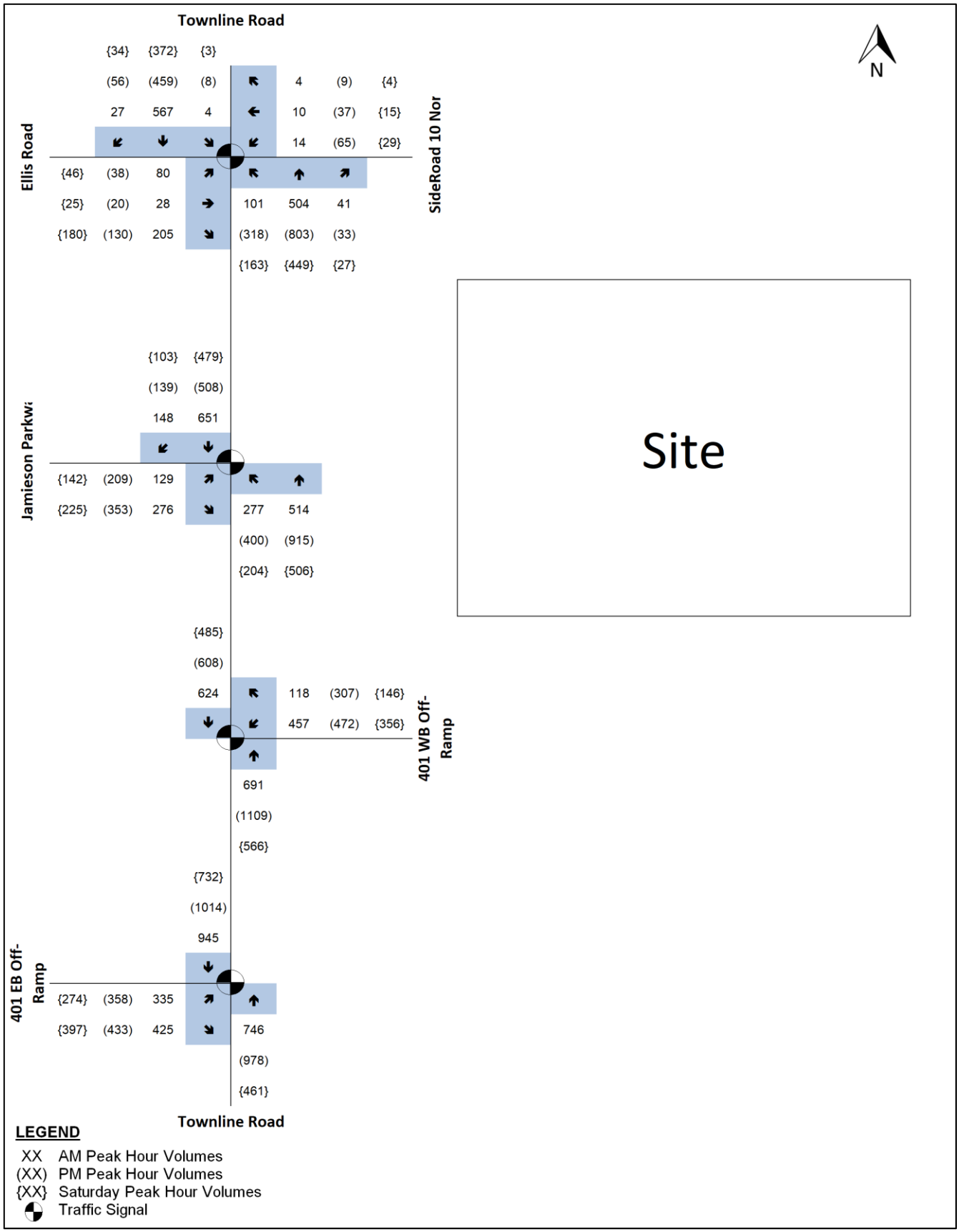


*Figure 7 Baseline 2025 Traffic Volumes*

# 4. Future Conditions

## 4.1 Study Horizon Year

As per the terms of reference future horizon years of 2028 build-out, 2033 representing five years post build-out, and 2038 representing ten years post build-out was selected as per the MTO and Town guidelines.

## 4.2 Corridor Growth

As per the approved terms of reference, a 2% rate was applied to the Highway 401 ramps, a 2% growth rate was applied to Ellis Road and Jamieson Parkway and a rate of 2% was calculated for Townline Road. As per the MTO request the MTO ramps projected volumes were calculated using simple growth rate.

## 4.3 Background Development Traffic

The terms of reference for this traffic impact study identified one background development at 2310 - 2420 Townline Road. This development consists of a two-phase industrial development of two buildings: Building A (GFA of 146, 622 sq.ft) and Building B (GFA of 159,905 sq.ft) that will be completed by a 2026 horizon year. **Figure 8** below summarizes the background volumes on the study intersections.

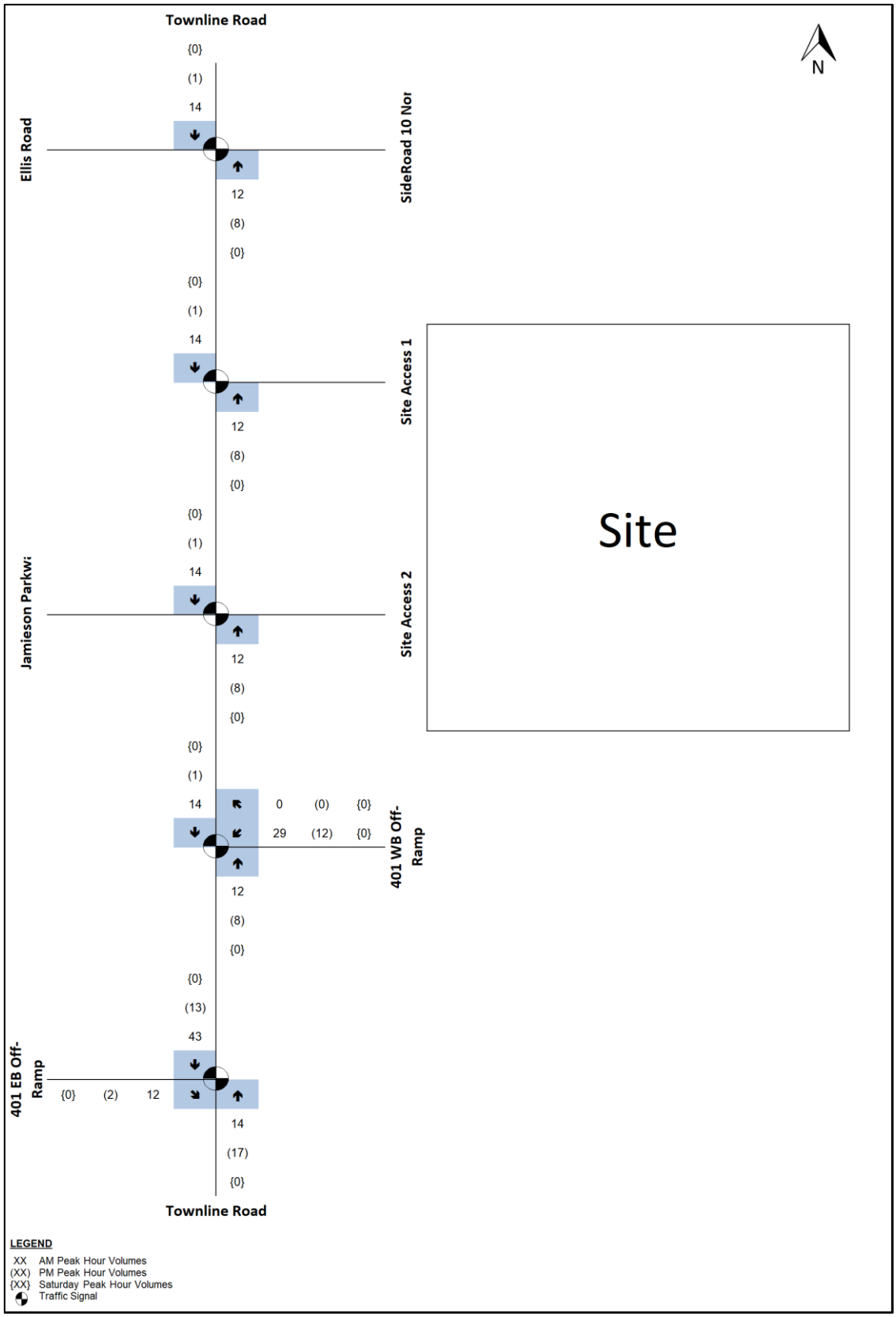


***Figure 8 Background Development Volumes***

## 4.4 Future Background Traffic Volumes

The background traffic volumes for the 2028 and 2038 horizon year were derived by applying the aforementioned growth rates to the study area roads. The resulting 2028 and 2038 future background traffic volumes are summarized in **Figure 9** to **Figure 11**.

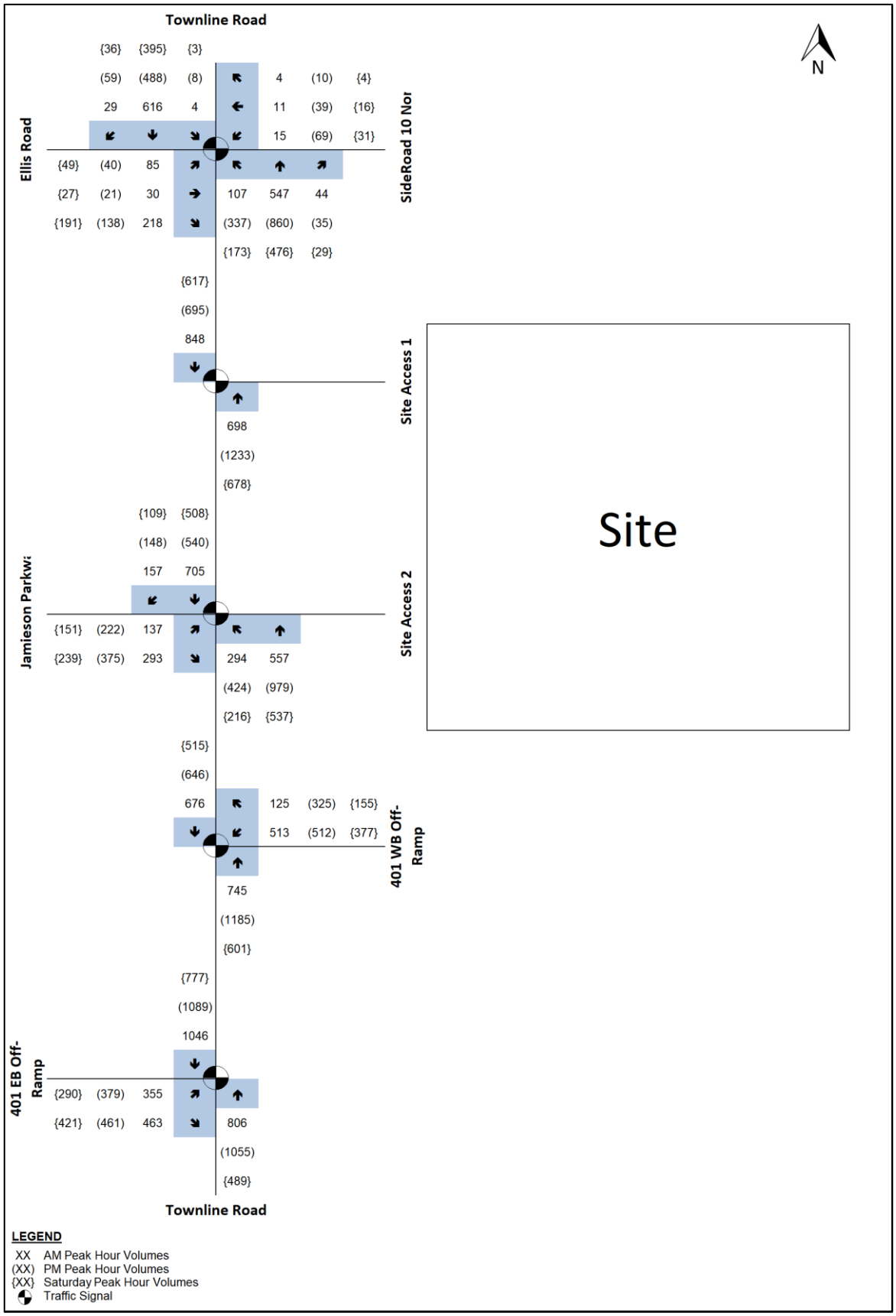


*Figure 9 2028 Future Background Traffic Volumes*

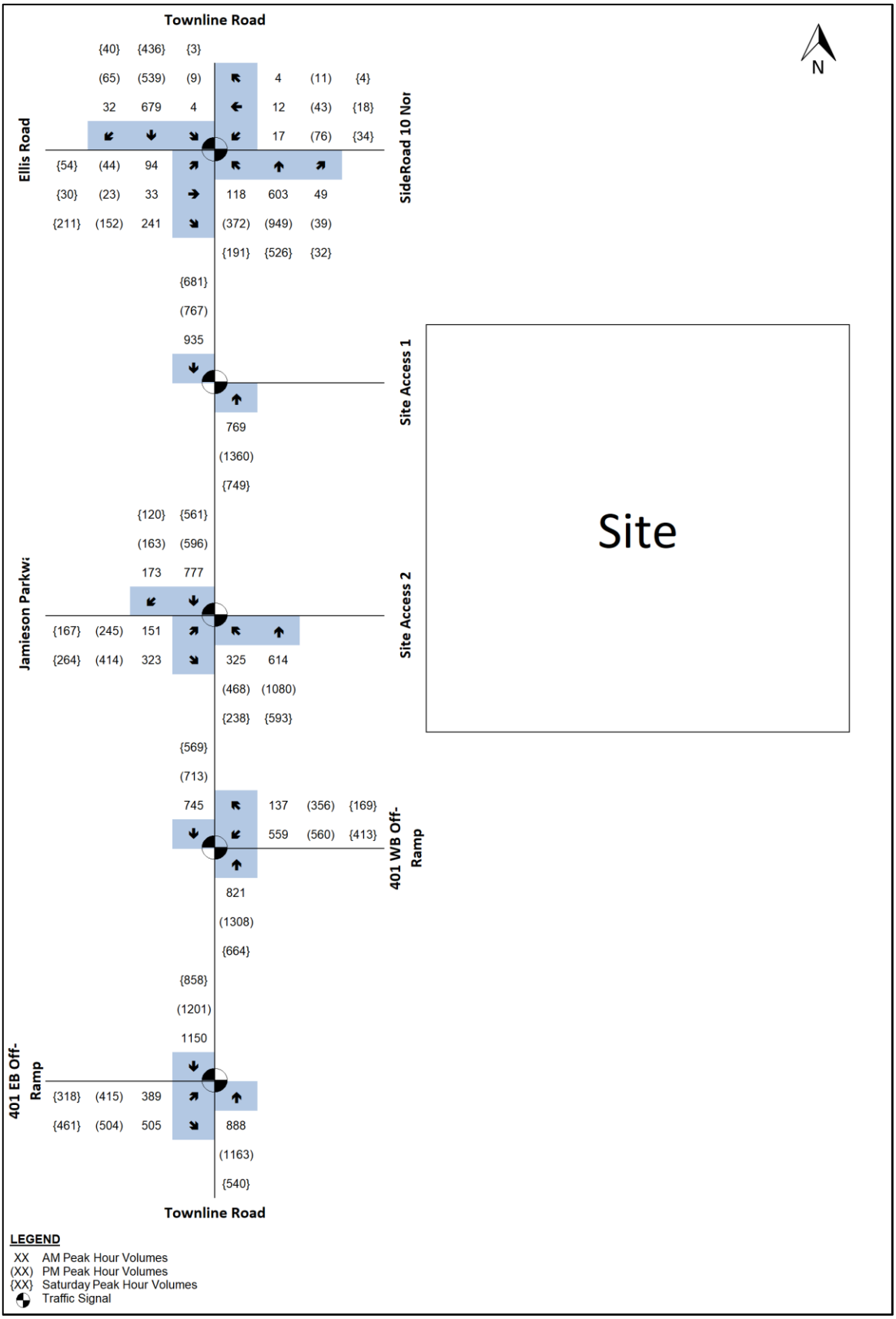


*Figure 10 2033 Future Background Traffic Volumes*

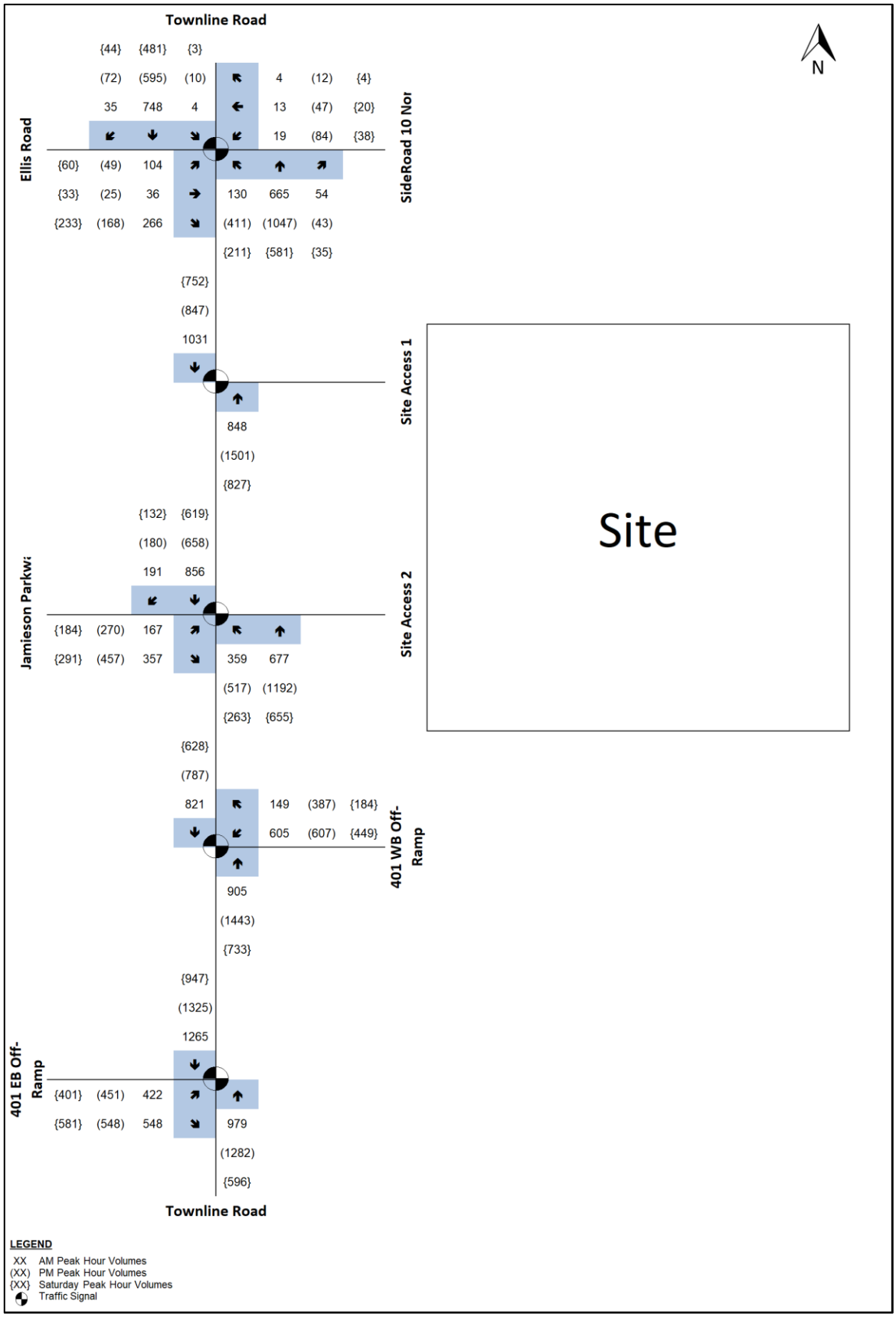


*Figure 11 Future Background 2038 Volumes*

# 5. Site Generated Traffic

## 5.1 Site Trip Generation

As there are two conceptual site plans for the development, site trip generation was calculated separately for each case. In both Site Plans, the trip generation for Buildings 1 through 6 remains the same. For each Site Plan, traffic generation for the proposed buildings during the a.m., p.m., and weekend peak hours was derived from the 12th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). Specifically, Land Use Code (LUC) 150 – Warehousing was applied to Buildings 1 to 3, and LUC 130 – Industrial Park was used for Buildings 4 to 6.

To ensure the most conservative approach, a comparison was made between the fitted curve equations and average trip generation rates for each Land Use Code. The higher of the two calculated trip generation values whether from the fitted curve or the average rate was selected for each land use and applied to the analysis.

**Table 2** summarizes the estimated trip generation for buildings 1 to 6 for the subject site.

***Table 2 Total Site Trip Generation for Buildings 1 to 6***

| Land Use Code | GFA | Parameters | Peak Hour Trip Generation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Weekday AM | | | Weekday PM | | | Saturday Midday | | |
| | | | In | Out | Total | In | Out | Total | In | Out | Total |
| Warehousing (LUC 150) Building 1 | 174,375 ft² GFA | Trip Rate | 0.138 | 0.040 | 0.178 | 0.063 | 0.161 | 0.224 | 0.034 | 0.018 | 0.052 |
| | | Trip Ratio | 77% | 23% | 100% | 28% | 72% | 100% | 64% | 36% | 100% |
| | | New Trips | 24 | 7 | 31 | 11 | 28 | 39 | 6 | 3 | 9 |
| Warehousing (LUC 150) Building 2 | 174,375 ft² GFA | Trip Rate | 0.138 | 0.040 | 0.178 | 0.063 | 0.161 | 0.224 | 0.034 | 0.018 | 0.052 |
| | | Trip Ratio | 77% | 23% | 100% | 28% | 72% | 100% | 64% | 36% | 100% |
| | | New Trips | 24 | 7 | 31 | 11 | 28 | 39 | 6 | 3 | 9 |
| Warehousing (LUC 150) Building 3 | 174,375 ft² GFA | Trip Rate | 0.138 | 0.040 | 0.178 | 0.063 | 0.161 | 0.224 | 0.034 | 0.018 | 0.052 |
| | | Trip Ratio | 77% | 23% | 100% | 28% | 72% | 100% | 64% | 36% | 100% |
| | | New Trips | 24 | 7 | 31 | 11 | 28 | 39 | 6 | 3 | 9 |
| Industrial Park (LUC 130) Building 4 | 112,236 ft² GFA | Trip Rate | 0.970 | 0.294 | 1.264 | 0.329 | 0.846 | 1.175 | 0.196 | 0.400 | 0.596 |
| | | Trip Ratio | 77% | 23% | 100% | 28% | 72% | 100% | 32% | 68% | 100% |
| | | New Trips | 109 | 33 | 142 | 37 | 95 | 132 | 22 | 45 | 67 |
| Industrial Park (LUC 130) Building 5 | 112,236 ft² GFA | Trip Rate | 0.970 | 0.294 | 1.264 | 0.329 | 0.846 | 1.175 | 0.196 | 0.400 | 0.596 |
| | | Trip Ratio | 77% | 23% | 100% | 28% | 72% | 100% | 32% | 68% | 100% |
| | | New Trips | 109 | 33 | 142 | 37 | 95 | 132 | 22 | 45 | 67 |
| Industrial Park | 105,636 ft² GFA | Trip Rate | 1.032 | 0.303 | 1.335 | 0.350 | 0.890 | 1.240 | 0.189 | 0.417 | 0.606 |
| | | Trip Ratio | 77% | 23% | 100% | 28% | 72% | 100% | 32% | 68% | 100% |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (LUC 130) Building 6 | | New Trips | 109 | 32 | 141 | 37 | 94 | 131 | 20 | 44 | 64 |
| | | **Total Trips** | **399** | **119** | **518** | **144** | **368** | **512** | **82** | **143** | **225** |

**Site Plan A**

For Site Plan A the site includes the addition of 1 big box retail with a GFA of 162,428 ft$^2$ and a gas station with 24 fueling stations.

To determine the site generated traffic for the big box retailer the average of LUC 815 – Free Standing Discount Store, 862 – Home Improvement Store, 863 – Electronic Superstore and 869 – Discount Home Furnishing Superstore. The gas station used LUC 945 – Convenience Store/Gas Station.

Additionally, as per the pass-by rates published by ITE, pass by rates were applied where applicable to the site traffic that is redistributed among the site accesses. The pass-by rates were applied to the generated trips for each assumed land use for the big box retail and based on the averages between the uses. The gas station also applied pass-by rates based on the ITE published document.

The table below outlines the adjusted site trips generated as well as the average of the trips and pass-by that were applied to the study intersections.

***Table 3 Site Trip Generation – Site Plan A***

| Land Use Code | GFA | Parameters | Peak Hour Trip Generation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Weekday AM | | | Weekday PM | | | Saturday Midday | | |
| | | | In | Out | Total | In | Out | Total | In | Out | Total |
| Free Standing Discount Store (LUC 815) | 162,426 ft$^2$ GFA | Trip Rate | 0.825 | 0.357 | 1.182 | 2.432 | 2.425 | 4.857 | 3.589 | 3.454 | 7.043 |
| | | Trip Ratio | 70% | 30% | 100% | 50% | 50% | 100% | 51% | 49% | 100% |
| | | Gross Trips | 134 | 58 | 192 | 395 | 394 | 789 | 583 | 561 | 1144 |
| | | Pass-by Trips | 20 | 20 | 40 | 79 | 79 | 158 | 138 | 138 | 276 |
| | | Adjusted Trips | 114 | 38 | 152 | 316 | 315 | 631 | 445 | 423 | 868 |
| Home Improvement Store (LUC 862) | 162,426 ft$^2$ GFA | Trip Rate | 0.138 | 0.040 | 0.178 | 1.114 | 1.164 | 2.278 | 2.222 | 2.137 | 4.359 |
| | | Trip Ratio | 57% | 43% | 100% | 49% | 51% | 100% | 51% | 49% | 100% |
| | | Gross Trips | 139 | 105 | 244 | 181 | 189 | 370 | 361 | 347 | 708 |
| | | Pass-by Trips | 0 | 0 | 0 | 78 | 78 | 156 | 0 | 0 | 0 |
| | | Adjusted Trips | 139 | 105 | 244 | 103 | 111 | 214 | 361 | 347 | 708 |
| Electronic Superstore (LUC 863) | 162,426 ft$^2$ GFA | Trip Rate | 0.357 | 0.135 | 0.493 | 3.497 | 3.497 | 6.994 | 3.294 | 3.164 | 6.458 |
| | | Trip Ratio | 73% | 27% | 100% | 50% | 50% | 100% | 51% | 49% | 100% |
| | | Gross Trips | 58 | 22 | 80 | 568 | 568 | 1136 | 535 | 514 | 1049 |
| | | Pass-by Trips | 0 | 0 | 0 | 228 | 228 | 456 | 0 | 0 | 0 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Adjusted Trips | 58 | 22 | 80 | 340 | 340 | 680 | 535 | 514 | 1049 |
| Discount Home Furnishing Superstore (LUC 869) | 162,426 ft² GFA | Trip Rate | 0.369 | 0.203 | 0.573 | 0.831 | 0.739 | 1.570 | 1.835 | 1.563 | 3.398 |
| | | Trip Ratio | 64% | 36% | 100% | 53% | 47% | 100% | 54% | 46% | 100% |
| | | Gross Trips | 60 | 33 | 93 | 135 | 120 | 255 | 298 | 254 | 552 |
| | | Pass-by Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Adjusted Trips | 60 | 33 | 93 | 135 | 120 | 255 | 298 | 254 | 552 |
| **Average Trips** | | | **93** | **50** | **142** | **224** | **222** | **445** | **410** | **385** | **794** |
| **Average Pass-by Trips** | | | **5** | **5** | **10** | **96** | **96** | **192** | **34** | **34** | **68** |
| Industrial Park (LUC 130) Building 6 | 105,636 ft² GFA | Trip Rate | 6.833 | 6.833 | 13.667 | 7.917 | 7.916 | 15.833 | 7.208 | 7.167 | 14.375 |
| | | Trip Ratio | 50% | 50% | 100% | 50% | 50% | 100% | 50% | 50% | 100% |
| | | Gross Trips | 164 | 164 | 328 | 190 | 190 | 380 | 173 | 172 | 345 |
| | | Pass-by Trips | 125 | 125 | 250 | 143 | 143 | 286 | 0 | 0 | 0 |
| | | Adjusted Trips | 39 | 39 | 78 | 47 | 47 | 94 | 173 | 172 | 345 |
| **Total Trips** | | | **132** | **89** | **221** | **271** | **269** | **540** | **583** | **557** | **1140** |
| **Total Pass-by Trips** | | | **130** | **130** | **260** | **239** | **239** | **478** | **34** | **34** | **68** |

***Table 4 Total Site Trip Generation - Site Plan A***

| Buildings | Peak Hour Trip Generation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Weekday AM | | | Weekday PM | | | Saturday Midday | | |
| | In | Out | Total | In | Out | Total | In | Out | Total |
| Retail and Gas Station Site Trips | 132 | 89 | 221 | 271 | 269 | 540 | 583 | 557 | 1140 |
| Buildings 1 to 6 Site Trips | 399 | 119 | 518 | 144 | 368 | 512 | 82 | 143 | 225 |
| **Total Site Trips** | **531** | **208** | **739** | **415** | **637** | **1052** | **665** | **700** | **1365** |
| **Retail and Gas Station Pass-by Trips** | **130** | **130** | **260** | **239** | **239** | **478** | **34** | **34** | **68** |

The proposed Site Plan A development is expected to generate a total of 739 two-way site trips during the a.m. peak hour consisting of 531 inbound and 208 outbound trips. During the p.m. peak hour, it is expected to generate 1052 new two-way site trips consisting of 415 inbound and 637 outbound trips. During the Saturday peak hour, it is expected to generate 1365 new two-way site trips consisting of 665 inbound and 700 outbound trips.

Additionally, the development is expected to generate a total of 260 two-way pass-by trips during the a.m. peak hour consisting of 130 inbound and 130 outbound trips. During the p.m. peak hour, it is expected to generate 478 pass-by trips consisting of 239 inbound and 239 outbound trips. During the Saturday peak hour, it is expected to generate 68 pass-by trips consisting of 34 inbound and 34 outbound trips. The pass by trips for the retail and the gas station component are shown below.

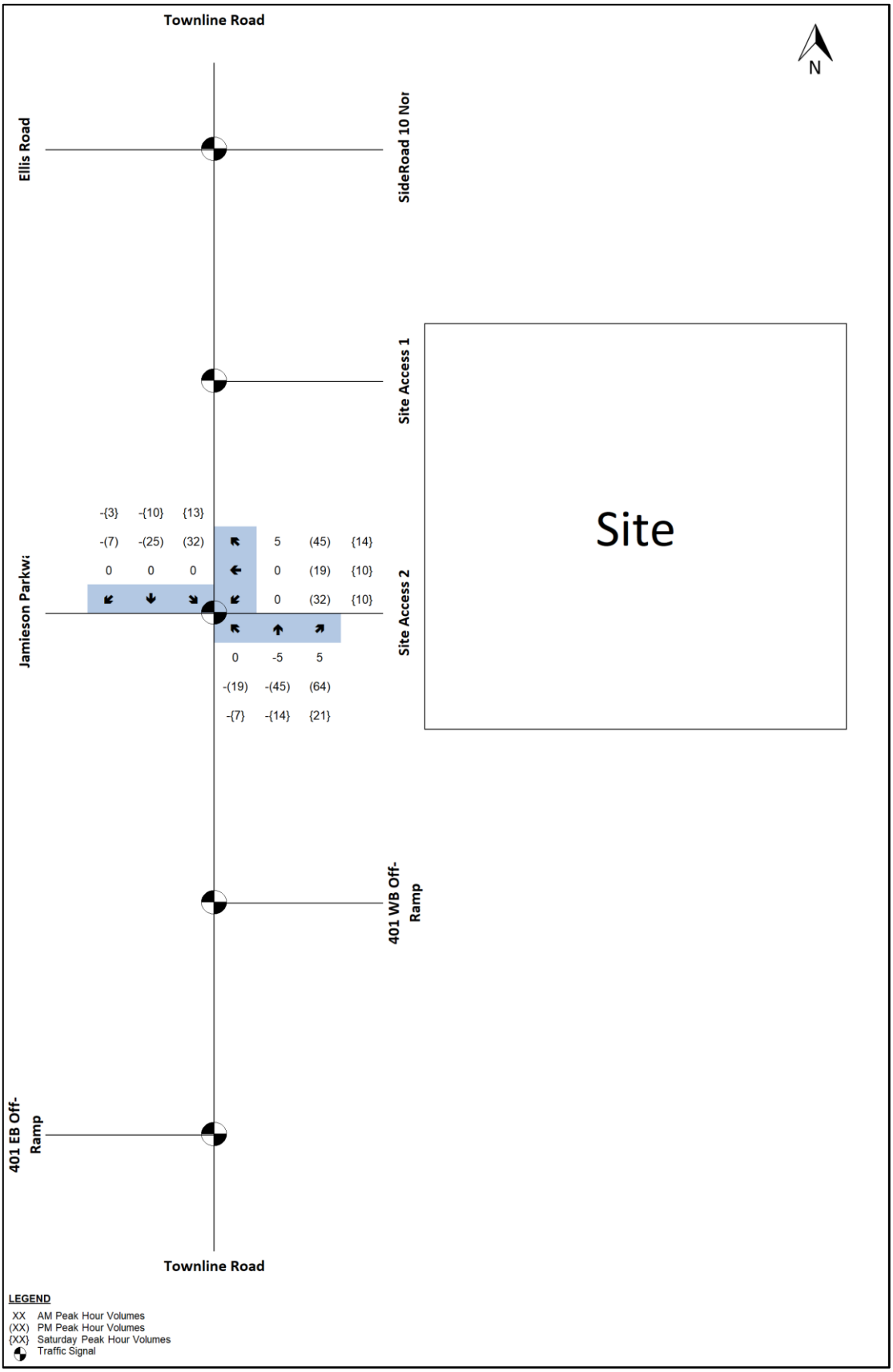


*Figure 12 Retail Pass-By Trips*

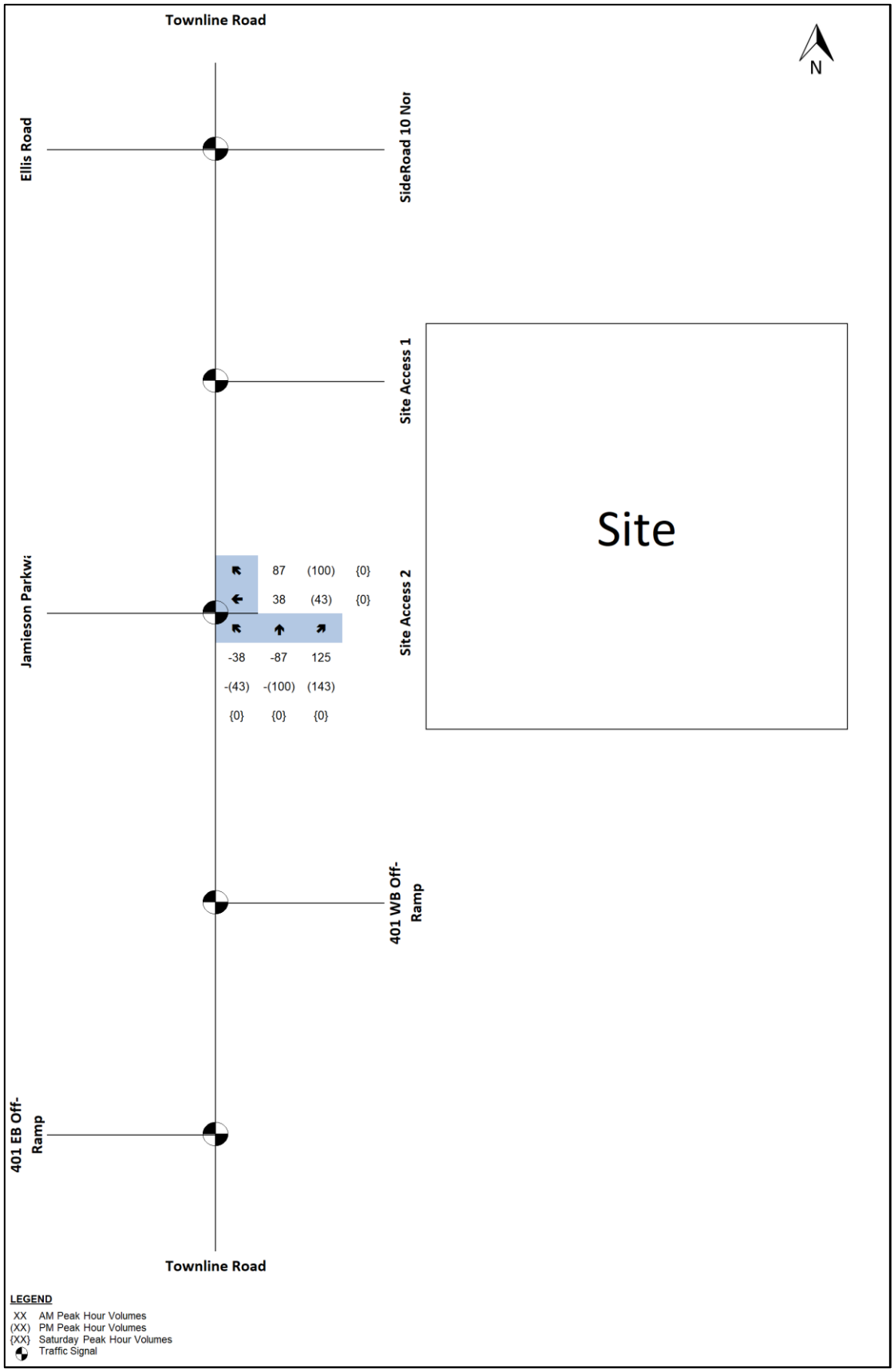


*Figure 13 Gas Station Pass-By Trips*

**Site Plan B**

For Site Plan B, the site includes the addition of two warehouses referred to as building 7 and 8 located on the southern portion of the lot with a GFA of 210,00 ft$^2$ for each building.

To determine the site generated traffic for the warehouses LUC 150 – Warehousing was selected and applied as part of the ITE 12$^{th}$ edition trip generation manual.

The table below summarizes the estimated trip generation for new buildings 7 and 8 on the subject site.

***Table 5 Site Trip Generation - Site Plan B***

| Land Use Code | GFA | Parameters | Peak Hour Trip Generation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Weekday AM | | | Weekday PM | | | Saturday Midday | | |
| | | | In | Out | Total | In | Out | Total | In | Out | Total |
| Warehousing (LUC 150) Building 7 | 210,000 ft$^2$ GFA | Trip Rate | 0.129 | 0.033 | 0.162 | 0.057 | 0.148 | 0.205 | 0.033 | 0.019 | 0.052 |
| | | Trip Ratio | 77% | 23% | 100% | 28% | 72% | 100% | 64% | 36% | 100% |
| | | Gross Trips | 27 | 7 | 34 | 12 | 31 | 43 | 7 | 4 | 11 |
| Warehousing (LUC 150) Building 8 | 210,000 ft$^2$ GFA | Trip Rate | 0.129 | 0.033 | 0.162 | 0.057 | 0.148 | 0.205 | 0.033 | 0.019 | 0.052 |
| | | Trip Ratio | 77% | 23% | 100% | 28% | 72% | 100% | 64% | 36% | 100% |
| | | Gross Trips | 27 | 7 | 34 | 12 | 31 | 43 | 7 | 4 | 11 |
| **Buildings 7 and 8 Total Site Trips** | | | **54** | **14** | **68** | **24** | **62** | **86** | **14** | **8** | **22** |

***Table 6 Total Site Trip Generation - Site Plan B***

| Buildings | Peak Hour Trip Generation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Weekday AM | | | Weekday PM | | | Saturday Midday | | |
| | In | Out | Total | In | Out | Total | In | Out | Total |
| Buildings 1 to 6 Site Trips | 399 | 119 | 518 | 144 | 368 | 512 | 82 | 143 | 225 |
| Buildings 7 and 8 Site Trips | 54 | 14 | 68 | 24 | 62 | 86 | 14 | 8 | 22 |
| **Total Site Trips** | **453** | **133** | **586** | **168** | **430** | **598** | **96** | **151** | **247** |

The proposed Site Plan B development is expected to generate a total of 586 two-way site trips during the a.m. peak hour consisting of 453 inbound and 133 outbound trips. During the p.m. peak hour, it is expected to generate 598 new two-way site trips consisting of 168 inbound and 430 outbound trips. During the Saturday peak hour, it is expected to generate 247 new two-way site trips consisting of 96 inbound and 151 outbound trips.

## 5.2 Site Traffic Distribution and Assignment

The site generated traffic for the subject site was distributed based on the existing travel patterns at the study intersections and a review of the 2022 Transportation Tomorrow Survey (TTS) data. The TTS derived data can be found in **Appendix G**

The directional distribution used for site generated traffic for Site Plan A is summarized in **Table 7** and **Table 8** and the distribution for Site Plan B is summarized in **Table 9.**

***Table 7 Site Traffic Distribution Commercial– Site Plan A***

| Peak Period | Direction | North (Townline Road) | South (Townline Road) | East (Ellis Road) | West (Ellis Road) | West (Jamieson Parkway) | West (401 EB Off Ramp) | East (401 WB Off ramp) | West (401 WB On Ramp) | West (401 EB On Ramp) |
|---|---|---|---|---|---|---|---|---|---|---|
| AM | Inbound | 25% | 30% | 5% | 10% | 15% | 10% | 5% | 0% | 0% |
| | Outbound | 25% | 35% | 5% | 5% | 10% | 0% | 0% | 10% | 10% |
| PM | Inbound | 20% | 35% | 5% | 5% | 10% | 15% | 10% | 0% | 0% |
| | Outbound | 30% | 25% | 5% | 5% | 25% | 0% | 0% | 5% | 5% |
| Sat | Inbound | 20% | 35% | 5% | 5% | 10% | 15% | 10% | 0% | 0% |
| | Outbound | 25% | 30% | 5% | 5% | 25% | 0% | 0% | 5% | 5% |

***Table 8 Site Traffic Distribution Industrial - Site Plan A***

| Peak Period | Direction | North (Townline Road) | South (Townline Road) | East (Ellis Road) | West (Ellis Road) | West (Jamieson Parkway) | West (401 EB Off Ramp) | East (401 WB Off ramp) | West (401 WB On Ramp) | West (401 EB On Ramp) |
|---|---|---|---|---|---|---|---|---|---|---|
| AM | Inbound | 10% | 40% | 10% | 5% | 0% | 20% | 15% | 0% | 0% |
| | Outbound | 10% | 25% | 15% | 5% | 5% | 0% | 0% | 20% | 20% |
| PM | Inbound | 10% | 40% | 10% | 5% | 0% | 20% | 15% | 0% | 0% |
| | Outbound | 10% | 25% | 15% | 5% | 5% | 0% | 0% | 20% | 20% |
| Sat | Inbound | 10% | 40% | 10% | 5% | 0% | 20% | 15% | 0% | 0% |
| | Outbound | 10% | 25% | 15% | 5% | 5% | 0% | 0% | 20% | 20% |

***Table 9 Site Traffic Distribution Industrial – Site Plan B***

| Peak Period | Direction | North (Townline Road) | South (Townline Road) | East (Ellis Road) | West (Ellis Road) | West (Jamieson Parkway) | West (401 EB Off Ramp) | East (401 WB Off ramp) | West (401 WB On Ramp) | West (401 EB On Ramp) |
|---|---|---|---|---|---|---|---|---|---|---|
| AM | Inbound | 10% | 40% | 10% | 5% | 0% | 20% | 15% | 0% | 0% |
| | Outbound | 10% | 25% | 15% | 5% | 5% | 0% | 0% | 20% | 20% |
| PM | Inbound | 10% | 40% | 10% | 5% | 0% | 20% | 15% | 0% | 0% |
| | Outbound | 10% | 25% | 15% | 5% | 5% | 0% | 0% | 20% | 20% |
| Sat | Inbound | 10% | 40% | 10% | 5% | 0% | 20% | 15% | 0% | 0% |
| | Outbound | 10% | 25% | 15% | 5% | 5% | 0% | 0% | 20% | 20% |

The percentage distributions for the conceptual site plans are shown below

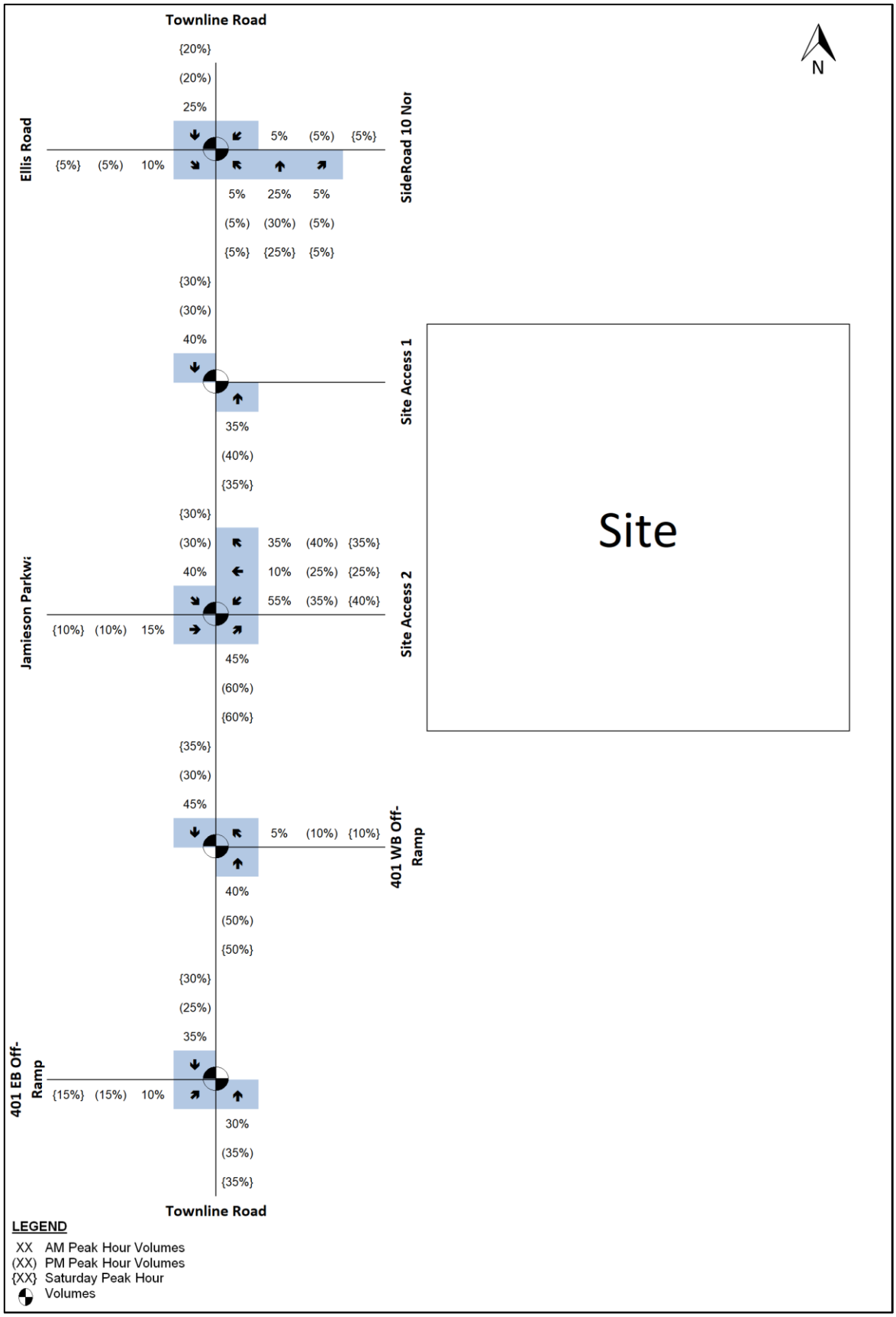


*Figure 14 Site Trip Distribution Commercial – Site Plan A*

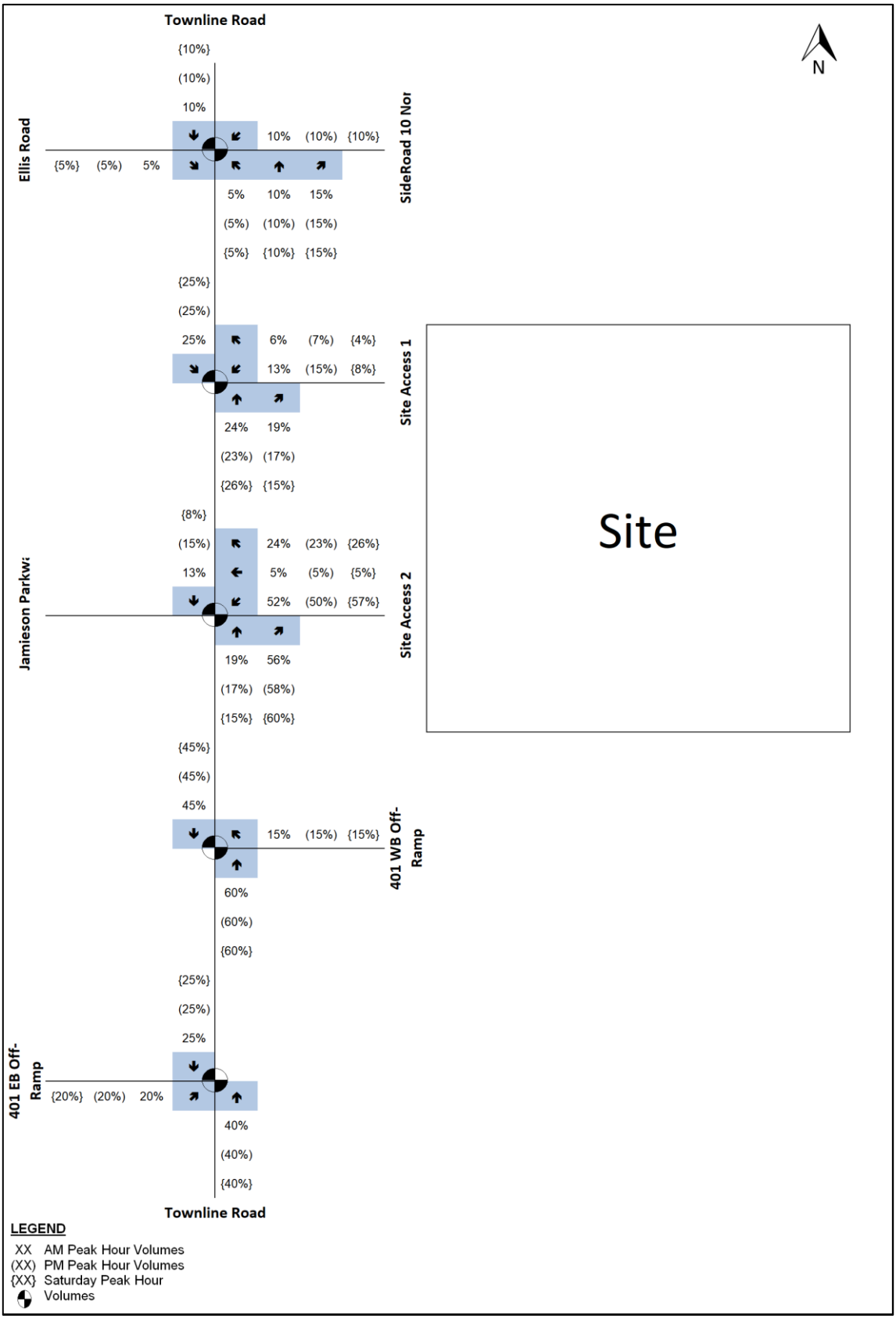


*Figure 15 Site Trip Distribution Industrial – Site Plan A*

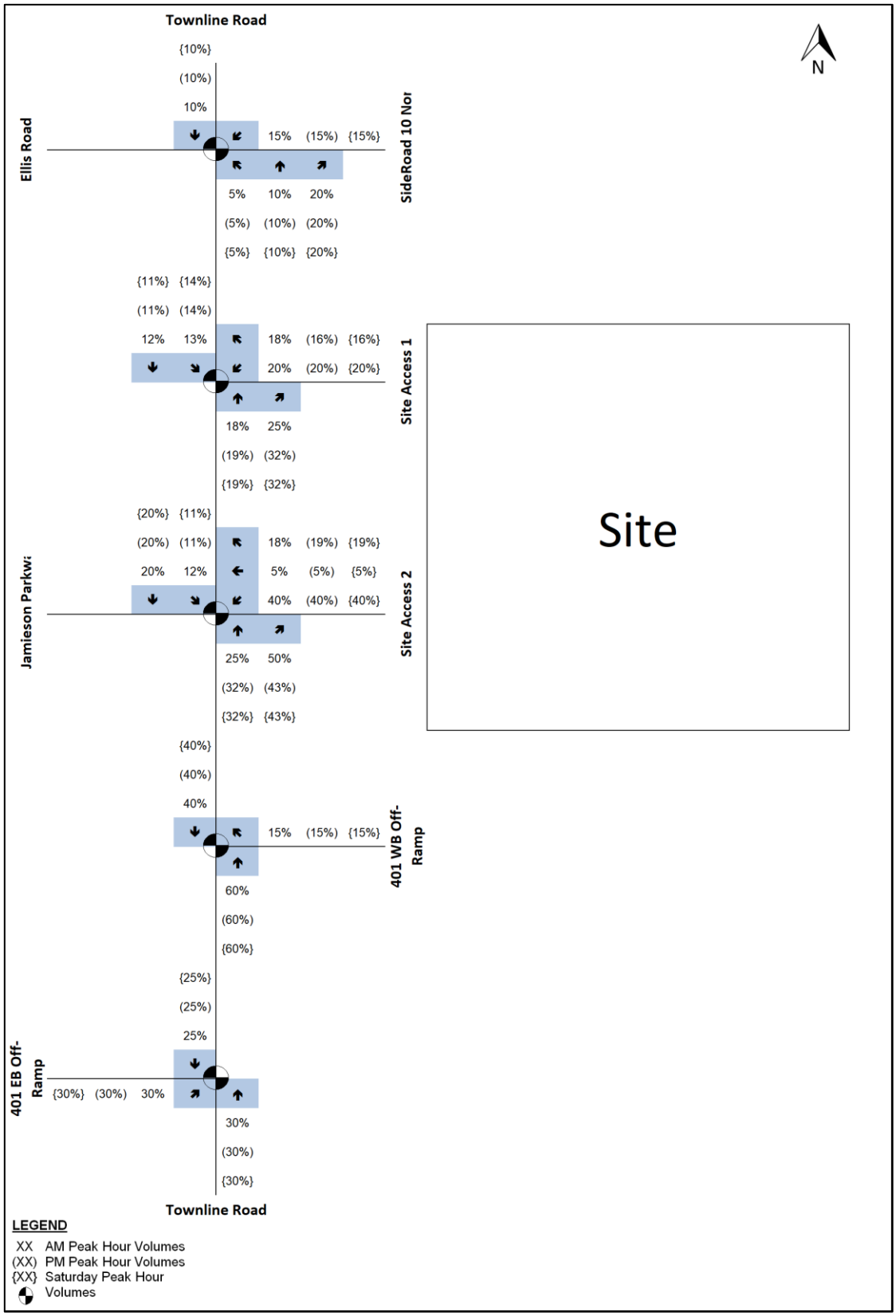


*Figure 16 Site Trip Distribution Industrial – Site Plan B*

The total site trips for each Site Plan are shown in Error! Reference source not found.**Figure 17** and **Figure 18**

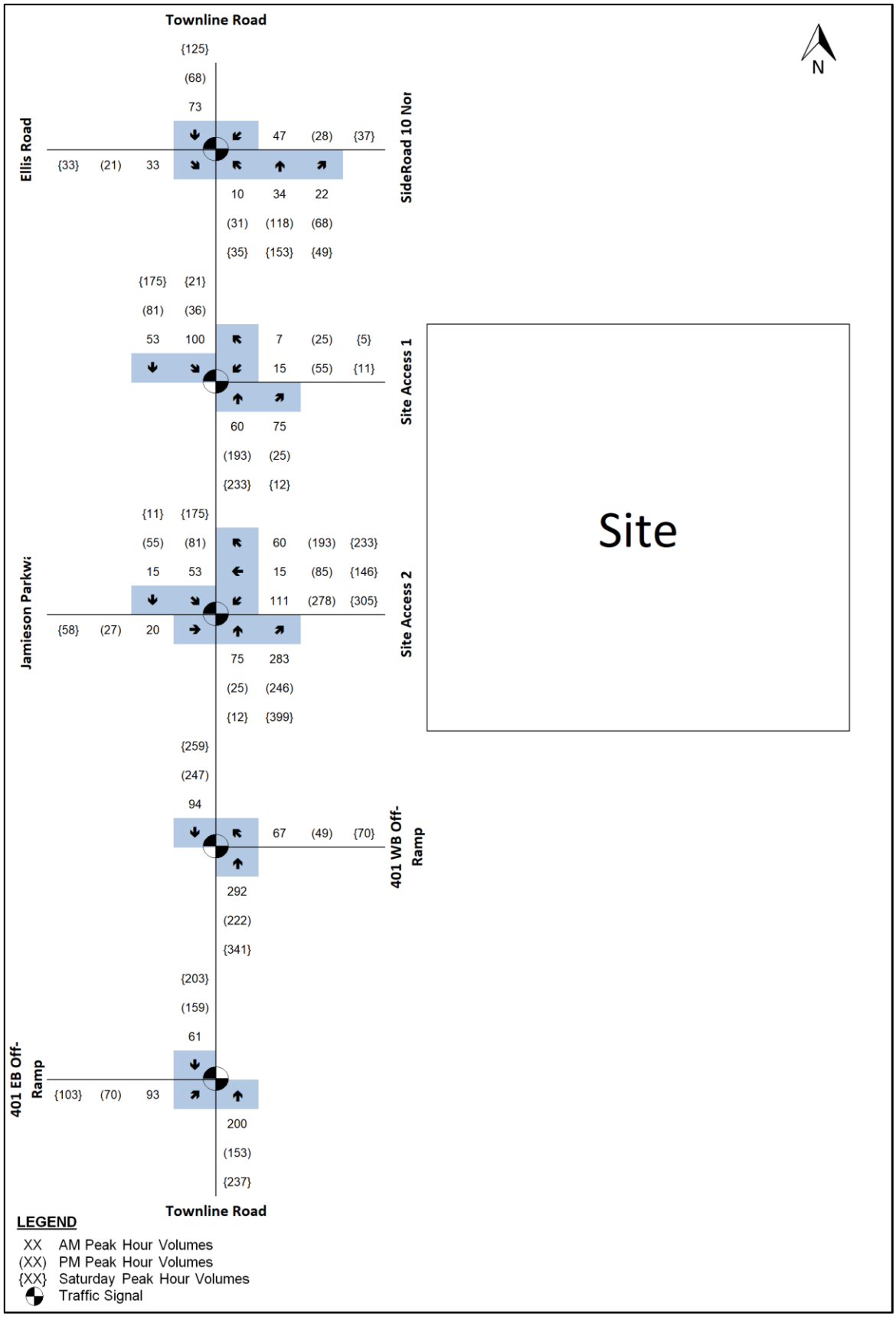


*Figure 17 Total Site Trips – Site Plan A*

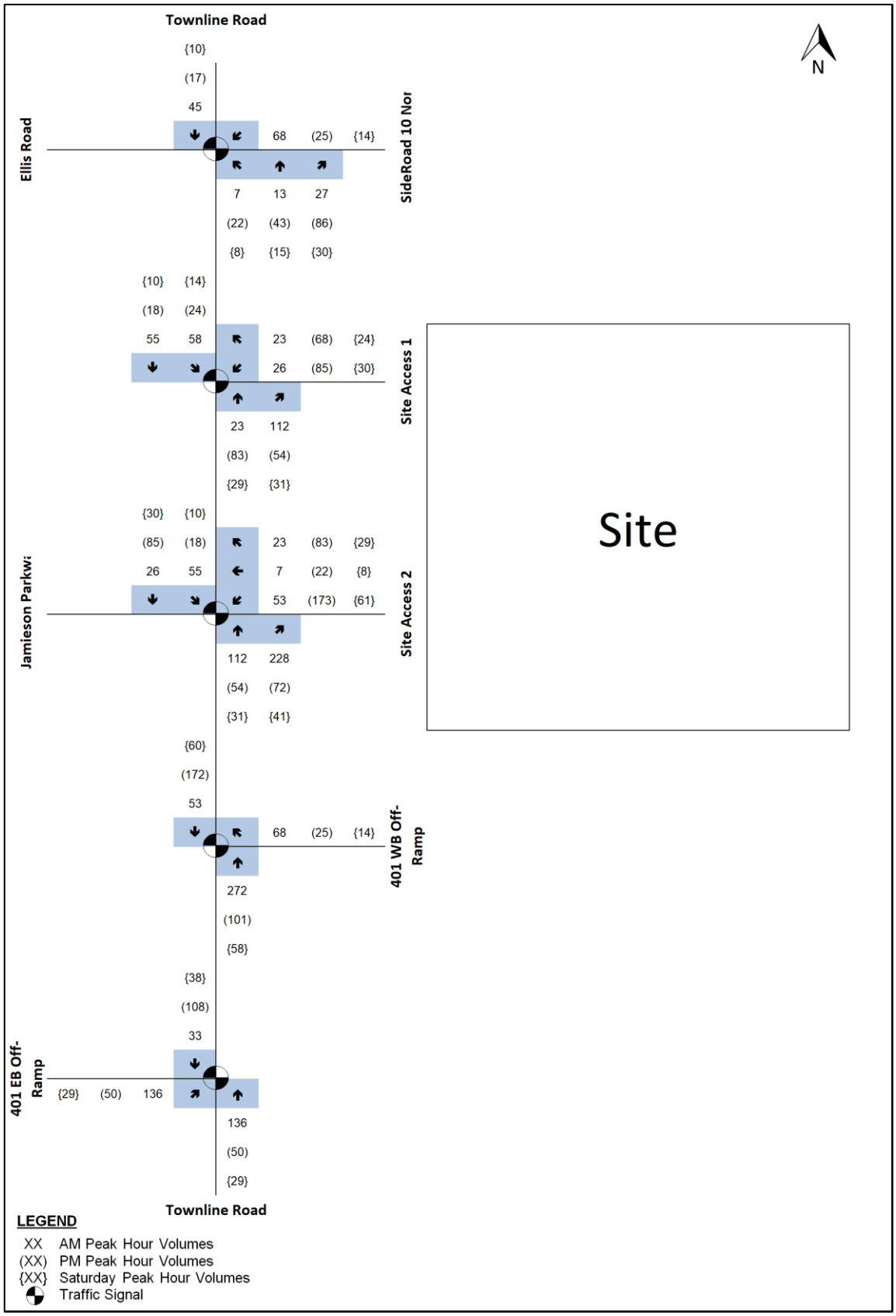


*Figure 18 Total Site Trips – Site Plan B*

# 6. Future Total Traffic

The future total traffic conditions in the weekday a.m. and p.m. and Saturday peak hours for the 2028 and 2038 planning horizon were derived by combining the projected future background traffic with the corresponding estimated site generated traffic and pass-by trips. The resulting traffic volumes are presented in **Figure 19** to Figure 21Figure 20 for Site Plan A and **Figure 22** and **Figure 24**Figure 24 for Site Plan B.

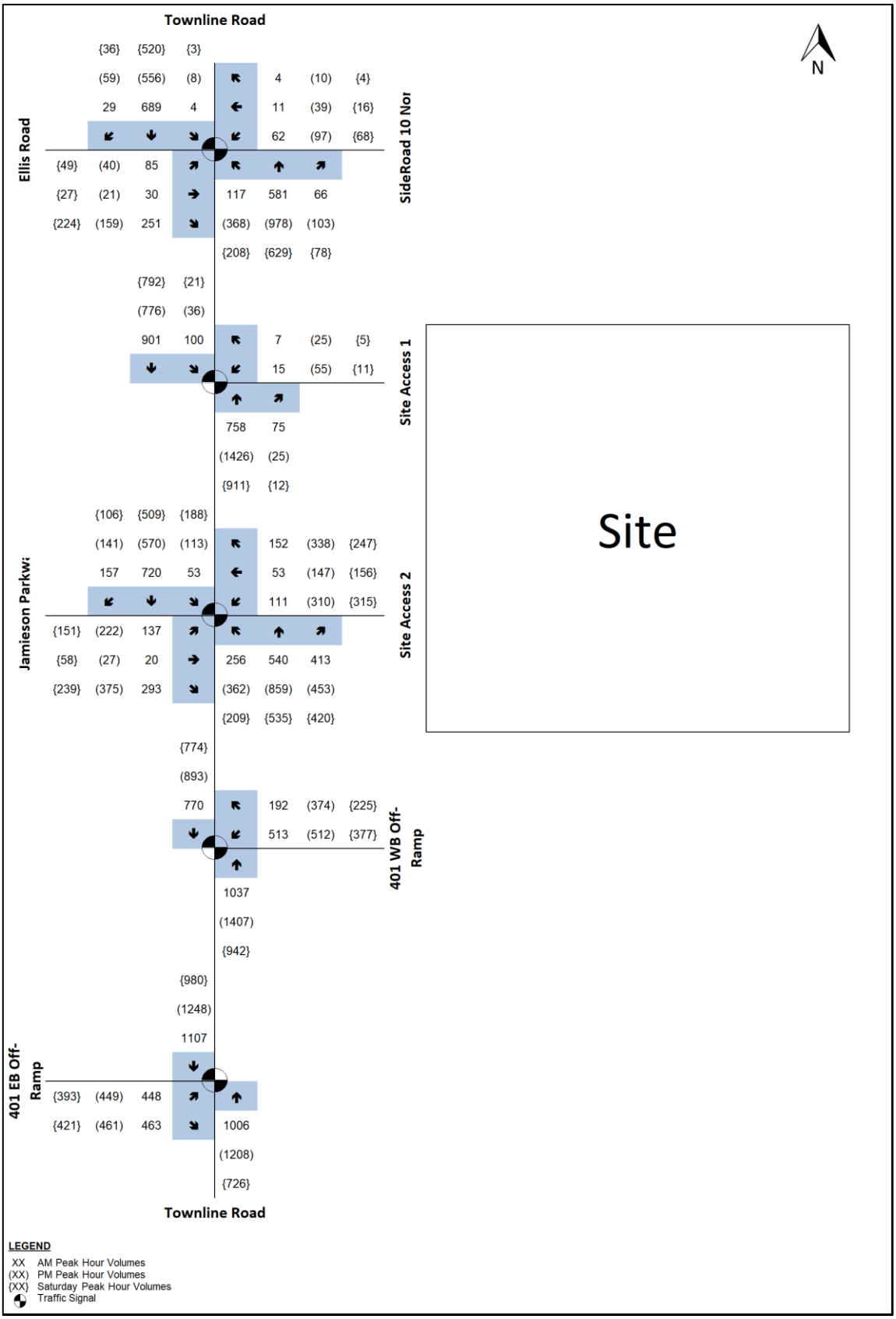


*Figure 19 2028 Future Total Traffic Volumes – Site Plan A*

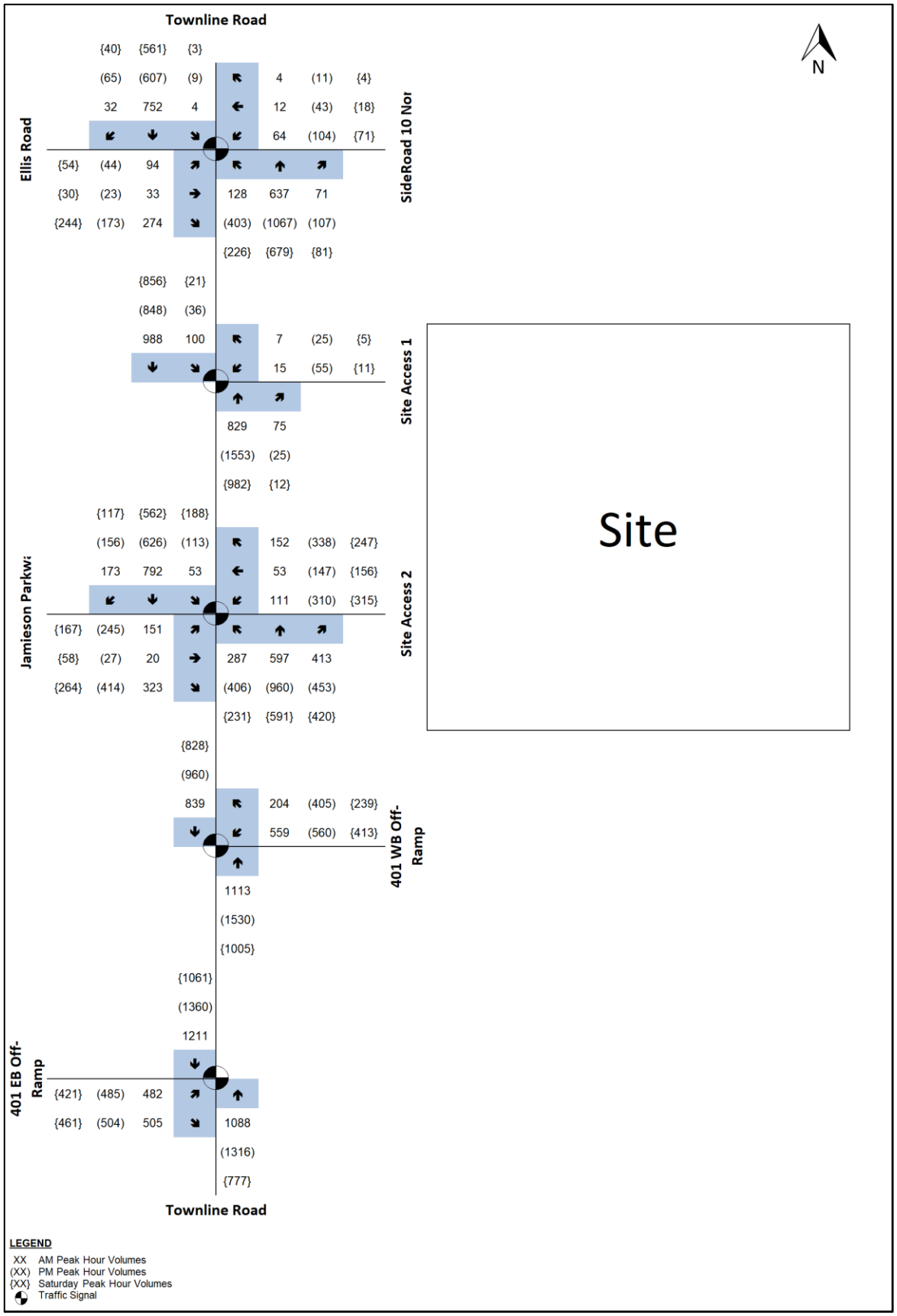


*Figure 20 2033 Future Total Traffic Volumes – Site Plan A*

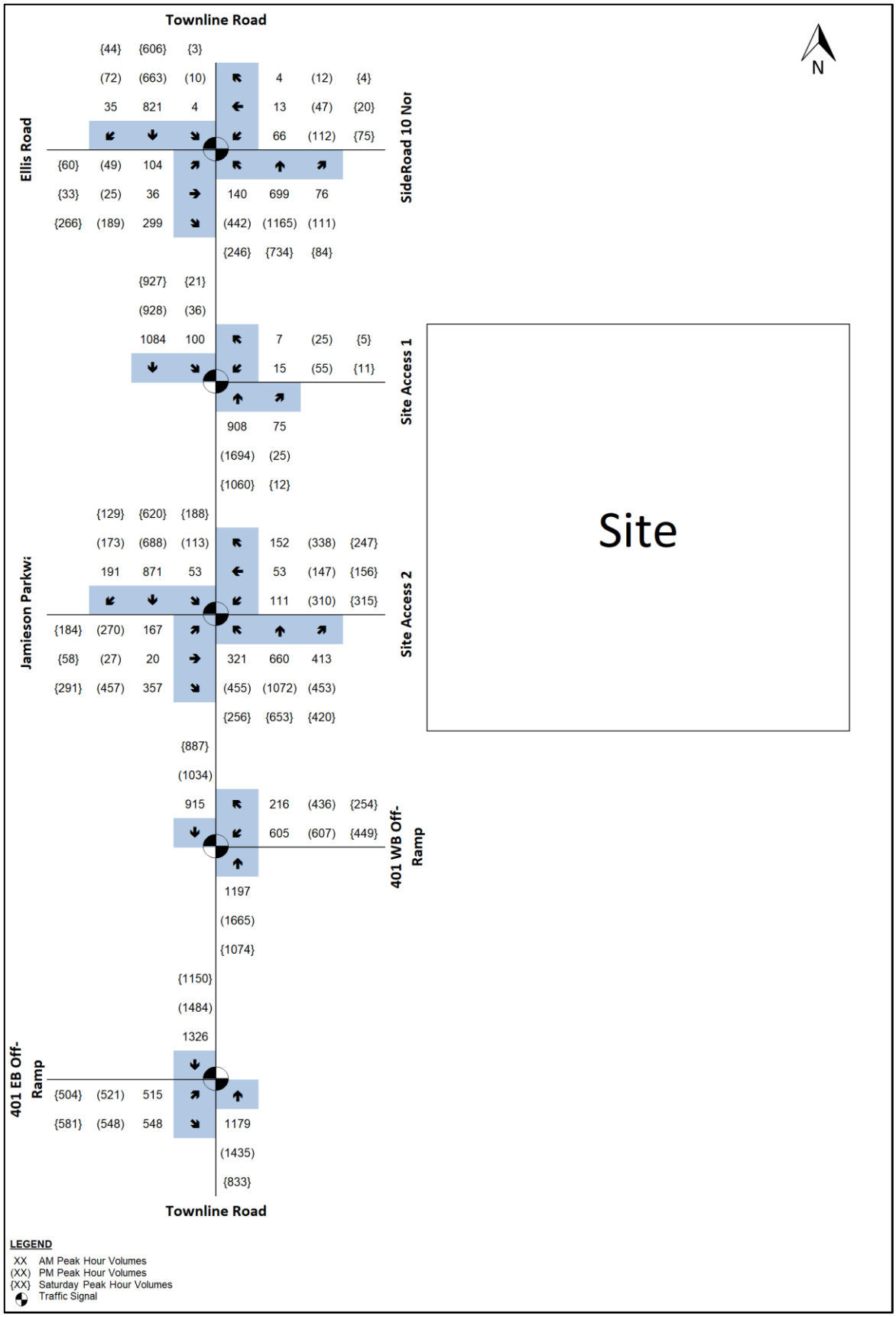


*Figure 21 Future Total 2038 Traffic Volumes - Site Plan A*

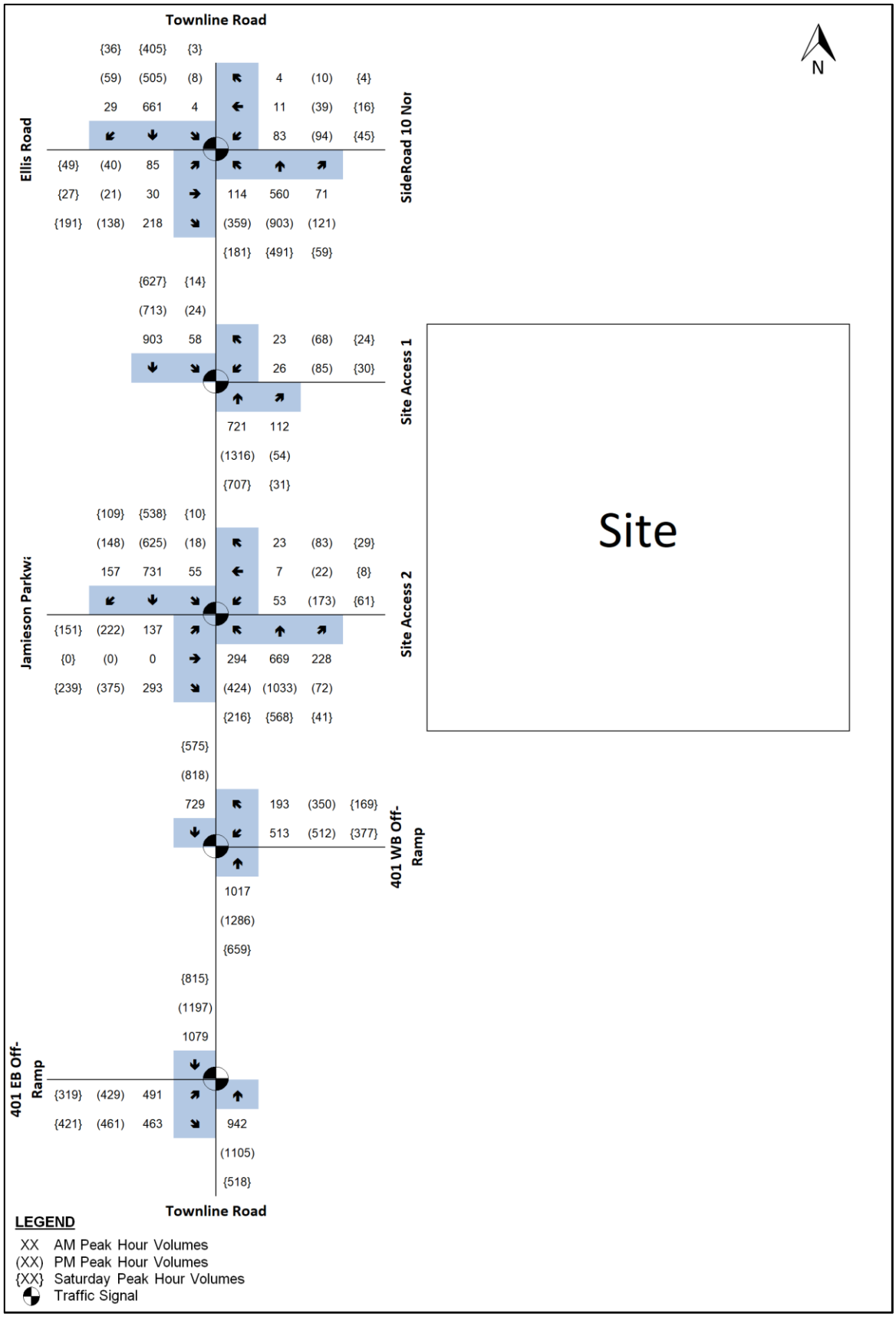


*Figure 22 2028 Future Total Traffic Volumes – Site Plan B*

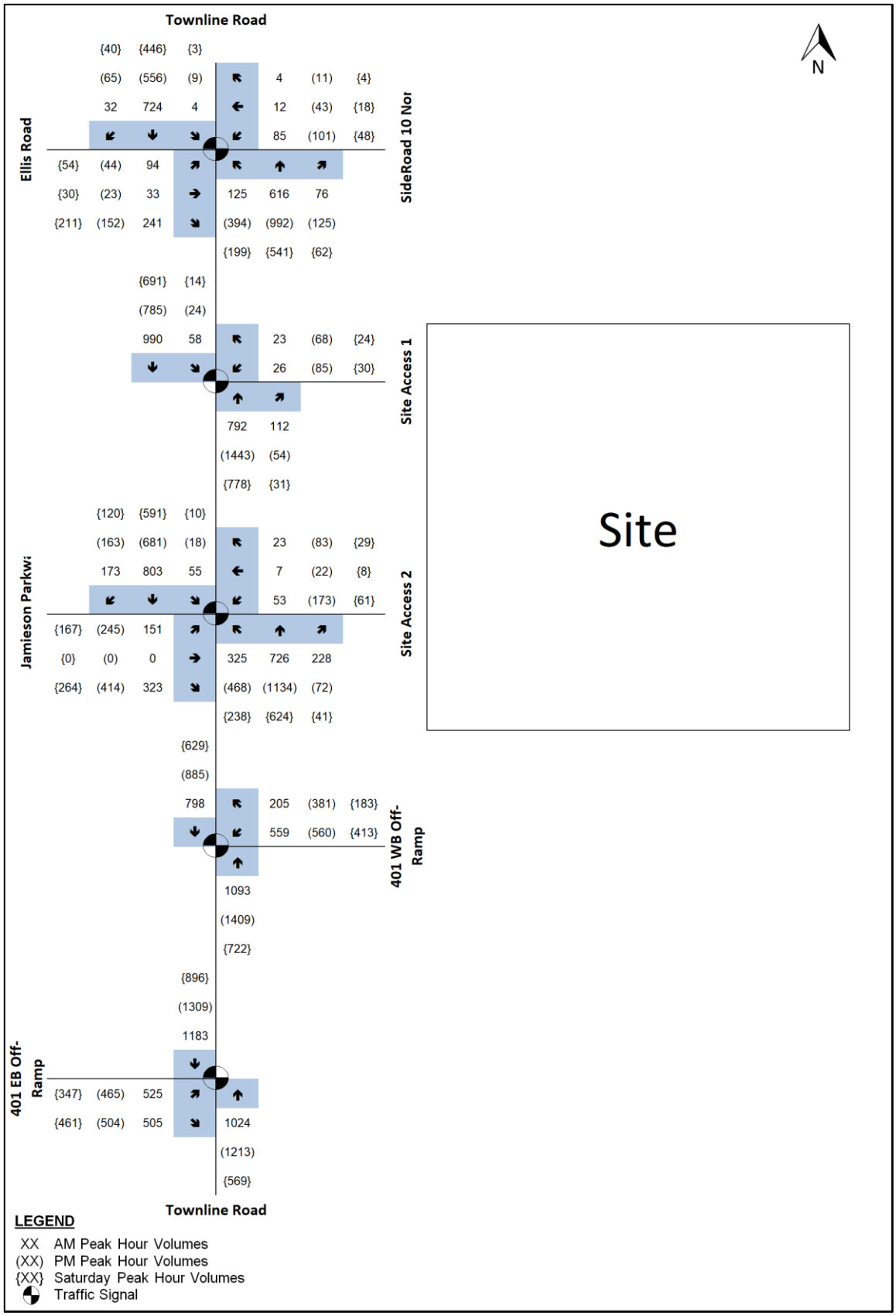


*Figure 23 Future Total 2033 Volumes - Site Plan B*

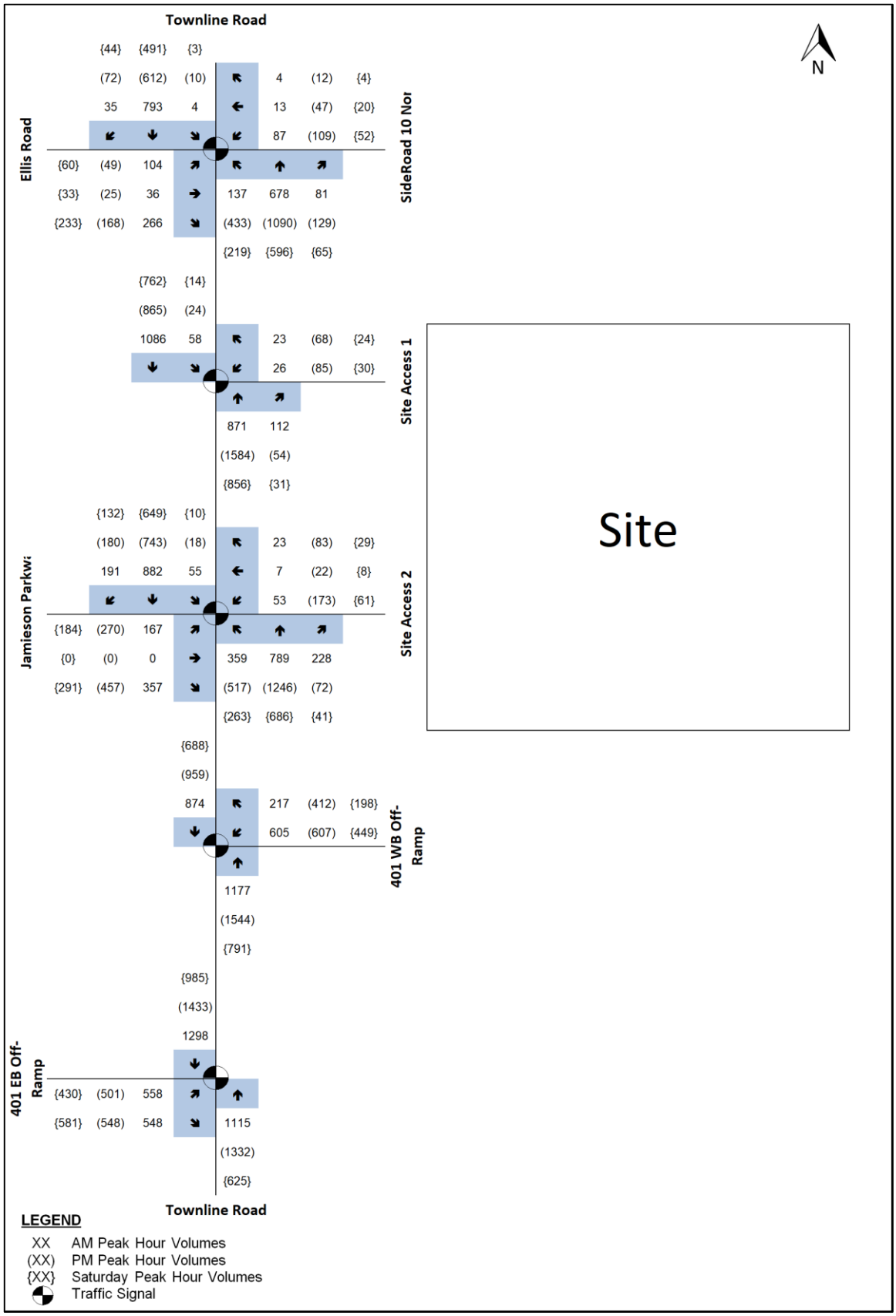


*Figure 24 2038 Future Total Traffic Volumes – Site Plan B*

# 7. Capacity Analysis

The capacity analysis identifies how well the intersections and driveways are operating. The analysis contained within this report utilized the Highway Capacity Manual (HCM) 2000 procedure within the Synchro Version 12 Software package. The reported intersection volume-to-capacity ratios (v/c) are a measure of the saturation volume for each turning movement, while the levels-of-service (LOS) are a measure of the average delay for each turning movement. Queuing characteristics are reported as the predicted 95th percentile queue for each turning movement. Both pedestrian crossing volumes and heavy vehicle proportions are included in the analyses. The peak hour factors from existing counts were used to analyze existing traffic conditions and for future traffic conditions.

The analysis includes identification and required mitigation measures (if any) at intersections where the addition of background growth or background growth plus site-generated traffic volumes causes the following:

Intersections within the County of Wellington and Township of Puslinch jurisdiction:

'Critical' intersections and movements for a signalized intersection include:

- V/C ratios for overall intersections operations, through movements, or shared through/turning movements increase to 0.85 or above;
- V/C ratios for exclusive movements increase to 0.90 or above; or
- 95$^{th}$ percentile queue length for individual movements that are projected to, or exceed, the storage length.

'Critical' intersections and movements for an unsignalized intersection include:

- Level of Services (LOS), based on average delay per vehicle, on individual movements exceeds LOS "D"; or
- Queue length for individual movements that exceeds the available queue storage.

Intersections within the MTO jurisdiction:

- At signalized intersections, movements with a volume/capacity (v/c) ratio greater than 0.85 are deemed to be "critical" in terms of operations. Movements that experience a v/c ratio of 0.85 or greater shall be evaluated for possible operational improvements.
- For ramps, a v/c ratio for terminal ramp approaches with a value greater than 0.75 would be deemed critical and shall be evaluated for possible operational improvements.

The following tables summarize the HCM capacity results for the study intersections during the weekday a.m. and p.m. peak hours under existing (2025), future background (2028, and 2038), and future total (2028, and 2038) traffic conditions. Although the 2033 future horizon year was considered as the background volume contribution is via corridor growth only the 2028 and 2038 years were analyzed as they represent the year of buildout and the most constrained future horizon case. The detailed calculation sheets are provided in **Appendix E**.

## 7.1 Hwy 401 EB off-ramp and Townline Road

Capacity analysis at this intersection during the weekday a.m. and p.m. peak hours and Saturday peak hour for the existing, future background, and future total traffic conditions are summarized in the following table.

*Table 10 Capacity analysis of Hwy 401 EB off-ramp and Townline Road*

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| Existing 2025 | Overall: 0.67 (C) 20<br>EBL = 0.73 (C) 33<br>**EBR = 0.86 (D) 46**<br>NBT = 0.38 (B) 11<br>SBT = 0.57 (B) 13 | <br>EBL = 80 m<br>EBR = 100 m<br>NBT = 50 m<br>SBT = 85 m | Overall: 0.7 (C) 21<br>EBL = 0.7 (C) 31<br>**EBR = 0.85 (D) 42**<br>NBT = 0.51 (B) 14<br>SBT = 0.61 (B) 15 | <br>EBL = 85 m<br>EBR = 100 m<br>NBT = 90 m<br>SBT = 110 m | Overall: 0.54 (B) 16<br>EBL = 0.61 (C) 25<br>EBR = 0.74 (C) 30<br>NBT = 0.24 (A) 8<br>SBT = 0.44 (B) 10 | <br>EBL = 55 m<br>EBR = 60 m<br>NBT = 30 m<br>SBT = 60 m |
| Future Background 2028 | Overall: 0.75 (C) 23<br>EBL = 0.71 (C) 31<br>**EBR = 0.93 (D) 54**<br>NBT = 0.43 (B) 13<br>SBT = 0.65 (B) 16 | <br>EBL = 85 m<br>EBR = 125 m<br>NBT = 55 m<br>SBT = 95 m | Overall: 0.75 (C) 23<br>EBL = 0.69 (C) 30<br>**EBR = 0.87 (D) 44**<br>NBT = 0.57 (B) 16<br>SBT = 0.67 (B) 18 | <br>EBL = 90 m<br>EBR = 110 m<br>NBT = 100 m<br>SBT = 120 m | Overall: 0.58 (B) 17<br>EBL = 0.62 (C) 24<br>**EBR = 0.79 (C) 33**<br>NBT = 0.26 (A) 9<br>SBT = 0.47 (B) 11 | <br>EBL = 55 m<br>EBR = 70 m<br>NBT = 35 m<br>SBT = 65 m |
| Future Total 2028 (Site Plan A) | Overall: 0.79 (C) 26<br>**EBL = 0.89 (D) 46**<br>**EBR = 0.94 (E) 56**<br>NBT = 0.54 (B) 14<br>SBT = 0.71 (B) 17 | <br>EBL = 125 m<br>EBR = 125 m<br>NBT = 75 m<br>SBT = 105 m | **Overall: 0.84 (C) 26**<br>**EBL = 0.8 (D) 35**<br>**EBR = 0.88 (D) 44**<br>NBT = 0.66 (B) 18<br>SBT = 0.82 (C) 23 | <br>EBL = 110 m<br>EBR = 125 m<br>NBT = 120 m<br>SBT = 165 m | Overall: 0.71 (B) 19<br>**EBL = 0.77 (C) 30**<br>**EBR = 0.82 (D) 35**<br>NBT = 0.4 (B) 11<br>SBT = 0.64 (B) 14 | <br>EBL = 80 m<br>EBR = 80 m<br>NBT = 50 m<br>SBT = 90 m |
| Future Total 2028 (Site Plan B) | Overall: 0.78 (C) 27<br>**EBL = 0.95 (E) 58**<br>**EBR = 0.87 (D) 45**<br>NBT = 0.51 (B) 14<br>SBT = 0.67 (B) 17 | <br>EBL = 145 m<br>EBR = 120 m<br>NBT = 70 m<br>SBT = 100 m | Overall: 0.82 (C) 25<br>**EBL = 0.77 (C) 34**<br>**EBR = 0.88 (D) 44**<br>NBT = 0.6 (B) 17<br>SBT = 0.78 (C) 21 | <br>EBL = 105 m<br>EBR = 120 m<br>NBT = 105 m<br>SBT = 150 m | Overall: 0.62 (B) 18<br>EBL = 0.67 (C) 26<br>**EBR = 0.8 (C) 34**<br>NBT = 0.28 (A) 10<br>SBT = 0.52 (B) 12 | <br>EBL = 65 m<br>EBR = 75 m<br>NBT = 35 m<br>SBT = 70 m |
| Future Background 2033 | Overall: 0.84 (C) 28<br>EBL = 0.74 (C) 32<br>**EBR = 1.00 (E) 73**<br>NBT = 0.49 (B) 14<br>SBT = 0.73 (B) 19 | <br>EBL = 95 m<br>EBR = 145 m<br>NBT = 65 m<br>SBT = 110 m | Overall: 0.83 (C) 26<br>EBL = 0.7 (C) 30<br>**EBR = 0.91 (D) 49**<br>NBT = 0.65 (B) 20<br>SBT = 0.77 (C) 23 | <br>EBL = 100 m<br>EBR = 140 m<br>NBT = 115 m<br>SBT = 140 m | Overall: 0.66 (B) 19<br>EBL = 0.61 (C) 24<br>**EBR = 0.85 (D) 37**<br>NBT = 0.3 (B) 11<br>SBT = 0.55 (B) 14 | <br>EBL = 60 m<br>EBR = 95 m<br>NBT = 40 m<br>SBT = 75 m |
| Future Total 2033 (Site Plan A) | **Overall: 0.87 (C) 31**<br>**EBL = 0.92 (D) 50**<br>**EBR = 1.02 (E) 76**<br>NBT = 0.59 (B) 16<br>SBT = 0.79 (C) 20 | <br>EBL = 140 m<br>EBR = 145 m<br>NBT = 85 m<br>SBT = 125 m | **Overall: 0.92 (C) 32**<br>**EBL = 0.81 (D) 36**<br>**EBR = 0.92 (D) 50**<br>NBT = 0.74 (C) 22<br>**SBT = 0.93 (C) 33** | <br>EBL = 120 m<br>EBR = 145 m<br>NBT = 135 m<br>SBT = 205 m | Overall: 0.78 (C) 21<br>**EBL = 0.77 (C) 29**<br>**EBR = 0.87 (D) 39**<br>NBT = 0.44 (B) 13<br>SBT = 0.71 (B) 17 | <br>EBL = 85 m<br>EBR = 105 m<br>NBT = 55 m<br>SBT = 100 m |
| Future Total 2033 (Site Plan B) | **Overall: 0.85 (C) 34**<br>**EBL = 1.01 (E) 71**<br>**EBR = 0.99 (E) 70**<br>NBT = 0.56 (B) 15<br>SBT = 0.76 (B) 20 | <br>EBL = 155 m<br>EBR = 145 m<br>NBT = 80 m<br>SBT = 115 m | **Overall: 0.9 (C) 30**<br>**EBL = 0.78 (C) 34**<br>**EBR = 0.92 (D) 50**<br>NBT = 0.69 (C) 21<br>**SBT = 0.89 (C) 30** | <br>EBL = 115 m<br>EBR = 145 m<br>NBT = 120 m<br>SBT = 190 m | Overall: 0.7 (B) 20<br>EBL = 0.66 (C) 25<br>**EBR = 0.86 (D) 39**<br>NBT = 0.33 (B) 11<br>SBT = 0.6 (B) 15 | <br>EBL = 70 m<br>EBR = 100 m<br>NBT = 40 m<br>SBT = 80 m |

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| Future Background 2038 | **Overall: 0.93 (D) 35**<br>**EBL = 0.8 (D) 36**<br>**EBR = 1.12 (F) 108**<br>NBT = 0.53 (B) 15<br>SBT = 0.81 (C) 21 | <br>EBL = 115 m<br>EBR = 165 m<br>NBT = 75 m<br>SBT = 130 m | **Overall: 0.91 (C) 32**<br>EBL = 0.72 (C) 30<br>**EBR = 0.96 (E) 57**<br>NBT = 0.74 (C) 23<br>**SBT = 0.88 (C) 30** | <br>EBL = 110 m<br>EBR = 165 m<br>NBT = 130 m<br>SBT = 170 m | Overall: 0.8 (C) 28<br>EBL = 0.67 (C) 24<br>**EBR = 0.99 (E) 62**<br>NBT = 0.36 (B) 14<br>SBT = 0.65 (B) 18 | <br>EBL = 80 m<br>EBR = 145 m<br>NBT = 40 m<br>SBT = 85 m |
| Future Total 2038 (Alterative A) | **Overall: 0.96 (D) 40**<br>**EBL = 0.98 (E) 64**<br>**EBR = 1.13 (F) 112**<br>NBT = 0.64 (B) 17<br>**SBT = 0.86 (C) 24** | <br>EBL = 150 m<br>EBR = 170 m<br>NBT = 95 m<br>SBT = 145 m | **Overall: 1 (D) 45**<br>**EBL = 0.83 (D) 36**<br>**EBR = 0.96 (E) 59**<br>NBT = 0.84 (C) 27<br>**SBT = 1.04 (E) 58** | <br>EBL = 145 m<br>EBR = 165 m<br>NBT = 155 m<br>SBT = 235 m | **Overall: 0.91 (C) 31**<br>**EBL = 0.84 (C) 33**<br>**EBR = 1.03 (E) 73**<br>NBT = 0.5 (B) 16<br>SBT = 0.81 (C) 22 | <br>EBL = 120 m<br>EBR = 155 m<br>NBT = 60 m<br>SBT = 115 m |
| Future Total 2038 (Alterative B) | **Overall: 0.95 (D) 45**<br>**EBL = 1.09 (F) 95**<br>**EBR = 1.13 (F) 112**<br>NBT = 0.62 (B) 16<br>**SBT = 0.85 (C) 23** | <br>EBL = 175 m<br>EBR = 170 m<br>NBT = 90 m<br>SBT = 140 m | **Overall: 1 (D) 44**<br>**EBL = 0.81 (C) 34**<br>**EBR = 0.97 (E) 61**<br>NBT = 0.8 (C) 26<br>**SBT = 1.03 (E) 55** | <br>EBL = 140 m<br>EBR = 175 m<br>NBT = 145 m<br>SBT = 225 m | **Overall: 0.79 (C) 23**<br>EBL = 0.66 (C) 24<br>**EBR = 0.92 (D) 46**<br>NBT = 0.38 (B) 13<br>SBT = 0.7 (B) 18 | <br>EBL = 75 m<br>EBR = 125 m<br>NBT = 45 m<br>SBT = 95 m |

### 7.1.1 MTO Eastbound Off-Ramp Queuing Analysis – Left-turn and Through Lanes

A queueing analysis was completed for the left-turn and through lanes at the intersection based on the MTO's Protocol using the MTO's Geometric Design Standards and Signal Timing Policy. The calculations are summarized in the table below and are based on the volumes from the 2038 future total scenarios. The recommended storage length (in vehicles) has been extracted from the MTO's Geometric Design Standards for Ontario Highways, Chapter B, Table B7-5 for urban/commuter intersections.

***Table 11 MTO Queuing Protocol - MTO Eastbound Ramp and Townline Road***

| Scenario | Lane | Volumes | Heavy Vehicle% | PCU | Cycle Length (in seconds) | Arrival Rate (vehicles/ cycle) | Recommended Storage, MTO Table B7-5 (vehicles) | Recommended Storage (in metres, 7.5 m/vehicle) | Available Storage (metres) |
|---|---|---|---|---|---|---|---|---|---|
| Future Total 2038-AM (ALT A) | EBL | 515 | 4% | 536 | 90 | 13.4 | 20 | 150 | 390 |
| | NBT | 1179 | 4% | 1226 | 90 | 15.3 | 22 | 165 | N/A |
| | SBT | 1326 | 7% | 1419 | 90 | 17.7 | 25 | 187.5 | N/A |
| Future Total 2038-PM (ALT A) | EBL | 521 | 3% | 537 | 100 | 14.9 | 21 | 157.5 | 390 |
| | NBT | 1435 | 1% | 1449 | 100 | 20.1 | 28 | 210 | N/A |
| | SBT | 1484 | 5% | 1558 | 100 | 21.6 | 29 | 217.5 | N/A |
| | EBL | 504 | 2% | 514 | 80 | 11.4 | 17 | 127.5 | 390 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Future Total 2038- SAT (ALT A) | NBT | 833 | 2% | 850 | 80 | 9.4 | 15 | 112.5 | N/A |
| | SBT | 1150 | 2% | 1173 | 80 | 13.0 | 19 | 142.5 | N/A |
| Future Total 2038- AM (ALT B) | EBL | 558 | 4% | 580 | 90 | 14.5 | 21 | 157.5 | 390 |
| | NBT | 1115 | 4% | 1160 | 90 | 14.5 | 21 | 157.5 | N/A |
| | SBT | 1298 | 7% | 1389 | 90 | 17.4 | 24 | 180 | N/A |
| Future Total 2038- PM (ALT B) | EBL | 501 | 3% | 516 | 100 | 14.3 | 21 | 157.5 | 390 |
| | NBT | 1332 | 1% | 1345 | 100 | 18.7 | 26 | 195 | N/A |
| | SBT | 1433 | 5% | 1505 | 100 | 20.9 | 29 | 217.5 | N/A |
| Future Total 2038- SAT (ALT B) | EBL | 430 | 2% | 439 | 80 | 9.7 | 15 | 112.5 | 390 |
| | NBT | 625 | 2% | 638 | 80 | 7.1 | 12 | 90 | N/A |
| | SBT | 985 | 2% | 1005 | 80 | 11.2 | 17 | 127.5 | N/A |

### 7.1.2 MTO Eastbound Off-Ramp Queuing Analysis – Right Turn Lanes

As directed by MTO staff, the right-turn lane queuing assessment was completed for the ultimate condition based on the methodology in Chapter 9 of TAC's Geometric Design Guide for Canadian Roads section 9.14.4. The queueing assessment was completed as follows:

- At signalized intersections, the storage length should accommodate about 1.5 times the average number of vehicles to be stored per cycle for roadways with design speeds of 60 km/h or less and about twice the average number of vehicles for design speeds greater than 60 km/hr

The right turn lane queueing analysis is summarized in the table below:

***Table 12 TAC Manual Chapter 9 Eastbound 401 Off-Ramp Right-Turn Storage Assessment***

| Scenario | Lane | Volumes | Design Speed (km/hr) | Cycle Length (in seconds) | Arrival Rate (vehicles/ cycle) (Factored by 1.5) | Recommended Storage, MTO Table B7-5 (vehicles) | Recommended Storage (in metres, 7.5 m/vehicle) | Available Storage (metres) |
|---|---|---|---|---|---|---|---|---|
| Future Total 2038- AM (ALT A) | EBR | 548 | 60 | 90 | 20.6 | 28 | 210 | 87 |
| Future Total 2038- PM (ALT A) | EBR | 548 | 60 | 100 | 22.8 | 31 | 232.5 | 87 |
| Future Total 2038- SAT (ALT A) | EBR | 581 | 60 | 80 | 19.4 | 27 | 202.5 | 87 |
| Future Total 2038- AM (ALT B) | EBR | 548 | 60 | 90 | 20.6 | 28 | 210 | 87 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Future Total 2038- PM (ALT B) | EBR | 548 | 60 | 100 | 22.8 | 31 | 232.5 | 87 |
| Future Total 2038- SAT (ALT B) | EBR | 581 | 60 | 80 | 19.4 | 27 | 202.5 | 87 |

Under existing traffic conditions, the intersection operates at satisfactory levels with an overall V/C ratio of 0.67 LOS C during the a.m. peak hour, 0.70 LOS C during the p.m. peak hour and an overall V/C of 0.54 LOS B during the Saturday peak hour.

With the addition of corridor growth for the 2028 future background traffic scenario, the intersection is reported to operate at a satisfactory level with an overall V/C ratio of 0.75 LOS C during the a.m. peak hour, an overall V/C of 0.75 LOS C during the p.m. peak hour and an overall V/C ratio of 0.58 LOS B during the Saturday Peak hour. During all peak hours, the eastbound right turn lane reports critical with a V/C of 0.93 LOS D, 0.87 LOS D and 0.79 LOS C for the a.m. p.m., and Saturday peak hour respectively.

**Future Total 2028 Site Plan A**

Under the 2028 future total traffic scenario for Site Plan A, with the addition of site generated traffic the intersection operates with an overall V/C ratio of 0.79 LOS D during the a.m. peak hour, 0.84 LOS C during the p.m. peak hour and an overall V/C of 0.71 LOS C during the Saturday peak hour. The eastbound left lane reports critical with a V/C of 0.89 LOS D as well as the eastbound right lane which reports a V/C of 0.94 LOS D during the a.m. peak hour. During the p.m. peak hour the eastbound left reports a critical V/C of 0.80 LOS D and the eastbound right reports critical with a V/C of 0.88 LOS D. During the Saturday peak hour the eastbound left reports critical with a V/C of 0.77 LOS C and the eastbound right-turn reports critical with a V/C of 0.88 LOS D. For the reported critical movement, the site trips contribute the following percentage of volume per movement:

**A.M. Peak Hour**

- Eastbound left movement: 21% of left turning volume
- Eastbound right movement: 0% of right-turning volume

**P.M. Peak Hour**

- Eastbound left movement: 16% of left turning volume
- Eastbound right movement: 0% of right-turning volume

**Saturday Peak Hour**

- Eastbound left movement: 26% of left turning volume
- Eastbound right movement: 0% of right-turning volume

**Future Total 2028 Site Plan B**

Under the 2028 future total traffic scenario for Site Plan B, with the addition of site generated traffic the intersection operates with an overall V/C ratio of 0.78 LOS D during the a.m. peak hour, 0.82 LOS C during the p.m. peak hour and an overall V/C of 0.62 LOS C during the Saturday peak hour. The eastbound left lane reports critical with a V/C of 0.95 LOS D as well as the eastbound right lane which reports a V/C of 0.87 LOS D during the a.m. peak hour. During the p.m. peak hour, the eastbound left reports a critical V/C of 0.77 LOS D and the eastbound right reports critical with a V/C of 0.88 LOS D. During the Saturday peak hour, the eastbound right-turn reports critical with a V/C of 0.80 LOS C. For the reported critical movement, the site trips contribute the following percentage of volume per movement:

**A.M. Peak Hour**

- Eastbound left movement: 28% of left turning volume
- Eastbound right movement: 0% of right-turning volume

**P.M. Peak Hour**

- Eastbound left movement: 12% of left turning volume
- Eastbound right movement: 0% of right-turning volume

**Saturday Peak Hour**

- Eastbound left movement: 9% of left turning volume
- Eastbound right movement: 0% of right-turning volume

With the addition of corridor growth for the 2033 future background traffic scenario, the intersection is reported to operate at a satisfactory level with an overall V/C ratio of 0.84 LOS C during the a.m. peak hour, an overall V/C of 0.83 LOS C during the p.m. peak hour and an overall V/C ratio of 0.66 LOS B during the Saturday Peak hour. During all peak hours, the eastbound right turn lane reports critical with a V/C of 1.00 LOS E, 0.91 LOS E and 0.85 LOS D for the a.m. p.m., and Saturday peak hour respectively.

**Future Total 2033 Site Plan A**

Under the 2033 future total traffic scenario for Site Plan A, with the addition of site generated traffic the intersection operates with an overall V/C ratio of 0.87 LOS C during the a.m. peak hour, 0.92 LOS C during the p.m. peak hour and an overall V/C of 0.78 LOS C during the Saturday peak hour. The eastbound left lane reports critical with a V/C of 0.92 LOS D as well as the eastbound right lane which reports a V/C of 1.02 LOS E during the a.m. peak hour. During the p.m. peak hour, the eastbound left reports a critical V/C of 0.81 LOS D, the eastbound right reports critical with a V/C of 0.92 LOS D and the southbound through reports a critical V/C of 0.93. During the Saturday peak hour, the eastbound left reports critical with a V/C of 0.77 LOS C and the eastbound right-turn reports critical with a V/C of 0.87 LOS D. For the reported critical movement, the site trips contribute the following percentage of volume per movement:

**A.M. Peak Hour**

- Eastbound left movement: 19% of left turning volume
- Eastbound right movement: 0% of right-turning volume

**P.M. Peak Hour**

- Eastbound left movement: 14% of left turning volume
- Eastbound right movement: 0% of right-turning volume
- Southbound through movement: 12% of through volume

**Saturday Peak Hour**

- Eastbound left movement: 24% of left turning volume
- Eastbound right movement: 0% of right-turning volume

**Future Total 2033 Site Plan B**

Under the 2033 future total traffic scenario for Site Plan B, with the addition of site generated traffic the intersection operates with an overall V/C ratio of 0.85 LOS D during the a.m. peak hour, 0.90 LOS C during the p.m. peak hour and an overall V/C of 0.70 LOS C during the Saturday peak hour. The eastbound left lane reports critical with a V/C of 1.01 LOS E as well as the eastbound right lane which reports a V/C of 0.99 LOS E during the a.m. peak hour. During the p.m. peak hour, the eastbound left reports a critical V/C of 0.78 LOS C, the eastbound right reports critical with a V/C of 0.92 LOS D and the southbound through reports a critical V/C of 0.89 LOS C. During the Saturday peak hour,

the eastbound right-turn reports critical with a V/C of 0.86 LOS C. For the reported critical movement, the site trips contribute the following percentage of volume per movement:

**A.M. Peak Hour**

- Eastbound left movement: 26% of left turning volume
- Eastbound right movement: 0% of right-turning volume

**P.M. Peak Hour**

- Eastbound left movement: 11% of left turning volume
- Eastbound right movement: 0% of right-turning volume
- Southbound through movement: 8% of through volume

**Saturday Peak Hour**

- Eastbound right movement: 0% of right-turning volume

With the addition of corridor growth for the 2038 future background traffic scenario, the intersection is reported to operate with an overall V/C ratio of 0.93 LOS D during the a.m. peak hour, an overall V/C of 0.91 LOS C during the p.m. peak hour and an overall V/C ratio of 0.80 LOS C during the Saturday Peak hour. The a.m. peak hour reports critical in the eastbound left and right direction. The p.m. peak hour reports a critical movement n the eastbound right movement and southbound through movement and the Saturday peak hour reports critical in the eastbound right direction.

**Future Total 2038 Site Plan A**

Under the 2038 future total traffic scenario Site Plan A, with the addition of site generated traffic, the intersection operates with an overall critical V/C ratio of 0.96 LOS D during the a.m. peak hour, critical V/C of 1.00 LOS D during the p.m. peak hour and a critical V/C of 0.91 LOS C during the Saturday peak hour. During the a.m. peak hour, the eastbound left, right and southbound through movements report critical. The p.m. peak hour also reports critical movements in the eastbound left, eastbound right, and southbound through. The Saturday reports a critical movement in the eastbound left and right direction. For the reported critical movements, the site trips contribute the following percentage of volume:

**A.M. Peak Hour**

- Eastbound left movement: 17% of left turning volume
- Eastbound right movement: 0% of right turning volume
- Southbound through movement: 5% of through volume

**P.M. Peak Hour**

- Eastbound left movement: 13% of left turning volume
- Eastbound right movement: 0% of right turning volume
- Southbound through movement: 11% of through volume

**Saturday Peak Hour**

- Eastbound left movement: 20% of left turning volume
- Eastbound right movement: 0% of right turning volume

**Future Total 2038 Site Plan B**

Under the 2038 future total traffic scenario, with the addition of site generated traffic operates with an overall critical V/C ratio of 0.95 LOS D during the a.m. peak hour, critical V/C of 1.00 LOS D during the p.m. peak hour and an overall V/C of 0.79 LOS B during the Saturday peak hour. During the a.m. peak hour, the eastbound left, and eastbound right and southbound through movement report critical movements. The p.m. peak hour also reports critical movements in the eastbound right, and southbound through. The Saturday peak hour reports a critical movement in the eastbound right direction. For the reported critical movement, the site trips contribute the following percentage of volumes:

**A.M. Peak Hour**

- Eastbound left movement: 24% of left turning volume
- Eastbound right movement: 0% of right turning volume
- Southbound through movement: 3% of through volume

**P.M. Peak Hour**

- Eastbound left movement: 10% of left turning volume
- Eastbound right movement: 0% of right turning volume
- Southbound through movement: 7% of through volume

**Saturday Peak Hour**

- Eastbound right movement: 0% of right turning volume

Although critical in the eastbound left and southbound through movements, the site traffic volume for both Site Plan A and B contribute a maximum of 28% of left-turning volume during the a.m. peak however for the remaining movements during the a.m. peak, p.m. peak and Saturday peak the site traffic contributes a nominal percentage in comparison to the projected corridor growth along Townline Road. Additionally, the existing analysis show that the eastbound right turn lane is currently operating above capacity and the left-turn is close to critical levels indicating that the intersection requires potential improvement prior to the implementation of the subject site.

As indicated by the queueing analysis there is sufficient queue length for the left-turn lane however the eastbound recommended length exceeds the available eastbound right storage.

### 7.1.3 Intersection Improvements – Eastbound Highway 401 Off-Ramp

To mitigate the reported queue lengths and V/C ratios for this intersection an additional shared left-right lane was added to assess the ramp need for improvement. As indicated by the background and existing condition the eastbound right-turn lane is currently operating above capacity and as such the shared right/left lane is made to address the over capacity. The below capacity table shows the result of the improvement in the ultimate condition.

***Table 13 Eastbound Highway 401 Off-Ramp and Townline Road Intersection Improvements Capacity Analysis***

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| Future Total 2038 (Site Plan A) | Overall: 0.82 (C) 22<br>**EBLR = 0.79 (C) 33**<br>**EBR = 0.82 (D) 41**<br>NBT = 0.61 (B) 14<br>SBT = 0.82 (B) 19 | <br>EBLR = 75 m<br>EBR = 95 m<br>NBT = 95 m<br>SBT = 145 m | **Overall: 0.88 (C) 26**<br>EBLR = 0.74 (C) 30<br>**EBR = 0.79 (D) 38**<br>NBT = 0.75 (B) 18<br>**SBT = 0.93 (C) 28** | <br>EBLR = 75 m<br>EBR = 90 m<br>NBT = 155 m<br>SBT = 235 m | Overall: 0.75 (B) 19<br>EBLR = 0.74 (C) 26<br>**EBR = 0.76 (C) 31**<br>NBT = 0.46 (B) 12<br>SBT = 0.75 (B) 17 | <br>EBLR = 65 m<br>EBR = 75 m<br>NBT = 60 m<br>SBT = 115 m |

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| Future Total 2038 (Site Plan B) | Overall: 0.82 (C) 23<br>**EBLR = 0.81 (C) 33**<br>**EBR = 0.84 (D) 43**<br>NBT = 0.6 (B) 14<br>SBT = 0.81 (B) 20 | <br>EBLR = 80 m<br>EBR = 105 m<br>NBT = 90 m<br>SBT = 140 m | **Overall: 0.87 (C) 25**<br>**EBLR = 0.75 (C) 30**<br>**EBR = 0.8 (D) 38**<br>NBT = 0.71 (B) 17<br>**SBT = 0.91 (C) 27** | <br>EBLR = 75 m<br>EBR = 90 m<br>NBT = 145 m<br>SBT = 225 m | Overall: 0.64 (B) 16<br>EBLR = 0.67 (C) 24<br>EBR = 0.66 (C) 27<br>NBT = 0.34 (A) 9<br>SBT = 0.63 (B) 13 | <br>EBLR = 50 m<br>EBR = 55 m<br>NBT = 45 m<br>SBT = 95 m |

With the addition of an additional shared left/right lane in the eastbound approach, the future total 2038 for Site A reports a V/C of 0.82 LOS C during the a.m. peak hour, an overall V/C of 0.88 LOS C during the p.m. peak and an overall V/C of 0.75 LOS B Saturday peak hour. The eastbound left and right reports critical during the a.m. peak. The eastbound right turn lane and southbound lane reports critical in p.m. peak and the eastbound right turn lane reports critical in the Saturday peak hour.

Under the future total 2038 for Site B reports a V/C of 0.82 LOS C during the a.m. peak hour, an overall V/C of 0.87 LOS C during the p.m. peak and an overall V/C of 0.75 LOS B during the Saturday peak hour. The eastbound left and right reports critical during the a.m. peak. The eastbound right turn lane, eastbound left/right turn lane and southbound lane report critical in p.m. peak and the eastbound right turn lane reports critical in the Saturday peak hour.

Although there are critical movements reported the addition of the shared lane adds additional capacity which allows the intersection movements on the ramp to operate with improved delays and queues and below the theoretical V/C of 1.00.

## 7.2 Hwy 401 WB off-ramp and Townline Road

Capacity analysis at this intersection during the weekday a.m. and p.m. peak hours and Saturday peak hour for the existing, future background, and future total traffic conditions are summarized in the following table.

***Table 14 Capacity analysis of Hwy 401 WB off-ramp and Townline Road***

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| Existing 2025 | Overall: 0.42 (B) 14<br>WBL = 0.71 (C) 32<br>WBR = 0.09 (C) 24<br>NBT = 0.32 (A) 8<br>SBT = 0.29 (A) 7 | <br>WBL = 50 m<br>WBR = 15 m<br>NBT = 40 m<br>SBT = 35 m | Overall: 0.59 (B) 17<br>WBL = 0.63 (C) 29<br>WBR = 0.73 (C) 35<br>NBT = 0.54 (B) 11<br>SBT = 0.29 (A) 9 | <br>WBL = 50 m<br>WBR = 65 m<br>NBT = 90 m<br>SBT = 45 m | Overall: 0.34 (B) 12<br>WBL = 0.57 (C) 24<br>WBR = 0.1 (C) 21<br>NBT = 0.27 (A) 6<br>SBT = 0.23 (A) 6 | <br>WBL = 30 m<br>WBR = 15 m<br>NBT = 25 m<br>SBT = 25 m |
| Future Background 2028 | Overall: 0.46 (B) 15<br>WBL = 0.73 (C) 32<br>WBR = 0.09 (C) 24<br>NBT = 0.35 (A) 9<br>SBT = 0.32 (A) 8 | <br>WBL = 55 m<br>WBR = 15 m<br>NBT = 50 m<br>SBT = 45 m | Overall: 0.62 (C) 22<br>WBL = 0.44 (C) 23<br>WBR = 0.52 (C) 26<br>NBT = 0.71 (C) 23<br>SBT = 0.38 (B) 17 | <br>WBL = 50 m<br>WBR = 70 m<br>NBT = 115 m<br>SBT = 55 m | Overall: 0.36 (B) 12<br>WBL = 0.59 (C) 24<br>WBR = 0.11 (C) 21<br>NBT = 0.28 (A) 7<br>SBT = 0.25 (A) 6 | <br>WBL = 35 m<br>WBR = 15 m<br>NBT = 30 m<br>SBT = 25 m |

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| Future Total 2028 (Site Plan A) | Overall: 0.56 (B) 15<br>WBL = 0.73 (C) 32<br>WBR = 0.39 (C) 26<br>NBT = 0.49 (A) 10<br>SBT = 0.37 (A) 9 | <br>WBL = 55 m<br>WBR = 35 m<br>NBT = 70 m<br>SBT = 50 m | Overall: 0.74 (C) 25<br>WBL = 0.44 (C) 23<br>WBR = 0.63 (C) 30<br>NBT = 0.84 (C) 28<br>SBT = 0.53 (B) 19 | <br>WBL = 50 m<br>WBR = 90 m<br>NBT = 150 m<br>SBT = 80 m | Overall: 0.48 (B) 12<br>WBL = 0.58 (C) 24<br>WBR = 0.53 (C) 24<br>NBT = 0.45 (A) 8<br>SBT = 0.37 (A) 7 | <br>WBL = 35 m<br>WBR = 35 m<br>NBT = 55 m<br>SBT = 40 m |
| Future Total 2028 (Site Plan B) | Overall: 0.54 (B) 15<br>WBL = 0.72 (C) 32<br>WBR = 0.39 (C) 26<br>NBT = 0.48 (A) 9<br>SBT = 0.34 (A) 8 | <br>WBL = 50 m<br>WBR = 35 m<br>NBT = 70 m<br>SBT = 45 m | Overall: 0.68 (C) 23<br>WBL = 0.43 (C) 23<br>WBR = 0.58 (C) 28<br>NBT = 0.77 (C) 25<br>SBT = 0.49 (B) 19 | <br>WBL = 50 m<br>WBR = 80 m<br>NBT = 135 m<br>SBT = 75 m | Overall: 0.39 (B) 12<br>WBL = 0.59 (C) 24<br>WBR = 0.12 (C) 21<br>NBT = 0.31 (A) 7<br>SBT = 0.28 (A) 6 | <br>WBL = 35 m<br>WBR = 15 m<br>NBT = 35 m<br>SBT = 30 m |
| Future Background 2033 | Overall: 0.51 (B) 16<br>**WBL = 0.75 (C) 32**<br>WBR = 0.1 (C) 23<br>NBT = 0.4 (A) 10<br>SBT = 0.36 (A) 9 | <br>WBL = 60 m<br>WBR = 15 m<br>NBT = 55 m<br>SBT = 50 m | Overall: 0.69 (C) 24<br>WBL = 0.48 (C) 24<br>WBR = 0.59 (C) 28<br>NBT = 0.78 (C) 25<br>SBT = 0.42 (B) 18 | <br>WBL = 60 m<br>WBR = 80 m<br>NBT = 135 m<br>SBT = 60 m | Overall: 0.4 (B) 12<br>WBL = 0.62 (C) 25<br>WBR = 0.12 (C) 20<br>NBT = 0.32 (A) 7<br>SBT = 0.28 (A) 7 | <br>WBL = 35 m<br>WBR = 15 m<br>NBT = 35 m<br>SBT = 30 m |
| Future Total 2033 (Site Plan A) | Overall: 0.61 (B) 16<br>**WBL = 0.75 (C) 32**<br>WBR = 0.43 (C) 26<br>NBT = 0.54 (B) 11<br>SBT = 0.41 (A) 10 | <br>WBL = 60 m<br>WBR = 40 m<br>NBT = 85 m<br>SBT = 60 m | Overall: 0.81 (C) 28<br>WBL = 0.48 (C) 24<br>WBR = 0.69 (C) 32<br>**NBT = 0.91 (C) 33**<br>SBT = 0.57 (C) 20 | <br>WBL = 60 m<br>WBR = 100 m<br>NBT = 190 m<br>SBT = 90 m | Overall: 0.52 (B) 13<br>WBL = 0.6 (C) 24<br>WBR = 0.58 (C) 25<br>NBT = 0.49 (A) 9<br>SBT = 0.4 (A) 8 | <br>WBL = 35 m<br>WBR = 40 m<br>NBT = 60 m<br>SBT = 50 m |
| Future Total 2033 (Site Plan B) | Overall: 0.59 (B) 16<br>WBL = 0.73 (C) 32<br>WBR = 0.44 (C) 26<br>NBT = 0.53 (B) 11<br>SBT = 0.39 (A) 9 | <br>WBL = 55 m<br>WBR = 40 m<br>NBT = 85 m<br>SBT = 55 m | Overall: 0.76 (C) 26<br>WBL = 0.48 (C) 24<br>WBR = 0.65 (C) 30<br>**NBT = 0.85 (C) 28**<br>SBT = 0.54 (B) 19 | <br>WBL = 55 m<br>WBR = 90 m<br>NBT = 155 m<br>SBT = 80 m | Overall: 0.43 (B) 12<br>WBL = 0.63 (C) 25<br>WBR = 0.24 (C) 21<br>NBT = 0.35 (A) 7<br>SBT = 0.31 (A) 7 | <br>WBL = 35 m<br>WBR = 20 m<br>NBT = 40 m<br>SBT = 35 m |
| Future Background 2038 | Overall: 0.55 (B) 17<br>**WBL = 0.78 (C) 33**<br>WBR = 0.17 (C) 23<br>NBT = 0.45 (B) 11<br>SBT = 0.41 (B) 10 | <br>WBL = 65 m<br>WBR = 20 m<br>NBT = 65 m<br>SBT = 60 m | Overall: 0.77 (C) 26<br>WBL = 0.52 (C) 25<br>WBR = 0.65 (C) 30<br>**NBT = 0.86 (C) 29**<br>SBT = 0.47 (B) 18 | <br>WBL = 65 m<br>WBR = 90 m<br>NBT = 160 m<br>SBT = 70 m | Overall: 0.44 (B) 13<br>WBL = 0.64 (C) 25<br>WBR = 0.22 (C) 21<br>NBT = 0.36 (A) 8<br>SBT = 0.31 (A) 7 | <br>WBL = 40 m<br>WBR = 20 m<br>NBT = 40 m<br>SBT = 35 m |
| Future Total 2038 (Site Plan A) | Overall: 0.65 (B) 17<br>**WBL = 0.78 (C) 33**<br>WBR = 0.47 (C) 26<br>NBT = 0.59 (B) 13<br>SBT = 0.45 (B) 11 | <br>WBL = 65 m<br>WBR = 45 m<br>NBT = 95 m<br>SBT = 65 m | **Overall: 0.88 (C) 34**<br>WBL = 0.52 (C) 25<br>**WBR = 0.75 (C) 35**<br>**NBT = 0.99 (D) 46**<br>SBT = 0.62 (C) 21 | <br>WBL = 65 m<br>WBR = 110 m<br>NBT = 220 m<br>SBT = 95 m | Overall: 0.55 (B) 13<br>WBL = 0.61 (C) 24<br>WBR = 0.62 (C) 26<br>NBT = 0.53 (A) 10<br>SBT = 0.44 (A) 9 | <br>WBL = 40 m<br>WBR = 45 m<br>NBT = 70 m<br>SBT = 55 m |
| Future Total 2038 (Site Plan B) | Overall: 0.65 (B) 17<br>**WBL = 0.77 (C) 33**<br>WBR = 0.49 (C) 27<br>NBT = 0.59 (B) 12<br>SBT = 0.44 (B) 10 | <br>WBL = 65 m<br>WBR = 45 m<br>NBT = 95 m<br>SBT = 65 m | **Overall: 0.85 (C) 30**<br>WBL = 0.53 (C) 25<br>WBR = 0.72 (C) 33<br>**NBT = 0.95 (D) 37**<br>SBT = 0.59 (C) 20 | <br>WBL = 65 m<br>WBR = 105 m<br>NBT = 205 m<br>SBT = 90 m | Overall: 0.47 (B) 13<br>WBL = 0.65 (C) 25<br>WBR = 0.35 (C) 22<br>NBT = 0.4 (A) 8<br>SBT = 0.35 (A) 8 | <br>WBL = 40 m<br>WBR = 25 m<br>NBT = 45 m<br>SBT = 40 m |

### 7.2.1 MTO Westbound Off-Ramp Queuing Analysis – Left-turn and Through Lanes

A queueing analysis was completed for the left-turn and through lanes at the intersection based on the MTO's Protocol using the MTO's Geometric Design Standards and Signal Timing Policy. The calculations are summarized in the table below and are based on the volumes from the 2038 future total scenarios. The recommended storage length (in vehicles) has been extracted from the MTO's Geometric Design Standards for Ontario Highways, Chapter B, Table B7-5 for urban/commuter intersections.

***Table 15 MTO Queuing Protocol - MTO Westbound Ramp and Townline Road***

| Scenario | Lane | Volumes | Heavy Vehicle% | PCU | Cycle Length (in seconds) | Arrival Rate (vehicles/ cycle) | Recommended Storage, MTO Table B7-5 (vehicles) | Recommended Storage (in metres, 7.5 m/vehicle) | Available Storage (metres) |
|---|---|---|---|---|---|---|---|---|---|
| Future Total 2038-AM (ALT A) | WBL | 605 | 13% | 684 | 90 | 8.5 | 14 | 105 | 124* |
| | NBT | 1179 | 4% | 1226 | 90 | 15.3 | 22 | 165 | N/A |
| | SBT | 915 | 2% | 933 | 90 | 11.7 | 18 | 135 | N/A |
| Future Total 2038-PM (ALT A) | WBL | 607 | 9% | 662 | 100 | 9.2 | 14 | 105 | 124* |
| | NBT | 1665 | 2% | 1698 | 100 | 23.6 | 32 | 240 | N/A |
| | SBT | 1034 | 2% | 1055 | 100 | 14.6 | 21 | 157.5 | N/A |
| Future Total 2038-SAT (ALT A) | WBL | 449 | 5% | 471 | 80 | 5.2 | 9 | 67.5 | 124* |
| | NBT | 1074 | 2% | 1095 | 80 | 12.2 | 18 | 135 | N/A |
| | SBT | 887 | 1% | 896 | 80 | 10.0 | 15 | 112.5 | N/A |
| Future Total 2038-AM (ALT B) | WBL | 605 | 13% | 684 | 90 | 8.5 | 14 | 105 | 124* |
| | NBT | 1177 | 4% | 1224 | 90 | 15.3 | 22 | 165 | N/A |
| | SBT | 874 | 2% | 891 | 90 | 11.1 | 17 | 127.5 | N/A |
| Future Total 2038-PM (ALT B) | WBL | 607 | 9% | 662 | 100 | 9.2 | 14 | 105 | 124* |
| | NBT | 1544 | 2% | 1575 | 100 | 21.9 | 30 | 225 | N/A |
| | SBT | 959 | 2% | 978 | 100 | 13.6 | 20 | 150 | N/A |
| Future Total 2038-SAT (ALT B) | WBL | 449 | 5% | 471 | 80 | 5.2 | 9 | 67.5 | 124* |
| | NBT | 791 | 2% | 807 | 80 | 9.0 | 14 | 105 | N/A |
| | SBT | 688 | 1% | 695 | 80 | 7.7 | 12 | 90 | N/A |

*Note the available storage is based on 2 left turn lanes

### 7.2.2 MTO Westbound Off-Ramp Queuing Analysis – Right Turn Lanes

As directed by MTO staff, the right-turn lane queuing assessment was completed for the ultimate condition based on the methodology in Chapter 9 of TAC's Geometric Design Guide for Canadian Roads section 9.14.4. The queueing assessment was completed as follows:

- At signalized intersections, the storage length should accommodate about 1.5 times the average number of vehicles to be stored per cycle for roadways with design speeds of 60 km/h or less and about twice the average number of vehicles for design speeds greater than 60 km/hr

The right turn lane queueing analysis is summarized in the table below:

***Table 16 TAC Manual Chapter 9 Westbound 401 Off-Ramp Right-Turn Storage Assessment***

| Scenario | Lane | Volumes | Design Speed (km/hr) | Cycle Length (in seconds) | Arrival Rate (vehicles/ cycle) (Factored by 1.5) | Recommended Storage, MTO Table B7-5 (vehicles) | Recommended Storage (in metres, 7.5 m/vehicle) | Available Storage (metres) |
|---|---|---|---|---|---|---|---|---|
| Future Total 2038-AM (ALT A) | EBR | 216 | 60 | 90 | 8.1 | 13 | 97.5 | 62 |
| Future Total 2038-PM (ALT A) | EBR | 436 | 60 | 100 | 18.2 | 25 | 187.5 | 62 |
| Future Total 2038-SAT (ALT A) | EBR | 254 | 60 | 80 | 8.5 | 14 | 105 | 62 |
| Future Total 2038-AM (ALT B) | EBR | 217 | 60 | 90 | 8.1 | 13 | 97.5 | 62 |
| Future Total 2038-PM (ALT B) | EBR | 412 | 60 | 100 | 17.2 | 24 | 180 | 62 |
| Future Total 2038-SAT (ALT B) | EBR | 198 | 60 | 80 | 6.6 | 11 | 82.5 | 62 |

Under existing traffic conditions, the intersection operates at satisfactory levels with an overall v/c ratio of 0.42 LOS B during the a.m. peak hour, 0.59 LOS B during the p.m. peak hour and an overall V/C of 0.34 LOS B during the Saturday peak hour.

With the addition of corridor growth for the 2028 future background traffic scenario, the intersection is reported to operate at a satisfactory level with an overall V/C ratio of 0.46 LOS B during the a.m. peak hour, an overall V/C of 0.62 LOS C during the p.m. peak hour and an overall V/C ratio of 0.36 LOS B during the Saturday Peak hour. No movements report critical.

**Future Total 2028 Site Plan A**

Under the 2028 future total traffic scenario for Site Plan A, with the addition of site generated traffic the intersection operates with an overall V/C ratio of 0.56 LOS B during the a.m. peak hour, 0.74 LOS C during the p.m. peak hour and an overall V/C of 0.48 LOS B during the Saturday peak hour. No critical movements are reported.

**Future Total 2028 Site Plan B**

Under the 2028 future total traffic scenario for Site Plan B, with the addition of site generated traffic the intersection operates with an overall V/C ratio of 0.54 LOS B during the a.m. peak hour, 0.68 LOS C during the p.m. peak hour and an overall V/C of 0.38 LOS B during the Saturday peak hour. No critical movements are reported.

With the addition of corridor growth for the 2033 future background traffic scenario, the intersection is reported to operate at a satisfactory level with an overall V/C ratio of 0.51 LOS B during the a.m. peak hour, an overall V/C of 0.69 LOS C during the p.m. peak hour and an overall V/C ratio of 0.39 LOS B during the Saturday Peak hour. The westbound left direction reports critical during the a.m. peak hour.

**Future Total 2033 Site Plan A**

Under the 2033 future total traffic scenario Site Plan A, with the addition of site generated traffic, the intersection operates with an overall critical V/C ratio of 0.61 LOS B during the a.m. peak hour, critical V/C of 0.81 LOS C during the p.m. peak hour and a V/C of 0.52 LOS B during the Saturday peak hour. The a.m. peak reports a critical westbound left turn, and the p.m. peak hour reports a critical northbound through movement. For the reported critical movements, the site trips contribute the following percentage of volume:

**A.M. Peak Hour**

- Westbound left-turn movement: 0% of through volume

**P.M. Peak Hour**

- Northbound through movement: 15% of through volume

Although critical the through volume for the proposed site contributes to 15% of the total northbound through volume where although critical the queueing and delay are acceptable.

**Future Total 2033 Site Plan B**

Under the 2033 future total traffic scenario, with the addition of site generated traffic operates with an overall V/C ratio of 0.59 LOS B during the a.m. peak hour, a V/C ratio of 0.76 LOS C during the p.m. peak hour and an overall V/C of 0.43 LOS B during the Saturday peak hour. The p.m. peak hour reports critical movements in the northbound through direction. For the reported critical movement, the site trips contribute the following percentage of volume:

**P.M. Peak Hour**

- Northbound through movement: 7% of through volume

With the addition of corridor growth for the 2038 future background traffic scenario, the intersection is reported to operate at a satisfactory level with an overall V/C ratio of 0.55 LOS B during the a.m. peak hour, an overall V/C of 0.77 LOS C during the p.m. peak hour and an overall V/C ratio of 0.44 LOS B during the Saturday Peak hour. The westbound left reports critical during the a.m. peak hour and the northbound through direction reports critical during the p.m. peak hour.

**Future Total 2038 Site Plan A**

Under the 2038 future total traffic scenario Site Plan A, with the addition of site generated traffic, the intersection operates with an overall critical V/C ratio of 0.65 LOS B during the a.m. peak hour, critical V/C of 0.88 LOS D during the p.m. peak hour and a V/C of 0.55 LOS C during the Saturday peak hour. The a.m. peak reports a critical movement in the westbound left, and the p.m. peak hour reports critical movements in the northbound through movement and westbound right direction. For the reported critical movements, the site trips contribute the following percentage of volume:

**A.M. Peak Hour**

- Westbound left movement: 0% of left-turning volume

**P.M. Peak Hour**

- Westbound right movement: 6% of right turning volume
- Northbound through movement: 13% of through volume

Although critical the through volume for the proposed site contributes to 6% of the total westbound right turns and 13% of the total northbound through volume which are nominal in comparison to the corridor growth.

**Future Total 2038 Site Plan B**

Under the 2038 future total traffic scenario, with the addition of site generated traffic operates with an overall V/C ratio of 0.65 LOS B during the a.m. peak hour, a V/C ratio of 0.85 LOS C during the p.m. peak hour and an overall V/C of 0.47 LOS B during the Saturday peak hour. The a.m. peak reports a critical westbound left and the p.m. peak hour reports critical movements in the northbound through direction. For the reported critical movement, the site trips contribute the following percentage of volume:

**A.M. Peak Hour**

- Westbound left movement: 0% of left-turning volume

**P.M. Peak Hour**

- Northbound through movement: 6% of through volume

Although critical the through volume for the proposed site A contributes 13% and site B contributes 6% of the total northbound through volume which indicates that the corridor growth for the northbound movement is the driving factor for causing the movement to become critical.

Therefore, though critical in the northbound through direction the critical movement will not be expected until the 2033 future horizon year where during the year of build-out 2028 there are no expected critical movement. As a result, no geometric improvements are recommended for the intersection.

As per the queueing analysis the recommended storage exceeds the available for the right turn lane however operationally the delay and under critical V/C of the movement indicate that it operates under acceptable parameters. Furthermore, it is shown that the Site Plan B outperforms Site Plan A and requires a lower recommended storage length in comparison.

# 7.3 Townline Road and Jamieson Parkway/Site Access 2

Capacity analysis at this intersection during the weekday a.m. and p.m. peak hours and Saturday peak hour for the existing, future background, and future total traffic conditions are summarized in the following table.

***Table 17 Capacity analysis of Townline Road and Jamieson Parkway***

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| Existing 2025 | Overall: 0.52 (C) 21<br>EBL = 0.56 (D) 37<br>EBR = 0.21 (C) 33<br>NBL = 0.37 (C) 29 | <br>EBL = 40 m<br>EBR = 20 m<br>NBL = 35 m | Overall: 0.54 (C) 25<br>EBL = 0.75 (E) 56<br>EBR = 0.25 (D) 42<br>NBL = 0.73 (D) 50 | <br>EBL = 70 m<br>EBR = 30 m<br>NBL = 60 m | Overall: 0.41 (B) 18<br>EBL = 0.58 (D) 37<br>EBR = 0.16 (C) 32<br>NBL = 0.51 (D) 36 | <br>EBL = 40 m<br>EBR = 20 m<br>NBL = 30 m |

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| | NBT = 0.22 (A) 4<br>SBT = 0.6 (C) 22 | NBT = 25 m<br>SBT = 75 m | NBT = 0.38 (A) 6<br>SBT = 0.4 (B) 18 | NBT = 55 m<br>SBT = 70 m | NBT = 0.22 (A) 4<br>SBT = 0.34 (B) 13 | NBT = 25 m<br>SBT = 45 m |
| Future Background 2028 | Overall: 0.6 (B) 20<br>EBL = 0.59 (C) 34<br>EBTR = 0.22 (C) 28<br>NBL = 0.6 (C) 34<br>NBTR = 0.25 (A) 6<br>SBTR = 0.6 (B) 19 | EBL = 40 m<br>EBTR = 5 m<br>NBL = 40 m<br>NBTR = 30 m<br>SBTR = 85 m | Overall: 0.62 (C) 25<br>EBL = 0.79 (D) 53<br>EBTR = 0.27 (C) 35<br>NBL = 0.72 (D) 44<br>NBTR = 0.44 (A) 8<br>SBTR = 0.5 (C) 22 | EBL = 80 m<br>EBTR = 0 m<br>WBTR = 0 m<br>NBL = 60 m<br>NBTR = 60 m<br>SBTR = 75 m | Overall: 0.48 (B) 18<br>EBL = 0.62 (C) 34<br>EBTR = 0.17 (C) 27<br>NBL = 0.5 (C) 32<br>NBTR = 0.25 (A) 6<br>SBTR = 0.41 (B) 15 | EBL = 40 m<br>EBTR = 0 m<br>NBL = 30 m<br>NBTR = 30 m<br>SBTR = 55 m |
| Future Total 2028 (Site Plan A) | Overall: 0.59 (C) 25<br>EBL = 0.51 (C) 35<br>EBTR = 0.34 (D) 40<br>WBL = 0.27 (C) 31<br>WBT = 0.26 (D) 38<br>WBR = 0.11 (D) 37<br>NBL = 0.64 (D) 43<br>NBT = 0.31 (B) 13<br>NBR = 0.28 (B) 13<br>SBL = 0.12 (B) 12<br>SBTR = 0.62 (C) 23 | EBL = 35 m<br>EBTR = 30 m<br>WBL = 15 m<br>WBT = 20 m<br>WBR = 15 m<br>NBL = 40 m<br>NBT = 50 m<br>NBR = 20 m<br>SBL = 10 m<br>SBTR = 100 m | Overall: 0.66 (D) 38<br>EBL = 0.65 (D) 44<br>EBTR = 0.72 (E) 61<br>WBL = 0.81 (E) 63<br>WBT = 0.55 (D) 49<br>WBR = 0.61 (D) 51<br>NBL = 0.79 (E) 58<br>NBT = 0.52 (C) 22<br>NBR = 0.3 (B) 19<br>SBL = 0.35 (B) 19<br>SBTR = 0.55 (C) 30 | EBL = 65 m<br>EBTR = 65 m<br>WBL = 70 m<br>WBT = 55 m<br>WBR = 60 m<br>NBL = 70 m<br>NBT = 110 m<br>NBR = 20 m<br>SBL = 25 m<br>SBTR = 105 m | Overall: 0.57 (C) 32<br>EBL = 0.47 (D) 37<br>EBTR = 0.77 (E) 59<br>WBL = 0.62 (C) 33<br>WBT = 0.47 (D) 41<br>WBR = 0.18 (D) 37<br>NBL = 0.6 (D) 51<br>NBT = 0.37 (C) 22<br>NBR = 0.28 (C) 21<br>SBL = 0.39 (B) 16<br>SBTR = 0.46 (C) 25 | EBL = 40 m<br>EBTR = 70 m<br>WBL = 40 m<br>WBT = 50 m<br>WBR = 20 m<br>NBL = 40 m<br>NBT = 70 m<br>NBR = 25 m<br>SBL = 40 m<br>SBTR = 80 m |
| Future Total 2028 (Site Plan B) | Overall: 0.63 (C) 24<br>EBL = 0.51 (C) 32<br>EBTR = 0.21 (D) 38<br>WBL = 0.28 (D) 37<br>WBTR = 0.1 (D) 41<br>NBL = 0.7 (D) 43<br>NBTR = 0.5 (B) 14<br>SBL = 0.16 (B) 12<br>SBTR = 0.61 (C) 21 | EBL = 40 m<br>EBTR = 5 m<br>WBL = 20 m<br>WBTR = 10 m<br>NBL = 40 m<br>NBTR = 70 m<br>SBL = 10 m<br>SBTR = 85 m | Overall: 0.69 (C) 34<br>EBL = 0.7 (D) 48<br>EBTR = 0.35 (D) 50<br>WBL = 0.65 (D) 42<br>WBTR = 0.18 (D) 46<br>NBL = 0.83 (E) 58<br>NBTR = 0.59 (B) 18<br>SBL = 0.08 (B) 19<br>SBTR = 0.59 (C) 29 | EBL = 60 m<br>EBTR = 35 m<br>WBL = 50 m<br>WBTR = 20 m<br>NBL = 90 m<br>NBTR = 150 m<br>SBL = 5 m<br>SBTR = 115 m | Overall: 0.48 (C) 23<br>EBL = 0.57 (D) 38<br>EBTR = 0.17 (D) 43<br>WBL = 0.32 (D) 41<br>WBTR = 0.15 (D) 47<br>NBL = 0.58 (D) 43<br>NBTR = 0.3 (A) 9<br>SBL = 0.03 (B) 12<br>SBTR = 0.4 (B) 16 | EBL = 45 m<br>EBTR = 0 m<br>WBL = 20 m<br>WBTR = 15 m<br>NBL = 35 m<br>NBTR = 45 m<br>SBL = 5 m<br>SBTR = 60 m |
| Future Background 2033 | Overall: 0.66 (C) 21<br>EBL = 0.62 (D) 35<br>EBTR = 0.24 (C) 29<br>NBL = 0.64 (C) 35<br>NBTR = 0.28 (A) 6<br>SBTR = 0.68 (C) 21 | EBL = 40 m<br>EBTR = 15 m<br>NBL = 45 m<br>NBTR = 35 m<br>SBTR = 100 m | Overall: 0.68 (C) 27<br>EBL = 0.84 (E) 59<br>EBTR = 0.3 (D) 35<br>NBL = 0.75 (D) 46<br>NBTR = 0.49 (A) 10<br>SBTR = 0.57 (C) 26 | EBL = 95 m<br>EBTR = 5 m<br>NBL = 65 m<br>NBTR = 70 m<br>SBTR = 90 m | Overall: 0.52 (B) 19<br>EBL = 0.64 (D) 35<br>EBTR = 0.19 (C) 27<br>NBL = 0.53 (C) 33<br>NBTR = 0.28 (A) 6<br>SBTR = 0.47 (B) 17 | EBL = 45 m<br>EBTR = 0 m<br>NBL = 35 m<br>NBTR = 35 m<br>SBTR = 65 m |
| Future Total 2033 (Site Plan A) | Overall: 0.65 (C) 26<br>EBL = 0.56 (D) 36<br>EBTR = 0.36 (D) 40<br>WBL = 0.27 (C) 31<br>WBT = 0.25 (D) 38<br>WBR = 0.11 (D) 37<br>NBL = 0.7 (D) 45 | EBL = 40 m<br>EBTR = 30 m<br>WBL = 15 m<br>WBT = 20 m<br>WBR = 15 m<br>NBL = 50 m<br>NBT = 60 m | Overall: 0.75 (D) 43<br>EBL = 0.66 (D) 43<br>EBTR = 0.84 (E) 72<br>WBL = 0.83 (E) 69<br>WBT = 0.47 (D) 46<br>WBR = 0.61 (D) 50<br>NBL = 0.87 (E) 68 | EBL = 70 m<br>EBTR = 95 m<br>WBL = 70 m<br>WBT = 55 m<br>WBR = 65 m<br>NBL = 85 m<br>NBT = 130 m | Overall: 0.61 (C) 33<br>EBL = 0.5 (D) 37<br>EBTR = 0.79 (E) 61<br>WBL = 0.63 (C) 33<br>WBT = 0.45 (D) 40<br>WBR = 0.18 (D) 37<br>NBL = 0.64 (D) 53 | EBL = 45 m<br>EBTR = 80 m<br>WBL = 40 m<br>WBT = 50 m<br>WBR = 20 m<br>NBL = 45 m |

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| | NBT = 0.35 (B) 14<br>NBR = 0.28 (B) 14<br>SBL = 0.13 (B) 13<br>SBTR = 0.69 (C) 25 | NBR = 20 m<br>SBL = 10 m<br>SBTR = 120 m | NBT = 0.6 (C) 26<br>NBR = 0.3 (C) 21<br>SBL = 0.41 (C) 22<br>SBTR = 0.65 (C) 35 | NBR = 20 m<br>SBL = 25 m<br>SBTR = 115 m | NBT = 0.42 (C) 23<br>NBR = 0.28 (C) 22<br>SBL = 0.42 (B) 17<br>SBTR = 0.51 (C) 27 | NBT = 80 m<br>NBR = 25 m<br>SBL = 40 m<br>SBTR = 90 m |
| Future Total 2033 (Site Plan B) | Overall: 0.69 (C) 26<br>EBL = 0.52 (C) 33<br>EBTR = 0.22 (D) 38<br>WBL = 0.28 (D) 37<br>WBTR = 0.09 (D) 41<br>NBL = 0.76 (D) 46<br>NBTR = 0.54 (B) 15<br>SBL = 0.17 (B) 12<br>SBTR = 0.69 (C) 24 | EBL = 40 m<br>EBTR = 10 m<br>WBL = 20 m<br>WBTR = 10 m<br>NBL = 50 m<br>NBTR = 85 m<br>SBL = 10 m<br>SBTR = 100 m | Overall: 0.72 (D) 36<br>EBL = 0.72 (D) 51<br>EBTR = 0.32 (D) 53<br>WBL = 0.71 (D) 53<br>WBTR = 0.21 (D) 53<br>NBL = 0.84 (E) 60<br>NBTR = 0.62 (B) 17<br>SBL = 0.09 (C) 20<br>SBTR = 0.64 (C) 31 | EBL = 75 m<br>EBTR = 35 m<br>WBL = 55 m<br>WBTR = 25 m<br>NBL = 90 m<br>NBTR = 160 m<br>SBL = 5 m<br>SBTR = 135 m | Overall: 0.53 (C) 23<br>EBL = 0.6 (D) 39<br>EBTR = 0.18 (D) 43<br>WBL = 0.32 (D) 42<br>WBTR = 0.15 (D) 47<br>NBL = 0.62 (D) 44<br>NBTR = 0.33 (A) 9<br>SBL = 0.03 (B) 12<br>SBTR = 0.45 (B) 17 | EBL = 50 m<br>EBTR = 0 m<br>WBL = 20 m<br>WBTR = 15 m<br>NBL = 35 m<br>NBTR = 50 m<br>SBL = 5 m<br>SBTR = 65 m |
| Future Background 2038 | Overall: 0.72 (C) 23<br>EBL = 0.65 (D) 36<br>EBTR = 0.27 (C) 29<br>NBL = 0.7 (D) 37<br>NBTR = 0.31 (A) 6<br>SBTR = 0.76 (C) 24 | EBL = 45 m<br>EBTR = 20 m<br>NBL = 50 m<br>NBTR = 40 m<br>SBTR = 125 m | Overall: 0.75 (C) 30<br>**EBL = 0.9 (E) 68**<br>EBTR = 0.33 (D) 36<br>NBL = 0.78 (D) 47<br>NBTR = 0.54 (B) 11<br>SBTR = 0.65 (C) 29 | EBL = 115 m<br>EBTR = 15 m<br>NBL = 75 m<br>NBTR = 80 m<br>SBTR = 105 m | Overall: 0.58 (B) 20<br>EBL = 0.68 (D) 37<br>EBTR = 0.21 (C) 28<br>NBL = 0.57 (C) 34<br>NBTR = 0.31 (A) 7<br>SBTR = 0.53 (B) 18 | EBL = 50 m<br>EBTR = 5 m<br>NBL = 35 m<br>NBTR = 40 m<br>SBTR = 75 m |
| Future Total 2038 (Site Plan A) | Overall: 0.73 (C) 28<br>EBL = 0.51 (C) 32<br>EBTR = 0.49 (D) 40<br>WBL = 0.28 (C) 33<br>WBT = 0.26 (D) 39<br>WBR = 0.14 (C) 33<br>NBL = 0.78 (D) 50<br>NBT = 0.41 (B) 17<br>NBR = 0.28 (B) 11<br>SBL = 0.13 (B) 14<br>SBTR = 0.8 (C) 31 | EBL = 45 m<br>EBTR = 40 m<br>WBL = 15 m<br>WBT = 20 m<br>WBR = 15 m<br>NBL = 60 m<br>NBT = 70 m<br>NBR = 15 m<br>SBL = 10 m<br>SBTR = 150 m | Overall: 0.83 (D) 47<br>EBL = 0.69 (D) 42<br>**EBTR = 0.92 (F) 86**<br>**WBL = 0.9 (F) 83**<br>WBT = 0.48 (D) 49<br>WBR = 0.71 (D) 51<br>**NBL = 0.91 (E) 75**<br>NBT = 0.69 (C) 30<br>NBR = 0.3 (B) 15<br>SBL = 0.47 (C) 24<br>SBTR = 0.74 (D) 40 | EBL = 80 m<br>EBTR = 125 m<br>WBL = 70 m<br>WBT = 55 m<br>WBR = 85 m<br>NBL = 95 m<br>NBT = 150 m<br>NBR = 15 m<br>SBL = 25 m<br>SBTR = 130 m | Overall: 0.66 (C) 34<br>EBL = 0.54 (D) 38<br>EBTR = 0.81 (E) 63<br>WBL = 0.64 (C) 34<br>WBT = 0.43 (D) 40<br>WBR = 0.18 (D) 37<br>NBL = 0.69 (E) 55<br>NBT = 0.46 (C) 25<br>NBR = 0.28 (C) 23<br>SBL = 0.46 (B) 18<br>SBTR = 0.58 (C) 29 | EBL = 50 m<br>EBTR = 90 m<br>WBL = 40 m<br>WBT = 50 m<br>WBR = 20 m<br>NBL = 50 m<br>NBT = 85 m<br>NBR = 25 m<br>SBL = 40 m<br>SBTR = 105 m |
| Future Total 2038 (Site Plan B) | Overall: 0.76 (C) 28<br>EBL = 0.54 (C) 33<br>EBTR = 0.23 (D) 39<br>WBL = 0.28 (D) 37<br>WBTR = 0.09 (D) 41<br>NBL = 0.83 (D) 52<br>NBTR = 0.58 (B) 16<br>SBL = 0.19 (B) 13<br>SBTR = 0.78 (C) 27 | EBL = 40 m<br>EBTR = 15 m<br>WBL = 20 m<br>WBTR = 10 m<br>NBL = 65 m<br>NBTR = 100 m<br>SBL = 10 m<br>SBTR = 125 m | Overall: 0.77 (D) 38<br>EBL = 0.83 (E) 65<br>EBTR = 0.49 (E) 57<br>WBL = 0.74 (D) 54<br>WBTR = 0.19 (D) 51<br>NBL = 0.87 (E) 63<br>NBTR = 0.68 (B) 18<br>SBL = 0.11 (C) 21<br>SBTR = 0.72 (C) 35 | EBL = 80 m<br>EBTR = 45 m<br>WBL = 60 m<br>WBTR = 25 m<br>NBL = 105 m<br>NBTR = 180 m<br>SBL = 5 m<br>SBTR = 155 m | Overall: 0.58 (C) 24<br>EBL = 0.63 (D) 41<br>EBTR = 0.18 (D) 43<br>WBL = 0.33 (D) 42<br>WBTR = 0.15 (D) 47<br>NBL = 0.66 (D) 45<br>NBTR = 0.36 (A) 9<br>SBL = 0.03 (B) 12<br>SBTR = 0.5 (B) 18 | EBL = 55 m<br>EBTR = 0 m<br>WBL = 20 m<br>WBTR = 15 m<br>NBL = 40 m<br>NBTR = 55 m<br>SBL = 5 m<br>SBTR = 75 m |

Under existing traffic conditions, the intersection operates at satisfactory levels with an overall V/C ratio of 0.52 LOS C during the a.m. peak hour, 0.54 LOS C during the p.m. peak hour and an overall V/C of 0.41 LOS B during the Saturday peak hour.

To ensure the V/C and delays are reduced with the implementation of the site access at Jamieson Parkway and Townline road the following was added to the intersection and into the model for Site A based on spacing constraints:

- Protected phase for the westbound left and permitted protected for the eastbound left and southbound left.
- Eastbound right lane converted to a through-right
- A double left-turn lane and a exclusive through and right lane on the westbound approach.
- Exclusive right turn lane added in the northbound direction
- A left-turn lane added on the southbound approach.
- Optimized signal timings and increase in cycle length to 135 seconds for the p.m. and Saturday peak

For Site B the following was added to the intersection and into the model:

- Permitted protected for the eastbound left, westbound left and southbound left.
- Eastbound right lane converted to a through-right
- A left-turn lane and a shared through-right lane on the westbound approach.
- A left-turn lane added on the southbound approach.
- Optimized signal timings and increase in cycle length to 135 seconds for the p.m. and Saturday peak

With the addition of corridor growth for the 2028 future background traffic scenario, the intersection is reported to operate at a satisfactory level with an overall V/C ratio of 0.60 LOS C during the a.m. peak hour, an overall V/C of 0.62 LOS C during the p.m. peak hour and an overall V/C ratio of 0.48 LOS B during the Saturday Peak hour.

**Future total 2028 Site Plan A**

Under the 2028 future total traffic Site Plan A scenario, with the addition of site generated traffic and signal and intersection improvements the intersection operates with a V/C ratio of 0.59 LOS C during the a.m. peak hour, a V/C of 0.66 LOS D during the p.m. peak hour and an overall V/C of 0.57 LOS C during the Saturday peak hour. No crotical movements are reported.

**Future total 2028 Site Plan B**

Under the 2028 future total traffic Site Plan B scenario, with the addition of site generated traffic and signal and intersection improvements the intersection operates with a V/C ratio of 0.63 LOS C during the a.m. peak hour, a V/C of 0.69 LOS C during the p.m. peak hour and an overall V/C of 0.48 LOS C during the Saturday peak hour.

With the addition of corridor growth for the 2033 future background traffic scenario, the intersection is reported to operate at a satisfactory level with an overall V/C ratio of 0.66 LOS C during the a.m. peak hour, an overall V/C of 0.68 LOS C during the p.m. peak hour and an overall V/C ratio of 0.52 LOS B during the Saturday Peak hour.

**Future total 2033 Site Plan A**

Under the 2033 future total traffic Site Plan A scenario, with the addition of site generated traffic and signal and intersection improvements the intersection operates with a V/C ratio of 0.65 LOS C during the a.m. peak hour, a V/C of 0.75 LOS D during the p.m. peak hour and an overall V/C of 0.61 LOS C during the Saturday peak hour. No critical movements are reported.

**Future total 2033 Site Plan B**

Under the 2033 future total traffic Site Plan B scenario, with the addition of site generated traffic and signal and intersection improvements the intersection operates with a V/C ratio of 0.69 LOS C during the a.m. peak hour, a V/C of 0.72 LOS D during the p.m. peak hour and an overall V/C of 0.53 LOS C during the Saturday peak hour.

With the addition of corridor growth for the 2038 future background traffic scenario, the intersection is reported to operate at a satisfactory level with an overall V/C ratio of 0.72 LOS C during the a.m. peak hour, an overall V/C of 0.75 LOS C during the p.m. peak hour and an overall V/C ratio of 0.48 LOS B during the Saturday Peak hour. The eastbound left reports critical in the p.m. peak hour.

**Future total 2038 Site Plan A**

Under the 2038 future total traffic Site Plan A scenario, with the addition of site generated traffic and signal and intersection improvements the intersection operates with a V/C ratio of 0.73 LOS C during the a.m. peak hour, a critical V/C of 0.83 LOS D during the p.m. peak hour and an overall V/C of 0.66 LOS C during the Saturday peak hour. The p.m. peak hour reports a critical movement in the eastbound through right, westbound left direction, and northbound left movement. The site traffic volumes contribute the following percentage of volume to its respective movement:

**P.M. Peak Hour**

- Eastbound through right movement: 5% of the through right volume
- Westbound left movement: 100% left turning volume.
- Northbound left movement: 0% of left-turning volume

**Future total 2038 Site Plan B**

Under the 2038 future total traffic Site Plan B scenario, with the addition of site generated traffic and signal and intersection improvements the intersection operates with a V/C ratio of 0.76 LOS C during the a.m. peak hour, a critical V/C of 0.77 LOS D during the p.m. peak hour and an overall V/C of 0.58 LOS D during the Saturday peak hour. No critical movements are reported.

As a result, the proposed site traffic can be accommodated at this intersection with no issues under the Site Plan B option. Under the Site Plan A scenario, the p.m. peak hour reports above capacity only under the Future Total 2038 scenario indicating that there is no critical movements under the 2028 and 2033 horizon year. Additionally, the v/c is reported below 1.00. Although critical the critical behaviour of the outbound volumes for a retail building and gas station is expected as there is a typically higher outbound volume during the p.m. peak hour coinciding with driver behaviour opting to use these services after working hours. Therefore, although critical Site Plan A can be accommodated at this intersection.

Thus, the recommended improvements to implement for the introduction of the site plan A include:

- Protected phase for the westbound left and permitted protected for the eastbound left and southbound left.
- Eastbound right lane converted to a through-right
- A double left-turn lane and a exclusive through and right lane on the westbound approach.
- Exclusive right turn lane added in the northbound direction
- A left-turn lane added on the southbound approach.
- Optimized signal timings and increase in cycle length to 135 seconds for the p.m. and Saturday peak

For Site Plan B the recommended improvements include:

- Permitted protected for the eastbound left, westbound left and southbound left.
- Eastbound right lane converted to a through-right
- A left-turn lane and a shared through-right lane on the westbound approach.
- A left-turn lane added on the southbound approach.

- Optimized signal timings

## 7.4 Townline Road and Ellis Road/Sideroad 10N

Capacity analysis at this intersection during the weekday a.m. and p.m. peak hours and Saturday peak hour for the existing, future background, and future total traffic conditions are summarized in the following table.

***Table 18 Capacity analysis of Townline Road and Ellis Road/Sideroad 10N***

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| Existing 2025 | Overall: 0.61 (B) 15<br>EBL = 0.47 (C) 33<br>EBTR = 0.3 (C) 31<br>WBL = 0.16 (C) 31<br>WBTR = 0.05 (C) 30<br>NBL = 0.22 (A) 5<br>NBTR = 0.49 (A) 7<br>SBL = 0.01 (A) 7<br>SBTR = 0.64 (B) 14 | EBL = 25 m<br>EBTR = 25 m<br>WBL = 10 m<br>WBTR = 10 m<br>NBL = 10 m<br>NBTR = 65 m<br>SBL = 5 m<br>SBTR = 110 m | Overall: 0.72 (B) 15<br>EBL = 0.24 (C) 35<br>EBTR = 0.21 (C) 34<br>WBL = 0.49 (D) 38<br>WBTR = 0.19 (C) 34<br>NBL = 0.54 (A) 6<br>NBTR = 0.71 (B) 10<br>SBL = 0.02 (A) 9<br>SBTR = 0.6 (B) 16 | EBL = 15 m<br>EBTR = 20 m<br>WBL = 25 m<br>WBTR = 15 m<br>NBL = 25 m<br>NBTR = 130 m<br>SBL = 5 m<br>SBTR = 95 m | Overall: 0.44 (B) 10<br>EBL = 0.21 (B) 19<br>EBTR = 0.23 (B) 20<br>WBL = 0.16 (B) 19<br>WBTR = 0.06 (B) 18<br>NBL = 0.3 (A) 7<br>NBTR = 0.5 (A) 8<br>SBL = 0.01 (A) 4<br>SBTR = 0.42 (A) 7 | EBL = 10 m<br>EBTR = 15 m<br>WBL = 10 m<br>WBTR = 5 m<br>NBL = 20 m<br>NBTR = 50 m<br>SBL = 5 m<br>SBTR = 40 m |
| Future Background 2028 | Overall: 0.66 (B) 16<br>EBL = 0.48 (C) 33<br>EBTR = 0.32 (C) 31<br>WBL = 0.17 (C) 31<br>WBTR = 0.05 (C) 29<br>NBL = 0.26 (A) 6<br>NBTR = 0.54 (A) 7<br>SBL = 0.01 (A) 7<br>SBTR = 0.7 (B) 16 | EBL = 25 m<br>EBTR = 25 m<br>WBL = 10 m<br>WBTR = 10 m<br>NBL = 10 m<br>NBTR = 75 m<br>SBL = 5 m<br>SBTR = 130 m | Overall: 0.77 (B) 16<br>EBL = 0.24 (C) 35<br>EBTR = 0.22 (C) 35<br>WBL = 0.53 (D) 40<br>WBTR = 0.2 (C) 34<br>NBL = 0.6 (A) 8<br>NBTR = 0.76 (B) 12<br>SBL = 0.03 (A) 9<br>SBTR = 0.62 (B) 16 | EBL = 15 m<br>EBTR = 20 m<br>WBL = 25 m<br>WBTR = 15 m<br>NBL = 30 m<br>NBTR = 160 m<br>SBL = 5 m<br>SBTR = 110 m | Overall: 0.47 (B) 10<br>EBL = 0.21 (B) 19<br>EBTR = 0.24 (B) 19<br>WBL = 0.16 (B) 19<br>WBTR = 0.06 (B) 18<br>NBL = 0.34 (A) 7<br>NBTR = 0.54 (A) 9<br>SBL = 0.01 (A) 4<br>SBTR = 0.45 (A) 8 | EBL = 10 m<br>EBTR = 15 m<br>WBL = 10 m<br>WBTR = 5 m<br>NBL = 20 m<br>NBTR = 55 m<br>SBL = 5 m<br>SBTR = 45 m |
| Future Total 2028 (Site Plan A) | Overall: 0.77 (B) 19<br>EBL = 0.44 (C) 32<br>EBTR = 0.33 (C) 31<br>WBL = 0.7 (D) 54<br>WBTR = 0.05 (C) 29<br>NBL = 0.33 (A) 8<br>NBTR = 0.6 (A) 9<br>SBL = 0.01 (A) 7<br>SBTR = 0.79 (B) 20 | EBL = 25 m<br>EBTR = 25 m<br>WBL = 25 m<br>WBTR = 10 m<br>NBL = 15 m<br>NBTR = 95 m<br>SBL = 5 m<br>SBTR = 175 m | **Overall: 0.95 (C) 27**<br>EBL = 0.2 (C) 34<br>EBTR = 0.21 (C) 34<br>WBL = 0.68 (D) 48<br>WBTR = 0.16 (C) 33<br>NBL = 0.75 (B) 16<br>**NBTR = 0.96 (C) 30**<br>SBL = 0.05 (B) 11<br>SBTR = 0.74 (C) 22 | EBL = 15 m<br>EBTR = 20 m<br>WBL = 35 m<br>WBTR = 15 m<br>NBL = 50 m<br>NBTR = 300 m<br>SBL = 5 m<br>SBTR = 160 m | Overall: 0.67 (B) 14<br>EBL = 0.2 (B) 18<br>EBTR = 0.26 (B) 19<br>WBL = 0.38 (B) 20<br>WBTR = 0.06 (B) 18<br>NBL = 0.52 (B) 11<br>NBTR = 0.77 (B) 15<br>SBL = 0.01 (A) 5<br>SBTR = 0.6 (B) 10 | EBL = 10 m<br>EBTR = 20 m<br>WBL = 15 m<br>WBTR = 5 m<br>NBL = 35 m<br>NBTR = 120 m<br>SBL = 5 m<br>SBTR = 65 m |
| Future Total 2028 (Site Plan B) | Overall: 0.76 (B) 18<br>EBL = 0.43 (C) 32<br>EBTR = 0.32 (C) 31<br>WBL = 0.69 (D) 52<br>WBTR = 0.05 (C) 29<br>NBL = 0.32 (A) 7<br>NBTR = 0.59 (A) 8 | EBL = 25 m<br>EBTR = 25 m<br>WBL = 25 m<br>WBTR = 5 m<br>NBL = 15 m<br>NBTR = 90 m<br>SBL = 5 m<br>SBTR = 170 m | **Overall: 0.89 (C) 21**<br>EBL = 0.21 (C) 34<br>EBTR = 0.2 (C) 34<br>WBL = 0.61 (D) 42<br>WBTR = 0.17 (C) 34<br>NBL = 0.68 (B) 11<br>**NBTR = 0.9 (C) 21** | EBL = 15 m<br>EBTR = 20 m<br>WBL = 30 m<br>WBTR = 15 m<br>NBL = 35 m<br>NBTR = 265 m<br>SBL = 5 m<br>SBTR = 120 m | Overall: 0.51 (B) 11<br>EBL = 0.21 (B) 19<br>EBTR = 0.24 (B) 19<br>WBL = 0.23 (B) 19<br>WBTR = 0.06 (B) 18<br>NBL = 0.36 (A) 7<br>NBTR = 0.59 (A) 9 | EBL = 10 m<br>EBTR = 15 m<br>WBL = 10 m<br>WBTR = 5 m<br>NBL = 25 m<br>NBTR = 60 m<br>SBL = 5 m<br>SBTR = 45 m |

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| | SBL = 0.01 (A) 7<br>SBTR = 0.77 (B) 19 | | SBL = 0.04 (A) 10<br>SBTR = 0.67 (B) 19 | | SBL = 0.01 (A) 4<br>SBTR = 0.46 (A) 8 | |
| Future Background 2033 | Overall: 0.72 (B) 17<br>EBL = 0.51 (C) 33<br>EBTR = 0.34 (C) 31<br>WBL = 0.19 (C) 31<br>WBTR = 0.06 (C) 29<br>NBL = 0.32 (A) 7<br>NBTR = 0.6 (A) 8<br>SBL = 0.01 (A) 7<br>SBTR = 0.77 (B) 19 | EBL = 30 m<br>EBTR = 25 m<br>WBL = 10 m<br>WBTR = 10 m<br>NBL = 15 m<br>NBTR = 95 m<br>SBL = 5 m<br>SBTR = 170 m | **Overall: 0.86 (B) 20**<br>EBL = 0.25 (C) 35<br>EBTR = 0.23 (C) 34<br>WBL = 0.6 (D) 44<br>WBTR = 0.2 (C) 34<br>NBL = 0.72 (B) 13<br>**NBTR = 0.85 (B) 17**<br>SBL = 0.04 (A) 10<br>SBTR = 0.71 (C) 20 | EBL = 20 m<br>EBTR = 20 m<br>WBL = 30 m<br>WBTR = 20 m<br>NBL = 40 m<br>NBTR = 245 m<br>SBL = 5 m<br>SBTR = 130 m | Overall: 0.52 (B) 11<br>EBL = 0.23 (B) 19<br>EBTR = 0.27 (B) 19<br>WBL = 0.19 (B) 18<br>WBTR = 0.07 (B) 18<br>NBL = 0.41 (A) 8<br>NBTR = 0.6 (A) 10<br>SBL = 0.01 (A) 5<br>SBTR = 0.51 (A) 8 | EBL = 15 m<br>EBTR = 20 m<br>WBL = 10 m<br>WBTR = 5 m<br>NBL = 25 m<br>NBTR = 70 m<br>SBL = 5 m<br>SBTR = 55 m |
| Future Total 2033 (Site Plan A) | Overall: 0.84 (C) 22<br>EBL = 0.45 (C) 32<br>EBTR = 0.37 (C) 31<br>WBL = 0.74 (E) 59<br>WBTR = 0.05 (C) 29<br>NBL = 0.42 (A) 10<br>NBTR = 0.67 (B) 11<br>SBL = 0.01 (A) 8<br>**SBTR = 0.87 (C) 26** | EBL = 25 m<br>EBTR = 30 m<br>WBL = 25 m<br>WBTR = 10 m<br>NBL = 15 m<br>NBTR = 125 m<br>SBL = 5 m<br>SBTR = 210 m | **Overall: 1.04 (D) 43**<br>EBL = 0.21 (C) 33<br>EBTR = 0.22 (C) 34<br>WBL = 0.73 (D) 53<br>WBTR = 0.17 (C) 33<br>**NBL = 0.92 (D) 37**<br>**NBTR = 1.05 (E) 56**<br>SBL = 0.1 (B) 13<br>SBTR = 0.83 (C) 28 | EBL = 15 m<br>EBTR = 25 m<br>WBL = 35 m<br>WBTR = 20 m<br>NBL = 80 m<br>NBTR = 350 m<br>SBL = 5 m<br>SBTR = 190 m | Overall: 0.73 (B) 16<br>EBL = 0.22 (B) 18<br>EBTR = 0.3 (B) 19<br>WBL = 0.42 (C) 20<br>WBTR = 0.06 (B) 17<br>NBL = 0.62 (B) 15<br>NBTR = 0.84 (B) 18<br>SBL = 0.01 (A) 5<br>SBTR = 0.65 (B) 11 | EBL = 15 m<br>EBTR = 20 m<br>WBL = 15 m<br>WBTR = 5 m<br>NBL = 50 m<br>NBTR = 135 m<br>SBL = 5 m<br>SBTR = 80 m |
| Future Total 2033 (Site Plan B) | **Overall: 0.85 (C) 22**<br>EBL = 0.44 (C) 32<br>EBTR = 0.33 (C) 31<br>WBL = 0.7 (D) 53<br>WBTR = 0.05 (C) 28<br>NBL = 0.41 (A) 10<br>NBTR = 0.66 (B) 10<br>SBL = 0.01 (A) 8<br>**SBTR = 0.89 (C) 29** | EBL = 25 m<br>EBTR = 25 m<br>WBL = 25 m<br>WBTR = 10 m<br>NBL = 15 m<br>NBTR = 115 m<br>SBL = 5 m<br>SBTR = 200 m | **Overall: 0.98 (C) 32**<br>EBL = 0.21 (C) 34<br>EBTR = 0.21 (C) 34<br>WBL = 0.64 (D) 44<br>WBTR = 0.17 (C) 34<br>NBL = 0.83 (C) 22<br>**NBTR = 1.00 (D) 39**<br>SBL = 0.07 (B) 11<br>SBTR = 0.76 (C) 23 | EBL = 15 m<br>EBTR = 20 m<br>WBL = 35 m<br>WBTR = 15 m<br>NBL = 65 m<br>NBTR = 315 m<br>SBL = 5 m<br>SBTR = 165 m | Overall: 0.56 (B) 12<br>EBL = 0.21 (B) 19<br>EBTR = 0.24 (B) 19<br>WBL = 0.24 (B) 19<br>WBTR = 0.06 (B) 18<br>NBL = 0.44 (A) 9<br>NBTR = 0.66 (B) 11<br>SBL = 0.01 (A) 4<br>SBTR = 0.53 (A) 9 | EBL = 10 m<br>EBTR = 15 m<br>WBL = 10 m<br>WBTR = 5 m<br>NBL = 30 m<br>NBTR = 80 m<br>SBL = 5 m<br>SBTR = 55 m |
| Future Background 2038 | Overall: 0.81 (C) 22<br>EBL = 0.52 (C) 33<br>EBTR = 0.36 (C) 31<br>WBL = 0.21 (C) 30<br>WBTR = 0.06 (C) 28<br>NBL = 0.41 (A) 10<br>NBTR = 0.67 (B) 10 | EBL = 30 m<br>EBTR = 30 m<br>WBL = 10 m<br>WBTR = 10 m<br>NBL = 15 m<br>NBTR = 120 m | **Overall: 0.95 (C) 29**<br>EBL = 0.26 (C) 34<br>EBTR = 0.24 (C) 34<br>WBL = 0.67 (D) 49<br>WBTR = 0.21 (C) 34<br>NBL = 0.89 (C) 30<br>**NBTR = 0.95 (C) 28** | EBL = 20 m<br>EBTR = 25 m<br>WBL = 30 m<br>WBTR = 20 m<br>NBL = 75 m<br>NBTR = 295 m | Overall: 0.58 (B) 12<br>EBL = 0.25 (B) 19<br>EBTR = 0.29 (B) 19<br>WBL = 0.23 (B) 19<br>WBTR = 0.07 (B) 18<br>NBL = 0.49 (B) 10<br>NBTR = 0.67 (B) 11 | EBL = 15 m<br>EBTR = 20 m<br>WBL = 10 m<br>WBTR = 10 m<br>NBL = 35 m<br>NBTR = 85 m |

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| | SBL = 0.01 (A) 8<br>**SBTR = 0.89 (C) 29** | SBL = 5 m<br>SBTR = 200 m | SBL = 0.06 (B) 11<br>SBTR = 0.8 (C) 25 | SBL = 5 m<br>SBTR = 175 m | SBL = 0.01 (A) 5<br>SBTR = 0.56 (A) 9 | SBL = 5 m<br>SBTR = 65 m |
| Future Total 2038 (Site Plan A) | **Overall: 0.94 (C) 33**<br>EBL = 0.46 (C) 31<br>EBTR = 0.55 (C) 33<br>WBL = 0.76 (E) 63<br>WBTR = 0.05 (C) 28<br>NBL = 0.56 (B) 16<br>NBTR = 0.74 (B) 14<br>SBL = 0.02 (A) 9<br>**SBTR = 1.01 (D) 51** | <br>EBL = 30 m<br>EBTR = 40 m<br>WBL = 25 m<br>WBTR = 10 m<br>NBL = 25 m<br>NBTR = 180 m<br>SBL = 5 m<br>SBTR = 245 m | **Overall: 1.14 (E) 74**<br>EBL = 0.22 (C) 33<br>EBTR = 0.24 (C) 33<br>WBL = 0.81 (E) 64<br>WBTR = 0.18 (C) 33<br>**NBL = 1.14 (F) 109**<br>**NBTR = 1.16 (F) 95**<br>SBL = 0.13 (B) 15<br>**SBTR = 0.91 (D) 37** | <br>EBL = 20 m<br>EBTR = 25 m<br>WBL = 40 m<br>WBTR = 20 m<br>NBL = 115 m<br>NBTR = 390 m<br>SBL = 5 m<br>SBTR = 220 m | Overall: 0.79 (C) 21<br>EBL = 0.23 (B) 18<br>EBTR = 0.45 (B) 20<br>WBL = 0.46 (C) 21<br>WBTR = 0.06 (B) 17<br>NBL = 0.78 (C) 26<br>NBTR = 0.91 (C) 26<br>SBL = 0.02 (A) 5<br>SBTR = 0.72 (B) 14 | <br>EBL = 15 m<br>EBTR = 25 m<br>WBL = 20 m<br>WBTR = 5 m<br>NBL = 65 m<br>NBTR = 165 m<br>SBL = 5 m<br>SBTR = 115 m |
| Future Total 2038 (Site Plan B) | **Overall: 0.93 (C) 31**<br>EBL = 0.44 (C) 32<br>EBTR = 0.43 (C) 31<br>WBL = 0.72 (E) 56<br>WBTR = 0.05 (C) 28<br>NBL = 0.57 (B) 15<br>NBTR = 0.74 (B) 12<br>SBL = 0.01 (A) 8<br>**SBTR = 1.00 (D) 49** | <br>EBL = 25 m<br>EBTR = 30 m<br>WBL = 25 m<br>WBTR = 10 m<br>NBL = 25 m<br>NBTR = 160 m<br>SBL = 5 m<br>SBTR = 240 m | **Overall: 1.08 (E) 58**<br>EBL = 0.22 (C) 34<br>EBTR = 0.21 (C) 34<br>WBL = 0.66 (D) 46<br>WBTR = 0.18 (C) 33<br>**NBL = 1.05 (E) 75**<br>**NBTR = 1.11 (E) 76**<br>SBL = 0.14 (B) 15<br>**SBTR = 0.86 (C) 30** | <br>EBL = 15 m<br>EBTR = 20 m<br>WBL = 35 m<br>WBTR = 20 m<br>NBL = 100 m<br>NBTR = 370 m<br>SBL = 5 m<br>SBTR = 200 m | Overall: 0.62 (B) 13<br>EBL = 0.22 (B) 19<br>EBTR = 0.25 (B) 19<br>WBL = 0.26 (B) 19<br>WBTR = 0.06 (B) 18<br>NBL = 0.56 (B) 12<br>NBTR = 0.74 (B) 13<br>SBL = 0.01 (A) 5<br>SBTR = 0.59 (A) 10 | <br>EBL = 15 m<br>EBTR = 20 m<br>WBL = 10 m<br>WBTR = 5 m<br>NBL = 40 m<br>NBTR = 115 m<br>SBL = 5 m<br>SBTR = 65 m |

Under existing traffic conditions, the intersection operates at satisfactory levels with an overall V/C ratio of 0.61 LOS B during the a.m. peak hour, 0.72 LOS B during the p.m. peak hour and an overall V/C of 0.44 LOS B during the Saturday peak hour.

With the addition of corridor growth for the 2028 future background traffic scenario, the intersection is reported to operate at a satisfactory level with an overall V/C ratio of 0.66 LOS B during the a.m. peak hour, an overall V/C of 0.77 LOS B during the p.m. peak hour and an overall V/C ratio of 0.47 LOS B during the Saturday Peak hour.

**Future total 2028 Site Plan A**

Under the 2028 future total traffic Site Plan A scenario, with the addition of site generated traffic, the intersection operates with an overall V/C ratio of 0.77 LOS C during the a.m. peak hour, an overall V/C of 0.95 LOS C during the p.m. peak hour and an overall V/C of 0.67 LOS B during the Saturday peak hour. The p.m. peak hour reports a critical movement in the northbound through right direction with a V/C of 0.96 LOS C. The site traffic volumes contribute the following percentage of volume to its respective movement:

**P.M. Peak Hour**

- Northbound through right movement: 15% of through-right volume

**Future total 2028 Site Plan B**

Under the 2028 future total traffic Site Plan B scenario, with the addition of site generated traffic and signal and intersection improvements the intersection operates with a V/C ratio of 0.76 LOS C during the a.m. peak hour, a V/C of 0.89 LOS C during the p.m. peak hour and an overall V/C of 0.51 LOS B during the Saturday peak hour. The northbound through right direction reports critical during the p.m. peak. The site traffic volumes contribute the following percentage of volume to its respective movement:

**P.M. Peak Hour**

- Northbound through right movement: 14% of through-right volume

With the addition of corridor growth for the 2033 future background traffic scenario, the intersection is reported to operate at a satisfactory level with an overall V/C ratio of 0.72 LOS B during the a.m. peak hour, an overall V/C of 0.86 LOS B during the p.m. peak hour and an overall V/C ratio of 0.52 LOS B during the Saturday Peak hour. The p.m. peak hour reports critical in the and northbound through-right direction.

**Future total 2033 Site Plan A**

Under the 2033 future total traffic Site Plan A scenario, with the addition of site generated traffic the intersection operates with a V/C ratio of 0.84 LOS C during the a.m. peak hour, a critical V/C of 1.04 LOS D during the p.m. peak hour and an overall V/C of 0.73 LOS B during the Saturday peak hour. The a.m. peak hour reports a critical movement in the southbound through right movement and the p.m. peak hour reports a critical movement in the northbound left, and northbound through right direction. The site traffic volumes contribute the following percentage of volume to its respective movement:

**A.M. Peak Hour**

- Southbound through-right: 9% of through-right volume

**P.M. Peak Hour**

- Northbound through right: 16% of through-right volume
- Northbound left movement: 8% of left turning volume

**Future total 2033 Site Plan B**

Under the 2033 future total traffic Site Plan B scenario, with the addition of site generated traffic the intersection operates with a critical V/C ratio of 0.85 LOS C during the a.m. peak hour, a critical V/C of 0.98 LOS C during the p.m. peak hour and an overall V/C of 0.56 LOS B during the Saturday peak hour. The a.m. peak hour reports a critical movement in the southbound through right direction and the p.m. peak hour reports a critical movement in the northbound through-right direction. The site traffic volumes contribute the following percentage of volume to its respective movement:

**A.M. Peak Hour**

- Southbound through-right: 6% of through-right volume

**P.M. Peak Hour**

- Northbound through right: 12% of through-right volume

With the addition of corridor growth for the 2038 future background traffic scenario, the intersection is reported to operate at a satisfactory level with an overall V/C ratio of 0.81 LOS C during the a.m. peak hour, an overall V/C of 0.95 LOS C during the p.m. peak hour and an overall V/C ratio of 0.58 LOS B during the Saturday Peak hour. The a.m. peak hour reports critical in the southbound through-right direction. The p.m. peak hour reports critical in the northbound through-right direction.

**Future total 2038 Site Plan A**

Under the 2038 future total traffic Site Plan A scenario, with the addition of site generated traffic the intersection operates with a critical V/C ratio of 0.94 LOS C during the a.m. peak hour, a critical V/C of 1.14 LOS F during the p.m. peak hour and an overall V/C of 0.79 LOS C during the Saturday peak hour. The a.m. peak hour reports a critical movement in the southbound through right movement and the p.m. peak hour reports a critical movement in the northbound left, northbound through right direction and southbound through-right direction. The site traffic volumes contribute the following percentage of volume to its respective movement:

**A.M. Peak Hour**

- Southbound through-right: 8% of through-right volume

**P.M. Peak Hour**

- Southbound through-right: 2% of through-right volume
- Northbound through right: 14% of through-right volume
- Northbound left movement: 4% of left turning volume

**Future total 2038 Site Plan B**

Under the 2038 future total traffic Site Plan B scenario, with the addition of site generated traffic the intersection operates with a critical V/C ratio of 0.93 LOS C during the a.m. peak hour, a critical V/C of 1.08 LOS E during the p.m. peak hour and an overall V/C of 0.62 LOS B during the Saturday peak hour. The a.m. peak hour reports a critical movement in the southbound through right direction and the p.m. peak hour reports a critical movement in the northbound left movement, northbound through-right and southbound through-right. The site traffic volumes contribute the following percentage of volume to its respective movement:

**A.M. Peak Hour**

- Southbound through-right: 5% of through-right volume

**P.M. Peak Hour**

- Southbound through-right: 9% of through-right volume
- Northbound through right: 11% of through-right volume
- Northbound left movement: 7% of left turning volume

As a result, comparing the Site Plan A to the Site Plan B scenario both operate similarly where the highest reported site volume is 14% of the southbound through-right volume at this intersection. Although the northbound through-right is critical with minor impacts from the site traffic for the remaining movements the site traffic contributes a nominal amount which indicate that the corridor growth contributes the intersection operating with critical movements in namely the southbound through-right and northbound left movement during the p.m. peak. The township may opt to optimise signal timings but under our review the similar movements remain critical.

### 7.4.1 Intersection Improvements - Townline Road and Ellis Road/Sideroad 10N

Based on the review of the capacity analysis and the existing intersection, the intersection has the potential to add an additional through lane to accommodate the high through volumes along Townline Road and the Town should consider widening to accommodate the corridor growth and anticipated site traffic. For the purpose of the sensitivity analysis a through lane was added in the northbound and southbound direction to the intersection to see how it will perform under the ultimate condition.

*Table 19 Townline Road and Ellis Road Intersection Improvements Capacity Analysis*

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| Future Total 2038 (Site Plan A) | Overall: 0.57 (B) 16<br>EBL = 0.46 (C) 31<br>EBTR = 0.55 (C) 33<br>WBL = 0.76 (E) 63<br>WBTR = 0.05 (C) 28<br>NBL = 0.36 (A) 6<br>NBTR = 0.39 (A) 6<br>SBL = 0.01 (A) 9<br>SBTR = 0.53 (B) 13 | EBL = 30 m<br>EBTR = 40 m<br>WBL = 25 m<br>WBTR = 10 m<br>NBL = 20 m<br>NBTR = 50 m<br>SBL = 5 m<br>SBTR = 75 m | **Overall: 0.88 (B) 17**<br>EBL = 0.22 (C) 33<br>EBTR = 0.24 (C) 33<br>WBL = 0.81 (E) 64<br>WBTR = 0.18 (C) 33<br>NBL = 0.86 (C) 22<br>NBTR = 0.61 (A) 9<br>SBL = 0.05 (B) 12<br>SBTR = 0.48 (B) 15 | EBL = 20 m<br>EBTR = 25 m<br>WBL = 40 m<br>WBTR = 20 m<br>NBL = 80 m<br>NBTR = 95 m<br>SBL = 5 m<br>SBTR = 65 m | Overall: 0.58 (B) 11<br>EBL = 0.23 (B) 18<br>EBTR = 0.45 (B) 20<br>WBL = 0.46 (C) 21<br>WBTR = 0.06 (B) 17<br>NBL = 0.62 (B) 15<br>NBTR = 0.48 (A) 8<br>SBL = 0.01 (A) 5<br>SBTR = 0.38 (A) 7 | EBL = 15 m<br>EBTR = 25 m<br>WBL = 20 m<br>WBTR = 5 m<br>NBL = 55 m<br>NBTR = 45 m<br>SBL = 5 m<br>SBTR = 35 m |
| Future Total 2038 (Site Plan B) | Overall: 0.56 (B) 14<br>EBL = 0.44 (C) 32<br>EBTR = 0.43 (C) 31<br>WBL = 0.72 (E) 56<br>WBTR = 0.05 (C) 28<br>NBL = 0.37 (A) 6<br>NBTR = 0.39 (A) 6<br>SBL = 0.01 (A) 8<br>SBTR = 0.52 (B) 12 | EBL = 25 m<br>EBTR = 30 m<br>WBL = 25 m<br>WBTR = 10 m<br>NBL = 15 m<br>NBTR = 45 m<br>SBL = 5 m<br>SBTR = 70 m | Overall: 0.83 (B) 15<br>EBL = 0.22 (C) 34<br>EBTR = 0.21 (C) 34<br>WBL = 0.66 (D) 46<br>WBTR = 0.18 (C) 33<br>NBL = 0.83 (B) 17<br>NBTR = 0.58 (A) 8<br>SBL = 0.05 (B) 11<br>SBTR = 0.45 (B) 14 | EBL = 15 m<br>EBTR = 20 m<br>WBL = 35 m<br>WBTR = 20 m<br>NBL = 75 m<br>NBTR = 85 m<br>SBL = 5 m<br>SBTR = 60 m | Overall: 0.45 (A) 9<br>EBL = 0.22 (B) 19<br>EBTR = 0.25 (B) 19<br>WBL = 0.26 (B) 19<br>WBTR = 0.06 (B) 18<br>NBL = 0.51 (B) 10<br>NBTR = 0.39 (A) 6<br>SBL = 0.01 (A) 5<br>SBTR = 0.31 (A) 6 | EBL = 15 m<br>EBTR = 20 m<br>WBL = 10 m<br>WBTR = 5 m<br>NBL = 35 m<br>NBTR = 30 m<br>SBL = 5 m<br>SBTR = 25 m |

With the addition of the additional through lane under both Site Plan A and B scenarios there are no critical movements in the northbound and southbound movements under all peak hours. No critical movements are reported.

# 7.5 Townline Road and Site Access 1

Capacity analysis at this intersection during the weekday a.m. and p.m. peak hours and Saturday peak hour for the existing, future background, and future total traffic conditions are summarized in the following table.

*Table 20 Townline Road and Site Access 1 Capacity Analysis*

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| Future Total 2028 (Site Plan A) | Overall: 0.56 (A) 3<br>WBL = 0.26 (D) 40<br>WBR = 0 (D) 37<br>NBT = 0.52 (A) 3<br>NBR = 0.05 (A) 1<br>SBL = 0.18 (A) 2<br>SBT = 0.57 (A) 3 | WBL = 10 m<br>WBR = 5 m<br>NBT = 50 m<br>NBR = 5 m<br>SBL = 10 m<br>SBT = 65 m | **Overall: 1.02 (D) 41**<br>WBL = 0.5 (E) 58<br>WBR = 0.02 (D) 53<br>**NBT = 1.07 (E) 61**<br>NBR = 0.02 (A) 3<br>SBL = 0.35 (D) 41<br>SBT = 0.51 (A) 4 | WBL = 25 m<br>WBR = 10 m<br>NBT = 480 m<br>NBR = 5 m<br>SBL = 5 m<br>SBT = 75 m | Overall: 0.6 (A) 4<br>WBL = 0.2 (D) 39<br>WBR = 0 (D) 37<br>NBT = 0.62 (A) 4<br>NBR = 0.01 (A) 1<br>SBL = 0.05 (A) 1<br>SBT = 0.5 (A) 3 | WBL = 10 m<br>WBR = 5 m<br>NBT = 70 m<br>NBR = 5 m<br>SBL = 5 m<br>SBT = 50 m |
| Future Total 2028 (Site Plan B) | Overall: 0.59 (A) 5<br>WBL = 0.29 (D) 38<br>WBR = 0.02 (D) 36 | WBL = 10 m<br>WBR = 10 m<br>NBT = 60 m | **Overall: 0.97 (C) 31**<br>WBL = 0.49 (C) 34<br>WBR = 0.06 (C) 31 | WBL = 25 m<br>WBR = 10 m<br>NBT = 295 m | Overall: 0.51 (A) 5<br>WBL = 0.33 (D) 38<br>WBR = 0.02 (D) 35 | WBL = 15 m<br>WBR = 10 m<br>NBT = 65 m |

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| | NBT = 0.52 (A) 4<br>NBR = 0.08 (A) 2<br>SBL = 0.11 (A) 2<br>SBT = 0.61 (A) 5 | NBR = 5 m<br>SBL = 5 m<br>SBT = 90 m | **NBT = 1.04 (D) 46**<br>NBR = 0.04 (A) 3<br>SBL = 0.25 (A) 9<br>SBT = 0.53 (A) 6 | NBR = 5 m<br>SBL = 10 m<br>SBT = 75 m | NBT = 0.52 (A) 4<br>NBR = 0.02 (A) 2<br>SBL = 0.03 (A) 2<br>SBT = 0.43 (A) 4 | NBR = 5 m<br>SBL = 5 m<br>SBT = 50 m |
| Future Total 2033 (Site Plan A) | Overall: 0.61 (A) 4<br>WBL = 0.26 (D) 40<br>WBR = 0 (D) 37<br>NBT = 0.57 (A) 3<br>NBR = 0.05 (A) 1<br>SBL = 0.2 (A) 2<br>SBT = 0.63 (A) 4 | WBL = 10 m<br>WBR = 5 m<br>NBT = 60 m<br>NBR = 5 m<br>SBL = 10 m<br>SBT = 80 m | **Overall: 1.11 (E) 64**<br>WBL = 0.5 (E) 58<br>WBR = 0.02 (D) 53<br>**NBT = 1.17 (F) 98**<br>NBR = 0.02 (A) 3<br>SBL = 0.35 (D) 41<br>SBT = 0.55 (A) 5 | WBL = 25 m<br>WBR = 10 m<br>NBT = 545 m<br>NBR = 5 m<br>SBL = 5 m<br>SBT = 90 m | Overall: 0.65 (A) 4<br>WBL = 0.2 (D) 39<br>WBR = 0 (D) 37<br>NBT = 0.67 (A) 4<br>NBR = 0.01 (A) 1<br>SBL = 0.05 (A) 1<br>SBT = 0.55 (A) 3 | WBL = 10 m<br>WBR = 5 m<br>NBT = 90 m<br>NBR = 5 m<br>SBL = 5 m<br>SBT = 55 m |
| Future Total 2033 (Site Plan B) | Overall: 0.66 (A) 6<br>WBL = 0.29 (D) 38<br>WBR = 0.02 (D) 36<br>NBT = 0.58 (A) 5<br>NBR = 0.08 (A) 2<br>SBL = 0.12 (A) 2<br>SBT = 0.68 (A) 6 | WBL = 10 m<br>WBR = 10 m<br>NBT = 75 m<br>NBR = 5 m<br>SBL = 5 m<br>SBT = 115 m | **Overall: 1.07 (E) 57**<br>WBL = 0.49 (C) 34<br>WBR = 0.17 (C) 32<br>**NBT = 1.16 (F) 90**<br>NBR = 0.04 (A) 3<br>SBL = 0.25 (A) 9<br>SBT = 0.59 (A) 7 | WBL = 25 m<br>WBR = 15 m<br>NBT = 340 m<br>NBR = 5 m<br>SBL = 10 m<br>SBT = 90 m | Overall: 0.57 (A) 6<br>WBL = 0.33 (D) 38<br>WBR = 0.02 (D) 35<br>NBT = 0.58 (A) 5<br>NBR = 0.02 (A) 2<br>SBL = 0.03 (A) 2<br>SBT = 0.48 (A) 4 | WBL = 15 m<br>WBR = 10 m<br>NBT = 80 m<br>NBR = 5 m<br>SBL = 5 m<br>SBT = 60 m |
| Future Total 2038 (Site Plan A) | Overall: 0.67 (A) 4<br>WBL = 0.26 (D) 40<br>WBR = 0 (D) 37<br>NBT = 0.62 (A) 4<br>NBR = 0.05 (A) 1<br>SBL = 0.22 (A) 2<br>SBT = 0.69 (A) 5 | WBL = 10 m<br>WBR = 5 m<br>NBT = 75 m<br>NBR = 5 m<br>SBL = 10 m<br>SBT = 105 m | **Overall: 1.21 (F) 92**<br>WBL = 0.5 (E) 58<br>WBR = 0.02 (D) 53<br>**NBT = 1.28 (F) 144**<br>NBR = 0.02 (A) 3<br>SBL = 0.35 (D) 41<br>SBT = 0.6 (A) 5 | WBL = 25 m<br>WBR = 10 m<br>NBT = 615 m<br>NBR = 5 m<br>SBL = 5 m<br>SBT = 105 m | Overall: 0.7 (A) 5<br>WBL = 0.2 (D) 39<br>WBR = 0 (D) 37<br>NBT = 0.72 (A) 5<br>NBR = 0.01 (A) 1<br>SBL = 0.06 (A) 1<br>SBT = 0.59 (A) 3 | WBL = 10 m<br>WBR = 5 m<br>NBT = 110 m<br>NBR = 5 m<br>SBL = 5 m<br>SBT = 65 m |
| Future Total 2038 (Site Plan B) | Overall: 0.73 (A) 7<br>WBL = 0.29 (D) 38<br>WBR = 0.02 (D) 36<br>NBT = 0.65 (A) 6<br>NBR = 0.08 (A) 2<br>SBL = 0.14 (A) 3<br>SBT = 0.76 (A) 8 | WBL = 10 m<br>WBR = 10 m<br>NBT = 95 m<br>NBR = 5 m<br>SBL = 5 m<br>SBT = 155 m | **Overall: 1.19 (F) 91**<br>WBL = 0.49 (C) 34<br>WBR = 0.26 (C) 32<br>**NBT = 1.29 (F) 146**<br>NBR = 0.04 (A) 3<br>SBL = 0.25 (A) 9<br>SBT = 0.66 (A) 8 | WBL = 25 m<br>WBR = 15 m<br>NBT = 395 m<br>NBR = 5 m<br>SBL = 10 m<br>SBT = 115 m | Overall: 0.63 (A) 6<br>WBL = 0.33 (D) 38<br>WBR = 0.02 (D) 35<br>NBT = 0.65 (A) 6<br>NBR = 0.02 (A) 2<br>SBL = 0.03 (A) 2<br>SBT = 0.54 (A) 4 | WBL = 15 m<br>WBR = 10 m<br>NBT = 100 m<br>NBR = 5 m<br>SBL = 5 m<br>SBT = 70 m |

GHD reviewed site access 1 and Townline Road with the implementation of a stop-controlled intersection but found that under all circumstances the westbound traffic leaving the site will experience major delays and V/C that exploring signalization was the next option. To check the validity of signal implementation, GHD ran a signal warrant for the Site Plan A and B cases for the future total 2028 scenario as it represents the build-out of the proposed development. The signal warrant for both Site Plans falls under case 2 – Might Be Warranted, which indicates that under the condition it doesn't completely satisfy but it has the potential to be signalized if agreed upon. The detailed signal warrant calculation sheets are attached in **Appendix E-1.**

GHD also reviewed a left-turn lane warrant for the intersection which is attached in **Appendix 89E-2.** In summary, as per the volumes in the future total 2028 scenario for both site plans, a south-bound left-turn is warranted for the

intersection. A right-turn lane was also determined to be warranted based on the projected right turning volumes into the intersection which exceed the threshold of 60 vehicles in the peak hour.

To ensure the V/C and delays are reduced with the implementation of the site access and Townline road the following was added to the intersection and into the model:

- Exclusive westbound right-lane and left-lane
- Exclusive northbound right-lane
- Exclusive Southbound left-lane
- Optimized signal timings

**Future total 2028 Site Plan A**

Under the 2028 future total traffic Site Plan A scenario, with the addition of site generated traffic, and intersection improvements operates with an overall V/C ratio of 0.56 LOS A during the a.m. peak hour, a critical V/C of 1.02 LOS D during the p.m. peak hour and an overall V/C of 0.60 LOS A during the Saturday peak hour. The p.m. peak hour reports a critical movement in the northbound through direction with a V/C of 1.07 LOS E. The site traffic volumes contribute the following percentage of volume to its respective movement:

**P.M. Peak Hour**

- Northbound through movement: 14% of through volume

**Future total 2028 Site Plan B**

Under the 2028 future total traffic Site Plan B scenario, with the addition of site generated traffic and signal and intersection improvements the intersection operates with a V/C ratio of 0.59 LOS A during the a.m. peak hour, a V/C of 0.97 LOS C during the p.m. peak hour and an overall V/C of 0.51 LOS A during the Saturday peak hour. The northbound through direction reports critical during the p.m. peak. The site traffic volumes contribute the following percentage of volume to its respective critical movement:

**P.M. Peak Hour**

- Northbound through movement: 6% of through-right volume

**Future total 2033 Site Plan A**

Under the 2033 future total traffic Site Plan A scenario, with the addition of site generated traffic, and intersection improvements operates with an overall V/C ratio of 0.61 LOS A during the a.m. peak hour, a critical V/C of 1.11 LOS E during the p.m. peak hour and an overall V/C of 0.65 LOS A during the Saturday peak hour. The p.m. peak hour reports a critical movement in the northbound through direction with a V/C of 1.17 LOS F. The site traffic volumes contribute the following percentage of volume to its respective movement:

**P.M. Peak Hour**

- Northbound through movement: 12% of through volume

**Future total 2033 Site Plan B**

Under the 2028 future total traffic Site Plan B scenario, with the addition of site generated traffic and signal and intersection improvements the intersection operates with a V/C ratio of 0.66 LOS A during the a.m. peak hour, a V/C of 1.07 LOS E during the p.m. peak hour and an overall V/C of 0.57 LOS A during the Saturday peak hour. The northbound through direction reports critical during the p.m. peak. The site traffic volumes contribute the following percentage of volume to its respective critical movement:

**P.M. Peak Hour**

- Northbound through movement: 6% of through-right volume

**Future total 2038 Site Plan A**

Under the 2038 future total traffic Site Plan A scenario, with the addition of site generated traffic the intersection operates with a V/C ratio of 0.67 LOS A during the a.m. peak hour, a critical V/C of 1.21 LOS F during the p.m. peak hour and an overall V/C of 0.71 LOS C during the Saturday peak hour. The p.m. peak hour reports a critical movement in the northbound through right movement. The site traffic volumes contribute the following percentage of volume to its respective movement:

**P.M. Peak Hour**

- Northbound through movement: 11% of through-right volume

**Future total 2038 Site Plan B**

Under the 2038 future total traffic Site Plan B scenario, with the addition of site generated traffic the intersection operates with a V/C ratio of 0.73 LOS A during the a.m. peak hour, a critical V/C of 1.19 LOS F during the p.m. peak hour and an overall V/C of 0.63 LOS A during the Saturday peak hour. The p.m. peak hour reports a critical movement in the northbound through right movement. The site traffic volumes contribute the following percentage of volume to its respective movement:

**P.M. Peak Hour**

- Northbound through movement: 5% of through-right volume

As a result, comparing the Site Plan A to the Site Plan B scenario both operate similarly. Where the northbound through volume generated by the site traffic is contributes a minor impact to the intersection where the Site Plan A contributes a maximum of 14% of the northbound through volume and in Site Plan B the northbound through site traffic contributes a maximum of 6% of the northbound through volume. This indicates that the corridor growth the main factor of causing the critical northbound through volume. As a result, to allow of the access to function GHD recommends the implementation of a signalized intersection at site access 1 and Townline Road.

## 7.5.1 Intersection Improvements Townline Road and Site Access 1

With the high volumes observed along the northbound direction an additional through-right lane was added to accommodate the over capacity volumes for this proposed intersection.

***Table 21 Townline Road and Site Access 1 Capacity Analysis Intersection Improvements***

| Scenario | Am Peak Hour | | PM Peak Hour | | Saturday Peak Hour | |
|---|---|---|---|---|---|---|
| | V/C (LOS) seconds | 95th % Que. | V/C (LOS) seconds | 95th % Que | V/C (LOS) seconds | 95th % Que |
| Future Total 2038 (Site Plan A) | Overall: 0.67 (A) 4<br>WBL = 0.26 (D) 40<br>WBR = 0 (D) 37<br>NBTR = 0.36 (A) 2<br>SBL = 0.22 (A) 2<br>SBT = 0.69 (A) 5 | <br>WBL = 10 m<br>WBR = 5 m<br>NBTR = 25 m<br>SBL = 10 m<br>SBT = 105 m | Overall: 0.68 (A) 8<br>WBL = 0.5 (E) 58<br>WBR = 0.02 (D) 53<br>NBTR = 0.68 (A) 8<br>SBL = 0.19 (A) 6<br>SBT = 0.6 (A) 5 | <br>WBL = 25 m<br>WBR = 10 m<br>NBTR = 145 m<br>SBL = 5 m<br>SBT = 105 m | Overall: 0.57 (A) 3<br>WBL = 0.2 (D) 39<br>WBR = 0 (D) 37<br>NBTR = 0.39 (A) 2<br>SBL = 0.05 (A) 1<br>SBT = 0.59 (A) 3 | <br>WBL = 10 m<br>WBR = 5 m<br>NBTR = 25 m<br>SBL = 5 m<br>SBT = 65 m |
| Future Total 2038 (Site Plan B) | Overall: 0.73 (A) 6<br>WBL = 0.29 (D) 38<br>WBR = 0.02 (D) 36<br>NBTR = 0.39 (A) 3<br>SBL = 0.14 (A) 3<br>SBT = 0.76 (A) 8 | <br>WBL = 10 m<br>WBR = 10 m<br>NBTR = 30 m<br>SBL = 5 m<br>SBT = 155 m | Overall: 0.68 (A) 9<br>WBL = 0.49 (C) 34<br>WBR = 0.26 (C) 32<br>NBTR = 0.7 (A) 7<br>SBL = 0.16 (A) 5<br>SBT = 0.66 (A) 8 | <br>WBL = 25 m<br>WBR = 15 m<br>NBTR = 100 m<br>SBL = 5 m<br>SBT = 115 m | Overall: 0.53 (A) 5<br>WBL = 0.33 (D) 38<br>WBR = 0.02 (D) 35<br>NBTR = 0.36 (A) 3<br>SBL = 0.03 (A) 2<br>SBT = 0.54 (A) 4 | <br>WBL = 15 m<br>WBR = 10 m<br>NBTR = 30 m<br>SBL = 5 m<br>SBT = 70 m |

As per the capacity analysis for both Site Plans converting the exclusive right-turn lane to a through-right lane reports no critical movements under the ultimate 2038 condition.

## 7.6 Potential Lane Configurations

As per the capacity analysis above the **Figure 25** and **Figure 26** below depicts the study intersections and the corresponding lane configurations as analyzed through the sensitivity analysis to better mitigate delays and improve operations of the intersections. All Synchro reports for proposed improvements are attached in **Appendix F.**

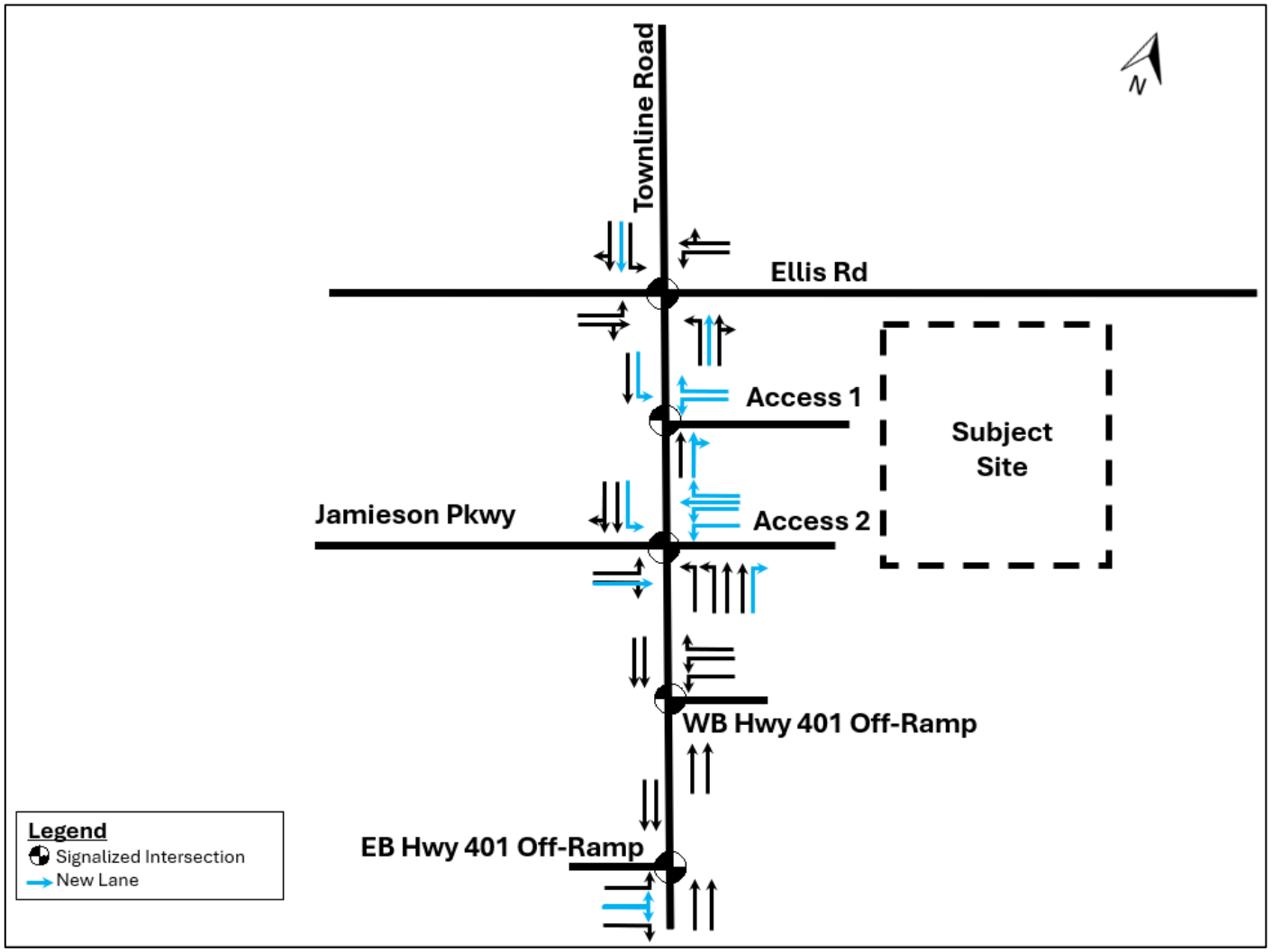


*Figure 25 Site Plan A Lane Improvements*

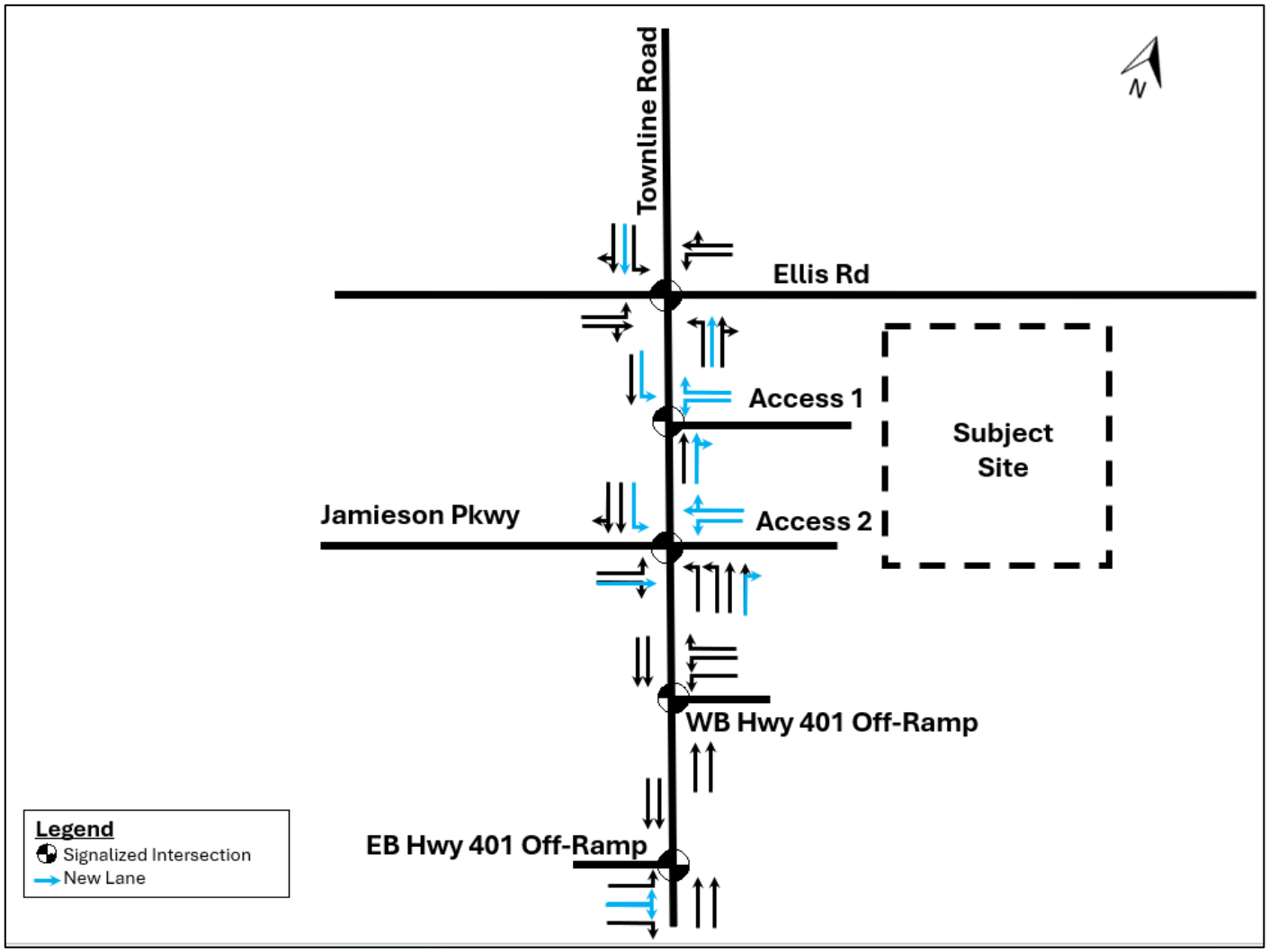


*Figure 26 Site Plan B Lane Improvements*

# 8. Parking Review

## 8.1 Township of Puslinch Zoning By-Law 023-18

### 8.1.1 Vehicular Parking

The current Township of Puslinch Comprehensive Zoning By-Law 023-18, the minimum parking requirements are found in Table 5.3. The minimum By-Law requirements for the subject site is as follows:

- Retail Store:
  - 1 per 20 m²
- Warehouse
  - 1 per 200 m²

- Industrial Use
    - 1 per 100 $m^2$ for the first 10,000 $m^2$ of floor area and 1/200 $m^2$ for any floor area after the first 10,000 $m^2$

For the buildings 1 to 3, the parking provision will follow the warehousing land-use and for building 4 to 6 the parking provision follows the industrial land-use. The required parking for each building is as follows.

- Building 1: 16,200 $m^2$
    - 1 per 200 $m^2$ = 16,200/200 = 81 required parking spaces
- Building 2: 16,200 $m^2$
    - 1 per 200 $m^2$ = 16,200/200 = 81 required parking spaces
- Building 3: 16,200 $m^2$
    - 1 per 200 $m^2$ = 16,200/200 = 81 required parking spaces
- Building 4: 10,427 $m^2$
    - 10,000/100 + 427/200 = 102 required parking spaces
- Building 5: 10,427 $m^2$
    - 10,000/100 + 427/200 = 102 required parking spaces
- Building 6: 9,814 $m^2$
    - 1 per 100 $m^2$ = 9,814/100 = 98 required parking spaces

In total 545 parking spaces are required for buildings 1 to 6 in both the Site Plan A and B scenarios.

**Site Plan A**

With the inclusion of the retail box store for this Site Plan the required parking is as follows:

- Retail Store: 15,090$m^2$
    - 1 per 20 $m^2$ = 15,090/20 = 755 required parking spaces

In total for Site Plan A, the site requires 1300 parking spaces for the proposed development under the Town of Puslinch Zoning

**Site Plan B**

With the inclusion of the two warehouses noted as Buildings 7 and 8 for this Site Plan the required parking is as follows:

- Building 7: 19,510 $m^2$
    - 1 per 200 $m^2$ = 19,510/200 = 98 required parking spaces
- Building 8: 19,510 $m^2$
    - 1 per 200 $m^2$ = 19,500/200 = 98 required parking spaces

In total for Site Plan B, the site requires 741 parking spaces for the proposed development under the Township of Puslinch Zoning by-law.

### 8.1.2 Accessible Parking

The minimum requirement for accessible parking spaces can also be found in the Township of Puslinch Zoning By-Law. The minimum By-Law requirement accessible parking for the subject site is based on the required number of parking spaces as follows:

- Required number of parking spaces:
    - 3-25: a minimum of 1 space
    - 26-100: 1 + 3% of total number of parking spaces on lot
    - 101 to 200: 4 + 2% of total number of parking spaces on lot
    - 201 or greater: 8 + 2% of total number of parking spaces on lot

The minimum number of accessible parking spaces required for the subject site is as follow:

Buildings 1 to 6:

- Building 1: 81 required parking spaces
    - 1 + 3% x 81 = 4 required accessible parking spaces
- Building 2: 81 required parking spaces
    - 1 + 3% x 81 = 4 required accessible parking spaces
- Building 3: 81 required parking spaces
    - 1 + 3% x 81 = 4 required accessible parking spaces
- Building 4: 102 required parking spaces
    - 4 + 2% x 102 = 7 required accessible parking spaces
- Building 5: 102 required parking spaces
    - 4 + 2% x 102 = 7 required accessible parking spaces
- Building 6: 98 required parking spaces
    - 1 + 3% x 98 = 4 required accessible parking spaces

Required number of accessible parking spaces for Buildings 1 to 6 = 30 required accessible spaces

**Site Plan A**

- Retail Store: 755 required parking spaces
    - 8 + 2% x 755 = 24 required accessible parking spaces

In total for Site Plan A the proposed development requires 54 accessible parking spaces

**Site Plan B**

- Building 7: 98 required parking spaces
    - 1 + 3% x 98 = 4 required accessible parking spaces
- Building 8: 98 required parking spaces
    - 1 + 3% x 98 = 4 required accessible parking spaces

In total for Site Plan B the proposed development requires 38 accessible parking spaces

### 8.1.3 Bicycle Parking

Under the Town's Zoning By-Law, the minimum bicycle parking requirement can be found in Table 5.6. The minimum By-Law requirement for the subject site is as follows:

- Retail
    - The greater of 2 spaces or 1 space /1000 m²
- Industrial
    - 2 / 1,000 m²

The minimum number of bicycle parking spaces required for the subject site is as follows:

- Building 1: 16,200 $m^2$
    - 16,200 $m^2$ / 1000 x 2 = 33 required bicycle parking spaces
- Building 2: 16,200 $m^2$
    - 16,200 $m^2$ / 1000 x 2 = 33 required bicycle parking spaces
- Building 3: 16,200 $m^2$
    - 16,200 $m^2$ / 1000 x 2 = 33 required bicycle parking spaces
- Building 4: 10,427 $m^2$
    - 10,427 $m^2$ / 1000 x 2 = 21 required bicycle parking spaces
- Building 5: 10,427 $m^2$
    - 10,427 $m^2$ / 1000 x 2 = 21 required bicycle parking spaces
- Building 6: 9,814 $m^2$
    - 9,814 $m^2$ / 1000 x 2 = 20 required bicycle parking spaces

In total, 161 bicycle parking spaces are required for Buildings 1 to 6 to satisfy the Town's By-law.

**Site Plan A**

- Retail Store: 15,090$m^2$
    - 15,090 $m^2$ / 1000 x 2 = 31 required bicycle parking spaces

In total 192 bicycle parking spaces are required for Site Plan A

**Site Plan B**

- Building 7: 19,510 $m^2$
    - 19,510 $m^2$ / 1000 x 2 = 40 required bicycle parking spaces
- Building 8: 19,510 $m^2$
    - 19,510 $m^2$ / 1000 x 2 = 40 required bicycle parking spaces

In total 241 bicycle parking spaces are required for Site Plan B

### 8.1.4 Loading Spaces

The minimum requirement for loading spaces is also found in the Zoning By-Law, Section 2.3.1. The minimum By-Law requirement for loading spaces for the subject site is as follows:

- Less than 500 $m^2$ gross floor area: none
- 500 $m^2$ to 2,000 $m^2$ gross floor area: 1 space
- Greater than 2,500 $m^2$ and less than 5,000 $m^2$: 2
- Greater than 5,000 $m^2$: 3 + 1 additional space for each 10,000 $m^2$ in excess of 5,000 $m^2$

The minimum By-law requirement for loading spaces for the subject site is as follows:

Site Plan A:

- Building 1: 16,200 $m^2$ = 4 spaces
- Building 2: 16,200 $m^2$ = 4 spaces
- Building 3: 16,200 $m^2$ = 4 spaces
- Building 4: 10,427 $m^2$ = 4 spaces
- Building 5: 10,427 $m^2$ = 4 spaces
- Building 6: 9,814 $m^2$ = 2 spaces
- Retail: 15090 $m^2$ = 4 spaces

Site Plan B:

- Building 1: 16,200 $m^2$ = 4 spaces
- Building 2: 16,200 $m^2$ = 4 spaces
- Building 3: 16,200 $m^2$ = 4 spaces
- Building 4: 10,427 $m^2$ = 4 spaces
- Building 5: 10,427 $m^2$ = 4 spaces
- Building 6: 9,814 $m^2$ = 2 spaces
- Building 7: 19,510 $m^2$ = 4 spaces
- Building 8: 19,510 $m^2$ = 4 spaces

In total, Site Plan A is required to provide a total of 26 loading spaces under the Town's By-Law.

In total, Site Plan B is required to provide a total of 30 loading spaces under the Town's By-Law.

## 8.2 Proposed Site Parking

The following table summarizes the minimum By-law requirements and the proposed parking/loading supply for the subject site.

*Table 22 Site Plan A Parking Requirements*

| Type | GFA | By-Law Requirement | Provided |
|---|---|---|---|
| **Vehicle Parking** | 94,358 $m^2$ Total GFA | 1,300 vehicle parking spaces | 2,384 vehicle parking spaces |
| **Accessible Parking** | | 54 accessible parking spaces | 54 accessible parking spaces will be provided |
| **Bicycle Parking** | | 161 Bicycle Parking spaces | 161 Bicycle Parking spaces will be provided |
| **Loading Spaces** | | 26 loading spaces | 208 loading spaces |

*Table 23 Site Plan B Parking Requirements*

| Type | GFA | By-Law Requirement | Provided |
|---|---|---|---|
| **Vehicle Parking** | 118,287 $m^2$ Total GFA | 741 vehicle parking spaces | 1,460 vehicle parking spaces |
| **Barrier Free Parking** | | 38 accessible parking spaces | 38 accessible parking spaces will be provided |
| **Bicycle Parking** | | 241 Bicycle Parking spaces | 241 Bicycle Parking spaces will be provided |
| **Loading Spaces** | | 30 loading spaces | 274 loading spaces |

The subject site satisfies the Township's Zoning By-Law requirement for vehicle parking, barrier free spaces and loading spaces in both Site Plans.

# 9. Site Plan Review

## 9.1 Access Width and Radii

As the Town of Puslinch does not have a standard for the curb radii of driveway entrance the OPSD 350 (Ontario Provincial Standard Drawing) for Urban Industrial, Commercial, and Apartment Entrances was used as it provides the

minimum and maximum access width requirement ranging from 7.2 to 12.0 metres with the radius required to be between 4.5 and 12 metres for two-way driveways and residential apartment land uses.

Additionally, the Town of Puslinch Zoning By-law provides the minimum unobstructed width of six (6) meter when two-way traffic is permitted.

The proposed site access along Townline Road has a driveway width of approximately 9 metres with an inbound and outbound radius of 9 metres. Therefore, the driveway width, and the curb radius satisfies both the Town of Puslinch curb detail and the OPSD 350 standards.

## 9.2 Sightline Assessment

As requested by Town staff, GHD completed a sightline assessment for the site driveway along Townline Road. For the purpose of the Sight Distance assessment, a design speed of 70 km/h along Townline Road was used for the assessment.

Section 9.9 of the Transportation Association of Canada's Geometric Design Guide for Canadian Roads (TAC GDGCR) recommends intersection sight distances for different scenarios, with the following scenarios used to complete the intersection sight distance analysis:

- Case B1 – Left turn from the minor road
- Case B2 – Right turn from the minor road

For the purpose of the assessment, the minor road is assumed to be the site driveway.

A vehicle entering the major road from the site driveways is assumed to stop a distance of approximately 4.5 metres to the pavement edge of the major road as recommended by TAC. In this stopped position, the driver will be required to look left and right in order to perceive and react to approaching vehicles prior to initiating a turning movement onto the intersecting drive aisle.

The recommended intersection sight distances are provided in TAC GDGCR Tables 9.9.4, 9.9.6 and 9.9.12 for passenger vehicles rucks turning left from stop, turning right from stop, or turning left from the major road.

The intersection sight distance is calculated from the equation.

$$ISD = 0.278\, V_{major}\, t_g$$

Where:

$$ISD = intersection\ sight\ distance$$

$$V_{major} = design\ speed\ of\ the\ major\ road\ \left(\frac{km}{h}\right)$$

$$t_g = time\ gap\ for\ the\ minor\ road\ vehicle\ to\ enter\ the\ major\ road\ (s)$$

The intersection sight distance requirement for passenger cars was determined by the equation above, where the time gap for the minor road vehicle to enter the major road for passenger vehicles is 7.5 seconds for turning left from stop, 6.5 seconds for vehicles turning right from a stop.

The intersection sight distance requirement for combination trucks was determined by the equation above, where the time gap for the minor road vehicle to enter the major road for combination trucks is 11.5 seconds for vehicles turning left from stop, 10.5 seconds for vehicles turning right from a stop.

The intersection sight distance requirement for single-unit trucks was determined by the equation above, where the time gap for the minor road vehicle to enter the major road for single-unit trucks is 9.5 seconds for vehicles turning left from stop, 8.5 seconds for vehicles turning right from a stop.

### 9.2.1 Townline Road and Site Accesses

The recommended intersection sight distances for the proposed driveways are summarized in the table below based on a 70 km/h design speed along Townline Road.

***Table 24 Intersection Sight Distance Requirement for the Proposed Driveway***

| Case (Design Speed of 60 km/h) | Suggested Intersection Sight Distance for Passenger Vehicles (TAC 2017) | Suggested Intersection Sight Distance for WB-20 Trucks (TAC 2017) | Suggested Intersection Sight Distance for Single-unit Trucks (TAC 2017) | Available Intersection Sight Distance | TAC Reference |
|---|---|---|---|---|---|
| B1: Vehicles turning left from stop | 150 m | 225 m | 185 m | >160 m | Table 9.9.4 |
| B2: Vehicles turning right from stop | 130 m | 205 m | 165 m | >160 m | Table 9.9.6 |

The available sight distances along Townline Road at the proposed driveways satisfy the minimum required intersection sight distance for a 70 km/h design speed for a WB-20 truck and a passenger vehicle. The available sightlines and how they are measured are illustrated in figures below and is shown for a WB-20 truck as it provides an assessment for the worst-case scenario.

*Figure 27 Intersection Sight Distance Passenger Vehicle (Site Access 1)*

*Figure 28 Intersection Sight Distance Passenger Vehicle (Site Access 2)*

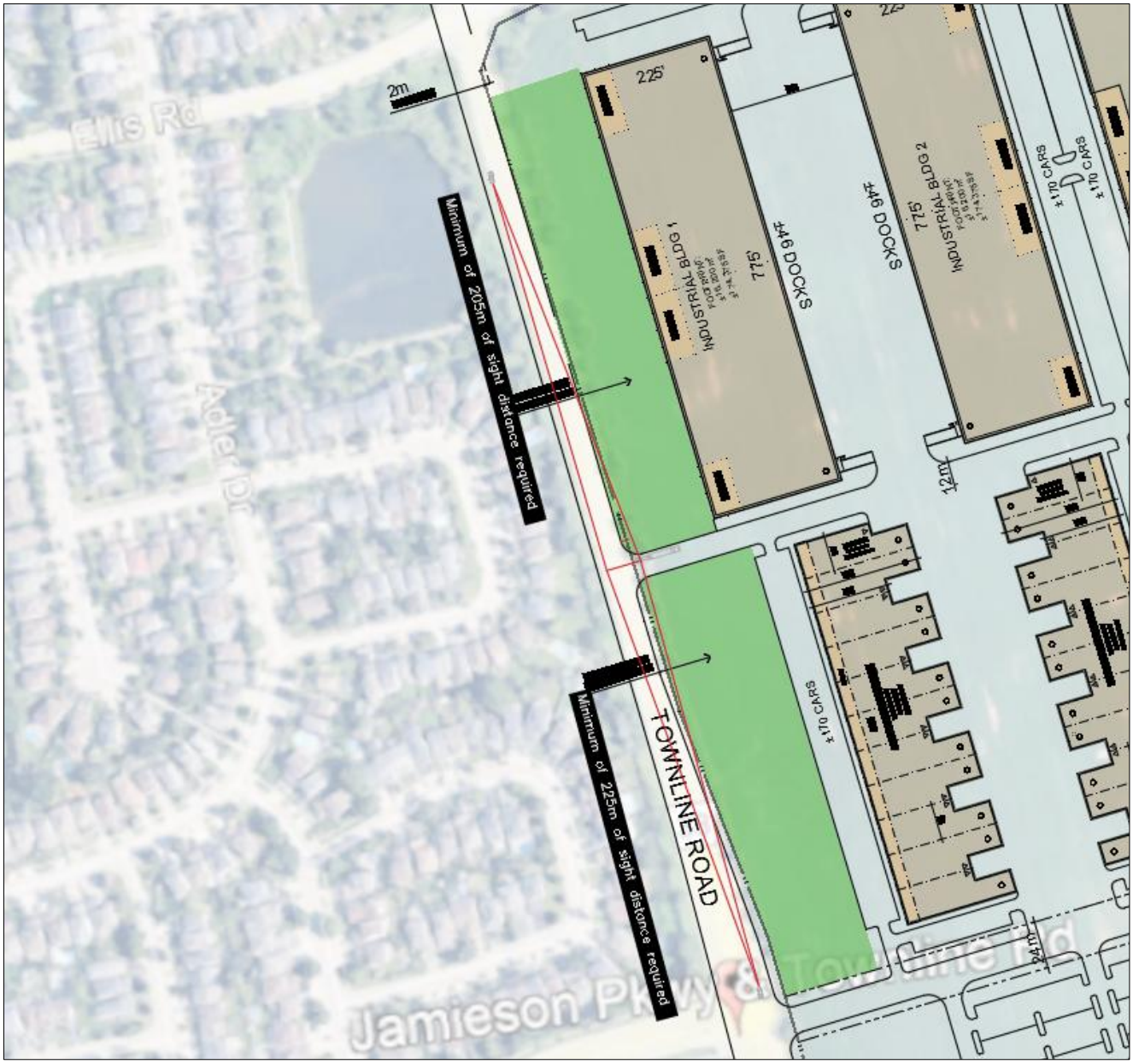


***Figure 29 Intersection Site Distance WB-20 (Site Access 1)***

*Figure 30 Intersection Sight Distance WB-20 (Site Access 2)*

The location of the proposed site accesses provides sufficient intersection sight distances to satisfy the TAC GDGCR minimum recommendations for both vehicles and trucks based on the applicable design speed of the adjacent roads.

# 10. Travel Demand Management

## 10.1 Travel Demand Management

Travel Demand Management (TDM) refers to a variety of strategies to reduce congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system. TDM strategies have multiple benefits including the following:

- Reduced auto-related emissions to improve air quality;

- Decreased traffic congestion to reduce travel time;
- Increased travel options for businesses and commuters;
- Reduced personal transportation costs and energy consumptions; and
- Support Provincial smart growth objectives.

The combined benefits listed above will assist in creating a more active and livable community through improvements to overall active transportation standards for the local businesses and surrounding community.

# 10.2 Existing TDM Opportunities

## 10.2.1 Walking/Cycling

Sidewalks are currently provided along the west side of Townline Road, both side of Jamieson Parkway and both side of Ellis Road until Side Road 10N.

Cycling lanes are provided on Townline Road, Jamieson Parkway, and Ellis Road.

## 10.2.2 Transit

As previously discussed in **Section 3.3**, the subject site is serviced by route GRT Route 51 which services the nearest transit stop at Townline Road and Jamieson Parkway west of the subject site.

# 10.3 Recommended TDM Measures

***Table 25 Recommended TDM Strategies***

| TDM Measure | Responsibility | Cost | Note |
|---|---|---|---|
| **Hard Measures** | | | |
| Bicycle Parking | Applicant | Integrated into the overall development cost. Short term bike parking costs are estimated at $300 per rack that can accommodate 2 bikes. Values to be confirmed through detailed design. | Bicycle parking will be provided matching the requirements of the Township of Puslinch Zoning By-law. |
| Carpool Parking | Applicant | Integrated into the overall development cost | Dedicated carpool space is provided in a prime location to encourage and support ride-sharing among employees and visitors. |
| **Soft Measures** | | | |

| | | | |
|---|---|---|---|
| Provide Individualized Marketing Programs & Travel Plans | Applicant | $500 to $1000 | Information packages (transit maps and schedules, cycling maps) distributed directly to employees or available on the internet. |

# 11. Conclusion

A site plan prepared by Ware Malcomb proposes two Site Plans for the site which are noted as Site Plan A and Site Plan B.

Both Site Plans consist of 6 industrial buildings located on the northern portion of the site on the Site Access 2/Jamieson Parkway and Townline Road. The GFA breakdown of the 6 buildings are as follows:

- Building 1: 174,375 $ft^2$
- Building 2: 174,375 $ft^2$
- Building 3: 174,375 $ft^2$
- Building 4: 112,236 $ft^2$
- Building 5: 112,236 $ft^2$
- Building 6: 105,636 $ft^2$

Site Plan A consists of the 6 industrial buildings mentioned above with a box retail component with a GFA of 162,428 $ft^2$, and 1 gas station with a capacity of 24 fueling stations located on the southern portion of the lot. The total GFA for Site Plan A is 1,015,662 $ft^2$ (94,358$m^2$).

Similar to Site Plan A, Site Plan B consists of the 6 industrial buildings on the northern portion of the lot mentioned above where instead of a box retail component and gas station, two industrial buildings are proposed on the southern portion of the lot noted as building 7 and 8. Both buildings 7 and 8 have a GFA of 210,000 $ft^2$ which equate to a total GFA of 1,273,234 $ft^2$ (118,287$m^2$) for Site Plan B.

Accesses to the subject site are proposed via a two full-moves driveway on Townline Road. Site Access 1 will be noted as the north most access on the lot, and Site Access 2 intersects with Townline Road and connects to Jamieson Parkway.

The proposed Site Plan A development is expected to generate a total of 739 two-way site trips during the a.m. peak hour consisting of 531 inbound and 208 outbound trips. During the p.m. peak hour, it is expected to generate 1052 new two-way site trips consisting of 415 inbound and 637 outbound trips. During the Saturday peak hour, it is expected to generate 1365 new two-way site trips consisting of 665 inbound and 700 outbound trips.

Additionally, the Site Plan A development is expected to generate a total of 260 two-way pass-by trips during the a.m. peak hour consisting of 130 inbound and 130 outbound trips. During the p.m. peak hour, it is expected to generate 478 pass-by trips consisting of 239 inbound and 239 outbound trips. During the Saturday peak hour, it is expected to generate 68 pass-by trips consisting of 34 inbound and 34 outbound trips.

The proposed Site Plan B development is expected to generate a total of 586 two-way site trips during the a.m. peak hour consisting of 453 inbound and 133 outbound trips. During the p.m. peak hour, it is expected to generate 598 new two-way site trips consisting of 168 inbound and 430 outbound trips. During the Saturday peak hour, it is expected to generate 247 new two-way site trips consisting of 96 inbound and 151 outbound trips.

Under existing traffic conditions, all intersections are operating at acceptable v/c ratios and levels of service during the a.m. peak and p.m. peak hours with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound Right with a v/c of 0.86 during the a.m. peak hour
- Eastbound Right with a v/c of 0.85 during the p.m. peak hour

Under the 2028 future total scenario for Site Plan A, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline Road all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 0.89 during the a.m. peak hour
- Eastbound Right with a v/c of 0.93 during the a.m. peak hour
- Eastbound left with a v/c of 0.80 during the p.m. peak hour
- Eastbound Right with a v/c of 0.88 during the p.m. peak hour
- Eastbound left with a v/c of 0.77 during the Saturday peak hour
- Eastbound Right with a v/c of 0.82 during the Saturday peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Northbound through-right with a V/C of 0.96 during the p.m. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.07 during the p.m. peak hour

Under the 2028 future total scenario for Site Plan B, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline Road all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 0.95 during the a.m. peak hour
- Eastbound Right with a v/c of 0.87 during the a.m. peak hour
- Eastbound left with a v/c of 0.77 during the p.m. peak hour
- Eastbound Right with a v/c of 0.88 during the p.m. peak hour
- Eastbound Right with a v/c of 0.82 during the Saturday peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Northbound through-right with a V/C of 0.90 during the p.m. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.04 during the p.m. peak hour

Under the 2033 future total scenario for Site Plan A, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline Road all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 0.92 during the a.m. peak hour
- Eastbound Right with a v/c of 1.02 during the a.m. peak hour
- Eastbound left with a v/c of 0.81 during the p.m. peak hour
- Eastbound Right with a v/c of 0.92 during the p.m. peak hour
- Southbound through with a v/c of 0.93 during the p.m. peak hour
- Eastbound left with a v/c of 0.77 during the Saturday peak hour
- Eastbound Right with a v/c of 0.87 during the Saturday peak hour

Highway 401 Westbound Off-Ramp

- Westbound left with a v/c of 0.75 during the a.m. peak hour
- Northbound through with a v/c of 0.91 during the p.m. peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Southbound through-right with a v/c of 0.87 during the a.m. peak hour
- Northbound left with a v/c of 0.92 during the p.m. peak hour
- Northbound through-right with a v/c of 1.05 during the p.m. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.17 during the p.m. peak hour

Under the 2033 future total scenario for Site Plan B, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline Road all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 1.01 during the a.m. peak hour
- Eastbound Right with a v/c of 0.99 during the a.m. peak hour
- Eastbound left with a v/c of 0.78 during the p.m. peak hour
- Eastbound Right with a v/c of 0.92 during the p.m. peak hour
- Southbound through with a v/c of 0.89 during the p.m. peak hour
- Eastbound Right with a v/c of 0.86 during the Saturday peak hour

Highway 401 Westbound Off-Ramp

- Northbound through with a v/c of 0.85 during the p.m. peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Southbound through-right with a v/c of 1.01 during the a.m. peak hour
- Northbound through-right with a v/c of 0.95 during the p.m. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.16 during the p.m. peak hour

Under the 2038 future total scenario for Site Plan A, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline Road all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 0.98 during the a.m. peak hour
- Eastbound Right with a v/c of 1.13 during the a.m. peak hour
- Southbound through with a v/c of 0.86 during the a.m. peak hour
- Eastbound left with a v/c of 0.83 during the p.m. peak hour
- Eastbound Right with a v/c of 0.96 during the p.m. peak hour
- Southbound through with a v/c of 1.04 during the p.m. peak hour
- Eastbound left with a v/c of 0.84 during the Saturday peak hour
- Eastbound Right with a v/c of 1.03 during the Saturday peak hour

Highway 401 Westbound Off-Ramp

- Westbound left with a v/c of 0.78 during the a.m. peak hour
- Westbound right with a v/c of 0.75 during the p.m. peak hour
- Northbound through with a V/C of 0.99 during the p.m. peak hour

Townline Road and Jamieson Parkway/Site Access 2

- Eastbound through right with a v/c of 0.92 during the p.m. peak hour
- Westbound left with a v/c of 0.90 during the p.m. peak hour
- Northbound left with a v/c of 0.91 during the p.m. peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Southbound through-right with a V/C of 1.01 during the a.m. peak hour
- Northbound left with a V/C of 1.14 during the p.m. peak hour
- Northbound through-right with a V/C of 1.16 during the p.m. peak hour
- Southbound through-right with a V/C of 0.91 during the a.m. peak hour
- Northbound through-right with a V/C of 0.91 during the Saturday. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.28 during the p.m. peak hour

Under the 2038 future total scenario for Site Plan B, with the addition of corridor growth, site traffic and intersection improvements to Jamieson Parkway and Townline line all intersections operate at acceptable v/c ratios delays and queues with exception to the following:

Highway 401 Eastbound Off-Ramp

- Eastbound left with a v/c of 1.09 during the a.m. peak hour
- Eastbound Right with a v/c of 1.13 during the a.m. peak hour
- Southbound through with a v/c of 0.85 during the a.m. peak hour

- Eastbound left with a v/c of 0.81 during the p.m. peak hour
- Eastbound Right with a v/c of 0.97 during the p.m. peak hour
- Southbound through with a v/c of 1.03 during the p.m. peak hour
- Eastbound Right with a v/c of 0.92 during the Saturday peak hour

Highway 401 Westbound Off-Ramp

- Westbound left with a v/c of 0.77 during the a.m. peak hour
- Northbound through with a V/C of 0.95 during the p.m. peak hour

Townline Road and Ellis Road and Sideroad 10 North

- Southbound through-right with a V/C of 1.00 during the a.m. peak hour
- Northbound left with a V/C of 1.05 during the p.m. peak hour
- Northbound through-right with a V/C of 1.11 during the p.m. peak hour
- Southbound through-right with a V/C of 0.86 during the a.m. peak hour

Townline Road and Site Access 1

- Northbound through with a V/C of 1.29 during the p.m. peak hour

Upon comparison of both Site Plans with the recommended intersection improvements both Site Plans operate similarly however Site Plan B requires less improvements for the intersection of Jamieson Parkway/Site Access 2 and Townline Road whereas Site Plan A will require additional lanes in the northbound direction to operate under capacity until the future 2038 scenario and below a v/c of 1. From the perspective of project buildout, the Site Plan B slightly outperforms Site Plan A as this Site Plan generates less traffic due to the nature of the buildings to be implemented.

A review of loading and parking requirements was undertaken and confirmed that the proposed site plan meets the municipal zoning requirements for both Site Plans.

The proposed site access meets the OPSD 350 design standard and Township of Puslinch Zoning By-law

The proposed site driveways meet the minimum intersection sight distance requirements for a 70 km/h design speed on Townline Road based on the TAC manual.

TDM measures are proposed for the subject site to encourage employees to explore various modes of transportation in order to reduce their dependency on single occupancy vehicle trips.

A site circulation assessment for a WB-20 truck, emergency vehicles, passenger vehicles, and waste collection vehicles confirmed no issues with the site circulation.

The traffic study confirms that the proposed development concepts A and B can be accommodated by the existing road network with the following recommended improvements:

**Jamieson Parkway/Site Access 2 and Townline Road for Site Plan A**

- Protected phase for the westbound left and permitted protected for the eastbound left and southbound left.
- Eastbound right lane converted to a through-right
- A double left-turn lane and an exclusive through and right lane on the westbound approach.
- Exclusive right turn lane added in the northbound direction
- A left-turn lane added on the southbound approach.
- Optimized signal timings

**Jamieson Parkway/Site Access 2 and Townline Road for Site Plan B**

- Permitted protected for the eastbound left, westbound left and southbound left.
- Eastbound right lane converted to a through-right
- A left-turn lane and a shared through-right lane on the westbound approach.
- A left-turn lane added on the southbound approach.
- Optimized signal timings

**Townline Road and Site Access 1**

- Signalization of the intersection
- Exclusive westbound right-lane and left-lane
- Addition of a northbound through/right-lane
- Exclusive Southbound left-lane
- Optimized signal timings

**Highway 401 Eastbound off-ramp and Townline Road**

- Addition of an eastbound shared left/right turn lane

**Townline Road and Ellis Road and Sideroad 10N**

- Addition of a northbound and southbound through lane

# Appendix A

## Terms of Reference

# DRAFT

## APPENDIX A:
## PRE-STUDY CONFERENCE FORM
## 2809 Townline Road, Puslinch (Wellington County)

| Item | Description | Details |
|---|---|---|
| **ISSUES** | | |
| 1 | List any issues expected that may impact the content or recommendations of the subject Transportation Impact Study. | ○ Nature of the retail is important…impacts trip generation<br>○ Cross-jurisdictional nature of application<br>○ Service Station / Big Box retail access in proximity to ramp terminals<br>○ Northern most proposed access to Townline violates Regional Road Access Policy.<br>○ Access will not be permitted onto the Township Road (Ellis/SR10) because it is a narrow road with a truck restriction not suited to industrial traffic<br>○ GHD Response: Revised site plan for both alternative A and B show only two access along Townline Road with the Access south of Jamieson Parkway Removed. Alternative A proposes a use of 6 industrial buildings and a retail store where Alternative B proposes 8 industrial buildings on the site. |
| **INTRODUCTION** | | |
| 2 | Nature of application (Attach a drawing) | X Official Plan Amendment<br>X Zoning Amendment<br>○ Site Plan Control Application<br>○ Plan of Subdivision<br>○ Community Plan<br>○ Other |
| 3 | TIS process, and relevant policies, procedures and approvals | X Region of Waterloo Transportation Impact Study Guidelines<br>X Transportation Impact Studies Requirements for Capacity Analysis, Roundabouts, Turn Lanes<br>X MTO TIS Guidelines<br>○ Policy and Procedures for Access onto Regional Roads<br>○ Twp Eng. Design and Infrastructure Manual (EDIM) |
| 4 | Public Meeting | ○ Required<br>X Not Required (for the TIS) |
| **CONTEXT** | | |
| 5 | Study intersections (Intersections to be analyzed)<br><br>Note: the consultant is responsible to identify any further intersections impacted as the study progresses. | X All new/proposed development accesses<br>X HWY 401 / Townline Road Ramp Terminals<br>X Townline Road / Jamieson Parkway<br>X Townline Road / Ellis Road<br>○<br>○<br>○ |
| 6 | Size and number of phases of Development | ○ One Phase of development<br>○ Two Alternatives to consider: Alternative A or Alternative B |

| Item | Description | Details |
|---|---|---|
| 7 | Approved and pending approval development applications | ○ |
| 8 | Planned transportation system improvements | ○ TCP 5943 (Year 2034): Rural Rehab (HWY 401 – Country Rd 34)<br>○ 2018 TMP projects |
| **TRAVEL DEMAND** | | |
| 9 | Horizon years | ○ 5 years from date of TIS<br>X 5 years after full occupancy<br>○ Transportation Plan horizon for large scale projects<br>○ Interim years<br>X 10 years after full occupancy (for MTO)<br>○ Other… |
| 10 | Peak hour determination | X AM weekday peak hour of adjacent roadway<br>X PM weekday peak hour of adjacent roadway<br>X Saturday peak of adjacent roadway<br>○ AM weekday peak hour of development<br>○ PM weekday peak hour of development<br>○ Saturday peak of development<br>○ Other… |
| 11 | Background | X Historical traffic/transit counts<br>X ROW travel demand forecasts<br>X Approved and pending approval development applications<br>GHD to include 2310-2420 Townline Road southwest of the interchange<br>○ Other… |
| 12 | Trip generation | X ITE average rates<br>X ITE fitted equation<br>○ Rates published elsewhere<br>○ Observed rates for similar areas<br>○ Observed rates for similar developments in the local area<br>○ Other… |
| 13 | Trip reductions<br>(TDM, internal, pass-by) | X Transportation Demand Management Checklist<br>○ Published Travel Demand Management reductions<br>○ Observed Travel Demand Management reductions<br>○ ITE internal capture reductions for mixed-use developments<br>○ Observed internal capture reductions for mixed-use developments<br>○ ITE pass-by reductions<br>○ Observed pass-by reductions for similar developments<br>○ Other… |
| 14 | Trip distribution | X ITE trip distribution IN/OUT split<br>○ Regional travel demand<br>○ Population and employment distribution<br>○ Market analysis of catchment area<br>X Transportation Tomorrow Survey (TTS)<br>○ Other… |

| Item | Description | Details |
|---|---|---|
| 15 | Trip assignment | X Local traffic pattern<br>X Site layout and access design<br>○ Existing turning movements<br>○ Other… |
| **EVALUATION OF IMPACTS** | | |
| 16 | Traffic impact analysis<br>(Use approved software) | X Unsignalized intersections<br>X left turn warrant analysis<br>X signal warrant analysis<br>X Signalized intersections<br>X LOS, v/c, delay, queuing<br>○ ROW saturation flow rates<br>X Existing signal timings for existing conditions<br>X Optimize signal timings for future conditions<br>○ Use existing cycle length to respect coordinated corridor<br>X Queuing analysis (MTO methods at ramp terminals)<br>X Roundabouts<br>○ Other… |
| 17 | Roundabout feasibility<br>(Use approved software) | X Initial screening<br>○ Intersection control study (10 year horizon) |
| 18 | Transit assessment | X Frequency and hours of service<br>X Presence of bus stops<br>○ Reliability of service<br>○ Passenger loads<br>○ Travel time<br>○ Other |
| 19 | Pedestrian assessment | X Presence, connectivity, and width of sidewalks<br>○ Barriers and buffers from traffic<br>X Crossing opportunities at intersections<br>○ Delay at intersections<br>○ Number of driveways and traffic volumes at the driveways<br>○ Presence of illumination<br>X Future needs (desire lines / policy / accessibility / demand)<br>○ Other |
| 20 | Cycling assessment | X Presence of a dedicated facility<br>X Network connectivity<br>○ Number and width of travel lanes adjacent to the route<br>○ Volume and speed of traffic<br>○ Percentage of trucks and buses encountered<br>○ Pavement condition<br>○ Presence of parking /showers/change rooms<br>X Future needs (desire lines / policy / demand)<br>○ Other |
| 21 | Safety analysis | ○ Road safety review<br>○ Collision risk analysis<br>○ Access conflict evaluation<br>○ Other |

| Item | Description | Details |
|---|---|---|
| 22 | Site access and circulation | X Review sight distances at all new access points<br>○ Internal traffic controls<br>X Loading facilities and access<br>X Service/maintenance vehicle access<br>X Emergency vehicle access |
| 23 | Submission format | ○ Three hard copies of main report including appendices (other than analysis results/output e.g. Synchro reports)<br>○ Minimum one original hard copy must be sealed by a professional engineer<br>X Electronic copy of complete report and all appendices<br>X Electronic copy of operational analysis files (e.g. Synchro, Arcady<br>X Electronic copy of all signal warrant calculation files<br>○ Other |

Additional Notes:

- The development should include access onto Ellis Road/Sideroad 10N as it is already a signalized intersection along Townline Road.
- GHD response: As per Township comments an Access along Ellis Road and Sideroad 10 N is not proposed
- New/proposed accesses onto Townline Road will be considered only if existing accesses are shown to fail operationally once the Development is in place and if new accesses are able to demonstrate improved operations along the corridor.
- GHD Response: Noted
- This pre-study form in no way implies support or approval for the application.
- GHD Response: Noted
- MTO will require resolution of access spacings between HWY 401 and Jamieson Parkway prior to initiating a TIS for the subject site.
- GHD Response: As attached to this Terms of Reference the new site plans have removed the access to the south of Jamieson Parkway.

Township comments on December 10, 2025 - (Julia Salvini <julia@salviniconsulting.com)

1. My recollection from our discussion is that access will not be permitted onto the Township Road

(Ellis/SR10) because it is a narrow road with a truck restriction not suited to industrial traffic.
GHD Response: This access has not been proposed for either site plan.

2. Both the Region and the MTO expressed in the meeting that they would not support access to Townline south of Jamieson. After the meeting, MTO provided correspondence to GHD that they would not even comment on the Terms of Reference until a revised TOR is submitted with a plan that addresses their minimum requirements (i.e. removal of the existing driveway).
GHD Response: As attached to this Terms of Reference the new site plans have removed the access to the south of Jamieson Parkway.
3. The background traffic development that was identified was the one at 2310-2420 Townline Road southwest of the interchange. I'm attaching a copy of the TIS for that site from July 2025 that the City provided. It appears from the study that they are planning for full build-out of that site by end of 2026, so full build-out should be included in all future scenarios for this TIS.
GHD Response: The Background development report is received and will be included in the updated TIS.
4. I don't have in my notes what background growth rates were agreed to by MTO, the Region and the City for their respective roads in the area. I would like that specifically included in this form. Could someone from MTO, the Region and the City please comment back on this with their preference for the background growth rates on their roads? Thank you.

From the City of Cambridge on December 11, 2025, Christine Kinahan (kinahanc@cambridge.ca) commented that the City will prefer a 2% background growth rate for all City Roads

Outlook

## RE: PSC Form - 2809 Townline Rd

**From** Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>

**Date** Wed 2/11/2026 2:47 PM

**To** Vincenzo Costantino <Vincenzo.Costantino@ghd.com>; Christine Kinahan <kinahanc@cambridge.ca>; Julia Salvini <julia@salviniconsulting.com>; Joshua Beech Falshaw <jbeechfalshaw@regionofwaterloo.ca>; 'pasqualec@wellington.ca' <pasqualec@wellington.ca>

**Cc** Will Maria <William.Maria@ghd.com>; Chris Clary-Lemon <cclarylemon@regionofwaterloo.ca>; Mike Fowler <mfowler@puslinch.ca>; Justine Brotherston <jbrotherston@puslinch.ca>; Monika Farncombe <mfarncombe@puslinch.ca>; Cheryl Marcy <cmarcy@regionofwaterloo.ca>

5 attachments (2 MB)

HWY 401 @ HWY 401_TOWNLINE RD - RAMP 51.pdf; HWY 401 @ HWY 401_TOWNLINE RD - RAMP 61.pdf; DRIVE THRU report.pdf; MTO Prequalified Engineering Service Providers–January 2026.pdf; MTO TIS Guidelines_Final 2023.pdf;

Good day, Vincenzo,

MTO has completed its review of the TOR for the proposed development at 2809 Townline, the following outline MTO:

- MTO require the submission of a full TIS (following MTO TIS guidelines and by a RAQS qualified consultant) to assess the future impact of the proposed development to identify if there are any warranted highway/road improvements. Digital Synchro version 12 files are required at the time of submission. Both editable/printable and locked/stamped and signed by P.Eng, version of the TIS is required. MTO will not review a TIS/TIB completed by a company that is not RAQS qualified, or that includes counts/data that is collected by a non RAQS qualified company. ITE 12$^{th}$ edition is the latest version and must be used. Arcady is the proper tool to review roundabouts and must be included. The files are required at submission time as well.
- The consultant is responsible for thoroughly reading and adhering to the MTO TIS guidelines. If any reasonable requirements are missed, it is the consultant's obligation to provide them. The absence of a specific instruction in the TOR does not negate the necessity of fulfilling the reasonable requirement.
- Any data collected for the TIS must be by a RAQS qualified company/consultant. It is the responsibility of the RAQS qualified consultant to ensure the proper data is used (ex. season or non MTO) and seasonal factors applied as appropriate. Winter counts are typically not accepted. It is the consultant's responsibility to update and use proper data. MTO data is attached.
- Please refer to MTO TIS guidelines/policy, page 16 for Trip Distribution/Assignment.
- A summary of the key findings on the transportation impact of the proposed development on the highway corridor shall be presented, along with a summary of the recommended improvements. Any improvements identified in the TIS as warranted within the first five years of the development's operation shall be constructed prior to opening day. Please note that 'monitoring' is not an acceptable recommendation.
- Use simple growth rate for volume projections.
- Use a 2.0% growth rate for MTO ramps.

- A site circulation plan is required to ensure that internal blockage does not occur or cause vehicle backups on the roadway. It appears the first internal roadway at the access at Jamieson signals should be set back farther but a detailed site plan and site circulation plan will provide more information. Please include distances on the site plan from Townline and internally.
- AM, PM and a Saturday analysis must be included.
- As part of the TIS, sightlines must be reviewed and a field measured distance provided and compared to TAC with mitigation measures if the minimum is not met. This includes stopping sight distance and intersection sight distance. We will not accept estimates of sight distance.
- As part of the TIS/, a LT warrant analysis and right turn auxiliary lane analysis must be included to determine if mitigation measures are required at study intersections (if there are current LT/RT lanes – they should analyze the lanes to ensure they are appropriate) using TAC and MTO TAC supplemental. For the LTL, if the value of the left turning volume % falls between two charts, the designer should check storage lengths produced using the two warrant charts that it falls between and then select the more conservative value after considering other project-specific factors (for example, if the LTL volume % is 16%, the designer should be using both the 15% and 20% warrant charts and then select the most conservative storage length of the two. Similarly, for a 28% left turning volume %, the 25% and 30% warrant charts should be looked at and the conservative storage length should be selected). If the left turning volume % is less than 5%, the 5% warrant chart must be used. In a constrained environment (other than cost) where the installation of conservative left turn storage length creates challenges, the designer should review the pros and cons of all elements and document such. If the intersection is being newly proposed, the designer should compare the safety of other similar (traffic volume and geometry) intersections in the corridor or vicinity with the proposed intersection. 20 over posted is design speed.
- Capacity analysis shall be performed at all proposed site access points and intersections in the study network in accordance with the methodology described in the latest edition of the Highway Capacity Manual (HCM). At signalized intersections, movements with a volume/capacity (v/c) ratio greater than 0.85 are deemed to be “critical” in terms of operations. Movements that experience a v/c ratio of 0.85 or greater shall be evaluated for possible operational improvements. For ramps, a v/c ratio for terminal ramp approaches with a value greater than 0.75 would be deemed critical and shall be evaluated for possible operational improvements.
- All intersection capacity analysis on impacted intersections or interchanges within MTO facilities must follow MTO/TAC protocols. When evaluating impacts at intersections please refer to the TAC’s Geometric Design Guide for Canadian Roads, MTO Design Supplement for TAC’s Geometric Design Guide for Canadian Roads (http://www.mto.gov.on.ca/phmpmbp/Reference%20Materials/HwyDes-MTO_DS_TAC_GDG-April2020-Final.pdf ) and the OTM Books.)
- Unique traffic generators like (but not limited to) a Tim Horton’s or a McDonald's have higher trip generation rates than those provided by the ITE manual. If unique traffic generators are proposed to be located at the site in the future, MTO will require further analysis utilizing the attached Drive-Thru report.
- Use the guiding principles included in the ITE’s 12$^{th}$ edition Trip Generation Handbook for the selection between rates and equations**.**
- The need for geometric improvements shall be reviewed at all locations in the study area and for each proposed development stage. The TIS shall clearly identify transportation impacts by movement, the transportation system improvements that are needed to mitigate these impacts, and the timing of any recommended improvements. A schematic representation of all geometric improvements shall be included as part of the TIS, identifying lane arrangements and intersection improvements for each horizon year.

- The need for traffic signals and/or underground traffic signal utility provisions shall be reviewed at all locations affected by the proposed development and for each proposed development stage. Determination of whether traffic signals or provisions for signals are warranted shall be made according to the process described in OTM Book 12. Eight (8) hours of data as a minimum are required to assess signal warrants for existing and background conditions. We do not use Average Hour Volume.
- Queue and storage lengths for left turn and through movements for signalized intersections under MTO jurisdiction need to be calculated using the arrival rate method explained on MTO's Signal Timing Policy. For queues/storage lengths for right turn movements please refer to Chapter 9 of TAC's Geometric Design Guide for Canadian Roads. Queue assessment shall include a review to determine if the thru queues impede access to auxiliary lanes or if they reach the adjacent intersection. For LT and thru, must convert trucks to passenger vehicles, use factor of 2.0. Provide the results in tabular form. For thru and left turn queues include: peak period, movement, volume, cycle length, %trucks, pcph, m value, number of vehicles and total length. For right turn storage length include: peak period, volume, cycle length, design speed, total length.
- Signal timing optimization can improve operations however, the resulting settings should still be consistent with our Signal Timing Policy. For example: the timing settings cannot be adjusted to favour the sideroad over the highway.
- **MTO's comments may change depending on which development option is selected. We can review a Traffic Impact Study (TIS), but if the developer has not confirmed the final land-use or tenants, any significant change—such as adding a high-traffic generator like a Costco—would trigger the need for a new TIS**.

If you have any question or require any other clarification please contact me.

Regards,

**O'Neil Nembhard**
Corridor Management Planner | Operation West | Operations Division
Ministry of Transportation Ontario | Ontario Public Service
548-388-2571 | o'neil.nembhard @ontario.ca

Ontario

*Taking pride in strengthening Ontario, its places and its people*

**Please note the Ministry no longer accepts Land Development review requests though its email system**. All Land Development Review requests to the Ministry must be submitted to the Ministry of Transportation through the Highway Corridor Management Online portal at: https://www.hcms.mto.gov.on.ca/landdev/en/land-development

The Land Development Review module is designed to better serve stakeholders through streamlining all land development planning approvals by the Ministry.

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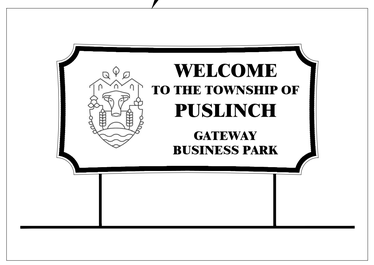
**From:** Vincenzo Costantino <Vincenzo.Costantino@ghd.com>
**Sent:** Monday, February 2, 2026 4:21 PM
**To:** Christine Kinahan <kinahanc@cambridge.ca>; Julia Salvini <julia@salviniconsulting.com>; Joshua Beech Falshaw <jbeechfalshaw@regionofwaterloo.ca>; 'pasqualec@wellington.ca' <pasqualec@wellington.ca>; Nembhard, O'Neil (MTO) <O'neil.Nembhard@ontario.ca>
**Cc:** Will Maria <William.Maria@ghd.com>; Chris Clary-Lemon <cclarylemon@regionofwaterloo.ca>; Mike Fowler <mfowler@puslinch.ca>; Justine Brotherston <jbrotherston@puslinch.ca>; Monika Farncombe <mfarncombe@puslinch.ca>; Cheryl Marcy <cmarcy@regionofwaterloo.ca>
**Subject:** Re: PSC Form - 2809 Townline Rd

# Appendix B

## Site Plan




| ZONING MATRIX | | |
|---|---|---|
| LEGAL NAME: PART LOT 1, CONCESSION 2, PUSLINCH, PARTS 1, 2 & 3 61R2992 AND AS IN ROS257095 SOUTH OF MS47320; EXCEPT PART 2 61R642, PART 1 61R6501, PARTS 1 & 2 61R2843, PARTS 1, 2, 3, 5, 6, 7 & 8 61R9198, PART 1 61R9263, PART 1 61R9689 AND PART 1 EXPROPRIATION PLAN WC505537; T/W RO693735; TOWNSHIP OF PUSLINCH | | |
| ITEM | **PROPOSAL** | **EXISTING** |
| ZONING CATEGORY | INDUSTRIAL (IND) | AGRICULTURAL (A) |
| GROSS SITE AREA (m²) | 337,346 m2 (33.7ha) | |
| TOTAL GROSS FLOOR AREA (m²) | 94358.00 | N/A |
| | **PROPOSED** | **REQUIRED** |
| MINIMUM REQUIRED LOT AREA (HA) | 33.7 | 0.4 |
| MINIMUM REQUIRED LOT FRONTAGE (m) | 752 | 30 |
| MINIMUM REQUIRED FRONT YARD (m) | 46 | 6 |
| MINIMUM REQUIRED INTERIOR SIDEYARD (m) | 36 | 5 |
| INTERIOR SIDE YARD ADJACENT TO RESIDENTIAL ZONE (m) | N/A | 15 |
| MINIMUM REQUIRED EXTERIOR SIDEYARD (m) | 141 | 15 |
| MINIMUM REQUIRED REAR YARD SETBACK (m) | 21 | 7.5 |
| REAR YARD ADJACENT TO RESIDENTIAL ZONE (m) | N/A | 15 |
| MAXIMUM PERMITTED LOT COVERAGE (%) | 28% | 75% |
| MINIMUM REQUIRED LANDSCAPED OPEN SPACE | 17% | 15% |
| MAXIMUM PERMITTED BUILDING HEIGHT (m) | 25 | 25 |
| BUFFER IF ADJACENT TO RESIDENTIAL ZONE BOUNDARY (m) | N/A | 1.5 |
| MTO SETBACK (m) | 14 | 14 |
| **BUILDING FLOOR AREA** | | |
| **BUILDING 1** | **m2** | |
| INDUSTRIAL | 15,390.00 | |
| (5%) OFFICE | 810.00 | |
| TOTAL | 16,200.00 | |
| **BUILDING 2** | | |
| INDUSTRIAL | 15,390.00 | |
| (5%) OFFICE | 810.00 | |
| TOTAL | 16,200.00 | |
| **BUILDING 3** | | |
| INDUSTRIAL | 15,390.00 | |
| (5%) OFFICE | 810.00 | |
| TOTAL | 16,200.00 | |
| **BUILDING 4** | | |
| INDUSTRIAL | 9,384.00 | |
| (10%) OFFICE | 1,043.00 | |
| TOTAL | 10,427.00 | |
| **BUILDING 5** | | |
| INDUSTRIAL | 9,384.00 | |
| (10%) OFFICE | 1,043.00 | |
| TOTAL | 10,427.00 | |
| **BUILDING 6** | | |
| INDUSTRIAL | 8,833.00 | |
| (10%) OFFICE | 981.00 | |
| TOTAL | 9,814.00 | |
| **RETAIL STORE** | 15,090.00 | |
| **TOTAL AREA** | 94,358.00 | |

**PARKING REQUIREMENT**

**Building 1-6:**
Parking stall ratio: 1/100 m² for the first 10,000 m² of floor area and 1/200 m² for any floor area after the first 10,000 m² Business/Professional
Office: 1/40 m²
Bicycle space (0.6X1.8m) ratio: 2/1000 m2 for industrial uses and 2 or 1/1000 m2 for retail uses, whichever is greater

**Retail Store:**
1/20 m²

**Gas Pump:**
1/Pump

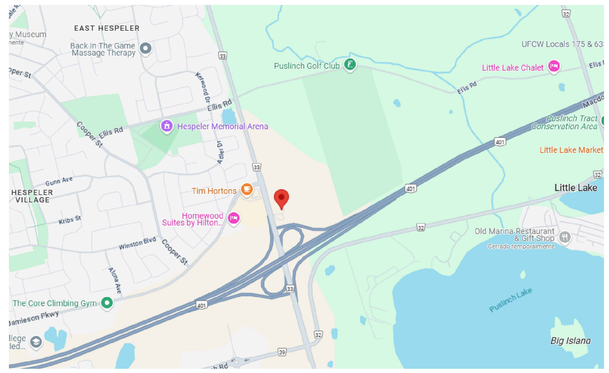
**Barrier-free stalls:**
1 stall if the total number of parking stalls is between 3 and 25 stalls.
1 stall + 3% if the total number of parking stalls is between 26 and 100 stalls.
4 stalls + 2% if the total number of parking stalls is between 101 and 200 stalls.
8 stalls + 2% if the total number of parking stalls is equal to or greater than 201 stalls

**Loading Spaces:**
0 spaces for buildings less than 250 m²
1 spaces for buildings between 250 m² and 2,500 m²
2 spaces for buildings greater than 2,500 m² and less than 5,000 m²
3 + 1 additional space for each 10,000 m² in excess of 5,000 m² for buildings greater than 5,000 m²

**PARKING STALL DIMENSIONS**

STANDARD: 3.0 m x 6.0 m
BARRIER-FREE : 3.6 m x 6.0 m
LOADING SPACE: 3.5 x 10m

| | **PROPOSED** | **REQUIRED** |
|---|---|---|
| BUILDING 1 | 147 | 147 |
| BUILDING 2 | 149 | 147 |
| BUILDING 3 | 149 | 147 |
| BUILDING 4 | 140 | 120 |
| BUILDING 5 | 140 | 120 |
| BUILDING 6 | 138 | 113 |
| RETAIL STORE | 1478 | 755 |
| GAS PUMP | 13 | 12 |
| TOTAL NO. OF PARKING SPACES | 2354 | 1561 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 1) | 7 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 2) | 7 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 3) | 7 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 4) | 7 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 5) | 7 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 6) | 7 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (RETAIL STORE) | 38 | 38 |
| REQ. LOADING SPACES (BUILDING 1) | 46 | 4 |
| REQ. LOADING SPACES (BUILDING 2) | 46 | 4 |
| REQ. LOADING SPACES (BUILDING 3) | 46 | 4 |
| REQ. LOADING SPACES (BUILDING 4) | 11 | 4 |
| REQ. LOADING SPACES (BUILDING 5) | 11 | 4 |
| REQ. LOADING SPACES (BUILDING 6) | 11 | 4 |
| REQ. LOADING SPACES (RETAIL STORE) | 4 | 4 |
| REQ. BICYCLE SPACES (BUILDING 1) | 32 | 32 |
| REQ. BICYCLE SPACES (BUILDING 2) | 32 | 32 |
| REQ. BICYCLE SPACES (BUILDING 3) | 32 | 32 |
| REQ. BICYCLE SPACES (BUILDING 4) | 22 | 21 |
| REQ. BICYCLE SPACES (BUILDING 5) | 22 | 21 |
| REQ. BICYCLE SPACES (BUILDING 6) | 20 | 20 |
| REQ. BICYCLE SPACES (RETAIL STORE) | 18 | 15 |




1:2000
0 20m 50m 100m 200m

NORTH

TOWNSHIP OF PUSLINCH
EST. 1850

**scheme: 06 (Plan A)**

Conceptual Site Plan A

**Townline**
2809 Townline Road, Puslinch, Ontario

WARE MALCOMB

TOR25-0087-00
01.28.2026

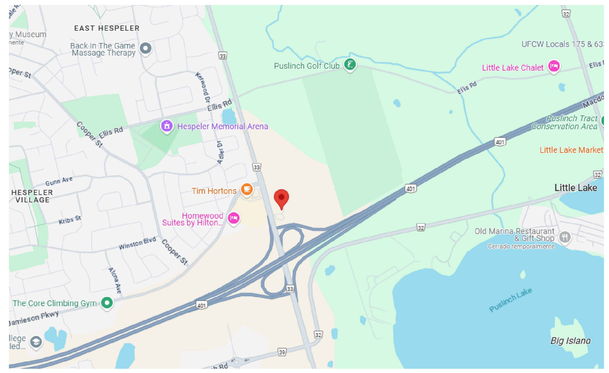
SHEET
**1**

TOWNSHIP OF
PUSLINCH
est. 1850

| ZONING MATRIX | | |
|---|---|---|
| LEGAL NAME: PART LOT 1, CONCESSION 2, PUSLINCH, PARTS 1, 2 & 3 61R2992 AND AS IN ROS257095 SOUTH OF MS47320; EXCEPT PART 2 61R642, PART 1 61R6501, PARTS 1 & 2 61R2843, PARTS 1, 2, 3, 5, 6, 7 & 8 61R9198, PART 1 61R9263, PART 1 61R9689 AND PART 1 EXPROPRIATION PLAN WC505537; T/W RO693735; TOWNSHIP OF PUSLINCH | | |
| ITEM | **PROPOSAL** | **EXISTING** |
| ZONING CATEGORY | INDUSTRIAL (IND) | AGRICULTURAL (A) |
| GROSS SITE AREA (m²) | 337,346 m2 (33.7ha) | |
| TOTAL GROSS FLOOR AREA (m²) | 118288.00 | N/A |
| | | |
| | **PROPOSED** | **REQUIRED** |
| MINIMUM REQUIRED LOT AREA (HA) | 33.7 | 0.4 |
| MINIMUM REQUIREDLOT FRONTAGE (m) | 752 | 30 |
| MINIMUM REQUIRED FRONT YARD (m) | 41 | 6 |
| MINIMUM REQUIRED INTERIOR SIDE YARD SETBACK (m) | 36 | 5 |
| INTERIOR SIDE YARD ADAJCENT TO RESIDENTIAL ZONE (m) | N/A | 15 |
| MINIMUM REQUIRED EXTERIOR SIDEYARD (m) | 55 | 15 |
| MINIMUM REQUIRED REAR YARD (m) | 47 | 7.5 |
| REAR YARD ADAJCENT TO RESIDENTIAL ZONE (m) | N/A | 15 |
| MAXIMUM PERMITTED LOT COVERAGE (%) | 35% | 75% |
| MINIMUM REQUIRED LANDSCAPED OPEN SPACE | 17% | 15% |
| MAXIMUM PERMITTED BUILDING HEIGHT (m) | 25 | 25 |
| BUFFER IF ADJACENT TO RESIDENTIAL ZONE (m) | N/A | 1.5 |
| | | |
| MTO SETBACK (m) | 14 | 14 |
| | | |
| **BUILDING FLOOR AREA** | | |
| **BUILDING 1** | **m2** | |
| INDUSTRIAL | 15,390.00 | |
| (5%) OFFICE | 810.00 | |
| TOTAL | 16,200.00 | |
| | | |
| **BUILDING 2** | | |
| INDUSTRIAL | 15,390.00 | |
| (5%) OFFICE | 810.00 | |
| TOTAL | 16,200.00 | |
| | | |
| **BUILDING 3** | | |
| INDUSTRIAL | 15,390.00 | |
| (5%) OFFICE | 810.00 | |
| TOTAL | 16,200.00 | |
| | | |
| **BUILDING 4** | | |
| INDUSTRIAL | 9,384.00 | |
| (10%) OFFICE | 1,043.00 | |
| TOTAL | 10,427.00 | |
| | | |
| **BUILDING 5** | | |
| INDUSTRIAL | 9,384.00 | |
| (10%) OFFICE | 1,043.00 | |
| TOTAL | 10,427.00 | |
| | | |
| **BUILDING 6** | | |
| INDUSTRIAL | 8,833.00 | |
| (10%) OFFICE | 981.00 | |
| TOTAL | 9,814.00 | |
| | | |
| **BUILDING 7** | | |
| INDUSTRIAL | 18,534.50 | |
| (5%) OFFICE | 975.50 | |
| TOTAL | 19,510.00 | |
| | | |
| **BUILDING 8** | | |
| INDUSTRIAL | 18,534.50 | |
| (5%) OFFICE | 975.50 | |
| TOTAL | 19,510.00 | |
| | | |
| **TOTAL AREA** | 118,288.00 | |

| PARKING REQUIREMENT |
|---|
| **Building 1-6:**<br>Parking stall ratio: 1/100 m² for the first 10,000 m² of floor area and 1/200 m² for any floor area after the first 10,000 m²<br>Business/Professional Office: 1/40 m²<br>Bicycle space (0.6X1.8m) ratio: 2/1000 m2 for industrial uses |
| **Barrier-free stalls:**<br>1 stall if the total number of parking stalls is between 3 and 25 stalls.<br>1 stall + 3% if the total number of parking stalls is between 26 and 100 stalls.<br>4 stalls + 2% if the total number of parking stalls is between 101 and 200 stalls.<br>8 stalls + 2% if the total number of parking stalls is equal to or greater than 201 stalls |
| **Loading Spaces:**<br>0 spaces for buildings less than 250 m²<br>1 spaces for buildings between 250 m² and 2,500 m²<br>2 spaces for buildings greater than 2,500 m² and less than 5,000 m²<br>3 + 1 additional space for each 10,000 m² in excess of 5,000 m² for buildings greater than 5,000 m² |

| **PARKING STALL DIMENSIONS** | STANDARD: 3.0 m x 6.0 m<br>BARRIER-FREE : 3.6 m x 6.0 m<br>LOADING SPACE: 3.5 x 10m | |
|---|---|---|
| | **PROPOSED** | **REQUIRED** |
| BUILDING 1 | 147 | 147 |
| BUILDING 2 | 149 | 147 |
| BUILDING 3 | 149 | 147 |
| BUILDING 4 | 140 | 120 |
| BUILDING 5 | 140 | 120 |
| BUILDING 6 | 138 | 113 |
| BUILDING 7 | 188 | 167 |
| BUILDING 8 | 189 | 167 |
| | | |
| TOTAL NO. OF PARKING SPACES | 1240 | 1128 |
| | | |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 1) | 7 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 2) | 7 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 3) | 7 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 4) | 6 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 5) | 7 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 6) | 7 | 7 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 7) | 9 | 8 |
| REQ. BARRIER-FREE PARKING SPACES (BUILDING 8) | 8 | 8 |
| | | |
| REQ. LOADING SPACES (BUILDING 1) | 46 | 4 |
| REQ. LOADING SPACES (BUILDING 2) | 46 | 4 |
| REQ. LOADING SPACES (BUILDING 3) | 46 | 4 |
| REQ. LOADING SPACES (BUILDING 4) | 11 | 4 |
| REQ. LOADING SPACES (BUILDING 5) | 11 | 4 |
| REQ. LOADING SPACES (BUILDING 6) | 11 | 4 |
| REQ. LOADING SPACES (BUILDING 7) | 33 | 4 |
| REQ. LOADING SPACES (BUILDING 8) | 33 | 4 |
| | | |
| REQ. BICYCLE SPACES (BUILDING 1) | 32 | 32 |
| REQ. BICYCLE SPACES (BUILDING 2) | 32 | 32 |
| REQ. BICYCLE SPACES (BUILDING 3) | 32 | 32 |
| REQ. BICYCLE SPACES (BUILDING 4) | 22 | 21 |
| REQ. BICYCLE SPACES (BUILDING 5) | 22 | 21 |
| REQ. BICYCLE SPACES (BUILDING 6) | 20 | 20 |
| REQ. BICYCLE SPACES (BUILDING 7) | 40 | 39 |
| REQ. BICYCLE SPACES (BUILDING 8 | 40 | 39 |




1:2000
0 20m 50m 100m 200m

NORTH

**scheme: 07 (Plan B)**

Conceptual Site Plan B

**Townline**
2809 Townline Road, Puslinch, Ontario

WARE MALCOMB

TOR25-0087-00
01-28-2026

SHEET
1

# Appendix C

## Traffic Data

Spectrum

Turning Movement Count
Location Name: HWY 401 EB OFF-RAMP & TOWNLINE ROAD
Date: Tue, Sep 30, 2025 Deployment Lead: Rey Fernandez

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

## Turning Movement Count (1 . HWY 401 EB OFF-RAMP & TOWNLINE ROAD)

| Start Time | N Approach TOWNLINE RD | | | | | E Approach HWY 401 EB ON RAMP FROM NB TOWNLINE RD | | | S Approach TOWNLINE RD | | | | | W Approach HWY 401 EB OFF RAMP AT TOWNLINE RD | | | | | NW Approach HWY 401 EB ON RAMP FROM SB TOWNLINE RD | | | Int. Total (15 min) | Int. Total (1 hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hard Right N:NW | Thru N:S | UTurn N:N | Peds N: | Approach Total | UTurn E:E | Peds E: | Approach Total | Right S:E | Thru S:N | UTurn S:S | Peds S: | Approach Total | Right W:S | Left W:N | UTurn W:W | Peds W: | Approach Total | UTurn NW:NW | Peds NW: | Approach Total | | |
| 2025-09-30 07:00:00 | 85 | 143 | 0 | 0 | 228 | 0 | 0 | 0 | 176 | 102 | 0 | 0 | 278 | 47 | 39 | 0 | 0 | 86 | 0 | 0 | 0 | 592 | |
| 2025-09-30 07:15:00 | 71 | 155 | 0 | 0 | 226 | 0 | 0 | 0 | 120 | 129 | 0 | 0 | 249 | 57 | 36 | 0 | 0 | 93 | 0 | 0 | 0 | 568 | |
| 2025-09-30 07:30:00 | 40 | 203 | 0 | 0 | 243 | 0 | 0 | 0 | 81 | 197 | 0 | 0 | 278 | 100 | 87 | 0 | 0 | 187 | 0 | 0 | 0 | 708 | |
| 2025-09-30 07:45:00 | 24 | 259 | 0 | 0 | 283 | 0 | 0 | 0 | 53 | 227 | 0 | 0 | 280 | 147 | 109 | 0 | 0 | 256 | 0 | 0 | 0 | 819 | 2687 |
| 2025-09-30 08:00:00 | 32 | 256 | 0 | 0 | 288 | 0 | 0 | 0 | 87 | 157 | 0 | 0 | 244 | 96 | 81 | 0 | 0 | 177 | 0 | 0 | 0 | 709 | 2804 |
| 2025-09-30 08:15:00 | 35 | 227 | 0 | 0 | 262 | 0 | 0 | 0 | 78 | 165 | 0 | 0 | 243 | 82 | 58 | 0 | 0 | 140 | 0 | 0 | 0 | 645 | 2881 |
| 2025-09-30 08:30:00 | 32 | 240 | 1 | 0 | 273 | 0 | 0 | 0 | 79 | 155 | 0 | 0 | 234 | 59 | 73 | 0 | 0 | 132 | 0 | 0 | 0 | 639 | 2812 |
| 2025-09-30 08:45:00 | 34 | 224 | 0 | 0 | 258 | 0 | 0 | 0 | 89 | 163 | 0 | 0 | 252 | 73 | 61 | 0 | 0 | 134 | 0 | 0 | 0 | 644 | 2637 |
| ***BREAK*** | | | | | | | | | | | | | | | | | | | | | | | |
| 2025-09-30 16:00:00 | 16 | 242 | 0 | 0 | 258 | 0 | 0 | 0 | 82 | 187 | 0 | 0 | 269 | 118 | 72 | 0 | 0 | 190 | 0 | 0 | 0 | 717 | |
| 2025-09-30 16:15:00 | 21 | 222 | 0 | 0 | 243 | 0 | 0 | 0 | 86 | 236 | 0 | 0 | 322 | 110 | 98 | 0 | 1 | 208 | 0 | 1 | 0 | 773 | |
| 2025-09-30 16:30:00 | 15 | 259 | 0 | 1 | 274 | 0 | 1 | 0 | 79 | 283 | 0 | 0 | 362 | 98 | 103 | 0 | 0 | 201 | 0 | 1 | 0 | 837 | |
| 2025-09-30 16:45:00 | 26 | 257 | 0 | 0 | 283 | 0 | 0 | 0 | 78 | 229 | 0 | 0 | 307 | 109 | 83 | 0 | 0 | 192 | 0 | 0 | 0 | 782 | 3109 |
| 2025-09-30 17:00:00 | 35 | 249 | 0 | 0 | 284 | 0 | 0 | 0 | 68 | 216 | 0 | 0 | 284 | 115 | 88 | 0 | 0 | 203 | 0 | 0 | 0 | 771 | 3163 |
| 2025-09-30 17:15:00 | 24 | 249 | 0 | 0 | 273 | 0 | 0 | 0 | 73 | 250 | 0 | 0 | 323 | 111 | 84 | 0 | 0 | 195 | 0 | 0 | 0 | 791 | 3181 |
| 2025-09-30 17:30:00 | 18 | 226 | 1 | 0 | 245 | 0 | 0 | 0 | 67 | 179 | 0 | 0 | 246 | 103 | 94 | 0 | 1 | 197 | 0 | 1 | 0 | 688 | 3032 |
| 2025-09-30 17:45:00 | 19 | 243 | 0 | 0 | 262 | 0 | 0 | 0 | 73 | 186 | 0 | 0 | 259 | 78 | 96 | 0 | 1 | 174 | 0 | 1 | 0 | 695 | 2945 |
| **Grand Total** | 527 | 3654 | 2 | 1 | 4183 | 0 | 1 | 0 | 1369 | 3061 | 0 | 0 | 4430 | 1503 | 1262 | 0 | 3 | 2765 | 0 | 4 | 0 | **11378** | - |
| **Approach%** | 12.6% | 87.4% | 0% | | - | 0% | | - | 30.9% | 69.1% | 0% | | - | 54.4% | 45.6% | 0% | | - | 0% | | - | **-** | - |
| **Totals %** | 4.6% | 32.1% | 0% | | 36.8% | 0% | | 0% | 12% | 26.9% | 0% | | 38.9% | 13.2% | 11.1% | 0% | | 24.3% | 0% | | 0% | **-** | - |
| **Heavy** | 26 | 231 | 0 | | - | 0 | | - | 200 | 79 | 0 | | - | 52 | 41 | 0 | | - | 0 | | - | **-** | - |
| **Heavy %** | 4.9% | 6.3% | 0% | | - | 0% | | - | 14.6% | 2.6% | 0% | | - | 3.5% | 3.2% | 0% | | - | 0% | | - | **-** | - |
| **Bicycles** | - | - | - | | - | - | | - | - | - | - | | - | - | - | - | | - | - | | - | **-** | - |
| **Bicycle %** | - | - | - | | - | - | | - | - | - | - | | - | - | - | - | | - | - | | - | **-** | - |

Spectrum

Turning Movement Count
Location Name: HWY 401 EB OFF-RAMP & TOWNLINE ROAD
Date: Tue, Sep 30, 2025 Deployment Lead: Rey Fernandez

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

**Peak Hour: 07:30 AM - 08:30 AM Weather: Clear Sky (11 °C)**

| Start Time | N Approach TOWNLINE RD | | | | | E Approach HWY 401 EB ON RAMP FROM NB TOWNLINE RD | | | S Approach TOWNLINE RD | | | | | W Approach HWY 401 EB OFF RAMP AT TOWNLINE RD | | | | | NW Approach HWY 401 EB ON RAMP FROM SB TOWNLINE RD | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hard Right | Thru | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | Right | Thru | UTurn | Peds | Approach Total | Right | Left | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | |
| 2025-09-30 07:30:00 | 40 | 203 | 0 | 0 | 243 | 0 | 0 | 0 | 81 | 197 | 0 | 0 | 278 | 100 | 87 | 0 | 0 | 187 | 0 | 0 | 0 | 708 |
| 2025-09-30 07:45:00 | 24 | 259 | 0 | 0 | 283 | 0 | 0 | 0 | 53 | 227 | 0 | 0 | 280 | 147 | 109 | 0 | 0 | 256 | 0 | 0 | 0 | 819 |
| 2025-09-30 08:00:00 | 32 | 256 | 0 | 0 | 288 | 0 | 0 | 0 | 87 | 157 | 0 | 0 | 244 | 96 | 81 | 0 | 0 | 177 | 0 | 0 | 0 | 709 |
| 2025-09-30 08:15:00 | 35 | 227 | 0 | 0 | 262 | 0 | 0 | 0 | 78 | 165 | 0 | 0 | 243 | 82 | 58 | 0 | 0 | 140 | 0 | 0 | 0 | 645 |
| **Grand Total** | 131 | 945 | 0 | 0 | 1076 | 0 | 0 | 0 | 299 | 746 | 0 | 0 | 1045 | 425 | 335 | 0 | 0 | 760 | 0 | 0 | 0 | **2881** |
| **Approach%** | 12.2% | 87.8% | 0% | | - | 0% | | - | 28.6% | 71.4% | 0% | | - | 55.9% | 44.1% | 0% | | - | 0% | | - | **-** |
| **Totals %** | 4.5% | 32.8% | 0% | | 37.3% | 0% | | 0% | 10.4% | 25.9% | 0% | | 36.3% | 14.8% | 11.6% | 0% | | 26.4% | 0% | | 0% | **-** |
| **PHF** | 0.82 | 0.91 | 0 | | 0.93 | 0 | | 0 | 0.86 | 0.82 | 0 | | 0.93 | 0.72 | 0.77 | 0 | | 0.74 | 0 | | 0 | 0.88 |
| **Heavy** | 6 | 64 | 0 | | 70 | 0 | | 0 | 54 | 26 | 0 | | 80 | 18 | 13 | 0 | | 31 | 0 | | 0 | 181 |
| **Heavy %** | 4.6% | 6.8% | 0% | | 6.5% | 0% | | 0% | 18.1% | 3.5% | 0% | | 7.7% | 4.2% | 3.9% | 0% | | 4.1% | 0% | | 0% | 6.3% |
| **Lights** | 125 | 881 | 0 | | 1006 | 0 | | 0 | 245 | 720 | 0 | | 965 | 407 | 322 | 0 | | 729 | 0 | | 0 | 2700 |
| **Lights %** | 95.4% | 93.2% | 0% | | 93.5% | 0% | | 0% | 81.9% | 96.5% | 0% | | 92.3% | 95.8% | 96.1% | 0% | | 95.9% | 0% | | 0% | 93.7% |
| **Single-Unit Trucks** | 5 | 12 | 0 | | 17 | 0 | | 0 | 21 | 12 | 0 | | 33 | 6 | 5 | 0 | | 11 | 0 | | 0 | 61 |
| **Single-Unit Trucks %** | 3.8% | 1.3% | 0% | | 1.6% | 0% | | 0% | 7% | 1.6% | 0% | | 3.2% | 1.4% | 1.5% | 0% | | 1.4% | 0% | | 0% | 2.1% |
| **Buses** | 0 | 3 | 0 | | 3 | 0 | | 0 | 1 | 8 | 0 | | 9 | 5 | 1 | 0 | | 6 | 0 | | 0 | 18 |
| **Buses %** | 0% | 0.3% | 0% | | 0.3% | 0% | | 0% | 0.3% | 1.1% | 0% | | 0.9% | 1.2% | 0.3% | 0% | | 0.8% | 0% | | 0% | 0.6% |
| **Articulated Trucks** | 1 | 49 | 0 | | 50 | 0 | | 0 | 32 | 6 | 0 | | 38 | 7 | 7 | 0 | | 14 | 0 | | 0 | 102 |
| **Articulated Trucks %** | 0.8% | 5.2% | 0% | | 4.6% | 0% | | 0% | 10.7% | 0.8% | 0% | | 3.6% | 1.6% | 2.1% | 0% | | 1.8% | 0% | | 0% | 3.5% |
| **Bicycles on Road** | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 |
| **Bicycles on Road %** | 0% | 0% | 0% | | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% | | 0% | 0% |
| **Pedestrians** | - | - | - | 0 | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | 0 | - | **-** |
| **Pedestrians%** | - | - | - | 0% | | - | 0% | | - | - | - | 0% | | - | - | - | 0% | | - | 0% | | **-** |

Spectrum

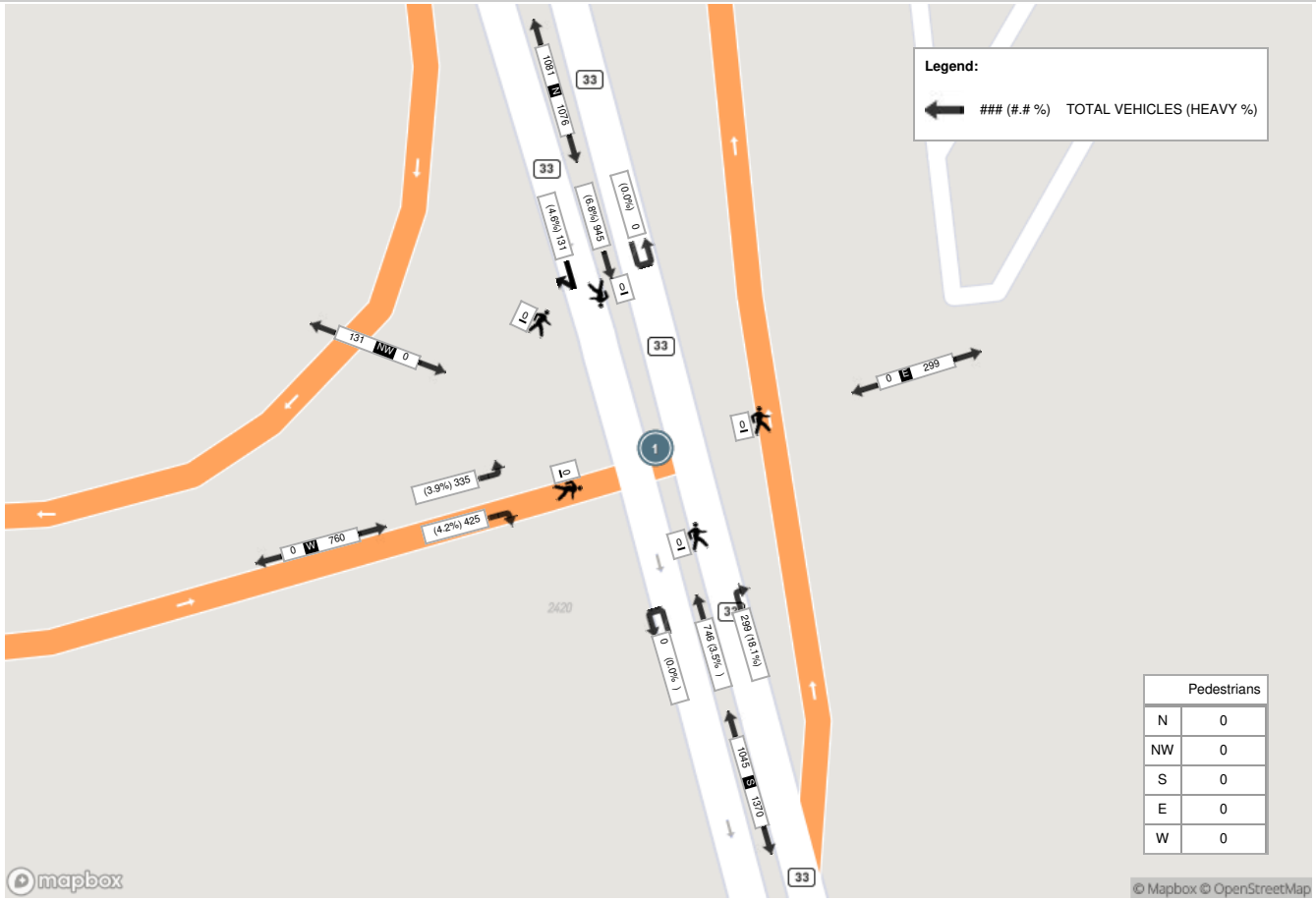
Turning Movement Count
Location Name: HWY 401 EB OFF-RAMP & TOWNLINE ROAD
Date: Tue, Sep 30, 2025 Deployment Lead: Rey Fernandez

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

**Peak Hour: 04:30 PM - 05:30 PM Weather: Clear Sky (23 °C)**

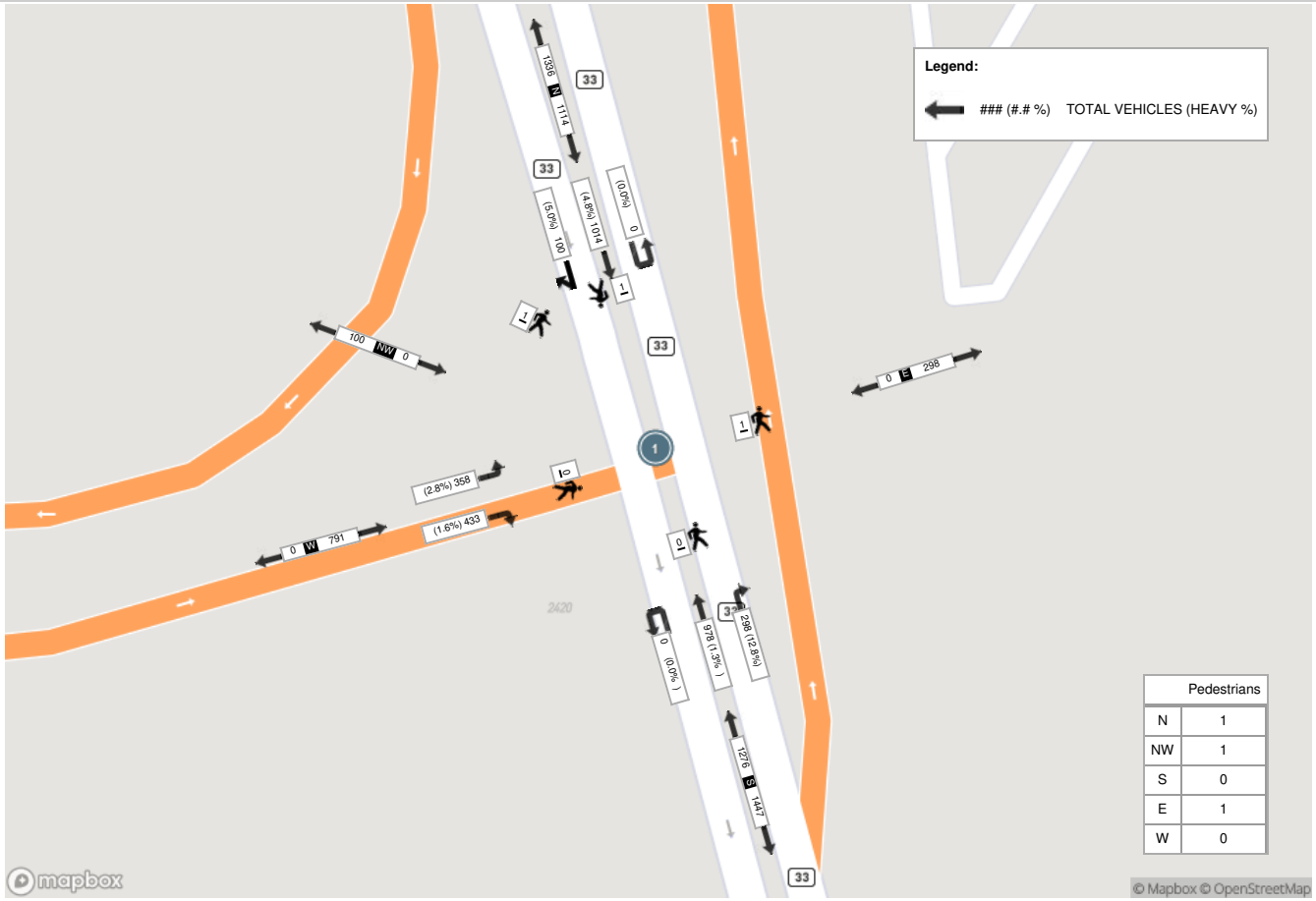
| Start Time | N Approach TOWNLINE RD | | | | | E Approach HWY 401 EB ON RAMP FROM NB TOWNLINE RD | | | S Approach TOWNLINE RD | | | | | W Approach HWY 401 EB OFF RAMP AT TOWNLINE RD | | | | | NW Approach HWY 401 EB ON RAMP FROM SB TOWNLINE RD | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hard Right | Thru | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | Right | Thru | UTurn | Peds | Approach Total | Right | Left | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | |
| 2025-09-30 16:30:00 | 15 | 259 | 0 | 1 | 274 | 0 | 1 | 0 | 79 | 283 | 0 | 0 | 362 | 98 | 103 | 0 | 0 | 201 | 0 | 1 | 0 | 837 |
| 2025-09-30 16:45:00 | 26 | 257 | 0 | 0 | 283 | 0 | 0 | 0 | 78 | 229 | 0 | 0 | 307 | 109 | 83 | 0 | 0 | 192 | 0 | 0 | 0 | 782 |
| 2025-09-30 17:00:00 | 35 | 249 | 0 | 0 | 284 | 0 | 0 | 0 | 68 | 216 | 0 | 0 | 284 | 115 | 88 | 0 | 0 | 203 | 0 | 0 | 0 | 771 |
| 2025-09-30 17:15:00 | 24 | 249 | 0 | 0 | 273 | 0 | 0 | 0 | 73 | 250 | 0 | 0 | 323 | 111 | 84 | 0 | 0 | 195 | 0 | 0 | 0 | 791 |
| **Grand Total** | 100 | 1014 | 0 | 1 | 1114 | 0 | 1 | 0 | 298 | 978 | 0 | 0 | 1276 | 433 | 358 | 0 | 0 | 791 | 0 | 1 | 0 | **3181** |
| **Approach%** | 9% | 91% | 0% | | - | 0% | | - | 23.4% | 76.6% | 0% | | - | 54.7% | 45.3% | 0% | | - | 0% | | - | **-** |
| **Totals %** | 3.1% | 31.9% | 0% | | 35% | 0% | | 0% | 9.4% | 30.7% | 0% | | 40.1% | 13.6% | 11.3% | 0% | | 24.9% | 0% | | 0% | **-** |
| **PHF** | 0.71 | 0.98 | 0 | | 0.98 | 0 | | 0 | 0.94 | 0.86 | 0 | | 0.88 | 0.94 | 0.87 | 0 | | 0.97 | 0 | | 0 | 0.95 |
| **Heavy** | 5 | 49 | 0 | | 54 | 0 | | 0 | 38 | 13 | 0 | | 51 | 7 | 10 | 0 | | 17 | 0 | | 0 | 122 |
| **Heavy %** | 5% | 4.8% | 0% | | 4.8% | 0% | | 0% | 12.8% | 1.3% | 0% | | 4% | 1.6% | 2.8% | 0% | | 2.1% | 0% | | 0% | 3.8% |
| **Lights** | 95 | 965 | 0 | | 1060 | 0 | | 0 | 260 | 962 | 0 | | 1222 | 426 | 348 | 0 | | 774 | 0 | | 0 | 3056 |
| **Lights %** | 95% | 95.2% | 0% | | 95.2% | 0% | | 0% | 87.2% | 98.4% | 0% | | 95.8% | 98.4% | 97.2% | 0% | | 97.9% | 0% | | 0% | 96.1% |
| **Single-Unit Trucks** | 2 | 18 | 0 | | 20 | 0 | | 0 | 12 | 6 | 0 | | 18 | 2 | 8 | 0 | | 10 | 0 | | 0 | 48 |
| **Single-Unit Trucks %** | 2% | 1.8% | 0% | | 1.8% | 0% | | 0% | 4% | 0.6% | 0% | | 1.4% | 0.5% | 2.2% | 0% | | 1.3% | 0% | | 0% | 1.5% |
| **Buses** | 1 | 0 | 0 | | 1 | 0 | | 0 | 0 | 2 | 0 | | 2 | 0 | 0 | 0 | | 0 | 0 | | 0 | 3 |
| **Buses %** | 1% | 0% | 0% | | 0.1% | 0% | | 0% | 0% | 0.2% | 0% | | 0.2% | 0% | 0% | 0% | | 0% | 0% | | 0% | 0.1% |
| **Articulated Trucks** | 2 | 31 | 0 | | 33 | 0 | | 0 | 26 | 5 | 0 | | 31 | 5 | 2 | 0 | | 7 | 0 | | 0 | 71 |
| **Articulated Trucks %** | 2% | 3.1% | 0% | | 3% | 0% | | 0% | 8.7% | 0.5% | 0% | | 2.4% | 1.2% | 0.6% | 0% | | 0.9% | 0% | | 0% | 2.2% |
| **Bicycles on Road** | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 3 | 0 | | 3 | 0 | 0 | 0 | | 0 | 0 | | 0 | 3 |
| **Bicycles on Road %** | 0% | 0% | 0% | | 0% | 0% | | 0% | 0% | 0.3% | 0% | | 0.2% | 0% | 0% | 0% | | 0% | 0% | | 0% | 0.1% |
| **Pedestrians** | - | - | - | 1 | - | - | 1 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | 1 | - | **-** |
| **Pedestrians%** | - | - | - | 33.3% | | - | 33.3% | | - | - | - | 0% | | - | - | - | 0% | | - | 33.3% | | **-** |

**Peak Hour: 07:30 AM - 08:30 AM** **Weather: Clear Sky (11 °C)**




| | Pedestrians |
|---|---|
| N | 0 |
| NW | 0 |
| S | 0 |
| E | 0 |
| W | 0 |

**Peak Hour: 04:30 PM - 05:30 PM** **Weather: Clear Sky (23 °C)**



Spectrum

Turning Movement Count
Location Name: HWY 401 WB OFF-RAMP & TOWNLINE ROAD
Date: Tue, Sep 30, 2025 Deployment Lead: Rey Fernandez

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

## Turning Movement Count (2 . HWY 401 WB OFF-RAMP & TOWNLINE ROAD)

| Start Time | N Approach TOWNLINE ROAD | | | | | E Approach HWY 401 WB OFF-RAMP | | | | | S Approach TOWNLINE ROAD | | | | | W Approach HWY 401 WB ON-RAMP | | | SE Approach HWY 401 WB ON-RAMP | | | Int. Total (15 min) | Int. Total (1 hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right N:W | Thru N:S | UTurn N:N | Peds N: | Approach Total | Right E:N | Left E:S | UTurn E:E | Peds E: | Approach Total | Hard Right S:SE | Thru S:N | UTurn S:S | Peds S: | Approach Total | UTurn W:W | Peds W: | Approach Total | UTurn SE:SE | Peds SE: | Approach Total | | |
| 2025-09-30 07:00:00 | 53 | 160 | 0 | 0 | 213 | 12 | 64 | 0 | 0 | 76 | 59 | 79 | 0 | 0 | 138 | 0 | 0 | 0 | 0 | 0 | 0 | 427 | |
| 2025-09-30 07:15:00 | 82 | 136 | 0 | 0 | 218 | 16 | 85 | 0 | 0 | 101 | 68 | 85 | 0 | 0 | 153 | 0 | 0 | 0 | 0 | 0 | 0 | 472 | |
| 2025-09-30 07:30:00 | 111 | 145 | 0 | 0 | 256 | 20 | 95 | 0 | 0 | 115 | 120 | 163 | 0 | 0 | 283 | 0 | 0 | 0 | 0 | 0 | 0 | 654 | |
| 2025-09-30 07:45:00 | 107 | 151 | 0 | 0 | 258 | 30 | 125 | 0 | 0 | 155 | 124 | 219 | 0 | 0 | 343 | 0 | 0 | 0 | 0 | 0 | 0 | 756 | 2309 |
| 2025-09-30 08:00:00 | 81 | 172 | 0 | 0 | 253 | 36 | 116 | 0 | 0 | 152 | 79 | 156 | 0 | 0 | 235 | 0 | 0 | 0 | 0 | 0 | 0 | 640 | 2522 |
| 2025-09-30 08:15:00 | 66 | 156 | 0 | 0 | 222 | 32 | 121 | 0 | 0 | 153 | 79 | 153 | 0 | 0 | 232 | 0 | 0 | 0 | 0 | 0 | 0 | 607 | 2657 |
| 2025-09-30 08:30:00 | 67 | 130 | 0 | 0 | 197 | 27 | 133 | 0 | 0 | 160 | 73 | 154 | 0 | 0 | 227 | 0 | 0 | 0 | 0 | 0 | 0 | 584 | 2587 |
| 2025-09-30 08:45:00 | 62 | 165 | 0 | 0 | 227 | 28 | 86 | 0 | 0 | 114 | 59 | 169 | 0 | 0 | 228 | 0 | 0 | 0 | 0 | 0 | 0 | 569 | 2400 |
| ***BREAK*** | | | | | | | | | | | | | | | | | | | | | | | |
| 2025-09-30 16:00:00 | 71 | 125 | 0 | 0 | 196 | 56 | 133 | 0 | 0 | 189 | 68 | 190 | 0 | 0 | 258 | 0 | 0 | 0 | 0 | 0 | 0 | 643 | |
| 2025-09-30 16:15:00 | 70 | 127 | 0 | 0 | 197 | 67 | 126 | 0 | 0 | 193 | 76 | 261 | 0 | 0 | 337 | 0 | 1 | 0 | 0 | 0 | 0 | 727 | |
| 2025-09-30 16:30:00 | 74 | 159 | 0 | 0 | 233 | 76 | 124 | 0 | 0 | 200 | 93 | 281 | 0 | 0 | 374 | 0 | 1 | 0 | 0 | 0 | 0 | 807 | |
| 2025-09-30 16:45:00 | 92 | 148 | 0 | 0 | 240 | 71 | 109 | 0 | 0 | 180 | 65 | 273 | 0 | 0 | 338 | 0 | 0 | 0 | 0 | 0 | 0 | 758 | 2935 |
| 2025-09-30 17:00:00 | 95 | 166 | 0 | 0 | 261 | 83 | 116 | 0 | 0 | 199 | 81 | 218 | 0 | 0 | 299 | 0 | 0 | 0 | 0 | 0 | 0 | 759 | 3051 |
| 2025-09-30 17:15:00 | 75 | 135 | 0 | 0 | 210 | 77 | 123 | 0 | 0 | 200 | 83 | 247 | 0 | 0 | 330 | 0 | 0 | 0 | 0 | 0 | 0 | 740 | 3064 |
| 2025-09-30 17:30:00 | 51 | 120 | 0 | 0 | 171 | 59 | 130 | 0 | 0 | 189 | 58 | 223 | 0 | 0 | 281 | 0 | 0 | 0 | 0 | 0 | 0 | 641 | 2898 |
| 2025-09-30 17:45:00 | 65 | 126 | 0 | 0 | 191 | 75 | 135 | 0 | 0 | 210 | 49 | 241 | 0 | 0 | 290 | 0 | 1 | 0 | 0 | 0 | 0 | 691 | 2831 |
| **Grand Total** | 1222 | 2321 | 0 | 0 | 3543 | 765 | 1821 | 0 | 0 | 2586 | 1234 | 3112 | 0 | 0 | 4346 | 0 | 3 | 0 | 0 | 0 | 0 | **10475** | - |
| **Approach%** | 34.5% | 65.5% | 0% | | - | 29.6% | 70.4% | 0% | | - | 28.4% | 71.6% | 0% | | - | 0% | | - | 0% | | - | **-** | - |
| **Totals %** | 11.7% | 22.2% | 0% | | 33.8% | 7.3% | 17.4% | 0% | | 24.7% | 11.8% | 29.7% | 0% | | 41.5% | 0% | | 0% | 0% | | 0% | **-** | - |
| **Heavy** | 38 | 53 | 0 | | - | 18 | 217 | 0 | | - | 44 | 85 | 0 | | - | 0 | | - | 0 | | - | **-** | - |
| **Heavy %** | 3.1% | 2.3% | 0% | | - | 2.4% | 11.9% | 0% | | - | 3.6% | 2.7% | 0% | | - | 0% | | - | 0% | | - | **-** | - |
| **Bicycles** | - | - | - | | - | - | - | - | | - | - | - | - | | - | - | | - | - | | - | **-** | - |
| **Bicycle %** | - | - | - | | - | - | - | - | | - | - | - | - | | - | - | | - | - | | - | **-** | - |

Spectrum

Turning Movement Count
Location Name: HWY 401 WB OFF-RAMP & TOWNLINE ROAD
Date: Tue, Sep 30, 2025 Deployment Lead: Rey Fernandez

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CANADA

**Peak Hour: 07:30 AM - 08:30 AM Weather: Clear Sky (11 °C)**

| Start Time | N Approach TOWNLINE ROAD | | | | | E Approach HWY 401 WB OFF-RAMP | | | | | S Approach TOWNLINE ROAD | | | | | W Approach HWY 401 WB ON-RAMP | | | SE Approach HWY 401 WB ON-RAMP | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | UTurn | Peds | Approach Total | Right | Left | UTurn | Peds | Approach Total | Hard Right | Thru | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | |
| 2025-09-30 07:30:00 | 111 | 145 | 0 | 0 | 256 | 20 | 95 | 0 | 0 | 115 | 120 | 163 | 0 | 0 | 283 | 0 | 0 | 0 | 0 | 0 | 0 | 654 |
| 2025-09-30 07:45:00 | 107 | 151 | 0 | 0 | 258 | 30 | 125 | 0 | 0 | 155 | 124 | 219 | 0 | 0 | 343 | 0 | 0 | 0 | 0 | 0 | 0 | 756 |
| 2025-09-30 08:00:00 | 81 | 172 | 0 | 0 | 253 | 36 | 116 | 0 | 0 | 152 | 79 | 156 | 0 | 0 | 235 | 0 | 0 | 0 | 0 | 0 | 0 | 640 |
| 2025-09-30 08:15:00 | 66 | 156 | 0 | 0 | 222 | 32 | 121 | 0 | 0 | 153 | 79 | 153 | 0 | 0 | 232 | 0 | 0 | 0 | 0 | 0 | 0 | 607 |
| **Grand Total** | 365 | 624 | 0 | 0 | 989 | 118 | 457 | 0 | 0 | 575 | 402 | 691 | 0 | 0 | 1093 | 0 | 0 | 0 | 0 | 0 | 0 | **2657** |
| **Approach%** | 36.9% | 63.1% | 0% | | - | 20.5% | 79.5% | 0% | | - | 36.8% | 63.2% | 0% | | - | 0% | | - | 0% | | - | **-** |
| **Totals %** | 13.7% | 23.5% | 0% | | 37.2% | 4.4% | 17.2% | 0% | | 21.6% | 15.1% | 26% | 0% | | 41.1% | 0% | | 0% | 0% | | 0% | **-** |
| **PHF** | 0.82 | 0.91 | 0 | | 0.96 | 0.82 | 0.91 | 0 | | 0.93 | 0.81 | 0.79 | 0 | | 0.8 | 0 | | 0 | 0 | | 0 | 0.88 |
| **Heavy** | 13 | 15 | 0 | | 28 | 8 | 58 | 0 | | 66 | 20 | 26 | 0 | | 46 | 0 | | 0 | 0 | | 0 | 140 |
| **Heavy %** | 3.6% | 2.4% | 0% | | 2.8% | 6.8% | 12.7% | 0% | | 11.5% | 5% | 3.8% | 0% | | 4.2% | 0% | | 0% | 0% | | 0% | 5.3% |
| **Lights** | 352 | 609 | 0 | | 961 | 110 | 399 | 0 | | 509 | 382 | 665 | 0 | | 1047 | 0 | | 0 | 0 | | 0 | 2517 |
| **Lights %** | 96.4% | 97.6% | 0% | | 97.2% | 93.2% | 87.3% | 0% | | 88.5% | 95% | 96.2% | 0% | | 95.8% | 0% | | 0% | 0% | | 0% | 94.7% |
| **Single-Unit Trucks** | 9 | 9 | 0 | | 18 | 2 | 11 | 0 | | 13 | 12 | 12 | 0 | | 24 | 0 | | 0 | 0 | | 0 | 55 |
| **Single-Unit Trucks %** | 2.5% | 1.4% | 0% | | 1.8% | 1.7% | 2.4% | 0% | | 2.3% | 3% | 1.7% | 0% | | 2.2% | 0% | | 0% | 0% | | 0% | 2.1% |
| **Buses** | 0 | 3 | 0 | | 3 | 0 | 0 | 0 | | 0 | 2 | 7 | 0 | | 9 | 0 | | 0 | 0 | | 0 | 12 |
| **Buses %** | 0% | 0.5% | 0% | | 0.3% | 0% | 0% | 0% | | 0% | 0.5% | 1% | 0% | | 0.8% | 0% | | 0% | 0% | | 0% | 0.5% |
| **Articulated Trucks** | 4 | 3 | 0 | | 7 | 6 | 47 | 0 | | 53 | 6 | 7 | 0 | | 13 | 0 | | 0 | 0 | | 0 | 73 |
| **Articulated Trucks %** | 1.1% | 0.5% | 0% | | 0.7% | 5.1% | 10.3% | 0% | | 9.2% | 1.5% | 1% | 0% | | 1.2% | 0% | | 0% | 0% | | 0% | 2.7% |
| **Bicycles on Road** | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 |
| **Bicycles on Road %** | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% | | 0% | 0% | | 0% | 0% |
| **Pedestrians** | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | 0 | - | - | 0 | - | **-** |
| **Pedestrians%** | - | - | - | 0% | | - | - | - | 0% | | - | - | - | 0% | | - | 0% | | - | 0% | | **-** |

Spectrum

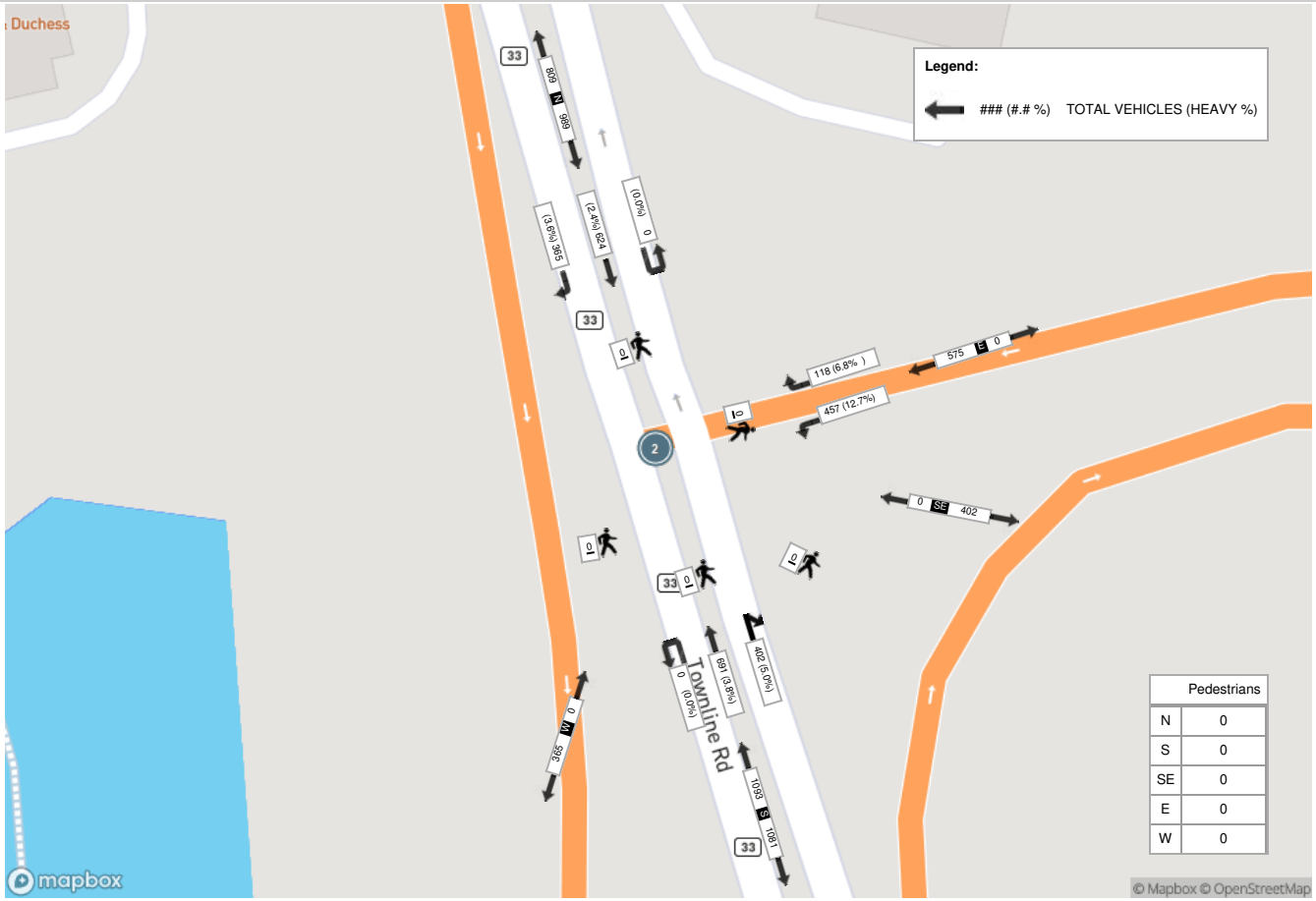
Turning Movement Count
Location Name: HWY 401 WB OFF-RAMP & TOWNLINE ROAD
Date: Tue, Sep 30, 2025 Deployment Lead: Rey Fernandez

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

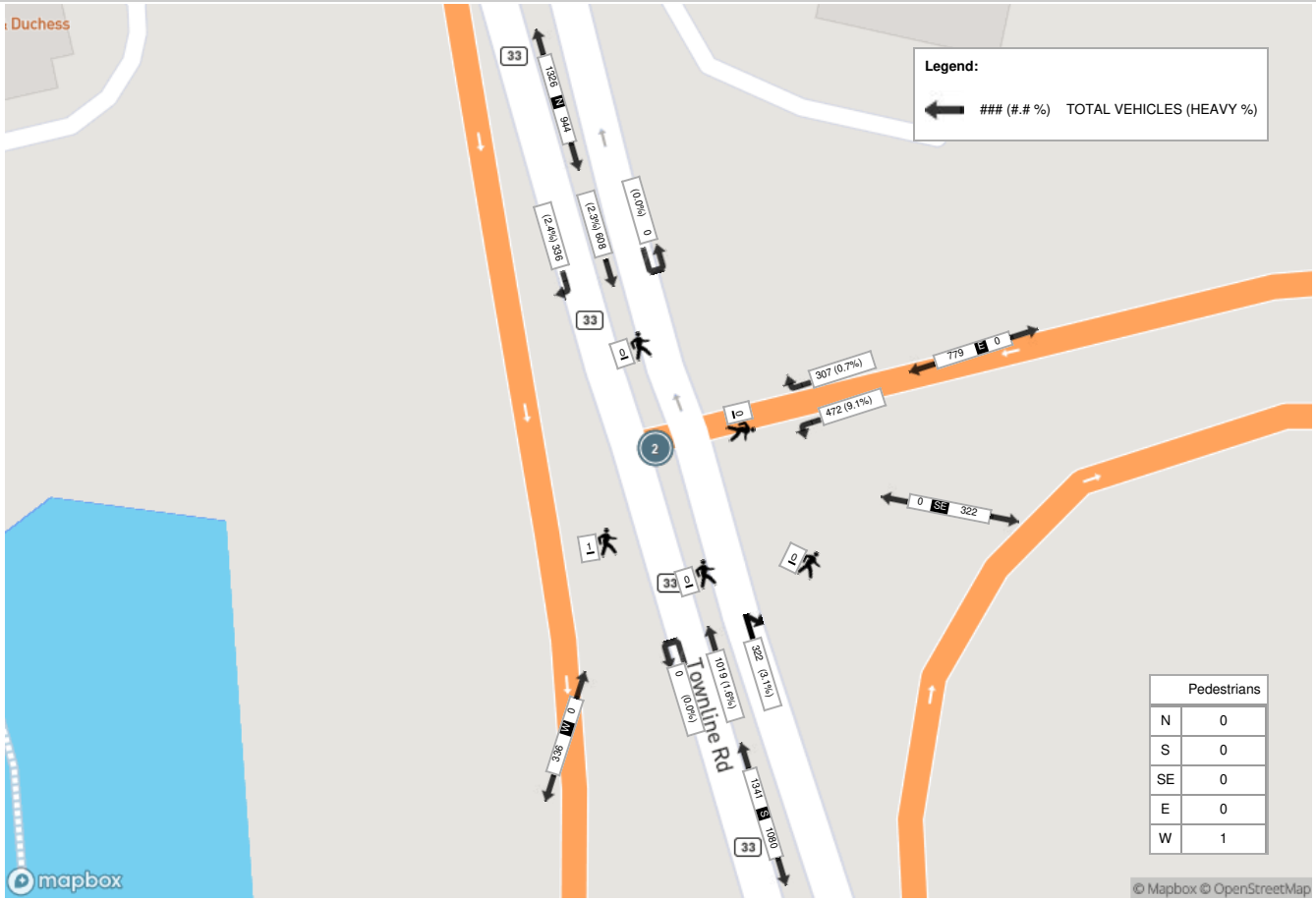
**Peak Hour: 04:30 PM - 05:30 PM Weather: Clear Sky (23 °C)**

| Start Time | N Approach TOWNLINE ROAD | | | | | E Approach HWY 401 WB OFF-RAMP | | | | | S Approach TOWNLINE ROAD | | | | | W Approach HWY 401 WB ON-RAMP | | | SE Approach HWY 401 WB ON-RAMP | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | UTurn | Peds | Approach Total | Right | Left | UTurn | Peds | Approach Total | Hard Right | Thru | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | |
| 2025-09-30 16:30:00 | 74 | 159 | 0 | 0 | 233 | 76 | 124 | 0 | 0 | 200 | 93 | 281 | 0 | 0 | 374 | 0 | 1 | 0 | 0 | 0 | 0 | 807 |
| 2025-09-30 16:45:00 | 92 | 148 | 0 | 0 | 240 | 71 | 109 | 0 | 0 | 180 | 65 | 273 | 0 | 0 | 338 | 0 | 0 | 0 | 0 | 0 | 0 | 758 |
| 2025-09-30 17:00:00 | 95 | 166 | 0 | 0 | 261 | 83 | 116 | 0 | 0 | 199 | 81 | 218 | 0 | 0 | 299 | 0 | 0 | 0 | 0 | 0 | 0 | 759 |
| 2025-09-30 17:15:00 | 75 | 135 | 0 | 0 | 210 | 77 | 123 | 0 | 0 | 200 | 83 | 247 | 0 | 0 | 330 | 0 | 0 | 0 | 0 | 0 | 0 | 740 |
| **Grand Total** | 336 | 608 | 0 | 0 | 944 | 307 | 472 | 0 | 0 | 779 | 322 | 1019 | 0 | 0 | 1341 | 0 | 1 | 0 | 0 | 0 | 0 | **3064** |
| **Approach%** | 35.6% | 64.4% | 0% | | - | 39.4% | 60.6% | 0% | | - | 24% | 76% | 0% | | - | 0% | | - | 0% | | - | **-** |
| **Totals %** | 11% | 19.8% | 0% | | 30.8% | 10% | 15.4% | 0% | | 25.4% | 10.5% | 33.3% | 0% | | 43.8% | 0% | | 0% | 0% | | 0% | **-** |
| **PHF** | 0.88 | 0.92 | 0 | | 0.9 | 0.92 | 0.95 | 0 | | 0.97 | 0.87 | 0.91 | 0 | | 0.9 | 0 | | 0 | 0 | | 0 | 0.95 |
| **Heavy** | 8 | 14 | 0 | | 22 | 2 | 43 | 0 | | 45 | 10 | 16 | 0 | | 26 | 0 | | 0 | 0 | | 0 | 93 |
| **Heavy %** | 2.4% | 2.3% | 0% | | 2.3% | 0.7% | 9.1% | 0% | | 5.8% | 3.1% | 1.6% | 0% | | 1.9% | 0% | | 0% | 0% | | 0% | 3% |
| **Lights** | 328 | 594 | 0 | | 922 | 305 | 429 | 0 | | 734 | 312 | 1002 | 0 | | 1314 | 0 | | 0 | 0 | | 0 | 2970 |
| **Lights %** | 97.6% | 97.7% | 0% | | 97.7% | 99.3% | 90.9% | 0% | | 94.2% | 96.9% | 98.3% | 0% | | 98% | 0% | | 0% | 0% | | 0% | 96.9% |
| **Single-Unit Trucks** | 6 | 6 | 0 | | 12 | 0 | 18 | 0 | | 18 | 6 | 10 | 0 | | 16 | 0 | | 0 | 0 | | 0 | 46 |
| **Single-Unit Trucks %** | 1.8% | 1% | 0% | | 1.3% | 0% | 3.8% | 0% | | 2.3% | 1.9% | 1% | 0% | | 1.2% | 0% | | 0% | 0% | | 0% | 1.5% |
| **Buses** | 1 | 1 | 0 | | 2 | 0 | 0 | 0 | | 0 | 0 | 2 | 0 | | 2 | 0 | | 0 | 0 | | 0 | 4 |
| **Buses %** | 0.3% | 0.2% | 0% | | 0.2% | 0% | 0% | 0% | | 0% | 0% | 0.2% | 0% | | 0.1% | 0% | | 0% | 0% | | 0% | 0.1% |
| **Articulated Trucks** | 1 | 7 | 0 | | 8 | 2 | 25 | 0 | | 27 | 4 | 4 | 0 | | 8 | 0 | | 0 | 0 | | 0 | 43 |
| **Articulated Trucks %** | 0.3% | 1.2% | 0% | | 0.8% | 0.7% | 5.3% | 0% | | 3.5% | 1.2% | 0.4% | 0% | | 0.6% | 0% | | 0% | 0% | | 0% | 1.4% |
| **Bicycles on Road** | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | 1 | 0 | | 1 | 0 | | 0 | 0 | | 0 | 1 |
| **Bicycles on Road %** | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% | 0.1% | 0% | | 0.1% | 0% | | 0% | 0% | | 0% | 0% |
| **Pedestrians** | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | 1 | - | - | 0 | - | **-** |
| **Pedestrians%** | - | - | - | 0% | | - | - | - | 0% | | - | - | - | 0% | | - | 100% | | - | 0% | | **-** |

**Peak Hour: 07:30 AM - 08:30 AM** **Weather: Clear Sky (11 °C)**



**Peak Hour: 04:30 PM - 05:30 PM** **Weather: Clear Sky (23 °C)**



Spectrum

Turning Movement Count
Location Name: TOWNLINE RD & ELLIS RD/SIDEROAD 10N
Date: Tue, Sep 30, 2025 Deployment Lead: Rey Fernandez

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

## Turning Movement Count (4 . TOWNLINE RD & ELLIS RD/SIDEROAD 10N)

| Start Time | N Approach TOWNLINE RD | | | | | | E Approach SIDEROAD 10N | | | | | | S Approach TOWNLINE RD | | | | | | W Approach ELLIS RD | | | | | | Int. Total (15 min) | Int. Total (1 hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right N:W | Thru N:S | Left N:E | UTurn N:N | Peds N: | Approach Total | Right E:N | Thru E:W | Left E:S | UTurn E:E | Peds E: | Approach Total | Right S:E | Thru S:N | Left S:W | UTurn S:S | Peds S: | Approach Total | Right W:S | Thru W:E | Left W:N | UTurn W:W | Peds W: | Approach Total | | |
| 2025-09-30 07:00:00 | 3 | 106 | 0 | 0 | 0 | 109 | 0 | 0 | 3 | 0 | 0 | 3 | 4 | 60 | 7 | 0 | 0 | 71 | 52 | 0 | 5 | 0 | 0 | 57 | 240 | |
| 2025-09-30 07:15:00 | 6 | 124 | 2 | 0 | 0 | 132 | 1 | 1 | 1 | 0 | 0 | 3 | 4 | 72 | 15 | 0 | 0 | 91 | 47 | 2 | 18 | 0 | 0 | 67 | 293 | |
| 2025-09-30 07:30:00 | 4 | 128 | 1 | 0 | 0 | 133 | 1 | 2 | 2 | 0 | 0 | 5 | 6 | 124 | 19 | 0 | 0 | 149 | 56 | 9 | 19 | 0 | 0 | 84 | 371 | |
| 2025-09-30 07:45:00 | 6 | 150 | 1 | 0 | 0 | 157 | 2 | 4 | 8 | 0 | 0 | 14 | 13 | 153 | 19 | 0 | 0 | 185 | 60 | 6 | 29 | 0 | 0 | 95 | 451 | 1355 |
| 2025-09-30 08:00:00 | 6 | 145 | 1 | 0 | 0 | 152 | 0 | 3 | 2 | 0 | 0 | 5 | 9 | 136 | 32 | 0 | 0 | 177 | 53 | 6 | 17 | 0 | 0 | 76 | 410 | 1525 |
| 2025-09-30 08:15:00 | 11 | 144 | 1 | 0 | 0 | 156 | 1 | 1 | 2 | 0 | 0 | 4 | 13 | 91 | 31 | 0 | 0 | 135 | 36 | 7 | 15 | 0 | 0 | 58 | 353 | 1585 |
| 2025-09-30 08:30:00 | 12 | 96 | 0 | 0 | 0 | 108 | 0 | 2 | 7 | 0 | 0 | 9 | 6 | 98 | 29 | 0 | 0 | 133 | 60 | 5 | 13 | 0 | 0 | 78 | 328 | 1542 |
| 2025-09-30 08:45:00 | 11 | 114 | 1 | 0 | 0 | 126 | 0 | 5 | 9 | 0 | 0 | 14 | 10 | 103 | 35 | 0 | 0 | 148 | 46 | 5 | 15 | 0 | 0 | 66 | 354 | 1445 |
| ***BREAK*** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2025-09-30 16:00:00 | 16 | 92 | 1 | 0 | 0 | 109 | 2 | 6 | 12 | 0 | 0 | 20 | 5 | 146 | 58 | 0 | 0 | 209 | 28 | 5 | 6 | 0 | 0 | 39 | 377 | |
| 2025-09-30 16:15:00 | 15 | 101 | 5 | 0 | 0 | 121 | 2 | 10 | 14 | 0 | 0 | 26 | 6 | 185 | 57 | 0 | 0 | 248 | 31 | 4 | 15 | 0 | 0 | 50 | 445 | |
| 2025-09-30 16:30:00 | 10 | 115 | 0 | 0 | 0 | 125 | 1 | 9 | 18 | 0 | 0 | 28 | 9 | 213 | 80 | 0 | 0 | 302 | 26 | 4 | 18 | 0 | 1 | 48 | 503 | |
| 2025-09-30 16:45:00 | 15 | 145 | 4 | 0 | 0 | 164 | 2 | 11 | 16 | 0 | 0 | 29 | 4 | 213 | 74 | 0 | 1 | 291 | 32 | 6 | 9 | 0 | 0 | 47 | 531 | 1856 |
| 2025-09-30 17:00:00 | 17 | 112 | 1 | 0 | 0 | 130 | 5 | 6 | 22 | 0 | 0 | 33 | 13 | 186 | 69 | 0 | 0 | 268 | 35 | 6 | 6 | 0 | 0 | 47 | 478 | 1957 |
| 2025-09-30 17:15:00 | 14 | 87 | 3 | 0 | 0 | 104 | 1 | 11 | 9 | 0 | 0 | 21 | 7 | 191 | 95 | 0 | 0 | 293 | 37 | 4 | 5 | 0 | 0 | 46 | 464 | 1976 |
| 2025-09-30 17:30:00 | 11 | 86 | 0 | 0 | 0 | 97 | 2 | 7 | 7 | 0 | 0 | 16 | 3 | 171 | 69 | 0 | 2 | 243 | 30 | 4 | 12 | 0 | 0 | 46 | 402 | 1875 |
| 2025-09-30 17:45:00 | 13 | 107 | 0 | 0 | 0 | 120 | 2 | 13 | 7 | 0 | 0 | 22 | 5 | 145 | 101 | 0 | 0 | 251 | 26 | 2 | 4 | 0 | 0 | 32 | 425 | 1769 |
| **Grand Total** | 170 | 1852 | 21 | 0 | 0 | 2043 | 22 | 91 | 139 | 0 | 0 | 252 | 117 | 2287 | 790 | 0 | 3 | 3194 | 655 | 75 | 206 | 0 | 1 | 936 | **6425** | - |
| **Approach%** | 8.3% | 90.7% | 1% | 0% | | - | 8.7% | 36.1% | 55.2% | 0% | | - | 3.7% | 71.6% | 24.7% | 0% | | - | 70% | 8% | 22% | 0% | | - | **-** | - |
| **Totals %** | 2.6% | 28.8% | 0.3% | 0% | | 31.8% | 0.3% | 1.4% | 2.2% | 0% | | 3.9% | 1.8% | 35.6% | 12.3% | 0% | | 49.7% | 10.2% | 1.2% | 3.2% | 0% | | 14.6% | **-** | - |
| **Heavy** | 1 | 55 | 2 | 0 | | - | 1 | 0 | 2 | 0 | | - | 2 | 65 | 11 | 0 | | - | 14 | 0 | 1 | 0 | | - | **-** | - |
| **Heavy %** | 0.6% | 3% | 9.5% | 0% | | - | 4.5% | 0% | 1.4% | 0% | | - | 1.7% | 2.8% | 1.4% | 0% | | - | 2.1% | 0% | 0.5% | 0% | | - | **-** | - |
| **Bicycles** | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | **-** | - |
| **Bicycle %** | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | **-** | - |

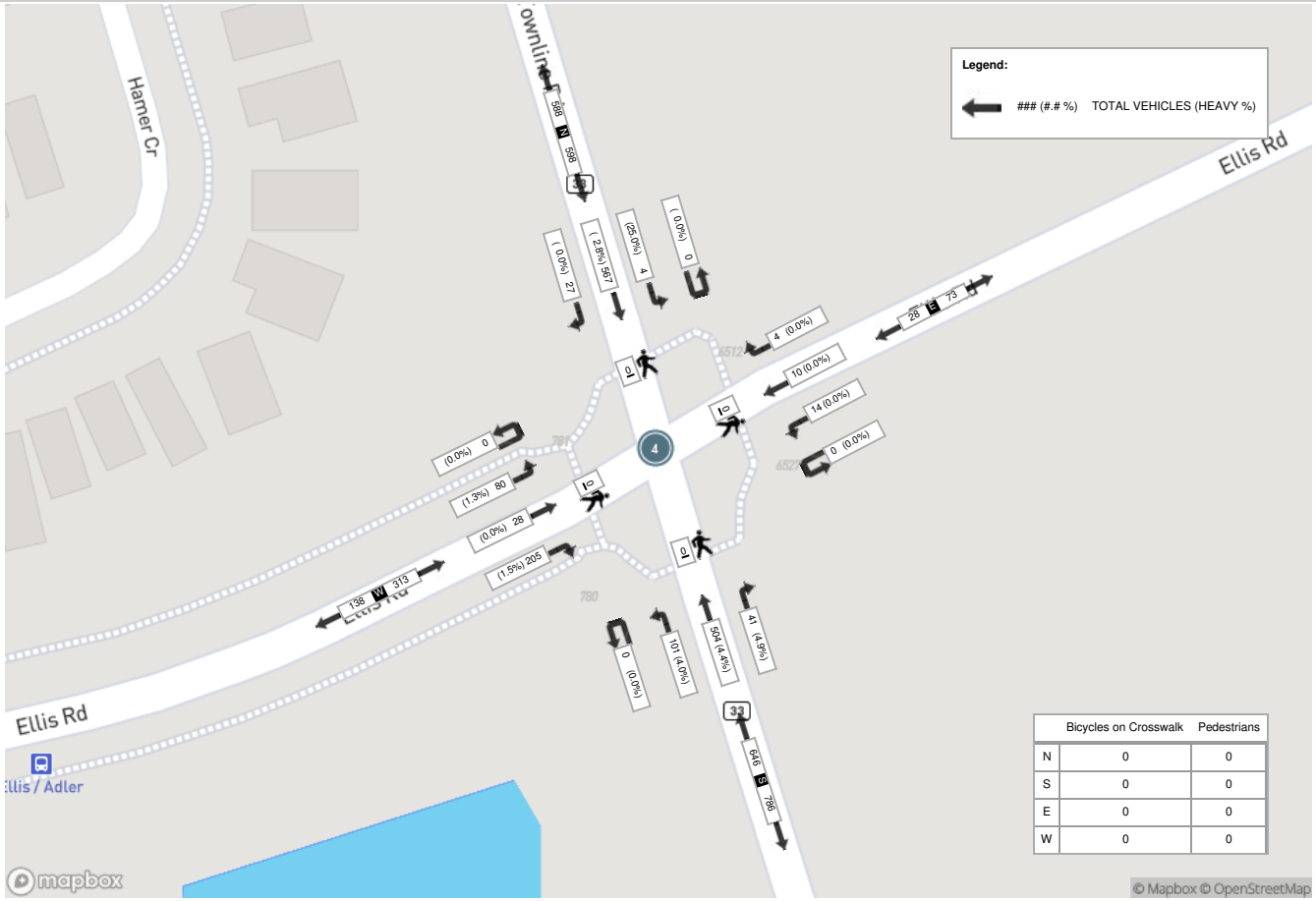
**Peak Hour: 07:30 AM - 08:30 AM** **Weather: Clear Sky (11 °C)**

| Start Time | N Approach TOWNLINE RD | | | | | | E Approach SIDEROAD 10N | | | | | | S Approach TOWNLINE RD | | | | | | W Approach ELLIS RD | | | | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | UTurn | Peds | Approach Total | Right | Thru | Left | UTurn | Peds | Approach Total | Right | Thru | Left | UTurn | Peds | Approach Total | Right | Thru | Left | UTurn | Peds | Approach Total | |
| 2025-09-30 07:30:00 | 4 | 128 | 1 | 0 | 0 | 133 | 1 | 2 | 2 | 0 | 0 | 5 | 6 | 124 | 19 | 0 | 0 | 149 | 56 | 9 | 19 | 0 | 0 | 84 | 371 |
| 2025-09-30 07:45:00 | 6 | 150 | 1 | 0 | 0 | 157 | 2 | 4 | 8 | 0 | 0 | 14 | 13 | 153 | 19 | 0 | 0 | 185 | 60 | 6 | 29 | 0 | 0 | 95 | 451 |
| 2025-09-30 08:00:00 | 6 | 145 | 1 | 0 | 0 | 152 | 0 | 3 | 2 | 0 | 0 | 5 | 9 | 136 | 32 | 0 | 0 | 177 | 53 | 6 | 17 | 0 | 0 | 76 | 410 |
| 2025-09-30 08:15:00 | 11 | 144 | 1 | 0 | 0 | 156 | 1 | 1 | 2 | 0 | 0 | 4 | 13 | 91 | 31 | 0 | 0 | 135 | 36 | 7 | 15 | 0 | 0 | 58 | 353 |
| **Grand Total** | 27 | 567 | 4 | 0 | 0 | 598 | 4 | 10 | 14 | 0 | 0 | 28 | 41 | 504 | 101 | 0 | 0 | 646 | 205 | 28 | 80 | 0 | 0 | 313 | **1585** |
| **Approach%** | 4.5% | 94.8% | 0.7% | 0% | | - | 14.3% | 35.7% | 50% | 0% | | - | 6.3% | 78% | 15.6% | 0% | | - | 65.5% | 8.9% | 25.6% | 0% | | - | **-** |
| **Totals %** | 1.7% | 35.8% | 0.3% | 0% | | 37.7% | 0.3% | 0.6% | 0.9% | 0% | | 1.8% | 2.6% | 31.8% | 6.4% | 0% | | 40.8% | 12.9% | 1.8% | 5% | 0% | | 19.7% | **-** |
| **PHF** | 0.61 | 0.95 | 1 | 0 | | 0.95 | 0.5 | 0.63 | 0.44 | 0 | | 0.5 | 0.79 | 0.82 | 0.79 | 0 | | 0.87 | 0.85 | 0.78 | 0.69 | 0 | | 0.82 | 0.88 |
| **Heavy** | 0 | 16 | 1 | 0 | | 17 | 0 | 0 | 0 | 0 | | 0 | 2 | 22 | 4 | 0 | | 28 | 3 | 0 | 1 | 0 | | 4 | 49 |
| **Heavy %** | 0% | 2.8% | 25% | 0% | | 2.8% | 0% | 0% | 0% | 0% | | 0% | 4.9% | 4.4% | 4% | 0% | | 4.3% | 1.5% | 0% | 1.3% | 0% | | 1.3% | 3.1% |
| **Lights** | 27 | 551 | 3 | 0 | | 581 | 4 | 9 | 13 | 0 | | 26 | 39 | 482 | 97 | 0 | | 618 | 202 | 28 | 79 | 0 | | 309 | 1534 |
| **Lights %** | 100% | 97.2% | 75% | 0% | | 97.2% | 100% | 90% | 92.9% | 0% | | 92.9% | 95.1% | 95.6% | 96% | 0% | | 95.7% | 98.5% | 100% | 98.8% | 0% | | 98.7% | 96.8% |
| **Single-Unit Trucks** | 0 | 9 | 0 | 0 | | 9 | 0 | 0 | 0 | 0 | | 0 | 1 | 5 | 1 | 0 | | 7 | 0 | 0 | 0 | 0 | | 0 | 16 |
| **Single-Unit Trucks %** | 0% | 1.6% | 0% | 0% | | 1.5% | 0% | 0% | 0% | 0% | | 0% | 2.4% | 1% | 1% | 0% | | 1.1% | 0% | 0% | 0% | 0% | | 0% | 1% |
| **Buses** | 0 | 2 | 1 | 0 | | 3 | 0 | 0 | 0 | 0 | | 0 | 1 | 5 | 3 | 0 | | 9 | 3 | 0 | 1 | 0 | | 4 | 16 |
| **Buses %** | 0% | 0.4% | 25% | 0% | | 0.5% | 0% | 0% | 0% | 0% | | 0% | 2.4% | 1% | 3% | 0% | | 1.4% | 1.5% | 0% | 1.3% | 0% | | 1.3% | 1% |
| **Articulated Trucks** | 0 | 5 | 0 | 0 | | 5 | 0 | 0 | 0 | 0 | | 0 | 0 | 12 | 0 | 0 | | 12 | 0 | 0 | 0 | 0 | | 0 | 17 |
| **Articulated Trucks %** | 0% | 0.9% | 0% | 0% | | 0.8% | 0% | 0% | 0% | 0% | | 0% | 0% | 2.4% | 0% | 0% | | 1.9% | 0% | 0% | 0% | 0% | | 0% | 1.1% |
| **Bicycles on Road** | 0 | 0 | 0 | 0 | | 0 | 0 | 1 | 1 | 0 | | 2 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 2 |
| **Bicycles on Road %** | 0% | 0% | 0% | 0% | | 0% | 0% | 10% | 7.1% | 0% | | 7.1% | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | 0% | | 0% | 0.1% |
| **Pedestrians** | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | **-** |
| **Pedestrians%** | - | - | - | - | 0% | | - | - | - | - | 0% | | - | - | - | - | 0% | | - | - | - | - | 0% | | **-** |
| **Bicycles on Crosswalk** | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | **-** |
| **Bicycles on Crosswalk%** | - | - | - | - | 0% | | - | - | - | - | 0% | | - | - | - | - | 0% | | - | - | - | - | 0% | | **-** |

**Peak Hour: 04:30 PM - 05:30 PM Weather: Clear Sky (23 °C)**

| Start Time | N Approach TOWNLINE RD | | | | | | E Approach SIDEROAD 10N | | | | | | S Approach TOWNLINE RD | | | | | | W Approach ELLIS RD | | | | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | UTurn | Peds | Approach Total | Right | Thru | Left | UTurn | Peds | Approach Total | Right | Thru | Left | UTurn | Peds | Approach Total | Right | Thru | Left | UTurn | Peds | Approach Total | |
| 2025-09-30 16:30:00 | 10 | 115 | 0 | 0 | 0 | 125 | 1 | 9 | 18 | 0 | 0 | 28 | 9 | 213 | 80 | 0 | 0 | 302 | 26 | 4 | 18 | 0 | 1 | 48 | 503 |
| 2025-09-30 16:45:00 | 15 | 145 | 4 | 0 | 0 | 164 | 2 | 11 | 16 | 0 | 0 | 29 | 4 | 213 | 74 | 0 | 1 | 291 | 32 | 6 | 9 | 0 | 0 | 47 | 531 |
| 2025-09-30 17:00:00 | 17 | 112 | 1 | 0 | 0 | 130 | 5 | 6 | 22 | 0 | 0 | 33 | 13 | 186 | 69 | 0 | 0 | 268 | 35 | 6 | 6 | 0 | 0 | 47 | 478 |
| 2025-09-30 17:15:00 | 14 | 87 | 3 | 0 | 0 | 104 | 1 | 11 | 9 | 0 | 0 | 21 | 7 | 191 | 95 | 0 | 0 | 293 | 37 | 4 | 5 | 0 | 0 | 46 | 464 |
| **Grand Total** | 56 | 459 | 8 | 0 | 0 | 523 | 9 | 37 | 65 | 0 | 0 | 111 | 33 | 803 | 318 | 0 | 1 | 1154 | 130 | 20 | 38 | 0 | 1 | 188 | **1976** |
| **Approach%** | 10.7% | 87.8% | 1.5% | 0% | | - | 8.1% | 33.3% | 58.6% | 0% | | - | 2.9% | 69.6% | 27.6% | 0% | | - | 69.1% | 10.6% | 20.2% | 0% | | - | **-** |
| **Totals %** | 2.8% | 23.2% | 0.4% | 0% | | 26.5% | 0.5% | 1.9% | 3.3% | 0% | | 5.6% | 1.7% | 40.6% | 16.1% | 0% | | 58.4% | 6.6% | 1% | 1.9% | 0% | | 9.5% | **-** |
| **PHF** | 0.82 | 0.79 | 0.5 | 0 | | 0.8 | 0.45 | 0.84 | 0.74 | 0 | | 0.84 | 0.63 | 0.94 | 0.84 | 0 | | 0.96 | 0.88 | 0.83 | 0.53 | 0 | | 0.98 | 0.93 |
| **Heavy** | 1 | 18 | 0 | 0 | | 19 | 0 | 0 | 1 | 0 | | 1 | 0 | 11 | 1 | 0 | | 12 | 3 | 0 | 0 | 0 | | 3 | 35 |
| **Heavy %** | 1.8% | 3.9% | 0% | 0% | | 3.6% | 0% | 0% | 1.5% | 0% | | 0.9% | 0% | 1.4% | 0.3% | 0% | | 1% | 2.3% | 0% | 0% | 0% | | 1.6% | 1.8% |
| **Lights** | 55 | 441 | 6 | 0 | | 502 | 9 | 37 | 64 | 0 | | 110 | 32 | 790 | 317 | 0 | | 1139 | 127 | 18 | 38 | 0 | | 183 | 1934 |
| **Lights %** | 98.2% | 96.1% | 75% | 0% | | 96% | 100% | 100% | 98.5% | 0% | | 99.1% | 97% | 98.4% | 99.7% | 0% | | 98.7% | 97.7% | 90% | 100% | 0% | | 97.3% | 97.9% |
| **Single-Unit Trucks** | 1 | 9 | 0 | 0 | | 10 | 0 | 0 | 0 | 0 | | 0 | 0 | 7 | 0 | 0 | | 7 | 1 | 0 | 0 | 0 | | 1 | 18 |
| **Single-Unit Trucks %** | 1.8% | 2% | 0% | 0% | | 1.9% | 0% | 0% | 0% | 0% | | 0% | 0% | 0.9% | 0% | 0% | | 0.6% | 0.8% | 0% | 0% | 0% | | 0.5% | 0.9% |
| **Buses** | 0 | 1 | 0 | 0 | | 1 | 0 | 0 | 1 | 0 | | 1 | 0 | 0 | 1 | 0 | | 1 | 2 | 0 | 0 | 0 | | 2 | 5 |
| **Buses %** | 0% | 0.2% | 0% | 0% | | 0.2% | 0% | 0% | 1.5% | 0% | | 0.9% | 0% | 0% | 0.3% | 0% | | 0.1% | 1.5% | 0% | 0% | 0% | | 1.1% | 0.3% |
| **Articulated Trucks** | 0 | 8 | 0 | 0 | | 8 | 0 | 0 | 0 | 0 | | 0 | 0 | 4 | 0 | 0 | | 4 | 0 | 0 | 0 | 0 | | 0 | 12 |
| **Articulated Trucks %** | 0% | 1.7% | 0% | 0% | | 1.5% | 0% | 0% | 0% | 0% | | 0% | 0% | 0.5% | 0% | 0% | | 0.3% | 0% | 0% | 0% | 0% | | 0% | 0.6% |
| **Bicycles on Road** | 0 | 0 | 2 | 0 | | 2 | 0 | 0 | 0 | 0 | | 0 | 1 | 2 | 0 | 0 | | 3 | 0 | 2 | 0 | 0 | | 2 | 7 |
| **Bicycles on Road %** | 0% | 0% | 25% | 0% | | 0.4% | 0% | 0% | 0% | 0% | | 0% | 3% | 0.2% | 0% | 0% | | 0.3% | 0% | 10% | 0% | 0% | | 1.1% | 0.4% |
| **Pedestrians** | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | **-** |
| **Pedestrians%** | - | - | - | - | 0% | | - | - | - | - | 0% | | - | - | - | - | 0% | | - | - | - | - | 50% | | **-** |
| **Bicycles on Crosswalk** | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | **-** |
| **Bicycles on Crosswalk%** | - | - | - | - | 0% | | - | - | - | - | 0% | | - | - | - | - | 50% | | - | - | - | - | 0% | | **-** |

**Peak Hour: 07:30 AM - 08:30 AM** **Weather: Clear Sky (11 °C)**




| | Bicycles on Crosswalk | Pedestrians |
|---|---|---|
| N | 0 | 0 |
| S | 0 | 0 |
| E | 0 | 0 |
| W | 0 | 0 |

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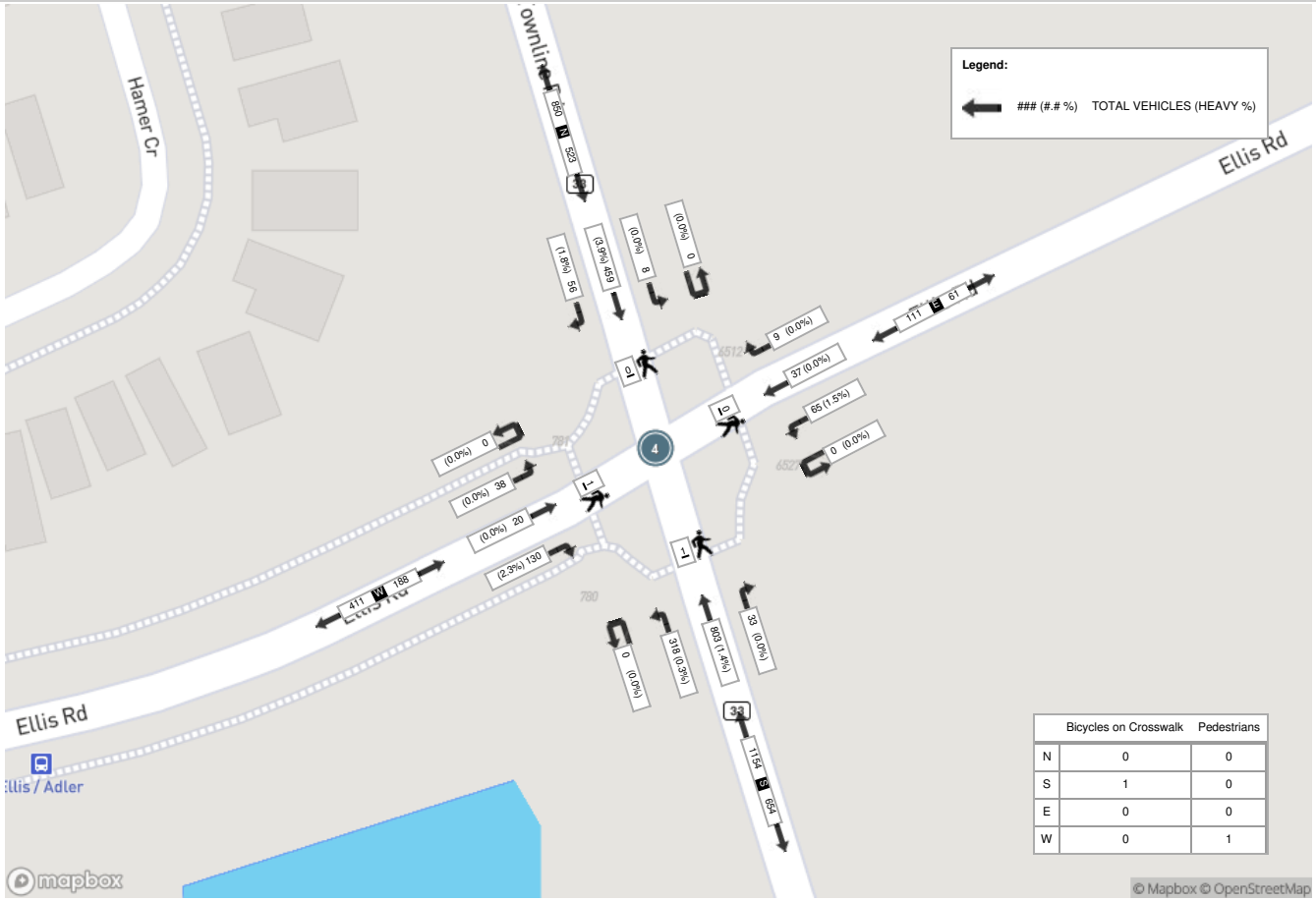
**Peak Hour: 04:30 PM - 05:30 PM** **Weather: Clear Sky (23 °C)**




| | Bicycles on Crosswalk | Pedestrians |
|---|---|---|
| N | 0 | 0 |
| S | 1 | 0 |
| E | 0 | 0 |
| W | 0 | 1 |

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## Turning Movement Count (3 . TOWNLINE RD & JAMIESON PKWY)

| Start Time | N Approach TOWNLINE RD | | | | | S Approach TOWNLINE RD | | | | | W Approach JAMIESON PKWY | | | | | Int. Total (15 min) | Int. Total (1 hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right N:W | Thru N:S | UTurn N:N | Peds N: | Approach Total | Thru S:N | Left S:W | UTurn S:S | Peds S: | Approach Total | Right W:S | Left W:N | UTurn W:W | Peds W: | Approach Total | | |
| 2025-09-30 07:00:00 | 13 | 153 | 0 | 0 | 166 | 54 | 28 | 0 | 0 | 82 | 65 | 14 | 0 | 0 | 79 | 327 | |
| 2025-09-30 07:15:00 | 18 | 131 | 0 | 0 | 149 | 60 | 48 | 0 | 0 | 108 | 53 | 30 | 0 | 0 | 83 | 340 | |
| 2025-09-30 07:30:00 | 22 | 181 | 1 | 0 | 204 | 126 | 46 | 0 | 0 | 172 | 64 | 26 | 0 | 1 | 90 | 466 | |
| 2025-09-30 07:45:00 | 45 | 164 | 0 | 0 | 209 | 144 | 101 | 0 | 0 | 245 | 79 | 38 | 0 | 0 | 117 | 571 | 1704 |
| 2025-09-30 08:00:00 | 40 | 151 | 0 | 0 | 191 | 133 | 68 | 0 | 0 | 201 | 78 | 35 | 0 | 0 | 113 | 505 | 1882 |
| 2025-09-30 08:15:00 | 41 | 154 | 0 | 0 | 195 | 111 | 61 | 1 | 0 | 173 | 55 | 30 | 0 | 0 | 85 | 453 | 1995 |
| 2025-09-30 08:30:00 | 28 | 131 | 0 | 0 | 159 | 100 | 77 | 0 | 0 | 177 | 56 | 33 | 0 | 0 | 89 | 425 | 1954 |
| 2025-09-30 08:45:00 | 26 | 146 | 0 | 0 | 172 | 115 | 72 | 3 | 0 | 190 | 69 | 32 | 0 | 0 | 101 | 463 | 1846 |
| ***BREAK*** | | | | | | | | | | | | | | | | | |
| 2025-09-30 16:00:00 | 23 | 95 | 0 | 0 | 118 | 156 | 73 | 3 | 0 | 232 | 79 | 40 | 0 | 0 | 119 | 469 | |
| 2025-09-30 16:15:00 | 32 | 122 | 0 | 0 | 154 | 218 | 95 | 1 | 0 | 314 | 67 | 47 | 0 | 0 | 114 | 582 | |
| 2025-09-30 16:30:00 | 36 | 111 | 0 | 0 | 147 | 225 | 108 | 1 | 0 | 334 | 87 | 57 | 0 | 0 | 144 | 625 | |
| 2025-09-30 16:45:00 | 54 | 143 | 0 | 0 | 197 | 255 | 101 | 3 | 0 | 359 | 85 | 45 | 0 | 0 | 130 | 686 | 2362 |
| 2025-09-30 17:00:00 | 24 | 136 | 0 | 0 | 160 | 191 | 103 | 0 | 0 | 294 | 98 | 61 | 0 | 0 | 159 | 613 | 2506 |
| 2025-09-30 17:15:00 | 25 | 118 | 0 | 0 | 143 | 244 | 83 | 1 | 0 | 328 | 83 | 46 | 0 | 0 | 129 | 600 | 2524 |
| 2025-09-30 17:30:00 | 22 | 99 | 0 | 0 | 121 | 187 | 95 | 1 | 0 | 283 | 52 | 44 | 0 | 1 | 96 | 500 | 2399 |
| 2025-09-30 17:45:00 | 19 | 123 | 0 | 0 | 142 | 227 | 73 | 4 | 0 | 304 | 57 | 27 | 0 | 0 | 84 | 530 | 2243 |
| **Grand Total** | 468 | 2158 | 1 | 0 | 2627 | 2546 | 1232 | 18 | 0 | 3796 | 1127 | 605 | 0 | 2 | 1732 | **8155** | - |
| **Approach%** | 17.8% | 82.1% | 0% | | - | 67.1% | 32.5% | 0.5% | | - | 65.1% | 34.9% | 0% | | - | **-** | - |
| **Totals %** | 5.7% | 26.5% | 0% | | 32.2% | 31.2% | 15.1% | 0.2% | | 46.5% | 13.8% | 7.4% | 0% | | 21.2% | **-** | - |
| **Heavy** | 12 | 63 | 0 | | - | 70 | 27 | 0 | | - | 21 | 8 | 0 | | - | **-** | - |
| **Heavy %** | 2.6% | 2.9% | 0% | | - | 2.7% | 2.2% | 0% | | - | 1.9% | 1.3% | 0% | | - | **-** | - |
| **Bicycles** | - | - | - | | - | - | - | - | | - | - | - | - | | - | **-** | - |
| **Bicycle %** | - | - | - | | - | - | - | - | | - | - | - | - | | - | **-** | - |

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CANADA

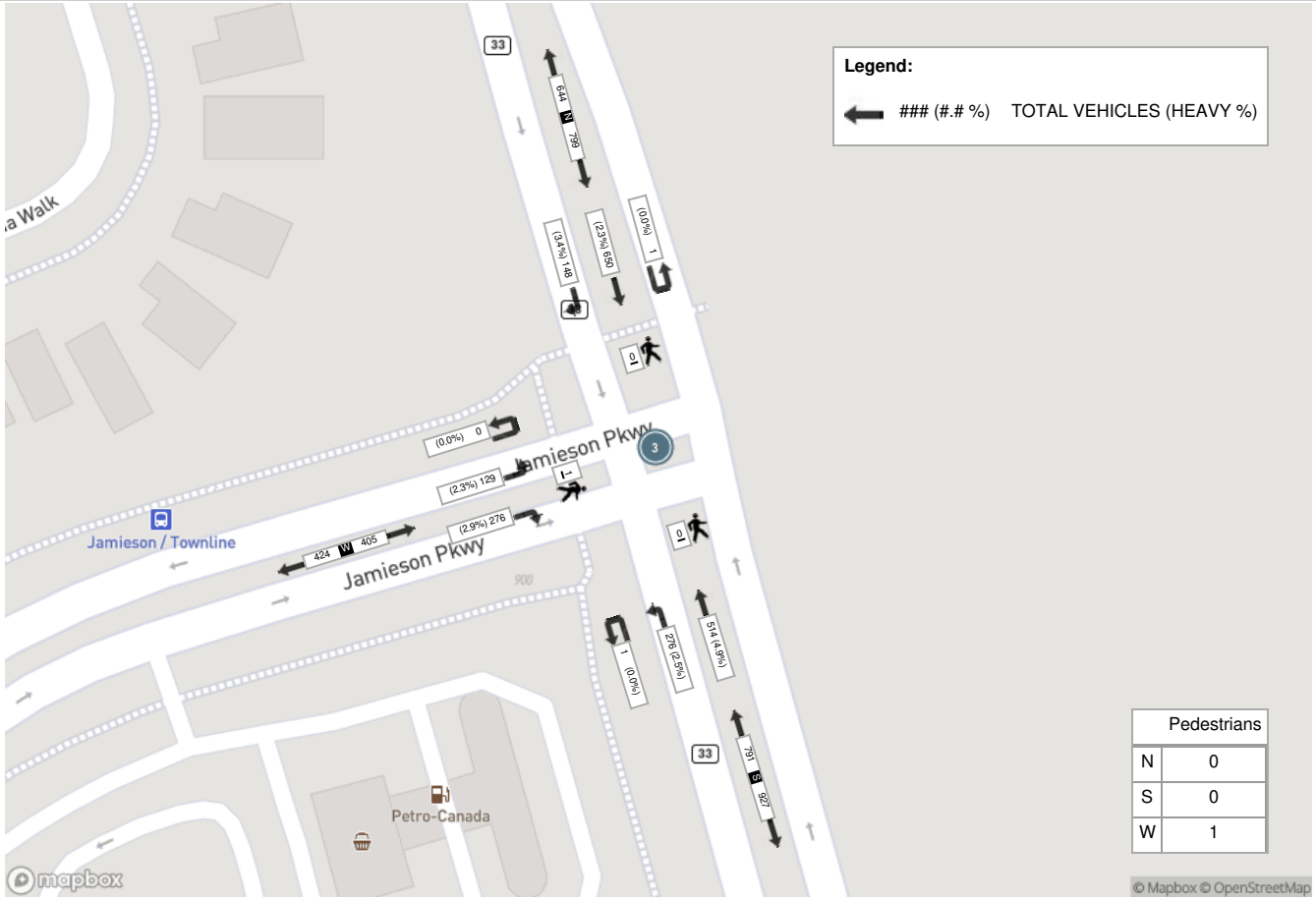
**Peak Hour: 07:30 AM - 08:30 AM Weather: Clear Sky (11 °C)**

| Start Time | N Approach TOWNLINE RD | | | | | S Approach TOWNLINE RD | | | | | W Approach JAMIESON PKWY | | | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | UTurn | Peds | Approach Total | Thru | Left | UTurn | Peds | Approach Total | Right | Left | UTurn | Peds | Approach Total | |
| 2025-09-30 07:30:00 | 22 | 181 | 1 | 0 | 204 | 126 | 46 | 0 | 0 | 172 | 64 | 26 | 0 | 1 | 90 | 466 |
| 2025-09-30 07:45:00 | 45 | 164 | 0 | 0 | 209 | 144 | 101 | 0 | 0 | 245 | 79 | 38 | 0 | 0 | 117 | 571 |
| 2025-09-30 08:00:00 | 40 | 151 | 0 | 0 | 191 | 133 | 68 | 0 | 0 | 201 | 78 | 35 | 0 | 0 | 113 | 505 |
| 2025-09-30 08:15:00 | 41 | 154 | 0 | 0 | 195 | 111 | 61 | 1 | 0 | 173 | 55 | 30 | 0 | 0 | 85 | 453 |
| **Grand Total** | 148 | 650 | 1 | 0 | 799 | 514 | 276 | 1 | 0 | 791 | 276 | 129 | 0 | 1 | 405 | **1995** |
| **Approach%** | 18.5% | 81.4% | 0.1% | | - | 65% | 34.9% | 0.1% | | - | 68.1% | 31.9% | 0% | | - | **-** |
| **Totals %** | 7.4% | 32.6% | 0.1% | | 40.1% | 25.8% | 13.8% | 0.1% | | 39.6% | 13.8% | 6.5% | 0% | | 20.3% | **-** |
| **PHF** | 0.82 | 0.9 | 0.25 | | 0.96 | 0.89 | 0.68 | 0.25 | | 0.81 | 0.87 | 0.85 | 0 | | 0.87 | 0.87 |
| **Heavy** | 5 | 15 | 0 | | 20 | 25 | 7 | 0 | | 32 | 8 | 3 | 0 | | 11 | 63 |
| **Heavy %** | 3.4% | 2.3% | 0% | | 2.5% | 4.9% | 2.5% | 0% | | 4% | 2.9% | 2.3% | 0% | | 2.7% | 3.2% |
| **Lights** | 143 | 635 | 1 | | 779 | 489 | 269 | 1 | | 759 | 268 | 126 | 0 | | 394 | 1932 |
| **Lights %** | 96.6% | 97.7% | 100% | | 97.5% | 95.1% | 97.5% | 100% | | 96% | 97.1% | 97.7% | 0% | | 97.3% | 96.8% |
| **Single-Unit Trucks** | 1 | 8 | 0 | | 9 | 7 | 4 | 0 | | 11 | 5 | 0 | 0 | | 5 | 25 |
| **Single-Unit Trucks %** | 0.7% | 1.2% | 0% | | 1.1% | 1.4% | 1.4% | 0% | | 1.4% | 1.8% | 0% | 0% | | 1.2% | 1.3% |
| **Buses** | 4 | 2 | 0 | | 6 | 7 | 1 | 0 | | 8 | 1 | 2 | 0 | | 3 | 17 |
| **Buses %** | 2.7% | 0.3% | 0% | | 0.8% | 1.4% | 0.4% | 0% | | 1% | 0.4% | 1.6% | 0% | | 0.7% | 0.9% |
| **Articulated Trucks** | 0 | 5 | 0 | | 5 | 11 | 2 | 0 | | 13 | 2 | 1 | 0 | | 3 | 21 |
| **Articulated Trucks %** | 0% | 0.8% | 0% | | 0.6% | 2.1% | 0.7% | 0% | | 1.6% | 0.7% | 0.8% | 0% | | 0.7% | 1.1% |
| **Bicycles on Road** | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 |
| **Bicycles on Road %** | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% |
| **Pedestrians** | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 1 | - | **-** |
| **Pedestrians%** | - | - | - | 0% | | - | - | - | 0% | | - | - | - | 100% | | **-** |

**Peak Hour: 04:30 PM - 05:30 PM Weather: Clear Sky (23 °C)**

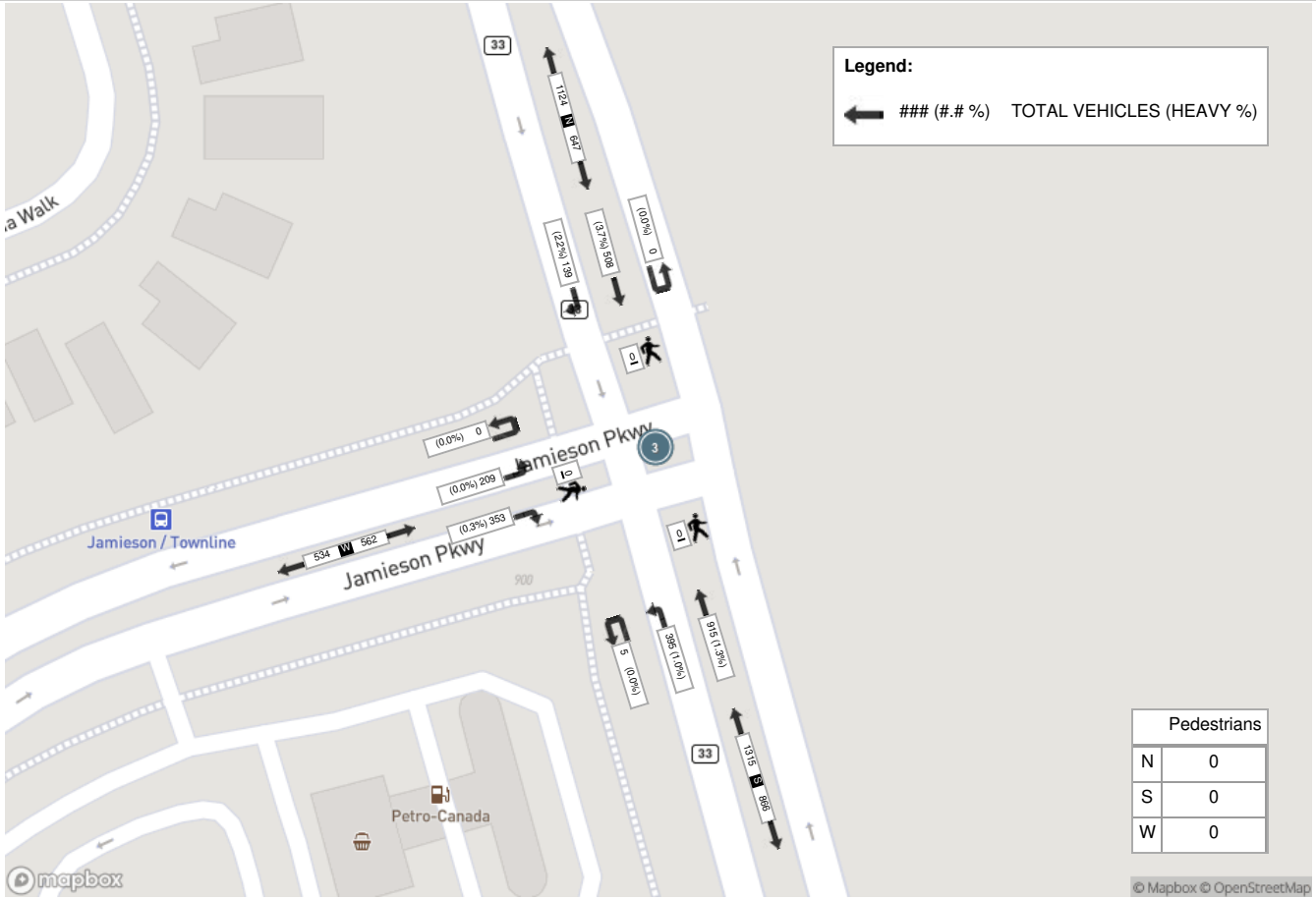
| Start Time | N Approach TOWNLINE RD | | | | | S Approach TOWNLINE RD | | | | | W Approach JAMIESON PKWY | | | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | UTurn | Peds | Approach Total | Thru | Left | UTurn | Peds | Approach Total | Right | Left | UTurn | Peds | Approach Total | |
| 2025-09-30 16:30:00 | 36 | 111 | 0 | 0 | 147 | 225 | 108 | 1 | 0 | 334 | 87 | 57 | 0 | 0 | 144 | 625 |
| 2025-09-30 16:45:00 | 54 | 143 | 0 | 0 | 197 | 255 | 101 | 3 | 0 | 359 | 85 | 45 | 0 | 0 | 130 | 686 |
| 2025-09-30 17:00:00 | 24 | 136 | 0 | 0 | 160 | 191 | 103 | 0 | 0 | 294 | 98 | 61 | 0 | 0 | 159 | 613 |
| 2025-09-30 17:15:00 | 25 | 118 | 0 | 0 | 143 | 244 | 83 | 1 | 0 | 328 | 83 | 46 | 0 | 0 | 129 | 600 |
| **Grand Total** | 139 | 508 | 0 | 0 | 647 | 915 | 395 | 5 | 0 | 1315 | 353 | 209 | 0 | 0 | 562 | **2524** |
| **Approach%** | 21.5% | 78.5% | 0% | | - | 69.6% | 30% | 0.4% | | - | 62.8% | 37.2% | 0% | | - | **-** |
| **Totals %** | 5.5% | 20.1% | 0% | | 25.6% | 36.3% | 15.6% | 0.2% | | 52.1% | 14% | 8.3% | 0% | | 22.3% | **-** |
| **PHF** | 0.64 | 0.89 | 0 | | 0.82 | 0.9 | 0.91 | 0.42 | | 0.92 | 0.9 | 0.86 | 0 | | 0.88 | 0.92 |
| **Heavy** | 3 | 19 | 0 | | 22 | 12 | 4 | 0 | | 16 | 1 | 0 | 0 | | 1 | 39 |
| **Heavy %** | 2.2% | 3.7% | 0% | | 3.4% | 1.3% | 1% | 0% | | 1.2% | 0.3% | 0% | 0% | | 0.2% | 1.5% |
| **Lights** | 136 | 489 | 0 | | 625 | 901 | 391 | 5 | | 1297 | 352 | 209 | 0 | | 561 | 2483 |
| **Lights %** | 97.8% | 96.3% | 0% | | 96.6% | 98.5% | 99% | 100% | | 98.6% | 99.7% | 100% | 0% | | 99.8% | 98.4% |
| **Single-Unit Trucks** | 0 | 10 | 0 | | 10 | 7 | 2 | 0 | | 9 | 0 | 0 | 0 | | 0 | 19 |
| **Single-Unit Trucks %** | 0% | 2% | 0% | | 1.5% | 0.8% | 0.5% | 0% | | 0.7% | 0% | 0% | 0% | | 0% | 0.8% |
| **Buses** | 3 | 1 | 0 | | 4 | 1 | 1 | 0 | | 2 | 0 | 0 | 0 | | 0 | 6 |
| **Buses %** | 2.2% | 0.2% | 0% | | 0.6% | 0.1% | 0.3% | 0% | | 0.2% | 0% | 0% | 0% | | 0% | 0.2% |
| **Articulated Trucks** | 0 | 8 | 0 | | 8 | 4 | 1 | 0 | | 5 | 1 | 0 | 0 | | 1 | 14 |
| **Articulated Trucks %** | 0% | 1.6% | 0% | | 1.2% | 0.4% | 0.3% | 0% | | 0.4% | 0.3% | 0% | 0% | | 0.2% | 0.6% |
| **Bicycles on Road** | 0 | 0 | 0 | | 0 | 2 | 0 | 0 | | 2 | 0 | 0 | 0 | | 0 | 2 |
| **Bicycles on Road %** | 0% | 0% | 0% | | 0% | 0.2% | 0% | 0% | | 0.2% | 0% | 0% | 0% | | 0% | 0.1% |
| **Pedestrians** | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | **-** |
| **Pedestrians%** | - | - | - | 0% | | - | - | - | 0% | | - | - | - | 0% | | **-** |

**Peak Hour: 07:30 AM - 08:30 AM Weather: Clear Sky (11 °C)**




| | Pedestrians |
|---|---|
| N | 0 |
| S | 0 |
| W | 1 |

**Peak Hour: 04:30 PM - 05:30 PM Weather: Clear Sky (23 °C)**




| | Pedestrians |
|---|---|
| N | 0 |
| S | 0 |
| W | 0 |

Spectrum

Turning Movement Count
Location Name: HWY 401 EB OFF-RAMP & TOWNLINE ROAD
Date: Sat, Nov 01, 2025 Deployment Lead: Constantinos Kotassidis

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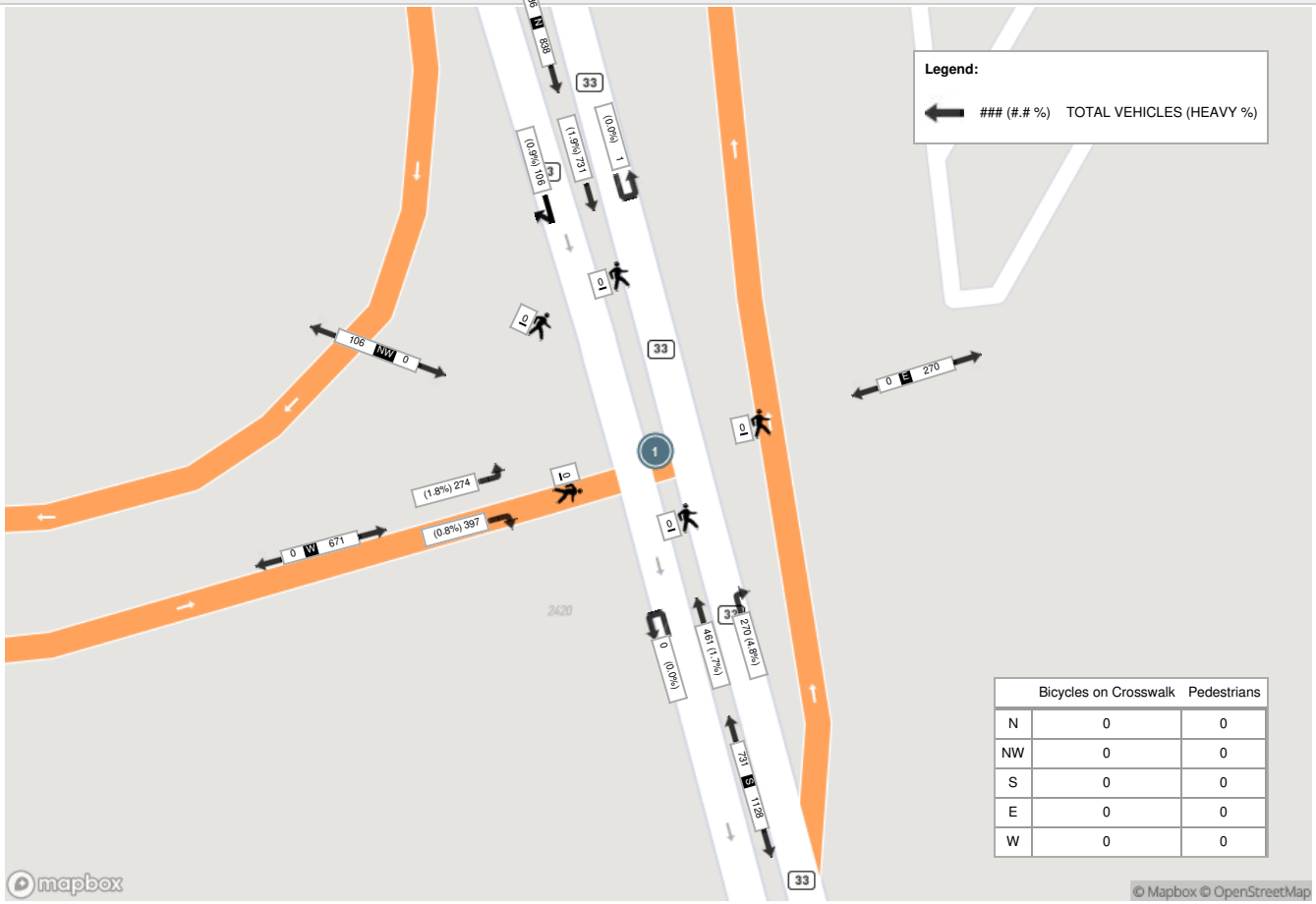
## Turning Movement Count (1 . HWY 401 EB OFF-RAMP & TOWNLINE ROAD)

| Start Time | N Approach TOWNLINE RD | | | | | E Approach HWY 401 EB ON RAMP FROM NB TOWNLINE RD | | | S Approach TOWNLINE RD | | | | | W Approach HWY 401 EB OFF RAMP AT TOWNLINE RD | | | | | NW Approach HWY 401 EB ON RAMP FROM SB TOWNLINE RD | | | Int. Total (15 min) | Int. Total (1 hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hard Right N:NW | Thru N:S | UTurn N:N | Peds N: | Approach Total | UTurn E:E | Peds E: | Approach Total | Right S:E | Thru S:N | UTurn S:S | Peds S: | Approach Total | Right W:S | Left W:N | UTurn W:W | Peds W: | Approach Total | UTurn NW:NW | Peds NW: | Approach Total | | |
| 2025-11-01 11:00:00 | 40 | 150 | 0 | 0 | 190 | 0 | 0 | 0 | 84 | 105 | 0 | 0 | 189 | 37 | 42 | 0 | 0 | 79 | 0 | 0 | 0 | 458 | |
| 2025-11-01 11:15:00 | 46 | 173 | 0 | 0 | 219 | 0 | 0 | 0 | 102 | 132 | 0 | 0 | 234 | 47 | 47 | 0 | 0 | 94 | 0 | 0 | 0 | 547 | |
| 2025-11-01 11:30:00 | 62 | 166 | 0 | 0 | 228 | 0 | 0 | 0 | 90 | 115 | 0 | 0 | 205 | 30 | 38 | 0 | 0 | 68 | 0 | 0 | 0 | 501 | |
| 2025-11-01 11:45:00 | 32 | 150 | 0 | 0 | 182 | 0 | 0 | 0 | 97 | 108 | 0 | 0 | 205 | 39 | 34 | 0 | 1 | 73 | 0 | 0 | 0 | 460 | 1966 |
| 2025-11-01 12:00:00 | 42 | 158 | 0 | 0 | 200 | 0 | 0 | 0 | 103 | 122 | 0 | 0 | 225 | 42 | 32 | 0 | 0 | 74 | 0 | 0 | 0 | 499 | 2007 |
| 2025-11-01 12:15:00 | 49 | 153 | 0 | 0 | 202 | 0 | 0 | 0 | 95 | 111 | 1 | 0 | 207 | 48 | 53 | 0 | 0 | 101 | 0 | 0 | 0 | 510 | 1970 |
| 2025-11-01 12:30:00 | 24 | 186 | 0 | 0 | 210 | 0 | 1 | 0 | 64 | 107 | 0 | 0 | 171 | 78 | 44 | 0 | 0 | 122 | 0 | 0 | 0 | 503 | 1972 |
| 2025-11-01 12:45:00 | 31 | 206 | 0 | 1 | 237 | 0 | 2 | 0 | 96 | 117 | 1 | 0 | 214 | 66 | 52 | 0 | 0 | 118 | 0 | 0 | 0 | 569 | 2081 |
| 2025-11-01 13:00:00 | 35 | 172 | 0 | 0 | 207 | 0 | 0 | 0 | 84 | 127 | 0 | 0 | 211 | 78 | 68 | 0 | 0 | 146 | 0 | 0 | 0 | 564 | 2146 |
| 2025-11-01 13:15:00 | 30 | 186 | 0 | 0 | 216 | 0 | 0 | 0 | 61 | 101 | 0 | 0 | 162 | 82 | 55 | 0 | 0 | 137 | 0 | 0 | 0 | 515 | 2151 |
| 2025-11-01 13:30:00 | 20 | 182 | 1 | 0 | 203 | 0 | 0 | 0 | 72 | 119 | 0 | 0 | 191 | 112 | 73 | 0 | 0 | 185 | 0 | 0 | 0 | 579 | 2227 |
| 2025-11-01 13:45:00 | 21 | 191 | 0 | 0 | 212 | 0 | 0 | 0 | 53 | 114 | 0 | 0 | 167 | 125 | 78 | 0 | 0 | 203 | 0 | 0 | 0 | 582 | 2240 |
| 2025-11-01 14:00:00 | 18 | 189 | 0 | 0 | 207 | 0 | 0 | 0 | 66 | 111 | 0 | 0 | 177 | 83 | 58 | 0 | 0 | 141 | 0 | 0 | 0 | 525 | 2201 |
| 2025-11-01 14:15:00 | 15 | 172 | 0 | 0 | 187 | 0 | 0 | 0 | 64 | 139 | 0 | 0 | 203 | 65 | 78 | 0 | 1 | 143 | 0 | 0 | 0 | 533 | 2219 |
| 2025-11-01 14:30:00 | 28 | 177 | 0 | 0 | 205 | 0 | 0 | 0 | 51 | 104 | 0 | 0 | 155 | 130 | 74 | 0 | 0 | 204 | 0 | 0 | 0 | 564 | 2204 |
| 2025-11-01 14:45:00 | 23 | 173 | 0 | 0 | 196 | 0 | 0 | 0 | 55 | 104 | 0 | 0 | 159 | 84 | 74 | 0 | 0 | 158 | 0 | 0 | 0 | 513 | 2135 |
| **Grand Total** | 516 | 2784 | 1 | 1 | 3301 | 0 | 3 | 0 | 1237 | 1836 | 2 | 0 | 3075 | 1146 | 900 | 0 | 2 | 2046 | 0 | 0 | 0 | **8422** | - |
| **Approach%** | 15.6% | 84.3% | 0% | | - | 0% | | - | 40.2% | 59.7% | 0.1% | | - | 56% | 44% | 0% | | - | 0% | | - | **-** | - |
| **Totals %** | 6.1% | 33.1% | 0% | | 39.2% | 0% | | 0% | 14.7% | 21.8% | 0% | | 36.5% | 13.6% | 10.7% | 0% | | 24.3% | 0% | | 0% | **-** | - |
| **Heavy** | 10 | 62 | 0 | | - | 0 | | - | 58 | 18 | 0 | | - | 11 | 12 | 0 | | - | 0 | | - | **-** | - |
| **Heavy %** | 1.9% | 2.2% | 0% | | - | 0% | | - | 4.7% | 1% | 0% | | - | 1% | 1.3% | 0% | | - | 0% | | - | **-** | - |
| **Bicycles** | - | - | - | | - | - | | - | - | - | - | | - | - | - | - | | - | - | | - | **-** | - |
| **Bicycle %** | - | - | - | | - | - | | - | - | - | - | | - | - | - | - | | - | - | | - | **-** | - |

**Peak Hour: 01:00 PM - 02:00 PM** **Weather: Broken Clouds (6 °C)**

| Start Time | N Approach TOWNLINE RD | | | | | E Approach HWY 401 EB ON RAMP FROM NB TOWNLINE RD | | | S Approach TOWNLINE RD | | | | | W Approach HWY 401 EB OFF RAMP AT TOWNLINE RD | | | | | NW Approach HWY 401 EB ON RAMP FROM SB TOWNLINE RD | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hard Right | Thru | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | Right | Thru | UTurn | Peds | Approach Total | Right | Left | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | |
| 2025-11-01 13:00:00 | 35 | 172 | 0 | 0 | 207 | 0 | 0 | 0 | 84 | 127 | 0 | 0 | 211 | 78 | 68 | 0 | 0 | 146 | 0 | 0 | 0 | 564 |
| 2025-11-01 13:15:00 | 30 | 186 | 0 | 0 | 216 | 0 | 0 | 0 | 61 | 101 | 0 | 0 | 162 | 82 | 55 | 0 | 0 | 137 | 0 | 0 | 0 | 515 |
| 2025-11-01 13:30:00 | 20 | 182 | 1 | 0 | 203 | 0 | 0 | 0 | 72 | 119 | 0 | 0 | 191 | 112 | 73 | 0 | 0 | 185 | 0 | 0 | 0 | 579 |
| 2025-11-01 13:45:00 | 21 | 191 | 0 | 0 | 212 | 0 | 0 | 0 | 53 | 114 | 0 | 0 | 167 | 125 | 78 | 0 | 0 | 203 | 0 | 0 | 0 | 582 |
| **Grand Total** | 106 | 731 | 1 | 0 | 838 | 0 | 0 | 0 | 270 | 461 | 0 | 0 | 731 | 397 | 274 | 0 | 0 | 671 | 0 | 0 | 0 | **2240** |
| **Approach%** | 12.6% | 87.2% | 0.1% | | - | 0% | | - | 36.9% | 63.1% | 0% | | - | 59.2% | 40.8% | 0% | | - | 0% | | - | **-** |
| **Totals %** | 4.7% | 32.6% | 0% | | 37.4% | 0% | | 0% | 12.1% | 20.6% | 0% | | 32.6% | 17.7% | 12.2% | 0% | | 30% | 0% | | 0% | **-** |
| **PHF** | 0.76 | 0.96 | 0.25 | | 0.97 | 0 | | 0 | 0.8 | 0.91 | 0 | | 0.87 | 0.79 | 0.88 | 0 | | 0.83 | 0 | | 0 | 0.96 |
| **Heavy** | 1 | 14 | 0 | | 15 | 0 | | 0 | 13 | 8 | 0 | | 21 | 3 | 5 | 0 | | 8 | 0 | | 0 | 44 |
| **Heavy %** | 0.9% | 1.9% | 0% | | 1.8% | 0% | | 0% | 4.8% | 1.7% | 0% | | 2.9% | 0.8% | 1.8% | 0% | | 1.2% | 0% | | 0% | 2% |
| **Lights** | 105 | 716 | 1 | | 822 | 0 | | 0 | 257 | 453 | 0 | | 710 | 394 | 269 | 0 | | 663 | 0 | | 0 | 2195 |
| **Lights %** | 99.1% | 97.9% | 100% | | 98.1% | 0% | | 0% | 95.2% | 98.3% | 0% | | 97.1% | 99.2% | 98.2% | 0% | | 98.8% | 0% | | 0% | 98% |
| **Single-Unit Trucks** | 0 | 8 | 0 | | 8 | 0 | | 0 | 7 | 3 | 0 | | 10 | 2 | 3 | 0 | | 5 | 0 | | 0 | 23 |
| **Single-Unit Trucks %** | 0% | 1.1% | 0% | | 1% | 0% | | 0% | 2.6% | 0.7% | 0% | | 1.4% | 0.5% | 1.1% | 0% | | 0.7% | 0% | | 0% | 1% |
| **Buses** | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 2 | 0 | | 2 | 1 | 1 | 0 | | 2 | 0 | | 0 | 4 |
| **Buses %** | 0% | 0% | 0% | | 0% | 0% | | 0% | 0% | 0.4% | 0% | | 0.3% | 0.3% | 0.4% | 0% | | 0.3% | 0% | | 0% | 0.2% |
| **Articulated Trucks** | 1 | 6 | 0 | | 7 | 0 | | 0 | 6 | 3 | 0 | | 9 | 0 | 1 | 0 | | 1 | 0 | | 0 | 17 |
| **Articulated Trucks %** | 0.9% | 0.8% | 0% | | 0.8% | 0% | | 0% | 2.2% | 0.7% | 0% | | 1.2% | 0% | 0.4% | 0% | | 0.1% | 0% | | 0% | 0.8% |
| **Bicycles on Road** | 0 | 1 | 0 | | 1 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 1 |
| **Bicycles on Road %** | 0% | 0.1% | 0% | | 0.1% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% | | 0% | 0% |
| **Pedestrians** | - | - | - | 0 | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | 0 | - | **-** |
| **Pedestrians%** | - | - | - | 0% | | - | 0% | | - | - | - | 0% | | - | - | - | 0% | | - | 0% | | **-** |
| **Bicycles on Crosswalk** | - | - | - | 0 | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | 0 | - | **-** |
| **Bicycles on Crosswalk%** | - | - | - | 0% | | - | 0% | | - | - | - | 0% | | - | - | - | 0% | | - | 0% | | **-** |

**Peak Hour: 01:00 PM - 02:00 PM** **Weather: Broken Clouds (6 °C)**




| | Bicycles on Crosswalk | Pedestrians |
|---|---|---|
| N | 0 | 0 |
| NW | 0 | 0 |
| S | 0 | 0 |
| E | 0 | 0 |
| W | 0 | 0 |

Spectrum

Turning Movement Count
Location Name: HWY 401 WB OFF-RAMP & TOWNLINE ROAD
Date: Sat, Nov 01, 2025 Deployment Lead: Constantinos Kotassidis

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

## Turning Movement Count (2 . HWY 401 WB OFF-RAMP & TOWNLINE ROAD)

| Start Time | N Approach TOWNLINE ROAD | | | | | E Approach HWY 401 WB OFF-RAMP | | | | | S Approach TOWNLINE ROAD | | | | | W Approach HWY 401 WB ON-RAMP | | | SE Approach HWY 401 WB ON-RAMP | | | Int. Total (15 min) | Int. Total (1 hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right N:W | Thru N:S | UTurn N:N | Peds N: | Approach Total | Right E:N | Left E:S | UTurn E:E | Peds E: | Approach Total | Hard Right S:SE | Thru S:N | UTurn S:S | Peds S: | Approach Total | UTurn W:W | Peds W: | Approach Total | UTurn SE:SE | Peds SE: | Approach Total | | |
| 2025-11-01 11:00:00 | 68 | 111 | 0 | 0 | 179 | 29 | 89 | 0 | 0 | 118 | 35 | 110 | 0 | 0 | 145 | 0 | 0 | 0 | 0 | 0 | 0 | 442 | |
| 2025-11-01 11:15:00 | 53 | 138 | 0 | 0 | 191 | 32 | 83 | 0 | 0 | 115 | 51 | 131 | 0 | 0 | 182 | 0 | 0 | 0 | 0 | 0 | 0 | 488 | |
| 2025-11-01 11:30:00 | 58 | 143 | 0 | 0 | 201 | 30 | 79 | 0 | 0 | 109 | 47 | 106 | 0 | 0 | 153 | 0 | 0 | 0 | 0 | 0 | 0 | 463 | |
| 2025-11-01 11:45:00 | 59 | 100 | 0 | 0 | 159 | 33 | 74 | 0 | 0 | 107 | 40 | 104 | 0 | 0 | 144 | 0 | 0 | 0 | 0 | 0 | 0 | 410 | 1803 |
| 2025-11-01 12:00:00 | 63 | 128 | 0 | 0 | 191 | 28 | 73 | 0 | 0 | 101 | 40 | 108 | 1 | 0 | 149 | 0 | 0 | 0 | 0 | 0 | 0 | 441 | 1802 |
| 2025-11-01 12:15:00 | 50 | 131 | 0 | 0 | 181 | 37 | 74 | 0 | 1 | 111 | 48 | 120 | 0 | 0 | 168 | 0 | 0 | 0 | 0 | 0 | 0 | 460 | 1774 |
| 2025-11-01 12:30:00 | 44 | 125 | 0 | 1 | 169 | 35 | 79 | 0 | 1 | 114 | 35 | 122 | 0 | 0 | 157 | 0 | 1 | 0 | 0 | 2 | 0 | 440 | 1751 |
| 2025-11-01 12:45:00 | 68 | 122 | 0 | 0 | 190 | 33 | 95 | 0 | 0 | 128 | 38 | 131 | 0 | 0 | 169 | 0 | 1 | 0 | 0 | 0 | 0 | 487 | 1828 |
| 2025-11-01 13:00:00 | 73 | 109 | 0 | 0 | 182 | 40 | 90 | 0 | 0 | 130 | 40 | 165 | 1 | 0 | 206 | 0 | 0 | 0 | 0 | 0 | 0 | 518 | 1905 |
| 2025-11-01 13:15:00 | 57 | 135 | 0 | 0 | 192 | 35 | 85 | 0 | 0 | 120 | 35 | 122 | 0 | 0 | 157 | 0 | 0 | 0 | 0 | 0 | 0 | 469 | 1914 |
| 2025-11-01 13:30:00 | 62 | 119 | 0 | 0 | 181 | 38 | 86 | 0 | 0 | 124 | 54 | 147 | 0 | 0 | 201 | 0 | 0 | 0 | 0 | 0 | 0 | 506 | 1980 |
| 2025-11-01 13:45:00 | 58 | 89 | 0 | 0 | 147 | 31 | 97 | 0 | 0 | 128 | 40 | 148 | 0 | 0 | 188 | 0 | 0 | 0 | 0 | 0 | 0 | 463 | 1956 |
| 2025-11-01 14:00:00 | 63 | 105 | 0 | 0 | 168 | 39 | 98 | 0 | 0 | 137 | 49 | 122 | 0 | 0 | 171 | 0 | 0 | 0 | 0 | 0 | 0 | 476 | 1914 |
| 2025-11-01 14:15:00 | 52 | 114 | 0 | 0 | 166 | 47 | 79 | 0 | 0 | 126 | 53 | 158 | 0 | 0 | 211 | 0 | 0 | 0 | 0 | 0 | 0 | 503 | 1948 |
| 2025-11-01 14:30:00 | 48 | 118 | 0 | 0 | 166 | 43 | 71 | 0 | 0 | 114 | 45 | 142 | 0 | 0 | 187 | 0 | 0 | 0 | 0 | 0 | 0 | 467 | 1909 |
| 2025-11-01 14:45:00 | 71 | 97 | 0 | 0 | 168 | 48 | 87 | 0 | 0 | 135 | 31 | 142 | 0 | 0 | 173 | 0 | 0 | 0 | 0 | 0 | 0 | 476 | 1922 |
| **Grand Total** | 947 | 1884 | 0 | 1 | 2831 | 578 | 1339 | 0 | 2 | 1917 | 681 | 2078 | 2 | 0 | 2761 | 0 | 2 | 0 | 0 | 2 | 0 | **7509** | - |
| **Approach%** | 33.5% | 66.5% | 0% | | - | 30.2% | 69.8% | 0% | | - | 24.7% | 75.3% | 0.1% | | - | 0% | | - | 0% | | - | **-** | - |
| **Totals %** | 12.6% | 25.1% | 0% | | 37.7% | 7.7% | 17.8% | 0% | | 25.5% | 9.1% | 27.7% | 0% | | 36.8% | 0% | | 0% | 0% | | 0% | **-** | - |
| **Heavy** | 8 | 14 | 0 | | - | 8 | 66 | 0 | | - | 14 | 22 | 0 | | - | 0 | | - | 0 | | - | **-** | - |
| **Heavy %** | 0.8% | 0.7% | 0% | | - | 1.4% | 4.9% | 0% | | - | 2.1% | 1.1% | 0% | | - | 0% | | - | 0% | | - | **-** | - |
| **Bicycles** | - | - | - | | - | - | - | - | | - | - | - | - | | - | - | | - | - | | - | **-** | - |
| **Bicycle %** | - | - | - | | - | - | - | - | | - | - | - | - | | - | - | | - | - | | - | **-** | - |

Spectrum

Turning Movement Count
Location Name: HWY 401 WB OFF-RAMP & TOWNLINE ROAD
Date: Sat, Nov 01, 2025 Deployment Lead: Constantinos Kotassidis

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

**Peak Hour: 12:45 PM - 01:45 PM Weather: Broken Clouds (6 °C)**

| Start Time | N Approach TOWNLINE ROAD | | | | | E Approach HWY 401 WB OFF-RAMP | | | | | S Approach TOWNLINE ROAD | | | | | W Approach HWY 401 WB ON-RAMP | | | SE Approach HWY 401 WB ON-RAMP | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | UTurn | Peds | Approach Total | Right | Left | UTurn | Peds | Approach Total | Hard Right | Thru | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | UTurn | Peds | Approach Total | |
| 2025-11-01 12:45:00 | 68 | 122 | 0 | 0 | 190 | 33 | 95 | 0 | 0 | 128 | 38 | 131 | 0 | 0 | 169 | 0 | 1 | 0 | 0 | 0 | 0 | 487 |
| 2025-11-01 13:00:00 | 73 | 109 | 0 | 0 | 182 | 40 | 90 | 0 | 0 | 130 | 40 | 165 | 1 | 0 | 206 | 0 | 0 | 0 | 0 | 0 | 0 | 518 |
| 2025-11-01 13:15:00 | 57 | 135 | 0 | 0 | 192 | 35 | 85 | 0 | 0 | 120 | 35 | 122 | 0 | 0 | 157 | 0 | 0 | 0 | 0 | 0 | 0 | 469 |
| 2025-11-01 13:30:00 | 62 | 119 | 0 | 0 | 181 | 38 | 86 | 0 | 0 | 124 | 54 | 147 | 0 | 0 | 201 | 0 | 0 | 0 | 0 | 0 | 0 | 506 |
| **Grand Total** | 260 | 485 | 0 | 0 | 745 | 146 | 356 | 0 | 0 | 502 | 167 | 565 | 1 | 0 | 733 | 0 | 1 | 0 | 0 | 0 | 0 | **1980** |
| **Approach%** | 34.9% | 65.1% | 0% | | - | 29.1% | 70.9% | 0% | | - | 22.8% | 77.1% | 0.1% | | - | 0% | | - | 0% | | - | **-** |
| **Totals %** | 13.1% | 24.5% | 0% | | 37.6% | 7.4% | 18% | 0% | | 25.4% | 8.4% | 28.5% | 0.1% | | 37% | 0% | | 0% | 0% | | 0% | **-** |
| **PHF** | 0.89 | 0.9 | 0 | | 0.97 | 0.91 | 0.94 | 0 | | 0.97 | 0.77 | 0.86 | 0.25 | | 0.89 | 0 | | 0 | 0 | | 0 | 0.96 |
| **Heavy** | 2 | 4 | 0 | | 6 | 2 | 19 | 0 | | 21 | 6 | 13 | 0 | | 19 | 0 | | 0 | 0 | | 0 | 46 |
| **Heavy %** | 0.8% | 0.8% | 0% | | 0.8% | 1.4% | 5.3% | 0% | | 4.2% | 3.6% | 2.3% | 0% | | 2.6% | 0% | | 0% | 0% | | 0% | 2.3% |
| **Lights** | 257 | 480 | 0 | | 737 | 144 | 337 | 0 | | 481 | 161 | 552 | 1 | | 714 | 0 | | 0 | 0 | | 0 | 1932 |
| **Lights %** | 98.8% | 99% | 0% | | 98.9% | 98.6% | 94.7% | 0% | | 95.8% | 96.4% | 97.7% | 100% | | 97.4% | 0% | | 0% | 0% | | 0% | 97.6% |
| **Single-Unit Trucks** | 1 | 3 | 0 | | 4 | 2 | 13 | 0 | | 15 | 2 | 11 | 0 | | 13 | 0 | | 0 | 0 | | 0 | 32 |
| **Single-Unit Trucks %** | 0.4% | 0.6% | 0% | | 0.5% | 1.4% | 3.7% | 0% | | 3% | 1.2% | 1.9% | 0% | | 1.8% | 0% | | 0% | 0% | | 0% | 1.6% |
| **Buses** | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 1 | 2 | 0 | | 3 | 0 | | 0 | 0 | | 0 | 3 |
| **Buses %** | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0.6% | 0.4% | 0% | | 0.4% | 0% | | 0% | 0% | | 0% | 0.2% |
| **Articulated Trucks** | 1 | 1 | 0 | | 2 | 0 | 6 | 0 | | 6 | 3 | 0 | 0 | | 3 | 0 | | 0 | 0 | | 0 | 11 |
| **Articulated Trucks %** | 0.4% | 0.2% | 0% | | 0.3% | 0% | 1.7% | 0% | | 1.2% | 1.8% | 0% | 0% | | 0.4% | 0% | | 0% | 0% | | 0% | 0.6% |
| **Bicycles on Road** | 1 | 1 | 0 | | 2 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 2 |
| **Bicycles on Road %** | 0.4% | 0.2% | 0% | | 0.3% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% | | 0% | 0% | | 0% | 0.1% |
| **Pedestrians** | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | 0 | - | - | 0 | - | **-** |
| **Pedestrians%** | - | - | - | 0% | | - | - | - | 0% | | - | - | - | 0% | | - | 0% | | - | 0% | | **-** |
| **Bicycles on Crosswalk** | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | 1 | - | - | 0 | - | **-** |
| **Bicycles on Crosswalk%** | - | - | - | 0% | | - | - | - | 0% | | - | - | - | 0% | | - | 100% | | - | 0% | | **-** |

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578
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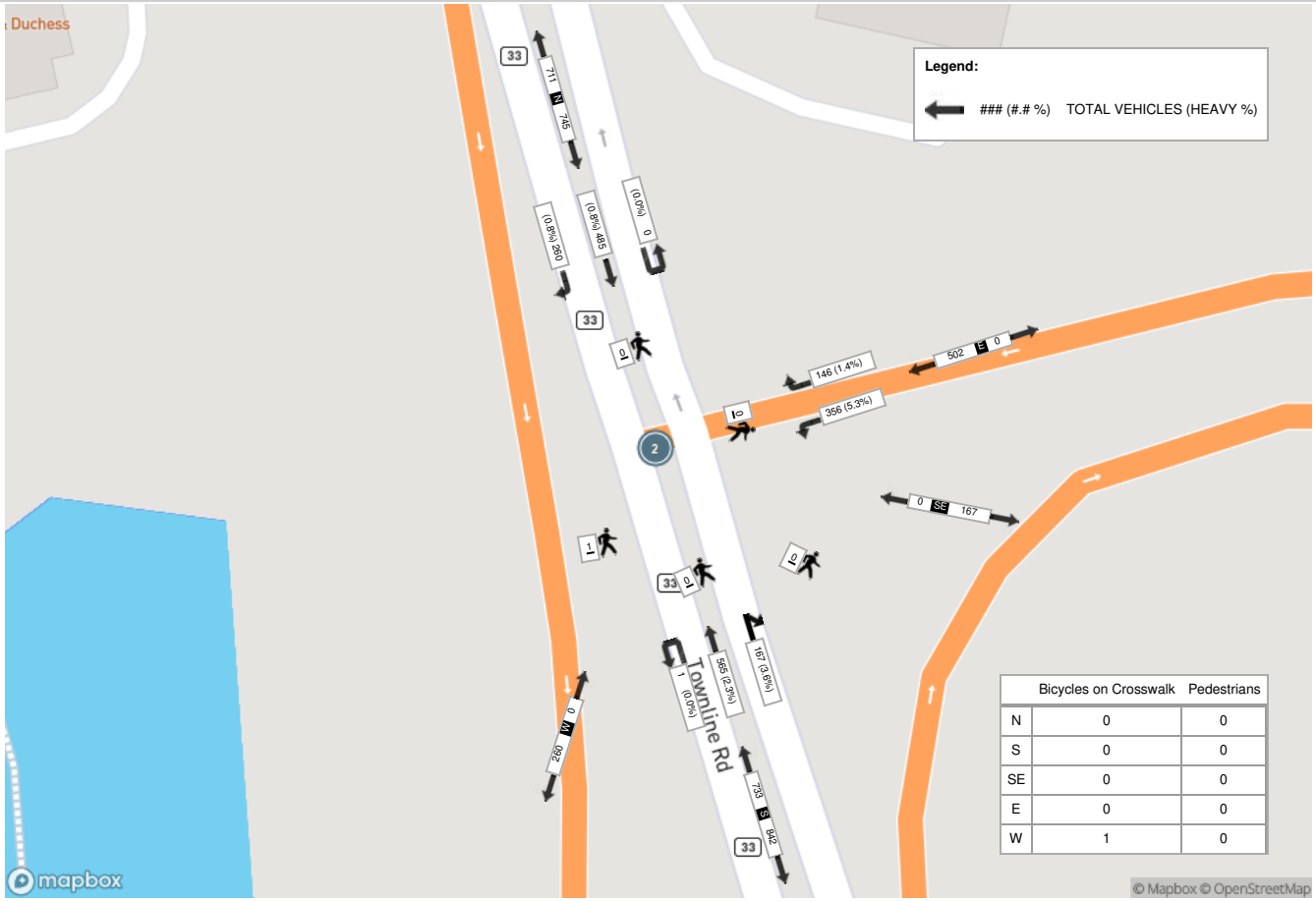
**Peak Hour: 12:45 PM - 01:45 PM** **Weather: Broken Clouds (6 °C)**




| | Bicycles on Crosswalk | Pedestrians |
|---|---|---|
| N | 0 | 0 |
| S | 0 | 0 |
| SE | 0 | 0 |
| E | 0 | 0 |
| W | 1 | 0 |

Spectrum

Turning Movement Count
Location Name: TOWNLINE RD & ELLIS RD/SIDEROAD 10N
Date: Sat, Nov 01, 2025 Deployment Lead: Constantinos Kotassidis

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

## Turning Movement Count (4 . TOWNLINE RD & ELLIS RD/SIDEROAD 10N)

| Start Time | N Approach TOWNLINE RD | | | | | | E Approach SIDEROAD 10N | | | | | | S Approach TOWNLINE RD | | | | | | W Approach ELLIS RD | | | | | | Int. Total (15 min) | Int. Total (1 hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right N:W | Thru N:S | Left N:E | UTurn N:N | Peds N: | Approach Total | Right E:N | Thru E:W | Left E:S | UTurn E:E | Peds E: | Approach Total | Right S:E | Thru S:N | Left S:W | UTurn S:S | Peds S: | Approach Total | Right W:S | Thru W:E | Left W:N | UTurn W:W | Peds W: | Approach Total | | |
| 2025-11-01 11:00:00 | 7 | 90 | 2 | 0 | 0 | 99 | 0 | 3 | 4 | 0 | 0 | 7 | 5 | 90 | 37 | 0 | 0 | 132 | 43 | 1 | 13 | 0 | 0 | 57 | 295 | |
| 2025-11-01 11:15:00 | 15 | 103 | 0 | 0 | 0 | 118 | 1 | 1 | 4 | 0 | 0 | 6 | 11 | 85 | 26 | 0 | 0 | 122 | 35 | 2 | 11 | 0 | 0 | 48 | 294 | |
| 2025-11-01 11:30:00 | 13 | 89 | 2 | 0 | 0 | 104 | 0 | 5 | 3 | 0 | 0 | 8 | 13 | 89 | 35 | 0 | 0 | 137 | 38 | 3 | 15 | 0 | 0 | 56 | 305 | |
| 2025-11-01 11:45:00 | 8 | 93 | 1 | 0 | 0 | 102 | 0 | 5 | 5 | 0 | 0 | 10 | 12 | 92 | 31 | 0 | 0 | 135 | 34 | 4 | 9 | 0 | 0 | 47 | 294 | 1188 |
| 2025-11-01 12:00:00 | 20 | 96 | 1 | 0 | 0 | 117 | 1 | 2 | 2 | 0 | 0 | 5 | 12 | 96 | 25 | 0 | 0 | 133 | 74 | 1 | 11 | 0 | 0 | 86 | 341 | 1234 |
| 2025-11-01 12:15:00 | 11 | 81 | 1 | 0 | 0 | 93 | 1 | 1 | 6 | 0 | 0 | 8 | 8 | 102 | 42 | 0 | 1 | 152 | 49 | 2 | 7 | 0 | 0 | 58 | 311 | 1251 |
| 2025-11-01 12:30:00 | 13 | 95 | 2 | 0 | 0 | 110 | 1 | 3 | 3 | 0 | 0 | 7 | 5 | 90 | 25 | 0 | 0 | 120 | 30 | 7 | 4 | 0 | 0 | 41 | 278 | 1224 |
| 2025-11-01 12:45:00 | 5 | 95 | 0 | 0 | 0 | 100 | 1 | 5 | 6 | 0 | 0 | 12 | 8 | 112 | 29 | 0 | 0 | 149 | 41 | 3 | 13 | 0 | 0 | 57 | 318 | 1248 |
| 2025-11-01 13:00:00 | 4 | 103 | 1 | 0 | 0 | 108 | 2 | 4 | 10 | 0 | 0 | 16 | 8 | 122 | 40 | 0 | 1 | 170 | 35 | 9 | 10 | 0 | 0 | 54 | 348 | 1255 |
| 2025-11-01 13:15:00 | 9 | 90 | 1 | 0 | 0 | 100 | 0 | 3 | 6 | 0 | 0 | 9 | 2 | 91 | 52 | 0 | 0 | 145 | 55 | 11 | 10 | 0 | 0 | 76 | 330 | 1274 |
| 2025-11-01 13:30:00 | 16 | 84 | 1 | 0 | 0 | 101 | 1 | 3 | 7 | 0 | 0 | 11 | 9 | 124 | 42 | 0 | 0 | 175 | 49 | 2 | 13 | 0 | 0 | 64 | 351 | 1347 |
| 2025-11-01 13:45:00 | 5 | 89 | 0 | 0 | 0 | 94 | 1 | 5 | 2 | 0 | 0 | 8 | 5 | 130 | 33 | 0 | 0 | 168 | 26 | 7 | 13 | 0 | 0 | 46 | 316 | 1345 |
| 2025-11-01 14:00:00 | 9 | 87 | 0 | 0 | 0 | 96 | 0 | 1 | 10 | 0 | 0 | 11 | 8 | 117 | 28 | 0 | 1 | 153 | 21 | 3 | 9 | 0 | 0 | 33 | 293 | 1290 |
| 2025-11-01 14:15:00 | 11 | 89 | 1 | 0 | 0 | 101 | 1 | 3 | 7 | 0 | 0 | 11 | 5 | 139 | 36 | 0 | 0 | 180 | 29 | 1 | 12 | 0 | 0 | 42 | 334 | 1294 |
| 2025-11-01 14:30:00 | 9 | 86 | 2 | 0 | 0 | 97 | 0 | 1 | 5 | 0 | 0 | 6 | 6 | 123 | 39 | 0 | 0 | 168 | 36 | 3 | 21 | 0 | 0 | 60 | 331 | 1274 |
| 2025-11-01 14:45:00 | 7 | 88 | 3 | 0 | 0 | 98 | 0 | 5 | 17 | 0 | 0 | 22 | 9 | 128 | 46 | 0 | 0 | 183 | 28 | 5 | 7 | 0 | 0 | 40 | 343 | 1301 |
| **Grand Total** | 162 | 1458 | 18 | 0 | 0 | 1638 | 10 | 50 | 97 | 0 | 0 | 157 | 126 | 1730 | 566 | 0 | 3 | 2422 | 623 | 64 | 178 | 0 | 0 | 865 | **5082** | - |
| **Approach%** | 9.9% | 89% | 1.1% | 0% | | - | 6.4% | 31.8% | 61.8% | 0% | | - | 5.2% | 71.4% | 23.4% | 0% | | - | 72% | 7.4% | 20.6% | 0% | | - | **-** | - |
| **Totals %** | 3.2% | 28.7% | 0.4% | 0% | | 32.2% | 0.2% | 1% | 1.9% | 0% | | 3.1% | 2.5% | 34% | 11.1% | 0% | | 47.7% | 12.3% | 1.3% | 3.5% | 0% | | 17% | **-** | - |
| **Heavy** | 1 | 6 | 0 | 0 | | - | 0 | 0 | 1 | 0 | | - | 0 | 14 | 1 | 0 | | - | 8 | 0 | 0 | 0 | | - | **-** | - |
| **Heavy %** | 0.6% | 0.4% | 0% | 0% | | - | 0% | 0% | 1% | 0% | | - | 0% | 0.8% | 0.2% | 0% | | - | 1.3% | 0% | 0% | 0% | | - | **-** | - |
| **Bicycles** | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | **-** | - |
| **Bicycle %** | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | - | - | - | - | | - | **-** | - |

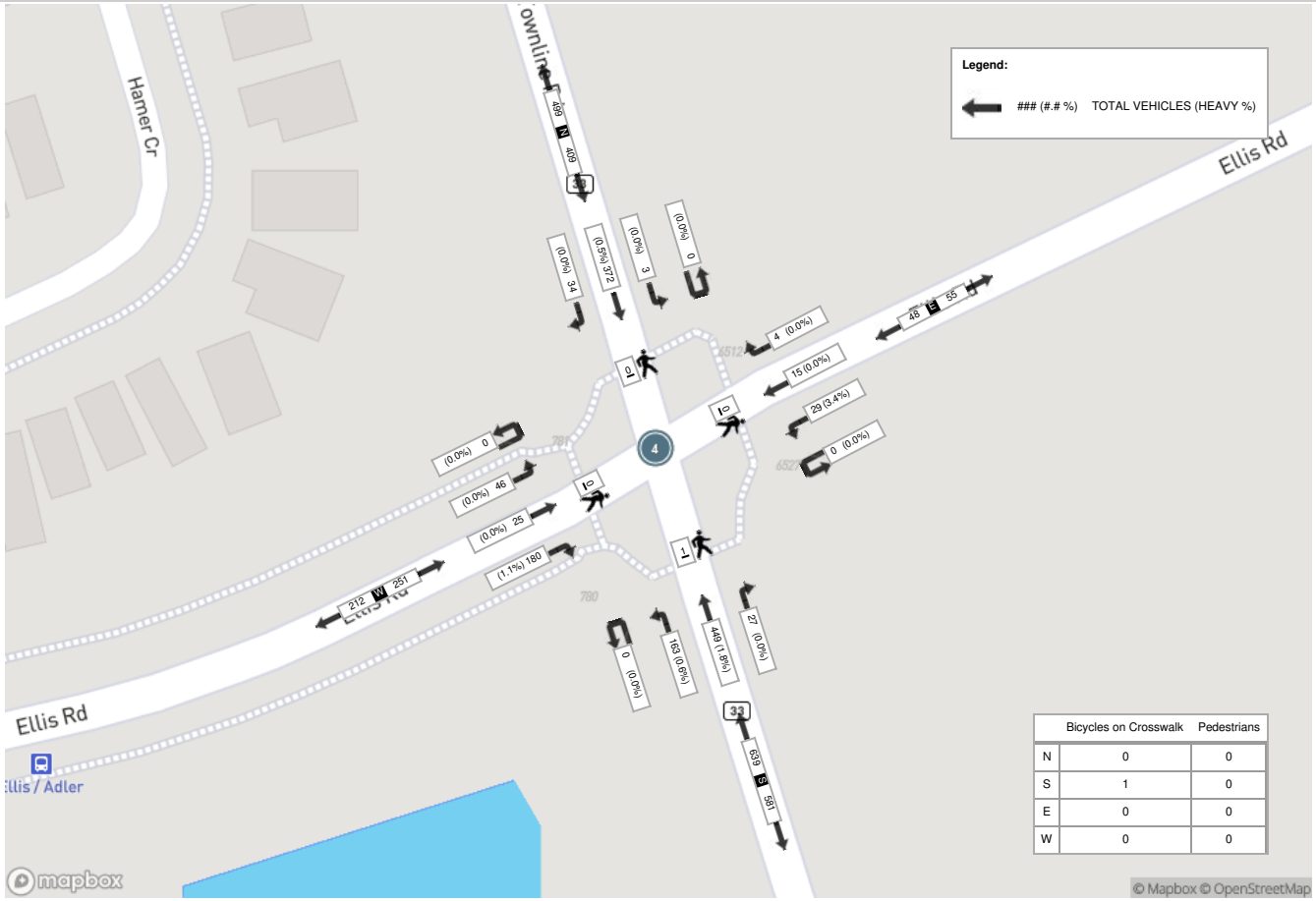
GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

**Peak Hour: 12:45 PM - 01:45 PM Weather: Broken Clouds (6 °C)**

| Start Time | N Approach TOWNLINE RD | | | | | | E Approach SIDEROAD 10N | | | | | | S Approach TOWNLINE RD | | | | | | W Approach ELLIS RD | | | | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | UTurn | Peds | Approach Total | Right | Thru | Left | UTurn | Peds | Approach Total | Right | Thru | Left | UTurn | Peds | Approach Total | Right | Thru | Left | UTurn | Peds | Approach Total | |
| 2025-11-01 12:45:00 | 5 | 95 | 0 | 0 | 0 | 100 | 1 | 5 | 6 | 0 | 0 | 12 | 8 | 112 | 29 | 0 | 0 | 149 | 41 | 3 | 13 | 0 | 0 | 57 | 318 |
| 2025-11-01 13:00:00 | 4 | 103 | 1 | 0 | 0 | 108 | 2 | 4 | 10 | 0 | 0 | 16 | 8 | 122 | 40 | 0 | 1 | 170 | 35 | 9 | 10 | 0 | 0 | 54 | 348 |
| 2025-11-01 13:15:00 | 9 | 90 | 1 | 0 | 0 | 100 | 0 | 3 | 6 | 0 | 0 | 9 | 2 | 91 | 52 | 0 | 0 | 145 | 55 | 11 | 10 | 0 | 0 | 76 | 330 |
| 2025-11-01 13:30:00 | 16 | 84 | 1 | 0 | 0 | 101 | 1 | 3 | 7 | 0 | 0 | 11 | 9 | 124 | 42 | 0 | 0 | 175 | 49 | 2 | 13 | 0 | 0 | 64 | 351 |
| **Grand Total** | 34 | 372 | 3 | 0 | 0 | 409 | 4 | 15 | 29 | 0 | 0 | 48 | 27 | 449 | 163 | 0 | 1 | 639 | 180 | 25 | 46 | 0 | 0 | 251 | **1347** |
| **Approach%** | 8.3% | 91% | 0.7% | 0% | | - | 8.3% | 31.3% | 60.4% | 0% | | - | 4.2% | 70.3% | 25.5% | 0% | | - | 71.7% | 10% | 18.3% | 0% | | - | **-** |
| **Totals %** | 2.5% | 27.6% | 0.2% | 0% | | 30.4% | 0.3% | 1.1% | 2.2% | 0% | | 3.6% | 2% | 33.3% | 12.1% | 0% | | 47.4% | 13.4% | 1.9% | 3.4% | 0% | | 18.6% | **-** |
| **PHF** | 0.53 | 0.9 | 0.75 | 0 | | 0.95 | 0.5 | 0.75 | 0.73 | 0 | | 0.75 | 0.75 | 0.91 | 0.78 | 0 | | 0.91 | 0.82 | 0.57 | 0.88 | 0 | | 0.83 | 0.96 |
| **Heavy** | 0 | 2 | 0 | 0 | | 2 | 0 | 0 | 1 | 0 | | 1 | 0 | 8 | 1 | 0 | | 9 | 2 | 0 | 0 | 0 | | 2 | 14 |
| **Heavy %** | 0% | 0.5% | 0% | 0% | | 0.5% | 0% | 0% | 3.4% | 0% | | 2.1% | 0% | 1.8% | 0.6% | 0% | | 1.4% | 1.1% | 0% | 0% | 0% | | 0.8% | 1% |
| **Lights** | 34 | 370 | 3 | 0 | | 407 | 4 | 14 | 28 | 0 | | 46 | 27 | 441 | 162 | 0 | | 630 | 177 | 23 | 46 | 0 | | 246 | 1329 |
| **Lights %** | 100% | 99.5% | 100% | 0% | | 99.5% | 100% | 93.3% | 96.6% | 0% | | 95.8% | 100% | 98.2% | 99.4% | 0% | | 98.6% | 98.3% | 92% | 100% | 0% | | 98% | 98.7% |
| **Single-Unit Trucks** | 0 | 1 | 0 | 0 | | 1 | 0 | 0 | 1 | 0 | | 1 | 0 | 7 | 0 | 0 | | 7 | 0 | 0 | 0 | 0 | | 0 | 9 |
| **Single-Unit Trucks %** | 0% | 0.3% | 0% | 0% | | 0.2% | 0% | 0% | 3.4% | 0% | | 2.1% | 0% | 1.6% | 0% | 0% | | 1.1% | 0% | 0% | 0% | 0% | | 0% | 0.7% |
| **Buses** | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 1 | 0 | 0 | | 1 | 2 | 0 | 0 | 0 | | 2 | 3 |
| **Buses %** | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | 0% | | 0% | 0% | 0.2% | 0% | 0% | | 0.2% | 1.1% | 0% | 0% | 0% | | 0.8% | 0.2% |
| **Articulated Trucks** | 0 | 1 | 0 | 0 | | 1 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 1 | 0 | | 1 | 0 | 0 | 0 | 0 | | 0 | 2 |
| **Articulated Trucks %** | 0% | 0.3% | 0% | 0% | | 0.2% | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0.6% | 0% | | 0.2% | 0% | 0% | 0% | 0% | | 0% | 0.1% |
| **Bicycles on Road** | 0 | 0 | 0 | 0 | | 0 | 0 | 1 | 0 | 0 | | 1 | 0 | 0 | 0 | 0 | | 0 | 1 | 2 | 0 | 0 | | 3 | 4 |
| **Bicycles on Road %** | 0% | 0% | 0% | 0% | | 0% | 0% | 6.7% | 0% | 0% | | 2.1% | 0% | 0% | 0% | 0% | | 0% | 0.6% | 8% | 0% | 0% | | 1.2% | 0.3% |
| **Pedestrians** | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | **-** |
| **Pedestrians%** | - | - | - | - | 0% | | - | - | - | - | 0% | | - | - | - | - | 0% | | - | - | - | - | 0% | | **-** |
| **Bicycles on Crosswalk** | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 1 | - | - | - | - | - | 0 | - | **-** |
| **Bicycles on Crosswalk%** | - | - | - | - | 0% | | - | - | - | - | 0% | | - | - | - | - | 100% | | - | - | - | - | 0% | | **-** |

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

**Peak Hour: 12:45 PM - 01:45 PM** **Weather: Broken Clouds (6 °C)**




| | Bicycles on Crosswalk | Pedestrians |
|---|---|---|
| N | 0 | 0 |
| S | 1 | 0 |
| E | 0 | 0 |
| W | 0 | 0 |

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## Turning Movement Count (3 . TOWNLINE RD & JAMIESON PKWY)

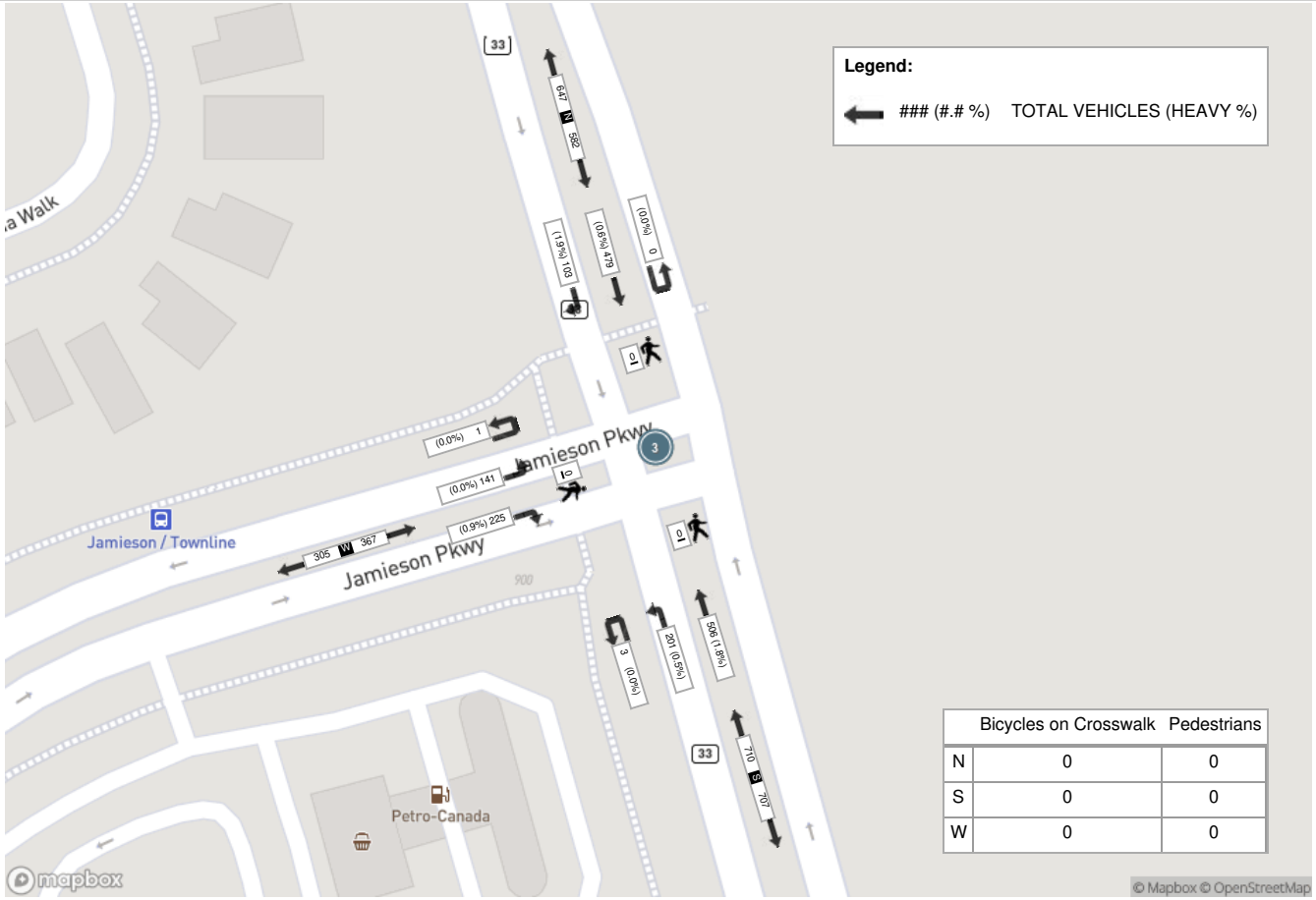
| Start Time | N Approach TOWNLINE RD | | | | | S Approach TOWNLINE RD | | | | | W Approach JAMIESON PKWY | | | | | Int. Total (15 min) | Int. Total (1 hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right N:W | Thru N:S | UTurn N:N | Peds N: | Approach Total | Thru S:N | Left S:W | UTurn S:S | Peds S: | Approach Total | Right W:S | Left W:N | UTurn W:W | Peds W: | Approach Total | | |
| 2025-11-01 11:00:00 | 27 | 105 | 0 | 0 | 132 | 92 | 47 | 1 | 0 | 140 | 60 | 33 | 0 | 0 | 93 | 365 | |
| 2025-11-01 11:15:00 | 23 | 119 | 0 | 0 | 142 | 96 | 63 | 1 | 0 | 160 | 60 | 39 | 0 | 0 | 99 | 401 | |
| 2025-11-01 11:30:00 | 27 | 103 | 0 | 0 | 130 | 98 | 42 | 1 | 0 | 141 | 74 | 36 | 1 | 0 | 111 | 382 | |
| 2025-11-01 11:45:00 | 21 | 107 | 0 | 0 | 128 | 88 | 47 | 2 | 0 | 137 | 38 | 42 | 0 | 0 | 80 | 345 | 1493 |
| 2025-11-01 12:00:00 | 25 | 143 | 0 | 0 | 168 | 80 | 54 | 0 | 0 | 134 | 52 | 49 | 0 | 1 | 101 | 403 | 1531 |
| 2025-11-01 12:15:00 | 23 | 109 | 0 | 0 | 132 | 112 | 48 | 0 | 0 | 160 | 54 | 43 | 0 | 0 | 97 | 389 | 1519 |
| 2025-11-01 12:30:00 | 27 | 102 | 0 | 0 | 129 | 95 | 51 | 1 | 0 | 147 | 51 | 33 | 0 | 0 | 84 | 360 | 1497 |
| 2025-11-01 12:45:00 | 19 | 128 | 0 | 0 | 147 | 119 | 53 | 1 | 0 | 173 | 50 | 33 | 0 | 0 | 83 | 403 | 1555 |
| 2025-11-01 13:00:00 | 29 | 116 | 0 | 0 | 145 | 136 | 60 | 0 | 0 | 196 | 61 | 45 | 0 | 0 | 106 | 447 | 1599 |
| 2025-11-01 13:15:00 | 34 | 117 | 0 | 0 | 151 | 109 | 50 | 0 | 0 | 159 | 59 | 30 | 0 | 0 | 89 | 399 | 1609 |
| 2025-11-01 13:30:00 | 21 | 118 | 0 | 0 | 139 | 142 | 38 | 2 | 0 | 182 | 55 | 33 | 1 | 0 | 89 | 410 | 1659 |
| 2025-11-01 13:45:00 | 30 | 85 | 0 | 0 | 115 | 132 | 56 | 1 | 0 | 189 | 51 | 46 | 0 | 0 | 97 | 401 | 1657 |
| 2025-11-01 14:00:00 | 20 | 100 | 0 | 0 | 120 | 111 | 51 | 1 | 0 | 163 | 49 | 42 | 0 | 0 | 91 | 374 | 1584 |
| 2025-11-01 14:15:00 | 25 | 97 | 0 | 0 | 122 | 142 | 58 | 1 | 0 | 201 | 48 | 38 | 0 | 0 | 86 | 409 | 1594 |
| 2025-11-01 14:30:00 | 20 | 106 | 1 | 0 | 127 | 132 | 44 | 0 | 0 | 176 | 49 | 37 | 0 | 1 | 86 | 389 | 1573 |
| 2025-11-01 14:45:00 | 28 | 106 | 0 | 0 | 134 | 139 | 59 | 2 | 0 | 200 | 54 | 45 | 0 | 0 | 99 | 433 | 1605 |
| **Grand Total** | 399 | 1761 | 1 | 0 | 2161 | 1823 | 821 | 14 | 0 | 2658 | 865 | 624 | 2 | 2 | 1491 | **6310** | - |
| **Approach%** | 18.5% | 81.5% | 0% | | - | 68.6% | 30.9% | 0.5% | | - | 58% | 41.9% | 0.1% | | - | **-** | - |
| **Totals %** | 6.3% | 27.9% | 0% | | 34.2% | 28.9% | 13% | 0.2% | | 42.1% | 13.7% | 9.9% | 0% | | 23.6% | **-** | - |
| **Heavy** | 9 | 6 | 0 | | - | 15 | 5 | 0 | | - | 9 | 1 | 0 | | - | **-** | - |
| **Heavy %** | 2.3% | 0.3% | 0% | | - | 0.8% | 0.6% | 0% | | - | 1% | 0.2% | 0% | | - | **-** | - |
| **Bicycles** | - | - | - | | - | - | - | - | | - | - | - | - | | - | **-** | - |
| **Bicycle %** | - | - | - | | - | - | - | - | | - | - | - | - | | - | **-** | - |

GHD
210 140 ALLSTATE PARKWAY
MARKHAM ONTARIO, L3R
578
CANADA

**Peak Hour: 12:45 PM - 01:45 PM Weather: Broken Clouds (6 °C)**

| Start Time | N Approach TOWNLINE RD | | | | | S Approach TOWNLINE RD | | | | | W Approach JAMIESON PKWY | | | | | Int. Total (15 min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | UTurn | Peds | Approach Total | Thru | Left | UTurn | Peds | Approach Total | Right | Left | UTurn | Peds | Approach Total | |
| 2025-11-01 12:45:00 | 19 | 128 | 0 | 0 | 147 | 119 | 53 | 1 | 0 | 173 | 50 | 33 | 0 | 0 | 83 | 403 |
| 2025-11-01 13:00:00 | 29 | 116 | 0 | 0 | 145 | 136 | 60 | 0 | 0 | 196 | 61 | 45 | 0 | 0 | 106 | 447 |
| 2025-11-01 13:15:00 | 34 | 117 | 0 | 0 | 151 | 109 | 50 | 0 | 0 | 159 | 59 | 30 | 0 | 0 | 89 | 399 |
| 2025-11-01 13:30:00 | 21 | 118 | 0 | 0 | 139 | 142 | 38 | 2 | 0 | 182 | 55 | 33 | 1 | 0 | 89 | 410 |
| **Grand Total** | 103 | 479 | 0 | 0 | 582 | 506 | 201 | 3 | 0 | 710 | 225 | 141 | 1 | 0 | 367 | **1659** |
| **Approach%** | 17.7% | 82.3% | 0% | | - | 71.3% | 28.3% | 0.4% | | - | 61.3% | 38.4% | 0.3% | | - | **-** |
| **Totals %** | 6.2% | 28.9% | 0% | | 35.1% | 30.5% | 12.1% | 0.2% | | 42.8% | 13.6% | 8.5% | 0.1% | | 22.1% | **-** |
| **PHF** | 0.76 | 0.94 | 0 | | 0.96 | 0.89 | 0.84 | 0.38 | | 0.91 | 0.92 | 0.78 | 0.25 | | 0.87 | 0.93 |
| **Heavy** | 2 | 3 | 0 | | 5 | 9 | 1 | 0 | | 10 | 2 | 0 | 0 | | 2 | 17 |
| **Heavy %** | 1.9% | 0.6% | 0% | | 0.9% | 1.8% | 0.5% | 0% | | 1.4% | 0.9% | 0% | 0% | | 0.5% | 1% |
| **Lights** | 101 | 476 | 0 | | 577 | 497 | 200 | 3 | | 700 | 223 | 141 | 1 | | 365 | 1642 |
| **Lights %** | 98.1% | 99.4% | 0% | | 99.1% | 98.2% | 99.5% | 100% | | 98.6% | 99.1% | 100% | 100% | | 99.5% | 99% |
| **Single-Unit Trucks** | 0 | 2 | 0 | | 2 | 7 | 0 | 0 | | 7 | 1 | 0 | 0 | | 1 | 10 |
| **Single-Unit Trucks %** | 0% | 0.4% | 0% | | 0.3% | 1.4% | 0% | 0% | | 1% | 0.4% | 0% | 0% | | 0.3% | 0.6% |
| **Buses** | 2 | 0 | 0 | | 2 | 1 | 1 | 0 | | 2 | 0 | 0 | 0 | | 0 | 4 |
| **Buses %** | 1.9% | 0% | 0% | | 0.3% | 0.2% | 0.5% | 0% | | 0.3% | 0% | 0% | 0% | | 0% | 0.2% |
| **Articulated Trucks** | 0 | 1 | 0 | | 1 | 1 | 0 | 0 | | 1 | 1 | 0 | 0 | | 1 | 3 |
| **Articulated Trucks %** | 0% | 0.2% | 0% | | 0.2% | 0.2% | 0% | 0% | | 0.1% | 0.4% | 0% | 0% | | 0.3% | 0.2% |
| **Bicycles on Road** | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 |
| **Bicycles on Road %** | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% | 0% | 0% | | 0% | 0% |
| **Pedestrians** | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | **-** |
| **Pedestrians%** | - | - | - | 0% | | - | - | - | 0% | | - | - | - | 0% | | **-** |
| **Bicycles on Crosswalk** | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | **-** |
| **Bicycles on Crosswalk%** | - | - | - | 0% | | - | - | - | 0% | | - | - | - | 0% | | **-** |

**Peak Hour: 12:45 PM - 01:45 PM Weather: Broken Clouds (6 °C)**




| | Bicycles on Crosswalk | Pedestrians |
|---|---|---|
| N | 0 | 0 |
| S | 0 | 0 |
| W | 0 | 0 |

# Appendix D

## Background Development Excerpts

## TABLE 4.1: ESTIMATED TRIP GENERATION (ALL VEHICLES)

| LUC | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|
| | Rate | In | Out | Total | Rate | In | Out | Total |
| Building A Phase 1<br>LUC 140 – (29,725 sq. ft.) | Eqn.[1] | 21 | 7 | 28 | Eqn.[2] | 2 | 6 | 8 |
| Building A Phase 1<br>LUC 150 – (118,897 sq. ft.) | Eqn.[3] | 29 | 9 | 38 | Eqn.[4] | 11 | 30 | 41 |
| **Total Building A (148,622 sq. ft.)** | | **50** | **16** | **66** | | **13** | **36** | **49** |
| Building B Phase 2<br>LUC 140 – (31,981 sq. ft.) | Eqn.[1] | 22 | 7 | 29 | Eqn.[2] | 3 | 7 | 10 |
| Building B Phase 2<br>LUC 150 – (127,924 sq. ft.) | Eqn.[3] | 30 | 9 | 39 | Eqn.[4] | 12 | 30 | 42 |
| **Total Building B (159,905 sq. ft.)** | | **52** | **16** | **68** | | **15** | **37** | **52** |
| **Total Trip Generation** | | **102** | **32** | **134** | | **28** | **73** | **101** |

Source: Institute of Transportation Engineers, *Trip Generation Manual*, 11th ed., (Washington, DC: ITE, 2021).

Notes:

1. LUC 140, T = 0.61(X) + 9.54, (76% entering, 24% exiting)
2. LUC 140, T = 0.87(X) – 17.5, (31% entering, 69% exiting)
3. LUC 150, T = 0.12(X) + 23.62, (77% entering, 23% exiting)
4. LUC 150, T = 0.12(X) + 26.48, (76% entering, 24% exiting)

## TABLE 4.2: ESTIMATED TRIP GENERATION (TRUCKS)

| LUC | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|
| | Rate | In | Out | Total | Rate | In | Out | Total |
| Building A Phase 1<br>LUC 140 – (29,725 sq. ft.) | 0.03[1] | 1 | 0 | 1 | 0.03[2] | 0 | 1 | 1 |
| Building A Phase 1<br>LUC 150 – (118,897 sq. ft.) | 0.02[3] | 1 | 1 | 2 | 0.03[4] | 2 | 2 | 4 |
| **Total Building A (148,622 sq. ft.)** | | **2** | **1** | **3** | | **2** | **3** | **5** |
| Building B Phase 2<br>LUC 140 – (31,981 sq. ft.) | 0.03[1] | 1 | 0 | 1 | 0.03[2] | 0 | 1 | 1 |
| Building B Phase 2<br>LUC 150 – (127,924 sq. ft.) | 0.02[3] | 2 | 1 | 3 | 0.03[4] | 2 | 2 | 4 |
| **Total Building B (159,905 sq. ft.)** | | **3** | **1** | **4** | | **2** | **3** | **5** |
| **Trucks** | | **5** | **2** | **7** | | **4** | **6** | **10** |

Source: Institute of Transportation Engineers, Trip Generation Manual, 11th ed., (Washington, DC: ITE, 2021).

Notes:

1. LUC 140, 0.03 trips per 1,000 sq. ft. GFA, (56% entering, 24% exiting)
2. LUC 140, 0.03 trips per 1,000 sq. ft. GFA, (41% entering, 69% exiting)
3. LUC 150, 0.02 trips per 1,000 sq. ft. GFA, (52% entering, 48% exiting)
4. LUC 150, 0.03 trips per 1,000 sq. ft. GFA, (52% entering, 48% exiting)

### 4.4.2 Trip Distribution

For the purposes of this TIS update, Paradigm has developed separate trip distributions for truck and non-truck traffic to and from the site. The trip distribution for non-truck traffic is based on the existing travel patterns documented in the turning movement count data in combination with trip information extracted from the 2016 Transportation Tomorrow Survey (TTS).

Trip origin and destination information were extracted from the TTS database for all trips into and out of traffic analysis zone (TAZ) 7453, separated as trips internal to Cambridge, and those to and from surrounding communities (such as Guelph, Hamilton, and Toronto). The TTS data was then cross-referenced with the general travel patterns documented in the turning movement counts.

**Table 4.3** summarizes the estimated trip distribution which reflects both macro travel direction (derived form the TTS) and micro route choice in the study area (derived from the existing travel patterns). **Appendix D** contains the TTS data and development of the trip distribution model for non-truck traffic.

**TABLE 4.3: ESTIMATED TRIP DISTRIBUTION (CARS)**

| Origin/Destination | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|
| | In | Out | In | Out |
| North via Townline Road | 14% | 38% | 4% | 11% |
| East via Lake Road | 9% | 3% | 4% | 12% |
| East via Highway 401 | 12% | 5% | 6% | 11% |
| South via Townline Road | 26% | 45% | 5% | 35% |
| West via Pinebush Road | 13% | 6% | 40% | 17% |
| West via Highway 401 | 26% | 3% | 41% | 14% |
| **Total** | **100%** | **100%** | **100%** | **100%** |

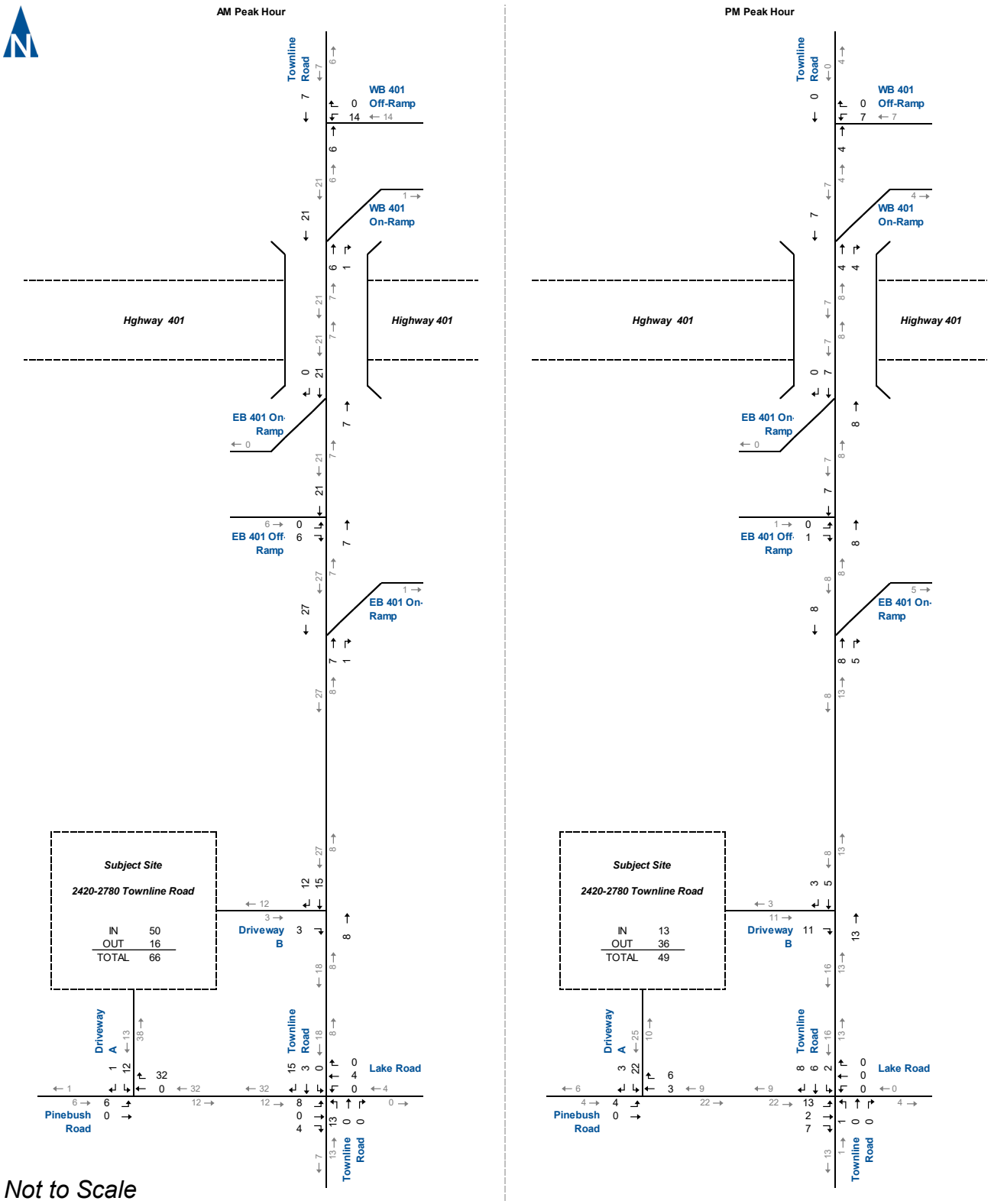
The trip distribution for truck traffic reflects existing travel patterns documented in the turning movement counts for heavy vehicle traffic only. **Table 4.4** summarizes the estimated trip distribution for truck traffic. **Figure 4.4** illustrates the site generated traffic estimates for the weekday AM peak hour and weekday PM peak hour.

**TABLE 4.4: ESTIMATED TRIP DISTRIBUTION (TRUCKS)**

| Origin/Destination | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|
| | In | Out | In | Out |
| North via Townline Road | 5% | 10% | 10% | 10% |
| East via Lake Road | 0% | 5% | 5% | 5% |
| East via Highway 401 | 10% | 25% | 10% | 35% |
| South via Townline Road | 30% | 30% | 35% | 35% |
| West via Pinebush Road | 15% | 20% | 15% | 15% |
| West via Highway 401 | 40% | 10% | 25% | 0% |
| **Total** | **100%** | **100%** | **100%** | **100%** |

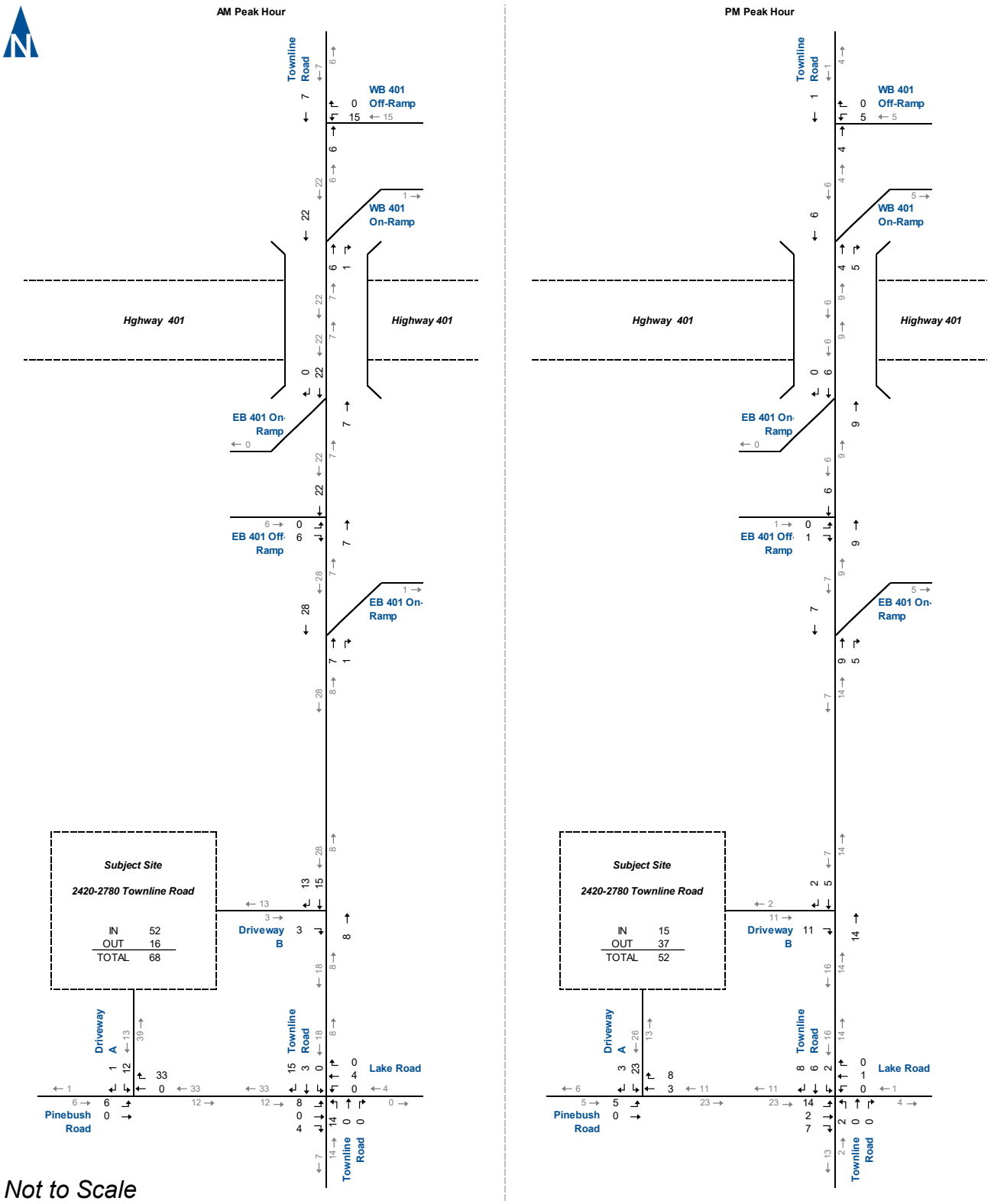
## 4.5 Future Total Traffic

**Figure 4.7, Figure 4.8** and **Figure 4.9** illustrate the estimated total traffic volumes at the 2026, 2031, and 2036 horizons, respectively. These represent the summation of the site-generated traffic volumes (see **Figure 4.4**) with the respective background traffic volumes at each horizon year.




*Not to Scale*

# Site Generated Traffic Volumes Phase 1

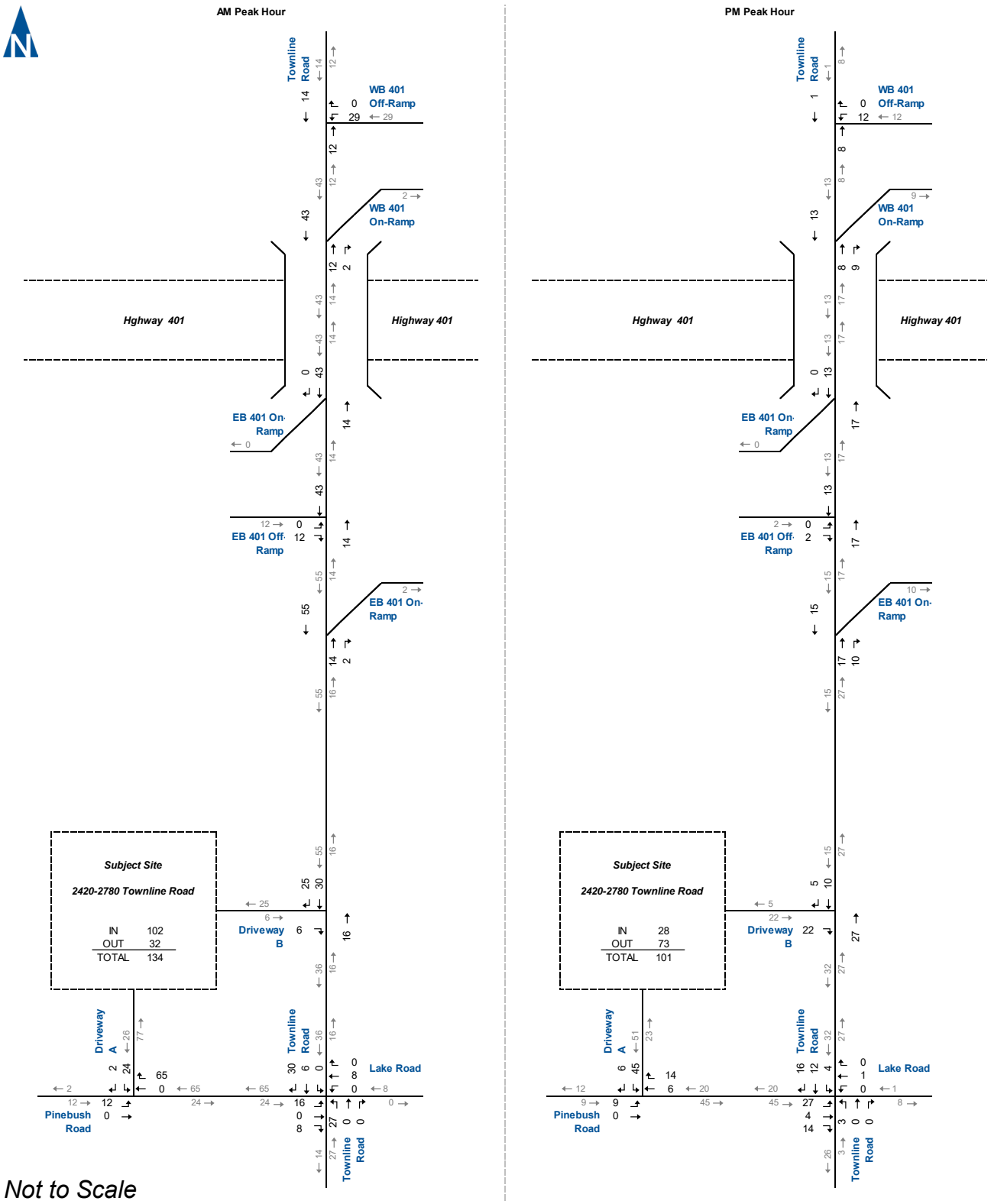



*Not to Scale*

# Site Generated Traffic Volumes Phase 2

2420-2780 Townline Road TIS
240656

**Figure 4.5**

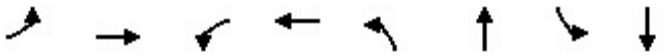



*Not to Scale*

# Site Generated Traffic Volumes Phases 1 & 2

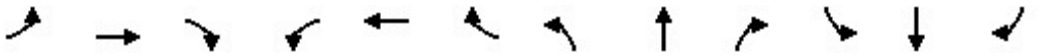
# Appendix E

## Synchro Outputs



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 80 | 233 | 14 | 14 | 101 | 545 | 4 | 594 |
| v/c Ratio | 0.46 | 0.64 | 0.15 | 0.07 | 0.21 | 0.50 | 0.01 | 0.63 |
| Control Delay | 38.9 | 15.4 | 32.4 | 24.6 | 4.6 | 7.6 | 9.0 | 15.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 38.9 | 15.4 | 32.4 | 24.6 | 4.6 | 7.6 | 9.0 | 15.8 |
| Queue Length 50th (m) | 10.9 | 3.6 | 1.8 | 1.3 | 3.2 | 28.5 | 0.2 | 54.2 |
| Queue Length 95th (m) | 23.1 | 22.8 | 6.9 | 6.0 | 9.3 | 63.7 | 1.7 | 107.2 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 497.3 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 402 | 572 | 210 | 485 | 492 | 1095 | 385 | 938 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.20 | 0.41 | 0.07 | 0.03 | 0.21 | 0.50 | 0.01 | 0.63 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 80 | 28 | 205 | 14 | 10 | 4 | 101 | 504 | 41 | 4 | 567 | 27 |
| Future Volume (vph) | 80 | 28 | 205 | 14 | 10 | 4 | 101 | 504 | 41 | 4 | 567 | 27 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1392 | | 1668 | 1562 | | 1603 | 1550 | | 1334 | 1575 | |
| Flt Permitted | 0.75 | 1.00 | | 0.39 | 1.00 | | 0.32 | 1.00 | | 0.46 | 1.00 | |
| Satd. Flow (perm) | 1301 | 1392 | | 682 | 1562 | | 542 | 1550 | | 647 | 1575 | |
| 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) | 80 | 28 | 205 | 14 | 10 | 4 | 101 | 504 | 41 | 4 | 567 | 27 |
| RTOR Reduction (vph) | 0 | 178 | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 80 | 55 | 0 | 14 | 11 | 0 | 101 | 543 | 0 | 4 | 592 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 10.3 | 10.3 | | 10.3 | 10.3 | | 55.0 | 55.0 | | 45.7 | 45.7 | |
| Effective Green, g (s) | 10.3 | 10.3 | | 10.3 | 10.3 | | 55.0 | 55.0 | | 45.7 | 45.7 | |
| Actuated g/C Ratio | 0.13 | 0.13 | | 0.13 | 0.13 | | 0.71 | 0.71 | | 0.59 | 0.59 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 172 | 184 | | 90 | 207 | | 456 | 1098 | | 381 | 927 | |
| v/s Ratio Prot | | 0.04 | | | 0.01 | | 0.02 | c0.35 | | | c0.38 | |
| v/s Ratio Perm | c0.06 | | | 0.02 | | | 0.14 | | | 0.01 | | |
| v/c Ratio | 0.47 | 0.30 | | 0.16 | 0.05 | | 0.22 | 0.49 | | 0.01 | 0.64 | |
| Uniform Delay, d1 | 31.1 | 30.4 | | 29.8 | 29.4 | | 4.9 | 5.1 | | 6.6 | 10.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.0 | 0.9 | | 0.8 | 0.1 | | 0.2 | 1.6 | | 0.1 | 3.4 | |
| Delay (s) | 33.1 | 31.3 | | 30.6 | 29.5 | | 5.1 | 6.7 | | 6.6 | 13.9 | |
| Level of Service | C | C | | C | C | | A | A | | A | B | |
| Approach Delay (s) | | 31.8 | | | 30.0 | | | 6.4 | | | 13.8 | |
| Approach LOS | | C | | | C | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 77.6 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 72.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBR | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 129 | 276 | 277 | 514 | 799 |
| v/c Ratio | 0.56 | 0.65 | 0.37 | 0.22 | 0.61 |
| Control Delay | 43.5 | 12.0 | 29.6 | 4.6 | 21.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 43.5 | 12.0 | 29.6 | 4.6 | 21.7 |
| Queue Length 50th (m) | 19.8 | 0.0 | 19.4 | 12.1 | 49.8 |
| Queue Length 95th (m) | 36.3 | 20.9 | 32.2 | 21.7 | 75.0 |
| Internal Link Dist (m) | 90.3 | | | 261.4 | 497.3 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 480 | 590 | 753 | 2368 | 1320 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.27 | 0.47 | 0.37 | 0.22 | 0.61 |

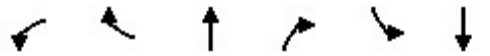
Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 129 | 276 | 277 | 514 | 651 | 148 |
| Future Volume (vph) | 129 | 276 | 277 | 514 | 651 | 148 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1347 | 3203 | 3302 | 3166 | |
| Flt Permitted | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1635 | 1347 | 3203 | 3302 | 3166 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 129 | 276 | 277 | 514 | 651 | 148 |
| RTOR Reduction (vph) | 0 | 237 | 0 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 129 | 39 | 277 | 514 | 781 | 0 |
| Confl. Peds. (#/hr) | | | 1 | | | 1 |
| Heavy Vehicles (%) | 2% | 3% | 1% | 1% | 2% | 3% |
| Turn Type | Perm | Perm | Prot | NA | NA | |
| Protected Phases | | | 5 | 2 | 6 | |
| Permitted Phases | 4 | 4 | | | | |
| Actuated Green, G (s) | 12.1 | 12.1 | 20.0 | 61.1 | 35.1 | |
| Effective Green, g (s) | 12.1 | 12.1 | 20.0 | 61.1 | 35.1 | |
| Actuated g/C Ratio | 0.14 | 0.14 | 0.23 | 0.72 | 0.41 | |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 232 | 191 | 751 | 2367 | 1304 | |
| v/s Ratio Prot | | | c0.09 | 0.16 | c0.25 | |
| v/s Ratio Perm | c0.08 | 0.03 | | | | |
| v/c Ratio | 0.56 | 0.21 | 0.37 | 0.22 | 0.60 | |
| Uniform Delay, d1 | 34.0 | 32.3 | 27.3 | 4.0 | 19.6 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.9 | 0.5 | 1.4 | 0.2 | 2.0 | |
| Delay (s) | 36.9 | 32.8 | 28.7 | 4.2 | 21.6 | |
| Level of Service | D | C | C | A | C | |
| Approach Delay (s) | 34.1 | | | 12.8 | 21.6 | |
| Approach LOS | C | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.52 | | |
| Actuated Cycle Length (s) | 85.2 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 60.3% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 457 | 118 | 691 | 624 |
| v/c Ratio | 0.71 | 0.29 | 0.32 | 0.29 |
| Control Delay | 34.3 | 7.0 | 8.3 | 8.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 34.3 | 7.0 | 8.3 | 8.1 |
| Queue Length 50th (m) | 32.2 | 0.0 | 22.9 | 20.1 |
| Queue Length 95th (m) | 46.7 | 11.5 | 39.8 | 35.5 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1081 | 592 | 2151 | 2151 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.42 | 0.20 | 0.32 | 0.29 |

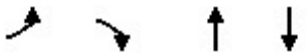
Intersection Summary



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 457 | 118 | 691 | 0 | 0 | 624 |
| Future Volume (vph) | 457 | 118 | 691 | 0 | 0 | 624 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 457 | 118 | 691 | 0 | 0 | 624 |
| RTOR Reduction (vph) | 0 | 91 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 457 | 27 | 691 | 0 | 0 | 624 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 17.6 | 17.6 | 48.1 | | | 48.1 |
| Effective Green, g (s) | 17.6 | 17.6 | 48.1 | | | 48.1 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.62 | | | 0.62 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 644 | 309 | 2152 | | | 2152 |
| v/s Ratio Prot | c0.16 | | c0.20 | | | 0.18 |
| v/s Ratio Perm | | 0.02 | | | | |
| v/c Ratio | 0.71 | 0.09 | 0.32 | | | 0.29 |
| Uniform Delay, d1 | 27.9 | 23.9 | 7.2 | | | 7.1 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 3.6 | 0.1 | 0.4 | | | 0.3 |
| Delay (s) | 31.5 | 24.1 | 7.6 | | | 7.4 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s) | 30.0 | | 7.6 | | | 7.4 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.42 | | |
| Actuated Cycle Length (s) | 78.2 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 43.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group



| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 335 | 425 | 746 | 1076 |
| v/c Ratio | 0.73 | 0.89 | 0.38 | 0.57 |
| Control Delay | 37.1 | 43.1 | 11.8 | 13.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 37.1 | 43.1 | 11.8 | 13.9 |
| Queue Length 50th (m) | 48.7 | 51.0 | 36.7 | 59.7 |
| Queue Length 95th (m) | 77.2 | #99.1 | 50.8 | 81.1 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 557 | 559 | 1940 | 1878 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.60 | 0.76 | 0.38 | 0.57 |

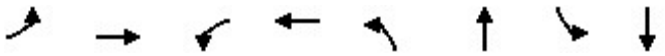
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 335 | 425 | 0 | 746 | 945 | 131 |
| Future Volume (vph) | 335 | 425 | 0 | 746 | 945 | 131 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1603 | 1414 | | 3433 | 3302 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1603 | 1414 | | 3433 | 3302 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 335 | 425 | 0 | 746 | 945 | 131 |
| RTOR Reduction (vph) | 0 | 74 | 0 | 0 | 11 | 0 |
| Lane Group Flow (vph) | 335 | 351 | 0 | 746 | 1065 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 24.5 | 24.5 | | 48.2 | 48.2 | |
| Effective Green, g (s) | 24.5 | 24.5 | | 48.2 | 48.2 | |
| Actuated g/C Ratio | 0.29 | 0.29 | | 0.57 | 0.57 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 460 | 406 | | 1942 | 1868 | |
| v/s Ratio Prot | 0.21 | | | 0.22 | c0.32 | |
| v/s Ratio Perm | | c0.25 | | | | |
| v/c Ratio | 0.73 | 0.86 | | 0.38 | 0.57 | |
| Uniform Delay, d1 | 27.4 | 28.8 | | 10.3 | 11.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 5.7 | 17.1 | | 0.6 | 1.3 | |
| Delay (s) | 33.0 | 45.9 | | 10.8 | 13.1 | |
| Level of Service | C | D | | B | B | |
| Approach Delay (s) | 40.2 | | | 10.8 | 13.1 | |
| Approach LOS | D | | | B | B | |

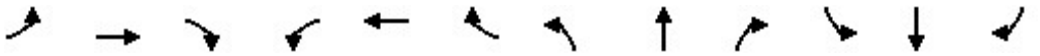
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.4 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 85.2 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 69.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 38 | 150 | 65 | 46 | 318 | 836 | 8 | 515 |
| v/c Ratio | 0.24 | 0.52 | 0.49 | 0.22 | 0.52 | 0.71 | 0.02 | 0.60 |
| Control Delay | 37.6 | 15.8 | 48.3 | 31.1 | 6.8 | 11.4 | 10.5 | 17.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 37.6 | 15.8 | 48.3 | 31.1 | 6.8 | 11.4 | 10.5 | 17.1 |
| Queue Length 50th (m) | 5.8 | 3.0 | 10.2 | 5.6 | 12.0 | 61.2 | 0.6 | 52.4 |
| Queue Length 95th (m) | 14.7 | 19.2 | 22.5 | 14.9 | 25.8 | 129.8 | 2.8 | 94.5 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 497.3 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 354 | 482 | 291 | 447 | 615 | 1186 | 340 | 858 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.31 | 0.22 | 0.10 | 0.52 | 0.70 | 0.02 | 0.60 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 38 | 20 | 130 | 65 | 37 | 9 | 318 | 803 | 33 | 8 | 459 | 56 |
| Future Volume (vph) | 38 | 20 | 130 | 65 | 37 | 9 | 318 | 803 | 33 | 8 | 459 | 56 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1395 | | 1635 | 1584 | | 1668 | 1607 | | 1668 | 1547 | |
| Flt Permitted | 0.73 | 1.00 | | 0.61 | 1.00 | | 0.35 | 1.00 | | 0.35 | 1.00 | |
| Satd. Flow (perm) | 1276 | 1395 | | 1048 | 1584 | | 620 | 1607 | | 617 | 1547 | |
| 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) | 38 | 20 | 130 | 65 | 37 | 9 | 318 | 803 | 33 | 8 | 459 | 56 |
| RTOR Reduction (vph) | 0 | 114 | 0 | 0 | 8 | 0 | 0 | 1 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 38 | 36 | 0 | 65 | 38 | 0 | 318 | 835 | 0 | 8 | 511 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 10.9 | 10.9 | | 10.9 | 10.9 | | 63.2 | 63.2 | | 47.8 | 47.8 | |
| Effective Green, g (s) | 10.9 | 10.9 | | 10.9 | 10.9 | | 63.2 | 63.2 | | 47.8 | 47.8 | |
| Actuated g/C Ratio | 0.13 | 0.13 | | 0.13 | 0.13 | | 0.73 | 0.73 | | 0.55 | 0.55 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 160 | 175 | | 132 | 199 | | 591 | 1175 | | 341 | 855 | |
| v/s Ratio Prot | | 0.03 | | | 0.02 | | 0.07 | c0.52 | | | 0.33 | |
| v/s Ratio Perm | 0.03 | | | c0.06 | | | 0.32 | | | 0.01 | | |
| v/c Ratio | 0.24 | 0.21 | | 0.49 | 0.19 | | 0.54 | 0.71 | | 0.02 | 0.60 | |
| Uniform Delay, d1 | 34.0 | 33.9 | | 35.2 | 33.8 | | 5.5 | 6.5 | | 8.7 | 12.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.8 | 0.6 | | 2.9 | 0.5 | | 0.9 | 3.7 | | 0.1 | 3.1 | |
| Delay (s) | 34.8 | 34.5 | | 38.0 | 34.3 | | 6.4 | 10.1 | | 8.9 | 16.0 | |
| Level of Service | C | C | | D | C | | A | B | | A | B | |
| Approach Delay (s) | | 34.5 | | | 36.5 | | | 9.1 | | | 15.9 | |
| Approach LOS | | C | | | D | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.72 | | |
| Actuated Cycle Length (s) | 86.4 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 92.8% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBR | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 209 | 353 | 400 | 915 | 647 |
| v/c Ratio | 0.75 | 0.67 | 0.73 | 0.38 | 0.41 |
| Control Delay | 62.4 | 11.2 | 53.1 | 6.8 | 19.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 62.4 | 11.2 | 53.1 | 6.8 | 19.1 |
| Queue Length 50th (m) | 44.8 | 0.0 | 44.1 | 35.7 | 43.5 |
| Queue Length 95th (m) | 70.0 | 26.5 | 60.0 | 54.9 | 70.1 |
| Internal Link Dist (m) | 90.3 | | | 261.4 | 497.3 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 369 | 582 | 912 | 2403 | 1587 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.57 | 0.61 | 0.44 | 0.38 | 0.41 |

Intersection Summary

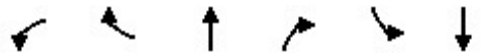
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 209 | 353 | 400 | 915 | 508 | 139 |
| Future Volume (vph) | 209 | 353 | 400 | 915 | 508 | 139 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | 3203 | 3302 | 3116 | |
| Flt Permitted | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1668 | 1387 | 3203 | 3302 | 3116 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 209 | 353 | 400 | 915 | 508 | 139 |
| RTOR Reduction (vph) | 0 | 294 | 0 | 0 | 16 | 0 |
| Lane Group Flow (vph) | 209 | 59 | 400 | 915 | 631 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 1% | 1% | 4% | 2% |
| Turn Type | Perm | Perm | Prot | NA | NA | |
| Protected Phases | | | 5 | 2 | 6 | |
| Permitted Phases | 4 | 4 | | | | |
| Actuated Green, G (s) | 19.0 | 19.0 | 19.5 | 82.9 | 57.4 | |
| Effective Green, g (s) | 19.0 | 19.0 | 19.5 | 82.9 | 57.4 | |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.17 | 0.73 | 0.50 | |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 278 | 231 | 548 | 2403 | 1570 | |
| v/s Ratio Prot | | | c0.12 | 0.28 | c0.20 | |
| v/s Ratio Perm | c0.13 | 0.04 | | | | |
| v/c Ratio | 0.75 | 0.25 | 0.73 | 0.38 | 0.40 | |
| Uniform Delay, d1 | 45.2 | 41.3 | 44.7 | 5.8 | 17.6 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 10.9 | 0.6 | 4.8 | 0.5 | 0.8 | |
| Delay (s) | 56.1 | 41.9 | 49.6 | 6.3 | 18.3 | |
| Level of Service | E | D | D | A | B | |
| Approach Delay (s) | 47.2 | | | 19.5 | 18.3 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 25.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.54 | | |
| Actuated Cycle Length (s) | 113.9 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 59.4% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 472 | 307 | 1109 | 608 |
| v/c Ratio | 0.63 | 0.76 | 0.54 | 0.29 |
| Control Delay | 30.6 | 35.5 | 12.3 | 9.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 30.6 | 35.5 | 12.3 | 9.7 |
| Queue Length 50th (m) | 33.3 | 36.8 | 49.0 | 22.2 |
| Queue Length 95th (m) | 47.1 | 63.2 | 89.0 | 42.5 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1432 | 734 | 2071 | 2071 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.33 | 0.42 | 0.54 | 0.29 |

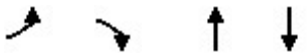
Intersection Summary



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 472 | 307 | 1109 | 0 | 0 | 608 |
| Future Volume (vph) | 472 | 307 | 1109 | 0 | 0 | 608 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 472 | 307 | 1109 | 0 | 0 | 608 |
| RTOR Reduction (vph) | 0 | 37 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 472 | 270 | 1109 | 0 | 0 | 608 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 20.8 | 20.8 | 48.3 | | | 48.3 |
| Effective Green, g (s) | 20.8 | 20.8 | 48.3 | | | 48.3 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.59 | | | 0.59 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 749 | 371 | 2071 | | | 2071 |
| v/s Ratio Prot | 0.16 | | c0.32 | | | 0.17 |
| v/s Ratio Perm | | c0.19 | | | | |
| v/c Ratio | 0.63 | 0.73 | 0.54 | | | 0.29 |
| Uniform Delay, d1 | 27.0 | 27.8 | 9.9 | | | 8.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.7 | 7.0 | 1.0 | | | 0.4 |
| Delay (s) | 28.7 | 34.8 | 10.9 | | | 8.6 |
| Level of Service | C | C | B | | | A |
| Approach Delay (s) | 31.1 | | 10.9 | | | 8.6 |
| Approach LOS | C | | B | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.59 | | |
| Actuated Cycle Length (s) | 81.6 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 61.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group



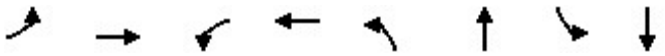
| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 358 | 433 | 978 | 1114 |
| v/c Ratio | 0.70 | 0.86 | 0.51 | 0.61 |
| Control Delay | 34.0 | 41.8 | 15.5 | 17.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 34.0 | 41.8 | 15.5 | 17.0 |
| Queue Length 50th (m) | 52.9 | 59.3 | 53.9 | 65.5 |
| Queue Length 95th (m) | 81.1 | 96.0 | 88.1 | 106.7 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 722 | 679 | 1916 | 1832 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.50 | 0.64 | 0.51 | 0.61 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 358 | 433 | 0 | 978 | 1014 | 100 |
| Future Volume (vph) | 358 | 433 | 0 | 978 | 1014 | 100 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1619 | 1442 | | 3535 | 3369 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1619 | 1442 | | 3535 | 3369 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 358 | 433 | 0 | 978 | 1014 | 100 |
| RTOR Reduction (vph) | 0 | 44 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 358 | 389 | 0 | 978 | 1108 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 28.3 | 28.3 | | 48.4 | 48.4 | |
| Effective Green, g (s) | 28.3 | 28.3 | | 48.4 | 48.4 | |
| Actuated g/C Ratio | 0.32 | 0.32 | | 0.54 | 0.54 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 513 | 457 | | 1918 | 1828 | |
| v/s Ratio Prot | 0.22 | | | 0.28 | c0.33 | |
| v/s Ratio Perm | | c0.27 | | | | |
| v/c Ratio | 0.70 | 0.85 | | 0.51 | 0.61 | |
| Uniform Delay, d1 | 26.7 | 28.5 | | 12.9 | 13.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 4.1 | 14.1 | | 1.0 | 1.5 | |
| Delay (s) | 30.8 | 42.5 | | 13.9 | 15.4 | |
| Level of Service | C | D | | B | B | |
| Approach Delay (s) | 37.2 | | | 13.9 | 15.4 | |
| Approach LOS | D | | | B | B | |

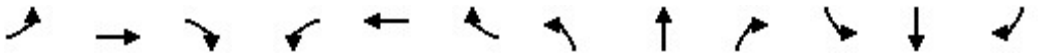
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.70 | | |
| Actuated Cycle Length (s) | 89.2 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 70.7% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group



| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 46 | 205 | 29 | 19 | 163 | 476 | 3 | 406 |
| v/c Ratio | 0.21 | 0.53 | 0.16 | 0.07 | 0.30 | 0.50 | 0.01 | 0.43 |
| Control Delay | 20.4 | 10.3 | 19.8 | 16.2 | 7.7 | 8.8 | 5.0 | 7.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 20.4 | 10.3 | 19.8 | 16.2 | 7.7 | 8.8 | 5.0 | 7.7 |
| Queue Length 50th (m) | 3.7 | 2.0 | 2.3 | 1.2 | 6.0 | 20.2 | 0.1 | 15.9 |
| Queue Length 95th (m) | 10.4 | 15.4 | 7.6 | 5.2 | 17.7 | 47.7 | 0.9 | 37.9 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 497.3 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 491 | 648 | 418 | 598 | 543 | 949 | 492 | 955 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.09 | 0.32 | 0.07 | 0.03 | 0.30 | 0.50 | 0.01 | 0.43 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 46 | 25 | 180 | 29 | 15 | 4 | 163 | 449 | 27 | 3 | 372 | 34 |
| Future Volume (vph) | 46 | 25 | 180 | 29 | 15 | 4 | 163 | 449 | 27 | 3 | 372 | 34 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1417 | | 1668 | 1570 | | 1651 | 1588 | | 1668 | 1597 | |
| Flt Permitted | 0.75 | 1.00 | | 0.63 | 1.00 | | 0.52 | 1.00 | | 0.47 | 1.00 | |
| Satd. Flow (perm) | 1295 | 1417 | | 1105 | 1570 | | 910 | 1588 | | 825 | 1597 | |
| 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) | 46 | 25 | 180 | 29 | 15 | 4 | 163 | 449 | 27 | 3 | 372 | 34 |
| RTOR Reduction (vph) | 0 | 149 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 46 | 56 | 0 | 29 | 16 | 0 | 163 | 473 | 0 | 3 | 402 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 9.0 | 9.0 | | 9.0 | 9.0 | | 31.6 | 31.6 | | 31.6 | 31.6 | |
| Effective Green, g (s) | 9.0 | 9.0 | | 9.0 | 9.0 | | 31.6 | 31.6 | | 31.6 | 31.6 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.17 | 0.17 | | 0.60 | 0.60 | | 0.60 | 0.60 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 220 | 241 | | 187 | 267 | | 543 | 948 | | 492 | 953 | |
| v/s Ratio Prot | | c0.04 | | | 0.01 | | | c0.30 | | | 0.25 | |
| v/s Ratio Perm | 0.04 | | | 0.03 | | | 0.18 | | | 0.00 | | |
| v/c Ratio | 0.21 | 0.23 | | 0.16 | 0.06 | | 0.30 | 0.50 | | 0.01 | 0.42 | |
| Uniform Delay, d1 | 18.9 | 19.0 | | 18.7 | 18.4 | | 5.2 | 6.1 | | 4.3 | 5.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.5 | | 0.4 | 0.1 | | 1.4 | 1.9 | | 0.0 | 1.4 | |
| Delay (s) | 19.4 | 19.5 | | 19.1 | 18.5 | | 6.6 | 8.0 | | 4.3 | 7.1 | |
| Level of Service | B | B | | B | B | | A | A | | A | A | |
| Approach Delay (s) | | 19.4 | | | 18.9 | | | 7.6 | | | 7.1 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.44 | | |
| Actuated Cycle Length (s) | 52.9 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 77.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Lane Group | EBL | EBR | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 142 | 225 | 204 | 506 | 582 |
| v/c Ratio | 0.58 | 0.57 | 0.51 | 0.22 | 0.35 |
| Control Delay | 43.8 | 10.8 | 39.8 | 4.8 | 13.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 43.8 | 10.8 | 39.8 | 4.8 | 13.2 |
| Queue Length 50th (m) | 22.0 | 0.0 | 16.2 | 12.3 | 26.2 |
| Queue Length 95th (m) | 39.5 | 18.2 | 27.0 | 22.1 | 45.6 |
| Internal Link Dist (m) | 90.3 | | | 261.4 | 497.3 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 487 | 564 | 748 | 2331 | 1674 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.29 | 0.40 | 0.27 | 0.22 | 0.35 |

Intersection Summary

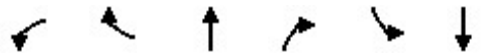
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 142 | 225 | 204 | 506 | 479 | 103 |
| Future Volume (vph) | 142 | 225 | 204 | 506 | 479 | 103 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | 3203 | 3270 | 3209 | |
| Flt Permitted | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1668 | 1387 | 3203 | 3270 | 3209 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 142 | 225 | 204 | 506 | 479 | 103 |
| RTOR Reduction (vph) | 0 | 192 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 142 | 33 | 204 | 506 | 568 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 1% | 2% | 1% | 2% |
| Turn Type | Perm | Perm | Prot | NA | NA | |
| Protected Phases | | | 5 | 2 | 6 | |
| Permitted Phases | 4 | 4 | | | | |
| Actuated Green, G (s) | 12.6 | 12.6 | 10.7 | 61.1 | 44.4 | |
| Effective Green, g (s) | 12.6 | 12.6 | 10.7 | 61.1 | 44.4 | |
| Actuated g/C Ratio | 0.15 | 0.15 | 0.12 | 0.71 | 0.52 | |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 245 | 203 | 399 | 2331 | 1662 | |
| v/s Ratio Prot | | | c0.06 | 0.15 | c0.18 | |
| v/s Ratio Perm | c0.09 | 0.02 | | | | |
| v/c Ratio | 0.58 | 0.16 | 0.51 | 0.22 | 0.34 | |
| Uniform Delay, d1 | 34.1 | 31.9 | 35.1 | 4.2 | 12.1 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.3 | 0.4 | 1.1 | 0.2 | 0.6 | |
| Delay (s) | 37.4 | 32.3 | 36.2 | 4.4 | 12.7 | |
| Level of Service | D | C | D | A | B | |
| Approach Delay (s) | 34.3 | | | 13.5 | 12.7 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM 2000 Control Delay | 17.8 | HCM 2000 Level of Service | B | |
| HCM 2000 Volume to Capacity ratio | 0.41 | | | |
| Actuated Cycle Length (s) | 85.7 | Sum of lost time (s) | 18.0 | |
| Intersection Capacity Utilization | 47.3% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 356 | 146 | 566 | 485 |
| v/c Ratio | 0.57 | 0.36 | 0.27 | 0.23 |
| Control Delay | 26.6 | 7.0 | 6.8 | 6.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 26.6 | 7.0 | 6.8 | 6.6 |
| Queue Length 50th (m) | 19.4 | 0.0 | 14.1 | 11.8 |
| Queue Length 95th (m) | 30.6 | 11.9 | 25.8 | 22.0 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1435 | 756 | 2122 | 2101 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.25 | 0.19 | 0.27 | 0.23 |

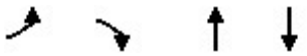
Intersection Summary



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 356 | 146 | 566 | 0 | 0 | 485 |
| Future Volume (vph) | 356 | 146 | 566 | 0 | 0 | 485 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 356 | 146 | 566 | 0 | 0 | 485 |
| RTOR Reduction (vph) | 0 | 117 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 356 | 29 | 566 | 0 | 0 | 485 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 12.8 | 12.8 | 38.1 | | | 38.1 |
| Effective Green, g (s) | 12.8 | 12.8 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.20 | 0.20 | 0.60 | | | 0.60 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 622 | 293 | 2124 | | | 2103 |
| v/s Ratio Prot | c0.12 | | c0.16 | | | 0.14 |
| v/s Ratio Perm | | 0.02 | | | | |
| v/c Ratio | 0.57 | 0.10 | 0.27 | | | 0.23 |
| Uniform Delay, d1 | 22.8 | 20.6 | 6.0 | | | 5.9 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.3 | 0.2 | 0.3 | | | 0.3 |
| Delay (s) | 24.1 | 20.8 | 6.3 | | | 6.1 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s) | 23.1 | | 6.3 | | | 6.1 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.34 | | |
| Actuated Cycle Length (s) | 63.4 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 36.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group



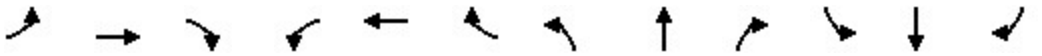
| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 274 | 397 | 461 | 838 |
| v/c Ratio | 0.62 | 0.79 | 0.24 | 0.44 |
| Control Delay | 28.1 | 26.8 | 9.8 | 11.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 28.1 | 26.8 | 9.8 | 11.1 |
| Queue Length 50th (m) | 30.9 | 30.4 | 14.5 | 29.2 |
| Queue Length 95th (m) | 51.6 | 59.6 | 30.5 | 57.8 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 694 | 700 | 1915 | 1895 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.39 | 0.57 | 0.24 | 0.44 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 274 | 397 | 0 | 461 | 732 | 106 |
| Future Volume (vph) | 274 | 397 | 0 | 461 | 732 | 106 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1456 | | 3500 | 3442 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1635 | 1456 | | 3500 | 3442 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 274 | 397 | 0 | 461 | 732 | 106 |
| RTOR Reduction (vph) | 0 | 104 | 0 | 0 | 12 | 0 |
| Lane Group Flow (vph) | 274 | 293 | 0 | 461 | 826 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 19.1 | 19.1 | | 38.3 | 38.3 | |
| Effective Green, g (s) | 19.1 | 19.1 | | 38.3 | 38.3 | |
| Actuated g/C Ratio | 0.27 | 0.27 | | 0.55 | 0.55 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 446 | 397 | | 1917 | 1885 | |
| v/s Ratio Prot | 0.17 | | | 0.13 | c0.24 | |
| v/s Ratio Perm | | c0.20 | | | | |
| v/c Ratio | 0.61 | 0.74 | | 0.24 | 0.44 | |
| Uniform Delay, d1 | 22.2 | 23.1 | | 8.2 | 9.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.5 | 7.0 | | 0.3 | 0.7 | |
| Delay (s) | 24.7 | 30.1 | | 8.5 | 10.1 | |
| Level of Service | C | C | | A | B | |
| Approach Delay (s) | 27.9 | | | 8.5 | 10.1 | |
| Approach LOS | C | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 15.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.54 | | |
| Actuated Cycle Length (s) | 69.9 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 60.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

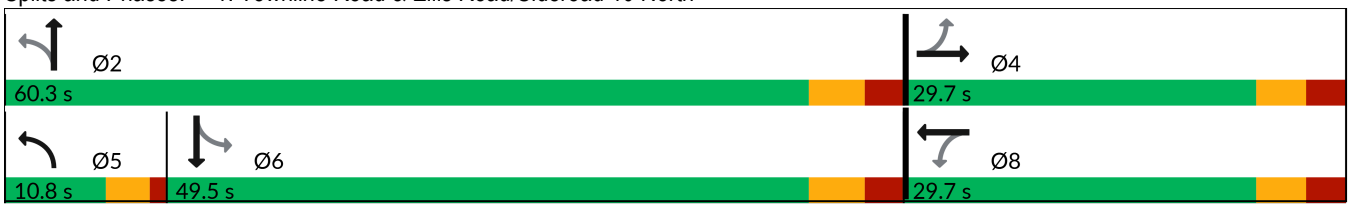


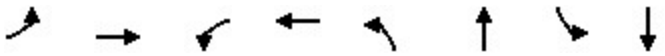
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 85 | 30 | 218 | 15 | 11 | 4 | 107 | 547 | 44 | 4 | 616 | 29 |
| Future Volume (vph) | 85 | 30 | 218 | 15 | 11 | 4 | 107 | 547 | 44 | 4 | 616 | 29 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.868 | | | 0.960 | | | 0.989 | | | 0.993 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1392 | 0 | 1668 | 1566 | 0 | 1603 | 1551 | 0 | 1334 | 1575 | 0 |
| Flt Permitted | 0.748 | | | 0.377 | | | 0.287 | | | 0.441 | | |
| Satd. Flow (perm) | 1300 | 1392 | 0 | 662 | 1566 | 0 | 484 | 1551 | 0 | 619 | 1575 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 218 | | | 4 | | | 8 | | | 4 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Adj. Flow (vph) | 85 | 30 | 218 | 15 | 11 | 4 | 107 | 547 | 44 | 4 | 616 | 29 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 85 | 248 | 0 | 15 | 15 | 0 | 107 | 591 | 0 | 4 | 645 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 9.0 | 49.5 | | 49.5 | 49.5 | |
| Total Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 10.8 | 60.3 | | 49.5 | 49.5 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 12.0% | 67.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 23.7 | 23.7 | | 23.7 | 23.7 | | 6.8 | 54.0 | | 43.2 | 43.2 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 35.2 | | 35.2 | 35.2 | |
| Flash Don't Walk (s) | 13.7 | 13.7 | | 13.7 | 13.7 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 10.6 | 10.6 | | 10.6 | 10.6 | | 56.4 | 54.1 | | 45.7 | 45.7 | |
| Actuated g/C Ratio | 0.14 | 0.14 | | 0.14 | 0.14 | | 0.73 | 0.70 | | 0.59 | 0.59 | |
| v/c Ratio | 0.47 | 0.65 | | 0.16 | 0.07 | | 0.24 | 0.54 | | 0.01 | 0.69 | |
| Control Delay (s/veh) | 39.3 | 15.4 | | 32.7 | 24.5 | | 5.0 | 8.5 | | 9.3 | 18.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 39.3 | 15.4 | | 32.7 | 24.5 | | 5.0 | 8.5 | | 9.3 | 18.0 | |
| LOS | D | B | | C | C | | A | A | | A | B | |
| Approach Delay (s/veh) | | 21.5 | | | 28.6 | | | 7.9 | | | 17.9 | |
| Approach LOS | | C | | | C | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 77.1 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.69 | | | |
| Intersection Signal Delay (s/veh): 14.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 76.6% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 85 | 248 | 15 | 15 | 107 | 591 | 4 | 645 |
| v/c Ratio | 0.47 | 0.65 | 0.16 | 0.07 | 0.24 | 0.54 | 0.01 | 0.69 |
| Control Delay (s/veh) | 39.3 | 15.4 | 32.7 | 24.5 | 5.0 | 8.5 | 9.3 | 18.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.3 | 15.4 | 32.7 | 24.5 | 5.0 | 8.5 | 9.3 | 18.0 |
| Queue Length 50th (m) | 11.6 | 3.9 | 2.0 | 1.4 | 3.5 | 33.0 | 0.2 | 62.8 |
| Queue Length 95th (m) | 24.4 | 23.8 | 7.1 | 6.2 | 10.0 | 74.6 | 1.7 | #128.7 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 400 | 579 | 204 | 485 | 453 | 1091 | 367 | 935 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.21 | 0.43 | 0.07 | 0.03 | 0.24 | 0.54 | 0.01 | 0.69 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 85 | 30 | 218 | 15 | 11 | 4 | 107 | 547 | 44 | 4 | 616 | 29 |
| Future Volume (vph) | 85 | 30 | 218 | 15 | 11 | 4 | 107 | 547 | 44 | 4 | 616 | 29 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1392 | | 1668 | 1566 | | 1603 | 1550 | | 1334 | 1576 | |
| Flt Permitted | 0.75 | 1.00 | | 0.38 | 1.00 | | 0.29 | 1.00 | | 0.44 | 1.00 | |
| Satd. Flow (perm) | 1299 | 1392 | | 662 | 1566 | | 485 | 1550 | | 620 | 1576 | |
| 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) | 85 | 30 | 218 | 15 | 11 | 4 | 107 | 547 | 44 | 4 | 616 | 29 |
| RTOR Reduction (vph) | 0 | 188 | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 85 | 60 | 0 | 15 | 12 | 0 | 107 | 589 | 0 | 4 | 643 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 10.6 | 10.6 | | 10.6 | 10.6 | | 55.0 | 55.0 | | 45.7 | 45.7 | |
| Effective Green, g (s) | 10.6 | 10.6 | | 10.6 | 10.6 | | 55.0 | 55.0 | | 45.7 | 45.7 | |
| Actuated g/C Ratio | 0.14 | 0.14 | | 0.14 | 0.14 | | 0.71 | 0.71 | | 0.59 | 0.59 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 176 | 189 | | 90 | 213 | | 418 | 1094 | | 363 | 924 | |
| v/s Ratio Prot | | 0.04 | | | 0.01 | | 0.02 | c0.38 | | | c0.41 | |
| v/s Ratio Perm | c0.07 | | | 0.02 | | | 0.16 | | | 0.01 | | |
| v/c Ratio | 0.48 | 0.32 | | 0.17 | 0.05 | | 0.26 | 0.54 | | 0.01 | 0.70 | |
| Uniform Delay, d1 | 31.1 | 30.4 | | 29.7 | 29.3 | | 5.5 | 5.4 | | 6.7 | 11.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.1 | 1.0 | | 0.9 | 0.1 | | 0.3 | 1.9 | | 0.1 | 4.3 | |
| Delay (s) | 33.2 | 31.3 | | 30.6 | 29.4 | | 5.8 | 7.3 | | 6.8 | 15.6 | |
| Level of Service | C | C | | C | C | | A | A | | A | B | |
| Approach Delay (s/veh) | | 31.8 | | | 30.0 | | | 7.1 | | | 15.5 | |
| Approach LOS | | C | | | C | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 15.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 77.9 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 76.6% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

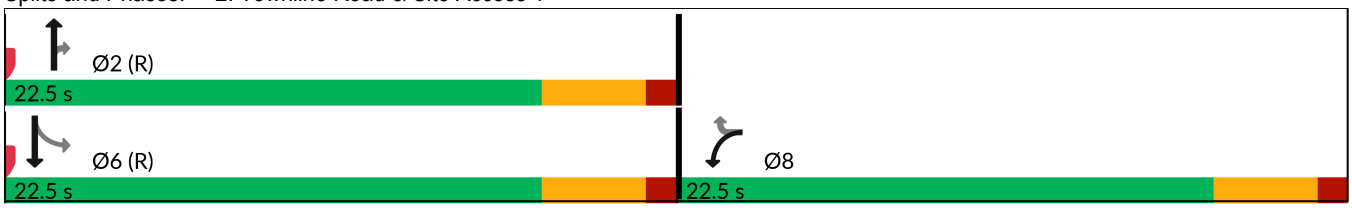
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 698 | 0 | 0 | 848 |
| Future Volume (vph) | 0 | 0 | 698 | 0 | 0 | 848 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 698 | 0 | 0 | 848 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 698 | 0 | 0 | 848 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| v/c Ratio | | | 0.41 | | | 0.46 |
| Control Delay (s/veh) | | | 0.7 | | | 0.8 |
| Queue Delay | | | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | | 0.7 | | | 0.8 |
| LOS | | | A | | | A |
| Approach Delay (s/veh) | | | 0.7 | | | 0.8 |
| Approach LOS | | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 45 | | | |
| Actuated Cycle Length: 45 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.46 | | | |
| Intersection Signal Delay (s/veh): 0.8 | | Intersection LOS: A | |
| Intersection Capacity Utilization 48.4% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

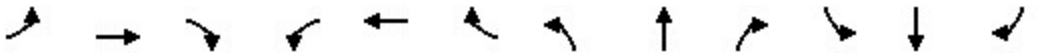


| Lane Group | NBT | SBT |
|---|---|---|
| Lane Group Flow (vph) | 698 | 848 |
| v/c Ratio | 0.41 | 0.46 |
| Control Delay (s/veh) | 0.7 | 0.8 |
| Queue Delay | 0.0 | 0.0 |
| Total Delay (s/veh) | 0.7 | 0.8 |
| Queue Length 50th (m) | 0.0 | 0.0 |
| Queue Length 95th (m) | 0.0 | 0.0 |
| Internal Link Dist (m) | 311.6 | 161.7 |
| Turn Bay Length (m) | | |
| Base Capacity (vph) | 1721 | 1842 |
| Starvation Cap Reductn | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 |
| Storage Cap Reductn | 0 | 0 |
| Reduced v/c Ratio | 0.41 | 0.46 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 698 | 0 | 0 | 848 |
| Future Volume (vph) | 0 | 0 | 698 | 0 | 0 | 848 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | | | 4.5 | | | 4.5 |
| Lane Util. Factor | | | 1.00 | | | 1.00 |
| Frt | | | 1.00 | | | 1.00 |
| Flt Protected | | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | | | 1721 | | | 1842 |
| Flt Permitted | | | 1.00 | | | 1.00 |
| Satd. Flow (perm) | | | 1721 | | | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 698 | 0 | 0 | 848 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 698 | 0 | 0 | 848 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | | | 45.0 | | | 45.0 |
| Effective Green, g (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| Clearance Time (s) | | | 4.5 | | | 4.5 |
| Vehicle Extension (s) | | | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | | | 1721 | | | 1842 |
| v/s Ratio Prot | | | 0.41 | | | c0.46 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | | | 0.41 | | | 0.46 |
| Uniform Delay, d1 | | | 0.0 | | | 0.0 |
| Progression Factor | | | 1.00 | | | 1.00 |
| Incremental Delay, d2 | | | 0.7 | | | 0.8 |
| Delay (s) | | | 0.7 | | | 0.8 |
| Level of Service | | | A | | | A |
| Approach Delay (s/veh) | 0.0 | | 0.7 | | | 0.8 |
| Approach LOS | A | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 0.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 45.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 48.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

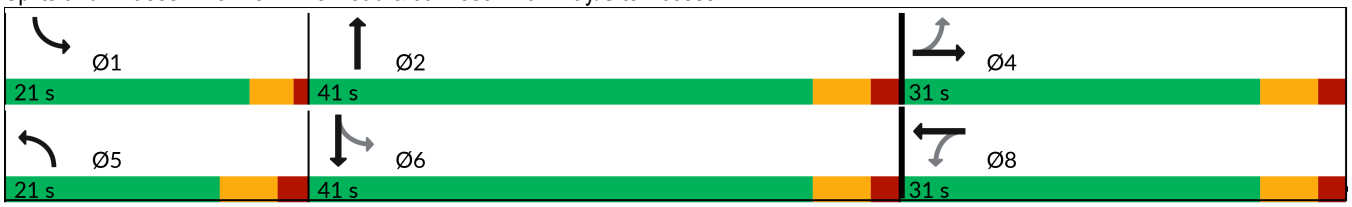


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 137 | 0 | 293 | 0 | 0 | 0 | 294 | 557 | 0 | 0 | 705 | 157 |
| Future Volume (vph) | 137 | 0 | 293 | 0 | 0 | 0 | 294 | 557 | 0 | 0 | 705 | 157 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | | | | | 1.00 | | | | 1.00 | |
| Frt | | 0.850 | | | | | | | | | 0.973 | |
| Flt Protected | 0.950 | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1347 | 0 | 3405 | 1632 | 0 | 3203 | 3302 | 0 | 1755 | 3168 | 0 |
| Flt Permitted | 0.757 | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 1303 | 1347 | 0 | 3405 | 1632 | 0 | 3202 | 3302 | 0 | 1755 | 3168 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 390 | | | | | | | | | 33 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| 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% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Adj. Flow (vph) | 137 | 0 | 293 | 0 | 0 | 0 | 294 | 557 | 0 | 0 | 705 | 157 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 137 | 293 | 0 | 0 | 0 | 0 | 294 | 557 | 0 | 0 | 862 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 11.0 | 41.0 | | 9.0 | 41.0 | |
| Total Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 21.0 | 41.0 | | 21.0 | 41.0 | |
| Total Split (%) | 33.3% | 33.3% | | 33.3% | 33.3% | | 22.6% | 44.1% | | 22.6% | 44.1% | |
| Maximum Green (s) | 25.0 | 25.0 | | 25.0 | 25.0 | | 15.0 | 35.0 | | 17.0 | 35.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 14.2 | 14.2 | | | | | 12.2 | 53.5 | | | 35.3 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | | | | 0.15 | 0.67 | | | 0.44 | |
| v/c Ratio | 0.59 | 0.52 | | | | | 0.60 | 0.25 | | | 0.61 | |
| Control Delay (s/veh) | 41.2 | 4.2 | | | | | 38.0 | 6.2 | | | 19.8 | |
| Queue Delay | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | 41.2 | 4.2 | | | | | 38.0 | 6.2 | | | 19.8 | |
| LOS | D | A | | | | | D | A | | | B | |
| Approach Delay (s/veh) | | 16.0 | | | | | | 17.2 | | | 19.8 | |
| Approach LOS | | B | | | | | | B | | | B | |

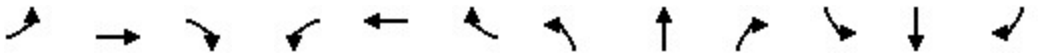
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 93 | | | |
| Actuated Cycle Length: 79.8 | | | |
| Natural Cycle: 85 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.61 | | | |
| Intersection Signal Delay (s/veh): 18.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 74.0% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 137 | 293 | 294 | 557 | 862 |
| v/c Ratio | 0.59 | 0.52 | 0.60 | 0.25 | 0.61 |
| Control Delay (s/veh) | 41.2 | 4.2 | 38.0 | 6.2 | 19.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 41.2 | 4.2 | 38.0 | 6.2 | 19.8 |
| Queue Length 50th (m) | 19.2 | 0.0 | 21.3 | 14.5 | 47.8 |
| Queue Length 95th (m) | 37.0 | 4.4 | 37.1 | 29.3 | 83.4 |
| Internal Link Dist (m) | | 90.3 | | 261.4 | 311.6 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 411 | 692 | 607 | 2214 | 1419 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.33 | 0.42 | 0.48 | 0.25 | 0.61 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 137 | 0 | 293 | 0 | 0 | 0 | 294 | 557 | 0 | 0 | 705 | 157 |
| Future Volume (vph) | 137 | 0 | 293 | 0 | 0 | 0 | 294 | 557 | 0 | 0 | 705 | 157 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | | | 0.97 | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Frt | 1.00 | 0.85 | | | | | 1.00 | 1.00 | | | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | 1635 | 1347 | | | | | 3203 | 3302 | | | 3167 | |
| Flt Permitted | 0.76 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 1303 | 1347 | | | | | 3203 | 3302 | | | 3167 | |
| 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) | 137 | 0 | 293 | 0 | 0 | 0 | 294 | 557 | 0 | 0 | 705 | 157 |
| RTOR Reduction (vph) | 0 | 241 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 137 | 52 | 0 | 0 | 0 | 0 | 294 | 557 | 0 | 0 | 844 | 0 |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| Heavy Vehicles (%) | 2% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 14.2 | 14.2 | | | | | 12.2 | 53.5 | | | 35.3 | |
| Effective Green, g (s) | 14.2 | 14.2 | | | | | 12.2 | 53.5 | | | 35.3 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | | | | 0.15 | 0.67 | | | 0.44 | |
| Clearance Time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 232 | 239 | | | | | 490 | 2216 | | | 1402 | |
| v/s Ratio Prot | | 0.04 | | | | | c0.09 | 0.17 | | | c0.27 | |
| v/s Ratio Perm | c0.11 | | | | | | | | | | | |
| v/c Ratio | 0.59 | 0.22 | | | | | 0.60 | 0.25 | | | 0.60 | |
| Uniform Delay, d1 | 30.1 | 28.0 | | | | | 31.5 | 5.2 | | | 16.9 | |
| Progression Factor | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 4.0 | 0.5 | | | | | 2.1 | 0.3 | | | 1.9 | |
| Delay (s) | 34.1 | 28.5 | | | | | 33.5 | 5.5 | | | 18.8 | |
| Level of Service | C | C | | | | | C | A | | | B | |
| Approach Delay (s/veh) | | 30.3 | | | 0.0 | | | 15.2 | | | 18.8 | |
| Approach LOS | | C | | | A | | | B | | | B | |

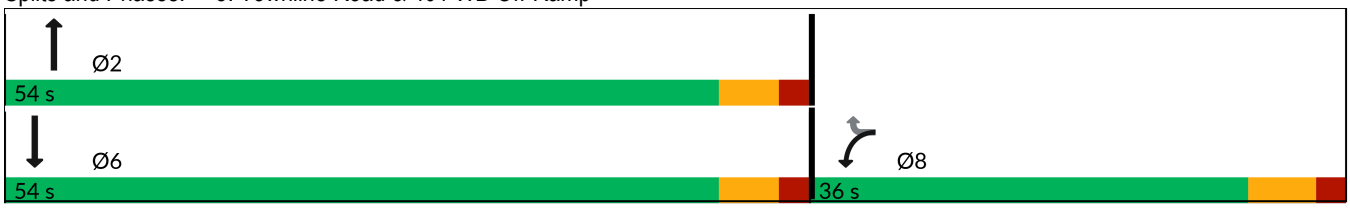
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 19.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 79.7 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 74.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 513 | 125 | 745 | 0 | 0 | 676 |
| Future Volume (vph) | 513 | 125 | 745 | 0 | 0 | 676 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 125 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 513 | 125 | 745 | 0 | 0 | 676 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 513 | 125 | 745 | 0 | 0 | 676 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (%) | 40.0% | 40.0% | 60.0% | | | 60.0% |
| Maximum Green (s) | 29.5 | 29.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 19.6 | 19.6 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.60 | | | 0.60 |
| v/c Ratio | 0.73 | 0.29 | 0.36 | | | 0.32 |
| Control Delay (s/veh) | 34.5 | 6.5 | 9.4 | | | 9.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 34.5 | 6.5 | 9.4 | | | 9.1 |
| LOS | C | A | A | | | A |
| Approach Delay (s/veh) | 29.1 | | 9.4 | | | 9.1 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 80.3 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.73 | | | |
| Intersection Signal Delay (s/veh): 15.4 | | Intersection LOS: B | |
| Intersection Capacity Utilization 46.7% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 513 | 125 | 745 | 676 |
| v/c Ratio | 0.73 | 0.29 | 0.36 | 0.32 |
| Control Delay (s/veh) | 34.5 | 6.5 | 9.4 | 9.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.5 | 6.5 | 9.4 | 9.1 |
| Queue Length 50th (m) | 37.1 | 0.0 | 27.0 | 23.9 |
| Queue Length 95th (m) | 52.6 | 11.6 | 46.7 | 41.7 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1055 | 585 | 2098 | 2098 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.49 | 0.21 | 0.36 | 0.32 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 513 | 125 | 745 | 0 | 0 | 676 |
| Future Volume (vph) | 513 | 125 | 745 | 0 | 0 | 676 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 513 | 125 | 745 | 0 | 0 | 676 |
| RTOR Reduction (vph) | 0 | 94 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 513 | 31 | 745 | 0 | 0 | 676 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 19.6 | 19.6 | 48.2 | | | 48.2 |
| Effective Green, g (s) | 19.6 | 19.6 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.60 | | | 0.60 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 698 | 335 | 2100 | | | 2100 |
| v/s Ratio Prot | c0.18 | | c0.21 | | | 0.19 |
| v/s Ratio Perm | | 0.02 | | | | |
| v/c Ratio | 0.73 | 0.09 | 0.35 | | | 0.32 |
| Uniform Delay, d1 | 28.0 | 23.5 | 8.2 | | | 8.0 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 4.0 | 0.1 | 0.5 | | | 0.4 |
| Delay (s) | 32.0 | 23.6 | 8.6 | | | 8.4 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 30.3 | | 8.6 | | | 8.4 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 15.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.46 | | |
| Actuated Cycle Length (s) | 80.3 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 46.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

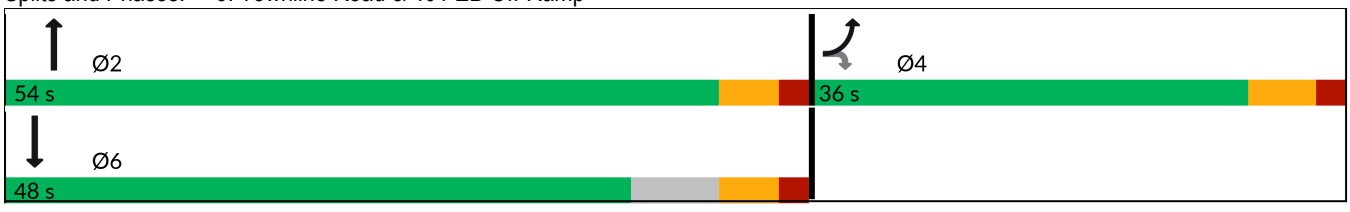
c Critical Lane Group

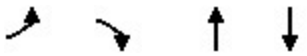
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 355 | 463 | 0 | 806 | 1046 | 139 |
| Future Volume (vph) | 355 | 463 | 0 | 806 | 1046 | 139 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.982 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1603 | 1414 | 0 | 3433 | 3302 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1603 | 1414 | 0 | 3433 | 3302 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 80 | | | 25 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Adj. Flow (vph) | 355 | 463 | 0 | 806 | 1046 | 139 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 355 | 463 | 0 | 806 | 1185 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 54.0 | 42.0 | |
| Total Split (s) | 36.0 | 36.0 | | 54.0 | 48.0 | |
| Total Split (%) | 40.0% | 40.0% | | 60.0% | 53.3% | |
| Maximum Green (s) | 29.5 | 29.5 | | 48.0 | 42.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 10.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 19.5 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 27.5 | 27.5 | | 48.1 | 48.1 | |
| Actuated g/C Ratio | 0.31 | 0.31 | | 0.55 | 0.55 | |
| v/c Ratio | 0.71 | 0.93 | | 0.43 | 0.65 | |
| Control Delay (s/veh) | 35.5 | 52.4 | | 13.1 | 16.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 35.5 | 52.4 | | 13.1 | 16.4 | |
| LOS | D | D | | B | B | |
| Approach Delay (s/veh) | 45.1 | | | 13.1 | 16.4 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 88.1 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.93 | | | |
| Intersection Signal Delay (s/veh): 23.8 | | Intersection LOS: C | |
| Intersection Capacity Utilization 74.9% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 355 | 463 | 806 | 1185 |
| v/c Ratio | 0.71 | 0.93 | 0.43 | 0.65 |
| Control Delay (s/veh) | 35.5 | 52.4 | 13.1 | 16.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.5 | 52.4 | 13.1 | 16.4 |
| Queue Length 50th (m) | 52.5 | 64.0 | 42.1 | 72.2 |
| Queue Length 95th (m) | 82.7 | #121.2 | 55.7 | 94.0 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 537 | 527 | 1873 | 1813 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.66 | 0.88 | 0.43 | 0.65 |

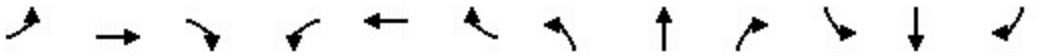
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 355 | 463 | 0 | 806 | 1046 | 139 |
| Future Volume (vph) | 355 | 463 | 0 | 806 | 1046 | 139 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1603 | 1414 | | 3433 | 3303 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1603 | 1414 | | 3433 | 3303 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 355 | 463 | 0 | 806 | 1046 | 139 |
| RTOR Reduction (vph) | 0 | 55 | 0 | 0 | 11 | 0 |
| Lane Group Flow (vph) | 355 | 408 | 0 | 806 | 1174 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 27.5 | 27.5 | | 48.1 | 48.1 | |
| Effective Green, g (s) | 27.5 | 27.5 | | 48.1 | 48.1 | |
| Actuated g/C Ratio | 0.31 | 0.31 | | 0.55 | 0.55 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 500 | 441 | | 1874 | 1803 | |
| v/s Ratio Prot | 0.22 | | | 0.23 | c0.36 | |
| v/s Ratio Perm | | c0.29 | | | | |
| v/c Ratio | 0.71 | 0.93 | | 0.43 | 0.65 | |
| Uniform Delay, d1 | 26.8 | 29.3 | | 11.9 | 14.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 4.7 | 25.2 | | 0.7 | 1.8 | |
| Delay (s) | 31.5 | 54.5 | | 12.6 | 15.9 | |
| Level of Service | C | D | | B | B | |
| Approach Delay (s/veh) | 44.5 | | | 12.6 | 15.9 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 23.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 88.1 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 74.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

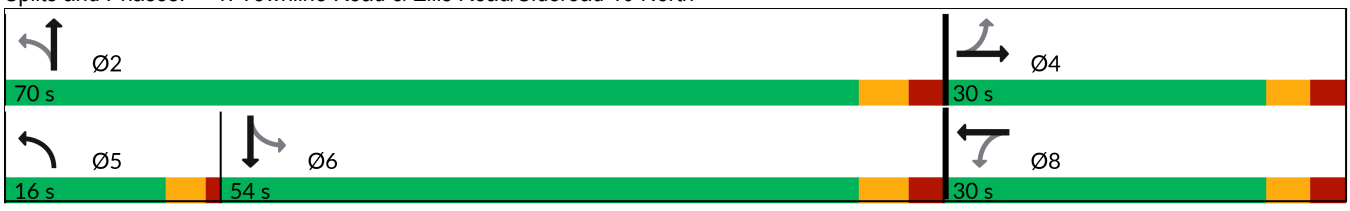


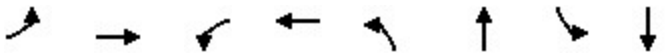
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 40 | 21 | 138 | 69 | 39 | 10 | 337 | 860 | 35 | 8 | 488 | 59 |
| Future Volume (vph) | 40 | 21 | 138 | 69 | 39 | 10 | 337 | 860 | 35 | 8 | 488 | 59 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.870 | | | 0.969 | | | 0.994 | | | 0.984 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1395 | 0 | 1635 | 1581 | 0 | 1668 | 1606 | 0 | 1668 | 1547 | 0 |
| Flt Permitted | 0.725 | | | 0.577 | | | 0.336 | | | 0.315 | | |
| Satd. Flow (perm) | 1273 | 1395 | 0 | 993 | 1581 | 0 | 590 | 1606 | 0 | 553 | 1547 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 138 | | | 10 | | | 4 | | | 8 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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 (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 40 | 21 | 138 | 69 | 39 | 10 | 337 | 860 | 35 | 8 | 488 | 59 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 40 | 159 | 0 | 69 | 49 | 0 | 337 | 895 | 0 | 8 | 547 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 9.0 | 54.0 | | 54.0 | 54.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 16.0 | 70.0 | | 54.0 | 54.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 16.0% | 70.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 12.0 | 63.7 | | 47.7 | 47.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 39.7 | | 39.7 | 39.7 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 11.4 | 11.4 | | 11.4 | 11.4 | | 66.1 | 63.8 | | 49.3 | 49.3 | |
| Actuated g/C Ratio | 0.13 | 0.13 | | 0.13 | 0.13 | | 0.76 | 0.73 | | 0.56 | 0.56 | |
| v/c Ratio | 0.24 | 0.53 | | 0.53 | 0.23 | | 0.59 | 0.76 | | 0.03 | 0.63 | |
| Control Delay (s/veh) | 37.3 | 15.4 | | 50.9 | 30.7 | | 8.1 | 13.7 | | 10.8 | 17.8 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 1.3 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 37.3 | 15.4 | | 50.9 | 30.7 | | 8.1 | 15.0 | | 10.8 | 17.8 | |
| LOS | D | B | | D | C | | A | B | | B | B | |
| Approach Delay (s/veh) | | 19.8 | | | 42.5 | | | 13.2 | | | 17.7 | |
| Approach LOS | | B | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 87.5 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.76 | | | |
| Intersection Signal Delay (s/veh): 16.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 94.5% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 40 | 159 | 69 | 49 | 337 | 895 | 8 | 547 |
| v/c Ratio | 0.24 | 0.53 | 0.53 | 0.23 | 0.59 | 0.76 | 0.03 | 0.63 |
| Control Delay (s/veh) | 37.3 | 15.4 | 50.9 | 30.7 | 8.1 | 13.7 | 10.8 | 17.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.3 | 15.4 | 50.9 | 30.7 | 8.1 | 15.0 | 10.8 | 17.8 |
| Queue Length 50th (m) | 6.1 | 3.2 | 11.0 | 5.9 | 13.3 | 73.0 | 0.6 | 56.5 |
| Queue Length 95th (m) | 15.2 | 19.8 | 23.9 | 15.6 | 28.9 | 160.7 | 2.9 | 106.2 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 349 | 483 | 272 | 441 | 593 | 1171 | 311 | 874 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 118 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.33 | 0.25 | 0.11 | 0.57 | 0.85 | 0.03 | 0.63 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 40 | 21 | 138 | 69 | 39 | 10 | 337 | 860 | 35 | 8 | 488 | 59 |
| Future Volume (vph) | 40 | 21 | 138 | 69 | 39 | 10 | 337 | 860 | 35 | 8 | 488 | 59 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1395 | | 1635 | 1582 | | 1668 | 1607 | | 1668 | 1547 | |
| Flt Permitted | 0.73 | 1.00 | | 0.58 | 1.00 | | 0.34 | 1.00 | | 0.31 | 1.00 | |
| Satd. Flow (perm) | 1273 | 1395 | | 993 | 1582 | | 589 | 1607 | | 552 | 1547 | |
| 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) | 40 | 21 | 138 | 69 | 39 | 10 | 337 | 860 | 35 | 8 | 488 | 59 |
| RTOR Reduction (vph) | 0 | 120 | 0 | 0 | 9 | 0 | 0 | 1 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 40 | 39 | 0 | 69 | 40 | 0 | 337 | 894 | 0 | 8 | 544 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 11.4 | 11.4 | | 11.4 | 11.4 | | 63.8 | 63.8 | | 49.3 | 49.3 | |
| Effective Green, g (s) | 11.4 | 11.4 | | 11.4 | 11.4 | | 63.8 | 63.8 | | 49.3 | 49.3 | |
| Actuated g/C Ratio | 0.13 | 0.13 | | 0.13 | 0.13 | | 0.73 | 0.73 | | 0.56 | 0.56 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 165 | 181 | | 129 | 206 | | 558 | 1171 | | 311 | 871 | |
| v/s Ratio Prot | | 0.03 | | | 0.03 | | 0.07 | c0.56 | | | 0.35 | |
| v/s Ratio Perm | 0.03 | | | c0.07 | | | 0.37 | | | 0.01 | | |
| v/c Ratio | 0.24 | 0.22 | | 0.53 | 0.20 | | 0.60 | 0.76 | | 0.03 | 0.62 | |
| Uniform Delay, d1 | 34.2 | 34.0 | | 35.6 | 34.0 | | 6.1 | 7.2 | | 8.5 | 12.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.8 | 0.6 | | 4.2 | 0.5 | | 1.9 | 4.7 | | 0.2 | 3.4 | |
| Delay (s) | 34.9 | 34.6 | | 39.8 | 34.4 | | 7.9 | 12.0 | | 8.6 | 16.2 | |
| Level of Service | C | C | | D | C | | A | B | | A | B | |
| Approach Delay (s/veh) | | 34.7 | | | 37.6 | | | 10.9 | | | 16.1 | |
| Approach LOS | | C | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 16.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.77 | | |
| Actuated Cycle Length (s) | 87.5 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 94.5% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

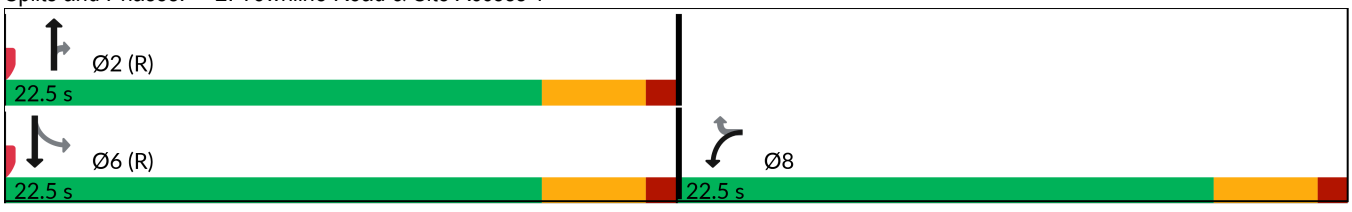
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 1233 | 0 | 0 | 695 |
| Future Volume (vph) | 0 | 0 | 1233 | 0 | 0 | 695 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 1233 | 0 | 0 | 695 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 1233 | 0 | 0 | 695 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| v/c Ratio | | | 0.72 | | | 0.38 |
| Control Delay (s/veh) | | | 2.6 | | | 0.6 |
| Queue Delay | | | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | | 2.6 | | | 0.6 |
| LOS | | | A | | | A |
| Approach Delay (s/veh) | | | 2.6 | | | 0.6 |
| Approach LOS | | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 45 | | | |
| Actuated Cycle Length: 45 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.72 | | | |
| Intersection Signal Delay (s/veh): 1.9 | | Intersection LOS: A | |
| Intersection Capacity Utilization 73.2% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

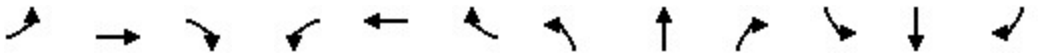


| Lane Group | NBT | SBT |
|---|---|---|
| Lane Group Flow (vph) | 1233 | 695 |
| v/c Ratio | 0.72 | 0.38 |
| Control Delay (s/veh) | 2.6 | 0.6 |
| Queue Delay | 0.0 | 0.0 |
| Total Delay (s/veh) | 2.6 | 0.6 |
| Queue Length 50th (m) | 0.0 | 0.0 |
| Queue Length 95th (m) | 0.0 | 0.0 |
| Internal Link Dist (m) | 311.6 | 161.7 |
| Turn Bay Length (m) | | |
| Base Capacity (vph) | 1721 | 1842 |
| Starvation Cap Reductn | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 |
| Storage Cap Reductn | 0 | 0 |
| Reduced v/c Ratio | 0.72 | 0.38 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 1233 | 0 | 0 | 695 |
| Future Volume (vph) | 0 | 0 | 1233 | 0 | 0 | 695 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | | | 4.5 | | | 4.5 |
| Lane Util. Factor | | | 1.00 | | | 1.00 |
| Frt | | | 1.00 | | | 1.00 |
| Flt Protected | | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | | | 1721 | | | 1842 |
| Flt Permitted | | | 1.00 | | | 1.00 |
| Satd. Flow (perm) | | | 1721 | | | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 1233 | 0 | 0 | 695 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 1233 | 0 | 0 | 695 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | | | 45.0 | | | 45.0 |
| Effective Green, g (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| Clearance Time (s) | | | 4.5 | | | 4.5 |
| Vehicle Extension (s) | | | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | | | 1721 | | | 1842 |
| v/s Ratio Prot | | | c0.72 | | | 0.38 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | | | 0.72 | | | 0.38 |
| Uniform Delay, d1 | | | 0.0 | | | 0.0 |
| Progression Factor | | | 1.00 | | | 1.00 |
| Incremental Delay, d2 | | | 2.6 | | | 0.6 |
| Delay (s) | | | 2.6 | | | 0.6 |
| Level of Service | | | A | | | A |
| Approach Delay (s/veh) | 0.0 | | 2.6 | | | 0.6 |
| Approach LOS | A | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 1.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 45.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 73.2% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

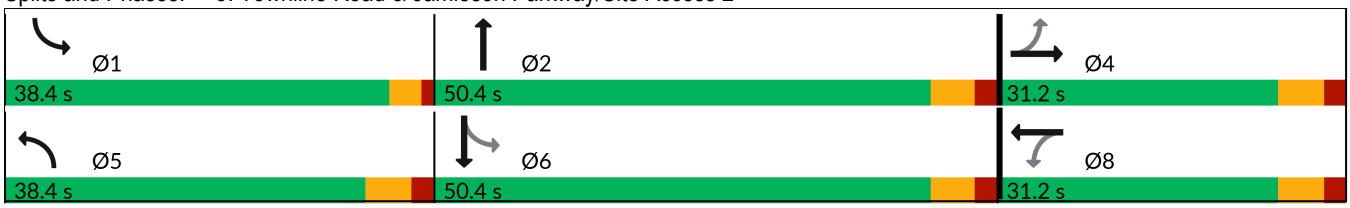


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 222 | 0 | 375 | 0 | 0 | 0 | 424 | 979 | 0 | 0 | 540 | 148 |
| Future Volume (vph) | 222 | 0 | 375 | 0 | 0 | 0 | 424 | 979 | 0 | 0 | 540 | 148 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | | | | | | | 0.968 | |
| Flt Protected | 0.950 | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3302 | 0 | 1755 | 3117 | 0 |
| Flt Permitted | 0.757 | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 1329 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3302 | 0 | 1755 | 3117 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 553 | | | | | | | | | 33 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 222 | 0 | 375 | 0 | 0 | 0 | 424 | 979 | 0 | 0 | 540 | 148 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 222 | 375 | 0 | 0 | 0 | 0 | 424 | 979 | 0 | 0 | 688 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 11.0 | 50.4 | | 9.0 | 50.4 | |
| Total Split (s) | 31.2 | 31.2 | | 31.2 | 31.2 | | 38.4 | 50.4 | | 38.4 | 50.4 | |
| Total Split (%) | 26.0% | 26.0% | | 26.0% | 26.0% | | 32.0% | 42.0% | | 32.0% | 42.0% | |
| Maximum Green (s) | 25.2 | 25.2 | | 25.2 | 25.2 | | 32.4 | 44.4 | | 34.4 | 44.4 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | | 23.4 | | | 23.4 | |
| Flash Don't Walk (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 21.7 | 21.7 | | | | | 18.9 | 69.6 | | | 44.7 | |
| Actuated g/C Ratio | 0.21 | 0.21 | | | | | 0.18 | 0.67 | | | 0.43 | |
| v/c Ratio | 0.80 | 0.52 | | | | | 0.73 | 0.44 | | | 0.50 | |
| Control Delay (s/veh) | 60.6 | 2.6 | | | | | 47.9 | 9.0 | | | 23.0 | |
| Queue Delay | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | 60.6 | 2.6 | | | | | 47.9 | 9.0 | | | 23.0 | |
| LOS | E | A | | | | | D | A | | | C | |
| Approach Delay (s/veh) | | 24.2 | | | | | | 20.7 | | | 23.0 | |
| Approach LOS | | C | | | | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 103.4 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.80 | | | |
| Intersection Signal Delay (s/veh): 22.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 75.7% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

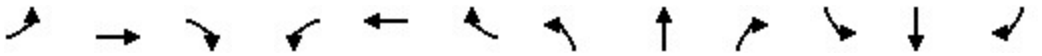
Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 222 | 375 | 424 | 979 | 688 |
| v/c Ratio | 0.80 | 0.52 | 0.73 | 0.44 | 0.50 |
| Control Delay (s/veh) | 60.6 | 2.6 | 47.9 | 9.0 | 23.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 60.6 | 2.6 | 47.9 | 9.0 | 23.0 |
| Queue Length 50th (m) | 42.5 | 0.0 | 43.0 | 47.3 | 51.8 |
| Queue Length 95th (m) | #80.7 | 0.0 | 59.5 | 60.6 | 75.7 |
| Internal Link Dist (m) | | 90.3 | | 261.4 | 311.6 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 325 | 757 | 1009 | 2222 | 1365 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.68 | 0.50 | 0.42 | 0.44 | 0.50 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 222 | 0 | 375 | 0 | 0 | 0 | 424 | 979 | 0 | 0 | 540 | 148 |
| Future Volume (vph) | 222 | 0 | 375 | 0 | 0 | 0 | 424 | 979 | 0 | 0 | 540 | 148 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | | | 0.97 | 0.95 | | | 0.95 | |
| Frt | 1.00 | 0.85 | | | | | 1.00 | 1.00 | | | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | | | | 3203 | 3302 | | | 3116 | |
| Flt Permitted | 0.76 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 1329 | 1387 | | | | | 3203 | 3302 | | | 3116 | |
| 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) | 222 | 0 | 375 | 0 | 0 | 0 | 424 | 979 | 0 | 0 | 540 | 148 |
| RTOR Reduction (vph) | 0 | 296 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 |
| Lane Group Flow (vph) | 222 | 79 | 0 | 0 | 0 | 0 | 424 | 979 | 0 | 0 | 669 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 21.8 | 21.8 | | | | | 18.9 | 69.6 | | | 44.7 | |
| Effective Green, g (s) | 21.8 | 21.8 | | | | | 18.9 | 69.6 | | | 44.7 | |
| Actuated g/C Ratio | 0.21 | 0.21 | | | | | 0.18 | 0.67 | | | 0.43 | |
| Clearance Time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 280 | 292 | | | | | 585 | 2222 | | | 1347 | |
| v/s Ratio Prot | | 0.06 | | | | | c0.13 | 0.30 | | | c0.21 | |
| v/s Ratio Perm | c0.17 | | | | | | | | | | | |
| v/c Ratio | 0.79 | 0.27 | | | | | 0.72 | 0.44 | | | 0.50 | |
| Uniform Delay, d1 | 38.7 | 34.1 | | | | | 39.8 | 7.9 | | | 21.2 | |
| Progression Factor | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 14.2 | 0.5 | | | | | 4.4 | 0.6 | | | 1.3 | |
| Delay (s) | 52.9 | 34.7 | | | | | 44.2 | 8.5 | | | 22.5 | |
| Level of Service | D | C | | | | | D | A | | | C | |
| Approach Delay (s/veh) | | 41.4 | | | 0.0 | | | 19.3 | | | 22.5 | |
| Approach LOS | | D | | | A | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 25.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 103.4 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 75.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

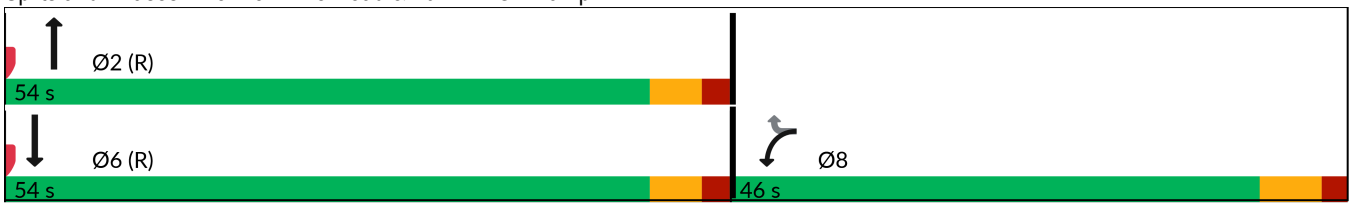
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 512 | 325 | 1185 | 0 | 0 | 646 |
| Future Volume (vph) | 512 | 325 | 1185 | 0 | 0 | 646 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 39 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 512 | 325 | 1185 | 0 | 0 | 646 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 512 | 325 | 1185 | 0 | 0 | 646 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Minimum Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (%) | 46.0% | 46.0% | 54.0% | | | 54.0% |
| Maximum Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 29.5 | 29.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| v/c Ratio | 0.44 | 0.54 | 0.71 | | | 0.38 |
| Control Delay (s/veh) | 23.7 | 24.4 | 23.3 | | | 17.4 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 23.7 | 24.4 | 23.3 | | | 17.4 |
| LOS | C | C | C | | | B |
| Approach Delay (s/veh) | 24.0 | | 23.3 | | | 17.4 |
| Approach LOS | C | | C | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 100 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.71 | | | |
| Intersection Signal Delay (s/veh): 22.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 65.0% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 512 | 325 | 1185 | 646 |
| v/c Ratio | 0.44 | 0.54 | 0.71 | 0.38 |
| Control Delay (s/veh) | 23.7 | 24.4 | 23.3 | 17.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 23.7 | 24.4 | 23.3 | 17.4 |
| Queue Length 50th (m) | 36.7 | 41.7 | 91.7 | 40.5 |
| Queue Length 95th (m) | 50.6 | 68.4 | 115.5 | 53.5 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1161 | 598 | 1680 | 1680 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.44 | 0.54 | 0.71 | 0.38 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 512 | 325 | 1185 | 0 | 0 | 646 |
| Future Volume (vph) | 512 | 325 | 1185 | 0 | 0 | 646 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 512 | 325 | 1185 | 0 | 0 | 646 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 512 | 301 | 1185 | 0 | 0 | 646 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Effective Green, g (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Grp Cap (vph) | 1161 | 575 | 1680 | | | 1680 |
| v/s Ratio Prot | 0.17 | | c0.34 | | | 0.18 |
| v/s Ratio Perm | | c0.21 | | | | |
| v/c Ratio | 0.44 | 0.52 | 0.71 | | | 0.38 |
| Uniform Delay, d1 | 22.2 | 23.1 | 20.4 | | | 16.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.2 | 3.4 | 2.5 | | | 0.7 |
| Delay (s) | 23.4 | 26.5 | 23.0 | | | 17.2 |
| Level of Service | C | C | C | | | B |
| Approach Delay (s/veh) | 24.6 | | 23.0 | | | 17.2 |
| Approach LOS | C | | C | | | B |

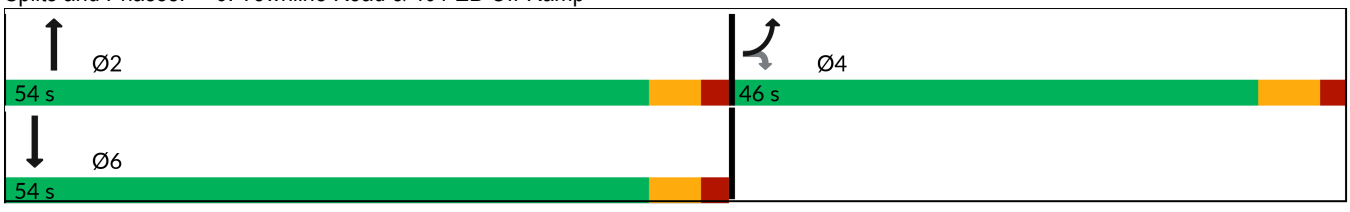
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 22.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 65.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

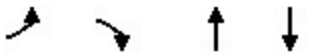
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 379 | 461 | 0 | 1055 | 1089 | 106 |
| Future Volume (vph) | 379 | 461 | 0 | 1055 | 1089 | 106 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.987 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1619 | 1442 | 0 | 3535 | 3370 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1619 | 1442 | 0 | 3535 | 3370 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 52 | | | 14 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Adj. Flow (vph) | 379 | 461 | 0 | 1055 | 1089 | 106 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 379 | 461 | 0 | 1055 | 1195 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (%) | 46.0% | 46.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 39.5 | 39.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 42.0 | |
| Flash Don't Walk (s) | 29.5 | 29.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 31.2 | 31.2 | | 48.4 | 48.4 | |
| Actuated g/C Ratio | 0.34 | 0.34 | | 0.52 | 0.52 | |
| v/c Ratio | 0.69 | 0.88 | | 0.57 | 0.67 | |
| Control Delay (s/veh) | 33.1 | 44.5 | | 17.6 | 19.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 33.1 | 44.5 | | 17.6 | 19.6 | |
| LOS | C | D | | B | B | |
| Approach Delay (s/veh) | 39.3 | | | 17.6 | 19.6 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 92.2 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay (s/veh): 24.3 | | Intersection LOS: C | |
| Intersection Capacity Utilization 74.9% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 379 | 461 | 1055 | 1195 |
| v/c Ratio | 0.69 | 0.88 | 0.57 | 0.67 |
| Control Delay (s/veh) | 33.1 | 44.5 | 17.6 | 19.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 33.1 | 44.5 | 17.6 | 19.6 |
| Queue Length 50th (m) | 56.9 | 68.3 | 66.7 | 81.0 |
| Queue Length 95th (m) | 86.8 | #110.8 | 97.4 | 118.4 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 699 | 652 | 1854 | 1774 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.54 | 0.71 | 0.57 | 0.67 |

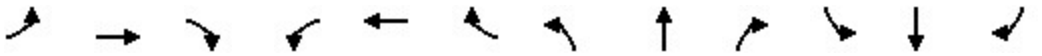
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 379 | 461 | 0 | 1055 | 1089 | 106 |
| Future Volume (vph) | 379 | 461 | 0 | 1055 | 1089 | 106 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1619 | 1442 | | 3535 | 3369 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1619 | 1442 | | 3535 | 3369 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 379 | 461 | 0 | 1055 | 1089 | 106 |
| RTOR Reduction (vph) | 0 | 34 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 379 | 427 | 0 | 1055 | 1188 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 31.2 | 31.2 | | 48.4 | 48.4 | |
| Effective Green, g (s) | 31.2 | 31.2 | | 48.4 | 48.4 | |
| Actuated g/C Ratio | 0.34 | 0.34 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 548 | 488 | | 1857 | 1770 | |
| v/s Ratio Prot | 0.23 | | | 0.30 | c0.35 | |
| v/s Ratio Perm | | c0.30 | | | | |
| v/c Ratio | 0.69 | 0.87 | | 0.57 | 0.67 | |
| Uniform Delay, d1 | 26.3 | 28.6 | | 14.8 | 16.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.8 | 15.9 | | 1.3 | 2.0 | |
| Delay (s) | 30.1 | 44.5 | | 16.0 | 18.1 | |
| Level of Service | C | D | | B | B | |
| Approach Delay (s/veh) | 38.0 | | | 16.0 | 18.1 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 22.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 92.1 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 74.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

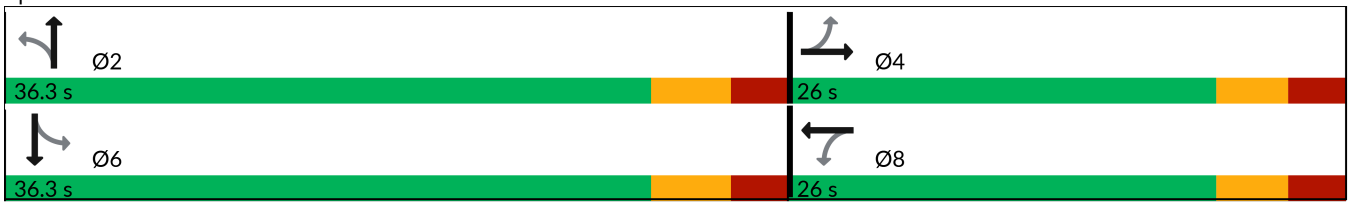


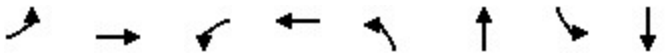
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 27 | 191 | 31 | 16 | 4 | 173 | 476 | 29 | 3 | 395 | 36 |
| Future Volume (vph) | 49 | 27 | 191 | 31 | 16 | 4 | 173 | 476 | 29 | 3 | 395 | 36 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.869 | | | 0.970 | | | 0.991 | | | 0.987 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1418 | 0 | 1668 | 1573 | 0 | 1651 | 1587 | 0 | 1668 | 1596 | 0 |
| Flt Permitted | 0.744 | | | 0.622 | | | 0.504 | | | 0.446 | | |
| Satd. Flow (perm) | 1293 | 1418 | 0 | 1092 | 1573 | 0 | 876 | 1587 | 0 | 783 | 1596 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 191 | | | 4 | | | 7 | | | 10 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Adj. Flow (vph) | 49 | 27 | 191 | 31 | 16 | 4 | 173 | 476 | 29 | 3 | 395 | 36 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 49 | 218 | 0 | 31 | 20 | 0 | 173 | 505 | 0 | 3 | 431 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (%) | 41.7% | 41.7% | | 41.7% | 41.7% | | 58.3% | 58.3% | | 58.3% | 58.3% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.7 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 2.6 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Max | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Flash Don't Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 9.2 | 9.2 | | 9.2 | 9.2 | | 30.7 | 30.7 | | 30.7 | 30.7 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.59 | 0.59 | | 0.59 | 0.59 | |
| v/c Ratio | 0.21 | 0.53 | | 0.16 | 0.07 | | 0.34 | 0.54 | | 0.01 | 0.46 | |
| Control Delay (s/veh) | 20.2 | 10.1 | | 19.6 | 16.1 | | 8.5 | 9.7 | | 5.3 | 8.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 20.2 | 10.1 | | 19.6 | 16.1 | | 8.5 | 9.7 | | 5.3 | 8.4 | |
| LOS | C | B | | B | B | | A | A | | A | A | |
| Approach Delay (s/veh) | | 12.0 | | | 18.2 | | | 9.4 | | | 8.4 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 62.3 | | | |
| Actuated Cycle Length: 52.3 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.54 | | | |
| Intersection Signal Delay (s/veh): 9.9 | | Intersection LOS: A | |
| Intersection Capacity Utilization 79.9% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

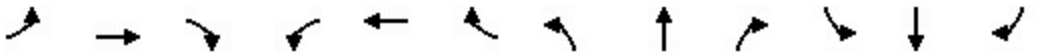
Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 49 | 218 | 31 | 20 | 173 | 505 | 3 | 431 |
| v/c Ratio | 0.21 | 0.53 | 0.16 | 0.07 | 0.34 | 0.54 | 0.01 | 0.46 |
| Control Delay (s/veh) | 20.2 | 10.1 | 19.6 | 16.1 | 8.5 | 9.7 | 5.3 | 8.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 20.2 | 10.1 | 19.6 | 16.1 | 8.5 | 9.7 | 5.3 | 8.4 |
| Queue Length 50th (m) | 3.9 | 2.1 | 2.4 | 1.3 | 6.5 | 21.9 | 0.1 | 17.3 |
| Queue Length 95th (m) | 10.8 | 15.9 | 7.9 | 5.4 | 20.4 | 55.3 | 1.0 | 43.8 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 495 | 661 | 418 | 605 | 514 | 935 | 459 | 941 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.10 | 0.33 | 0.07 | 0.03 | 0.34 | 0.54 | 0.01 | 0.46 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 27 | 191 | 31 | 16 | 4 | 173 | 476 | 29 | 3 | 395 | 36 |
| Future Volume (vph) | 49 | 27 | 191 | 31 | 16 | 4 | 173 | 476 | 29 | 3 | 395 | 36 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1417 | | 1668 | 1573 | | 1651 | 1588 | | 1668 | 1597 | |
| Flt Permitted | 0.74 | 1.00 | | 0.62 | 1.00 | | 0.50 | 1.00 | | 0.45 | 1.00 | |
| Satd. Flow (perm) | 1294 | 1417 | | 1092 | 1573 | | 876 | 1588 | | 782 | 1597 | |
| 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) | 49 | 27 | 191 | 31 | 16 | 4 | 173 | 476 | 29 | 3 | 395 | 36 |
| RTOR Reduction (vph) | 0 | 157 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 49 | 61 | 0 | 31 | 17 | 0 | 173 | 502 | 0 | 3 | 427 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 9.2 | 9.2 | | 9.2 | 9.2 | | 30.7 | 30.7 | | 30.7 | 30.7 | |
| Effective Green, g (s) | 9.2 | 9.2 | | 9.2 | 9.2 | | 30.7 | 30.7 | | 30.7 | 30.7 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.59 | 0.59 | | 0.59 | 0.59 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 228 | 249 | | 192 | 277 | | 515 | 933 | | 459 | 939 | |
| v/s Ratio Prot | | c0.04 | | | 0.01 | | | c0.32 | | | 0.27 | |
| v/s Ratio Perm | 0.04 | | | 0.03 | | | 0.20 | | | 0.00 | | |
| v/c Ratio | 0.21 | 0.24 | | 0.16 | 0.06 | | 0.34 | 0.54 | | 0.01 | 0.45 | |
| Uniform Delay, d1 | 18.4 | 18.5 | | 18.2 | 17.9 | | 5.5 | 6.5 | | 4.4 | 6.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.5 | | 0.4 | 0.1 | | 1.8 | 2.2 | | 0.0 | 1.6 | |
| Delay (s) | 18.9 | 19.0 | | 18.6 | 18.0 | | 7.3 | 8.7 | | 4.5 | 7.6 | |
| Level of Service | B | B | | B | B | | A | A | | A | A | |
| Approach Delay (s/veh) | | 19.0 | | | 18.4 | | | 8.3 | | | 7.6 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 10.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.47 | | |
| Actuated Cycle Length (s) | 52.2 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 79.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

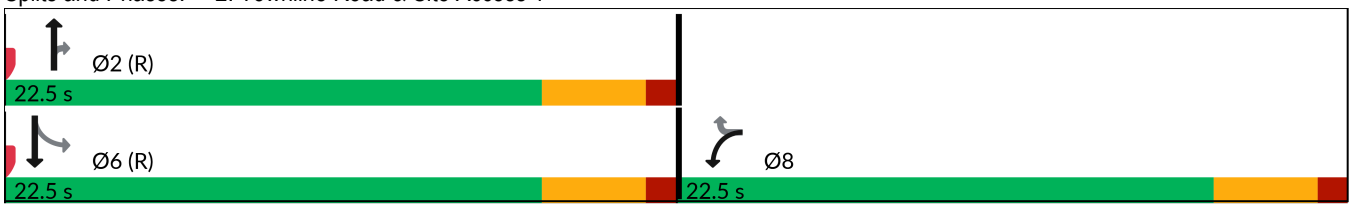
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 678 | 0 | 0 | 617 |
| Future Volume (vph) | 0 | 0 | 678 | 0 | 0 | 617 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 678 | 0 | 0 | 617 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 678 | 0 | 0 | 617 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| v/c Ratio | | | 0.39 | | | 0.33 |
| Control Delay (s/veh) | | | 0.7 | | | 0.5 |
| Queue Delay | | | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | | 0.7 | | | 0.5 |
| LOS | | | A | | | A |
| Approach Delay (s/veh) | | | 0.7 | | | 0.5 |
| Approach LOS | | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 45 | | | |
| Actuated Cycle Length: 45 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.39 | | | |
| Intersection Signal Delay (s/veh): 0.6 | | Intersection LOS: A | |
| Intersection Capacity Utilization 41.9% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | NBT | SBT |
|---|---|---|
| Lane Group Flow (vph) | 678 | 617 |
| v/c Ratio | 0.39 | 0.33 |
| Control Delay (s/veh) | 0.7 | 0.5 |
| Queue Delay | 0.0 | 0.0 |
| Total Delay (s/veh) | 0.7 | 0.5 |
| Queue Length 50th (m) | 0.0 | 0.0 |
| Queue Length 95th (m) | 0.0 | 0.0 |
| Internal Link Dist (m) | 311.6 | 161.7 |
| Turn Bay Length (m) | | |
| Base Capacity (vph) | 1721 | 1842 |
| Starvation Cap Reductn | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 |
| Storage Cap Reductn | 0 | 0 |
| Reduced v/c Ratio | 0.39 | 0.33 |

| Intersection Summary |
|---|

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 678 | 0 | 0 | 617 |
| Future Volume (vph) | 0 | 0 | 678 | 0 | 0 | 617 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | | | 4.5 | | | 4.5 |
| Lane Util. Factor | | | 1.00 | | | 1.00 |
| Frt | | | 1.00 | | | 1.00 |
| Flt Protected | | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | | | 1721 | | | 1842 |
| Flt Permitted | | | 1.00 | | | 1.00 |
| Satd. Flow (perm) | | | 1721 | | | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 678 | 0 | 0 | 617 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 678 | 0 | 0 | 617 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | | | 45.0 | | | 45.0 |
| Effective Green, g (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| Clearance Time (s) | | | 4.5 | | | 4.5 |
| Vehicle Extension (s) | | | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | | | 1721 | | | 1842 |
| v/s Ratio Prot | | | c0.39 | | | 0.33 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | | | 0.39 | | | 0.33 |
| Uniform Delay, d1 | | | 0.0 | | | 0.0 |
| Progression Factor | | | 1.00 | | | 1.00 |
| Incremental Delay, d2 | | | 0.7 | | | 0.5 |
| Delay (s) | | | 0.7 | | | 0.5 |
| Level of Service | | | A | | | A |
| Approach Delay (s/veh) | 0.0 | | 0.7 | | | 0.5 |
| Approach LOS | A | | A | | | A |

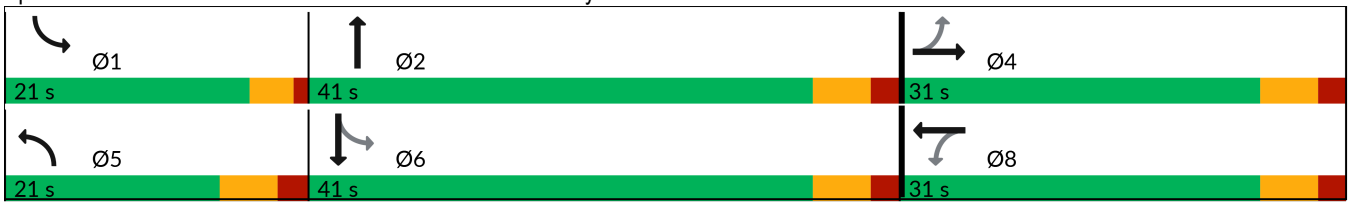
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 0.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.49 | | |
| Actuated Cycle Length (s) | 45.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 41.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 151 | 0 | 239 | 0 | 0 | 0 | 216 | 537 | 0 | 0 | 508 | 109 |
| Future Volume (vph) | 151 | 0 | 239 | 0 | 0 | 0 | 216 | 537 | 0 | 0 | 508 | 109 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | | | | | | | 0.974 | |
| Flt Protected | 0.950 | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3270 | 0 | 1755 | 3211 | 0 |
| Flt Permitted | 0.757 | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 1329 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3270 | 0 | 1755 | 3211 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 457 | | | | | | | | | 31 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Adj. Flow (vph) | 151 | 0 | 239 | 0 | 0 | 0 | 216 | 537 | 0 | 0 | 508 | 109 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 151 | 239 | 0 | 0 | 0 | 0 | 216 | 537 | 0 | 0 | 617 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Minimum Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 11.0 | 41.0 | | 9.0 | 41.0 | |
| Total Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 21.0 | 41.0 | | 21.0 | 41.0 | |
| Total Split (%) | 33.3% | 33.3% | | 33.3% | 33.3% | | 22.6% | 44.1% | | 22.6% | 44.1% | |
| Maximum Green (s) | 25.0 | 25.0 | | 25.0 | 25.0 | | 15.0 | 35.0 | | 17.0 | 35.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 14.5 | 14.5 | | | | | 10.6 | 52.0 | | | 35.3 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | | | | 0.13 | 0.66 | | | 0.45 | |
| v/c Ratio | 0.62 | 0.38 | | | | | 0.50 | 0.25 | | | 0.42 | |
| Control Delay (s/veh) | 41.1 | 1.7 | | | | | 36.6 | 6.3 | | | 16.3 | |
| Queue Delay | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | 41.1 | 1.7 | | | | | 36.6 | 6.3 | | | 16.3 | |
| LOS | D | A | | | | | D | A | | | B | |
| Approach Delay (s/veh) | | 17.0 | | | | | | 15.0 | | | 16.3 | |
| Approach LOS | | B | | | | | | B | | | B | |

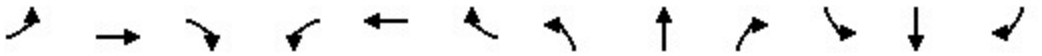
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 93 | | | |
| Actuated Cycle Length: 78.6 | | | |
| Natural Cycle: 85 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.62 | | | |
| Intersection Signal Delay (s/veh): 15.9 | | Intersection LOS: B | |
| Intersection Capacity Utilization 57.4% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 151 | 239 | 216 | 537 | 617 |
| v/c Ratio | 0.62 | 0.38 | 0.50 | 0.25 | 0.42 |
| Control Delay (s/veh) | 41.1 | 1.7 | 36.6 | 6.3 | 16.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 41.1 | 1.7 | 36.6 | 6.3 | 16.3 |
| Queue Length 50th (m) | 20.7 | 0.0 | 15.3 | 14.3 | 29.2 |
| Queue Length 95th (m) | 40.2 | 0.0 | 28.0 | 28.4 | 54.6 |
| Internal Link Dist (m) | | 90.3 | | 261.4 | 311.6 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 426 | 755 | 616 | 2163 | 1460 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.35 | 0.32 | 0.35 | 0.25 | 0.42 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 151 | 0 | 239 | 0 | 0 | 0 | 216 | 537 | 0 | 0 | 508 | 109 |
| Future Volume (vph) | 151 | 0 | 239 | 0 | 0 | 0 | 216 | 537 | 0 | 0 | 508 | 109 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | | | 0.97 | 0.95 | | | 0.95 | |
| Frt | 1.00 | 0.85 | | | | | 1.00 | 1.00 | | | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | | | | 3203 | 3270 | | | 3209 | |
| Flt Permitted | 0.76 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 1329 | 1387 | | | | | 3203 | 3270 | | | 3209 | |
| 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) | 151 | 0 | 239 | 0 | 0 | 0 | 216 | 537 | 0 | 0 | 508 | 109 |
| RTOR Reduction (vph) | 0 | 195 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 |
| Lane Group Flow (vph) | 151 | 44 | 0 | 0 | 0 | 0 | 216 | 537 | 0 | 0 | 600 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 14.5 | 14.5 | | | | | 10.6 | 52.0 | | | 35.4 | |
| Effective Green, g (s) | 14.5 | 14.5 | | | | | 10.6 | 52.0 | | | 35.4 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | | | | 0.14 | 0.66 | | | 0.45 | |
| Clearance Time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 245 | 256 | | | | | 432 | 2166 | | | 1447 | |
| v/s Ratio Prot | | 0.03 | | | | | c0.07 | 0.16 | | | c0.19 | |
| v/s Ratio Perm | c0.11 | | | | | | | | | | | |
| v/c Ratio | 0.62 | 0.17 | | | | | 0.50 | 0.25 | | | 0.41 | |
| Uniform Delay, d1 | 29.4 | 26.9 | | | | | 31.5 | 5.4 | | | 14.6 | |
| Progression Factor | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 4.6 | 0.3 | | | | | 0.9 | 0.3 | | | 0.9 | |
| Delay (s) | 34.0 | 27.3 | | | | | 32.4 | 5.6 | | | 15.4 | |
| Level of Service | C | C | | | | | C | A | | | B | |
| Approach Delay (s/veh) | | 29.9 | | | 0.0 | | | 13.3 | | | 15.4 | |
| Approach LOS | | C | | | A | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 17.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.48 | | |
| Actuated Cycle Length (s) | 78.5 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 57.4% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

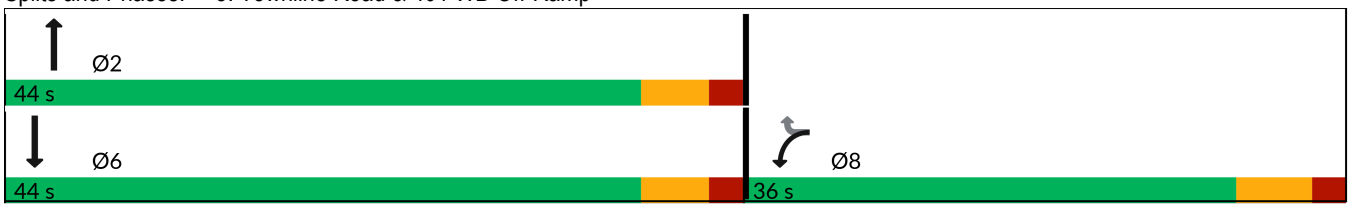
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 377 | 155 | 601 | 0 | 0 | 515 |
| Future Volume (vph) | 377 | 155 | 601 | 0 | 0 | 515 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 155 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 377 | 155 | 601 | 0 | 0 | 515 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 377 | 155 | 601 | 0 | 0 | 515 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (%) | 45.0% | 45.0% | 55.0% | | | 55.0% |
| Maximum Green (s) | 29.5 | 29.5 | 38.0 | | | 38.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 33.0 | | | 33.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 13.2 | 13.2 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.60 | | | 0.60 |
| v/c Ratio | 0.59 | 0.37 | 0.28 | | | 0.25 |
| Control Delay (s/veh) | 26.9 | 6.8 | 7.1 | | | 6.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 26.9 | 6.8 | 7.1 | | | 6.8 |
| LOS | C | A | A | | | A |
| Approach Delay (s/veh) | 21.0 | | 7.1 | | | 6.8 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 63.8 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.59 | | | |
| Intersection Signal Delay (s/veh): 11.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 38.5% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 377 | 155 | 601 | 515 |
| v/c Ratio | 0.59 | 0.37 | 0.28 | 0.25 |
| Control Delay (s/veh) | 26.9 | 6.8 | 7.1 | 6.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 26.9 | 6.8 | 7.1 | 6.8 |
| Queue Length 50th (m) | 20.8 | 0.0 | 15.5 | 12.9 |
| Queue Length 95th (m) | 32.3 | 12.2 | 28.2 | 23.9 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1427 | 757 | 2109 | 2089 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.26 | 0.20 | 0.28 | 0.25 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 377 | 155 | 601 | 0 | 0 | 515 |
| Future Volume (vph) | 377 | 155 | 601 | 0 | 0 | 515 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 377 | 155 | 601 | 0 | 0 | 515 |
| RTOR Reduction (vph) | 0 | 123 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 377 | 32 | 601 | 0 | 0 | 515 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 13.2 | 13.2 | 38.1 | | | 38.1 |
| Effective Green, g (s) | 13.2 | 13.2 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.60 | | | 0.60 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 637 | 301 | 2111 | | | 2090 |
| v/s Ratio Prot | c0.12 | | c0.17 | | | 0.15 |
| v/s Ratio Perm | | 0.02 | | | | |
| v/c Ratio | 0.59 | 0.11 | 0.28 | | | 0.25 |
| Uniform Delay, d1 | 22.9 | 20.5 | 6.2 | | | 6.1 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.5 | 0.2 | 0.3 | | | 0.3 |
| Delay (s) | 24.3 | 20.7 | 6.6 | | | 6.4 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 23.3 | | 6.6 | | | 6.4 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 11.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.36 | | |
| Actuated Cycle Length (s) | 63.8 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 38.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

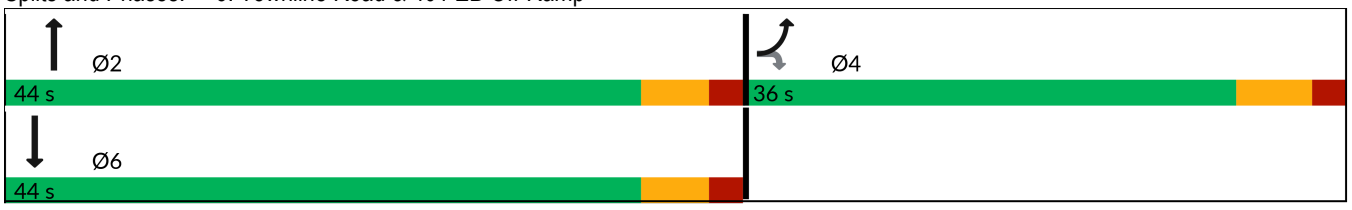
c Critical Lane Group

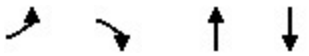
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 290 | 421 | 0 | 489 | 777 | 112 |
| Future Volume (vph) | 290 | 421 | 0 | 489 | 777 | 112 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.981 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1456 | 0 | 3500 | 3442 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1635 | 1456 | 0 | 3500 | 3442 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 126 | | | 27 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Adj. Flow (vph) | 290 | 421 | 0 | 489 | 777 | 112 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 290 | 421 | 0 | 489 | 889 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (%) | 45.0% | 45.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 32.0 | 32.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 20.6 | 20.6 | | 38.3 | 38.3 | |
| Actuated g/C Ratio | 0.29 | 0.29 | | 0.54 | 0.54 | |
| v/c Ratio | 0.62 | 0.83 | | 0.26 | 0.48 | |
| Control Delay (s/veh) | 27.7 | 30.8 | | 10.5 | 12.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 27.7 | 30.8 | | 10.5 | 12.2 | |
| LOS | C | C | | B | B | |
| Approach Delay (s/veh) | 29.5 | | | 10.5 | 12.2 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 71.5 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.83 | | | |
| Intersection Signal Delay (s/veh): 17.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 63.8% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





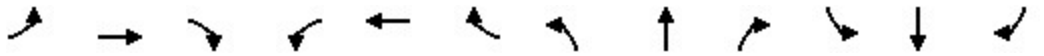
| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 290 | 421 | 489 | 889 |
| v/c Ratio | 0.62 | 0.83 | 0.26 | 0.48 |
| Control Delay (s/veh) | 27.7 | 30.8 | 10.5 | 12.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.7 | 30.8 | 10.5 | 12.2 |
| Queue Length 50th (m) | 33.1 | 36.7 | 17.1 | 34.7 |
| Queue Length 95th (m) | 54.9 | 68.8 | 32.5 | 62.5 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 680 | 679 | 1876 | 1858 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.43 | 0.62 | 0.26 | 0.48 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 290 | 421 | 0 | 489 | 777 | 112 |
| Future Volume (vph) | 290 | 421 | 0 | 489 | 777 | 112 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1456 | | 3500 | 3442 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1635 | 1456 | | 3500 | 3442 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 290 | 421 | 0 | 489 | 777 | 112 |
| RTOR Reduction (vph) | 0 | 90 | 0 | 0 | 12 | 0 |
| Lane Group Flow (vph) | 290 | 331 | 0 | 489 | 877 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 20.5 | 20.5 | | 38.3 | 38.3 | |
| Effective Green, g (s) | 20.5 | 20.5 | | 38.3 | 38.3 | |
| Actuated g/C Ratio | 0.29 | 0.29 | | 0.54 | 0.54 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 470 | 418 | | 1880 | 1848 | |
| v/s Ratio Prot | 0.18 | | | 0.14 | c0.25 | |
| v/s Ratio Perm | | c0.23 | | | | |
| v/c Ratio | 0.62 | 0.79 | | 0.26 | 0.47 | |
| Uniform Delay, d1 | 22.0 | 23.4 | | 8.9 | 10.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.4 | 9.9 | | 0.3 | 0.9 | |
| Delay (s) | 24.4 | 33.3 | | 9.2 | 11.1 | |
| Level of Service | C | C | | A | B | |
| Approach Delay (s/veh) | 29.7 | | | 9.2 | 11.1 | |
| Approach LOS | C | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 17.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 71.3 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 63.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

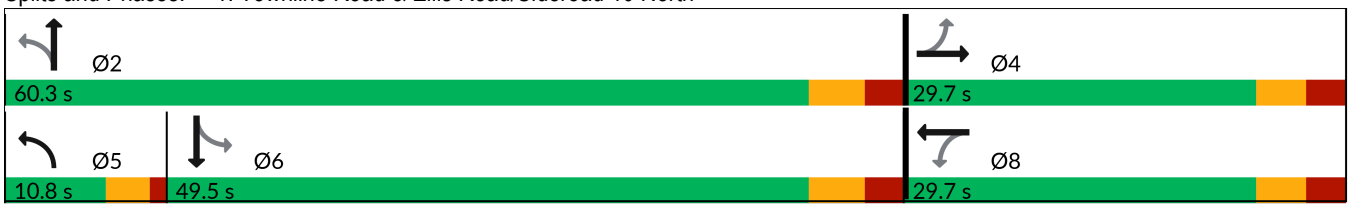


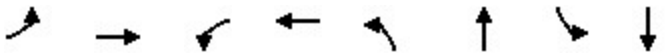
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 94 | 33 | 241 | 17 | 12 | 4 | 118 | 603 | 49 | 4 | 679 | 32 |
| Future Volume (vph) | 94 | 33 | 241 | 17 | 12 | 4 | 118 | 603 | 49 | 4 | 679 | 32 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.868 | | | 0.962 | | | 0.989 | | | 0.993 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1392 | 0 | 1668 | 1570 | 0 | 1603 | 1551 | 0 | 1334 | 1575 | 0 |
| Flt Permitted | 0.747 | | | 0.357 | | | 0.243 | | | 0.417 | | |
| Satd. Flow (perm) | 1298 | 1392 | 0 | 627 | 1570 | 0 | 410 | 1551 | 0 | 586 | 1575 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 241 | | | 4 | | | 8 | | | 4 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Adj. Flow (vph) | 94 | 33 | 241 | 17 | 12 | 4 | 118 | 603 | 49 | 4 | 679 | 32 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 94 | 274 | 0 | 17 | 16 | 0 | 118 | 652 | 0 | 4 | 711 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 9.0 | 49.5 | | 49.5 | 49.5 | |
| Total Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 10.8 | 60.3 | | 49.5 | 49.5 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 12.0% | 67.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 23.7 | 23.7 | | 23.7 | 23.7 | | 6.8 | 54.0 | | 43.2 | 43.2 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 35.2 | | 35.2 | 35.2 | |
| Flash Don't Walk (s) | 13.7 | 13.7 | | 13.7 | 13.7 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 11.2 | 11.2 | | 11.2 | 11.2 | | 56.5 | 54.2 | | 45.7 | 45.7 | |
| Actuated g/C Ratio | 0.14 | 0.14 | | 0.14 | 0.14 | | 0.73 | 0.70 | | 0.59 | 0.59 | |
| v/c Ratio | 0.50 | 0.67 | | 0.19 | 0.07 | | 0.30 | 0.60 | | 0.01 | 0.77 | |
| Control Delay (s/veh) | 39.9 | 15.3 | | 33.4 | 24.4 | | 5.8 | 9.8 | | 9.5 | 21.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.2 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 39.9 | 15.3 | | 33.4 | 24.4 | | 5.8 | 10.0 | | 9.5 | 21.7 | |
| LOS | D | B | | C | C | | A | A | | A | C | |
| Approach Delay (s/veh) | | 21.5 | | | 29.0 | | | 9.4 | | | 21.6 | |
| Approach LOS | | C | | | C | | | A | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 77.7 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.77 | | | |
| Intersection Signal Delay (s/veh): 16.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 83.1% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

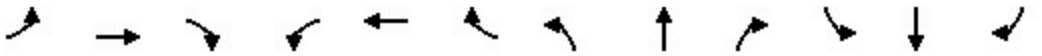




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 94 | 274 | 17 | 16 | 118 | 652 | 4 | 711 |
| v/c Ratio | 0.50 | 0.67 | 0.19 | 0.07 | 0.30 | 0.60 | 0.01 | 0.77 |
| Control Delay (s/veh) | 39.9 | 15.3 | 33.4 | 24.4 | 5.8 | 9.8 | 9.5 | 21.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.9 | 15.3 | 33.4 | 24.4 | 5.8 | 10.0 | 9.5 | 21.7 |
| Queue Length 50th (m) | 12.9 | 4.3 | 2.2 | 1.5 | 4.0 | 40.0 | 0.2 | 75.9 |
| Queue Length 95th (m) | 26.3 | 25.6 | 7.7 | 6.5 | 11.4 | 91.7 | 1.8 | #167.8 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 396 | 592 | 191 | 483 | 402 | 1083 | 344 | 927 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.24 | 0.46 | 0.09 | 0.03 | 0.29 | 0.63 | 0.01 | 0.77 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 94 | 33 | 241 | 17 | 12 | 4 | 118 | 603 | 49 | 4 | 679 | 32 |
| Future Volume (vph) | 94 | 33 | 241 | 17 | 12 | 4 | 118 | 603 | 49 | 4 | 679 | 32 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1392 | | 1668 | 1570 | | 1603 | 1550 | | 1334 | 1576 | |
| Flt Permitted | 0.75 | 1.00 | | 0.36 | 1.00 | | 0.24 | 1.00 | | 0.42 | 1.00 | |
| Satd. Flow (perm) | 1298 | 1392 | | 627 | 1570 | | 410 | 1550 | | 586 | 1576 | |
| 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) | 94 | 33 | 241 | 17 | 12 | 4 | 118 | 603 | 49 | 4 | 679 | 32 |
| RTOR Reduction (vph) | 0 | 207 | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 94 | 67 | 0 | 17 | 13 | 0 | 118 | 650 | 0 | 4 | 709 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 11.2 | 11.2 | | 11.2 | 11.2 | | 55.0 | 55.0 | | 45.7 | 45.7 | |
| Effective Green, g (s) | 11.2 | 11.2 | | 11.2 | 11.2 | | 55.0 | 55.0 | | 45.7 | 45.7 | |
| Actuated g/C Ratio | 0.14 | 0.14 | | 0.14 | 0.14 | | 0.70 | 0.70 | | 0.58 | 0.58 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 185 | 198 | | 89 | 224 | | 367 | 1085 | | 341 | 917 | |
| v/s Ratio Prot | | 0.05 | | | 0.01 | | 0.02 | c0.42 | | | c0.45 | |
| v/s Ratio Perm | c0.07 | | | 0.03 | | | 0.20 | | | 0.01 | | |
| v/c Ratio | 0.51 | 0.34 | | 0.19 | 0.06 | | 0.32 | 0.60 | | 0.01 | 0.77 | |
| Uniform Delay, d1 | 31.1 | 30.3 | | 29.7 | 29.1 | | 6.6 | 6.1 | | 6.9 | 12.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.2 | 1.0 | | 1.0 | 0.1 | | 0.5 | 2.4 | | 0.1 | 6.3 | |
| Delay (s) | 33.3 | 31.3 | | 30.7 | 29.2 | | 7.1 | 8.5 | | 7.0 | 18.8 | |
| Level of Service | C | C | | C | C | | A | A | | A | B | |
| Approach Delay (s/veh) | | 31.8 | | | 30.0 | | | 8.3 | | | 18.7 | |
| Approach LOS | | C | | | C | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 17.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.72 | | |
| Actuated Cycle Length (s) | 78.5 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 83.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

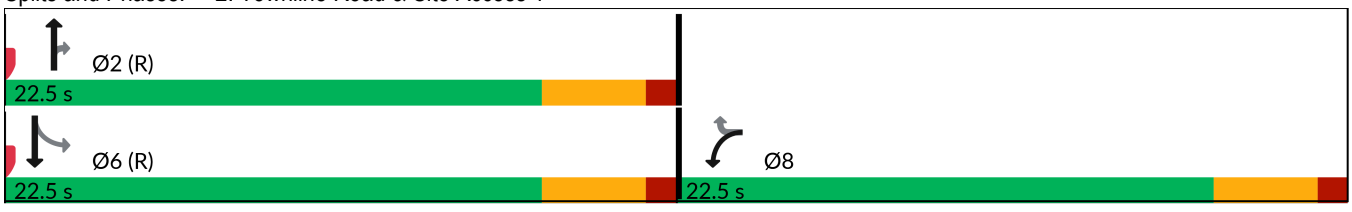
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 769 | 0 | 0 | 935 |
| Future Volume (vph) | 0 | 0 | 769 | 0 | 0 | 935 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 769 | 0 | 0 | 935 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 769 | 0 | 0 | 935 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| v/c Ratio | | | 0.45 | | | 0.51 |
| Control Delay (s/veh) | | | 0.8 | | | 1.0 |
| Queue Delay | | | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | | 0.8 | | | 1.0 |
| LOS | | | A | | | A |
| Approach Delay (s/veh) | | | 0.8 | | | 1.0 |
| Approach LOS | | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 45 | | | |
| Actuated Cycle Length: 45 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 65 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.51 | | | |
| Intersection Signal Delay (s/veh): 0.9 | | Intersection LOS: A | |
| Intersection Capacity Utilization 53.0% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

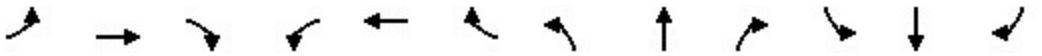


| Lane Group | NBT | SBT |
|---|---|---|
| Lane Group Flow (vph) | 769 | 935 |
| v/c Ratio | 0.45 | 0.51 |
| Control Delay (s/veh) | 0.8 | 1.0 |
| Queue Delay | 0.0 | 0.0 |
| Total Delay (s/veh) | 0.8 | 1.0 |
| Queue Length 50th (m) | 0.0 | 0.0 |
| Queue Length 95th (m) | 0.0 | 0.0 |
| Internal Link Dist (m) | 311.6 | 161.7 |
| Turn Bay Length (m) | | |
| Base Capacity (vph) | 1721 | 1842 |
| Starvation Cap Reductn | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 |
| Storage Cap Reductn | 0 | 0 |
| Reduced v/c Ratio | 0.45 | 0.51 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 769 | 0 | 0 | 935 |
| Future Volume (vph) | 0 | 0 | 769 | 0 | 0 | 935 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | | | 4.5 | | | 4.5 |
| Lane Util. Factor | | | 1.00 | | | 1.00 |
| Frt | | | 1.00 | | | 1.00 |
| Flt Protected | | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | | | 1721 | | | 1842 |
| Flt Permitted | | | 1.00 | | | 1.00 |
| Satd. Flow (perm) | | | 1721 | | | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 769 | 0 | 0 | 935 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 769 | 0 | 0 | 935 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | | | 45.0 | | | 45.0 |
| Effective Green, g (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| Clearance Time (s) | | | 4.5 | | | 4.5 |
| Vehicle Extension (s) | | | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | | | 1721 | | | 1842 |
| v/s Ratio Prot | | | 0.45 | | | c0.51 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | | | 0.45 | | | 0.51 |
| Uniform Delay, d1 | | | 0.0 | | | 0.0 |
| Progression Factor | | | 1.00 | | | 1.00 |
| Incremental Delay, d2 | | | 0.8 | | | 1.0 |
| Delay (s) | | | 0.8 | | | 1.0 |
| Level of Service | | | A | | | A |
| Approach Delay (s/veh) | 0.0 | | 0.8 | | | 1.0 |
| Approach LOS | A | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 0.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 45.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 53.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

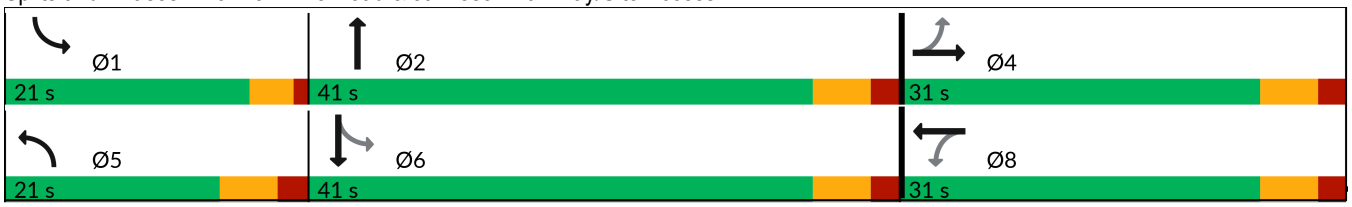


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 151 | 0 | 323 | 0 | 0 | 0 | 325 | 614 | 0 | 0 | 777 | 173 |
| Future Volume (vph) | 151 | 0 | 323 | 0 | 0 | 0 | 325 | 614 | 0 | 0 | 777 | 173 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | | | | | 1.00 | | | | 1.00 | |
| Frt | | 0.850 | | | | | | | | | 0.973 | |
| Flt Protected | 0.950 | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1347 | 0 | 3405 | 1632 | 0 | 3203 | 3302 | 0 | 1755 | 3168 | 0 |
| Flt Permitted | 0.757 | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 1303 | 1347 | 0 | 3405 | 1632 | 0 | 3202 | 3302 | 0 | 1755 | 3168 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 375 | | | | | | | | | 33 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| 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% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Adj. Flow (vph) | 151 | 0 | 323 | 0 | 0 | 0 | 325 | 614 | 0 | 0 | 777 | 173 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 151 | 323 | 0 | 0 | 0 | 0 | 325 | 614 | 0 | 0 | 950 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 11.0 | 41.0 | | 9.0 | 41.0 | |
| Total Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 21.0 | 41.0 | | 21.0 | 41.0 | |
| Total Split (%) | 33.3% | 33.3% | | 33.3% | 33.3% | | 22.6% | 44.1% | | 22.6% | 44.1% | |
| Maximum Green (s) | 25.0 | 25.0 | | 25.0 | 25.0 | | 15.0 | 35.0 | | 17.0 | 35.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 15.1 | 15.1 | | | | | 12.8 | 54.1 | | | 35.3 | |
| Actuated g/C Ratio | 0.19 | 0.19 | | | | | 0.16 | 0.67 | | | 0.43 | |
| v/c Ratio | 0.63 | 0.58 | | | | | 0.65 | 0.28 | | | 0.68 | |
| Control Delay (s/veh) | 42.4 | 6.2 | | | | | 39.5 | 6.7 | | | 22.3 | |
| Queue Delay | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | 42.4 | 6.2 | | | | | 39.5 | 6.7 | | | 22.3 | |
| LOS | D | A | | | | | D | A | | | C | |
| Approach Delay (s/veh) | | 17.7 | | | | | | 18.0 | | | 22.3 | |
| Approach LOS | | B | | | | | | B | | | C | |

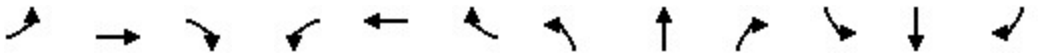
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 93 | | | |
| Actuated Cycle Length: 81.3 | | | |
| Natural Cycle: 85 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.68 | | | |
| Intersection Signal Delay (s/veh): 19.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 77.1% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 151 | 323 | 325 | 614 | 950 |
| v/c Ratio | 0.63 | 0.58 | 0.65 | 0.28 | 0.68 |
| Control Delay (s/veh) | 42.4 | 6.2 | 39.5 | 6.7 | 22.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.4 | 6.2 | 39.5 | 6.7 | 22.3 |
| Queue Length 50th (m) | 21.8 | 0.0 | 24.2 | 17.3 | 58.0 |
| Queue Length 95th (m) | 40.3 | 11.4 | 41.4 | 34.3 | 97.8 |
| Internal Link Dist (m) | | 90.3 | | 261.4 | 311.6 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 404 | 676 | 595 | 2197 | 1394 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.37 | 0.48 | 0.55 | 0.28 | 0.68 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 151 | 0 | 323 | 0 | 0 | 0 | 325 | 614 | 0 | 0 | 777 | 173 |
| Future Volume (vph) | 151 | 0 | 323 | 0 | 0 | 0 | 325 | 614 | 0 | 0 | 777 | 173 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | | | 0.97 | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Frt | 1.00 | 0.85 | | | | | 1.00 | 1.00 | | | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | 1635 | 1347 | | | | | 3203 | 3302 | | | 3167 | |
| Flt Permitted | 0.76 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 1303 | 1347 | | | | | 3203 | 3302 | | | 3167 | |
| 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) | 151 | 0 | 323 | 0 | 0 | 0 | 325 | 614 | 0 | 0 | 777 | 173 |
| RTOR Reduction (vph) | 0 | 263 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 |
| Lane Group Flow (vph) | 151 | 60 | 0 | 0 | 0 | 0 | 325 | 614 | 0 | 0 | 931 | 0 |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| Heavy Vehicles (%) | 2% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 15.1 | 15.1 | | | | | 12.8 | 54.1 | | | 35.3 | |
| Effective Green, g (s) | 15.1 | 15.1 | | | | | 12.8 | 54.1 | | | 35.3 | |
| Actuated g/C Ratio | 0.19 | 0.19 | | | | | 0.16 | 0.67 | | | 0.43 | |
| Clearance Time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 242 | 250 | | | | | 504 | 2199 | | | 1376 | |
| v/s Ratio Prot | | 0.04 | | | | | c0.10 | 0.19 | | | c0.29 | |
| v/s Ratio Perm | c0.12 | | | | | | | | | | | |
| v/c Ratio | 0.62 | 0.24 | | | | | 0.64 | 0.28 | | | 0.68 | |
| Uniform Delay, d1 | 30.4 | 28.2 | | | | | 32.1 | 5.6 | | | 18.4 | |
| Progression Factor | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 4.9 | 0.5 | | | | | 2.8 | 0.3 | | | 2.7 | |
| Delay (s) | 35.4 | 28.7 | | | | | 34.9 | 5.9 | | | 21.1 | |
| Level of Service | D | C | | | | | C | A | | | C | |
| Approach Delay (s/veh) | | 30.8 | | | 0.0 | | | 15.9 | | | 21.1 | |
| Approach LOS | | C | | | A | | | B | | | C | |

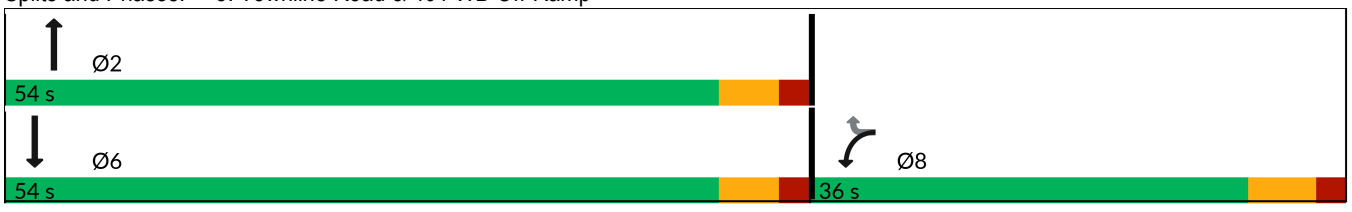
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 21.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 81.2 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 77.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 559 | 137 | 821 | 0 | 0 | 745 |
| Future Volume (vph) | 559 | 137 | 821 | 0 | 0 | 745 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 137 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 559 | 137 | 821 | 0 | 0 | 745 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 559 | 137 | 821 | 0 | 0 | 745 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (%) | 40.0% | 40.0% | 60.0% | | | 60.0% |
| Maximum Green (s) | 29.5 | 29.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 21.2 | 21.2 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.26 | 0.26 | 0.59 | | | 0.59 |
| v/c Ratio | 0.76 | 0.30 | 0.40 | | | 0.36 |
| Control Delay (s/veh) | 34.9 | 6.1 | 10.5 | | | 10.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 34.9 | 6.1 | 10.5 | | | 10.1 |
| LOS | C | A | B | | | B |
| Approach Delay (s/veh) | 29.2 | | 10.5 | | | 10.1 |
| Approach LOS | C | | B | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 81.9 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.76 | | | |
| Intersection Signal Delay (s/veh): 16.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 50.2% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 559 | 137 | 821 | 745 |
| v/c Ratio | 0.76 | 0.30 | 0.40 | 0.36 |
| Control Delay (s/veh) | 34.9 | 6.1 | 10.5 | 10.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.9 | 6.1 | 10.5 | 10.1 |
| Queue Length 50th (m) | 41.2 | 0.0 | 32.4 | 28.5 |
| Queue Length 95th (m) | 57.6 | 11.9 | 55.7 | 49.6 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1035 | 584 | 2059 | 2059 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.54 | 0.23 | 0.40 | 0.36 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 559 | 137 | 821 | 0 | 0 | 745 |
| Future Volume (vph) | 559 | 137 | 821 | 0 | 0 | 745 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 559 | 137 | 821 | 0 | 0 | 745 |
| RTOR Reduction (vph) | 0 | 102 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 559 | 35 | 821 | 0 | 0 | 745 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 21.2 | 21.2 | 48.2 | | | 48.2 |
| Effective Green, g (s) | 21.2 | 21.2 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.26 | 0.26 | 0.59 | | | 0.59 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 741 | 355 | 2059 | | | 2059 |
| v/s Ratio Prot | c0.20 | | c0.23 | | | 0.21 |
| v/s Ratio Perm | | 0.03 | | | | |
| v/c Ratio | 0.75 | 0.10 | 0.40 | | | 0.36 |
| Uniform Delay, d1 | 28.0 | 23.1 | 9.1 | | | 8.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 4.4 | 0.1 | 0.6 | | | 0.5 |
| Delay (s) | 32.3 | 23.2 | 9.6 | | | 9.3 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 30.5 | | 9.6 | | | 9.3 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 16.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 81.9 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 50.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

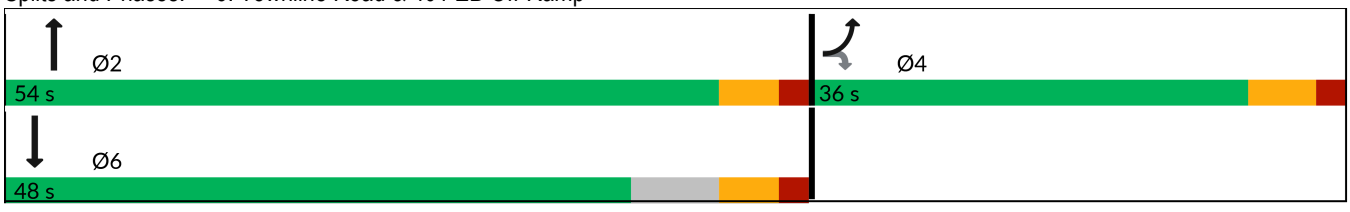
c Critical Lane Group

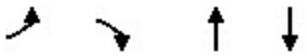
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 389 | 505 | 0 | 888 | 1150 | 153 |
| Future Volume (vph) | 389 | 505 | 0 | 888 | 1150 | 153 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.982 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1603 | 1414 | 0 | 3433 | 3302 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1603 | 1414 | 0 | 3433 | 3302 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 61 | | | 25 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Adj. Flow (vph) | 389 | 505 | 0 | 888 | 1150 | 153 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 389 | 505 | 0 | 888 | 1303 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 54.0 | 42.0 | |
| Total Split (s) | 36.0 | 36.0 | | 54.0 | 48.0 | |
| Total Split (%) | 40.0% | 40.0% | | 60.0% | 53.3% | |
| Maximum Green (s) | 29.5 | 29.5 | | 48.0 | 42.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 10.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 19.5 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| v/c Ratio | 0.74 | 1.00 | | 0.49 | 0.74 | |
| Control Delay (s/veh) | 37.0 | 69.3 | | 14.4 | 18.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 37.0 | 69.3 | | 14.4 | 18.9 | |
| LOS | D | E | | B | B | |
| Approach Delay (s/veh) | 55.3 | | | 14.4 | 18.9 | |
| Approach LOS | E | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.00 | | | |
| Intersection Signal Delay (s/veh): 28.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 81.0% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 389 | 505 | 888 | 1303 |
| v/c Ratio | 0.74 | 1.00 | 0.49 | 0.74 |
| Control Delay (s/veh) | 37.0 | 69.3 | 14.4 | 18.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.0 | 69.3 | 14.4 | 18.9 |
| Queue Length 50th (m) | 59.1 | ~78.5 | 47.8 | 84.2 |
| Queue Length 95th (m) | #94.9 | #143.5 | 62.9 | 109.3 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 525 | 504 | 1830 | 1772 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.74 | 1.00 | 0.49 | 0.74 |

Intersection Summary

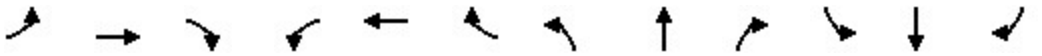
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 389 | 505 | 0 | 888 | 1150 | 153 |
| Future Volume (vph) | 389 | 505 | 0 | 888 | 1150 | 153 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1603 | 1414 | | 3433 | 3303 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1603 | 1414 | | 3433 | 3303 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 389 | 505 | 0 | 888 | 1150 | 153 |
| RTOR Reduction (vph) | 0 | 41 | 0 | 0 | 12 | 0 |
| Lane Group Flow (vph) | 389 | 464 | 0 | 888 | 1291 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Effective Green, g (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 525 | 463 | | 1830 | 1761 | |
| v/s Ratio Prot | 0.24 | | | 0.26 | c0.39 | |
| v/s Ratio Perm | | c0.33 | | | | |
| v/c Ratio | 0.74 | 1.00 | | 0.49 | 0.73 | |
| Uniform Delay, d1 | 26.9 | 30.3 | | 13.2 | 16.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 5.6 | 42.4 | | 0.9 | 2.7 | |
| Delay (s) | 32.4 | 72.6 | | 14.1 | 18.8 | |
| Level of Service | C | E | | B | B | |
| Approach Delay (s/veh) | 55.1 | | | 14.1 | 18.8 | |
| Approach LOS | E | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 28.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.84 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 81.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

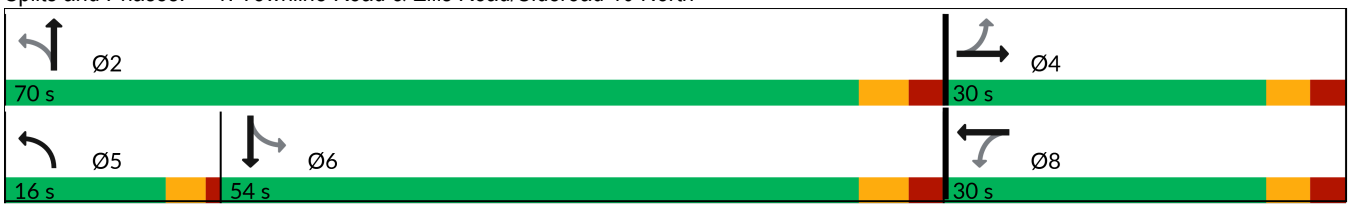


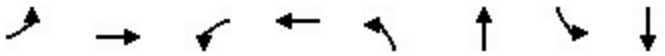
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 44 | 23 | 152 | 76 | 43 | 11 | 372 | 949 | 39 | 9 | 539 | 65 |
| Future Volume (vph) | 44 | 23 | 152 | 76 | 43 | 11 | 372 | 949 | 39 | 9 | 539 | 65 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.870 | | | 0.969 | | | 0.994 | | | 0.984 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1395 | 0 | 1635 | 1581 | 0 | 1668 | 1606 | 0 | 1668 | 1547 | 0 |
| Flt Permitted | 0.722 | | | 0.530 | | | 0.285 | | | 0.256 | | |
| Satd. Flow (perm) | 1267 | 1395 | 0 | 912 | 1581 | 0 | 500 | 1606 | 0 | 449 | 1547 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 152 | | | 11 | | | 4 | | | 8 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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 (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 44 | 23 | 152 | 76 | 43 | 11 | 372 | 949 | 39 | 9 | 539 | 65 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 44 | 175 | 0 | 76 | 54 | 0 | 372 | 988 | 0 | 9 | 604 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 9.0 | 54.0 | | 54.0 | 54.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 16.0 | 70.0 | | 54.0 | 54.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 16.0% | 70.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 12.0 | 63.7 | | 47.7 | 47.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 39.7 | | 39.7 | 39.7 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 12.3 | 12.3 | | 12.3 | 12.3 | | 66.1 | 63.8 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.14 | 0.14 | | 0.14 | 0.14 | | 0.75 | 0.72 | | 0.54 | 0.54 | |
| v/c Ratio | 0.25 | 0.54 | | 0.60 | 0.24 | | 0.70 | 0.85 | | 0.04 | 0.72 | |
| Control Delay (s/veh) | 37.0 | 14.9 | | 55.7 | 30.3 | | 12.6 | 19.3 | | 11.7 | 21.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 3.2 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 37.0 | 14.9 | | 55.7 | 30.3 | | 12.6 | 22.5 | | 11.7 | 21.9 | |
| LOS | D | B | | E | C | | B | C | | B | C | |
| Approach Delay (s/veh) | | 19.3 | | | 45.2 | | | 19.8 | | | 21.7 | |
| Approach LOS | | B | | | D | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 88.4 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.85 | | | |
| Intersection Signal Delay (s/veh): 21.7 | | Intersection LOS: C | |
| Intersection Capacity Utilization 101.6% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 44 | 175 | 76 | 54 | 372 | 988 | 9 | 604 |
| v/c Ratio | 0.25 | 0.54 | 0.60 | 0.24 | 0.70 | 0.85 | 0.04 | 0.72 |
| Control Delay (s/veh) | 37.0 | 14.9 | 55.7 | 30.3 | 12.6 | 19.3 | 11.7 | 21.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.0 | 14.9 | 55.7 | 30.3 | 12.6 | 22.5 | 11.7 | 21.9 |
| Queue Length 50th (m) | 6.7 | 3.5 | 12.3 | 6.5 | 16.0 | 97.7 | 0.7 | 70.3 |
| Queue Length 95th (m) | 16.1 | 20.8 | 26.3 | 16.6 | #37.9 | #242.4 | 3.3 | 130.0 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 344 | 490 | 248 | 438 | 532 | 1160 | 243 | 844 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 99 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.36 | 0.31 | 0.12 | 0.70 | 0.93 | 0.04 | 0.72 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 44 | 23 | 152 | 76 | 43 | 11 | 372 | 949 | 39 | 9 | 539 | 65 |
| Future Volume (vph) | 44 | 23 | 152 | 76 | 43 | 11 | 372 | 949 | 39 | 9 | 539 | 65 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1395 | | 1635 | 1582 | | 1668 | 1607 | | 1668 | 1547 | |
| Flt Permitted | 0.72 | 1.00 | | 0.53 | 1.00 | | 0.28 | 1.00 | | 0.26 | 1.00 | |
| Satd. Flow (perm) | 1267 | 1395 | | 913 | 1582 | | 500 | 1607 | | 449 | 1547 | |
| 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) | 44 | 23 | 152 | 76 | 43 | 11 | 372 | 949 | 39 | 9 | 539 | 65 |
| RTOR Reduction (vph) | 0 | 131 | 0 | 0 | 9 | 0 | 0 | 1 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 44 | 44 | 0 | 76 | 45 | 0 | 372 | 987 | 0 | 9 | 600 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 12.2 | 12.2 | | 12.2 | 12.2 | | 63.8 | 63.8 | | 48.0 | 48.0 | |
| Effective Green, g (s) | 12.2 | 12.2 | | 12.2 | 12.2 | | 63.8 | 63.8 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.14 | 0.14 | | 0.14 | 0.14 | | 0.72 | 0.72 | | 0.54 | 0.54 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 175 | 192 | | 126 | 218 | | 517 | 1161 | | 244 | 840 | |
| v/s Ratio Prot | | 0.03 | | | 0.03 | | 0.10 | c0.61 | | | 0.39 | |
| v/s Ratio Perm | 0.03 | | | c0.08 | | | 0.42 | | | 0.02 | | |
| v/c Ratio | 0.25 | 0.23 | | 0.60 | 0.20 | | 0.72 | 0.85 | | 0.04 | 0.71 | |
| Uniform Delay, d1 | 34.0 | 33.9 | | 35.8 | 33.7 | | 8.0 | 8.8 | | 9.4 | 15.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.8 | 0.6 | | 7.9 | 0.5 | | 4.8 | 7.9 | | 0.3 | 5.2 | |
| Delay (s) | 34.7 | 34.5 | | 43.7 | 34.2 | | 12.7 | 16.7 | | 9.7 | 20.2 | |
| Level of Service | C | C | | D | C | | B | B | | A | C | |
| Approach Delay (s/veh) | | 34.5 | | | 39.7 | | | 15.6 | | | 20.0 | |
| Approach LOS | | C | | | D | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 19.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.86 | | |
| Actuated Cycle Length (s) | 88.3 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 101.6% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |

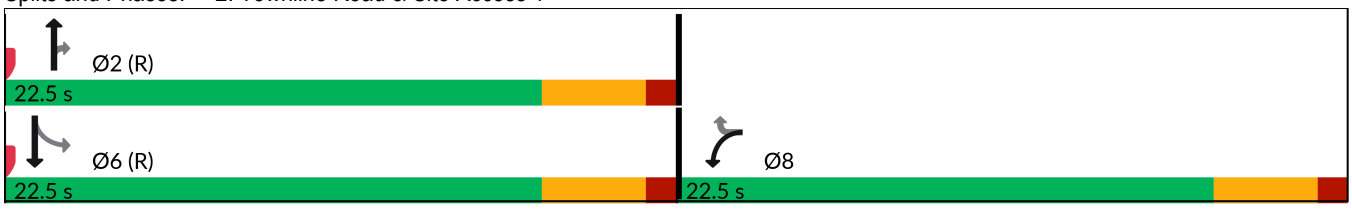
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 1360 | 0 | 0 | 767 |
| Future Volume (vph) | 0 | 0 | 1360 | 0 | 0 | 767 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 1360 | 0 | 0 | 767 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 1360 | 0 | 0 | 767 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| v/c Ratio | | | 0.79 | | | 0.42 |
| Control Delay (s/veh) | | | 4.3 | | | 0.7 |
| Queue Delay | | | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | | 4.3 | | | 0.7 |
| LOS | | | A | | | A |
| Approach Delay (s/veh) | | | 4.3 | | | 0.7 |
| Approach LOS | | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 45 | | | |
| Actuated Cycle Length: 45 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 130 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.79 | | | |
| Intersection Signal Delay (s/veh): 3.0 | | Intersection LOS: A | |
| Intersection Capacity Utilization 80.4% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

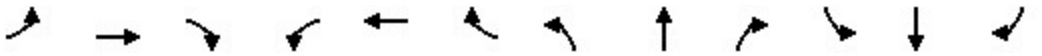


| Lane Group | NBT | SBT |
|---|---|---|
| Lane Group Flow (vph) | 1360 | 767 |
| v/c Ratio | 0.79 | 0.42 |
| Control Delay (s/veh) | 4.3 | 0.7 |
| Queue Delay | 0.0 | 0.0 |
| Total Delay (s/veh) | 4.3 | 0.7 |
| Queue Length 50th (m) | 0.0 | 0.0 |
| Queue Length 95th (m) | 0.0 | 0.0 |
| Internal Link Dist (m) | 311.6 | 161.7 |
| Turn Bay Length (m) | | |
| Base Capacity (vph) | 1721 | 1842 |
| Starvation Cap Reductn | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 |
| Storage Cap Reductn | 0 | 0 |
| Reduced v/c Ratio | 0.79 | 0.42 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 1360 | 0 | 0 | 767 |
| Future Volume (vph) | 0 | 0 | 1360 | 0 | 0 | 767 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | | | 4.5 | | | 4.5 |
| Lane Util. Factor | | | 1.00 | | | 1.00 |
| Frt | | | 1.00 | | | 1.00 |
| Flt Protected | | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | | | 1721 | | | 1842 |
| Flt Permitted | | | 1.00 | | | 1.00 |
| Satd. Flow (perm) | | | 1721 | | | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 1360 | 0 | 0 | 767 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 1360 | 0 | 0 | 767 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | | | 45.0 | | | 45.0 |
| Effective Green, g (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| Clearance Time (s) | | | 4.5 | | | 4.5 |
| Vehicle Extension (s) | | | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | | | 1721 | | | 1842 |
| v/s Ratio Prot | | | c0.79 | | | 0.42 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | | | 0.79 | | | 0.42 |
| Uniform Delay, d1 | | | 0.0 | | | 0.0 |
| Progression Factor | | | 1.00 | | | 1.00 |
| Incremental Delay, d2 | | | 3.8 | | | 0.7 |
| Delay (s) | | | 3.8 | | | 0.7 |
| Level of Service | | | A | | | A |
| Approach Delay (s/veh) | 0.0 | | 3.8 | | | 0.7 |
| Approach LOS | A | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 2.7 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.99 | | |
| Actuated Cycle Length (s) | 45.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 80.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

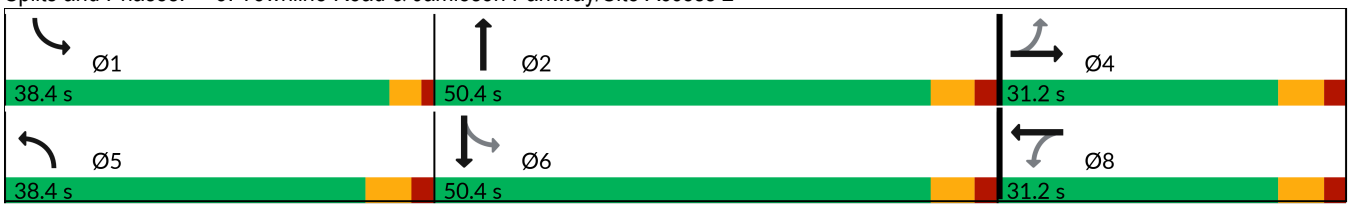


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 245 | 0 | 414 | 0 | 0 | 0 | 468 | 1080 | 0 | 0 | 596 | 163 |
| Future Volume (vph) | 245 | 0 | 414 | 0 | 0 | 0 | 468 | 1080 | 0 | 0 | 596 | 163 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | | | | | | | 0.968 | |
| Flt Protected | 0.950 | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3302 | 0 | 1755 | 3117 | 0 |
| Flt Permitted | 0.757 | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 1329 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3302 | 0 | 1755 | 3117 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 536 | | | | | | | | | 33 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 245 | 0 | 414 | 0 | 0 | 0 | 468 | 1080 | 0 | 0 | 596 | 163 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 245 | 414 | 0 | 0 | 0 | 0 | 468 | 1080 | 0 | 0 | 759 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 11.0 | 50.4 | | 9.0 | 50.4 | |
| Total Split (s) | 31.2 | 31.2 | | 31.2 | 31.2 | | 38.4 | 50.4 | | 38.4 | 50.4 | |
| Total Split (%) | 26.0% | 26.0% | | 26.0% | 26.0% | | 32.0% | 42.0% | | 32.0% | 42.0% | |
| Maximum Green (s) | 25.2 | 25.2 | | 25.2 | 25.2 | | 32.4 | 44.4 | | 34.4 | 44.4 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | | 23.4 | | | 23.4 | |
| Flash Don't Walk (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 23.4 | 23.4 | | | | | 20.7 | 71.4 | | | 44.6 | |
| Actuated g/C Ratio | 0.22 | 0.22 | | | | | 0.19 | 0.67 | | | 0.42 | |
| v/c Ratio | 0.84 | 0.57 | | | | | 0.75 | 0.49 | | | 0.57 | |
| Control Delay (s/veh) | 66.4 | 3.7 | | | | | 49.0 | 9.8 | | | 25.8 | |
| Queue Delay | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | 66.4 | 3.7 | | | | | 49.0 | 9.8 | | | 25.8 | |
| LOS | E | A | | | | | D | A | | | C | |
| Approach Delay (s/veh) | | 27.0 | | | | | | 21.7 | | | 25.8 | |
| Approach LOS | | C | | | | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 106.8 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.84 | | | |
| Intersection Signal Delay (s/veh): 23.9 | | Intersection LOS: C | |
| Intersection Capacity Utilization 82.0% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

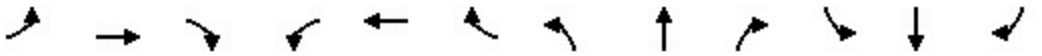
Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 245 | 414 | 468 | 1080 | 759 |
| v/c Ratio | 0.84 | 0.57 | 0.75 | 0.49 | 0.57 |
| Control Delay (s/veh) | 66.4 | 3.7 | 49.0 | 9.8 | 25.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 66.4 | 3.7 | 49.0 | 9.8 | 25.8 |
| Queue Length 50th (m) | 49.0 | 0.0 | 48.6 | 55.6 | 61.6 |
| Queue Length 95th (m) | #95.4 | 1.1 | 65.5 | 69.3 | 88.4 |
| Internal Link Dist (m) | | 90.3 | | 261.4 | 311.6 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 314 | 737 | 976 | 2206 | 1321 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.78 | 0.56 | 0.48 | 0.49 | 0.57 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 245 | 0 | 414 | 0 | 0 | 0 | 468 | 1080 | 0 | 0 | 596 | 163 |
| Future Volume (vph) | 245 | 0 | 414 | 0 | 0 | 0 | 468 | 1080 | 0 | 0 | 596 | 163 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | | | 0.97 | 0.95 | | | 0.95 | |
| Frt | 1.00 | 0.85 | | | | | 1.00 | 1.00 | | | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | | | | 3203 | 3302 | | | 3116 | |
| Flt Permitted | 0.76 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 1329 | 1387 | | | | | 3203 | 3302 | | | 3116 | |
| 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) | 245 | 0 | 414 | 0 | 0 | 0 | 468 | 1080 | 0 | 0 | 596 | 163 |
| RTOR Reduction (vph) | 0 | 323 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 |
| Lane Group Flow (vph) | 245 | 91 | 0 | 0 | 0 | 0 | 468 | 1080 | 0 | 0 | 740 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 23.4 | 23.4 | | | | | 20.7 | 71.3 | | | 44.6 | |
| Effective Green, g (s) | 23.4 | 23.4 | | | | | 20.7 | 71.3 | | | 44.6 | |
| Actuated g/C Ratio | 0.22 | 0.22 | | | | | 0.19 | 0.67 | | | 0.42 | |
| Clearance Time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 291 | 304 | | | | | 621 | 2206 | | | 1302 | |
| v/s Ratio Prot | | 0.07 | | | | | c0.15 | 0.33 | | | c0.24 | |
| v/s Ratio Perm | c0.18 | | | | | | | | | | | |
| v/c Ratio | 0.84 | 0.30 | | | | | 0.75 | 0.49 | | | 0.57 | |
| Uniform Delay, d1 | 39.9 | 34.8 | | | | | 40.6 | 8.7 | | | 23.7 | |
| Progression Factor | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 19.3 | 0.6 | | | | | 5.2 | 0.8 | | | 1.8 | |
| Delay (s) | 59.2 | 35.3 | | | | | 45.8 | 9.5 | | | 25.5 | |
| Level of Service | E | D | | | | | D | A | | | C | |
| Approach Delay (s/veh) | | 44.2 | | | 0.0 | | | 20.5 | | | 25.5 | |
| Approach LOS | | D | | | A | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 27.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 106.7 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 82.0% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

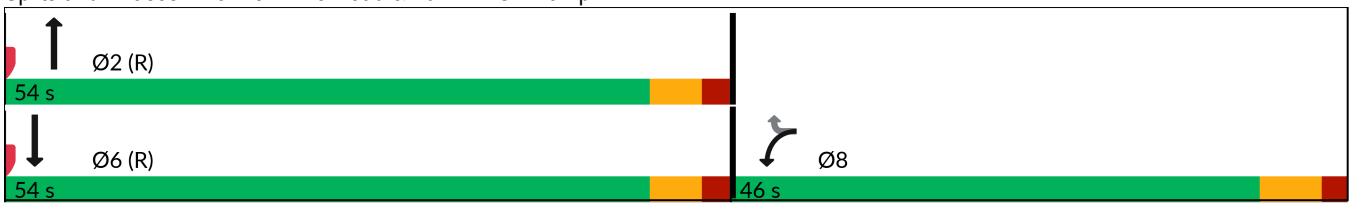
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 560 | 356 | 1308 | 0 | 0 | 713 |
| Future Volume (vph) | 560 | 356 | 1308 | 0 | 0 | 713 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 27 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 560 | 356 | 1308 | 0 | 0 | 713 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 560 | 356 | 1308 | 0 | 0 | 713 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Minimum Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (%) | 46.0% | 46.0% | 54.0% | | | 54.0% |
| Maximum Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 29.5 | 29.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| v/c Ratio | 0.48 | 0.60 | 0.78 | | | 0.42 |
| Control Delay (s/veh) | 24.4 | 27.2 | 25.6 | | | 18.0 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 24.4 | 27.2 | 25.6 | | | 18.0 |
| LOS | C | C | C | | | B |
| Approach Delay (s/veh) | 25.5 | | 25.6 | | | 18.0 |
| Approach LOS | C | | C | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 100 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.78 | | | |
| Intersection Signal Delay (s/veh): 23.7 | | Intersection LOS: C | |
| Intersection Capacity Utilization 70.5% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 560 | 356 | 1308 | 713 |
| v/c Ratio | 0.48 | 0.60 | 0.78 | 0.42 |
| Control Delay (s/veh) | 24.4 | 27.2 | 25.6 | 18.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 24.4 | 27.2 | 25.6 | 18.0 |
| Queue Length 50th (m) | 41.0 | 49.7 | 106.8 | 45.8 |
| Queue Length 95th (m) | 56.0 | 79.3 | 134.0 | 60.0 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1161 | 591 | 1680 | 1680 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.48 | 0.60 | 0.78 | 0.42 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 560 | 356 | 1308 | 0 | 0 | 713 |
| Future Volume (vph) | 560 | 356 | 1308 | 0 | 0 | 713 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 560 | 356 | 1308 | 0 | 0 | 713 |
| RTOR Reduction (vph) | 0 | 16 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 560 | 340 | 1308 | 0 | 0 | 713 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Effective Green, g (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Grp Cap (vph) | 1161 | 575 | 1680 | | | 1680 |
| v/s Ratio Prot | 0.19 | | c0.37 | | | 0.20 |
| v/s Ratio Perm | | c0.23 | | | | |
| v/c Ratio | 0.48 | 0.59 | 0.78 | | | 0.42 |
| Uniform Delay, d1 | 22.6 | 23.9 | 21.6 | | | 17.0 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.4 | 4.4 | 3.6 | | | 0.8 |
| Delay (s) | 24.0 | 28.3 | 25.2 | | | 17.8 |
| Level of Service | C | C | C | | | B |
| Approach Delay (s/veh) | 25.7 | | 25.2 | | | 17.8 |
| Approach LOS | C | | C | | | B |

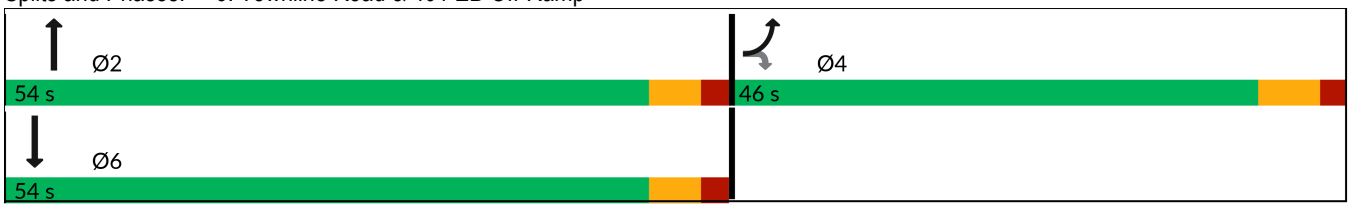
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 23.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.69 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 70.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

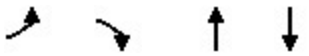
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 415 | 504 | 0 | 1163 | 1201 | 117 |
| Future Volume (vph) | 415 | 504 | 0 | 1163 | 1201 | 117 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.987 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1619 | 1442 | 0 | 3535 | 3370 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1619 | 1442 | 0 | 3535 | 3370 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 37 | | | 14 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Adj. Flow (vph) | 415 | 504 | 0 | 1163 | 1201 | 117 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 415 | 504 | 0 | 1163 | 1318 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (%) | 46.0% | 46.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 39.5 | 39.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 42.0 | |
| Flash Don't Walk (s) | 29.5 | 29.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 35.0 | 35.0 | | 48.2 | 48.2 | |
| Actuated g/C Ratio | 0.37 | 0.37 | | 0.50 | 0.50 | |
| v/c Ratio | 0.70 | 0.92 | | 0.65 | 0.77 | |
| Control Delay (s/veh) | 32.9 | 50.0 | | 20.6 | 24.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 32.9 | 50.0 | | 20.6 | 24.0 | |
| LOS | C | D | | C | C | |
| Approach Delay (s/veh) | 42.3 | | | 20.6 | 24.0 | |
| Approach LOS | D | | | C | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 95.7 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.92 | | | |
| Intersection Signal Delay (s/veh): 27.8 | | Intersection LOS: C | |
| Intersection Capacity Utilization 81.2% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 415 | 504 | 1163 | 1318 |
| v/c Ratio | 0.70 | 0.92 | 0.65 | 0.77 |
| Control Delay (s/veh) | 32.9 | 50.0 | 20.6 | 24.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 32.9 | 50.0 | 20.6 | 24.0 |
| Queue Length 50th (m) | 64.3 | 81.9 | 88.5 | 109.3 |
| Queue Length 95th (m) | 96.9 | #140.6 | 111.6 | 138.1 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 670 | 618 | 1779 | 1703 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.62 | 0.82 | 0.65 | 0.77 |

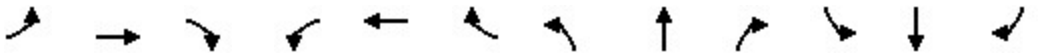
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 415 | 504 | 0 | 1163 | 1201 | 117 |
| Future Volume (vph) | 415 | 504 | 0 | 1163 | 1201 | 117 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1619 | 1442 | | 3535 | 3369 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1619 | 1442 | | 3535 | 3369 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 415 | 504 | 0 | 1163 | 1201 | 117 |
| RTOR Reduction (vph) | 0 | 23 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 415 | 481 | 0 | 1163 | 1311 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 35.0 | 35.0 | | 48.2 | 48.2 | |
| Effective Green, g (s) | 35.0 | 35.0 | | 48.2 | 48.2 | |
| Actuated g/C Ratio | 0.37 | 0.37 | | 0.50 | 0.50 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 592 | 527 | | 1780 | 1696 | |
| v/s Ratio Prot | 0.26 | | | 0.33 | c0.39 | |
| v/s Ratio Perm | | c0.33 | | | | |
| v/c Ratio | 0.70 | 0.91 | | 0.65 | 0.77 | |
| Uniform Delay, d1 | 25.9 | 28.9 | | 17.6 | 19.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.7 | 20.1 | | 1.9 | 3.5 | |
| Delay (s) | 29.6 | 49.0 | | 19.5 | 22.8 | |
| Level of Service | C | D | | B | C | |
| Approach Delay (s/veh) | 40.2 | | | 19.5 | 22.8 | |
| Approach LOS | D | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 26.4 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.83 | | |
| Actuated Cycle Length (s) | 95.7 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 81.2% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

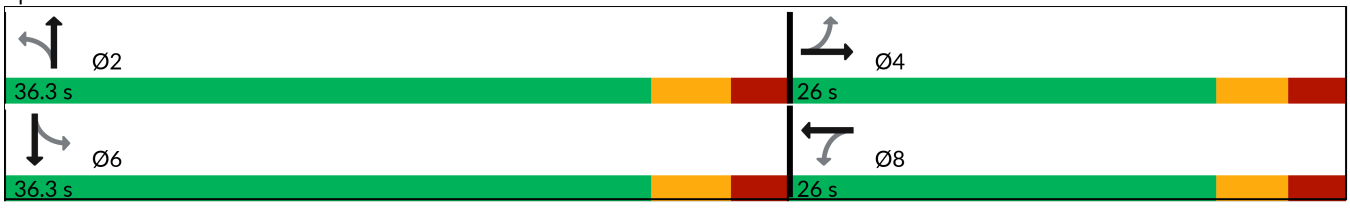


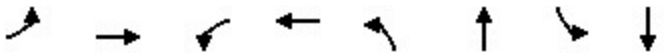
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 54 | 30 | 211 | 34 | 18 | 4 | 191 | 526 | 32 | 3 | 436 | 40 |
| Future Volume (vph) | 54 | 30 | 211 | 34 | 18 | 4 | 191 | 526 | 32 | 3 | 436 | 40 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.869 | | | 0.973 | | | 0.991 | | | 0.987 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1418 | 0 | 1668 | 1579 | 0 | 1651 | 1587 | 0 | 1668 | 1596 | 0 |
| Flt Permitted | 0.743 | | | 0.573 | | | 0.466 | | | 0.403 | | |
| Satd. Flow (perm) | 1291 | 1418 | 0 | 1006 | 1579 | 0 | 810 | 1587 | 0 | 707 | 1596 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 211 | | | 4 | | | 7 | | | 10 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Adj. Flow (vph) | 54 | 30 | 211 | 34 | 18 | 4 | 191 | 526 | 32 | 3 | 436 | 40 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 54 | 241 | 0 | 34 | 22 | 0 | 191 | 558 | 0 | 3 | 476 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (%) | 41.7% | 41.7% | | 41.7% | 41.7% | | 58.3% | 58.3% | | 58.3% | 58.3% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.7 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 2.6 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Max | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Flash Don't Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 9.4 | 9.4 | | 9.4 | 9.4 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.58 | 0.58 | | 0.58 | 0.58 | |
| v/c Ratio | 0.23 | 0.56 | | 0.19 | 0.08 | | 0.41 | 0.60 | | 0.01 | 0.51 | |
| Control Delay (s/veh) | 20.4 | 10.2 | | 20.1 | 16.0 | | 10.0 | 11.0 | | 5.7 | 9.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 20.4 | 10.2 | | 20.1 | 16.0 | | 10.0 | 11.0 | | 5.7 | 9.3 | |
| LOS | C | B | | C | B | | A | B | | A | A | |
| Approach Delay (s/veh) | | 12.1 | | | 18.5 | | | 10.8 | | | 9.3 | |
| Approach LOS | | B | | | B | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 62.3 | | | |
| Actuated Cycle Length: 51.8 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.60 | | | |
| Intersection Signal Delay (s/veh): 10.8 | | Intersection LOS: B | |
| Intersection Capacity Utilization 84.8% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 54 | 241 | 34 | 22 | 191 | 558 | 3 | 476 |
| v/c Ratio | 0.23 | 0.56 | 0.19 | 0.08 | 0.41 | 0.60 | 0.01 | 0.51 |
| Control Delay (s/veh) | 20.4 | 10.2 | 20.1 | 16.0 | 10.0 | 11.0 | 5.7 | 9.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 20.4 | 10.2 | 20.1 | 16.0 | 10.0 | 11.0 | 5.7 | 9.3 |
| Queue Length 50th (m) | 4.3 | 2.4 | 2.7 | 1.4 | 7.6 | 25.6 | 0.1 | 19.9 |
| Queue Length 95th (m) | 11.6 | 16.7 | 8.4 | 5.7 | 25.0 | 66.6 | 1.0 | 51.8 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 499 | 677 | 389 | 613 | 470 | 924 | 410 | 930 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.36 | 0.09 | 0.04 | 0.41 | 0.60 | 0.01 | 0.51 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 54 | 30 | 211 | 34 | 18 | 4 | 191 | 526 | 32 | 3 | 436 | 40 |
| Future Volume (vph) | 54 | 30 | 211 | 34 | 18 | 4 | 191 | 526 | 32 | 3 | 436 | 40 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1417 | | 1668 | 1579 | | 1651 | 1588 | | 1668 | 1596 | |
| Flt Permitted | 0.74 | 1.00 | | 0.57 | 1.00 | | 0.47 | 1.00 | | 0.40 | 1.00 | |
| Satd. Flow (perm) | 1291 | 1417 | | 1006 | 1579 | | 811 | 1588 | | 707 | 1596 | |
| 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) | 54 | 30 | 211 | 34 | 18 | 4 | 191 | 526 | 32 | 3 | 436 | 40 |
| RTOR Reduction (vph) | 0 | 173 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 54 | 68 | 0 | 34 | 19 | 0 | 191 | 555 | 0 | 3 | 472 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 9.4 | 9.4 | | 9.4 | 9.4 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Effective Green, g (s) | 9.4 | 9.4 | | 9.4 | 9.4 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.58 | 0.58 | | 0.58 | 0.58 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 234 | 257 | | 182 | 286 | | 471 | 922 | | 410 | 927 | |
| v/s Ratio Prot | | c0.05 | | | 0.01 | | | c0.35 | | | 0.30 | |
| v/s Ratio Perm | 0.04 | | | 0.03 | | | 0.24 | | | 0.00 | | |
| v/c Ratio | 0.23 | 0.27 | | 0.19 | 0.07 | | 0.41 | 0.60 | | 0.01 | 0.51 | |
| Uniform Delay, d1 | 18.1 | 18.2 | | 18.0 | 17.6 | | 5.9 | 7.0 | | 4.6 | 6.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.6 | | 0.5 | 0.1 | | 2.6 | 2.9 | | 0.0 | 2.0 | |
| Delay (s) | 18.6 | 18.8 | | 18.5 | 17.7 | | 8.5 | 9.9 | | 4.6 | 8.4 | |
| Level of Service | B | B | | B | B | | A | A | | A | A | |
| Approach Delay (s/veh) | | 18.8 | | | 18.1 | | | 9.5 | | | 8.4 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 11.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.52 | | |
| Actuated Cycle Length (s) | 51.8 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 84.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

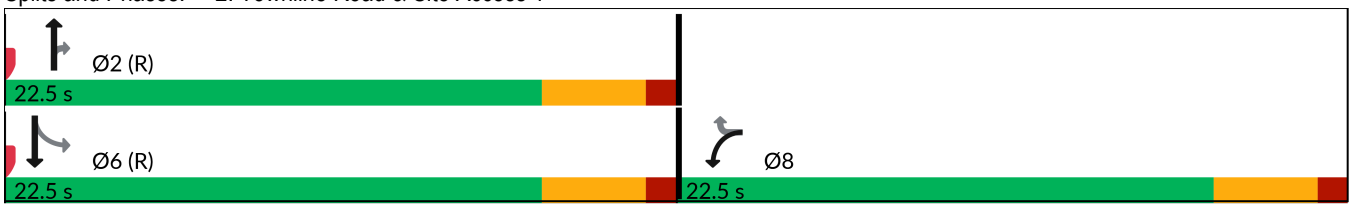
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 749 | 0 | 0 | 681 |
| Future Volume (vph) | 0 | 0 | 749 | 0 | 0 | 681 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 749 | 0 | 0 | 681 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 749 | 0 | 0 | 681 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| v/c Ratio | | | 0.44 | | | 0.37 |
| Control Delay (s/veh) | | | 0.8 | | | 0.6 |
| Queue Delay | | | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | | 0.8 | | | 0.6 |
| LOS | | | A | | | A |
| Approach Delay (s/veh) | | | 0.8 | | | 0.6 |
| Approach LOS | | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 45 | | | |
| Actuated Cycle Length: 45 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.44 | | | |
| Intersection Signal Delay (s/veh): 0.7 | | Intersection LOS: A | |
| Intersection Capacity Utilization 45.9% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | NBT | SBT |
|---|---|---|
| Lane Group Flow (vph) | 749 | 681 |
| v/c Ratio | 0.44 | 0.37 |
| Control Delay (s/veh) | 0.8 | 0.6 |
| Queue Delay | 0.0 | 0.0 |
| Total Delay (s/veh) | 0.8 | 0.6 |
| Queue Length 50th (m) | 0.0 | 0.0 |
| Queue Length 95th (m) | 0.0 | 0.0 |
| Internal Link Dist (m) | 311.6 | 161.7 |
| Turn Bay Length (m) | | |
| Base Capacity (vph) | 1721 | 1842 |
| Starvation Cap Reductn | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 |
| Storage Cap Reductn | 0 | 0 |
| Reduced v/c Ratio | 0.44 | 0.37 |

| Intersection Summary |
|---|

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 749 | 0 | 0 | 681 |
| Future Volume (vph) | 0 | 0 | 749 | 0 | 0 | 681 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | | | 4.5 | | | 4.5 |
| Lane Util. Factor | | | 1.00 | | | 1.00 |
| Frt | | | 1.00 | | | 1.00 |
| Flt Protected | | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | | | 1721 | | | 1842 |
| Flt Permitted | | | 1.00 | | | 1.00 |
| Satd. Flow (perm) | | | 1721 | | | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 749 | 0 | 0 | 681 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 749 | 0 | 0 | 681 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | | | 45.0 | | | 45.0 |
| Effective Green, g (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| Clearance Time (s) | | | 4.5 | | | 4.5 |
| Vehicle Extension (s) | | | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | | | 1721 | | | 1842 |
| v/s Ratio Prot | | | c0.44 | | | 0.37 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | | | 0.44 | | | 0.37 |
| Uniform Delay, d1 | | | 0.0 | | | 0.0 |
| Progression Factor | | | 1.00 | | | 1.00 |
| Incremental Delay, d2 | | | 0.8 | | | 0.6 |
| Delay (s) | | | 0.8 | | | 0.6 |
| Level of Service | | | A | | | A |
| Approach Delay (s/veh) | 0.0 | | 0.8 | | | 0.6 |
| Approach LOS | A | | A | | | A |

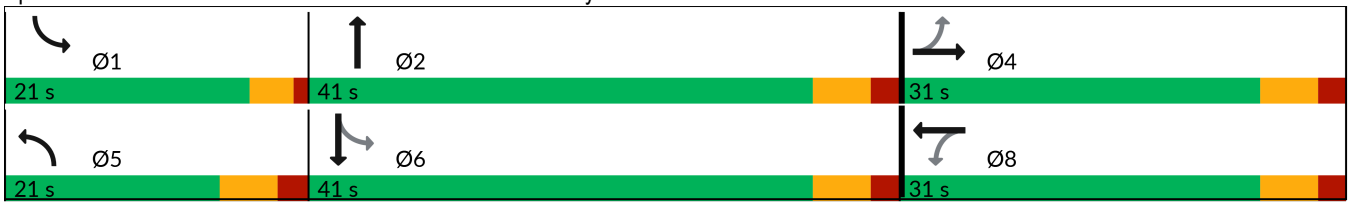
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 0.7 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.54 | | |
| Actuated Cycle Length (s) | 45.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 45.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 167 | 0 | 264 | 0 | 0 | 0 | 238 | 593 | 0 | 0 | 561 | 120 |
| Future Volume (vph) | 167 | 0 | 264 | 0 | 0 | 0 | 238 | 593 | 0 | 0 | 561 | 120 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | | | | | | | 0.974 | |
| Flt Protected | 0.950 | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3270 | 0 | 1755 | 3211 | 0 |
| Flt Permitted | 0.757 | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 1329 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3270 | 0 | 1755 | 3211 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 435 | | | | | | | | | 31 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Adj. Flow (vph) | 167 | 0 | 264 | 0 | 0 | 0 | 238 | 593 | 0 | 0 | 561 | 120 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 167 | 264 | 0 | 0 | 0 | 0 | 238 | 593 | 0 | 0 | 681 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Minimum Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 11.0 | 41.0 | | 9.0 | 41.0 | |
| Total Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 21.0 | 41.0 | | 21.0 | 41.0 | |
| Total Split (%) | 33.3% | 33.3% | | 33.3% | 33.3% | | 22.6% | 44.1% | | 22.6% | 44.1% | |
| Maximum Green (s) | 25.0 | 25.0 | | 25.0 | 25.0 | | 15.0 | 35.0 | | 17.0 | 35.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 15.7 | 15.7 | | | | | 11.2 | 52.6 | | | 35.3 | |
| Actuated g/C Ratio | 0.20 | 0.20 | | | | | 0.14 | 0.65 | | | 0.44 | |
| v/c Ratio | 0.64 | 0.43 | | | | | 0.53 | 0.28 | | | 0.48 | |
| Control Delay (s/veh) | 41.9 | 2.1 | | | | | 37.8 | 7.0 | | | 18.0 | |
| Queue Delay | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | 41.9 | 2.1 | | | | | 37.8 | 7.0 | | | 18.0 | |
| LOS | D | A | | | | | D | A | | | B | |
| Approach Delay (s/veh) | | 17.5 | | | | | | 15.8 | | | 18.0 | |
| Approach LOS | | B | | | | | | B | | | B | |

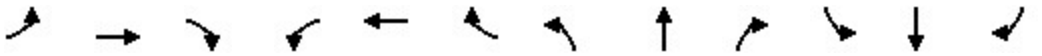
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 93 | | | |
| Actuated Cycle Length: 80.4 | | | |
| Natural Cycle: 85 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.64 | | | |
| Intersection Signal Delay (s/veh): 17.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 61.8% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 167 | 264 | 238 | 593 | 681 |
| v/c Ratio | 0.64 | 0.43 | 0.53 | 0.28 | 0.48 |
| Control Delay (s/veh) | 41.9 | 2.1 | 37.8 | 7.0 | 18.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 41.9 | 2.1 | 37.8 | 7.0 | 18.0 |
| Queue Length 50th (m) | 23.5 | 0.0 | 17.3 | 17.0 | 34.8 |
| Queue Length 95th (m) | 44.2 | 0.0 | 31.3 | 34.0 | 64.4 |
| Internal Link Dist (m) | | 90.3 | | 261.4 | 311.6 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 417 | 733 | 603 | 2139 | 1429 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.40 | 0.36 | 0.39 | 0.28 | 0.48 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 167 | 0 | 264 | 0 | 0 | 0 | 238 | 593 | 0 | 0 | 561 | 120 |
| Future Volume (vph) | 167 | 0 | 264 | 0 | 0 | 0 | 238 | 593 | 0 | 0 | 561 | 120 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | | | 0.97 | 0.95 | | | 0.95 | |
| Frt | 1.00 | 0.85 | | | | | 1.00 | 1.00 | | | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | | | | 3203 | 3270 | | | 3209 | |
| Flt Permitted | 0.76 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 1329 | 1387 | | | | | 3203 | 3270 | | | 3209 | |
| 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) | 167 | 0 | 264 | 0 | 0 | 0 | 238 | 593 | 0 | 0 | 561 | 120 |
| RTOR Reduction (vph) | 0 | 212 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 |
| Lane Group Flow (vph) | 167 | 52 | 0 | 0 | 0 | 0 | 238 | 593 | 0 | 0 | 664 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 15.7 | 15.7 | | | | | 11.2 | 52.6 | | | 35.4 | |
| Effective Green, g (s) | 15.7 | 15.7 | | | | | 11.2 | 52.6 | | | 35.4 | |
| Actuated g/C Ratio | 0.20 | 0.20 | | | | | 0.14 | 0.66 | | | 0.44 | |
| Clearance Time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 259 | 271 | | | | | 446 | 2141 | | | 1414 | |
| v/s Ratio Prot | | 0.04 | | | | | c0.07 | 0.18 | | | c0.21 | |
| v/s Ratio Perm | c0.13 | | | | | | | | | | | |
| v/c Ratio | 0.64 | 0.19 | | | | | 0.53 | 0.28 | | | 0.47 | |
| Uniform Delay, d1 | 29.7 | 27.0 | | | | | 32.1 | 5.8 | | | 15.8 | |
| Progression Factor | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 5.4 | 0.3 | | | | | 1.2 | 0.3 | | | 1.1 | |
| Delay (s) | 35.2 | 27.3 | | | | | 33.4 | 6.2 | | | 16.9 | |
| Level of Service | D | C | | | | | C | A | | | B | |
| Approach Delay (s/veh) | | 30.4 | | | 0.0 | | | 13.9 | | | 16.9 | |
| Approach LOS | | C | | | A | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 18.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.52 | | |
| Actuated Cycle Length (s) | 80.3 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 61.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

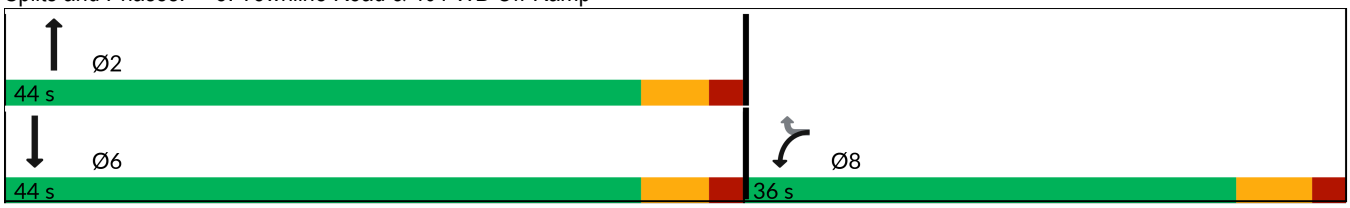
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 413 | 169 | 664 | 0 | 0 | 569 |
| Future Volume (vph) | 413 | 169 | 664 | 0 | 0 | 569 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 169 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 413 | 169 | 664 | 0 | 0 | 569 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 413 | 169 | 664 | 0 | 0 | 569 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (%) | 45.0% | 45.0% | 55.0% | | | 55.0% |
| Maximum Green (s) | 29.5 | 29.5 | 38.0 | | | 38.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 33.0 | | | 33.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 13.9 | 13.9 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.59 | | | 0.59 |
| v/c Ratio | 0.62 | 0.38 | 0.32 | | | 0.28 |
| Control Delay (s/veh) | 27.2 | 6.6 | 7.6 | | | 7.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 27.2 | 6.6 | 7.6 | | | 7.4 |
| LOS | C | A | A | | | A |
| Approach Delay (s/veh) | 21.2 | | 7.6 | | | 7.4 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 64.5 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.62 | | | |
| Intersection Signal Delay (s/veh): 11.9 | | Intersection LOS: B | |
| Intersection Capacity Utilization 41.4% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 413 | 169 | 664 | 569 |
| v/c Ratio | 0.62 | 0.38 | 0.32 | 0.28 |
| Control Delay (s/veh) | 27.2 | 6.6 | 7.6 | 7.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.2 | 6.6 | 7.6 | 7.4 |
| Queue Length 50th (m) | 23.1 | 0.0 | 18.3 | 15.2 |
| Queue Length 95th (m) | 35.3 | 12.5 | 32.8 | 27.7 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1411 | 758 | 2086 | 2066 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.29 | 0.22 | 0.32 | 0.28 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 413 | 169 | 664 | 0 | 0 | 569 |
| Future Volume (vph) | 413 | 169 | 664 | 0 | 0 | 569 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 413 | 169 | 664 | 0 | 0 | 569 |
| RTOR Reduction (vph) | 0 | 133 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 413 | 36 | 664 | 0 | 0 | 569 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 13.9 | 13.9 | 38.1 | | | 38.1 |
| Effective Green, g (s) | 13.9 | 13.9 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.59 | | | 0.59 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 663 | 313 | 2088 | | | 2067 |
| v/s Ratio Prot | c0.13 | | c0.19 | | | 0.16 |
| v/s Ratio Perm | | 0.03 | | | | |
| v/c Ratio | 0.62 | 0.12 | 0.32 | | | 0.28 |
| Uniform Delay, d1 | 22.9 | 20.4 | 6.7 | | | 6.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.8 | 0.2 | 0.4 | | | 0.3 |
| Delay (s) | 24.8 | 20.5 | 7.1 | | | 6.8 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 23.5 | | 7.1 | | | 6.8 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 12.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.40 | | |
| Actuated Cycle Length (s) | 64.5 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 41.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

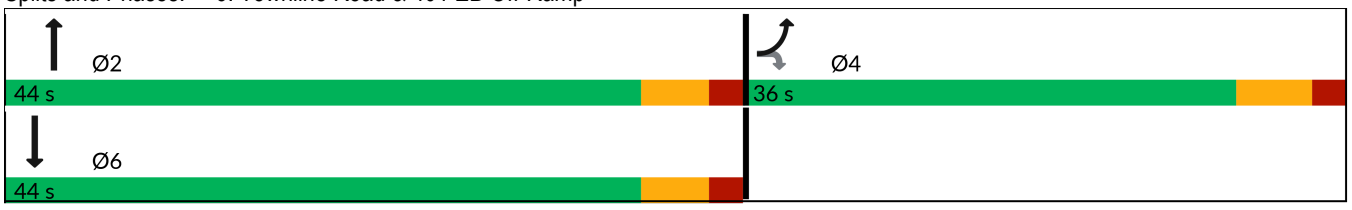
c Critical Lane Group

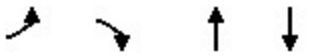
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 318 | 461 | 0 | 540 | 858 | 124 |
| Future Volume (vph) | 318 | 461 | 0 | 540 | 858 | 124 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.981 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1456 | 0 | 3500 | 3442 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1635 | 1456 | 0 | 3500 | 3442 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 99 | | | 27 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Adj. Flow (vph) | 318 | 461 | 0 | 540 | 858 | 124 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 318 | 461 | 0 | 540 | 982 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (%) | 45.0% | 45.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 32.0 | 32.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 23.7 | 23.7 | | 38.3 | 38.3 | |
| Actuated g/C Ratio | 0.32 | 0.32 | | 0.51 | 0.51 | |
| v/c Ratio | 0.61 | 0.87 | | 0.30 | 0.55 | |
| Control Delay (s/veh) | 26.6 | 36.6 | | 12.0 | 14.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 26.6 | 36.6 | | 12.0 | 14.4 | |
| LOS | C | D | | B | B | |
| Approach Delay (s/veh) | 32.5 | | | 12.0 | 14.4 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 74.6 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.87 | | | |
| Intersection Signal Delay (s/veh): 20.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 69.1% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 318 | 461 | 540 | 982 |
| v/c Ratio | 0.61 | 0.87 | 0.30 | 0.55 |
| Control Delay (s/veh) | 26.6 | 36.6 | 12.0 | 14.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 26.6 | 36.6 | 12.0 | 14.4 |
| Queue Length 50th (m) | 37.1 | 48.0 | 23.5 | 49.1 |
| Queue Length 95th (m) | 60.9 | #95.1 | 36.1 | 71.4 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 650 | 639 | 1795 | 1778 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.49 | 0.72 | 0.30 | 0.55 |

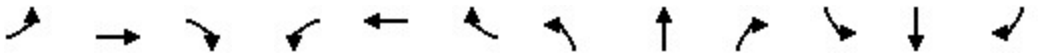
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 318 | 461 | 0 | 540 | 858 | 124 |
| Future Volume (vph) | 318 | 461 | 0 | 540 | 858 | 124 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1456 | | 3500 | 3442 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1635 | 1456 | | 3500 | 3442 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 318 | 461 | 0 | 540 | 858 | 124 |
| RTOR Reduction (vph) | 0 | 68 | 0 | 0 | 13 | 0 |
| Lane Group Flow (vph) | 318 | 393 | 0 | 540 | 969 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 23.7 | 23.7 | | 38.3 | 38.3 | |
| Effective Green, g (s) | 23.7 | 23.7 | | 38.3 | 38.3 | |
| Actuated g/C Ratio | 0.32 | 0.32 | | 0.51 | 0.51 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 520 | 463 | | 1799 | 1769 | |
| v/s Ratio Prot | 0.19 | | | 0.15 | c0.28 | |
| v/s Ratio Perm | | c0.27 | | | | |
| v/c Ratio | 0.61 | 0.85 | | 0.30 | 0.55 | |
| Uniform Delay, d1 | 21.5 | 23.7 | | 10.4 | 12.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.1 | 13.6 | | 0.4 | 1.2 | |
| Delay (s) | 23.6 | 37.4 | | 10.8 | 13.5 | |
| Level of Service | C | D | | B | B | |
| Approach Delay (s/veh) | 31.8 | | | 10.8 | 13.5 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 19.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 74.5 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 69.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

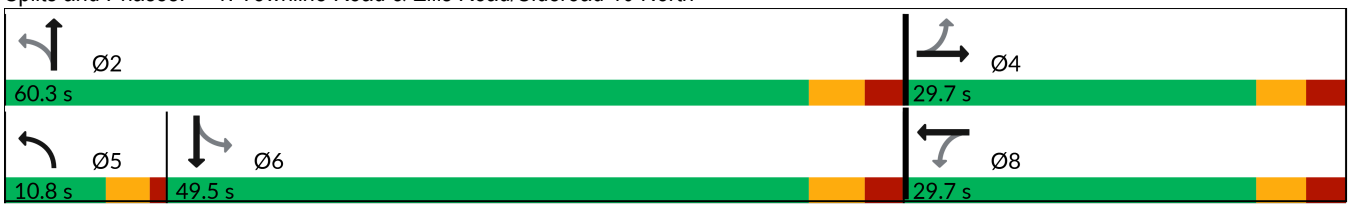


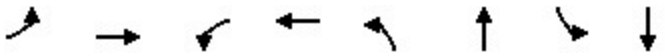
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 104 | 36 | 266 | 19 | 13 | 4 | 130 | 665 | 54 | 4 | 748 | 35 |
| Future Volume (vph) | 104 | 36 | 266 | 19 | 13 | 4 | 130 | 665 | 54 | 4 | 748 | 35 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.868 | | | 0.965 | | | 0.989 | | | 0.993 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1392 | 0 | 1668 | 1575 | 0 | 1603 | 1551 | 0 | 1334 | 1575 | 0 |
| Flt Permitted | 0.746 | | | 0.331 | | | 0.178 | | | 0.392 | | |
| Satd. Flow (perm) | 1296 | 1392 | 0 | 581 | 1575 | 0 | 300 | 1551 | 0 | 550 | 1575 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 266 | | | 4 | | | 8 | | | 4 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Adj. Flow (vph) | 104 | 36 | 266 | 19 | 13 | 4 | 130 | 665 | 54 | 4 | 748 | 35 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 104 | 302 | 0 | 19 | 17 | 0 | 130 | 719 | 0 | 4 | 783 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 9.0 | 49.5 | | 49.5 | 49.5 | |
| Total Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 10.8 | 60.3 | | 49.5 | 49.5 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 12.0% | 67.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 23.7 | 23.7 | | 23.7 | 23.7 | | 6.8 | 54.0 | | 43.2 | 43.2 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 35.2 | | 35.2 | 35.2 | |
| Flash Don't Walk (s) | 13.7 | 13.7 | | 13.7 | 13.7 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 12.1 | 12.1 | | 12.1 | 12.1 | | 56.5 | 54.2 | | 43.6 | 43.6 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.72 | 0.69 | | 0.55 | 0.55 | |
| v/c Ratio | 0.52 | 0.69 | | 0.21 | 0.07 | | 0.40 | 0.67 | | 0.01 | 0.90 | |
| Control Delay (s/veh) | 39.9 | 14.9 | | 34.1 | 23.9 | | 7.9 | 12.0 | | 10.0 | 32.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.2 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 39.9 | 14.9 | | 34.1 | 23.9 | | 7.9 | 12.2 | | 10.0 | 32.4 | |
| LOS | D | B | | C | C | | A | B | | A | C | |
| Approach Delay (s/veh) | | 21.3 | | | 29.3 | | | 11.6 | | | 32.3 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 78.6 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.90 | | | |
| Intersection Signal Delay (s/veh): 21.6 | | Intersection LOS: C | |
| Intersection Capacity Utilization 90.2% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 104 | 302 | 19 | 17 | 130 | 719 | 4 | 783 |
| v/c Ratio | 0.52 | 0.69 | 0.21 | 0.07 | 0.40 | 0.67 | 0.01 | 0.90 |
| Control Delay (s/veh) | 39.9 | 14.9 | 34.1 | 23.9 | 7.9 | 12.0 | 10.0 | 32.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.9 | 14.9 | 34.1 | 23.9 | 7.9 | 12.2 | 10.0 | 32.4 |
| Queue Length 50th (m) | 14.4 | 4.7 | 2.5 | 1.7 | 4.6 | 49.6 | 0.2 | 93.5 |
| Queue Length 95th (m) | 28.7 | 27.1 | 8.4 | 6.7 | 13.0 | 116.3 | 1.8 | #199.6 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 391 | 606 | 175 | 479 | 328 | 1071 | 304 | 874 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.27 | 0.50 | 0.11 | 0.04 | 0.40 | 0.70 | 0.01 | 0.90 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 104 | 36 | 266 | 19 | 13 | 4 | 130 | 665 | 54 | 4 | 748 | 35 |
| Future Volume (vph) | 104 | 36 | 266 | 19 | 13 | 4 | 130 | 665 | 54 | 4 | 748 | 35 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1392 | | 1668 | 1574 | | 1603 | 1550 | | 1334 | 1576 | |
| Flt Permitted | 0.75 | 1.00 | | 0.33 | 1.00 | | 0.18 | 1.00 | | 0.39 | 1.00 | |
| Satd. Flow (perm) | 1297 | 1392 | | 580 | 1574 | | 300 | 1550 | | 550 | 1576 | |
| 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) | 104 | 36 | 266 | 19 | 13 | 4 | 130 | 665 | 54 | 4 | 748 | 35 |
| RTOR Reduction (vph) | 0 | 225 | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 104 | 77 | 0 | 19 | 14 | 0 | 130 | 717 | 0 | 4 | 781 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 12.1 | 12.1 | | 12.1 | 12.1 | | 54.2 | 54.2 | | 43.6 | 43.6 | |
| Effective Green, g (s) | 12.1 | 12.1 | | 12.1 | 12.1 | | 54.2 | 54.2 | | 43.6 | 43.6 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.69 | 0.69 | | 0.55 | 0.55 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 199 | 214 | | 89 | 242 | | 316 | 1068 | | 305 | 874 | |
| v/s Ratio Prot | | 0.06 | | | 0.01 | | 0.03 | c0.46 | | | c0.50 | |
| v/s Ratio Perm | c0.08 | | | 0.03 | | | 0.25 | | | 0.01 | | |
| v/c Ratio | 0.52 | 0.36 | | 0.21 | 0.06 | | 0.41 | 0.67 | | 0.01 | 0.89 | |
| Uniform Delay, d1 | 30.6 | 29.8 | | 29.1 | 28.4 | | 9.0 | 7.0 | | 7.8 | 15.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.5 | 1.0 | | 1.2 | 0.1 | | 0.9 | 3.4 | | 0.1 | 13.5 | |
| Delay (s) | 33.1 | 30.8 | | 30.3 | 28.5 | | 9.9 | 10.4 | | 7.9 | 29.0 | |
| Level of Service | C | C | | C | C | | A | B | | A | C | |
| Approach Delay (s/veh) | | 31.4 | | | 29.4 | | | 10.3 | | | 28.9 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 21.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.81 | | |
| Actuated Cycle Length (s) | 78.6 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 90.2% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

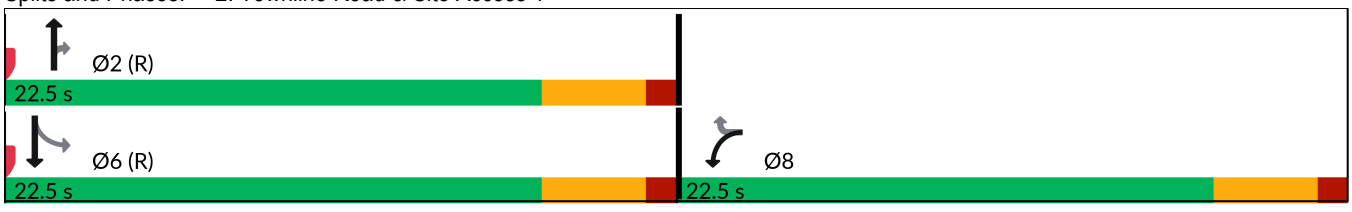
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 848 | 0 | 0 | 1031 |
| Future Volume (vph) | 0 | 0 | 848 | 0 | 0 | 1031 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 848 | 0 | 0 | 1031 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 848 | 0 | 0 | 1031 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| v/c Ratio | | | 0.49 | | | 0.56 |
| Control Delay (s/veh) | | | 1.0 | | | 1.2 |
| Queue Delay | | | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | | 1.0 | | | 1.2 |
| LOS | | | A | | | A |
| Approach Delay (s/veh) | | | 1.0 | | | 1.2 |
| Approach LOS | | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 45 | | | |
| Actuated Cycle Length: 45 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 75 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.56 | | | |
| Intersection Signal Delay (s/veh): 1.1 | | Intersection LOS: A | |
| Intersection Capacity Utilization 58.0% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

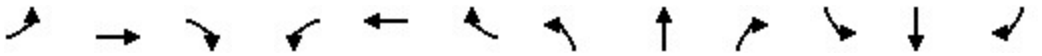


| Lane Group | NBT | SBT |
|---|---|---|
| Lane Group Flow (vph) | 848 | 1031 |
| v/c Ratio | 0.49 | 0.56 |
| Control Delay (s/veh) | 1.0 | 1.2 |
| Queue Delay | 0.0 | 0.0 |
| Total Delay (s/veh) | 1.0 | 1.2 |
| Queue Length 50th (m) | 0.0 | 0.0 |
| Queue Length 95th (m) | 0.0 | 0.0 |
| Internal Link Dist (m) | 311.6 | 161.7 |
| Turn Bay Length (m) | | |
| Base Capacity (vph) | 1721 | 1842 |
| Starvation Cap Reductn | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 |
| Storage Cap Reductn | 0 | 0 |
| Reduced v/c Ratio | 0.49 | 0.56 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 848 | 0 | 0 | 1031 |
| Future Volume (vph) | 0 | 0 | 848 | 0 | 0 | 1031 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | | | 4.5 | | | 4.5 |
| Lane Util. Factor | | | 1.00 | | | 1.00 |
| Frt | | | 1.00 | | | 1.00 |
| Flt Protected | | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | | | 1721 | | | 1842 |
| Flt Permitted | | | 1.00 | | | 1.00 |
| Satd. Flow (perm) | | | 1721 | | | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 848 | 0 | 0 | 1031 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 848 | 0 | 0 | 1031 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | | | 45.0 | | | 45.0 |
| Effective Green, g (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| Clearance Time (s) | | | 4.5 | | | 4.5 |
| Vehicle Extension (s) | | | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | | | 1721 | | | 1842 |
| v/s Ratio Prot | | | 0.49 | | | c0.56 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | | | 0.49 | | | 0.56 |
| Uniform Delay, d1 | | | 0.0 | | | 0.0 |
| Progression Factor | | | 1.00 | | | 1.00 |
| Incremental Delay, d2 | | | 1.0 | | | 1.2 |
| Delay (s) | | | 1.0 | | | 1.2 |
| Level of Service | | | A | | | A |
| Approach Delay (s/veh) | 0.0 | | 1.0 | | | 1.2 |
| Approach LOS | A | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 1.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.70 | | |
| Actuated Cycle Length (s) | 45.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 58.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

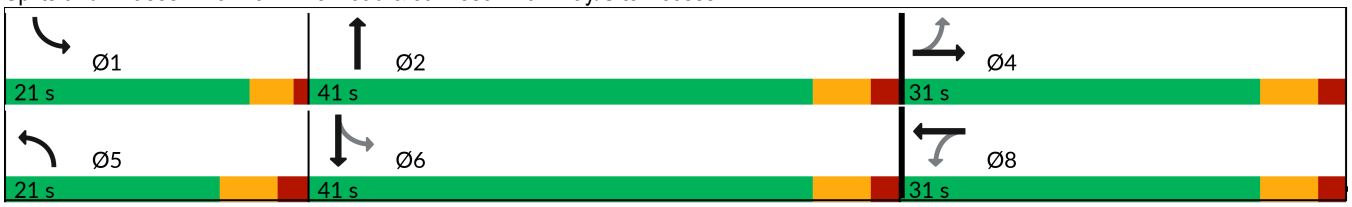


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 167 | 0 | 357 | 0 | 0 | 0 | 359 | 677 | 0 | 0 | 856 | 191 |
| Future Volume (vph) | 167 | 0 | 357 | 0 | 0 | 0 | 359 | 677 | 0 | 0 | 856 | 191 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | | | | | 1.00 | | | | 1.00 | |
| Frt | | 0.850 | | | | | | | | | 0.973 | |
| Flt Protected | 0.950 | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1347 | 0 | 3405 | 1632 | 0 | 3203 | 3302 | 0 | 1755 | 3168 | 0 |
| Flt Permitted | 0.757 | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 1303 | 1347 | 0 | 3405 | 1632 | 0 | 3202 | 3302 | 0 | 1755 | 3168 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 363 | | | | | | | | | 33 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| 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% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Adj. Flow (vph) | 167 | 0 | 357 | 0 | 0 | 0 | 359 | 677 | 0 | 0 | 856 | 191 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 167 | 357 | 0 | 0 | 0 | 0 | 359 | 677 | 0 | 0 | 1047 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 11.0 | 41.0 | | 9.0 | 41.0 | |
| Total Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 21.0 | 41.0 | | 21.0 | 41.0 | |
| Total Split (%) | 33.3% | 33.3% | | 33.3% | 33.3% | | 22.6% | 44.1% | | 22.6% | 44.1% | |
| Maximum Green (s) | 25.0 | 25.0 | | 25.0 | 25.0 | | 15.0 | 35.0 | | 17.0 | 35.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 16.3 | 16.3 | | | | | 13.3 | 54.7 | | | 35.3 | |
| Actuated g/C Ratio | 0.20 | 0.20 | | | | | 0.16 | 0.66 | | | 0.42 | |
| v/c Ratio | 0.65 | 0.64 | | | | | 0.70 | 0.31 | | | 0.77 | |
| Control Delay (s/veh) | 43.3 | 8.9 | | | | | 41.9 | 7.3 | | | 26.0 | |
| Queue Delay | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | 43.3 | 8.9 | | | | | 41.9 | 7.3 | | | 26.0 | |
| LOS | D | A | | | | | D | A | | | C | |
| Approach Delay (s/veh) | | 19.9 | | | | | | 19.3 | | | 26.0 | |
| Approach LOS | | B | | | | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 93 | | | |
| Actuated Cycle Length: 83.1 | | | |
| Natural Cycle: 85 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.77 | | | |
| Intersection Signal Delay (s/veh): 22.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 83.3% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

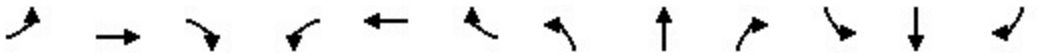
Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 167 | 357 | 359 | 677 | 1047 |
| v/c Ratio | 0.65 | 0.64 | 0.70 | 0.31 | 0.77 |
| Control Delay (s/veh) | 43.3 | 8.9 | 41.9 | 7.3 | 26.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 43.3 | 8.9 | 41.9 | 7.3 | 26.0 |
| Queue Length 50th (m) | 24.9 | 0.0 | 28.0 | 21.6 | 72.8 |
| Queue Length 95th (m) | 44.4 | 20.2 | 46.1 | 39.3 | #123.3 |
| Internal Link Dist (m) | | 90.3 | | 261.4 | 311.6 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 395 | 661 | 583 | 2172 | 1365 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.42 | 0.54 | 0.62 | 0.31 | 0.77 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 167 | 0 | 357 | 0 | 0 | 0 | 359 | 677 | 0 | 0 | 856 | 191 |
| Future Volume (vph) | 167 | 0 | 357 | 0 | 0 | 0 | 359 | 677 | 0 | 0 | 856 | 191 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | | | 0.97 | 0.95 | | | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Frt | 1.00 | 0.85 | | | | | 1.00 | 1.00 | | | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | 1635 | 1347 | | | | | 3203 | 3302 | | | 3167 | |
| Flt Permitted | 0.76 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 1303 | 1347 | | | | | 3203 | 3302 | | | 3167 | |
| 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) | 167 | 0 | 357 | 0 | 0 | 0 | 359 | 677 | 0 | 0 | 856 | 191 |
| RTOR Reduction (vph) | 0 | 287 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 |
| Lane Group Flow (vph) | 167 | 70 | 0 | 0 | 0 | 0 | 359 | 677 | 0 | 0 | 1028 | 0 |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| Heavy Vehicles (%) | 2% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 16.3 | 16.3 | | | | | 13.3 | 54.6 | | | 35.3 | |
| Effective Green, g (s) | 16.3 | 16.3 | | | | | 13.3 | 54.6 | | | 35.3 | |
| Actuated g/C Ratio | 0.20 | 0.20 | | | | | 0.16 | 0.66 | | | 0.43 | |
| Clearance Time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 256 | 264 | | | | | 513 | 2174 | | | 1348 | |
| v/s Ratio Prot | | 0.05 | | | | | c0.11 | 0.21 | | | c0.32 | |
| v/s Ratio Perm | c0.13 | | | | | | | | | | | |
| v/c Ratio | 0.65 | 0.27 | | | | | 0.70 | 0.31 | | | 0.76 | |
| Uniform Delay, d1 | 30.7 | 28.2 | | | | | 32.9 | 6.1 | | | 20.2 | |
| Progression Factor | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 5.9 | 0.5 | | | | | 4.2 | 0.4 | | | 4.1 | |
| Delay (s) | 36.5 | 28.8 | | | | | 37.1 | 6.5 | | | 24.4 | |
| Level of Service | D | C | | | | | D | A | | | C | |
| Approach Delay (s/veh) | | 31.2 | | | 0.0 | | | 17.1 | | | 24.4 | |
| Approach LOS | | C | | | A | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 22.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.72 | | |
| Actuated Cycle Length (s) | 82.9 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 83.3% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 605 | 149 | 905 | 0 | 0 | 821 |
| Future Volume (vph) | 605 | 149 | 905 | 0 | 0 | 821 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 116 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 605 | 149 | 905 | 0 | 0 | 821 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 605 | 149 | 905 | 0 | 0 | 821 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (%) | 40.0% | 40.0% | 60.0% | | | 60.0% |
| Maximum Green (s) | 29.5 | 29.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 22.7 | 22.7 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.58 | | | 0.58 |
| v/c Ratio | 0.78 | 0.33 | 0.45 | | | 0.41 |
| Control Delay (s/veh) | 35.4 | 9.2 | 11.6 | | | 11.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 35.4 | 9.2 | 11.6 | | | 11.2 |
| LOS | D | A | B | | | B |
| Approach Delay (s/veh) | 30.2 | | 11.6 | | | 11.2 |
| Approach LOS | C | | B | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 83.4 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.78 | | | |
| Intersection Signal Delay (s/veh): 17.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 53.9% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp

| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 605 | 149 | 905 | 821 |
| v/c Ratio | 0.78 | 0.33 | 0.45 | 0.41 |
| Control Delay (s/veh) | 35.4 | 9.2 | 11.6 | 11.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 9.2 | 11.6 | 11.2 |
| Queue Length 50th (m) | 45.5 | 3.9 | 40.4 | 35.5 |
| Queue Length 95th (m) | 63.0 | 16.8 | 63.8 | 56.5 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1016 | 562 | 2021 | 2021 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.60 | 0.27 | 0.45 | 0.41 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 605 | 149 | 905 | 0 | 0 | 821 |
| Future Volume (vph) | 605 | 149 | 905 | 0 | 0 | 821 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 605 | 149 | 905 | 0 | 0 | 821 |
| RTOR Reduction (vph) | 0 | 84 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 605 | 65 | 905 | 0 | 0 | 821 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 22.7 | 22.7 | 48.2 | | | 48.2 |
| Effective Green, g (s) | 22.7 | 22.7 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.58 | | | 0.58 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 779 | 374 | 2022 | | | 2022 |
| v/s Ratio Prot | c0.21 | | c0.26 | | | 0.23 |
| v/s Ratio Perm | | 0.05 | | | | |
| v/c Ratio | 0.78 | 0.17 | 0.45 | | | 0.41 |
| Uniform Delay, d1 | 28.0 | 23.2 | 10.0 | | | 9.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 4.9 | 0.2 | 0.7 | | | 0.6 |
| Delay (s) | 32.9 | 23.4 | 10.7 | | | 10.3 |
| Level of Service | C | C | B | | | B |
| Approach Delay (s/veh) | 31.0 | | 10.7 | | | 10.3 |
| Approach LOS | C | | B | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 16.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.55 | | |
| Actuated Cycle Length (s) | 83.4 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 53.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

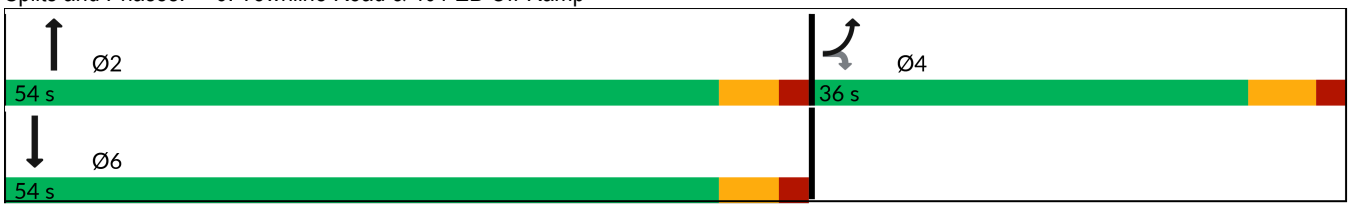
c Critical Lane Group

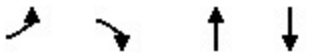
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 422 | 548 | 0 | 979 | 1265 | 169 |
| Future Volume (vph) | 422 | 548 | 0 | 979 | 1265 | 169 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.982 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1603 | 1414 | 0 | 3433 | 3302 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1603 | 1414 | 0 | 3433 | 3302 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 45 | | | 25 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Adj. Flow (vph) | 422 | 548 | 0 | 979 | 1265 | 169 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 422 | 548 | 0 | 979 | 1434 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 54.0 | 42.0 | |
| Total Split (s) | 36.0 | 36.0 | | 54.0 | 54.0 | |
| Total Split (%) | 40.0% | 40.0% | | 60.0% | 60.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 10.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 19.5 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| v/c Ratio | 0.80 | 1.11 | | 0.53 | 0.81 | |
| Control Delay (s/veh) | 41.3 | 103.3 | | 15.1 | 21.5 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 41.3 | 103.3 | | 15.1 | 21.5 | |
| LOS | D | F | | B | C | |
| Approach Delay (s/veh) | 76.3 | | | 15.1 | 21.5 | |
| Approach LOS | E | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.11 | | | |
| Intersection Signal Delay (s/veh): 35.4 | | Intersection LOS: D | |
| Intersection Capacity Utilization 87.6% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 422 | 548 | 979 | 1434 |
| v/c Ratio | 0.80 | 1.11 | 0.53 | 0.81 |
| Control Delay (s/veh) | 41.3 | 103.3 | 15.1 | 21.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 41.3 | 103.3 | 15.1 | 21.5 |
| Queue Length 50th (m) | 66.0 | ~104.1 | 54.7 | 99.4 |
| Queue Length 95th (m) | #112.4 | #165.4 | 71.4 | 128.8 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 525 | 493 | 1830 | 1772 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 1.11 | 0.53 | 0.81 |

Intersection Summary

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

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 422 | 548 | 0 | 979 | 1265 | 169 |
| Future Volume (vph) | 422 | 548 | 0 | 979 | 1265 | 169 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1603 | 1414 | | 3433 | 3303 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1603 | 1414 | | 3433 | 3303 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 422 | 548 | 0 | 979 | 1265 | 169 |
| RTOR Reduction (vph) | 0 | 30 | 0 | 0 | 12 | 0 |
| Lane Group Flow (vph) | 422 | 518 | 0 | 979 | 1422 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Effective Green, g (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 525 | 463 | | 1830 | 1761 | |
| v/s Ratio Prot | 0.26 | | | 0.29 | c0.43 | |
| v/s Ratio Perm | | c0.37 | | | | |
| v/c Ratio | 0.80 | 1.12 | | 0.53 | 0.81 | |
| Uniform Delay, d1 | 27.6 | 30.3 | | 13.7 | 17.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 8.7 | 78.2 | | 1.1 | 4.1 | |
| Delay (s) | 36.3 | 108.5 | | 14.8 | 21.3 | |
| Level of Service | D | F | | B | C | |
| Approach Delay (s/veh) | 77.1 | | | 14.8 | 21.3 | |
| Approach LOS | E | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 35.4 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.93 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 87.6% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

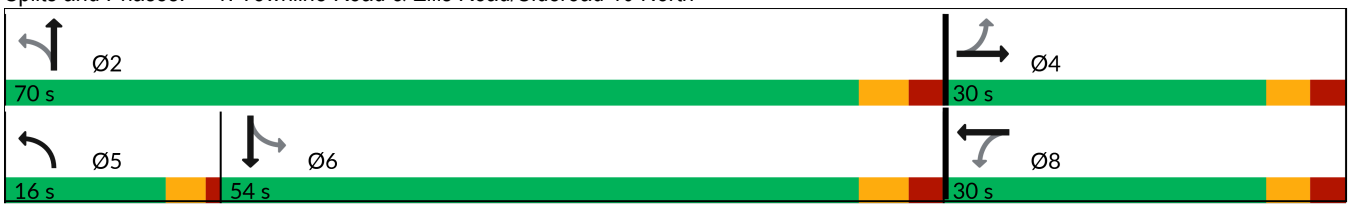
c Critical Lane Group

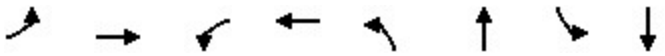
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 25 | 168 | 84 | 47 | 12 | 411 | 1047 | 43 | 10 | 595 | 72 |
| Future Volume (vph) | 49 | 25 | 168 | 84 | 47 | 12 | 411 | 1047 | 43 | 10 | 595 | 72 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.869 | | | 0.969 | | | 0.994 | | | 0.984 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1394 | 0 | 1635 | 1581 | 0 | 1668 | 1606 | 0 | 1668 | 1547 | 0 |
| Flt Permitted | 0.719 | | | 0.487 | | | 0.235 | | | 0.178 | | |
| Satd. Flow (perm) | 1262 | 1394 | 0 | 838 | 1581 | 0 | 412 | 1606 | 0 | 312 | 1547 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 168 | | | 12 | | | 4 | | | 8 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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 (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 49 | 25 | 168 | 84 | 47 | 12 | 411 | 1047 | 43 | 10 | 595 | 72 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 49 | 193 | 0 | 84 | 59 | 0 | 411 | 1090 | 0 | 10 | 667 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 9.0 | 54.0 | | 54.0 | 54.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 16.0 | 70.0 | | 54.0 | 54.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 16.0% | 70.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 12.0 | 63.7 | | 47.7 | 47.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 39.7 | | 39.7 | 39.7 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 13.4 | 13.4 | | 13.4 | 13.4 | | 66.2 | 63.9 | | 47.8 | 47.8 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.74 | 0.71 | | 0.53 | 0.53 | |
| v/c Ratio | 0.26 | 0.55 | | 0.67 | 0.24 | | 0.87 | 0.95 | | 0.06 | 0.80 | |
| Control Delay (s/veh) | 36.5 | 14.1 | | 61.6 | 29.7 | | 29.1 | 31.8 | | 13.2 | 27.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 13.8 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 36.5 | 14.1 | | 61.6 | 29.7 | | 29.1 | 45.6 | | 13.2 | 27.4 | |
| LOS | D | B | | E | C | | C | D | | B | C | |
| Approach Delay (s/veh) | | 18.6 | | | 48.4 | | | 41.1 | | | 27.2 | |
| Approach LOS | | B | | | D | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 89.6 | | | |
| Natural Cycle: 105 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.95 | | | |
| Intersection Signal Delay (s/veh): 35.7 | | Intersection LOS: D | |
| Intersection Capacity Utilization 109.6% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

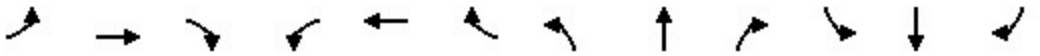




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 49 | 193 | 84 | 59 | 411 | 1090 | 10 | 667 |
| v/c Ratio | 0.26 | 0.55 | 0.67 | 0.24 | 0.87 | 0.95 | 0.06 | 0.80 |
| Control Delay (s/veh) | 36.5 | 14.1 | 61.6 | 29.7 | 29.1 | 31.8 | 13.2 | 27.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.8 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.5 | 14.1 | 61.6 | 29.7 | 29.1 | 45.6 | 13.2 | 27.4 |
| Queue Length 50th (m) | 7.5 | 3.8 | 13.8 | 7.2 | 19.7 | 137.8 | 0.8 | 86.3 |
| Queue Length 95th (m) | 17.3 | 22.2 | 28.8 | 17.5 | #71.8 | #294.9 | 3.9 | #175.4 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 338 | 497 | 225 | 433 | 472 | 1145 | 166 | 829 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 78 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.14 | 0.39 | 0.37 | 0.14 | 0.87 | 1.02 | 0.06 | 0.80 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 25 | 168 | 84 | 47 | 12 | 411 | 1047 | 43 | 10 | 595 | 72 |
| Future Volume (vph) | 49 | 25 | 168 | 84 | 47 | 12 | 411 | 1047 | 43 | 10 | 595 | 72 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1394 | | 1635 | 1582 | | 1668 | 1607 | | 1668 | 1547 | |
| Flt Permitted | 0.72 | 1.00 | | 0.49 | 1.00 | | 0.24 | 1.00 | | 0.18 | 1.00 | |
| Satd. Flow (perm) | 1261 | 1394 | | 837 | 1582 | | 413 | 1607 | | 312 | 1547 | |
| 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) | 49 | 25 | 168 | 84 | 47 | 12 | 411 | 1047 | 43 | 10 | 595 | 72 |
| RTOR Reduction (vph) | 0 | 143 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 49 | 50 | 0 | 84 | 49 | 0 | 411 | 1089 | 0 | 10 | 663 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 13.4 | 13.4 | | 13.4 | 13.4 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Effective Green, g (s) | 13.4 | 13.4 | | 13.4 | 13.4 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.71 | 0.71 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 188 | 208 | | 125 | 236 | | 462 | 1146 | | 166 | 827 | |
| v/s Ratio Prot | | 0.04 | | | 0.03 | | 0.12 | c0.68 | | | 0.43 | |
| v/s Ratio Perm | 0.04 | | | c0.10 | | | 0.52 | | | 0.03 | | |
| v/c Ratio | 0.26 | 0.24 | | 0.67 | 0.21 | | 0.89 | 0.95 | | 0.06 | 0.80 | |
| Uniform Delay, d1 | 33.7 | 33.6 | | 36.0 | 33.4 | | 11.3 | 11.4 | | 10.0 | 17.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.7 | 0.6 | | 13.3 | 0.4 | | 18.5 | 17.0 | | 0.7 | 8.1 | |
| Delay (s) | 34.5 | 34.2 | | 49.3 | 33.9 | | 29.8 | 28.5 | | 10.7 | 25.1 | |
| Level of Service | C | C | | D | C | | C | C | | B | C | |
| Approach Delay (s/veh) | | 34.3 | | | 43.0 | | | 28.8 | | | 24.9 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 29.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.95 | | |
| Actuated Cycle Length (s) | 89.6 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 109.6% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |

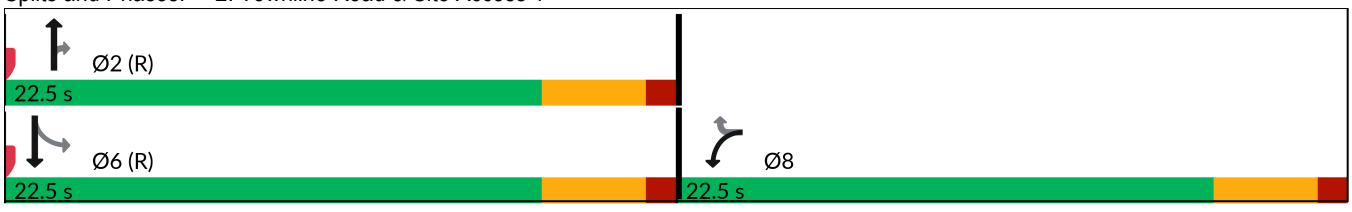
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 1501 | 0 | 0 | 847 |
| Future Volume (vph) | 0 | 0 | 1501 | 0 | 0 | 847 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 1501 | 0 | 0 | 847 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 1501 | 0 | 0 | 847 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| v/c Ratio | | | 0.87 | | | 0.46 |
| Control Delay (s/veh) | | | 8.2 | | | 0.8 |
| Queue Delay | | | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | | 8.2 | | | 0.8 |
| LOS | | | A | | | A |
| Approach Delay (s/veh) | | | 8.2 | | | 0.8 |
| Approach LOS | | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 45 | | | |
| Actuated Cycle Length: 45 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 150 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.87 | | | |
| Intersection Signal Delay (s/veh): 5.5 | | Intersection LOS: A | |
| Intersection Capacity Utilization 88.3% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | NBT | SBT |
|---|---|---|
| Lane Group Flow (vph) | 1501 | 847 |
| v/c Ratio | 0.87 | 0.46 |
| Control Delay (s/veh) | 8.2 | 0.8 |
| Queue Delay | 0.0 | 0.0 |
| Total Delay (s/veh) | 8.2 | 0.8 |
| Queue Length 50th (m) | 0.0 | 0.0 |
| Queue Length 95th (m) | #24.8 | 0.0 |
| Internal Link Dist (m) | 311.6 | 161.7 |
| Turn Bay Length (m) | | |
| Base Capacity (vph) | 1721 | 1842 |
| Starvation Cap Reductn | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 |
| Storage Cap Reductn | 0 | 0 |
| Reduced v/c Ratio | 0.87 | 0.46 |

Intersection Summary

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 1501 | 0 | 0 | 847 |
| Future Volume (vph) | 0 | 0 | 1501 | 0 | 0 | 847 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | | | 4.5 | | | 4.5 |
| Lane Util. Factor | | | 1.00 | | | 1.00 |
| Frt | | | 1.00 | | | 1.00 |
| Flt Protected | | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | | | 1721 | | | 1842 |
| Flt Permitted | | | 1.00 | | | 1.00 |
| Satd. Flow (perm) | | | 1721 | | | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 1501 | 0 | 0 | 847 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 1501 | 0 | 0 | 847 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | | | 45.0 | | | 45.0 |
| Effective Green, g (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| Clearance Time (s) | | | 4.5 | | | 4.5 |
| Vehicle Extension (s) | | | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | | | 1721 | | | 1842 |
| v/s Ratio Prot | | | c0.87 | | | 0.46 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | | | 0.87 | | | 0.46 |
| Uniform Delay, d1 | | | 0.0 | | | 0.0 |
| Progression Factor | | | 1.00 | | | 1.00 |
| Incremental Delay, d2 | | | 6.4 | | | 0.8 |
| Delay (s) | | | 6.4 | | | 0.8 |
| Level of Service | | | A | | | A |
| Approach Delay (s/veh) | 0.0 | | 6.4 | | | 0.8 |
| Approach LOS | A | | A | | | A |

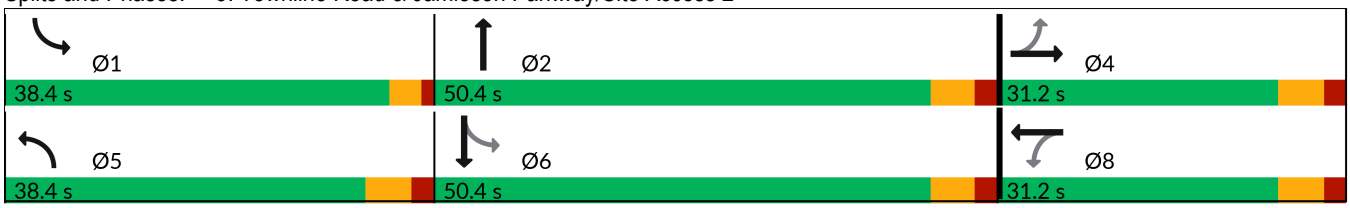
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 4.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 1.09 | | |
| Actuated Cycle Length (s) | 45.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 88.3% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 270 | 0 | 457 | 0 | 0 | 0 | 517 | 1192 | 0 | 0 | 658 | 180 |
| Future Volume (vph) | 270 | 0 | 457 | 0 | 0 | 0 | 517 | 1192 | 0 | 0 | 658 | 180 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | | | | | | | 0.968 | |
| Flt Protected | 0.950 | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3302 | 0 | 1755 | 3117 | 0 |
| Flt Permitted | 0.757 | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 1329 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3302 | 0 | 1755 | 3117 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 520 | | | | | | | | | 33 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 157.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 9.4 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 270 | 0 | 457 | 0 | 0 | 0 | 517 | 1192 | 0 | 0 | 658 | 180 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 270 | 457 | 0 | 0 | 0 | 0 | 517 | 1192 | 0 | 0 | 838 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 11.0 | 50.4 | | 9.0 | 50.4 | |
| Total Split (s) | 31.2 | 31.2 | | 31.2 | 31.2 | | 38.4 | 50.4 | | 38.4 | 50.4 | |
| Total Split (%) | 26.0% | 26.0% | | 26.0% | 26.0% | | 32.0% | 42.0% | | 32.0% | 42.0% | |
| Maximum Green (s) | 25.2 | 25.2 | | 25.2 | 25.2 | | 32.4 | 44.4 | | 34.4 | 44.4 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | | 23.4 | | | 23.4 | |
| Flash Don't Walk (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 25.0 | 25.0 | | | | | 22.9 | 73.3 | | | 44.5 | |
| Actuated g/C Ratio | 0.23 | 0.23 | | | | | 0.21 | 0.66 | | | 0.40 | |
| v/c Ratio | 0.90 | 0.64 | | | | | 0.78 | 0.54 | | | 0.66 | |
| Control Delay (s/veh) | 74.3 | 5.9 | | | | | 50.2 | 10.8 | | | 29.3 | |
| Queue Delay | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | 74.3 | 5.9 | | | | | 50.2 | 10.8 | | | 29.3 | |
| LOS | E | A | | | | | D | B | | | C | |
| Approach Delay (s/veh) | | 31.3 | | | | | | 22.7 | | | 29.3 | |
| Approach LOS | | C | | | | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 120 | | | |
| Actuated Cycle Length: 110.4 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.90 | | | |
| Intersection Signal Delay (s/veh): 26.3 | | Intersection LOS: C | |
| Intersection Capacity Utilization 89.0% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

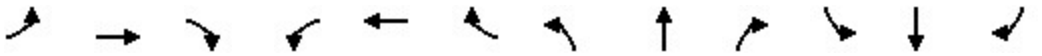
Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 270 | 457 | 517 | 1192 | 838 |
| v/c Ratio | 0.90 | 0.64 | 0.78 | 0.54 | 0.66 |
| Control Delay (s/veh) | 74.3 | 5.9 | 50.2 | 10.8 | 29.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 74.3 | 5.9 | 50.2 | 10.8 | 29.3 |
| Queue Length 50th (m) | 56.7 | 0.0 | 54.7 | 64.8 | 73.1 |
| Queue Length 95th (m) | #112.4 | 12.8 | 72.6 | 79.9 | 104.1 |
| Internal Link Dist (m) | | 90.3 | | 133.4 | 311.6 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 303 | 718 | 941 | 2193 | 1275 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.89 | 0.64 | 0.55 | 0.54 | 0.66 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 270 | 0 | 457 | 0 | 0 | 0 | 517 | 1192 | 0 | 0 | 658 | 180 |
| Future Volume (vph) | 270 | 0 | 457 | 0 | 0 | 0 | 517 | 1192 | 0 | 0 | 658 | 180 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | | | 0.97 | 0.95 | | | 0.95 | |
| Frt | 1.00 | 0.85 | | | | | 1.00 | 1.00 | | | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | | | | 3203 | 3302 | | | 3116 | |
| Flt Permitted | 0.76 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 1329 | 1387 | | | | | 3203 | 3302 | | | 3116 | |
| 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) | 270 | 0 | 457 | 0 | 0 | 0 | 517 | 1192 | 0 | 0 | 658 | 180 |
| RTOR Reduction (vph) | 0 | 353 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| Lane Group Flow (vph) | 270 | 104 | 0 | 0 | 0 | 0 | 517 | 1192 | 0 | 0 | 818 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 25.1 | 25.1 | | | | | 22.9 | 73.4 | | | 44.5 | |
| Effective Green, g (s) | 25.1 | 25.1 | | | | | 22.9 | 73.4 | | | 44.5 | |
| Actuated g/C Ratio | 0.23 | 0.23 | | | | | 0.21 | 0.66 | | | 0.40 | |
| Clearance Time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 301 | 315 | | | | | 663 | 2193 | | | 1254 | |
| v/s Ratio Prot | | 0.07 | | | | | c0.16 | 0.36 | | | c0.26 | |
| v/s Ratio Perm | c0.20 | | | | | | | | | | | |
| v/c Ratio | 0.90 | 0.33 | | | | | 0.78 | 0.54 | | | 0.65 | |
| Uniform Delay, d1 | 41.4 | 35.7 | | | | | 41.4 | 9.7 | | | 26.7 | |
| Progression Factor | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 27.1 | 0.6 | | | | | 5.8 | 1.0 | | | 2.7 | |
| Delay (s) | 68.5 | 36.3 | | | | | 47.2 | 10.7 | | | 29.4 | |
| Level of Service | E | D | | | | | D | B | | | C | |
| Approach Delay (s/veh) | | 48.3 | | | 0.0 | | | 21.8 | | | 29.4 | |
| Approach LOS | | D | | | A | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 29.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 110.5 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 89.0% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

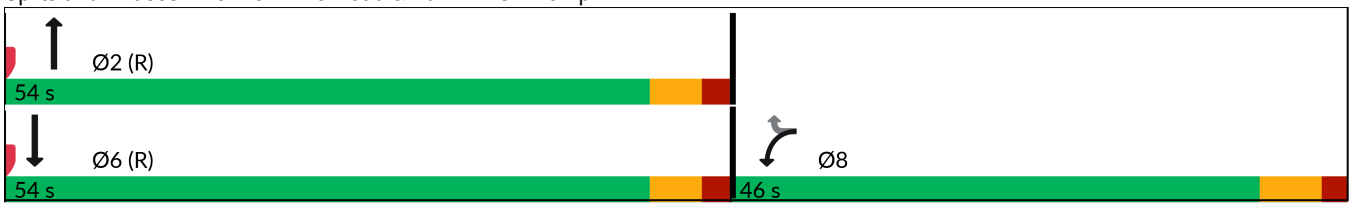
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 607 | 387 | 1443 | 0 | 0 | 787 |
| Future Volume (vph) | 607 | 387 | 1443 | 0 | 0 | 787 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 18 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 128.0 |
| Travel Time (s) | 8.5 | | 24.7 | | | 7.7 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 607 | 387 | 1443 | 0 | 0 | 787 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 607 | 387 | 1443 | 0 | 0 | 787 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 0.0 | | | 0.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Minimum Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (%) | 46.0% | 46.0% | 54.0% | | | 54.0% |
| Maximum Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 29.5 | 29.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| v/c Ratio | 0.52 | 0.66 | 0.86 | | | 0.47 |
| Control Delay (s/veh) | 25.1 | 30.1 | 29.6 | | | 18.6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 25.1 | 30.1 | 29.6 | | | 18.6 |
| LOS | C | C | C | | | B |
| Approach Delay (s/veh) | 27.0 | | 29.6 | | | 18.6 |
| Approach LOS | C | | C | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 100 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.86 | | | |
| Intersection Signal Delay (s/veh): 26.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 76.3% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 607 | 387 | 1443 | 787 |
| v/c Ratio | 0.52 | 0.66 | 0.86 | 0.47 |
| Control Delay (s/veh) | 25.1 | 30.1 | 29.6 | 18.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 25.1 | 30.1 | 29.6 | 18.6 |
| Queue Length 50th (m) | 45.4 | 57.5 | 125.4 | 51.8 |
| Queue Length 95th (m) | 61.3 | 90.4 | 156.9 | 67.4 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 104.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1161 | 586 | 1680 | 1680 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.52 | 0.66 | 0.86 | 0.47 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 607 | 387 | 1443 | 0 | 0 | 787 |
| Future Volume (vph) | 607 | 387 | 1443 | 0 | 0 | 787 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 607 | 387 | 1443 | 0 | 0 | 787 |
| RTOR Reduction (vph) | 0 | 11 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 607 | 376 | 1443 | 0 | 0 | 787 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Effective Green, g (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Grp Cap (vph) | 1161 | 575 | 1680 | | | 1680 |
| v/s Ratio Prot | 0.21 | | c0.41 | | | 0.22 |
| v/s Ratio Perm | | c0.26 | | | | |
| v/c Ratio | 0.52 | 0.65 | 0.86 | | | 0.47 |
| Uniform Delay, d1 | 23.1 | 24.7 | 23.0 | | | 17.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.7 | 5.7 | 6.0 | | | 0.9 |
| Delay (s) | 24.7 | 30.4 | 29.0 | | | 18.4 |
| Level of Service | C | C | C | | | B |
| Approach Delay (s/veh) | 26.9 | | 29.0 | | | 18.4 |
| Approach LOS | C | | C | | | B |

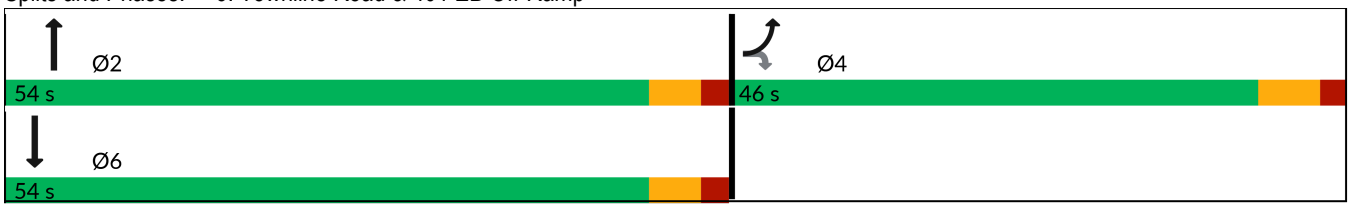
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 25.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.77 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 76.3% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

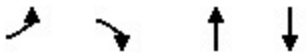
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 451 | 548 | 0 | 1282 | 1325 | 129 |
| Future Volume (vph) | 451 | 548 | 0 | 1282 | 1325 | 129 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.987 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1619 | 1442 | 0 | 3535 | 3370 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1619 | 1442 | 0 | 3535 | 3370 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 26 | | | 14 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Adj. Flow (vph) | 451 | 548 | 0 | 1282 | 1325 | 129 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 451 | 548 | 0 | 1282 | 1454 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (%) | 46.0% | 46.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 39.5 | 39.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 42.0 | |
| Flash Don't Walk (s) | 29.5 | 29.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 38.0 | 38.0 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.39 | 0.39 | | 0.49 | 0.49 | |
| v/c Ratio | 0.72 | 0.96 | | 0.74 | 0.88 | |
| Control Delay (s/veh) | 33.5 | 58.2 | | 24.0 | 30.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 33.5 | 58.2 | | 24.0 | 30.7 | |
| LOS | C | E | | C | C | |
| Approach Delay (s/veh) | 47.1 | | | 24.0 | 30.7 | |
| Approach LOS | D | | | C | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 98.5 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.96 | | | |
| Intersection Signal Delay (s/veh): 32.8 | | Intersection LOS: C | |
| Intersection Capacity Utilization 88.0% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 451 | 548 | 1282 | 1454 |
| v/c Ratio | 0.72 | 0.96 | 0.74 | 0.88 |
| Control Delay (s/veh) | 33.5 | 58.2 | 24.0 | 30.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 33.5 | 58.2 | 24.0 | 30.7 |
| Queue Length 50th (m) | 71.9 | 96.5 | 102.7 | 129.3 |
| Queue Length 95th (m) | 108.2 | #163.3 | 129.1 | #168.1 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 649 | 594 | 1723 | 1649 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.69 | 0.92 | 0.74 | 0.88 |

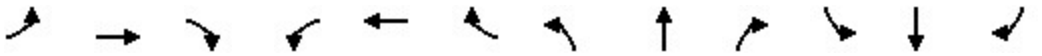
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 451 | 548 | 0 | 1282 | 1325 | 129 |
| Future Volume (vph) | 451 | 548 | 0 | 1282 | 1325 | 129 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1619 | 1442 | | 3535 | 3369 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1619 | 1442 | | 3535 | 3369 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 451 | 548 | 0 | 1282 | 1325 | 129 |
| RTOR Reduction (vph) | 0 | 16 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 451 | 532 | 0 | 1282 | 1447 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 38.0 | 38.0 | | 48.0 | 48.0 | |
| Effective Green, g (s) | 38.0 | 38.0 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.39 | 0.39 | | 0.49 | 0.49 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 624 | 556 | | 1722 | 1641 | |
| v/s Ratio Prot | 0.28 | | | 0.36 | c0.43 | |
| v/s Ratio Perm | | c0.37 | | | | |
| v/c Ratio | 0.72 | 0.96 | | 0.74 | 0.88 | |
| Uniform Delay, d1 | 25.8 | 29.5 | | 20.3 | 22.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 4.1 | 27.4 | | 3.0 | 7.2 | |
| Delay (s) | 29.9 | 56.9 | | 23.3 | 29.9 | |
| Level of Service | C | E | | C | C | |
| Approach Delay (s/veh) | 44.7 | | | 23.3 | 29.9 | |
| Approach LOS | D | | | C | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 31.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.91 | | |
| Actuated Cycle Length (s) | 98.5 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 88.0% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

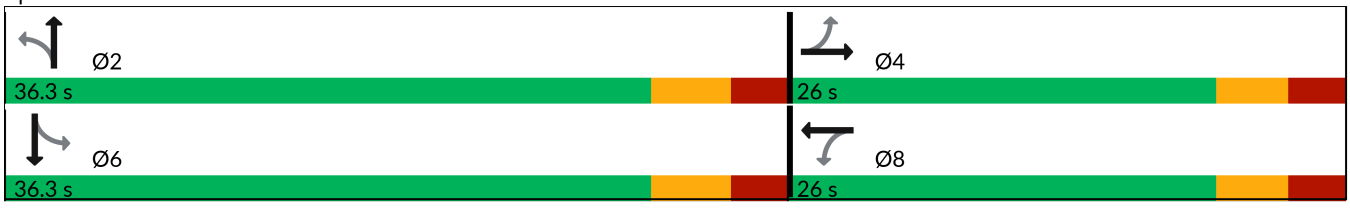


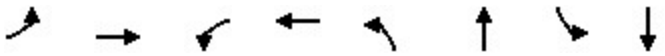
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 33 | 233 | 38 | 20 | 4 | 211 | 581 | 35 | 3 | 481 | 44 |
| Future Volume (vph) | 60 | 33 | 233 | 38 | 20 | 4 | 211 | 581 | 35 | 3 | 481 | 44 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.869 | | | 0.975 | | | 0.991 | | | 0.987 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1418 | 0 | 1668 | 1583 | 0 | 1651 | 1587 | 0 | 1668 | 1596 | 0 |
| Flt Permitted | 0.742 | | | 0.511 | | | 0.427 | | | 0.358 | | |
| Satd. Flow (perm) | 1290 | 1418 | 0 | 897 | 1583 | 0 | 742 | 1587 | 0 | 628 | 1596 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 233 | | | 4 | | | 7 | | | 10 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Adj. Flow (vph) | 60 | 33 | 233 | 38 | 20 | 4 | 211 | 581 | 35 | 3 | 481 | 44 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 60 | 266 | 0 | 38 | 24 | 0 | 211 | 616 | 0 | 3 | 525 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (%) | 41.7% | 41.7% | | 41.7% | 41.7% | | 58.3% | 58.3% | | 58.3% | 58.3% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.7 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 2.6 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Max | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Flash Don't Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 9.6 | 9.6 | | 9.6 | 9.6 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.58 | 0.58 | | 0.58 | 0.58 | |
| v/c Ratio | 0.25 | 0.59 | | 0.23 | 0.08 | | 0.49 | 0.67 | | 0.01 | 0.57 | |
| Control Delay (s/veh) | 20.6 | 10.3 | | 21.3 | 15.9 | | 12.4 | 13.1 | | 6.0 | 10.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 20.6 | 10.3 | | 21.3 | 15.9 | | 12.4 | 13.1 | | 6.0 | 10.4 | |
| LOS | C | B | | C | B | | B | B | | A | B | |
| Approach Delay (s/veh) | | 12.2 | | | 19.2 | | | 12.9 | | | 10.4 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 62.3 | | | |
| Actuated Cycle Length: 52 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.67 | | | |
| Intersection Signal Delay (s/veh): 12.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 90.5% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 60 | 266 | 38 | 24 | 211 | 616 | 3 | 525 |
| v/c Ratio | 0.25 | 0.59 | 0.23 | 0.08 | 0.49 | 0.67 | 0.01 | 0.57 |
| Control Delay (s/veh) | 20.6 | 10.3 | 21.3 | 15.9 | 12.4 | 13.1 | 6.0 | 10.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 20.6 | 10.3 | 21.3 | 15.9 | 12.4 | 13.1 | 6.0 | 10.4 |
| Queue Length 50th (m) | 4.8 | 2.6 | 3.1 | 1.6 | 8.9 | 29.9 | 0.1 | 23.0 |
| Queue Length 95th (m) | 12.5 | 17.5 | 9.2 | 6.1 | 31.7 | #84.1 | 1.1 | 61.6 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 497 | 689 | 345 | 612 | 428 | 920 | 363 | 926 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.12 | 0.39 | 0.11 | 0.04 | 0.49 | 0.67 | 0.01 | 0.57 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 33 | 233 | 38 | 20 | 4 | 211 | 581 | 35 | 3 | 481 | 44 |
| Future Volume (vph) | 60 | 33 | 233 | 38 | 20 | 4 | 211 | 581 | 35 | 3 | 481 | 44 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.98 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1417 | | 1668 | 1583 | | 1651 | 1588 | | 1668 | 1597 | |
| Flt Permitted | 0.74 | 1.00 | | 0.51 | 1.00 | | 0.43 | 1.00 | | 0.36 | 1.00 | |
| Satd. Flow (perm) | 1289 | 1417 | | 898 | 1583 | | 742 | 1588 | | 629 | 1597 | |
| 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) | 60 | 33 | 233 | 38 | 20 | 4 | 211 | 581 | 35 | 3 | 481 | 44 |
| RTOR Reduction (vph) | 0 | 190 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 60 | 76 | 0 | 38 | 21 | 0 | 211 | 613 | 0 | 3 | 521 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 9.6 | 9.6 | | 9.6 | 9.6 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Effective Green, g (s) | 9.6 | 9.6 | | 9.6 | 9.6 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.58 | 0.58 | | 0.58 | 0.58 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 237 | 261 | | 165 | 292 | | 429 | 919 | | 364 | 924 | |
| v/s Ratio Prot | | c0.05 | | | 0.01 | | | c0.39 | | | 0.33 | |
| v/s Ratio Perm | 0.05 | | | 0.04 | | | 0.28 | | | 0.00 | | |
| v/c Ratio | 0.25 | 0.29 | | 0.23 | 0.07 | | 0.49 | 0.67 | | 0.01 | 0.56 | |
| Uniform Delay, d1 | 18.1 | 18.3 | | 18.1 | 17.5 | | 6.4 | 7.5 | | 4.6 | 6.8 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.6 | | 0.7 | 0.1 | | 4.0 | 3.8 | | 0.0 | 2.5 | |
| Delay (s) | 18.7 | 18.9 | | 18.8 | 17.6 | | 10.4 | 11.3 | | 4.7 | 9.3 | |
| Level of Service | B | B | | B | B | | B | B | | A | A | |
| Approach Delay (s/veh) | | 18.9 | | | 18.3 | | | 11.1 | | | 9.3 | |
| Approach LOS | | B | | | B | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 12.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 52.0 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 90.5% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

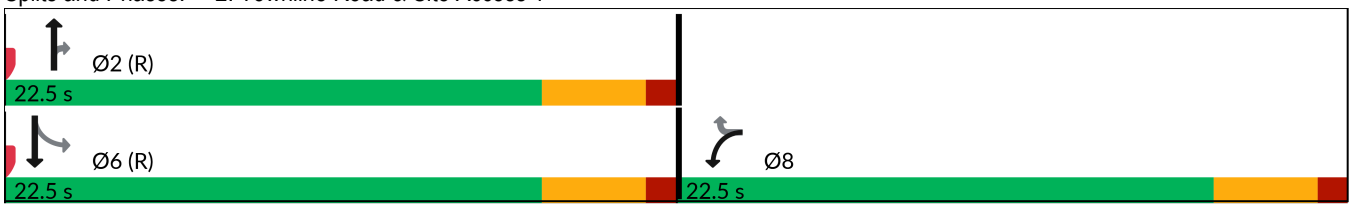
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 827 | 0 | 0 | 752 |
| Future Volume (vph) | 0 | 0 | 827 | 0 | 0 | 752 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1711 | 1711 | 1721 | 1721 | 1842 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 827 | 0 | 0 | 752 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 827 | 0 | 0 | 752 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| v/c Ratio | | | 0.48 | | | 0.41 |
| Control Delay (s/veh) | | | 1.0 | | | 0.7 |
| Queue Delay | | | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | | 1.0 | | | 0.7 |
| LOS | | | A | | | A |
| Approach Delay (s/veh) | | | 1.0 | | | 0.7 |
| Approach LOS | | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 45 | | | |
| Actuated Cycle Length: 45 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.48 | | | |
| Intersection Signal Delay (s/veh): 0.8 | | Intersection LOS: A | |
| Intersection Capacity Utilization 50.3% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | NBT | SBT |
|---|---|---|
| Lane Group Flow (vph) | 827 | 752 |
| v/c Ratio | 0.48 | 0.41 |
| Control Delay (s/veh) | 1.0 | 0.7 |
| Queue Delay | 0.0 | 0.0 |
| Total Delay (s/veh) | 1.0 | 0.7 |
| Queue Length 50th (m) | 0.0 | 0.0 |
| Queue Length 95th (m) | 0.0 | 0.0 |
| Internal Link Dist (m) | 311.6 | 161.7 |
| Turn Bay Length (m) | | |
| Base Capacity (vph) | 1721 | 1842 |
| Starvation Cap Reductn | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 |
| Storage Cap Reductn | 0 | 0 |
| Reduced v/c Ratio | 0.48 | 0.41 |

| Intersection Summary |
|---|

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 827 | 0 | 0 | 752 |
| Future Volume (vph) | 0 | 0 | 827 | 0 | 0 | 752 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | | | 4.5 | | | 4.5 |
| Lane Util. Factor | | | 1.00 | | | 1.00 |
| Frt | | | 1.00 | | | 1.00 |
| Flt Protected | | | 1.00 | | | 1.00 |
| Satd. Flow (prot) | | | 1721 | | | 1842 |
| Flt Permitted | | | 1.00 | | | 1.00 |
| Satd. Flow (perm) | | | 1721 | | | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 827 | 0 | 0 | 752 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 827 | 0 | 0 | 752 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | | | 45.0 | | | 45.0 |
| Effective Green, g (s) | | | 45.0 | | | 45.0 |
| Actuated g/C Ratio | | | 1.00 | | | 1.00 |
| Clearance Time (s) | | | 4.5 | | | 4.5 |
| Vehicle Extension (s) | | | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | | | 1721 | | | 1842 |
| v/s Ratio Prot | | | c0.48 | | | 0.41 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | | | 0.48 | | | 0.41 |
| Uniform Delay, d1 | | | 0.0 | | | 0.0 |
| Progression Factor | | | 1.00 | | | 1.00 |
| Incremental Delay, d2 | | | 1.0 | | | 0.7 |
| Delay (s) | | | 1.0 | | | 0.7 |
| Level of Service | | | A | | | A |
| Approach Delay (s/veh) | 0.0 | | 1.0 | | | 0.7 |
| Approach LOS | A | | A | | | A |

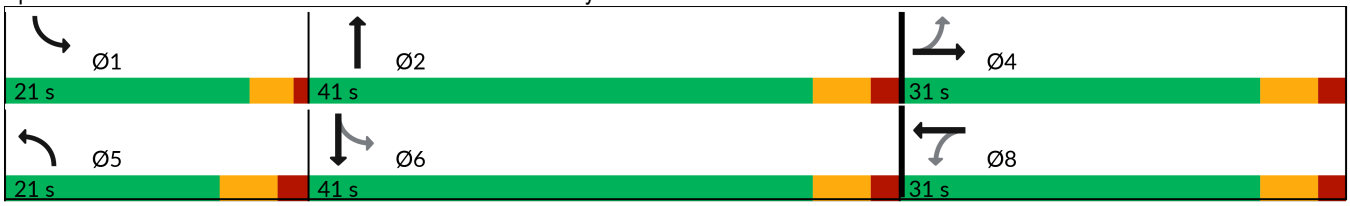
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 0.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 45.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 50.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 184 | 0 | 291 | 0 | 0 | 0 | 263 | 655 | 0 | 0 | 619 | 132 |
| Future Volume (vph) | 184 | 0 | 291 | 0 | 0 | 0 | 263 | 655 | 0 | 0 | 619 | 132 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | | | | | | | 0.974 | |
| Flt Protected | 0.950 | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3270 | 0 | 1755 | 3211 | 0 |
| Flt Permitted | 0.757 | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 1329 | 1387 | 0 | 3405 | 1632 | 0 | 3203 | 3270 | 0 | 1755 | 3211 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 414 | | | | | | | | | 31 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Adj. Flow (vph) | 184 | 0 | 291 | 0 | 0 | 0 | 263 | 655 | 0 | 0 | 619 | 132 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 184 | 291 | 0 | 0 | 0 | 0 | 263 | 655 | 0 | 0 | 751 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Minimum Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 11.0 | 41.0 | | 9.0 | 41.0 | |
| Total Split (s) | 31.0 | 31.0 | | 31.0 | 31.0 | | 21.0 | 41.0 | | 21.0 | 41.0 | |
| Total Split (%) | 33.3% | 33.3% | | 33.3% | 33.3% | | 22.6% | 44.1% | | 22.6% | 44.1% | |
| Maximum Green (s) | 25.0 | 25.0 | | 25.0 | 25.0 | | 15.0 | 35.0 | | 17.0 | 35.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 16.6 | 16.6 | | | | | 11.7 | 53.1 | | | 35.3 | |
| Actuated g/C Ratio | 0.20 | 0.20 | | | | | 0.14 | 0.65 | | | 0.43 | |
| v/c Ratio | 0.68 | 0.48 | | | | | 0.57 | 0.31 | | | 0.54 | |
| Control Delay (s/veh) | 43.7 | 2.9 | | | | | 38.9 | 7.5 | | | 19.6 | |
| Queue Delay | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | 43.7 | 2.9 | | | | | 38.9 | 7.5 | | | 19.6 | |
| LOS | D | A | | | | | D | A | | | B | |
| Approach Delay (s/veh) | | 18.7 | | | | | | 16.5 | | | 19.6 | |
| Approach LOS | | B | | | | | | B | | | B | |

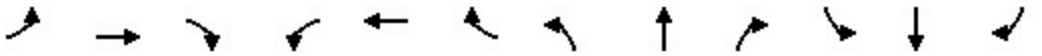
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 93 | | | |
| Actuated Cycle Length: 81.9 | | | |
| Natural Cycle: 85 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.68 | | | |
| Intersection Signal Delay (s/veh): 18.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 66.6% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | NBL | NBT | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 184 | 291 | 263 | 655 | 751 |
| v/c Ratio | 0.68 | 0.48 | 0.57 | 0.31 | 0.54 |
| Control Delay (s/veh) | 43.7 | 2.9 | 38.9 | 7.5 | 19.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 43.7 | 2.9 | 38.9 | 7.5 | 19.6 |
| Queue Length 50th (m) | 26.6 | 0.0 | 19.7 | 20.4 | 41.8 |
| Queue Length 95th (m) | 48.8 | 0.7 | 34.3 | 38.0 | 72.6 |
| Internal Link Dist (m) | | 90.3 | | 261.4 | 311.6 |
| Turn Bay Length (m) | 45.0 | | 115.0 | | |
| Base Capacity (vph) | 409 | 714 | 592 | 2122 | 1403 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.45 | 0.41 | 0.44 | 0.31 | 0.54 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 184 | 0 | 291 | 0 | 0 | 0 | 263 | 655 | 0 | 0 | 619 | 132 |
| Future Volume (vph) | 184 | 0 | 291 | 0 | 0 | 0 | 263 | 655 | 0 | 0 | 619 | 132 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | | | | 0.97 | 0.95 | | | 0.95 | |
| Frt | 1.00 | 0.85 | | | | | 1.00 | 1.00 | | | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | | | | 3203 | 3270 | | | 3209 | |
| Flt Permitted | 0.76 | 1.00 | | | | | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 1329 | 1387 | | | | | 3203 | 3270 | | | 3209 | |
| 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) | 184 | 0 | 291 | 0 | 0 | 0 | 263 | 655 | 0 | 0 | 619 | 132 |
| RTOR Reduction (vph) | 0 | 232 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 184 | 59 | 0 | 0 | 0 | 0 | 263 | 655 | 0 | 0 | 733 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Turn Type | Perm | NA | | Perm | | | Prot | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 16.6 | 16.6 | | | | | 11.7 | 53.1 | | | 35.4 | |
| Effective Green, g (s) | 16.6 | 16.6 | | | | | 11.7 | 53.1 | | | 35.4 | |
| Actuated g/C Ratio | 0.20 | 0.20 | | | | | 0.14 | 0.65 | | | 0.43 | |
| Clearance Time (s) | 6.0 | 6.0 | | | | | 6.0 | 6.0 | | | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | | 3.0 | |
| Lane Grp Cap (vph) | 270 | 281 | | | | | 458 | 2125 | | | 1390 | |
| v/s Ratio Prot | | 0.04 | | | | | c0.08 | 0.20 | | | c0.23 | |
| v/s Ratio Perm | c0.14 | | | | | | | | | | | |
| v/c Ratio | 0.68 | 0.21 | | | | | 0.57 | 0.31 | | | 0.53 | |
| Uniform Delay, d1 | 30.1 | 27.1 | | | | | 32.7 | 6.3 | | | 17.0 | |
| Progression Factor | 1.00 | 1.00 | | | | | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 6.9 | 0.4 | | | | | 1.7 | 0.4 | | | 1.4 | |
| Delay (s) | 37.0 | 27.5 | | | | | 34.4 | 6.6 | | | 18.4 | |
| Level of Service | D | C | | | | | C | A | | | B | |
| Approach Delay (s/veh) | | 31.2 | | | 0.0 | | | 14.6 | | | 18.4 | |
| Approach LOS | | C | | | A | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 19.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 81.7 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 66.6% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

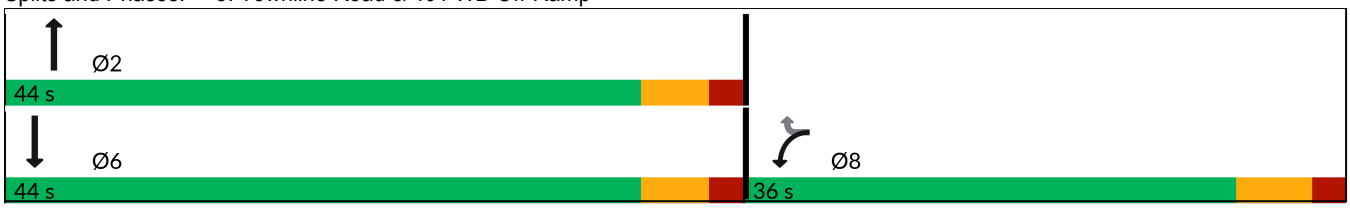
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 449 | 184 | 733 | 0 | 0 | 628 |
| Future Volume (vph) | 449 | 184 | 733 | 0 | 0 | 628 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 143 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 449 | 184 | 733 | 0 | 0 | 628 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 449 | 184 | 733 | 0 | 0 | 628 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (%) | 45.0% | 45.0% | 55.0% | | | 55.0% |
| Maximum Green (s) | 29.5 | 29.5 | 38.0 | | | 38.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 33.0 | | | 33.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 14.9 | 14.9 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.58 | | | 0.58 |
| v/c Ratio | 0.64 | 0.42 | 0.36 | | | 0.31 |
| Control Delay (s/veh) | 27.3 | 9.6 | 8.4 | | | 8.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 27.3 | 9.6 | 8.4 | | | 8.0 |
| LOS | C | A | A | | | A |
| Approach Delay (s/veh) | 22.1 | | 8.4 | | | 8.0 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 65.5 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.64 | | | |
| Intersection Signal Delay (s/veh): 12.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 44.4% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 449 | 184 | 733 | 628 |
| v/c Ratio | 0.64 | 0.42 | 0.36 | 0.31 |
| Control Delay (s/veh) | 27.3 | 9.6 | 8.4 | 8.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.3 | 9.6 | 8.4 | 8.0 |
| Queue Length 50th (m) | 25.4 | 4.0 | 21.6 | 17.8 |
| Queue Length 95th (m) | 38.2 | 17.6 | 38.2 | 32.2 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1390 | 735 | 2055 | 2034 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.32 | 0.25 | 0.36 | 0.31 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 449 | 184 | 733 | 0 | 0 | 628 |
| Future Volume (vph) | 449 | 184 | 733 | 0 | 0 | 628 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 449 | 184 | 733 | 0 | 0 | 628 |
| RTOR Reduction (vph) | 0 | 110 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 449 | 74 | 733 | 0 | 0 | 628 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 14.9 | 14.9 | 38.1 | | | 38.1 |
| Effective Green, g (s) | 14.9 | 14.9 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.58 | | | 0.58 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 700 | 331 | 2056 | | | 2035 |
| v/s Ratio Prot | c0.15 | | c0.21 | | | 0.18 |
| v/s Ratio Perm | | 0.05 | | | | |
| v/c Ratio | 0.64 | 0.22 | 0.36 | | | 0.31 |
| Uniform Delay, d1 | 22.9 | 20.6 | 7.2 | | | 7.0 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 2.0 | 0.3 | 0.5 | | | 0.4 |
| Delay (s) | 24.9 | 20.9 | 7.7 | | | 7.4 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 23.7 | | 7.7 | | | 7.4 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 12.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.44 | | |
| Actuated Cycle Length (s) | 65.5 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 44.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

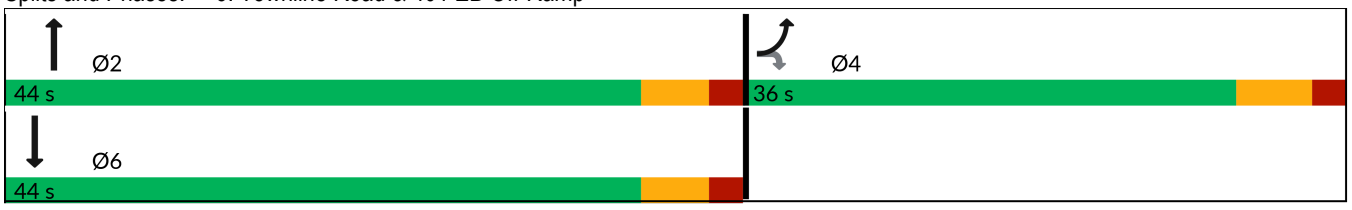
c Critical Lane Group

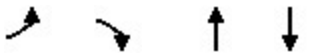
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 401 | 581 | 0 | 596 | 947 | 137 |
| Future Volume (vph) | 401 | 581 | 0 | 596 | 947 | 137 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.981 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1456 | 0 | 3500 | 3442 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1635 | 1456 | 0 | 3500 | 3442 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 77 | | | 27 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Adj. Flow (vph) | 401 | 581 | 0 | 596 | 947 | 137 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 401 | 581 | 0 | 596 | 1084 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (%) | 45.0% | 45.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 32.0 | 32.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Actuated g/C Ratio | 0.37 | 0.37 | | 0.48 | 0.48 | |
| v/c Ratio | 0.67 | 0.99 | | 0.36 | 0.66 | |
| Control Delay (s/veh) | 27.6 | 60.0 | | 14.1 | 18.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 27.6 | 60.0 | | 14.1 | 18.0 | |
| LOS | C | E | | B | B | |
| Approach Delay (s/veh) | 46.8 | | | 14.1 | 18.0 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.99 | | | |
| Intersection Signal Delay (s/veh): 27.7 | | Intersection LOS: C | |
| Intersection Capacity Utilization 80.0% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 401 | 581 | 596 | 1084 |
| v/c Ratio | 0.67 | 0.99 | 0.36 | 0.66 |
| Control Delay (s/veh) | 27.6 | 60.0 | 14.1 | 18.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.6 | 60.0 | 14.1 | 18.0 |
| Queue Length 50th (m) | 50.0 | 77.2 | 28.7 | 61.5 |
| Queue Length 95th (m) | 80.1 | #144.0 | 40.1 | 81.8 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 602 | 585 | 1662 | 1649 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.67 | 0.99 | 0.36 | 0.66 |

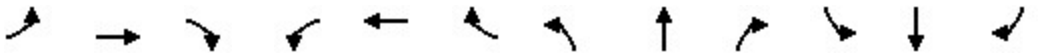
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 401 | 581 | 0 | 596 | 947 | 137 |
| Future Volume (vph) | 401 | 581 | 0 | 596 | 947 | 137 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1456 | | 3500 | 3442 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1635 | 1456 | | 3500 | 3442 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 401 | 581 | 0 | 596 | 947 | 137 |
| RTOR Reduction (vph) | 0 | 49 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 401 | 532 | 0 | 596 | 1070 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Effective Green, g (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Actuated g/C Ratio | 0.37 | 0.37 | | 0.48 | 0.48 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 602 | 536 | | 1662 | 1634 | |
| v/s Ratio Prot | 0.25 | | | 0.17 | c0.31 | |
| v/s Ratio Perm | | c0.37 | | | | |
| v/c Ratio | 0.67 | 0.99 | | 0.36 | 0.65 | |
| Uniform Delay, d1 | 21.1 | 25.2 | | 13.3 | 16.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.8 | 36.9 | | 0.6 | 2.1 | |
| Delay (s) | 23.9 | 62.1 | | 13.9 | 18.1 | |
| Level of Service | C | E | | B | B | |
| Approach Delay (s/veh) | 46.5 | | | 13.9 | 18.1 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 27.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.80 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 80.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

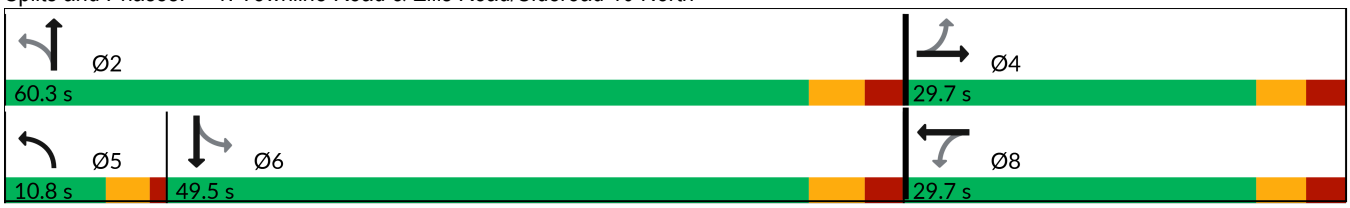


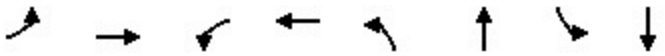
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 85 | 30 | 251 | 62 | 11 | 4 | 117 | 581 | 66 | 4 | 689 | 29 |
| Future Volume (vph) | 85 | 30 | 251 | 62 | 11 | 4 | 117 | 581 | 66 | 4 | 689 | 29 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.866 | | | 0.960 | | | 0.985 | | | 0.994 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1388 | 0 | 1668 | 1566 | 0 | 1603 | 1544 | 0 | 1334 | 1576 | 0 |
| Flt Permitted | 0.748 | | | 0.339 | | | 0.236 | | | 0.419 | | |
| Satd. Flow (perm) | 1300 | 1388 | 0 | 595 | 1566 | 0 | 398 | 1544 | 0 | 588 | 1576 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 251 | | | 4 | | | 11 | | | 3 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Adj. Flow (vph) | 85 | 30 | 251 | 62 | 11 | 4 | 117 | 581 | 66 | 4 | 689 | 29 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 85 | 281 | 0 | 62 | 15 | 0 | 117 | 647 | 0 | 4 | 718 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 9.0 | 49.5 | | 49.5 | 49.5 | |
| Total Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 10.8 | 60.3 | | 49.5 | 49.5 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 12.0% | 67.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 23.7 | 23.7 | | 23.7 | 23.7 | | 6.8 | 54.0 | | 43.2 | 43.2 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 35.2 | | 35.2 | 35.2 | |
| Flash Don't Walk (s) | 13.7 | 13.7 | | 13.7 | 13.7 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 11.8 | 11.8 | | 11.8 | 11.8 | | 56.5 | 54.2 | | 45.7 | 45.7 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.72 | 0.69 | | 0.58 | 0.58 | |
| v/c Ratio | 0.44 | 0.67 | | 0.70 | 0.06 | | 0.30 | 0.60 | | 0.01 | 0.78 | |
| Control Delay (s/veh) | 36.7 | 14.2 | | 68.5 | 23.7 | | 6.2 | 10.3 | | 10.0 | 22.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.1 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 36.7 | 14.2 | | 68.5 | 23.7 | | 6.2 | 10.4 | | 10.0 | 22.9 | |
| LOS | D | B | | E | C | | A | B | | A | C | |
| Approach Delay (s/veh) | | 19.5 | | | 59.7 | | | 9.8 | | | 22.8 | |
| Approach LOS | | B | | | E | | | A | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 78.3 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.78 | | | |
| Intersection Signal Delay (s/veh): 18.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 93.1% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

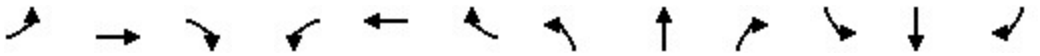




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 85 | 281 | 62 | 15 | 117 | 647 | 4 | 718 |
| v/c Ratio | 0.44 | 0.67 | 0.70 | 0.06 | 0.30 | 0.60 | 0.01 | 0.78 |
| Control Delay (s/veh) | 36.7 | 14.2 | 68.5 | 23.7 | 6.2 | 10.3 | 10.0 | 22.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.7 | 14.2 | 68.5 | 23.7 | 6.2 | 10.4 | 10.0 | 22.9 |
| Queue Length 50th (m) | 11.6 | 3.9 | 8.8 | 1.4 | 4.2 | 41.2 | 0.2 | 79.7 |
| Queue Length 95th (m) | 24.1 | 25.1 | 21.4 | 6.0 | 11.8 | 94.3 | 1.8 | #174.5 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 394 | 596 | 180 | 478 | 391 | 1071 | 343 | 921 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 52 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.47 | 0.34 | 0.03 | 0.30 | 0.63 | 0.01 | 0.78 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 85 | 30 | 251 | 62 | 11 | 4 | 117 | 581 | 66 | 4 | 689 | 29 |
| Future Volume (vph) | 85 | 30 | 251 | 62 | 11 | 4 | 117 | 581 | 66 | 4 | 689 | 29 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1388 | | 1668 | 1566 | | 1603 | 1543 | | 1334 | 1576 | |
| Flt Permitted | 0.75 | 1.00 | | 0.34 | 1.00 | | 0.24 | 1.00 | | 0.42 | 1.00 | |
| Satd. Flow (perm) | 1299 | 1388 | | 595 | 1566 | | 397 | 1543 | | 588 | 1576 | |
| 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) | 85 | 30 | 251 | 62 | 11 | 4 | 117 | 581 | 66 | 4 | 689 | 29 |
| RTOR Reduction (vph) | 0 | 214 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 85 | 67 | 0 | 62 | 12 | 0 | 117 | 644 | 0 | 4 | 717 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 11.8 | 11.8 | | 11.8 | 11.8 | | 55.0 | 55.0 | | 45.7 | 45.7 | |
| Effective Green, g (s) | 11.8 | 11.8 | | 11.8 | 11.8 | | 55.0 | 55.0 | | 45.7 | 45.7 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.70 | 0.70 | | 0.58 | 0.58 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 193 | 207 | | 88 | 233 | | 356 | 1072 | | 339 | 910 | |
| v/s Ratio Prot | | 0.05 | | | 0.01 | | 0.02 | c0.42 | | | c0.45 | |
| v/s Ratio Perm | 0.07 | | | c0.10 | | | 0.21 | | | 0.01 | | |
| v/c Ratio | 0.44 | 0.33 | | 0.70 | 0.05 | | 0.33 | 0.60 | | 0.01 | 0.79 | |
| Uniform Delay, d1 | 30.6 | 30.1 | | 32.0 | 28.8 | | 7.0 | 6.3 | | 7.1 | 12.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.6 | 0.9 | | 22.5 | 0.1 | | 0.5 | 2.5 | | 0.1 | 6.8 | |
| Delay (s) | 32.2 | 31.0 | | 54.5 | 28.9 | | 7.5 | 8.8 | | 7.2 | 19.8 | |
| Level of Service | C | C | | D | C | | A | A | | A | B | |
| Approach Delay (s/veh) | | 31.3 | | | 49.5 | | | 8.6 | | | 19.7 | |
| Approach LOS | | C | | | D | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 18.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.77 | | |
| Actuated Cycle Length (s) | 79.1 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 93.1% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

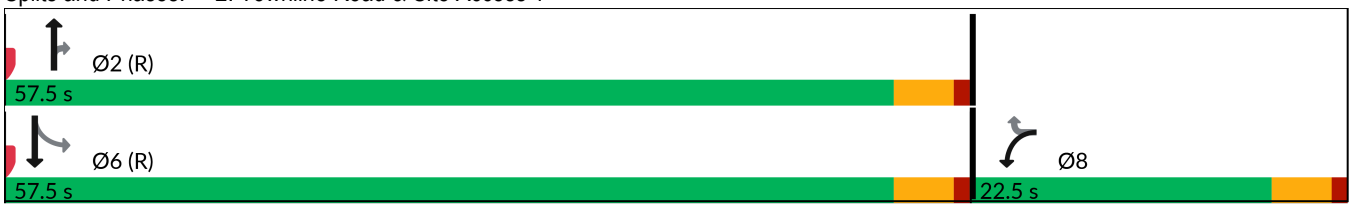
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 15 | 7 | 758 | 75 | 100 | 901 |
| Future Volume (vph) | 15 | 7 | 758 | 75 | 100 | 901 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.355 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 654 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 7 | | 75 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 15 | 7 | 758 | 75 | 100 | 901 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 15 | 7 | 758 | 75 | 100 | 901 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 57.5 | 57.5 | 57.5 | 57.5 |
| Total Split (%) | 28.1% | 28.1% | 71.9% | 71.9% | 71.9% | 71.9% |
| Maximum Green (s) | 18.0 | 18.0 | 53.0 | 53.0 | 53.0 | 53.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 6.3 | 6.3 | 73.5 | 73.5 | 73.5 | 73.5 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.92 | 0.92 | 0.92 | 0.92 |
| v/c Ratio | 0.12 | 0.06 | 0.48 | 0.06 | 0.17 | 0.53 |
| Control Delay (s/veh) | 35.7 | 21.0 | 2.8 | 0.6 | 2.0 | 3.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.7 | 21.0 | 2.8 | 0.6 | 2.0 | 3.2 |
| LOS | D | C | A | A | A | A |
| Approach Delay (s/veh) | 31.0 | | 2.6 | | | 3.1 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.53 | | | |
| Intersection Signal Delay (s/veh): 3.2 | | Intersection LOS: A | |
| Intersection Capacity Utilization 63.7% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

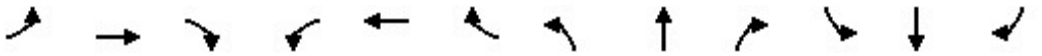


| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 15 | 7 | 758 | 75 | 100 | 901 |
| v/c Ratio | 0.12 | 0.06 | 0.48 | 0.06 | 0.17 | 0.53 |
| Control Delay (s/veh) | 35.7 | 21.0 | 2.8 | 0.6 | 2.0 | 3.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.7 | 21.0 | 2.8 | 0.6 | 2.0 | 3.2 |
| Queue Length 50th (m) | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Queue Length 95th (m) | 7.5 | 3.6 | 48.7 | 1.9 | 6.0 | 63.3 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 365 | 332 | 1581 | 1350 | 601 | 1692 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 63 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.04 | 0.02 | 0.48 | 0.06 | 0.17 | 0.55 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 15 | 7 | 758 | 75 | 100 | 901 |
| Future Volume (vph) | 15 | 7 | 758 | 75 | 100 | 901 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.35 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 654 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 15 | 7 | 758 | 75 | 100 | 901 |
| RTOR Reduction (vph) | 0 | 7 | 0 | 11 | 0 | 0 |
| Lane Group Flow (vph) | 15 | 0 | 758 | 64 | 100 | 901 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 2.9 | 2.9 | 68.1 | 68.1 | 68.1 | 68.1 |
| Effective Green, g (s) | 2.9 | 2.9 | 68.1 | 68.1 | 68.1 | 68.1 |
| Actuated g/C Ratio | 0.04 | 0.04 | 0.85 | 0.85 | 0.85 | 0.85 |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 58 | 52 | 1465 | 1245 | 556 | 1568 |
| v/s Ratio Prot | c0.01 | | 0.44 | | | c0.49 |
| v/s Ratio Perm | | 0.00 | | 0.04 | 0.15 | |
| v/c Ratio | 0.26 | 0.00 | 0.52 | 0.05 | 0.18 | 0.57 |
| Uniform Delay, d1 | 37.5 | 37.2 | 1.6 | 0.9 | 1.0 | 1.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.4 | 0.0 | 1.3 | 0.1 | 0.7 | 1.5 |
| Delay (s) | 39.9 | 37.2 | 2.9 | 1.0 | 1.8 | 3.3 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 39.0 | | 2.7 | | | 3.1 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 3.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.56 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 63.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

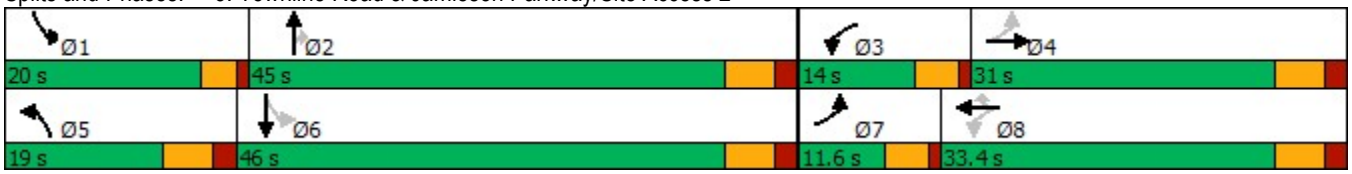


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 137 | 20 | 293 | 111 | 53 | 152 | 256 | 540 | 413 | 53 | 720 | 157 |
| Future Volume (vph) | 137 | 20 | 293 | 111 | 53 | 152 | 256 | 540 | 413 | 53 | 720 | 157 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 1 | 2 | | 1 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | | | | | 1.00 | | | | 1.00 | |
| Frt | | 0.860 | | | | 0.850 | | | 0.850 | | 0.973 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1635 | 1365 | 0 | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3168 | 0 |
| Flt Permitted | 0.722 | | | 0.339 | | | 0.950 | | | 0.451 | | |
| Satd. Flow (perm) | 1242 | 1365 | 0 | 1154 | 1632 | 1387 | 3201 | 3302 | 1492 | 792 | 3168 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 293 | | | | 152 | | | 413 | | 26 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 157.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 9.4 | | | 20.1 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| 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% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Adj. Flow (vph) | 137 | 20 | 293 | 111 | 53 | 152 | 256 | 540 | 413 | 53 | 720 | 157 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 137 | 313 | 0 | 111 | 53 | 152 | 256 | 540 | 413 | 53 | 877 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | Prot | NA | Perm | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | | 5.0 | 8.0 | 8.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 9.5 | 31.0 | | 9.5 | 31.0 | 31.0 | 11.0 | 41.0 | 41.0 | 9.0 | 41.0 | |
| Total Split (s) | 11.6 | 31.0 | | 14.0 | 33.4 | 33.4 | 19.0 | 45.0 | 45.0 | 20.0 | 46.0 | |
| Total Split (%) | 10.5% | 28.2% | | 12.7% | 30.4% | 30.4% | 17.3% | 40.9% | 40.9% | 18.2% | 41.8% | |
| Maximum Green (s) | 7.1 | 25.0 | | 9.5 | 27.4 | 27.4 | 13.0 | 39.0 | 39.0 | 16.0 | 40.0 | |
| Yellow Time (s) | 3.5 | 4.0 | | 3.5 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 14.0 | 14.0 | | 14.0 | |
| Flash Dont Walk (s) | | 18.0 | | | 18.0 | 18.0 | | 21.0 | 21.0 | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | 0 | | 0 | |
| Act Effct Green (s) | 19.7 | 11.1 | | 21.1 | 11.8 | 11.8 | 11.7 | 49.3 | 49.3 | 48.8 | 40.2 | |
| Actuated g/C Ratio | 0.21 | 0.12 | | 0.23 | 0.13 | 0.13 | 0.13 | 0.53 | 0.53 | 0.52 | 0.43 | |
| v/c Ratio | 0.47 | 0.75 | | 0.26 | 0.26 | 0.50 | 0.64 | 0.31 | 0.42 | 0.11 | 0.64 | |
| Control Delay | 34.0 | 17.9 | | 27.3 | 39.5 | 11.9 | 47.5 | 14.6 | 3.1 | 8.7 | 23.8 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 34.0 | 17.9 | | 27.3 | 39.5 | 11.9 | 47.5 | 14.6 | 3.1 | 8.7 | 23.8 | |
| LOS | C | B | | C | D | B | D | B | A | A | C | |
| Approach Delay | | 22.8 | | | 21.9 | | | 17.6 | | | 22.9 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 110 | | | |
| Actuated Cycle Length: 93.4 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.75 | | | |
| Intersection Signal Delay: 20.6 | | Intersection LOS: C | |
| Intersection Capacity Utilization 82.0% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 137 | 313 | 111 | 53 | 152 | 256 | 540 | 413 | 53 | 877 |
| v/c Ratio | 0.47 | 0.75 | 0.26 | 0.26 | 0.50 | 0.64 | 0.31 | 0.42 | 0.11 | 0.64 |
| Control Delay | 34.0 | 17.9 | 27.3 | 39.5 | 11.9 | 47.5 | 14.6 | 3.1 | 8.7 | 23.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 34.0 | 17.9 | 27.3 | 39.5 | 11.9 | 47.5 | 14.6 | 3.1 | 8.7 | 23.8 |
| Queue Length 50th (m) | 19.9 | 3.3 | 7.8 | 8.8 | 0.0 | 21.9 | 26.3 | 0.0 | 2.8 | 58.5 |
| Queue Length 95th (m) | 35.0 | 29.6 | 14.1 | 19.3 | 15.9 | 38.8 | 50.2 | 16.4 | 9.5 | 99.2 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | | 133.4 | | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | | 115.0 | | | 115.0 | |
| Base Capacity (vph) | 292 | 581 | 494 | 480 | 516 | 447 | 1742 | 982 | 643 | 1378 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.47 | 0.54 | 0.22 | 0.11 | 0.29 | 0.57 | 0.31 | 0.42 | 0.08 | 0.64 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 137 | 20 | 293 | 111 | 53 | 152 | 256 | 540 | 413 | 53 | 720 | 157 |
| Future Volume (vph) | 137 | 20 | 293 | 111 | 53 | 152 | 256 | 540 | 413 | 53 | 720 | 157 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.86 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1364 | | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3169 | |
| Flt Permitted | 0.72 | 1.00 | | 0.34 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.45 | 1.00 | |
| Satd. Flow (perm) | 1243 | 1364 | | 1154 | 1632 | 1387 | 3203 | 3302 | 1492 | 791 | 3169 | |
| 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) | 137 | 20 | 293 | 111 | 53 | 152 | 256 | 540 | 413 | 53 | 720 | 157 |
| RTOR Reduction (vph) | 0 | 258 | 0 | 0 | 0 | 133 | 0 | 0 | 197 | 0 | 15 | 0 |
| Lane Group Flow (vph) | 137 | 55 | 0 | 111 | 53 | 19 | 256 | 540 | 216 | 53 | 862 | 0 |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| Heavy Vehicles (%) | 2% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | Prot | NA | Perm | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Actuated Green, G (s) | 18.2 | 11.1 | | 19.6 | 11.8 | 11.8 | 11.7 | 49.3 | 49.3 | 46.6 | 41.1 | |
| Effective Green, g (s) | 18.2 | 11.1 | | 19.6 | 11.8 | 11.8 | 11.7 | 49.3 | 49.3 | 46.6 | 41.1 | |
| Actuated g/C Ratio | 0.19 | 0.12 | | 0.21 | 0.13 | 0.13 | 0.12 | 0.52 | 0.52 | 0.49 | 0.44 | |
| Clearance Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 269 | 160 | | 412 | 204 | 173 | 397 | 1728 | 780 | 442 | 1382 | |
| v/s Ratio Prot | c0.04 | 0.04 | | 0.02 | 0.03 | | c0.08 | 0.16 | | 0.01 | c0.27 | |
| v/s Ratio Perm | c0.06 | | | 0.03 | | 0.01 | | | 0.14 | 0.05 | | |
| v/c Ratio | 0.51 | 0.34 | | 0.27 | 0.26 | 0.11 | 0.64 | 0.31 | 0.28 | 0.12 | 0.62 | |
| Uniform Delay, d1 | 33.5 | 38.2 | | 30.9 | 37.3 | 36.5 | 39.3 | 12.8 | 12.5 | 12.4 | 20.6 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.5 | 1.3 | | 0.4 | 0.7 | 0.3 | 3.6 | 0.5 | 0.9 | 0.1 | 2.1 | |
| Delay (s) | 35.0 | 39.5 | | 31.3 | 37.9 | 36.8 | 42.8 | 13.3 | 13.4 | 12.5 | 22.7 | |
| Level of Service | C | D | | C | D | D | D | B | B | B | C | |
| Approach Delay (s) | | 38.1 | | | 35.1 | | | 19.6 | | | 22.1 | |
| Approach LOS | | D | | | D | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 24.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.59 | | |
| Actuated Cycle Length (s) | 94.2 | Sum of lost time (s) | 22.5 |
| Intersection Capacity Utilization | 82.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 513 | 192 | 1037 | 0 | 0 | 770 |
| Future Volume (vph) | 513 | 192 | 1037 | 0 | 0 | 770 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 82 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 513 | 192 | 1037 | 0 | 0 | 770 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 513 | 192 | 1037 | 0 | 0 | 770 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (%) | 40.0% | 40.0% | 60.0% | | | 60.0% |
| Maximum Green (s) | 29.5 | 29.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 19.6 | 19.6 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.60 | | | 0.60 |
| v/c Ratio | 0.73 | 0.48 | 0.49 | | | 0.37 |
| Control Delay (s/veh) | 34.5 | 18.8 | 10.8 | | | 9.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 34.5 | 18.8 | 10.8 | | | 9.5 |
| LOS | C | B | B | | | A |
| Approach Delay (s/veh) | 30.3 | | 10.8 | | | 9.5 |
| Approach LOS | C | | B | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 80.3 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.73 | | | |
| Intersection Signal Delay (s/veh): 15.9 | | Intersection LOS: B | |
| Intersection Capacity Utilization 54.7% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp

| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 513 | 192 | 1037 | 770 |
| v/c Ratio | 0.73 | 0.48 | 0.49 | 0.37 |
| Control Delay (s/veh) | 34.5 | 18.8 | 10.8 | 9.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.5 | 18.8 | 10.8 | 9.5 |
| Queue Length 50th (m) | 37.1 | 13.8 | 42.1 | 28.2 |
| Queue Length 95th (m) | 52.6 | 31.5 | 70.8 | 48.6 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1055 | 558 | 2098 | 2098 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.49 | 0.34 | 0.49 | 0.37 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 513 | 192 | 1037 | 0 | 0 | 770 |
| Future Volume (vph) | 513 | 192 | 1037 | 0 | 0 | 770 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 513 | 192 | 1037 | 0 | 0 | 770 |
| RTOR Reduction (vph) | 0 | 62 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 513 | 130 | 1037 | 0 | 0 | 770 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 19.6 | 19.6 | 48.2 | | | 48.2 |
| Effective Green, g (s) | 19.6 | 19.6 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.60 | | | 0.60 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 698 | 335 | 2100 | | | 2100 |
| v/s Ratio Prot | c0.18 | | c0.30 | | | 0.22 |
| v/s Ratio Perm | | 0.09 | | | | |
| v/c Ratio | 0.73 | 0.39 | 0.49 | | | 0.37 |
| Uniform Delay, d1 | 28.0 | 25.3 | 9.1 | | | 8.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 4.0 | 0.7 | 0.8 | | | 0.5 |
| Delay (s) | 32.0 | 26.1 | 10.0 | | | 8.7 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 30.4 | | 10.0 | | | 8.7 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 15.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.56 | | |
| Actuated Cycle Length (s) | 80.3 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 54.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

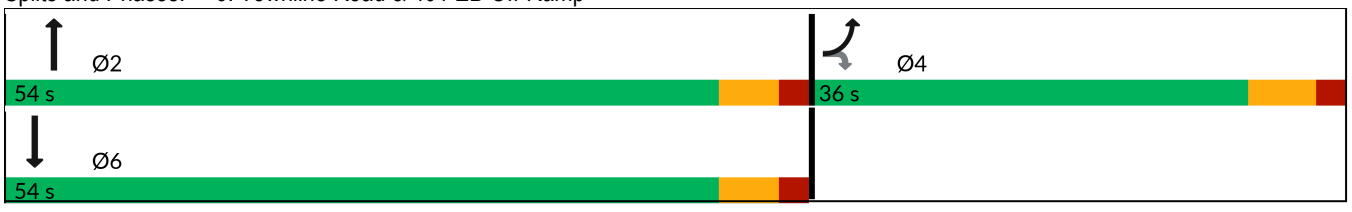
c Critical Lane Group

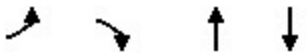
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 448 | 463 | 0 | 1006 | 1107 | 172 |
| Future Volume (vph) | 448 | 463 | 0 | 1006 | 1107 | 172 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.980 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1603 | 1414 | 0 | 3433 | 3299 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1603 | 1414 | 0 | 3433 | 3299 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 68 | | | 29 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Adj. Flow (vph) | 448 | 463 | 0 | 1006 | 1107 | 172 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 448 | 463 | 0 | 1006 | 1279 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 54.0 | 42.0 | |
| Total Split (s) | 36.0 | 36.0 | | 54.0 | 54.0 | |
| Total Split (%) | 40.0% | 40.0% | | 60.0% | 60.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 10.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 19.5 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 27.9 | 27.9 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.32 | 0.32 | | 0.54 | 0.54 | |
| v/c Ratio | 0.89 | 0.94 | | 0.54 | 0.71 | |
| Control Delay (s/veh) | 49.9 | 54.6 | | 14.7 | 17.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 49.9 | 54.6 | | 14.7 | 17.7 | |
| LOS | D | D | | B | B | |
| Approach Delay (s/veh) | 52.3 | | | 14.7 | 17.7 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 88.5 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.94 | | | |
| Intersection Signal Delay (s/veh): 26.6 | | Intersection LOS: C | |
| Intersection Capacity Utilization 77.6% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 448 | 463 | 1006 | 1279 |
| v/c Ratio | 0.89 | 0.94 | 0.54 | 0.71 |
| Control Delay (s/veh) | 49.9 | 54.6 | 14.7 | 17.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.9 | 54.6 | 14.7 | 17.7 |
| Queue Length 50th (m) | 71.6 | 66.3 | 56.9 | 81.2 |
| Queue Length 95th (m) | #122.9 | #124.3 | 74.0 | 105.8 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 534 | 517 | 1863 | 1804 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.84 | 0.90 | 0.54 | 0.71 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 448 | 463 | 0 | 1006 | 1107 | 172 |
| Future Volume (vph) | 448 | 463 | 0 | 1006 | 1107 | 172 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1603 | 1414 | | 3433 | 3298 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1603 | 1414 | | 3433 | 3298 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 448 | 463 | 0 | 1006 | 1107 | 172 |
| RTOR Reduction (vph) | 0 | 47 | 0 | 0 | 13 | 0 |
| Lane Group Flow (vph) | 448 | 416 | 0 | 1006 | 1266 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 27.9 | 27.9 | | 48.1 | 48.1 | |
| Effective Green, g (s) | 27.9 | 27.9 | | 48.1 | 48.1 | |
| Actuated g/C Ratio | 0.32 | 0.32 | | 0.54 | 0.54 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 505 | 445 | | 1865 | 1792 | |
| v/s Ratio Prot | 0.28 | | | 0.29 | c0.38 | |
| v/s Ratio Perm | | c0.29 | | | | |
| v/c Ratio | 0.89 | 0.94 | | 0.54 | 0.71 | |
| Uniform Delay, d1 | 28.8 | 29.4 | | 13.0 | 15.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 17.0 | 27.0 | | 1.1 | 2.4 | |
| Delay (s) | 45.8 | 56.5 | | 14.2 | 17.3 | |
| Level of Service | D | E | | B | B | |
| Approach Delay (s/veh) | 51.2 | | | 14.2 | 17.3 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 26.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.79 | | |
| Actuated Cycle Length (s) | 88.5 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 77.6% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

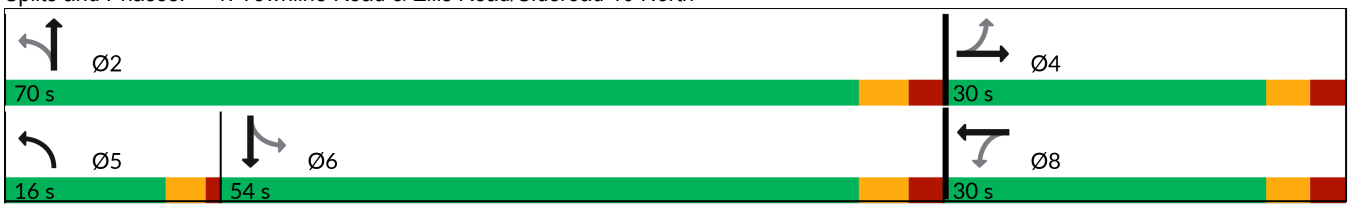
c Critical Lane Group

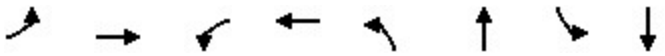
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 40 | 21 | 159 | 97 | 39 | 10 | 368 | 978 | 103 | 8 | 556 | 59 |
| Future Volume (vph) | 40 | 21 | 159 | 97 | 39 | 10 | 368 | 978 | 103 | 8 | 556 | 59 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.867 | | | 0.969 | | | 0.986 | | | 0.986 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1390 | 0 | 1635 | 1581 | 0 | 1668 | 1594 | 0 | 1668 | 1550 | 0 |
| Flt Permitted | 0.725 | | | 0.532 | | | 0.269 | | | 0.176 | | |
| Satd. Flow (perm) | 1273 | 1390 | 0 | 915 | 1581 | 0 | 472 | 1594 | 0 | 309 | 1550 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 159 | | | 10 | | | 10 | | | 7 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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 (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 40 | 21 | 159 | 97 | 39 | 10 | 368 | 978 | 103 | 8 | 556 | 59 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 40 | 180 | 0 | 97 | 49 | 0 | 368 | 1081 | 0 | 8 | 615 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 9.0 | 54.0 | | 54.0 | 54.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 16.0 | 70.0 | | 54.0 | 54.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 16.0% | 70.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 12.0 | 63.7 | | 47.7 | 47.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 39.7 | | 39.7 | 39.7 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 14.2 | 14.2 | | 14.2 | 14.2 | | 66.2 | 63.9 | | 48.1 | 48.1 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.73 | 0.71 | | 0.53 | 0.53 | |
| v/c Ratio | 0.20 | 0.51 | | 0.68 | 0.19 | | 0.73 | 0.96 | | 0.05 | 0.74 | |
| Control Delay (s/veh) | 34.7 | 13.0 | | 59.0 | 28.6 | | 15.6 | 33.4 | | 13.4 | 24.5 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 14.8 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 34.7 | 13.0 | | 59.0 | 28.6 | | 15.6 | 48.2 | | 13.4 | 24.5 | |
| LOS | C | B | | E | C | | B | D | | B | C | |
| Approach Delay (s/veh) | | 17.0 | | | 48.8 | | | 39.9 | | | 24.3 | |
| Approach LOS | | B | | | D | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 90.4 | | | |
| Natural Cycle: 105 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.96 | | | |
| Intersection Signal Delay (s/veh): 34.4 | | Intersection LOS: C | |
| Intersection Capacity Utilization 109.5% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

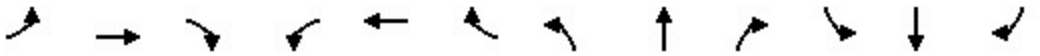




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 40 | 180 | 97 | 49 | 368 | 1081 | 8 | 615 |
| v/c Ratio | 0.20 | 0.51 | 0.68 | 0.19 | 0.73 | 0.96 | 0.05 | 0.74 |
| Control Delay (s/veh) | 34.7 | 13.0 | 59.0 | 28.6 | 15.6 | 33.4 | 13.4 | 24.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 14.8 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.7 | 13.0 | 59.0 | 28.6 | 15.6 | 48.2 | 13.4 | 24.5 |
| Queue Length 50th (m) | 6.1 | 3.2 | 16.1 | 5.9 | 17.8 | 142.0 | 0.6 | 77.0 |
| Queue Length 95th (m) | 14.8 | 20.5 | 32.2 | 15.3 | #49.0 | #298.3 | 3.3 | #157.1 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 338 | 486 | 243 | 428 | 505 | 1129 | 164 | 827 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 76 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.12 | 0.37 | 0.40 | 0.11 | 0.73 | 1.03 | 0.05 | 0.74 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 40 | 21 | 159 | 97 | 39 | 10 | 368 | 978 | 103 | 8 | 556 | 59 |
| Future Volume (vph) | 40 | 21 | 159 | 97 | 39 | 10 | 368 | 978 | 103 | 8 | 556 | 59 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1391 | | 1635 | 1582 | | 1668 | 1594 | | 1668 | 1549 | |
| Flt Permitted | 0.73 | 1.00 | | 0.53 | 1.00 | | 0.27 | 1.00 | | 0.18 | 1.00 | |
| Satd. Flow (perm) | 1273 | 1391 | | 915 | 1582 | | 472 | 1594 | | 309 | 1549 | |
| 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) | 40 | 21 | 159 | 97 | 39 | 10 | 368 | 978 | 103 | 8 | 556 | 59 |
| RTOR Reduction (vph) | 0 | 134 | 0 | 0 | 8 | 0 | 0 | 3 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 40 | 46 | 0 | 97 | 41 | 0 | 368 | 1078 | 0 | 8 | 612 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 14.2 | 14.2 | | 14.2 | 14.2 | | 63.9 | 63.9 | | 48.1 | 48.1 | |
| Effective Green, g (s) | 14.2 | 14.2 | | 14.2 | 14.2 | | 63.9 | 63.9 | | 48.1 | 48.1 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.71 | 0.71 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 199 | 218 | | 143 | 248 | | 489 | 1126 | | 164 | 824 | |
| v/s Ratio Prot | | 0.03 | | | 0.03 | | 0.10 | c0.68 | | | 0.39 | |
| v/s Ratio Perm | 0.03 | | | c0.11 | | | 0.43 | | | 0.03 | | |
| v/c Ratio | 0.20 | 0.21 | | 0.68 | 0.16 | | 0.75 | 0.96 | | 0.05 | 0.74 | |
| Uniform Delay, d1 | 33.2 | 33.2 | | 35.9 | 33.0 | | 9.1 | 12.0 | | 10.2 | 16.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.5 | | 12.1 | 0.3 | | 6.5 | 18.4 | | 0.6 | 6.0 | |
| Delay (s) | 33.7 | 33.7 | | 48.0 | 33.3 | | 15.6 | 30.4 | | 10.7 | 22.3 | |
| Level of Service | C | C | | D | C | | B | C | | B | C | |
| Approach Delay (s/veh) | | 33.7 | | | 43.1 | | | 26.6 | | | 22.2 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 27.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.95 | | |
| Actuated Cycle Length (s) | 90.4 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 109.5% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |

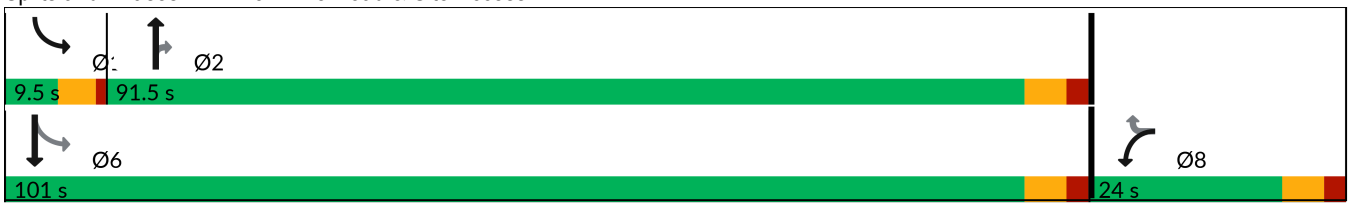
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 55 | 25 | 1426 | 25 | 36 | 776 |
| Future Volume (vph) | 55 | 25 | 1426 | 25 | 36 | 776 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.041 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 76 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 25 | | 18 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 55 | 25 | 1426 | 25 | 36 | 776 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 55 | 25 | 1426 | 25 | 36 | 776 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | 24.0 | 9.5 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 91.5 | 91.5 | 9.5 | 101.0 |
| Total Split (%) | 19.2% | 19.2% | 73.2% | 73.2% | 7.6% | 80.8% |
| Maximum Green (s) | 18.0 | 18.0 | 85.5 | 85.5 | 5.0 | 95.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 3.5 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 4.5 | 6.0 |
| Lead/Lag | | | Lag | Lag | Lead | |
| 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 | Max | Max | None | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | | 0 |
| Act Effct Green (s) | 9.4 | 9.4 | 95.0 | 95.0 | 100.9 | 100.7 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.80 | 0.80 | 0.85 | 0.85 |
| v/c Ratio | 0.43 | 0.18 | 1.03 | 0.02 | 0.27 | 0.50 |
| Control Delay (s/veh) | 61.6 | 20.8 | 50.1 | 2.6 | 7.4 | 4.6 |
| Queue Delay | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.8 |
| Total Delay (s/veh) | 61.6 | 20.8 | 50.7 | 2.6 | 7.4 | 5.4 |
| LOS | E | C | D | A | A | A |
| Approach Delay (s/veh) | 48.9 | | 49.8 | | | 5.5 |
| Approach LOS | D | | D | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 125 | | | |
| Actuated Cycle Length: 118.4 | | | |
| Natural Cycle: 150 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.03 | | | |
| Intersection Signal Delay (s/veh): 34.4 | | Intersection LOS: C | |
| Intersection Capacity Utilization 94.5% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 55 | 25 | 1426 | 25 | 36 | 776 |
| v/c Ratio | 0.43 | 0.18 | 1.03 | 0.02 | 0.27 | 0.50 |
| Control Delay (s/veh) | 61.6 | 20.8 | 50.1 | 2.6 | 7.4 | 4.6 |
| Queue Delay | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.8 |
| Total Delay (s/veh) | 61.6 | 20.8 | 50.7 | 2.6 | 7.4 | 5.4 |
| Queue Length 50th (m) | 12.4 | 0.0 | ~381.6 | 0.4 | 1.1 | 43.7 |
| Queue Length 95th (m) | 25.2 | 8.3 | #478.8 | 2.8 | 4.2 | 74.8 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 247 | 242 | 1380 | 1177 | 135 | 1566 |
| Starvation Cap Reductn | 0 | 0 | 2 | 0 | 0 | 466 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.10 | 1.03 | 0.02 | 0.27 | 0.71 |

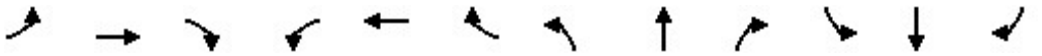
Intersection Summary

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 55 | 25 | 1426 | 25 | 36 | 776 |
| Future Volume (vph) | 55 | 25 | 1426 | 25 | 36 | 776 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 4.5 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.04 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 75 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 55 | 25 | 1426 | 25 | 36 | 776 |
| RTOR Reduction (vph) | 0 | 23 | 0 | 4 | 0 | 0 |
| Lane Group Flow (vph) | 55 | 2 | 1426 | 21 | 36 | 776 |
| Turn Type | Prot | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 8.2 | 8.2 | 93.8 | 93.8 | 101.3 | 101.3 |
| Effective Green, g (s) | 8.2 | 8.2 | 93.8 | 93.8 | 101.3 | 101.3 |
| Actuated g/C Ratio | 0.07 | 0.07 | 0.77 | 0.77 | 0.83 | 0.83 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 4.5 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 109 | 98 | 1328 | 1129 | 103 | 1535 |
| v/s Ratio Prot | c0.03 | | c0.83 | | 0.01 | c0.42 |
| v/s Ratio Perm | | 0.00 | | 0.01 | 0.28 | |
| v/c Ratio | 0.50 | 0.02 | 1.07 | 0.02 | 0.35 | 0.51 |
| Uniform Delay, d1 | 54.7 | 52.9 | 13.9 | 3.2 | 39.0 | 2.9 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 3.6 | 0.1 | 47.1 | 0.0 | 2.1 | 1.2 |
| Delay (s) | 58.3 | 53.0 | 61.0 | 3.2 | 41.1 | 4.1 |
| Level of Service | E | D | E | A | D | A |
| Approach Delay (s/veh) | 56.7 | | 60.0 | | | 5.7 |
| Approach LOS | E | | E | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 41.1 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.02 | | |
| Actuated Cycle Length (s) | 121.5 | Sum of lost time (s) | 16.5 |
| Intersection Capacity Utilization | 94.5% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

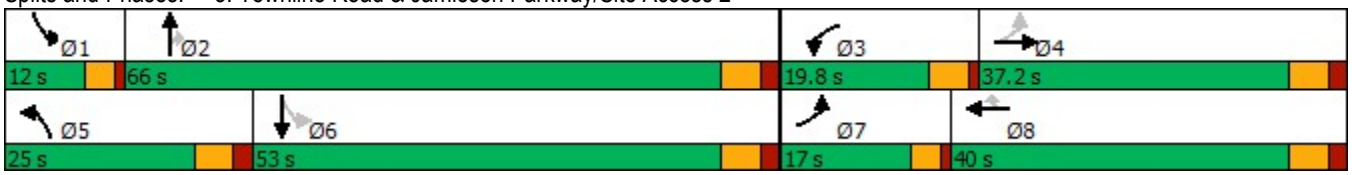


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 222 | 27 | 375 | 310 | 147 | 338 | 362 | 859 | 453 | 113 | 570 | 141 |
| Future Volume (vph) | 222 | 27 | 375 | 310 | 147 | 338 | 362 | 859 | 453 | 113 | 570 | 141 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 1 | 2 | | 1 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.860 | | | | 0.850 | | | 0.850 | | 0.970 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1403 | 0 | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3122 | 0 |
| Flt Permitted | 0.645 | | | 0.950 | | | 0.950 | | | 0.313 | | |
| Satd. Flow (perm) | 1132 | 1403 | 0 | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 549 | 3122 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 301 | | | | 240 | | | 453 | | 25 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 157.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 9.4 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 222 | 27 | 375 | 310 | 147 | 338 | 362 | 859 | 453 | 113 | 570 | 141 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 222 | 402 | 0 | 310 | 147 | 338 | 362 | 859 | 453 | 113 | 711 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | Prot | NA | Perm | Prot | NA | Perm | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | | | 8 | | | 2 | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | | 5.0 | 8.0 | 8.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 9.5 | 31.0 | | 10.0 | 31.0 | 31.0 | 11.0 | 50.4 | 50.4 | 9.0 | 50.4 | |
| Total Split (s) | 17.0 | 37.2 | | 19.8 | 40.0 | 40.0 | 25.0 | 66.0 | 66.0 | 12.0 | 53.0 | |
| Total Split (%) | 12.6% | 27.6% | | 14.7% | 29.6% | 29.6% | 18.5% | 48.9% | 48.9% | 8.9% | 39.3% | |
| Maximum Green (s) | 13.0 | 31.2 | | 14.8 | 34.0 | 34.0 | 19.0 | 60.0 | 60.0 | 8.0 | 47.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 6.0 | | 5.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 23.4 | 23.4 | | 23.4 | |
| Flash Dont Walk (s) | | 18.0 | | | 18.0 | 18.0 | | 21.0 | 21.0 | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | 0 | | 0 | |
| Act Effct Green (s) | 32.0 | 17.2 | | 14.4 | 19.8 | 19.8 | 17.4 | 60.4 | 60.4 | 58.2 | 48.6 | |
| Actuated g/C Ratio | 0.27 | 0.14 | | 0.12 | 0.16 | 0.16 | 0.14 | 0.50 | 0.50 | 0.48 | 0.40 | |
| v/c Ratio | 0.62 | 0.88 | | 0.80 | 0.55 | 0.79 | 0.79 | 0.52 | 0.47 | 0.34 | 0.56 | |
| Control Delay | 40.8 | 34.1 | | 69.1 | 53.5 | 28.1 | 63.7 | 23.2 | 3.6 | 15.7 | 30.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 40.8 | 34.1 | | 69.1 | 53.5 | 28.1 | 63.7 | 23.2 | 3.6 | 15.7 | 30.6 | |
| LOS | D | C | | E | D | C | E | C | A | B | C | |
| Approach Delay | | 36.5 | | | 48.8 | | | 26.7 | | | 28.6 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 135 | | | |
| Actuated Cycle Length: 120.7 | | | |
| Natural Cycle: 115 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay: 33.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 89.7% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

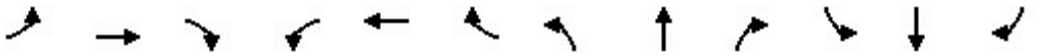
Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 222 | 402 | 310 | 147 | 338 | 362 | 859 | 453 | 113 | 711 |
| v/c Ratio | 0.62 | 0.88 | 0.80 | 0.55 | 0.79 | 0.79 | 0.52 | 0.47 | 0.34 | 0.56 |
| Control Delay | 40.8 | 34.1 | 69.1 | 53.5 | 28.1 | 63.7 | 23.2 | 3.6 | 15.7 | 30.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 40.8 | 34.1 | 69.1 | 53.5 | 28.1 | 63.7 | 23.2 | 3.6 | 15.7 | 30.6 |
| Queue Length 50th (m) | 41.1 | 23.9 | 37.0 | 32.4 | 22.0 | 42.2 | 69.6 | 0.0 | 10.3 | 65.9 |
| Queue Length 95th (m) | 62.1 | 63.8 | #67.5 | 52.4 | 56.1 | #70.3 | 109.5 | 18.7 | 23.9 | 102.1 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | | 133.4 | | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | | 115.0 | | | 115.0 | |
| Base Capacity (vph) | 360 | 587 | 398 | 462 | 564 | 507 | 1651 | 972 | 341 | 1271 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.62 | 0.68 | 0.78 | 0.32 | 0.60 | 0.71 | 0.52 | 0.47 | 0.33 | 0.56 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 222 | 27 | 375 | 310 | 147 | 338 | 362 | 859 | 453 | 113 | 570 | 141 |
| Future Volume (vph) | 222 | 27 | 375 | 310 | 147 | 338 | 362 | 859 | 453 | 113 | 570 | 141 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.0 | 6.0 | | 5.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.86 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1403 | | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3123 | |
| Flt Permitted | 0.65 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.31 | 1.00 | |
| Satd. Flow (perm) | 1133 | 1403 | | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 550 | 3123 | |
| 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) | 222 | 27 | 375 | 310 | 147 | 338 | 362 | 859 | 453 | 113 | 570 | 141 |
| RTOR Reduction (vph) | 0 | 258 | 0 | 0 | 0 | 201 | 0 | 0 | 226 | 0 | 15 | 0 |
| Lane Group Flow (vph) | 222 | 144 | 0 | 310 | 147 | 137 | 362 | 859 | 227 | 113 | 696 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | pm+pt | NA | | Prot | NA | Perm | Prot | NA | Perm | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | | | 8 | | | 2 | 6 | | |
| Actuated Green, G (s) | 30.2 | 17.3 | | 14.4 | 19.8 | 19.8 | 17.4 | 60.4 | 60.4 | 56.2 | 48.6 | |
| Effective Green, g (s) | 30.2 | 17.3 | | 14.4 | 19.8 | 19.8 | 17.4 | 60.4 | 60.4 | 56.2 | 48.6 | |
| Actuated g/C Ratio | 0.25 | 0.14 | | 0.12 | 0.16 | 0.16 | 0.14 | 0.50 | 0.50 | 0.47 | 0.40 | |
| Clearance Time (s) | 4.0 | 6.0 | | 5.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 340 | 201 | | 385 | 267 | 227 | 461 | 1652 | 746 | 326 | 1257 | |
| v/s Ratio Prot | 0.07 | c0.10 | | c0.10 | 0.09 | | c0.11 | 0.26 | | 0.02 | c0.22 | |
| v/s Ratio Perm | 0.09 | | | | | 0.10 | | | 0.15 | 0.14 | | |
| v/c Ratio | 0.65 | 0.72 | | 0.81 | 0.55 | 0.61 | 0.79 | 0.52 | 0.30 | 0.35 | 0.55 | |
| Uniform Delay, d1 | 39.2 | 49.4 | | 51.8 | 46.4 | 46.8 | 49.8 | 20.4 | 17.8 | 18.5 | 27.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 4.5 | 11.5 | | 11.6 | 2.4 | 4.5 | 8.6 | 1.2 | 1.0 | 0.6 | 1.8 | |
| Delay (s) | 43.6 | 60.9 | | 63.4 | 48.8 | 51.3 | 58.4 | 21.5 | 18.8 | 19.2 | 29.5 | |
| Level of Service | D | E | | E | D | D | E | C | B | B | C | |
| Approach Delay (s) | | 54.8 | | | 55.6 | | | 28.8 | | | 28.1 | |
| Approach LOS | | D | | | E | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 38.2 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 120.7 | Sum of lost time (s) | 23.0 |
| Intersection Capacity Utilization | 89.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

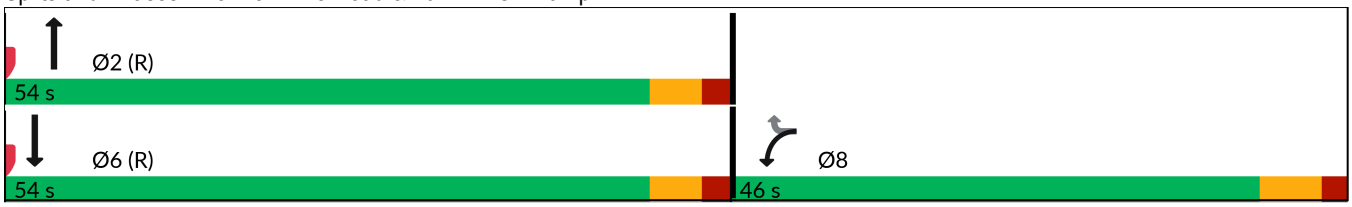
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 512 | 374 | 1407 | 0 | 0 | 893 |
| Future Volume (vph) | 512 | 374 | 1407 | 0 | 0 | 893 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 20 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 512 | 374 | 1407 | 0 | 0 | 893 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 512 | 374 | 1407 | 0 | 0 | 893 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Minimum Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (%) | 46.0% | 46.0% | 54.0% | | | 54.0% |
| Maximum Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 29.5 | 29.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| v/c Ratio | 0.44 | 0.64 | 0.84 | | | 0.53 |
| Control Delay (s/veh) | 23.7 | 29.0 | 28.3 | | | 19.6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 23.7 | 29.0 | 28.3 | | | 19.6 |
| LOS | C | C | C | | | B |
| Approach Delay (s/veh) | 25.9 | | 28.3 | | | 19.6 |
| Approach LOS | C | | C | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 100 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.84 | | | |
| Intersection Signal Delay (s/veh): 25.2 | | Intersection LOS: C | |
| Intersection Capacity Utilization 74.5% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 512 | 374 | 1407 | 893 |
| v/c Ratio | 0.44 | 0.64 | 0.84 | 0.53 |
| Control Delay (s/veh) | 23.7 | 29.0 | 28.3 | 19.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 23.7 | 29.0 | 28.3 | 19.6 |
| Queue Length 50th (m) | 36.7 | 54.4 | 120.3 | 61.3 |
| Queue Length 95th (m) | 50.6 | 86.2 | 150.5 | 78.6 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1161 | 587 | 1680 | 1680 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.44 | 0.64 | 0.84 | 0.53 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 512 | 374 | 1407 | 0 | 0 | 893 |
| Future Volume (vph) | 512 | 374 | 1407 | 0 | 0 | 893 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 512 | 374 | 1407 | 0 | 0 | 893 |
| RTOR Reduction (vph) | 0 | 12 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 512 | 362 | 1407 | 0 | 0 | 893 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Effective Green, g (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Grp Cap (vph) | 1161 | 575 | 1680 | | | 1680 |
| v/s Ratio Prot | 0.17 | | c0.40 | | | 0.26 |
| v/s Ratio Perm | | c0.25 | | | | |
| v/c Ratio | 0.44 | 0.63 | 0.84 | | | 0.53 |
| Uniform Delay, d1 | 22.2 | 24.4 | 22.6 | | | 18.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.2 | 5.2 | 5.2 | | | 1.2 |
| Delay (s) | 23.4 | 29.5 | 27.8 | | | 19.4 |
| Level of Service | C | C | C | | | B |
| Approach Delay (s/veh) | 26.0 | | 27.8 | | | 19.4 |
| Approach LOS | C | | C | | | B |

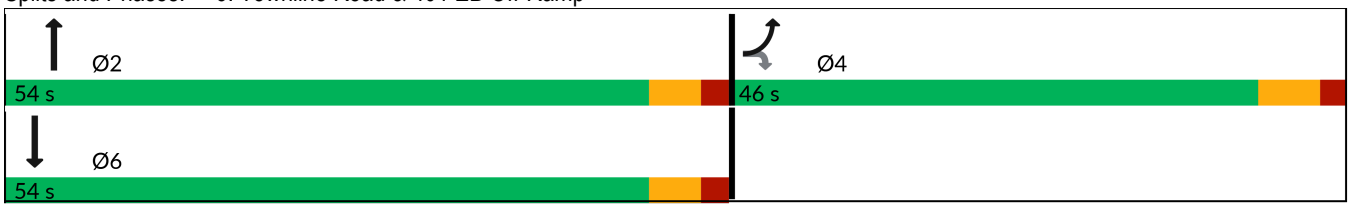
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 24.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.74 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 74.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

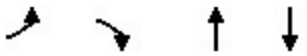
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 449 | 461 | 0 | 1208 | 1248 | 193 |
| Future Volume (vph) | 449 | 461 | 0 | 1208 | 1248 | 193 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.980 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1619 | 1442 | 0 | 3535 | 3353 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1619 | 1442 | 0 | 3535 | 3353 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 32 | | | 24 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Adj. Flow (vph) | 449 | 461 | 0 | 1208 | 1248 | 193 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 449 | 461 | 0 | 1208 | 1441 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (%) | 46.0% | 46.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 39.5 | 39.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 42.0 | |
| Flash Don't Walk (s) | 29.5 | 29.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 32.4 | 32.4 | | 48.3 | 48.3 | |
| Actuated g/C Ratio | 0.35 | 0.35 | | 0.52 | 0.52 | |
| v/c Ratio | 0.80 | 0.88 | | 0.66 | 0.82 | |
| Control Delay (s/veh) | 38.8 | 46.3 | | 19.8 | 25.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 38.8 | 46.3 | | 19.8 | 25.1 | |
| LOS | D | D | | B | C | |
| Approach Delay (s/veh) | 42.6 | | | 19.8 | 25.1 | |
| Approach LOS | D | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 93.3 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay (s/veh): 27.8 | | Intersection LOS: C | |
| Intersection Capacity Utilization 82.1% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 449 | 461 | 1208 | 1441 |
| v/c Ratio | 0.80 | 0.88 | 0.66 | 0.82 |
| Control Delay (s/veh) | 38.8 | 46.3 | 19.8 | 25.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 38.8 | 46.3 | 19.8 | 25.1 |
| Queue Length 50th (m) | 71.5 | 72.0 | 84.6 | 114.4 |
| Queue Length 95th (m) | 107.4 | #122.4 | 117.9 | #163.1 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 689 | 632 | 1830 | 1747 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.65 | 0.73 | 0.66 | 0.82 |

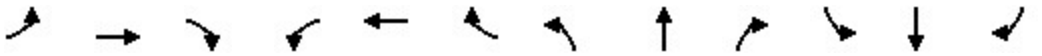
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 449 | 461 | 0 | 1208 | 1248 | 193 |
| Future Volume (vph) | 449 | 461 | 0 | 1208 | 1248 | 193 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1619 | 1442 | | 3535 | 3353 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1619 | 1442 | | 3535 | 3353 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 449 | 461 | 0 | 1208 | 1248 | 193 |
| RTOR Reduction (vph) | 0 | 21 | 0 | 0 | 12 | 0 |
| Lane Group Flow (vph) | 449 | 440 | 0 | 1208 | 1429 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 32.4 | 32.4 | | 48.3 | 48.3 | |
| Effective Green, g (s) | 32.4 | 32.4 | | 48.3 | 48.3 | |
| Actuated g/C Ratio | 0.35 | 0.35 | | 0.52 | 0.52 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 562 | 501 | | 1831 | 1737 | |
| v/s Ratio Prot | 0.28 | | | 0.34 | c0.43 | |
| v/s Ratio Perm | | c0.31 | | | | |
| v/c Ratio | 0.80 | 0.88 | | 0.66 | 0.82 | |
| Uniform Delay, d1 | 27.5 | 28.6 | | 16.4 | 18.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 7.8 | 15.9 | | 1.9 | 4.6 | |
| Delay (s) | 35.3 | 44.5 | | 18.3 | 23.4 | |
| Level of Service | D | D | | B | C | |
| Approach Delay (s/veh) | 39.9 | | | 18.3 | 23.4 | |
| Approach LOS | D | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 25.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.84 | | |
| Actuated Cycle Length (s) | 93.2 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 82.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

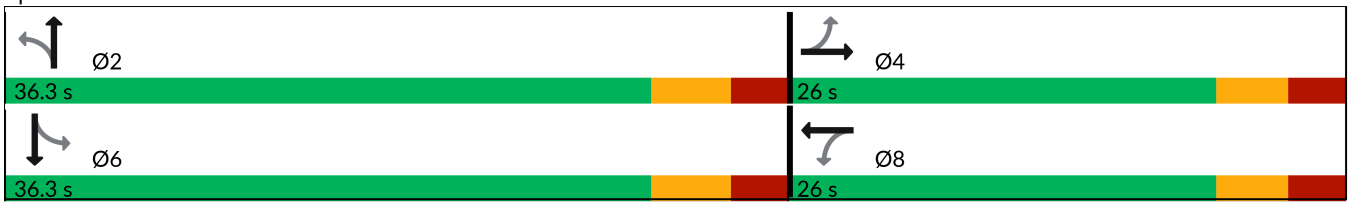


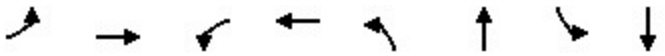
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 27 | 224 | 68 | 16 | 4 | 208 | 629 | 78 | 3 | 520 | 36 |
| Future Volume (vph) | 49 | 27 | 224 | 68 | 16 | 4 | 208 | 629 | 78 | 3 | 520 | 36 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.866 | | | 0.970 | | | 0.983 | | | 0.990 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1413 | 0 | 1668 | 1573 | 0 | 1651 | 1576 | 0 | 1668 | 1600 | 0 |
| Flt Permitted | 0.744 | | | 0.550 | | | 0.402 | | | 0.291 | | |
| Satd. Flow (perm) | 1293 | 1413 | 0 | 965 | 1573 | 0 | 699 | 1576 | 0 | 511 | 1600 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 224 | | | 4 | | | 14 | | | 8 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Adj. Flow (vph) | 49 | 27 | 224 | 68 | 16 | 4 | 208 | 629 | 78 | 3 | 520 | 36 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 49 | 251 | 0 | 68 | 20 | 0 | 208 | 707 | 0 | 3 | 556 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (%) | 41.7% | 41.7% | | 41.7% | 41.7% | | 58.3% | 58.3% | | 58.3% | 58.3% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.7 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 2.6 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Max | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Flash Don't Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 9.8 | 9.8 | | 9.8 | 9.8 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Actuated g/C Ratio | 0.19 | 0.19 | | 0.19 | 0.19 | | 0.58 | 0.58 | | 0.58 | 0.58 | |
| v/c Ratio | 0.20 | 0.56 | | 0.38 | 0.07 | | 0.52 | 0.77 | | 0.01 | 0.60 | |
| Control Delay (s/veh) | 19.6 | 9.7 | | 24.6 | 15.7 | | 13.4 | 17.4 | | 6.0 | 11.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 19.6 | 9.7 | | 24.6 | 15.7 | | 13.4 | 17.4 | | 6.0 | 11.2 | |
| LOS | B | A | | C | B | | B | B | | A | B | |
| Approach Delay (s/veh) | | 11.3 | | | 22.6 | | | 16.5 | | | 11.1 | |
| Approach LOS | | B | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 62.3 | | | |
| Actuated Cycle Length: 52.2 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.77 | | | |
| Intersection Signal Delay (s/veh): 14.4 | | Intersection LOS: B | |
| Intersection Capacity Utilization 95.0% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

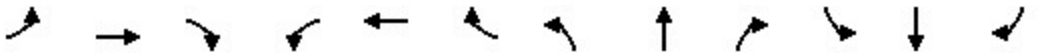




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 49 | 251 | 68 | 20 | 208 | 707 | 3 | 556 |
| v/c Ratio | 0.20 | 0.56 | 0.38 | 0.07 | 0.52 | 0.77 | 0.01 | 0.60 |
| Control Delay (s/veh) | 19.6 | 9.7 | 24.6 | 15.7 | 13.4 | 17.4 | 6.0 | 11.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 19.6 | 9.7 | 24.6 | 15.7 | 13.4 | 17.4 | 6.0 | 11.2 |
| Queue Length 50th (m) | 3.9 | 2.1 | 5.6 | 1.3 | 9.4 | 39.6 | 0.1 | 26.5 |
| Queue Length 95th (m) | 10.8 | 16.7 | 14.5 | 5.4 | 32.1 | #118.5 | 1.1 | 65.9 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 496 | 680 | 370 | 606 | 402 | 913 | 293 | 924 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.10 | 0.37 | 0.18 | 0.03 | 0.52 | 0.77 | 0.01 | 0.60 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 27 | 224 | 68 | 16 | 4 | 208 | 629 | 78 | 3 | 520 | 36 |
| Future Volume (vph) | 49 | 27 | 224 | 68 | 16 | 4 | 208 | 629 | 78 | 3 | 520 | 36 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1413 | | 1668 | 1573 | | 1651 | 1577 | | 1668 | 1601 | |
| Flt Permitted | 0.74 | 1.00 | | 0.55 | 1.00 | | 0.40 | 1.00 | | 0.29 | 1.00 | |
| Satd. Flow (perm) | 1294 | 1413 | | 965 | 1573 | | 698 | 1577 | | 511 | 1601 | |
| 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) | 49 | 27 | 224 | 68 | 16 | 4 | 208 | 629 | 78 | 3 | 520 | 36 |
| RTOR Reduction (vph) | 0 | 182 | 0 | 0 | 3 | 0 | 0 | 6 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 49 | 69 | 0 | 68 | 17 | 0 | 208 | 701 | 0 | 3 | 553 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 9.8 | 9.8 | | 9.8 | 9.8 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Effective Green, g (s) | 9.8 | 9.8 | | 9.8 | 9.8 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Actuated g/C Ratio | 0.19 | 0.19 | | 0.19 | 0.19 | | 0.58 | 0.58 | | 0.58 | 0.58 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 242 | 265 | | 181 | 295 | | 402 | 909 | | 294 | 923 | |
| v/s Ratio Prot | | 0.05 | | | 0.01 | | | c0.44 | | | 0.35 | |
| v/s Ratio Perm | 0.04 | | | c0.07 | | | 0.30 | | | 0.01 | | |
| v/c Ratio | 0.20 | 0.26 | | 0.38 | 0.06 | | 0.52 | 0.77 | | 0.01 | 0.60 | |
| Uniform Delay, d1 | 17.9 | 18.1 | | 18.5 | 17.4 | | 6.7 | 8.4 | | 4.7 | 7.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | 0.5 | | 1.3 | 0.1 | | 4.7 | 6.3 | | 0.1 | 2.9 | |
| Delay (s) | 18.3 | 18.6 | | 19.8 | 17.5 | | 11.4 | 14.7 | | 4.8 | 10.0 | |
| Level of Service | B | B | | B | B | | B | B | | A | B | |
| Approach Delay (s/veh) | | 18.6 | | | 19.3 | | | 14.0 | | | 10.0 | |
| Approach LOS | | B | | | B | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 13.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 52.2 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 95.0% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

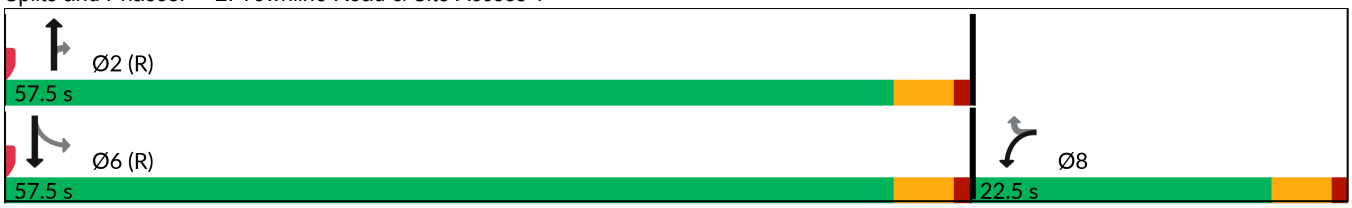
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 11 | 5 | 911 | 12 | 21 | 792 |
| Future Volume (vph) | 11 | 5 | 911 | 12 | 21 | 792 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.291 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 536 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 5 | | 12 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 11 | 5 | 911 | 12 | 21 | 792 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 11 | 5 | 911 | 12 | 21 | 792 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 57.5 | 57.5 | 57.5 | 57.5 |
| Total Split (%) | 28.1% | 28.1% | 71.9% | 71.9% | 71.9% | 71.9% |
| Maximum Green (s) | 18.0 | 18.0 | 53.0 | 53.0 | 53.0 | 53.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 6.2 | 6.2 | 73.6 | 73.6 | 73.6 | 73.6 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.92 | 0.92 | 0.92 | 0.92 |
| v/c Ratio | 0.09 | 0.04 | 0.58 | 0.01 | 0.04 | 0.47 |
| Control Delay (s/veh) | 35.4 | 22.2 | 3.7 | 0.9 | 1.6 | 2.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 22.2 | 3.7 | 0.9 | 1.6 | 2.6 |
| LOS | D | C | A | A | A | A |
| Approach Delay (s/veh) | 31.3 | | 3.7 | | | 2.6 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.58 | | | |
| Intersection Signal Delay (s/veh): 3.4 | | Intersection LOS: A | |
| Intersection Capacity Utilization 63.0% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

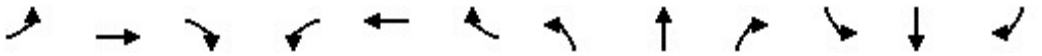


| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 11 | 5 | 911 | 12 | 21 | 792 |
| v/c Ratio | 0.09 | 0.04 | 0.58 | 0.01 | 0.04 | 0.47 |
| Control Delay (s/veh) | 35.4 | 22.2 | 3.7 | 0.9 | 1.6 | 2.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 22.2 | 3.7 | 0.9 | 1.6 | 2.6 |
| Queue Length 50th (m) | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Queue Length 95th (m) | 6.2 | 3.2 | 70.8 | 0.7 | 1.6 | 47.5 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 365 | 331 | 1584 | 1347 | 493 | 1695 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 76 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.03 | 0.02 | 0.58 | 0.01 | 0.04 | 0.49 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 11 | 5 | 911 | 12 | 21 | 792 |
| Future Volume (vph) | 11 | 5 | 911 | 12 | 21 | 792 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.29 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 536 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 11 | 5 | 911 | 12 | 21 | 792 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 2 | 0 | 0 |
| Lane Group Flow (vph) | 11 | 0 | 911 | 10 | 21 | 792 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 2.8 | 2.8 | 68.2 | 68.2 | 68.2 | 68.2 |
| Effective Green, g (s) | 2.8 | 2.8 | 68.2 | 68.2 | 68.2 | 68.2 |
| Actuated g/C Ratio | 0.03 | 0.03 | 0.85 | 0.85 | 0.85 | 0.85 |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 56 | 50 | 1467 | 1247 | 456 | 1570 |
| v/s Ratio Prot | c0.01 | | c0.53 | | | 0.43 |
| v/s Ratio Perm | | 0.00 | | 0.01 | 0.04 | |
| v/c Ratio | 0.20 | 0.00 | 0.62 | 0.01 | 0.05 | 0.50 |
| Uniform Delay, d1 | 37.5 | 37.3 | 1.8 | 0.9 | 0.9 | 1.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.7 | 0.0 | 2.0 | 0.0 | 0.2 | 1.2 |
| Delay (s) | 39.2 | 37.3 | 3.8 | 0.9 | 1.1 | 2.7 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 38.6 | | 3.8 | | | 2.6 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 3.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 63.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

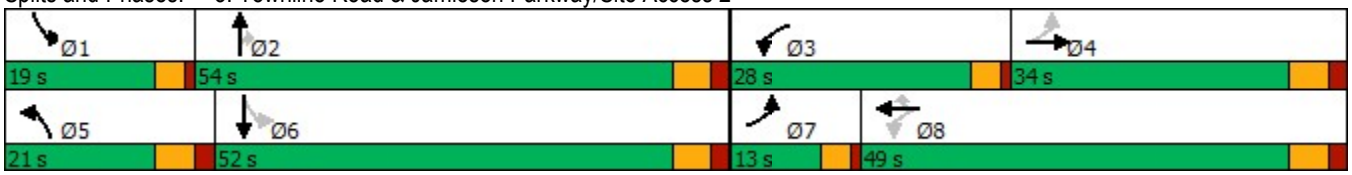


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 151 | 58 | 239 | 315 | 156 | 247 | 209 | 535 | 420 | 188 | 509 | 106 |
| Future Volume (vph) | 151 | 58 | 239 | 315 | 156 | 247 | 209 | 535 | 420 | 188 | 509 | 106 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 1 | 2 | | 1 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.879 | | | | 0.850 | | | 0.850 | | 0.974 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1434 | 0 | 3235 | 1632 | 1387 | 3203 | 3270 | 1492 | 1668 | 3211 | 0 |
| Flt Permitted | 0.658 | | | 0.178 | | | 0.950 | | | 0.425 | | |
| Satd. Flow (perm) | 1155 | 1434 | 0 | 606 | 1632 | 1387 | 3203 | 3270 | 1492 | 746 | 3211 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 139 | | | | 247 | | | 420 | | 20 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 157.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 9.4 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Adj. Flow (vph) | 151 | 58 | 239 | 315 | 156 | 247 | 209 | 535 | 420 | 188 | 509 | 106 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 151 | 297 | 0 | 315 | 156 | 247 | 209 | 535 | 420 | 188 | 615 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | pm+pt | NA | Perm | Prot | NA | Perm | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 9.0 | 31.0 | | 9.0 | 31.0 | 31.0 | 11.0 | 50.4 | 50.4 | 9.0 | 41.0 | |
| Total Split (s) | 13.0 | 34.0 | | 28.0 | 49.0 | 49.0 | 21.0 | 54.0 | 54.0 | 19.0 | 52.0 | |
| Total Split (%) | 9.6% | 25.2% | | 20.7% | 36.3% | 36.3% | 15.6% | 40.0% | 40.0% | 14.1% | 38.5% | |
| Maximum Green (s) | 9.0 | 28.0 | | 24.0 | 43.0 | 43.0 | 15.0 | 48.0 | 48.0 | 15.0 | 46.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 14.0 | 14.0 | | 14.0 | |
| Flash Dont Walk (s) | | 18.0 | | | 18.0 | 18.0 | | 21.0 | 21.0 | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | 0 | | 0 | |
| Act Effct Green (s) | 29.5 | 18.5 | | 37.2 | 23.0 | 23.0 | 12.3 | 49.5 | 49.5 | 59.9 | 46.5 | |
| Actuated g/C Ratio | 0.26 | 0.16 | | 0.33 | 0.20 | 0.20 | 0.11 | 0.44 | 0.44 | 0.53 | 0.41 | |
| v/c Ratio | 0.44 | 0.85 | | 0.61 | 0.47 | 0.52 | 0.60 | 0.37 | 0.47 | 0.39 | 0.46 | |
| Control Delay | 32.6 | 46.3 | | 32.6 | 43.8 | 8.5 | 57.1 | 24.4 | 4.4 | 15.0 | 26.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 32.6 | 46.3 | | 32.6 | 43.8 | 8.5 | 57.1 | 24.4 | 4.4 | 15.0 | 26.6 | |
| LOS | C | D | | C | D | A | E | C | A | B | C | |
| Approach Delay | | 41.7 | | | 26.7 | | | 23.1 | | | 23.9 | |
| Approach LOS | | D | | | C | | | C | | | C | |

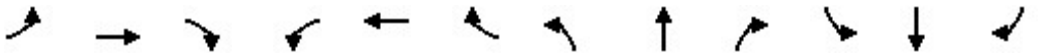
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 135 | | | |
| Actuated Cycle Length: 113.1 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.85 | | | |
| Intersection Signal Delay: 26.8 | | Intersection LOS: C | |
| Intersection Capacity Utilization 73.7% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 151 | 297 | 315 | 156 | 247 | 209 | 535 | 420 | 188 | 615 |
| v/c Ratio | 0.44 | 0.85 | 0.61 | 0.47 | 0.52 | 0.60 | 0.37 | 0.47 | 0.39 | 0.46 |
| Control Delay | 32.6 | 46.3 | 32.6 | 43.8 | 8.5 | 57.1 | 24.4 | 4.4 | 15.0 | 26.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 32.6 | 46.3 | 32.6 | 43.8 | 8.5 | 57.1 | 24.4 | 4.4 | 15.0 | 26.6 |
| Queue Length 50th (m) | 24.1 | 35.0 | 26.1 | 30.5 | 0.0 | 23.0 | 41.4 | 0.0 | 18.2 | 50.1 |
| Queue Length 95th (m) | 40.4 | 70.3 | 37.5 | 50.8 | 19.8 | 38.9 | 68.6 | 21.0 | 37.2 | 80.3 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | | 133.4 | | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | | 115.0 | | | 115.0 | |
| Base Capacity (vph) | 343 | 463 | 768 | 627 | 685 | 429 | 1431 | 889 | 543 | 1333 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.44 | 0.64 | 0.41 | 0.25 | 0.36 | 0.49 | 0.37 | 0.47 | 0.35 | 0.46 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 151 | 58 | 239 | 315 | 156 | 247 | 209 | 535 | 420 | 188 | 509 | 106 |
| Future Volume (vph) | 151 | 58 | 239 | 315 | 156 | 247 | 209 | 535 | 420 | 188 | 509 | 106 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.88 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1435 | | 3235 | 1632 | 1387 | 3203 | 3270 | 1492 | 1668 | 3211 | |
| Flt Permitted | 0.66 | 1.00 | | 0.18 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.43 | 1.00 | |
| Satd. Flow (perm) | 1155 | 1435 | | 605 | 1632 | 1387 | 3203 | 3270 | 1492 | 746 | 3211 | |
| 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) | 151 | 58 | 239 | 315 | 156 | 247 | 209 | 535 | 420 | 188 | 509 | 106 |
| RTOR Reduction (vph) | 0 | 116 | 0 | 0 | 0 | 197 | 0 | 0 | 236 | 0 | 12 | 0 |
| Lane Group Flow (vph) | 151 | 181 | 0 | 315 | 156 | 50 | 209 | 535 | 184 | 188 | 603 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | Prot | NA | Perm | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Actuated Green, G (s) | 27.5 | 18.5 | | 36.0 | 23.0 | 23.0 | 12.3 | 49.5 | 49.5 | 58.0 | 46.6 | |
| Effective Green, g (s) | 27.5 | 18.5 | | 36.0 | 23.0 | 23.0 | 12.3 | 49.5 | 49.5 | 58.0 | 46.6 | |
| Actuated g/C Ratio | 0.24 | 0.16 | | 0.32 | 0.20 | 0.20 | 0.11 | 0.44 | 0.44 | 0.51 | 0.41 | |
| Clearance Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 322 | 235 | | 507 | 332 | 282 | 348 | 1433 | 654 | 476 | 1325 | |
| v/s Ratio Prot | 0.04 | c0.13 | | c0.07 | 0.10 | | c0.07 | c0.16 | | 0.04 | c0.19 | |
| v/s Ratio Perm | 0.08 | | | 0.12 | | 0.04 | | | 0.12 | 0.16 | | |
| v/c Ratio | 0.47 | 0.77 | | 0.62 | 0.47 | 0.18 | 0.60 | 0.37 | 0.28 | 0.39 | 0.46 | |
| Uniform Delay, d1 | 35.5 | 45.2 | | 30.4 | 39.6 | 37.1 | 48.0 | 21.3 | 20.3 | 15.1 | 24.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.1 | 14.0 | | 2.4 | 1.1 | 0.3 | 2.9 | 0.7 | 1.1 | 0.5 | 1.1 | |
| Delay (s) | 36.6 | 59.2 | | 32.8 | 40.6 | 37.4 | 50.9 | 22.0 | 21.4 | 15.6 | 25.1 | |
| Level of Service | D | E | | C | D | D | D | C | C | B | C | |
| Approach Delay (s) | | 51.6 | | | 36.1 | | | 27.0 | | | 22.9 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 31.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.57 | | |
| Actuated Cycle Length (s) | 112.9 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 73.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

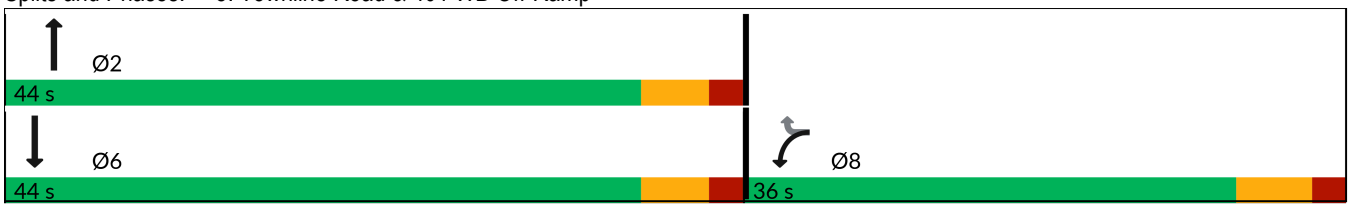
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 377 | 225 | 942 | 0 | 0 | 774 |
| Future Volume (vph) | 377 | 225 | 942 | 0 | 0 | 774 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 78 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 377 | 225 | 942 | 0 | 0 | 774 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 377 | 225 | 942 | 0 | 0 | 774 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (%) | 45.0% | 45.0% | 55.0% | | | 55.0% |
| Maximum Green (s) | 29.5 | 29.5 | 38.0 | | | 38.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 33.0 | | | 33.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 13.5 | 13.5 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.59 | | | 0.59 |
| v/c Ratio | 0.58 | 0.61 | 0.45 | | | 0.37 |
| Control Delay (s/veh) | 26.4 | 22.2 | 8.6 | | | 7.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 26.4 | 22.2 | 8.6 | | | 7.9 |
| LOS | C | C | A | | | A |
| Approach Delay (s/veh) | 24.8 | | 8.6 | | | 7.9 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 64.2 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.61 | | | |
| Intersection Signal Delay (s/veh): 12.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 51.6% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 377 | 225 | 942 | 774 |
| v/c Ratio | 0.58 | 0.61 | 0.45 | 0.37 |
| Control Delay (s/veh) | 26.4 | 22.2 | 8.6 | 7.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 26.4 | 22.2 | 8.6 | 7.9 |
| Queue Length 50th (m) | 20.8 | 15.4 | 27.5 | 21.2 |
| Queue Length 95th (m) | 32.0 | 34.2 | 51.3 | 40.4 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1420 | 713 | 2099 | 2078 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.27 | 0.32 | 0.45 | 0.37 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 377 | 225 | 942 | 0 | 0 | 774 |
| Future Volume (vph) | 377 | 225 | 942 | 0 | 0 | 774 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 377 | 225 | 942 | 0 | 0 | 774 |
| RTOR Reduction (vph) | 0 | 62 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 377 | 163 | 942 | 0 | 0 | 774 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 13.5 | 13.5 | 38.1 | | | 38.1 |
| Effective Green, g (s) | 13.5 | 13.5 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.59 | | | 0.59 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 648 | 306 | 2101 | | | 2080 |
| v/s Ratio Prot | c0.12 | | c0.27 | | | 0.22 |
| v/s Ratio Perm | | 0.11 | | | | |
| v/c Ratio | 0.58 | 0.53 | 0.45 | | | 0.37 |
| Uniform Delay, d1 | 22.8 | 22.5 | 7.2 | | | 6.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.3 | 1.8 | 0.7 | | | 0.5 |
| Delay (s) | 24.1 | 24.3 | 7.9 | | | 7.3 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 24.2 | | 7.9 | | | 7.3 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 11.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.48 | | |
| Actuated Cycle Length (s) | 64.1 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 51.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

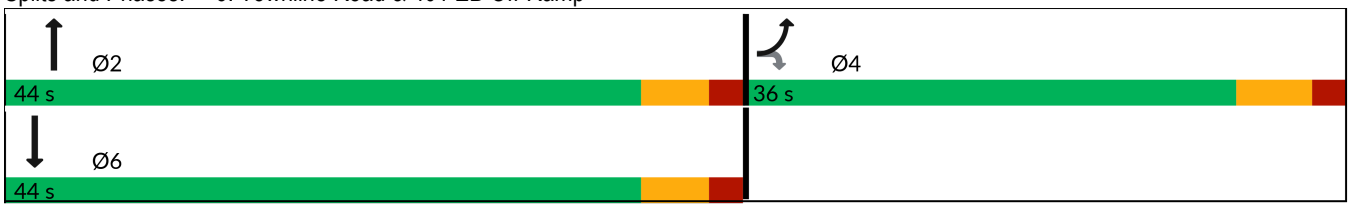
c Critical Lane Group

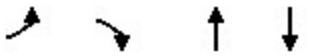
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 393 | 421 | 0 | 726 | 980 | 169 |
| Future Volume (vph) | 393 | 421 | 0 | 726 | 980 | 169 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.978 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1456 | 0 | 3500 | 3433 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1635 | 1456 | 0 | 3500 | 3433 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 69 | | | 33 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Adj. Flow (vph) | 393 | 421 | 0 | 726 | 980 | 169 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 393 | 421 | 0 | 726 | 1149 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (%) | 45.0% | 45.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 32.0 | 32.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 23.0 | 23.0 | | 38.3 | 38.3 | |
| Actuated g/C Ratio | 0.31 | 0.31 | | 0.52 | 0.52 | |
| v/c Ratio | 0.77 | 0.84 | | 0.40 | 0.64 | |
| Control Delay (s/veh) | 33.8 | 35.5 | | 12.7 | 15.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 33.8 | 35.5 | | 12.7 | 15.6 | |
| LOS | C | D | | B | B | |
| Approach Delay (s/veh) | 34.7 | | | 12.7 | 15.6 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 73.9 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.84 | | | |
| Intersection Signal Delay (s/veh): 20.6 | | Intersection LOS: C | |
| Intersection Capacity Utilization 71.2% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 393 | 421 | 726 | 1149 |
| v/c Ratio | 0.77 | 0.84 | 0.40 | 0.64 |
| Control Delay (s/veh) | 33.8 | 35.5 | 12.7 | 15.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 33.8 | 35.5 | 12.7 | 15.6 |
| Queue Length 50th (m) | 48.6 | 45.3 | 31.8 | 58.0 |
| Queue Length 95th (m) | 78.1 | #79.4 | 50.0 | 88.7 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 657 | 627 | 1813 | 1794 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.60 | 0.67 | 0.40 | 0.64 |

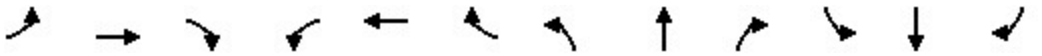
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 393 | 421 | 0 | 726 | 980 | 169 |
| Future Volume (vph) | 393 | 421 | 0 | 726 | 980 | 169 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1456 | | 3500 | 3433 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1635 | 1456 | | 3500 | 3433 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 393 | 421 | 0 | 726 | 980 | 169 |
| RTOR Reduction (vph) | 0 | 47 | 0 | 0 | 16 | 0 |
| Lane Group Flow (vph) | 393 | 374 | 0 | 726 | 1133 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 23.0 | 23.0 | | 38.3 | 38.3 | |
| Effective Green, g (s) | 23.0 | 23.0 | | 38.3 | 38.3 | |
| Actuated g/C Ratio | 0.31 | 0.31 | | 0.52 | 0.52 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 509 | 453 | | 1816 | 1781 | |
| v/s Ratio Prot | 0.24 | | | 0.21 | c0.33 | |
| v/s Ratio Perm | | c0.26 | | | | |
| v/c Ratio | 0.77 | 0.82 | | 0.40 | 0.64 | |
| Uniform Delay, d1 | 23.0 | 23.5 | | 10.8 | 12.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 7.1 | 11.6 | | 0.7 | 1.7 | |
| Delay (s) | 30.2 | 35.1 | | 11.4 | 14.5 | |
| Level of Service | C | D | | B | B | |
| Approach Delay (s/veh) | 32.7 | | | 11.4 | 14.5 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 19.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.71 | | |
| Actuated Cycle Length (s) | 73.8 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 71.2% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

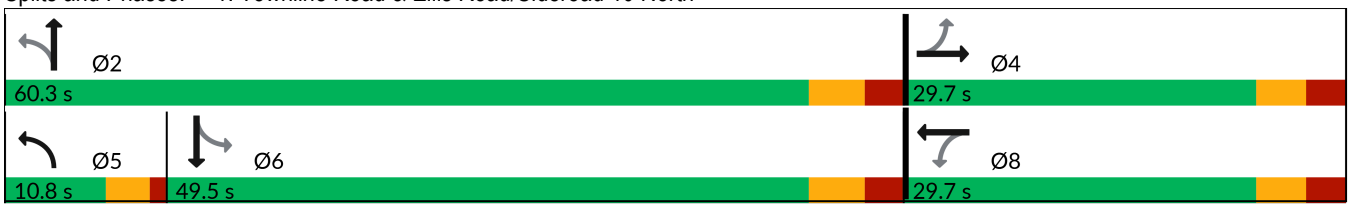


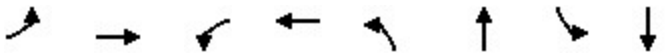
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 94 | 33 | 274 | 64 | 12 | 4 | 128 | 637 | 71 | 4 | 752 | 32 |
| Future Volume (vph) | 94 | 33 | 274 | 64 | 12 | 4 | 128 | 637 | 71 | 4 | 752 | 32 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.866 | | | 0.962 | | | 0.985 | | | 0.994 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1388 | 0 | 1668 | 1570 | 0 | 1603 | 1544 | 0 | 1334 | 1577 | 0 |
| Flt Permitted | 0.747 | | | 0.310 | | | 0.189 | | | 0.390 | | |
| Satd. Flow (perm) | 1298 | 1388 | 0 | 544 | 1570 | 0 | 319 | 1544 | 0 | 548 | 1577 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 268 | | | 4 | | | 11 | | | 3 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Adj. Flow (vph) | 94 | 33 | 274 | 64 | 12 | 4 | 128 | 637 | 71 | 4 | 752 | 32 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 94 | 307 | 0 | 64 | 16 | 0 | 128 | 708 | 0 | 4 | 784 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 9.0 | 49.5 | | 49.5 | 49.5 | |
| Total Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 10.8 | 60.3 | | 49.5 | 49.5 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 12.0% | 67.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 23.7 | 23.7 | | 23.7 | 23.7 | | 6.8 | 54.0 | | 43.2 | 43.2 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 35.2 | | 35.2 | 35.2 | |
| Flash Don't Walk (s) | 13.7 | 13.7 | | 13.7 | 13.7 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 12.9 | 12.9 | | 12.9 | 12.9 | | 56.6 | 54.3 | | 45.8 | 45.8 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.71 | 0.68 | | 0.58 | 0.58 | |
| v/c Ratio | 0.45 | 0.68 | | 0.73 | 0.06 | | 0.38 | 0.67 | | 0.01 | 0.86 | |
| Control Delay (s/veh) | 36.3 | 14.5 | | 73.7 | 23.2 | | 8.0 | 12.6 | | 10.8 | 29.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.2 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 36.3 | 14.5 | | 73.7 | 23.2 | | 8.0 | 12.8 | | 10.8 | 29.4 | |
| LOS | D | B | | E | C | | A | B | | B | C | |
| Approach Delay (s/veh) | | 19.6 | | | 63.6 | | | 12.1 | | | 29.3 | |
| Approach LOS | | B | | | E | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 79.5 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.86 | | | |
| Intersection Signal Delay (s/veh): 21.9 | | Intersection LOS: C | |
| Intersection Capacity Utilization 99.6% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

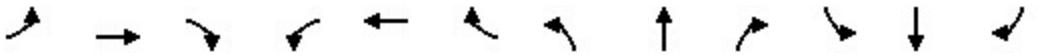




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 94 | 307 | 64 | 16 | 128 | 708 | 4 | 784 |
| v/c Ratio | 0.45 | 0.68 | 0.73 | 0.06 | 0.38 | 0.67 | 0.01 | 0.86 |
| Control Delay (s/veh) | 36.3 | 14.5 | 73.7 | 23.2 | 8.0 | 12.6 | 10.8 | 29.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.3 | 14.5 | 73.7 | 23.2 | 8.0 | 12.8 | 10.8 | 29.4 |
| Queue Length 50th (m) | 12.9 | 5.1 | 9.2 | 1.5 | 4.9 | 51.2 | 0.3 | 97.3 |
| Queue Length 95th (m) | 25.9 | 27.7 | 22.4 | 6.3 | 13.9 | 121.3 | 2.0 | #207.5 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 388 | 603 | 162 | 473 | 337 | 1057 | 315 | 910 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 47 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.24 | 0.51 | 0.40 | 0.03 | 0.38 | 0.70 | 0.01 | 0.86 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 94 | 33 | 274 | 64 | 12 | 4 | 128 | 637 | 71 | 4 | 752 | 32 |
| Future Volume (vph) | 94 | 33 | 274 | 64 | 12 | 4 | 128 | 637 | 71 | 4 | 752 | 32 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1388 | | 1668 | 1570 | | 1603 | 1544 | | 1334 | 1576 | |
| Flt Permitted | 0.75 | 1.00 | | 0.31 | 1.00 | | 0.19 | 1.00 | | 0.39 | 1.00 | |
| Satd. Flow (perm) | 1298 | 1388 | | 544 | 1570 | | 319 | 1544 | | 547 | 1576 | |
| 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) | 94 | 33 | 274 | 64 | 12 | 4 | 128 | 637 | 71 | 4 | 752 | 32 |
| RTOR Reduction (vph) | 0 | 225 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 94 | 82 | 0 | 64 | 13 | 0 | 128 | 705 | 0 | 4 | 783 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 12.9 | 12.9 | | 12.9 | 12.9 | | 55.1 | 55.1 | | 45.8 | 45.8 | |
| Effective Green, g (s) | 12.9 | 12.9 | | 12.9 | 12.9 | | 55.1 | 55.1 | | 45.8 | 45.8 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.69 | 0.69 | | 0.57 | 0.57 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 208 | 222 | | 87 | 252 | | 303 | 1059 | | 311 | 898 | |
| v/s Ratio Prot | | 0.06 | | | 0.01 | | 0.03 | c0.46 | | | c0.50 | |
| v/s Ratio Perm | 0.07 | | | c0.12 | | | 0.26 | | | 0.01 | | |
| v/c Ratio | 0.45 | 0.37 | | 0.74 | 0.05 | | 0.42 | 0.67 | | 0.01 | 0.87 | |
| Uniform Delay, d1 | 30.5 | 30.1 | | 32.1 | 28.5 | | 8.9 | 7.3 | | 7.5 | 14.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.6 | 1.0 | | 27.3 | 0.1 | | 1.0 | 3.3 | | 0.1 | 11.4 | |
| Delay (s) | 32.1 | 31.1 | | 59.3 | 28.6 | | 9.9 | 10.6 | | 7.5 | 26.1 | |
| Level of Service | C | C | | E | C | | A | B | | A | C | |
| Approach Delay (s/veh) | | 31.3 | | | 53.2 | | | 10.5 | | | 26.0 | |
| Approach LOS | | C | | | D | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 21.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.84 | | |
| Actuated Cycle Length (s) | 80.3 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 99.6% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

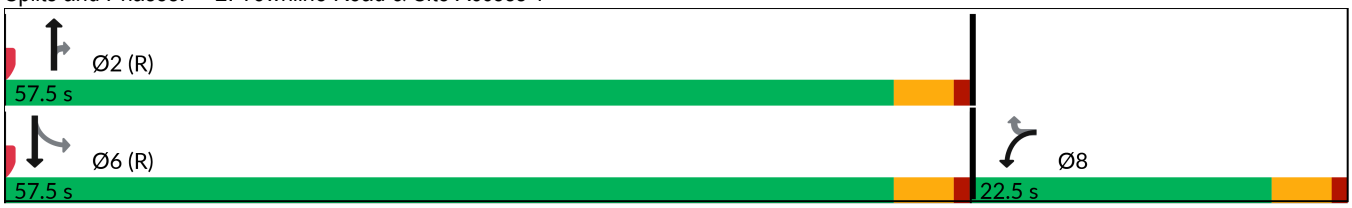
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 15 | 7 | 829 | 75 | 100 | 988 |
| Future Volume (vph) | 15 | 7 | 829 | 75 | 100 | 988 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.324 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 597 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 7 | | 75 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 15 | 7 | 829 | 75 | 100 | 988 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 15 | 7 | 829 | 75 | 100 | 988 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 57.5 | 57.5 | 57.5 | 57.5 |
| Total Split (%) | 28.1% | 28.1% | 71.9% | 71.9% | 71.9% | 71.9% |
| Maximum Green (s) | 18.0 | 18.0 | 53.0 | 53.0 | 53.0 | 53.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 6.3 | 6.3 | 73.5 | 73.5 | 73.5 | 73.5 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.92 | 0.92 | 0.92 | 0.92 |
| v/c Ratio | 0.12 | 0.06 | 0.52 | 0.06 | 0.18 | 0.58 |
| Control Delay (s/veh) | 35.7 | 21.0 | 3.2 | 0.6 | 2.2 | 3.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay (s/veh) | 35.7 | 21.0 | 3.2 | 0.6 | 2.2 | 3.8 |
| LOS | D | C | A | A | A | A |
| Approach Delay (s/veh) | 31.0 | | 3.0 | | | 3.6 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.58 | | | |
| Intersection Signal Delay (s/veh): 3.7 | | Intersection LOS: A | |
| Intersection Capacity Utilization 67.7% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

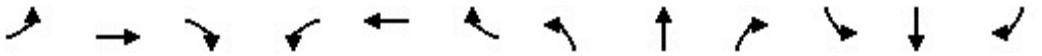


| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 15 | 7 | 829 | 75 | 100 | 988 |
| v/c Ratio | 0.12 | 0.06 | 0.52 | 0.06 | 0.18 | 0.58 |
| Control Delay (s/veh) | 35.7 | 21.0 | 3.2 | 0.6 | 2.2 | 3.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay (s/veh) | 35.7 | 21.0 | 3.2 | 0.6 | 2.2 | 3.8 |
| Queue Length 50th (m) | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Queue Length 95th (m) | 7.5 | 3.6 | 58.5 | 1.9 | 6.3 | 78.3 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 365 | 332 | 1581 | 1350 | 548 | 1692 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 54 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.04 | 0.02 | 0.52 | 0.06 | 0.18 | 0.60 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 15 | 7 | 829 | 75 | 100 | 988 |
| Future Volume (vph) | 15 | 7 | 829 | 75 | 100 | 988 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.32 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 597 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 15 | 7 | 829 | 75 | 100 | 988 |
| RTOR Reduction (vph) | 0 | 7 | 0 | 11 | 0 | 0 |
| Lane Group Flow (vph) | 15 | 0 | 829 | 64 | 100 | 988 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 2.9 | 2.9 | 68.1 | 68.1 | 68.1 | 68.1 |
| Effective Green, g (s) | 2.9 | 2.9 | 68.1 | 68.1 | 68.1 | 68.1 |
| Actuated g/C Ratio | 0.04 | 0.04 | 0.85 | 0.85 | 0.85 | 0.85 |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 58 | 52 | 1465 | 1245 | 508 | 1568 |
| v/s Ratio Prot | c0.01 | | 0.48 | | | c0.54 |
| v/s Ratio Perm | | 0.00 | | 0.04 | 0.17 | |
| v/c Ratio | 0.26 | 0.00 | 0.57 | 0.05 | 0.20 | 0.63 |
| Uniform Delay, d1 | 37.5 | 37.2 | 1.7 | 0.9 | 1.1 | 1.9 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.4 | 0.0 | 1.6 | 0.1 | 0.9 | 1.9 |
| Delay (s) | 39.9 | 37.2 | 3.3 | 1.0 | 1.9 | 3.8 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 39.0 | | 3.1 | | | 3.7 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 3.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 67.7% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

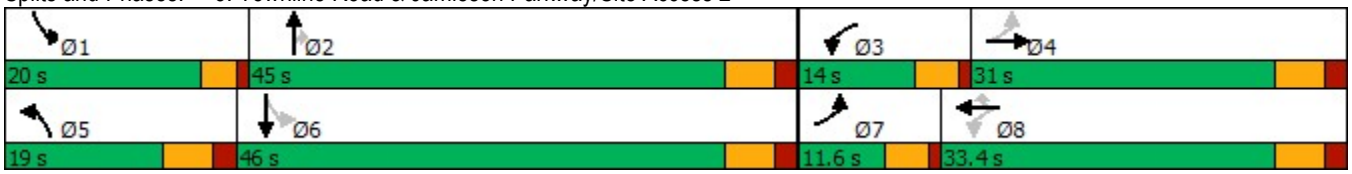


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 151 | 20 | 323 | 111 | 53 | 152 | 287 | 597 | 413 | 53 | 792 | 173 |
| Future Volume (vph) | 151 | 20 | 323 | 111 | 53 | 152 | 287 | 597 | 413 | 53 | 792 | 173 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 1 | 2 | | 1 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | | | | | 1.00 | | | | 1.00 | |
| Frt | | 0.859 | | | | 0.850 | | | 0.850 | | 0.973 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1635 | 1363 | 0 | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3168 | 0 |
| Flt Permitted | 0.722 | | | 0.325 | | | 0.950 | | | 0.426 | | |
| Satd. Flow (perm) | 1242 | 1363 | 0 | 1107 | 1632 | 1387 | 3202 | 3302 | 1492 | 748 | 3168 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 323 | | | | 152 | | | 413 | | 27 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 157.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 9.4 | | | 20.1 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| 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% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Adj. Flow (vph) | 151 | 20 | 323 | 111 | 53 | 152 | 287 | 597 | 413 | 53 | 792 | 173 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 151 | 343 | 0 | 111 | 53 | 152 | 287 | 597 | 413 | 53 | 965 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | Prot | NA | Perm | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | | 5.0 | 8.0 | 8.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 9.5 | 31.0 | | 9.5 | 31.0 | 31.0 | 11.0 | 41.0 | 41.0 | 9.0 | 41.0 | |
| Total Split (s) | 11.6 | 31.0 | | 14.0 | 33.4 | 33.4 | 19.0 | 45.0 | 45.0 | 20.0 | 46.0 | |
| Total Split (%) | 10.5% | 28.2% | | 12.7% | 30.4% | 30.4% | 17.3% | 40.9% | 40.9% | 18.2% | 41.8% | |
| Maximum Green (s) | 7.1 | 25.0 | | 9.5 | 27.4 | 27.4 | 13.0 | 39.0 | 39.0 | 16.0 | 40.0 | |
| Yellow Time (s) | 3.5 | 4.0 | | 3.5 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 14.0 | 14.0 | | 14.0 | |
| Flash Dont Walk (s) | | 18.0 | | | 18.0 | 18.0 | | 21.0 | 21.0 | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | 0 | | 0 | |
| Act Effct Green (s) | 20.2 | 11.5 | | 21.6 | 12.3 | 12.3 | 12.2 | 49.8 | 49.8 | 48.9 | 40.2 | |
| Actuated g/C Ratio | 0.21 | 0.12 | | 0.23 | 0.13 | 0.13 | 0.13 | 0.53 | 0.53 | 0.52 | 0.43 | |
| v/c Ratio | 0.51 | 0.76 | | 0.26 | 0.25 | 0.49 | 0.69 | 0.34 | 0.42 | 0.12 | 0.71 | |
| Control Delay | 35.3 | 17.6 | | 27.2 | 39.1 | 11.6 | 49.9 | 15.2 | 3.2 | 9.1 | 26.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 35.3 | 17.6 | | 27.2 | 39.1 | 11.6 | 49.9 | 15.2 | 3.2 | 9.1 | 26.2 | |
| LOS | D | B | | C | D | B | D | B | A | A | C | |
| Approach Delay | | 23.0 | | | 21.7 | | | 19.1 | | | 25.3 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 110 | | | |
| Actuated Cycle Length: 94.4 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.76 | | | |
| Intersection Signal Delay: 22.0 | | Intersection LOS: C | |
| Intersection Capacity Utilization 85.3% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 151 | 343 | 111 | 53 | 152 | 287 | 597 | 413 | 53 | 965 |
| v/c Ratio | 0.51 | 0.76 | 0.26 | 0.25 | 0.49 | 0.69 | 0.34 | 0.42 | 0.12 | 0.71 |
| Control Delay | 35.3 | 17.6 | 27.2 | 39.1 | 11.6 | 49.9 | 15.2 | 3.2 | 9.1 | 26.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 35.3 | 17.6 | 27.2 | 39.1 | 11.6 | 49.9 | 15.2 | 3.2 | 9.1 | 26.2 |
| Queue Length 50th (m) | 22.3 | 3.3 | 7.9 | 8.9 | 0.0 | 24.8 | 29.8 | 0.0 | 2.8 | 67.7 |
| Queue Length 95th (m) | 37.9 | 30.6 | 14.0 | 19.1 | 15.8 | #46.9 | 58.4 | 16.8 | 9.9 | 116.8 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | | 133.4 | | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | | 115.0 | | | 115.0 | |
| Base Capacity (vph) | 294 | 599 | 488 | 475 | 512 | 443 | 1741 | 981 | 618 | 1364 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.51 | 0.57 | 0.23 | 0.11 | 0.30 | 0.65 | 0.34 | 0.42 | 0.09 | 0.71 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 151 | 20 | 323 | 111 | 53 | 152 | 287 | 597 | 413 | 53 | 792 | 173 |
| Future Volume (vph) | 151 | 20 | 323 | 111 | 53 | 152 | 287 | 597 | 413 | 53 | 792 | 173 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.86 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1363 | | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3169 | |
| Flt Permitted | 0.72 | 1.00 | | 0.33 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.43 | 1.00 | |
| Satd. Flow (perm) | 1243 | 1363 | | 1107 | 1632 | 1387 | 3203 | 3302 | 1492 | 748 | 3169 | |
| 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) | 151 | 20 | 323 | 111 | 53 | 152 | 287 | 597 | 413 | 53 | 792 | 173 |
| RTOR Reduction (vph) | 0 | 284 | 0 | 0 | 0 | 132 | 0 | 0 | 197 | 0 | 15 | 0 |
| Lane Group Flow (vph) | 151 | 59 | 0 | 111 | 53 | 20 | 287 | 597 | 216 | 53 | 950 | 0 |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| Heavy Vehicles (%) | 2% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | Prot | NA | Perm | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Actuated Green, G (s) | 18.6 | 11.5 | | 20.2 | 12.3 | 12.3 | 12.2 | 49.8 | 49.8 | 46.6 | 41.1 | |
| Effective Green, g (s) | 18.6 | 11.5 | | 20.2 | 12.3 | 12.3 | 12.2 | 49.8 | 49.8 | 46.6 | 41.1 | |
| Actuated g/C Ratio | 0.20 | 0.12 | | 0.21 | 0.13 | 0.13 | 0.13 | 0.52 | 0.52 | 0.49 | 0.43 | |
| Clearance Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 272 | 164 | | 411 | 210 | 179 | 410 | 1727 | 780 | 419 | 1368 | |
| v/s Ratio Prot | c0.04 | 0.04 | | 0.02 | 0.03 | | c0.09 | 0.18 | | 0.01 | c0.30 | |
| v/s Ratio Perm | c0.07 | | | 0.03 | | 0.01 | | | 0.14 | 0.05 | | |
| v/c Ratio | 0.56 | 0.36 | | 0.27 | 0.25 | 0.11 | 0.70 | 0.35 | 0.28 | 0.13 | 0.69 | |
| Uniform Delay, d1 | 34.0 | 38.5 | | 31.0 | 37.3 | 36.6 | 39.7 | 13.2 | 12.7 | 12.8 | 22.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.4 | 1.4 | | 0.4 | 0.6 | 0.3 | 5.2 | 0.5 | 0.9 | 0.1 | 2.9 | |
| Delay (s) | 36.4 | 39.8 | | 31.3 | 37.9 | 36.9 | 44.9 | 13.8 | 13.5 | 12.9 | 24.9 | |
| Level of Service | D | D | | C | D | D | D | B | B | B | C | |
| Approach Delay (s) | | 38.8 | | | 35.1 | | | 20.6 | | | 24.3 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 26.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 95.2 | Sum of lost time (s) | 22.5 |
| Intersection Capacity Utilization | 85.3% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 559 | 204 | 1113 | 0 | 0 | 839 |
| Future Volume (vph) | 559 | 204 | 1113 | 0 | 0 | 839 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 67 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 559 | 204 | 1113 | 0 | 0 | 839 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 559 | 204 | 1113 | 0 | 0 | 839 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (%) | 40.0% | 40.0% | 60.0% | | | 60.0% |
| Maximum Green (s) | 29.5 | 29.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 21.5 | 21.5 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.26 | 0.26 | 0.59 | | | 0.59 |
| v/c Ratio | 0.75 | 0.50 | 0.54 | | | 0.41 |
| Control Delay (s/veh) | 34.4 | 21.0 | 12.4 | | | 10.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 34.4 | 21.0 | 12.4 | | | 10.7 |
| LOS | C | C | B | | | B |
| Approach Delay (s/veh) | 30.9 | | 12.4 | | | 10.7 |
| Approach LOS | C | | B | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 82.2 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.75 | | | |
| Intersection Signal Delay (s/veh): 17.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 58.3% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp

| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 559 | 204 | 1113 | 839 |
| v/c Ratio | 0.75 | 0.50 | 0.54 | 0.41 |
| Control Delay (s/veh) | 34.4 | 21.0 | 12.4 | 10.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.4 | 21.0 | 12.4 | 10.7 |
| Queue Length 50th (m) | 41.2 | 17.5 | 51.1 | 34.5 |
| Queue Length 95th (m) | 57.6 | 36.5 | 84.1 | 58.1 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1031 | 538 | 2051 | 2051 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.54 | 0.38 | 0.54 | 0.41 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 559 | 204 | 1113 | 0 | 0 | 839 |
| Future Volume (vph) | 559 | 204 | 1113 | 0 | 0 | 839 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 559 | 204 | 1113 | 0 | 0 | 839 |
| RTOR Reduction (vph) | 0 | 49 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 559 | 155 | 1113 | 0 | 0 | 839 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 21.5 | 21.5 | 48.2 | | | 48.2 |
| Effective Green, g (s) | 21.5 | 21.5 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.26 | 0.26 | 0.59 | | | 0.59 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 748 | 359 | 2052 | | | 2052 |
| v/s Ratio Prot | c0.20 | | c0.32 | | | 0.24 |
| v/s Ratio Perm | | 0.11 | | | | |
| v/c Ratio | 0.75 | 0.43 | 0.54 | | | 0.41 |
| Uniform Delay, d1 | 27.9 | 25.3 | 10.3 | | | 9.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 4.1 | 0.8 | 1.0 | | | 0.6 |
| Delay (s) | 32.0 | 26.1 | 11.3 | | | 9.9 |
| Level of Service | C | C | B | | | A |
| Approach Delay (s/veh) | 30.4 | | 11.3 | | | 9.9 |
| Approach LOS | C | | B | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 16.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 82.2 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 58.3% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

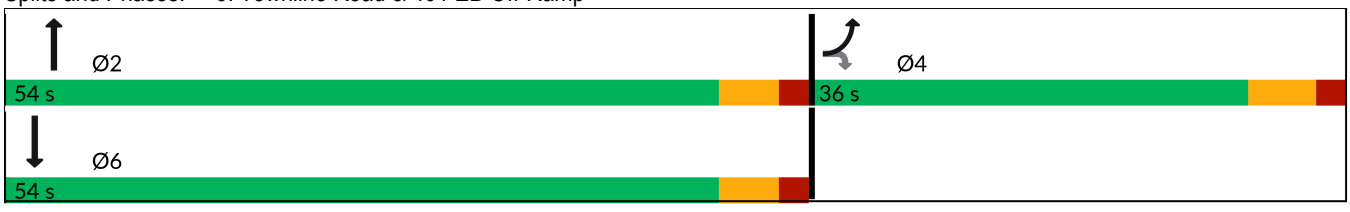
c Critical Lane Group

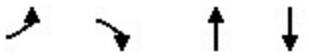
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 482 | 505 | 0 | 1088 | 1211 | 186 |
| Future Volume (vph) | 482 | 505 | 0 | 1088 | 1211 | 186 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.980 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1603 | 1414 | 0 | 3433 | 3298 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1603 | 1414 | 0 | 3433 | 3298 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 52 | | | 29 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Adj. Flow (vph) | 482 | 505 | 0 | 1088 | 1211 | 186 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 482 | 505 | 0 | 1088 | 1397 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 54.0 | 42.0 | |
| Total Split (s) | 36.0 | 36.0 | | 54.0 | 54.0 | |
| Total Split (%) | 40.0% | 40.0% | | 60.0% | 60.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 10.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 19.5 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| v/c Ratio | 0.92 | 1.01 | | 0.59 | 0.79 | |
| Control Delay (s/veh) | 54.4 | 73.0 | | 16.0 | 20.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 54.4 | 73.0 | | 16.0 | 20.6 | |
| LOS | D | E | | B | C | |
| Approach Delay (s/veh) | 63.9 | | | 16.0 | 20.6 | |
| Approach LOS | E | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.01 | | | |
| Intersection Signal Delay (s/veh): 31.5 | | Intersection LOS: C | |
| Intersection Capacity Utilization 83.8% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 482 | 505 | 1088 | 1397 |
| v/c Ratio | 0.92 | 1.01 | 0.59 | 0.79 |
| Control Delay (s/veh) | 54.4 | 73.0 | 16.0 | 20.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 54.4 | 73.0 | 16.0 | 20.6 |
| Queue Length 50th (m) | 79.3 | ~82.1 | 63.7 | 94.6 |
| Queue Length 95th (m) | #136.7 | #145.8 | 82.5 | 122.8 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 525 | 498 | 1830 | 1772 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.92 | 1.01 | 0.59 | 0.79 |

Intersection Summary

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

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 482 | 505 | 0 | 1088 | 1211 | 186 |
| Future Volume (vph) | 482 | 505 | 0 | 1088 | 1211 | 186 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1603 | 1414 | | 3433 | 3298 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1603 | 1414 | | 3433 | 3298 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 482 | 505 | 0 | 1088 | 1211 | 186 |
| RTOR Reduction (vph) | 0 | 35 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 482 | 470 | 0 | 1088 | 1383 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Effective Green, g (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 525 | 463 | | 1830 | 1758 | |
| v/s Ratio Prot | 0.30 | | | 0.32 | c0.42 | |
| v/s Ratio Perm | | c0.33 | | | | |
| v/c Ratio | 0.92 | 1.02 | | 0.59 | 0.79 | |
| Uniform Delay, d1 | 29.1 | 30.3 | | 14.4 | 16.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 21.0 | 45.7 | | 1.4 | 3.6 | |
| Delay (s) | 50.1 | 76.0 | | 15.8 | 20.5 | |
| Level of Service | D | E | | B | C | |
| Approach Delay (s/veh) | 63.3 | | | 15.8 | 20.5 | |
| Approach LOS | E | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 31.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.87 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 83.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

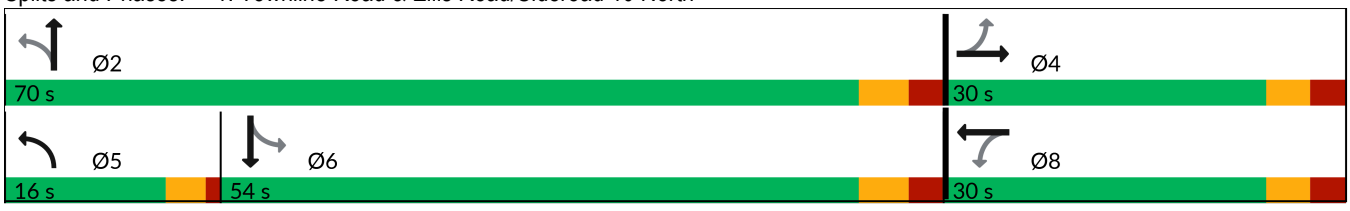
c Critical Lane Group

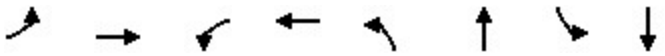
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 44 | 23 | 173 | 104 | 43 | 11 | 403 | 1067 | 107 | 9 | 607 | 65 |
| Future Volume (vph) | 44 | 23 | 173 | 104 | 43 | 11 | 403 | 1067 | 107 | 9 | 607 | 65 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.868 | | | 0.969 | | | 0.986 | | | 0.985 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1392 | 0 | 1635 | 1581 | 0 | 1668 | 1594 | 0 | 1668 | 1548 | 0 |
| Flt Permitted | 0.722 | | | 0.497 | | | 0.223 | | | 0.098 | | |
| Satd. Flow (perm) | 1267 | 1392 | 0 | 855 | 1581 | 0 | 391 | 1594 | 0 | 172 | 1548 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 173 | | | 11 | | | 10 | | | 7 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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 (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 44 | 23 | 173 | 104 | 43 | 11 | 403 | 1067 | 107 | 9 | 607 | 65 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 44 | 196 | 0 | 104 | 54 | 0 | 403 | 1174 | 0 | 9 | 672 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 9.0 | 54.0 | | 54.0 | 54.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 16.0 | 70.0 | | 54.0 | 54.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 16.0% | 70.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 12.0 | 63.7 | | 47.7 | 47.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 39.7 | | 39.7 | 39.7 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 15.3 | 15.3 | | 15.3 | 15.3 | | 66.3 | 64.0 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.17 | 0.17 | | 0.72 | 0.70 | | 0.52 | 0.52 | |
| v/c Ratio | 0.21 | 0.52 | | 0.73 | 0.20 | | 0.90 | 1.05 | | 0.10 | 0.83 | |
| Control Delay (s/veh) | 34.2 | 12.5 | | 64.3 | 28.1 | | 34.4 | 59.1 | | 17.0 | 30.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 19.2 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 34.2 | 12.5 | | 64.3 | 28.1 | | 34.4 | 78.4 | | 17.0 | 30.3 | |
| LOS | C | B | | E | C | | C | E | | B | C | |
| Approach Delay (s/veh) | | 16.5 | | | 51.9 | | | 67.1 | | | 30.1 | |
| Approach LOS | | B | | | D | | | E | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 91.6 | | | |
| Natural Cycle: 125 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.05 | | | |
| Intersection Signal Delay (s/veh): 52.1 | | Intersection LOS: D | |
| Intersection Capacity Utilization 116.7% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 44 | 196 | 104 | 54 | 403 | 1174 | 9 | 672 |
| v/c Ratio | 0.21 | 0.52 | 0.73 | 0.20 | 0.90 | 1.05 | 0.10 | 0.83 |
| Control Delay (s/veh) | 34.2 | 12.5 | 64.3 | 28.1 | 34.4 | 59.1 | 17.0 | 30.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.2 | 12.5 | 64.3 | 28.1 | 34.4 | 78.4 | 17.0 | 30.3 |
| Queue Length 50th (m) | 6.7 | 3.5 | 17.5 | 6.5 | 23.4 | ~226.8 | 0.8 | 92.9 |
| Queue Length 95th (m) | 15.7 | 21.3 | 34.9 | 16.3 | #80.8 | #347.4 | 4.3 | #188.2 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 333 | 493 | 225 | 423 | 450 | 1116 | 89 | 812 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 58 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.40 | 0.46 | 0.13 | 0.90 | 1.11 | 0.10 | 0.83 |

Intersection Summary

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

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 44 | 23 | 173 | 104 | 43 | 11 | 403 | 1067 | 107 | 9 | 607 | 65 |
| Future Volume (vph) | 44 | 23 | 173 | 104 | 43 | 11 | 403 | 1067 | 107 | 9 | 607 | 65 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1391 | | 1635 | 1582 | | 1668 | 1595 | | 1668 | 1549 | |
| Flt Permitted | 0.72 | 1.00 | | 0.50 | 1.00 | | 0.22 | 1.00 | | 0.10 | 1.00 | |
| Satd. Flow (perm) | 1267 | 1391 | | 856 | 1582 | | 391 | 1595 | | 173 | 1549 | |
| 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) | 44 | 23 | 173 | 104 | 43 | 11 | 403 | 1067 | 107 | 9 | 607 | 65 |
| RTOR Reduction (vph) | 0 | 144 | 0 | 0 | 9 | 0 | 0 | 3 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 44 | 52 | 0 | 104 | 45 | 0 | 403 | 1171 | 0 | 9 | 669 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 15.3 | 15.3 | | 15.3 | 15.3 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Effective Green, g (s) | 15.3 | 15.3 | | 15.3 | 15.3 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.17 | 0.17 | | 0.70 | 0.70 | | 0.52 | 0.52 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 211 | 232 | | 143 | 264 | | 440 | 1113 | | 90 | 810 | |
| v/s Ratio Prot | | 0.04 | | | 0.03 | | 0.12 | c0.73 | | | 0.43 | |
| v/s Ratio Perm | 0.03 | | | c0.12 | | | 0.52 | | | 0.05 | | |
| v/c Ratio | 0.21 | 0.22 | | 0.73 | 0.17 | | 0.92 | 1.05 | | 0.10 | 0.83 | |
| Uniform Delay, d1 | 32.9 | 33.0 | | 36.1 | 32.7 | | 13.1 | 13.8 | | 11.0 | 18.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.5 | | 16.8 | 0.3 | | 23.5 | 41.8 | | 2.2 | 9.4 | |
| Delay (s) | 33.4 | 33.5 | | 52.9 | 33.0 | | 36.6 | 55.6 | | 13.2 | 27.7 | |
| Level of Service | C | C | | D | C | | D | E | | B | C | |
| Approach Delay (s/veh) | | 33.4 | | | 46.1 | | | 50.7 | | | 27.5 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 42.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.04 | | |
| Actuated Cycle Length (s) | 91.5 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 116.7% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |

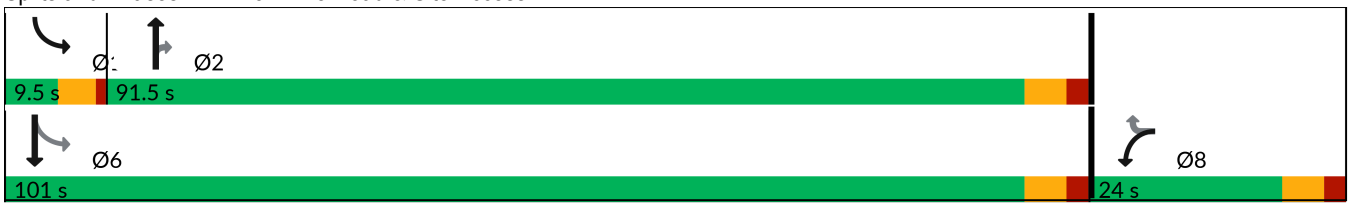
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 55 | 25 | 1553 | 25 | 36 | 848 |
| Future Volume (vph) | 55 | 25 | 1553 | 25 | 36 | 848 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.041 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 76 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 25 | | 16 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 55 | 25 | 1553 | 25 | 36 | 848 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 55 | 25 | 1553 | 25 | 36 | 848 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | 24.0 | 9.5 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 91.5 | 91.5 | 9.5 | 101.0 |
| Total Split (%) | 19.2% | 19.2% | 73.2% | 73.2% | 7.6% | 80.8% |
| Maximum Green (s) | 18.0 | 18.0 | 85.5 | 85.5 | 5.0 | 95.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 3.5 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 4.5 | 6.0 |
| Lead/Lag | | | Lag | Lag | Lead | |
| 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 | Max | Max | None | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | | 0 |
| Act Effct Green (s) | 9.4 | 9.4 | 95.0 | 95.0 | 100.9 | 100.7 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.80 | 0.80 | 0.85 | 0.85 |
| v/c Ratio | 0.43 | 0.18 | 1.13 | 0.02 | 0.27 | 0.54 |
| Control Delay (s/veh) | 61.6 | 20.8 | 83.9 | 2.8 | 7.4 | 5.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| Total Delay (s/veh) | 61.6 | 20.8 | 83.9 | 2.8 | 7.4 | 6.1 |
| LOS | E | C | F | A | A | A |
| Approach Delay (s/veh) | 48.9 | | 82.6 | | | 6.1 |
| Approach LOS | D | | F | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 125 | | | |
| Actuated Cycle Length: 118.4 | | | |
| Natural Cycle: 150 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.13 | | | |
| Intersection Signal Delay (s/veh): 55.0 | | Intersection LOS: D | |
| Intersection Capacity Utilization 101.7% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 55 | 25 | 1553 | 25 | 36 | 848 |
| v/c Ratio | 0.43 | 0.18 | 1.13 | 0.02 | 0.27 | 0.54 |
| Control Delay (s/veh) | 61.6 | 20.8 | 83.9 | 2.8 | 7.4 | 5.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| Total Delay (s/veh) | 61.6 | 20.8 | 83.9 | 2.8 | 7.4 | 6.1 |
| Queue Length 50th (m) | 12.4 | 0.0 | ~442.9 | 0.5 | 1.1 | 51.3 |
| Queue Length 95th (m) | 25.2 | 8.3 | #541.6 | 2.9 | 4.2 | 88.1 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 247 | 242 | 1380 | 1177 | 135 | 1566 |
| Starvation Cap Reductn | 0 | 0 | 1 | 0 | 0 | 431 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.10 | 1.13 | 0.02 | 0.27 | 0.75 |

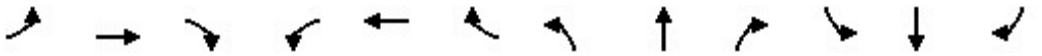
Intersection Summary

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 55 | 25 | 1553 | 25 | 36 | 848 |
| Future Volume (vph) | 55 | 25 | 1553 | 25 | 36 | 848 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 4.5 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.04 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 75 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 55 | 25 | 1553 | 25 | 36 | 848 |
| RTOR Reduction (vph) | 0 | 23 | 0 | 4 | 0 | 0 |
| Lane Group Flow (vph) | 55 | 2 | 1553 | 21 | 36 | 848 |
| Turn Type | Prot | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 8.2 | 8.2 | 93.8 | 93.8 | 101.3 | 101.3 |
| Effective Green, g (s) | 8.2 | 8.2 | 93.8 | 93.8 | 101.3 | 101.3 |
| Actuated g/C Ratio | 0.07 | 0.07 | 0.77 | 0.77 | 0.83 | 0.83 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 4.5 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 109 | 98 | 1328 | 1129 | 103 | 1535 |
| v/s Ratio Prot | c0.03 | | c0.90 | | 0.01 | c0.46 |
| v/s Ratio Perm | | 0.00 | | 0.01 | 0.28 | |
| v/c Ratio | 0.50 | 0.02 | 1.17 | 0.02 | 0.35 | 0.55 |
| Uniform Delay, d1 | 54.7 | 52.9 | 13.9 | 3.2 | 39.0 | 3.1 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 3.6 | 0.1 | 84.7 | 0.0 | 2.1 | 1.4 |
| Delay (s) | 58.3 | 53.0 | 98.5 | 3.2 | 41.1 | 4.6 |
| Level of Service | E | D | F | A | D | A |
| Approach Delay (s/veh) | 56.7 | | 97.0 | | | 6.0 |
| Approach LOS | E | | F | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 64.1 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 1.11 | | |
| Actuated Cycle Length (s) | 121.5 | Sum of lost time (s) | 16.5 |
| Intersection Capacity Utilization | 101.7% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

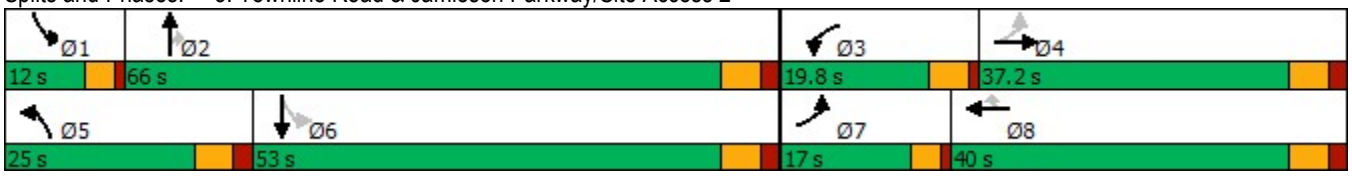


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 245 | 27 | 414 | 310 | 147 | 338 | 406 | 960 | 453 | 113 | 626 | 156 |
| Future Volume (vph) | 245 | 27 | 414 | 310 | 147 | 338 | 406 | 960 | 453 | 113 | 626 | 156 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 1 | 2 | | 1 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.859 | | | | 0.850 | | | 0.850 | | 0.970 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1402 | 0 | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3123 | 0 |
| Flt Permitted | 0.645 | | | 0.950 | | | 0.950 | | | 0.256 | | |
| Satd. Flow (perm) | 1132 | 1402 | 0 | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 449 | 3123 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 285 | | | | 217 | | | 453 | | 25 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 157.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 9.4 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 245 | 27 | 414 | 310 | 147 | 338 | 406 | 960 | 453 | 113 | 626 | 156 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 245 | 441 | 0 | 310 | 147 | 338 | 406 | 960 | 453 | 113 | 782 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | Prot | NA | Perm | Prot | NA | Perm | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | | | 8 | | | 2 | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | | 5.0 | 8.0 | 8.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 9.5 | 31.0 | | 10.0 | 31.0 | 31.0 | 11.0 | 50.4 | 50.4 | 9.0 | 50.4 | |
| Total Split (s) | 17.0 | 37.2 | | 19.8 | 40.0 | 40.0 | 25.0 | 66.0 | 66.0 | 12.0 | 53.0 | |
| Total Split (%) | 12.6% | 27.6% | | 14.7% | 29.6% | 29.6% | 18.5% | 48.9% | 48.9% | 8.9% | 39.3% | |
| Maximum Green (s) | 13.0 | 31.2 | | 14.8 | 34.0 | 34.0 | 19.0 | 60.0 | 60.0 | 8.0 | 47.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 6.0 | | 5.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 23.4 | 23.4 | | 23.4 | |
| Flash Dont Walk (s) | | 18.0 | | | 18.0 | 18.0 | | 21.0 | 21.0 | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | 0 | | 0 | |
| Act Effct Green (s) | 37.0 | 21.9 | | 14.5 | 24.3 | 24.3 | 18.4 | 60.4 | 60.4 | 57.3 | 47.7 | |
| Actuated g/C Ratio | 0.29 | 0.17 | | 0.12 | 0.19 | 0.19 | 0.15 | 0.48 | 0.48 | 0.46 | 0.38 | |
| v/c Ratio | 0.63 | 0.92 | | 0.83 | 0.47 | 0.76 | 0.87 | 0.60 | 0.48 | 0.41 | 0.65 | |
| Control Delay | 40.2 | 42.9 | | 74.9 | 48.9 | 28.3 | 72.3 | 27.3 | 3.8 | 19.2 | 35.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 40.2 | 42.9 | | 74.9 | 48.9 | 28.3 | 72.3 | 27.3 | 3.8 | 19.2 | 35.7 | |
| LOS | D | D | | E | D | C | E | C | A | B | D | |
| Approach Delay | | 41.9 | | | 50.3 | | | 31.5 | | | 33.6 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 135 | | | |
| Actuated Cycle Length: 125.6 | | | |
| Natural Cycle: 115 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.92 | | | |
| Intersection Signal Delay: 37.2 | | Intersection LOS: D | |
| Intersection Capacity Utilization 96.0% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

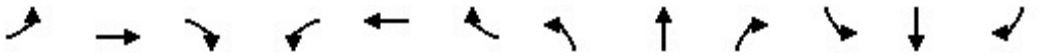
Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 245 | 441 | 310 | 147 | 338 | 406 | 960 | 453 | 113 | 782 |
| v/c Ratio | 0.63 | 0.92 | 0.83 | 0.47 | 0.76 | 0.87 | 0.60 | 0.48 | 0.41 | 0.65 |
| Control Delay | 40.2 | 42.9 | 74.9 | 48.9 | 28.3 | 72.3 | 27.3 | 3.8 | 19.2 | 35.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 40.2 | 42.9 | 74.9 | 48.9 | 28.3 | 72.3 | 27.3 | 3.8 | 19.2 | 35.7 |
| Queue Length 50th (m) | 46.1 | 41.8 | 39.9 | 32.4 | 28.5 | 51.9 | 92.9 | 0.0 | 12.3 | 83.7 |
| Queue Length 95th (m) | 68.6 | #95.6 | #67.5 | 52.4 | 63.3 | #83.7 | 126.6 | 18.7 | 23.9 | 115.0 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | | 133.4 | | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | | 115.0 | | | 115.0 | |
| Base Capacity (vph) | 389 | 564 | 383 | 445 | 535 | 487 | 1588 | 952 | 284 | 1200 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.63 | 0.78 | 0.81 | 0.33 | 0.63 | 0.83 | 0.60 | 0.48 | 0.40 | 0.65 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 245 | 27 | 414 | 310 | 147 | 338 | 406 | 960 | 453 | 113 | 626 | 156 |
| Future Volume (vph) | 245 | 27 | 414 | 310 | 147 | 338 | 406 | 960 | 453 | 113 | 626 | 156 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.0 | 6.0 | | 5.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.86 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1402 | | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3123 | |
| Flt Permitted | 0.65 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.26 | 1.00 | |
| Satd. Flow (perm) | 1133 | 1402 | | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 450 | 3123 | |
| 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) | 245 | 27 | 414 | 310 | 147 | 338 | 406 | 960 | 453 | 113 | 626 | 156 |
| RTOR Reduction (vph) | 0 | 235 | 0 | 0 | 0 | 175 | 0 | 0 | 235 | 0 | 15 | 0 |
| Lane Group Flow (vph) | 245 | 206 | 0 | 310 | 147 | 163 | 406 | 960 | 218 | 113 | 767 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | pm+pt | NA | | Prot | NA | Perm | Prot | NA | Perm | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | | | 8 | | | 2 | 6 | | |
| Actuated Green, G (s) | 35.0 | 21.9 | | 14.5 | 24.3 | 24.3 | 18.4 | 60.4 | 60.4 | 55.4 | 47.7 | |
| Effective Green, g (s) | 35.0 | 21.9 | | 14.5 | 24.3 | 24.3 | 18.4 | 60.4 | 60.4 | 55.4 | 47.7 | |
| Actuated g/C Ratio | 0.28 | 0.17 | | 0.12 | 0.19 | 0.19 | 0.15 | 0.48 | 0.48 | 0.44 | 0.38 | |
| Clearance Time (s) | 4.0 | 6.0 | | 5.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 371 | 244 | | 373 | 315 | 268 | 469 | 1589 | 718 | 273 | 1186 | |
| v/s Ratio Prot | 0.07 | c0.15 | | c0.10 | 0.09 | | c0.13 | 0.29 | | 0.03 | c0.25 | |
| v/s Ratio Perm | 0.12 | | | | | 0.12 | | | 0.15 | 0.16 | | |
| v/c Ratio | 0.66 | 0.84 | | 0.83 | 0.47 | 0.61 | 0.87 | 0.60 | 0.30 | 0.41 | 0.65 | |
| Uniform Delay, d1 | 38.4 | 50.1 | | 54.3 | 44.9 | 46.2 | 52.3 | 23.8 | 19.8 | 21.2 | 32.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 4.4 | 22.4 | | 14.5 | 1.1 | 3.9 | 15.3 | 1.7 | 1.1 | 1.0 | 2.7 | |
| Delay (s) | 42.8 | 72.5 | | 68.8 | 46.0 | 50.1 | 67.7 | 25.5 | 20.9 | 22.2 | 34.7 | |
| Level of Service | D | E | | E | D | D | E | C | C | C | C | |
| Approach Delay (s) | | 61.9 | | | 56.6 | | | 33.8 | | | 33.1 | |
| Approach LOS | | E | | | E | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 42.6 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 125.5 | Sum of lost time (s) | 23.0 |
| Intersection Capacity Utilization | 96.0% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

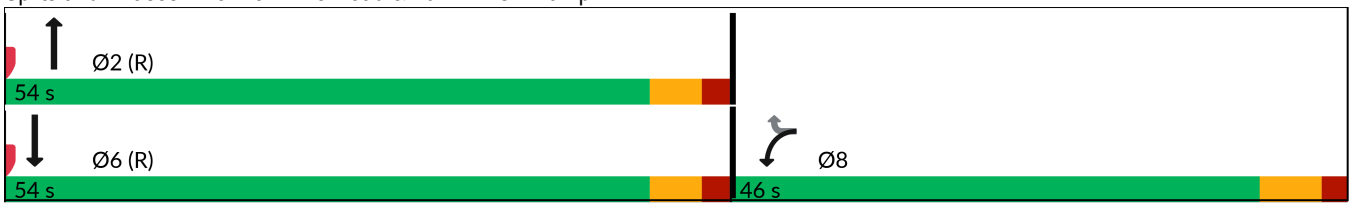
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 560 | 405 | 1530 | 0 | 0 | 960 |
| Future Volume (vph) | 560 | 405 | 1530 | 0 | 0 | 960 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 14 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 560 | 405 | 1530 | 0 | 0 | 960 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 560 | 405 | 1530 | 0 | 0 | 960 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Minimum Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (%) | 46.0% | 46.0% | 54.0% | | | 54.0% |
| Maximum Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 29.5 | 29.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| v/c Ratio | 0.48 | 0.69 | 0.91 | | | 0.57 |
| Control Delay (s/veh) | 24.4 | 31.9 | 33.7 | | | 20.3 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 24.4 | 31.9 | 33.7 | | | 20.3 |
| LOS | C | C | C | | | C |
| Approach Delay (s/veh) | 27.5 | | 33.7 | | | 20.3 |
| Approach LOS | C | | C | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 100 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.91 | | | |
| Intersection Signal Delay (s/veh): 28.2 | | Intersection LOS: C | |
| Intersection Capacity Utilization 79.9% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 560 | 405 | 1530 | 960 |
| v/c Ratio | 0.48 | 0.69 | 0.91 | 0.57 |
| Control Delay (s/veh) | 24.4 | 31.9 | 33.7 | 20.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 24.4 | 31.9 | 33.7 | 20.3 |
| Queue Length 50th (m) | 41.0 | 62.1 | 139.0 | 67.6 |
| Queue Length 95th (m) | 56.0 | 97.2 | #188.6 | 86.2 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1161 | 583 | 1680 | 1680 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.48 | 0.69 | 0.91 | 0.57 |

Intersection Summary

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 560 | 405 | 1530 | 0 | 0 | 960 |
| Future Volume (vph) | 560 | 405 | 1530 | 0 | 0 | 960 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 560 | 405 | 1530 | 0 | 0 | 960 |
| RTOR Reduction (vph) | 0 | 8 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 560 | 397 | 1530 | 0 | 0 | 960 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Effective Green, g (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Grp Cap (vph) | 1161 | 575 | 1680 | | | 1680 |
| v/s Ratio Prot | 0.19 | | c0.44 | | | 0.27 |
| v/s Ratio Perm | | c0.27 | | | | |
| v/c Ratio | 0.48 | 0.69 | 0.91 | | | 0.57 |
| Uniform Delay, d1 | 22.6 | 25.2 | 24.0 | | | 18.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.4 | 6.6 | 8.9 | | | 1.4 |
| Delay (s) | 24.0 | 31.8 | 33.0 | | | 20.0 |
| Level of Service | C | C | C | | | C |
| Approach Delay (s/veh) | 27.3 | | 33.0 | | | 20.0 |
| Approach LOS | C | | C | | | C |

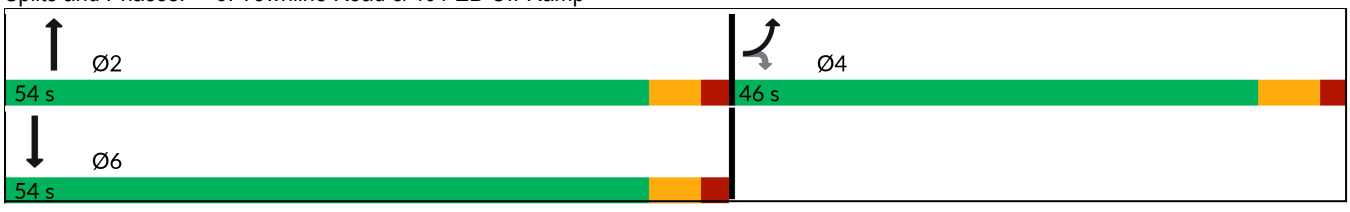
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 27.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.81 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 79.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

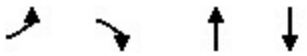
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 485 | 504 | 0 | 1316 | 1360 | 204 |
| Future Volume (vph) | 485 | 504 | 0 | 1316 | 1360 | 204 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.980 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1619 | 1442 | 0 | 3535 | 3353 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1619 | 1442 | 0 | 3535 | 3353 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 23 | | | 23 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Adj. Flow (vph) | 485 | 504 | 0 | 1316 | 1360 | 204 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 485 | 504 | 0 | 1316 | 1564 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (%) | 46.0% | 46.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 39.5 | 39.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 42.0 | |
| Flash Don't Walk (s) | 29.5 | 29.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 35.6 | 35.6 | | 48.2 | 48.2 | |
| Actuated g/C Ratio | 0.37 | 0.37 | | 0.50 | 0.50 | |
| v/c Ratio | 0.81 | 0.92 | | 0.74 | 0.93 | |
| Control Delay (s/veh) | 39.2 | 51.8 | | 23.2 | 34.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 39.2 | 51.8 | | 23.2 | 34.0 | |
| LOS | D | D | | C | C | |
| Approach Delay (s/veh) | 45.6 | | | 23.2 | 34.0 | |
| Approach LOS | D | | | C | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 96.3 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.93 | | | |
| Intersection Signal Delay (s/veh): 33.3 | | Intersection LOS: C | |
| Intersection Capacity Utilization 88.4% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 485 | 504 | 1316 | 1564 |
| v/c Ratio | 0.81 | 0.92 | 0.74 | 0.93 |
| Control Delay (s/veh) | 39.2 | 51.8 | 23.2 | 34.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.2 | 51.8 | 23.2 | 34.0 |
| Queue Length 50th (m) | 79.7 | 84.7 | 107.2 | 147.3 |
| Queue Length 95th (m) | 119.3 | #144.2 | 134.3 | #201.6 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 666 | 607 | 1768 | 1688 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 0.83 | 0.74 | 0.93 |

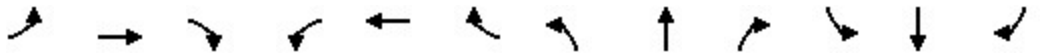
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 485 | 504 | 0 | 1316 | 1360 | 204 |
| Future Volume (vph) | 485 | 504 | 0 | 1316 | 1360 | 204 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1619 | 1442 | | 3535 | 3354 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1619 | 1442 | | 3535 | 3354 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 485 | 504 | 0 | 1316 | 1360 | 204 |
| RTOR Reduction (vph) | 0 | 14 | 0 | 0 | 11 | 0 |
| Lane Group Flow (vph) | 485 | 490 | 0 | 1316 | 1553 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 35.6 | 35.6 | | 48.2 | 48.2 | |
| Effective Green, g (s) | 35.6 | 35.6 | | 48.2 | 48.2 | |
| Actuated g/C Ratio | 0.37 | 0.37 | | 0.50 | 0.50 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 598 | 533 | | 1769 | 1678 | |
| v/s Ratio Prot | 0.30 | | | 0.37 | c0.46 | |
| v/s Ratio Perm | | c0.34 | | | | |
| v/c Ratio | 0.81 | 0.92 | | 0.74 | 0.93 | |
| Uniform Delay, d1 | 27.3 | 29.0 | | 19.1 | 22.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 8.2 | 20.8 | | 2.9 | 10.2 | |
| Delay (s) | 35.5 | 49.7 | | 22.0 | 32.6 | |
| Level of Service | D | D | | C | C | |
| Approach Delay (s/veh) | 42.8 | | | 22.0 | 32.6 | |
| Approach LOS | D | | | C | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 31.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.92 | | |
| Actuated Cycle Length (s) | 96.3 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 88.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

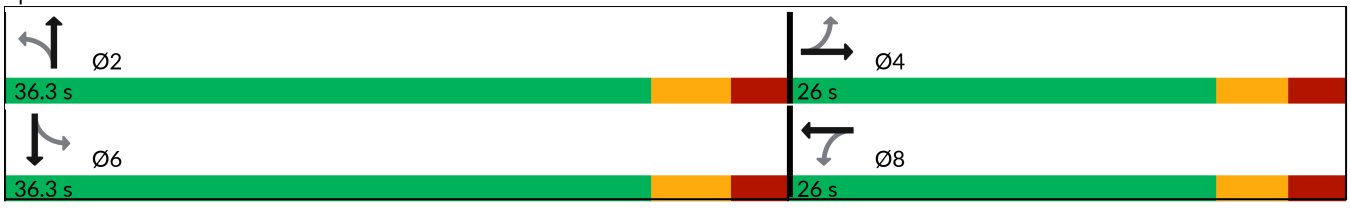


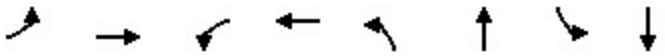
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 54 | 30 | 244 | 71 | 18 | 4 | 226 | 679 | 81 | 3 | 561 | 40 |
| Future Volume (vph) | 54 | 30 | 244 | 71 | 18 | 4 | 226 | 679 | 81 | 3 | 561 | 40 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.866 | | | 0.973 | | | 0.984 | | | 0.990 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1413 | 0 | 1668 | 1579 | 0 | 1651 | 1577 | 0 | 1668 | 1600 | 0 |
| Flt Permitted | 0.743 | | | 0.497 | | | 0.365 | | | 0.250 | | |
| Satd. Flow (perm) | 1291 | 1413 | 0 | 872 | 1579 | 0 | 634 | 1577 | 0 | 439 | 1600 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 238 | | | 4 | | | 13 | | | 8 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Adj. Flow (vph) | 54 | 30 | 244 | 71 | 18 | 4 | 226 | 679 | 81 | 3 | 561 | 40 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 54 | 274 | 0 | 71 | 22 | 0 | 226 | 760 | 0 | 3 | 601 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (%) | 41.7% | 41.7% | | 41.7% | 41.7% | | 58.3% | 58.3% | | 58.3% | 58.3% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.7 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 2.6 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Max | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Flash Don't Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 10.2 | 10.2 | | 10.2 | 10.2 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Actuated g/C Ratio | 0.19 | 0.19 | | 0.19 | 0.19 | | 0.57 | 0.57 | | 0.57 | 0.57 | |
| v/c Ratio | 0.22 | 0.59 | | 0.42 | 0.07 | | 0.62 | 0.84 | | 0.01 | 0.65 | |
| Control Delay (s/veh) | 19.6 | 10.1 | | 26.5 | 15.5 | | 19.5 | 21.6 | | 6.3 | 12.8 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 19.6 | 10.1 | | 26.5 | 15.5 | | 19.5 | 21.6 | | 6.3 | 12.8 | |
| LOS | B | B | | C | B | | B | C | | A | B | |
| Approach Delay (s/veh) | | 11.7 | | | 23.9 | | | 21.1 | | | 12.8 | |
| Approach LOS | | B | | | C | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 62.3 | | | |
| Actuated Cycle Length: 52.6 | | | |
| Natural Cycle: 70 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.84 | | | |
| Intersection Signal Delay (s/veh): 17.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 99.8% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

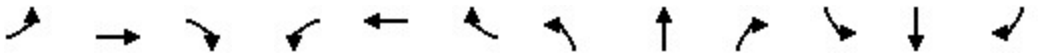




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 54 | 274 | 71 | 22 | 226 | 760 | 3 | 601 |
| v/c Ratio | 0.22 | 0.59 | 0.42 | 0.07 | 0.62 | 0.84 | 0.01 | 0.65 |
| Control Delay (s/veh) | 19.6 | 10.1 | 26.5 | 15.5 | 19.5 | 21.6 | 6.3 | 12.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 19.6 | 10.1 | 26.5 | 15.5 | 19.5 | 21.6 | 6.3 | 12.8 |
| Queue Length 50th (m) | 4.3 | 2.8 | 5.9 | 1.4 | 11.4 | 46.3 | 0.1 | 30.6 |
| Queue Length 95th (m) | 11.4 | 18.1 | 15.3 | 5.7 | #48.8 | #135.7 | 1.1 | 77.8 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 492 | 686 | 332 | 604 | 362 | 907 | 250 | 918 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.40 | 0.21 | 0.04 | 0.62 | 0.84 | 0.01 | 0.65 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 54 | 30 | 244 | 71 | 18 | 4 | 226 | 679 | 81 | 3 | 561 | 40 |
| Future Volume (vph) | 54 | 30 | 244 | 71 | 18 | 4 | 226 | 679 | 81 | 3 | 561 | 40 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1414 | | 1668 | 1579 | | 1651 | 1577 | | 1668 | 1600 | |
| Flt Permitted | 0.74 | 1.00 | | 0.50 | 1.00 | | 0.37 | 1.00 | | 0.25 | 1.00 | |
| Satd. Flow (perm) | 1291 | 1414 | | 873 | 1579 | | 634 | 1577 | | 439 | 1600 | |
| 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) | 54 | 30 | 244 | 71 | 18 | 4 | 226 | 679 | 81 | 3 | 561 | 40 |
| RTOR Reduction (vph) | 0 | 192 | 0 | 0 | 3 | 0 | 0 | 6 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 54 | 82 | 0 | 71 | 19 | 0 | 226 | 754 | 0 | 3 | 598 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 10.2 | 10.2 | | 10.2 | 10.2 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Effective Green, g (s) | 10.2 | 10.2 | | 10.2 | 10.2 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Actuated g/C Ratio | 0.19 | 0.19 | | 0.19 | 0.19 | | 0.57 | 0.57 | | 0.57 | 0.57 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 250 | 274 | | 169 | 306 | | 362 | 902 | | 251 | 915 | |
| v/s Ratio Prot | | 0.06 | | | 0.01 | | | c0.48 | | | 0.37 | |
| v/s Ratio Perm | 0.04 | | | c0.08 | | | 0.36 | | | 0.01 | | |
| v/c Ratio | 0.22 | 0.30 | | 0.42 | 0.06 | | 0.62 | 0.84 | | 0.01 | 0.65 | |
| Uniform Delay, d1 | 17.8 | 18.1 | | 18.6 | 17.3 | | 7.5 | 9.2 | | 4.8 | 7.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | 0.6 | | 1.7 | 0.1 | | 7.9 | 9.1 | | 0.1 | 3.6 | |
| Delay (s) | 18.3 | 18.8 | | 20.3 | 17.4 | | 15.4 | 18.3 | | 4.9 | 11.3 | |
| Level of Service | B | B | | C | B | | B | B | | A | B | |
| Approach Delay (s/veh) | | 18.7 | | | 19.6 | | | 17.6 | | | 11.3 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 16.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 52.6 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 99.8% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

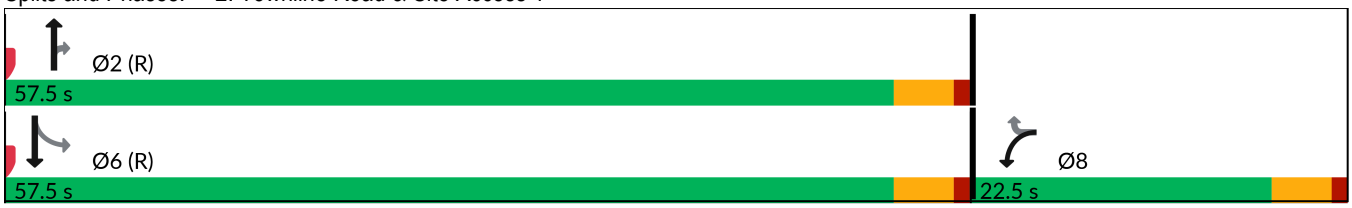
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 11 | 5 | 982 | 12 | 21 | 856 |
| Future Volume (vph) | 11 | 5 | 982 | 12 | 21 | 856 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.263 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 484 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 5 | | 12 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 11 | 5 | 982 | 12 | 21 | 856 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 11 | 5 | 982 | 12 | 21 | 856 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 57.5 | 57.5 | 57.5 | 57.5 |
| Total Split (%) | 28.1% | 28.1% | 71.9% | 71.9% | 71.9% | 71.9% |
| Maximum Green (s) | 18.0 | 18.0 | 53.0 | 53.0 | 53.0 | 53.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 6.2 | 6.2 | 73.6 | 73.6 | 73.6 | 73.6 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.92 | 0.92 | 0.92 | 0.92 |
| v/c Ratio | 0.09 | 0.04 | 0.62 | 0.01 | 0.05 | 0.51 |
| Control Delay (s/veh) | 35.4 | 22.2 | 4.3 | 0.9 | 1.6 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 22.2 | 4.3 | 0.9 | 1.6 | 2.9 |
| LOS | D | C | A | A | A | A |
| Approach Delay (s/veh) | 31.3 | | 4.3 | | | 2.9 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 75 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.62 | | | |
| Intersection Signal Delay (s/veh): 3.9 | | Intersection LOS: A | |
| Intersection Capacity Utilization 67.0% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

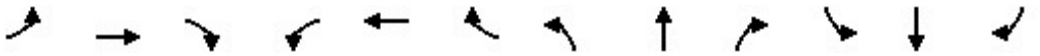


| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 11 | 5 | 982 | 12 | 21 | 856 |
| v/c Ratio | 0.09 | 0.04 | 0.62 | 0.01 | 0.05 | 0.51 |
| Control Delay (s/veh) | 35.4 | 22.2 | 4.3 | 0.9 | 1.6 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 22.2 | 4.3 | 0.9 | 1.6 | 2.9 |
| Queue Length 50th (m) | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Queue Length 95th (m) | 6.2 | 3.2 | 86.2 | 0.7 | 1.7 | 55.2 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 365 | 331 | 1584 | 1347 | 445 | 1695 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 69 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.03 | 0.02 | 0.62 | 0.01 | 0.05 | 0.53 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 11 | 5 | 982 | 12 | 21 | 856 |
| Future Volume (vph) | 11 | 5 | 982 | 12 | 21 | 856 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.26 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 484 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 11 | 5 | 982 | 12 | 21 | 856 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 2 | 0 | 0 |
| Lane Group Flow (vph) | 11 | 0 | 982 | 10 | 21 | 856 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 2.8 | 2.8 | 68.2 | 68.2 | 68.2 | 68.2 |
| Effective Green, g (s) | 2.8 | 2.8 | 68.2 | 68.2 | 68.2 | 68.2 |
| Actuated g/C Ratio | 0.03 | 0.03 | 0.85 | 0.85 | 0.85 | 0.85 |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 56 | 50 | 1467 | 1247 | 412 | 1570 |
| v/s Ratio Prot | c0.01 | | c0.57 | | | 0.46 |
| v/s Ratio Perm | | 0.00 | | 0.01 | 0.04 | |
| v/c Ratio | 0.20 | 0.00 | 0.67 | 0.01 | 0.05 | 0.55 |
| Uniform Delay, d1 | 37.5 | 37.3 | 2.0 | 0.9 | 0.9 | 1.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.7 | 0.0 | 2.4 | 0.0 | 0.2 | 1.4 |
| Delay (s) | 39.2 | 37.3 | 4.5 | 0.9 | 1.1 | 3.0 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 38.6 | | 4.4 | | | 2.9 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 4.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 67.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

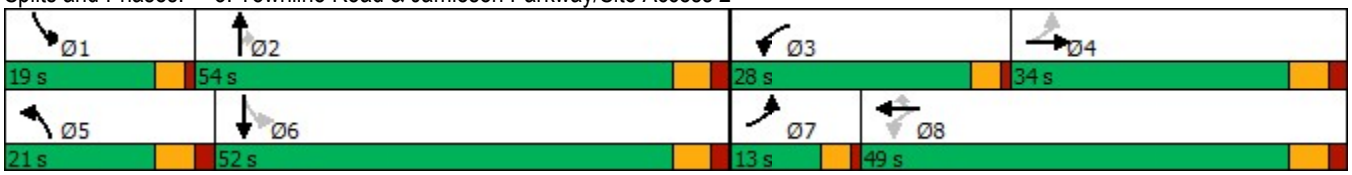


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 167 | 58 | 264 | 315 | 156 | 247 | 231 | 591 | 420 | 188 | 562 | 117 |
| Future Volume (vph) | 167 | 58 | 264 | 315 | 156 | 247 | 231 | 591 | 420 | 188 | 562 | 117 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 1 | 2 | | 1 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.877 | | | | 0.850 | | | 0.850 | | 0.974 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1431 | 0 | 3235 | 1632 | 1387 | 3203 | 3270 | 1492 | 1668 | 3211 | 0 |
| Flt Permitted | 0.658 | | | 0.167 | | | 0.950 | | | 0.389 | | |
| Satd. Flow (perm) | 1155 | 1431 | 0 | 569 | 1632 | 1387 | 3203 | 3270 | 1492 | 683 | 3211 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 153 | | | | 247 | | | 420 | | 20 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 157.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 9.4 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Adj. Flow (vph) | 167 | 58 | 264 | 315 | 156 | 247 | 231 | 591 | 420 | 188 | 562 | 117 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 167 | 322 | 0 | 315 | 156 | 247 | 231 | 591 | 420 | 188 | 679 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | pm+pt | NA | Perm | Prot | NA | Perm | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 9.0 | 31.0 | | 9.0 | 31.0 | 31.0 | 11.0 | 50.4 | 50.4 | 9.0 | 41.0 | |
| Total Split (s) | 13.0 | 34.0 | | 28.0 | 49.0 | 49.0 | 21.0 | 54.0 | 54.0 | 19.0 | 52.0 | |
| Total Split (%) | 9.6% | 25.2% | | 20.7% | 36.3% | 36.3% | 15.6% | 40.0% | 40.0% | 14.1% | 38.5% | |
| Maximum Green (s) | 9.0 | 28.0 | | 24.0 | 43.0 | 43.0 | 15.0 | 48.0 | 48.0 | 15.0 | 46.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 14.0 | 14.0 | | 14.0 | |
| Flash Dont Walk (s) | | 18.0 | | | 18.0 | 18.0 | | 21.0 | 21.0 | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | 0 | | 0 | |
| Act Effct Green (s) | 31.0 | 19.9 | | 38.7 | 24.4 | 24.4 | 12.9 | 49.8 | 49.8 | 60.1 | 46.5 | |
| Actuated g/C Ratio | 0.27 | 0.17 | | 0.34 | 0.21 | 0.21 | 0.11 | 0.43 | 0.43 | 0.52 | 0.40 | |
| v/c Ratio | 0.47 | 0.86 | | 0.62 | 0.45 | 0.51 | 0.65 | 0.42 | 0.48 | 0.41 | 0.52 | |
| Control Delay | 33.7 | 46.5 | | 32.8 | 43.1 | 8.2 | 59.2 | 25.8 | 4.5 | 16.0 | 28.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 33.7 | 46.5 | | 32.8 | 43.1 | 8.2 | 59.2 | 25.8 | 4.5 | 16.0 | 28.6 | |
| LOS | C | D | | C | D | A | E | C | A | B | C | |
| Approach Delay | | 42.1 | | | 26.5 | | | 24.8 | | | 25.9 | |
| Approach LOS | | D | | | C | | | C | | | C | |

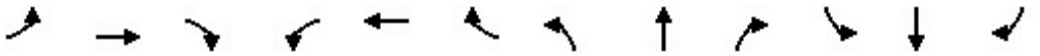
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 135 | | | |
| Actuated Cycle Length: 115.1 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.86 | | | |
| Intersection Signal Delay: 28.0 | | Intersection LOS: C | |
| Intersection Capacity Utilization 77.9% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 167 | 322 | 315 | 156 | 247 | 231 | 591 | 420 | 188 | 679 |
| v/c Ratio | 0.47 | 0.86 | 0.62 | 0.45 | 0.51 | 0.65 | 0.42 | 0.48 | 0.41 | 0.52 |
| Control Delay | 33.7 | 46.5 | 32.8 | 43.1 | 8.2 | 59.2 | 25.8 | 4.5 | 16.0 | 28.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 33.7 | 46.5 | 32.8 | 43.1 | 8.2 | 59.2 | 25.8 | 4.5 | 16.0 | 28.6 |
| Queue Length 50th (m) | 27.3 | 38.7 | 26.4 | 30.9 | 0.0 | 26.2 | 48.7 | 0.0 | 19.2 | 59.9 |
| Queue Length 95th (m) | 44.5 | 76.1 | 37.5 | 50.8 | 19.8 | 42.5 | 76.5 | 21.0 | 37.2 | 90.2 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | | 133.4 | | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | | 115.0 | | | 115.0 | |
| Base Capacity (vph) | 352 | 467 | 757 | 615 | 677 | 421 | 1415 | 884 | 507 | 1309 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.47 | 0.69 | 0.42 | 0.25 | 0.36 | 0.55 | 0.42 | 0.48 | 0.37 | 0.52 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 167 | 58 | 264 | 315 | 156 | 247 | 231 | 591 | 420 | 188 | 562 | 117 |
| Future Volume (vph) | 167 | 58 | 264 | 315 | 156 | 247 | 231 | 591 | 420 | 188 | 562 | 117 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.88 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1431 | | 3235 | 1632 | 1387 | 3203 | 3270 | 1492 | 1668 | 3211 | |
| Flt Permitted | 0.66 | 1.00 | | 0.17 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.39 | 1.00 | |
| Satd. Flow (perm) | 1155 | 1431 | | 570 | 1632 | 1387 | 3203 | 3270 | 1492 | 683 | 3211 | |
| 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) | 167 | 58 | 264 | 315 | 156 | 247 | 231 | 591 | 420 | 188 | 562 | 117 |
| RTOR Reduction (vph) | 0 | 127 | 0 | 0 | 0 | 195 | 0 | 0 | 238 | 0 | 12 | 0 |
| Lane Group Flow (vph) | 167 | 195 | 0 | 315 | 156 | 52 | 231 | 591 | 182 | 188 | 667 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | Prot | NA | Perm | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Actuated Green, G (s) | 29.0 | 19.9 | | 37.5 | 24.4 | 24.4 | 12.9 | 49.8 | 49.8 | 58.1 | 46.5 | |
| Effective Green, g (s) | 29.0 | 19.9 | | 37.5 | 24.4 | 24.4 | 12.9 | 49.8 | 49.8 | 58.1 | 46.5 | |
| Actuated g/C Ratio | 0.25 | 0.17 | | 0.33 | 0.21 | 0.21 | 0.11 | 0.43 | 0.43 | 0.51 | 0.40 | |
| Clearance Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 332 | 247 | | 501 | 346 | 294 | 359 | 1417 | 646 | 444 | 1299 | |
| v/s Ratio Prot | 0.04 | c0.14 | | c0.07 | 0.10 | | c0.07 | c0.18 | | 0.04 | c0.21 | |
| v/s Ratio Perm | 0.09 | | | 0.13 | | 0.04 | | | 0.12 | 0.17 | | |
| v/c Ratio | 0.50 | 0.79 | | 0.63 | 0.45 | 0.18 | 0.64 | 0.42 | 0.28 | 0.42 | 0.51 | |
| Uniform Delay, d1 | 35.7 | 45.5 | | 30.6 | 39.4 | 37.0 | 48.8 | 22.5 | 21.0 | 15.9 | 25.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.2 | 15.8 | | 2.5 | 0.9 | 0.3 | 3.9 | 0.9 | 1.1 | 0.7 | 1.5 | |
| Delay (s) | 36.9 | 61.3 | | 33.1 | 40.4 | 37.3 | 52.7 | 23.4 | 22.1 | 16.6 | 27.2 | |
| Level of Service | D | E | | C | D | D | D | C | C | B | C | |
| Approach Delay (s) | | 53.0 | | | 36.1 | | | 28.4 | | | 24.9 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 32.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 114.9 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 77.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

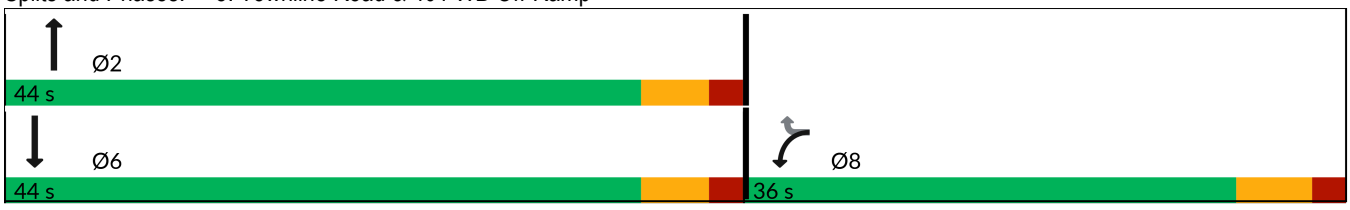
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 413 | 239 | 1005 | 0 | 0 | 828 |
| Future Volume (vph) | 413 | 239 | 1005 | 0 | 0 | 828 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 65 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 413 | 239 | 1005 | 0 | 0 | 828 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 413 | 239 | 1005 | 0 | 0 | 828 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (%) | 45.0% | 45.0% | 55.0% | | | 55.0% |
| Maximum Green (s) | 29.5 | 29.5 | 38.0 | | | 38.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 33.0 | | | 33.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 14.6 | 14.6 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.58 | | | 0.58 |
| v/c Ratio | 0.60 | 0.64 | 0.49 | | | 0.41 |
| Control Delay (s/veh) | 26.3 | 24.4 | 9.6 | | | 8.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 26.3 | 24.4 | 9.6 | | | 8.8 |
| LOS | C | C | A | | | A |
| Approach Delay (s/veh) | 25.6 | | 9.6 | | | 8.8 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 65.3 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.64 | | | |
| Intersection Signal Delay (s/veh): 13.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 54.3% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 413 | 239 | 1005 | 828 |
| v/c Ratio | 0.60 | 0.64 | 0.49 | 0.41 |
| Control Delay (s/veh) | 26.3 | 24.4 | 9.6 | 8.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 26.3 | 24.4 | 9.6 | 8.8 |
| Queue Length 50th (m) | 23.1 | 18.6 | 31.6 | 24.4 |
| Queue Length 95th (m) | 34.9 | 38.5 | 59.3 | 46.5 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1397 | 695 | 2064 | 2044 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.30 | 0.34 | 0.49 | 0.41 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 413 | 239 | 1005 | 0 | 0 | 828 |
| Future Volume (vph) | 413 | 239 | 1005 | 0 | 0 | 828 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 413 | 239 | 1005 | 0 | 0 | 828 |
| RTOR Reduction (vph) | 0 | 50 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 413 | 189 | 1005 | 0 | 0 | 828 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 14.6 | 14.6 | 38.1 | | | 38.1 |
| Effective Green, g (s) | 14.6 | 14.6 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.58 | | | 0.58 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 689 | 326 | 2065 | | | 2045 |
| v/s Ratio Prot | c0.13 | | c0.28 | | | 0.24 |
| v/s Ratio Perm | | 0.13 | | | | |
| v/c Ratio | 0.60 | 0.58 | 0.49 | | | 0.40 |
| Uniform Delay, d1 | 22.7 | 22.6 | 7.9 | | | 7.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.4 | 2.5 | 0.8 | | | 0.6 |
| Delay (s) | 24.1 | 25.0 | 8.7 | | | 8.0 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 24.4 | | 8.7 | | | 8.0 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 12.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.52 | | |
| Actuated Cycle Length (s) | 65.2 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 54.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

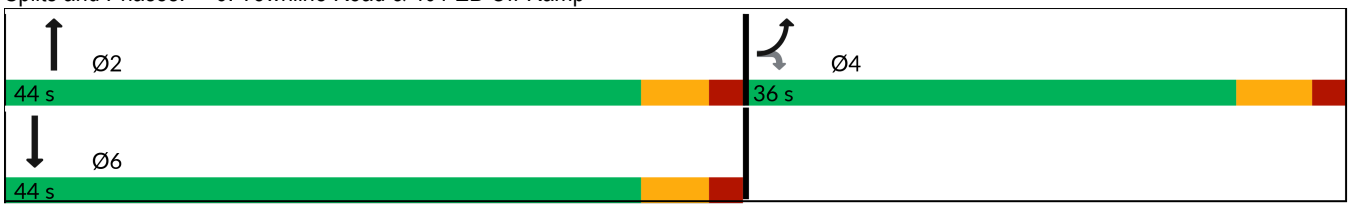
c Critical Lane Group

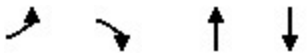
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 421 | 461 | 0 | 777 | 1061 | 181 |
| Future Volume (vph) | 421 | 461 | 0 | 777 | 1061 | 181 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.978 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1456 | 0 | 3500 | 3433 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1635 | 1456 | 0 | 3500 | 3433 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 55 | | | 33 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Adj. Flow (vph) | 421 | 461 | 0 | 777 | 1061 | 181 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 421 | 461 | 0 | 777 | 1242 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (%) | 45.0% | 45.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 32.0 | 32.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 25.6 | 25.6 | | 38.2 | 38.2 | |
| Actuated g/C Ratio | 0.34 | 0.34 | | 0.50 | 0.50 | |
| v/c Ratio | 0.77 | 0.88 | | 0.44 | 0.72 | |
| Control Delay (s/veh) | 32.9 | 40.5 | | 14.0 | 18.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 32.9 | 40.5 | | 14.0 | 18.2 | |
| LOS | C | D | | B | B | |
| Approach Delay (s/veh) | 36.9 | | | 14.0 | 18.2 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 76.4 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay (s/veh): 22.8 | | Intersection LOS: C | |
| Intersection Capacity Utilization 76.5% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 421 | 461 | 777 | 1242 |
| v/c Ratio | 0.77 | 0.88 | 0.44 | 0.72 |
| Control Delay (s/veh) | 32.9 | 40.5 | 14.0 | 18.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 32.9 | 40.5 | 14.0 | 18.2 |
| Queue Length 50th (m) | 53.4 | 54.9 | 39.9 | 75.4 |
| Queue Length 95th (m) | 85.0 | #104.5 | 54.2 | 100.0 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 634 | 598 | 1750 | 1733 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.66 | 0.77 | 0.44 | 0.72 |

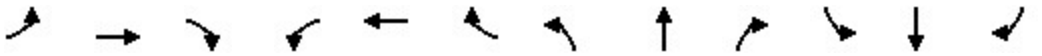
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 421 | 461 | 0 | 777 | 1061 | 181 |
| Future Volume (vph) | 421 | 461 | 0 | 777 | 1061 | 181 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1456 | | 3500 | 3433 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1635 | 1456 | | 3500 | 3433 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 421 | 461 | 0 | 777 | 1061 | 181 |
| RTOR Reduction (vph) | 0 | 37 | 0 | 0 | 16 | 0 |
| Lane Group Flow (vph) | 421 | 424 | 0 | 777 | 1226 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 25.6 | 25.6 | | 38.2 | 38.2 | |
| Effective Green, g (s) | 25.6 | 25.6 | | 38.2 | 38.2 | |
| Actuated g/C Ratio | 0.34 | 0.34 | | 0.50 | 0.50 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 548 | 488 | | 1752 | 1718 | |
| v/s Ratio Prot | 0.26 | | | 0.22 | c0.36 | |
| v/s Ratio Perm | | c0.29 | | | | |
| v/c Ratio | 0.77 | 0.87 | | 0.44 | 0.71 | |
| Uniform Delay, d1 | 22.7 | 23.8 | | 12.2 | 14.8 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 6.4 | 15.2 | | 0.8 | 2.6 | |
| Delay (s) | 29.1 | 39.0 | | 13.0 | 17.4 | |
| Level of Service | C | D | | B | B | |
| Approach Delay (s/veh) | 34.3 | | | 13.0 | 17.4 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 21.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.78 | | |
| Actuated Cycle Length (s) | 76.3 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 76.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

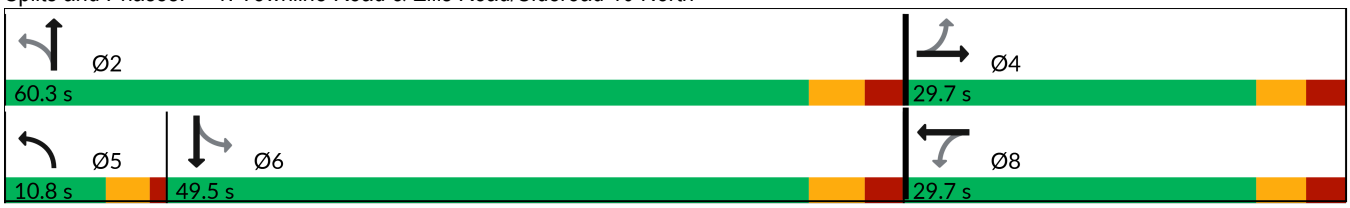


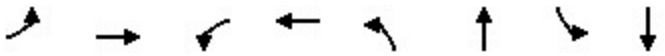
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| Future Volume (vph) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.866 | | | 0.965 | | | 0.985 | | | 0.994 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1388 | 0 | 1668 | 1575 | 0 | 1603 | 1544 | 0 | 1334 | 1577 | 0 |
| Flt Permitted | 0.746 | | | 0.284 | | | 0.117 | | | 0.348 | | |
| Satd. Flow (perm) | 1296 | 1388 | 0 | 498 | 1575 | 0 | 197 | 1544 | 0 | 489 | 1577 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 246 | | | 4 | | | 11 | | | 3 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Adj. Flow (vph) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 104 | 335 | 0 | 66 | 17 | 0 | 140 | 775 | 0 | 4 | 856 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 9.0 | 49.5 | | 49.5 | 49.5 | |
| Total Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 10.8 | 60.3 | | 49.5 | 49.5 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 12.0% | 67.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 23.7 | 23.7 | | 23.7 | 23.7 | | 6.8 | 54.0 | | 43.2 | 43.2 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 35.2 | | 35.2 | 35.2 | |
| Flash Don't Walk (s) | 13.7 | 13.7 | | 13.7 | 13.7 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 56.6 | 54.3 | | 43.5 | 43.5 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.17 | 0.17 | | 0.70 | 0.67 | | 0.54 | 0.54 | |
| v/c Ratio | 0.46 | 0.75 | | 0.76 | 0.06 | | 0.55 | 0.74 | | 0.02 | 1.01 | |
| Control Delay (s/veh) | 35.8 | 20.4 | | 78.5 | 22.7 | | 15.6 | 16.2 | | 11.5 | 54.8 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.3 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 35.8 | 20.4 | | 78.5 | 22.7 | | 15.6 | 16.5 | | 11.5 | 54.8 | |
| LOS | D | C | | E | C | | B | B | | B | D | |
| Approach Delay (s/veh) | | 24.0 | | | 67.0 | | | 16.4 | | | 54.6 | |
| Approach LOS | | C | | | E | | | B | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 80.8 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.01 | | | |
| Intersection Signal Delay (s/veh): 34.0 | | Intersection LOS: C | |
| Intersection Capacity Utilization 106.7% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North



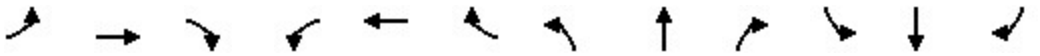


| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 104 | 335 | 66 | 17 | 140 | 775 | 4 | 856 |
| v/c Ratio | 0.46 | 0.75 | 0.76 | 0.06 | 0.55 | 0.74 | 0.02 | 1.01 |
| Control Delay (s/veh) | 35.8 | 20.4 | 78.5 | 22.7 | 15.6 | 16.2 | 11.5 | 54.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.8 | 20.4 | 78.5 | 22.7 | 15.6 | 16.5 | 11.5 | 54.8 |
| Queue Length 50th (m) | 14.4 | 12.1 | 9.7 | 1.7 | 5.8 | 65.2 | 0.3 | ~124.2 |
| Queue Length 95th (m) | 28.2 | 39.1 | #25.6 | 6.6 | #23.9 | #178.8 | 2.1 | #243.6 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 382 | 582 | 147 | 467 | 256 | 1041 | 263 | 850 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 42 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.27 | 0.58 | 0.45 | 0.04 | 0.55 | 0.78 | 0.02 | 1.01 |

Intersection Summary

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

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| Future Volume (vph) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1388 | | 1668 | 1574 | | 1603 | 1544 | | 1334 | 1576 | |
| Flt Permitted | 0.75 | 1.00 | | 0.28 | 1.00 | | 0.12 | 1.00 | | 0.35 | 1.00 | |
| Satd. Flow (perm) | 1297 | 1388 | | 498 | 1574 | | 197 | 1544 | | 488 | 1576 | |
| 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) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| RTOR Reduction (vph) | 0 | 203 | 0 | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 104 | 132 | 0 | 66 | 14 | 0 | 140 | 771 | 0 | 4 | 855 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 54.3 | 54.3 | | 43.5 | 43.5 | |
| Effective Green, g (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 54.3 | 54.3 | | 43.5 | 43.5 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.17 | 0.17 | | 0.67 | 0.67 | | 0.54 | 0.54 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 226 | 242 | | 87 | 275 | | 251 | 1038 | | 263 | 849 | |
| v/s Ratio Prot | | 0.10 | | | 0.01 | | 0.05 | c0.50 | | | c0.54 | |
| v/s Ratio Perm | 0.08 | | | c0.13 | | | 0.33 | | | 0.01 | | |
| v/c Ratio | 0.46 | 0.55 | | 0.76 | 0.05 | | 0.56 | 0.74 | | 0.02 | 1.01 | |
| Uniform Delay, d1 | 29.9 | 30.4 | | 31.7 | 27.7 | | 12.8 | 8.6 | | 8.6 | 18.6 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.5 | 2.5 | | 30.9 | 0.1 | | 2.7 | 4.8 | | 0.1 | 32.5 | |
| Delay (s) | 31.4 | 32.9 | | 62.6 | 27.8 | | 15.5 | 13.5 | | 8.8 | 51.1 | |
| Level of Service | C | C | | E | C | | B | B | | A | D | |
| Approach Delay (s/veh) | | 32.5 | | | 55.4 | | | 13.8 | | | 50.9 | |
| Approach LOS | | C | | | E | | | B | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 32.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.94 | | |
| Actuated Cycle Length (s) | 80.7 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 106.7% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |

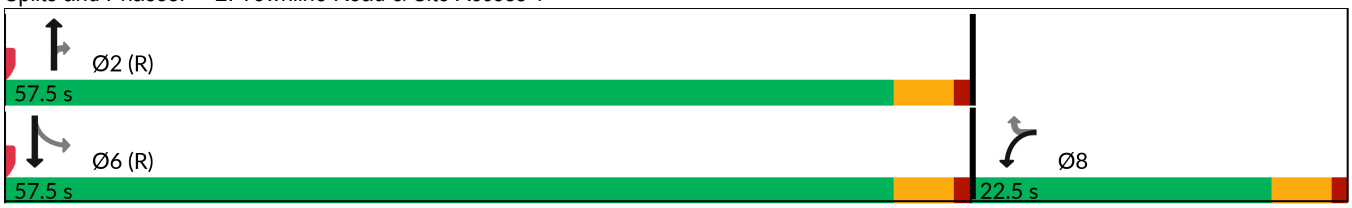
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| Future Volume (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.292 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 538 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 7 | | 75 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 57.5 | 57.5 | 57.5 | 57.5 |
| Total Split (%) | 28.1% | 28.1% | 71.9% | 71.9% | 71.9% | 71.9% |
| Maximum Green (s) | 18.0 | 18.0 | 53.0 | 53.0 | 53.0 | 53.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 6.3 | 6.3 | 73.5 | 73.5 | 73.5 | 73.5 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.92 | 0.92 | 0.92 | 0.92 |
| v/c Ratio | 0.12 | 0.06 | 0.57 | 0.06 | 0.20 | 0.64 |
| Control Delay (s/veh) | 35.7 | 21.0 | 3.8 | 0.6 | 2.5 | 4.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay (s/veh) | 35.7 | 21.0 | 3.8 | 0.6 | 2.5 | 4.6 |
| LOS | D | C | A | A | A | A |
| Approach Delay (s/veh) | 31.0 | | 3.5 | | | 4.4 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.64 | | | |
| Intersection Signal Delay (s/veh): 4.3 | | Intersection LOS: A | |
| Intersection Capacity Utilization 72.1% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

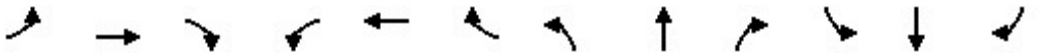


| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| v/c Ratio | 0.12 | 0.06 | 0.57 | 0.06 | 0.20 | 0.64 |
| Control Delay (s/veh) | 35.7 | 21.0 | 3.8 | 0.6 | 2.5 | 4.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay (s/veh) | 35.7 | 21.0 | 3.8 | 0.6 | 2.5 | 4.6 |
| Queue Length 50th (m) | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Queue Length 95th (m) | 7.5 | 3.6 | 72.3 | 1.9 | 6.6 | 101.0 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 365 | 332 | 1581 | 1350 | 494 | 1692 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 44 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.04 | 0.02 | 0.57 | 0.06 | 0.20 | 0.66 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| Future Volume (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.29 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 537 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| RTOR Reduction (vph) | 0 | 7 | 0 | 11 | 0 | 0 |
| Lane Group Flow (vph) | 15 | 0 | 908 | 64 | 100 | 1084 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 2.9 | 2.9 | 68.1 | 68.1 | 68.1 | 68.1 |
| Effective Green, g (s) | 2.9 | 2.9 | 68.1 | 68.1 | 68.1 | 68.1 |
| Actuated g/C Ratio | 0.04 | 0.04 | 0.85 | 0.85 | 0.85 | 0.85 |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 58 | 52 | 1465 | 1245 | 457 | 1568 |
| v/s Ratio Prot | c0.01 | | 0.53 | | | c0.59 |
| v/s Ratio Perm | | 0.00 | | 0.04 | 0.19 | |
| v/c Ratio | 0.26 | 0.00 | 0.62 | 0.05 | 0.22 | 0.69 |
| Uniform Delay, d1 | 37.5 | 37.2 | 1.9 | 0.9 | 1.1 | 2.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.4 | 0.0 | 2.0 | 0.1 | 1.1 | 2.5 |
| Delay (s) | 39.9 | 37.2 | 3.9 | 1.0 | 2.2 | 4.7 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 39.0 | | 3.6 | | | 4.5 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 4.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 72.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

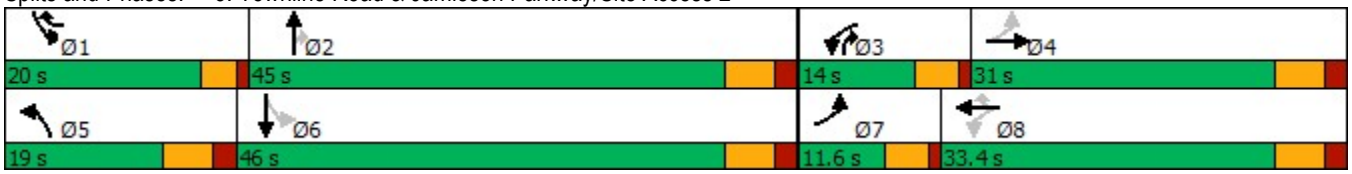


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 167 | 20 | 357 | 111 | 53 | 152 | 321 | 660 | 413 | 53 | 871 | 191 |
| Future Volume (vph) | 167 | 20 | 357 | 111 | 53 | 152 | 321 | 660 | 413 | 53 | 871 | 191 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 1 | 2 | | 1 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | | | | | 1.00 | | | | 1.00 | |
| Frt | | 0.858 | | | | 0.850 | | | 0.850 | | 0.973 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1635 | 1361 | 0 | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3168 | 0 |
| Flt Permitted | 0.614 | | | 0.320 | | | 0.950 | | | 0.401 | | |
| Satd. Flow (perm) | 1057 | 1361 | 0 | 1090 | 1632 | 1387 | 3202 | 3302 | 1492 | 704 | 3168 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 326 | | | | 141 | | | 413 | | 27 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 157.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 9.4 | | | 20.1 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| 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% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Adj. Flow (vph) | 167 | 20 | 357 | 111 | 53 | 152 | 321 | 660 | 413 | 53 | 871 | 191 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 167 | 377 | 0 | 111 | 53 | 152 | 321 | 660 | 413 | 53 | 1062 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | pm+pt | NA | | pm+pt | NA | pm+ov | Prot | NA | pm+ov | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | | 5.0 | 8.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 9.5 | 31.0 | | 9.5 | 31.0 | 9.0 | 11.0 | 41.0 | 9.5 | 9.0 | 41.0 | |
| Total Split (s) | 11.6 | 31.0 | | 14.0 | 33.4 | 20.0 | 19.0 | 45.0 | 14.0 | 20.0 | 46.0 | |
| Total Split (%) | 10.5% | 28.2% | | 12.7% | 30.4% | 18.2% | 17.3% | 40.9% | 12.7% | 18.2% | 41.8% | |
| Maximum Green (s) | 7.1 | 25.0 | | 9.5 | 27.4 | 16.0 | 13.0 | 39.0 | 9.5 | 16.0 | 40.0 | |
| Yellow Time (s) | 3.5 | 4.0 | | 3.5 | 4.0 | 3.0 | 4.0 | 4.0 | 3.5 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | 4.0 | 6.0 | 6.0 | 4.5 | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | None | None | Max | None | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Dont Walk (s) | | 18.0 | | | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 22.9 | 13.4 | | 21.6 | 14.3 | 24.0 | 12.7 | 48.2 | 62.2 | 49.1 | 40.3 | |
| Actuated g/C Ratio | 0.24 | 0.14 | | 0.22 | 0.15 | 0.25 | 0.13 | 0.50 | 0.64 | 0.51 | 0.42 | |
| v/c Ratio | 0.54 | 0.81 | | 0.27 | 0.22 | 0.34 | 0.76 | 0.40 | 0.37 | 0.13 | 0.80 | |
| Control Delay | 35.8 | 21.3 | | 27.2 | 37.3 | 7.1 | 54.9 | 17.6 | 2.1 | 10.2 | 31.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 35.8 | 21.3 | | 27.2 | 37.3 | 7.1 | 54.9 | 17.6 | 2.1 | 10.2 | 31.0 | |
| LOS | D | C | | C | D | A | D | B | A | B | C | |
| Approach Delay | | 25.8 | | | 19.3 | | | 21.6 | | | 30.0 | |
| Approach LOS | | C | | | B | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 110 | | | |
| Actuated Cycle Length: 96.9 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.81 | | | |
| Intersection Signal Delay: 24.8 | | Intersection LOS: C | |
| Intersection Capacity Utilization 91.7% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 167 | 377 | 111 | 53 | 152 | 321 | 660 | 413 | 53 | 1062 |
| v/c Ratio | 0.54 | 0.81 | 0.27 | 0.22 | 0.34 | 0.76 | 0.40 | 0.37 | 0.13 | 0.80 |
| Control Delay | 35.8 | 21.3 | 27.2 | 37.3 | 7.1 | 54.9 | 17.6 | 2.1 | 10.2 | 31.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 35.8 | 21.3 | 27.2 | 37.3 | 7.1 | 54.9 | 17.6 | 2.1 | 10.2 | 31.0 |
| Queue Length 50th (m) | 24.9 | 8.7 | 7.9 | 8.9 | 1.5 | 29.2 | 36.5 | 0.0 | 3.2 | 83.5 |
| Queue Length 95th (m) | 41.5 | 40.6 | 13.8 | 19.1 | 14.1 | #58.0 | 69.2 | 12.8 | 10.7 | #150.7 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | | 133.4 | | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | | 115.0 | | | 115.0 | |
| Base Capacity (vph) | 309 | 594 | 473 | 464 | 570 | 432 | 1642 | 1123 | 584 | 1332 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.54 | 0.63 | 0.23 | 0.11 | 0.27 | 0.74 | 0.40 | 0.37 | 0.09 | 0.80 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 167 | 20 | 357 | 111 | 53 | 152 | 321 | 660 | 413 | 53 | 871 | 191 |
| Future Volume (vph) | 167 | 20 | 357 | 111 | 53 | 152 | 321 | 660 | 413 | 53 | 871 | 191 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | 4.0 | 6.0 | 6.0 | 4.5 | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.86 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1361 | | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3169 | |
| Flt Permitted | 0.61 | 1.00 | | 0.32 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.40 | 1.00 | |
| Satd. Flow (perm) | 1057 | 1361 | | 1090 | 1632 | 1387 | 3203 | 3302 | 1492 | 704 | 3169 | |
| 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) | 167 | 20 | 357 | 111 | 53 | 152 | 321 | 660 | 413 | 53 | 871 | 191 |
| RTOR Reduction (vph) | 0 | 277 | 0 | 0 | 0 | 113 | 0 | 0 | 177 | 0 | 16 | 0 |
| Lane Group Flow (vph) | 167 | 100 | 0 | 111 | 53 | 39 | 321 | 660 | 236 | 53 | 1046 | 0 |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| Heavy Vehicles (%) | 2% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Turn Type | pm+pt | NA | | pm+pt | NA | pm+ov | Prot | NA | pm+ov | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Actuated Green, G (s) | 24.8 | 14.7 | | 20.4 | 12.5 | 19.3 | 12.7 | 48.2 | 56.1 | 47.1 | 40.3 | |
| Effective Green, g (s) | 24.8 | 14.7 | | 20.4 | 12.5 | 19.3 | 12.7 | 48.2 | 56.1 | 47.1 | 40.3 | |
| Actuated g/C Ratio | 0.25 | 0.15 | | 0.21 | 0.13 | 0.20 | 0.13 | 0.49 | 0.57 | 0.48 | 0.41 | |
| Clearance Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | 4.0 | 6.0 | 6.0 | 4.5 | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 326 | 203 | | 399 | 207 | 272 | 414 | 1622 | 853 | 404 | 1301 | |
| v/s Ratio Prot | c0.05 | 0.07 | | 0.02 | 0.03 | 0.01 | c0.10 | 0.20 | 0.02 | 0.01 | c0.33 | |
| v/s Ratio Perm | c0.08 | | | 0.04 | | 0.02 | | | 0.14 | 0.05 | | |
| v/c Ratio | 0.51 | 0.49 | | 0.28 | 0.26 | 0.14 | 0.78 | 0.41 | 0.28 | 0.13 | 0.80 | |
| Uniform Delay, d1 | 30.5 | 38.3 | | 32.2 | 38.6 | 32.6 | 41.3 | 15.9 | 10.7 | 13.7 | 25.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.4 | 1.9 | | 0.4 | 0.7 | 0.2 | 8.8 | 0.8 | 0.2 | 0.1 | 5.4 | |
| Delay (s) | 31.9 | 40.1 | | 32.6 | 39.3 | 32.8 | 50.1 | 16.6 | 10.9 | 13.8 | 30.8 | |
| Level of Service | C | D | | C | D | C | D | B | B | B | C | |
| Approach Delay (s) | | 37.6 | | | 33.8 | | | 22.6 | | | 30.0 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 28.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 98.1 | Sum of lost time (s) | 22.5 |
| Intersection Capacity Utilization | 91.7% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 605 | 216 | 1197 | 0 | 0 | 915 |
| Future Volume (vph) | 605 | 216 | 1197 | 0 | 0 | 915 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 54 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 605 | 216 | 1197 | 0 | 0 | 915 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 605 | 216 | 1197 | 0 | 0 | 915 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (%) | 40.0% | 40.0% | 60.0% | | | 60.0% |
| Maximum Green (s) | 29.5 | 29.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 22.7 | 22.7 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.58 | | | 0.58 |
| v/c Ratio | 0.78 | 0.52 | 0.59 | | | 0.45 |
| Control Delay (s/veh) | 35.4 | 23.6 | 13.6 | | | 11.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 35.4 | 23.6 | 13.6 | | | 11.7 |
| LOS | D | C | B | | | B |
| Approach Delay (s/veh) | 32.3 | | 13.6 | | | 11.7 |
| Approach LOS | C | | B | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 83.4 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.78 | | | |
| Intersection Signal Delay (s/veh): 18.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 62.0% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp

| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 605 | 216 | 1197 | 915 |
| v/c Ratio | 0.78 | 0.52 | 0.59 | 0.45 |
| Control Delay (s/veh) | 35.4 | 23.6 | 13.6 | 11.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 23.6 | 13.6 | 11.7 |
| Queue Length 50th (m) | 45.5 | 21.3 | 60.3 | 41.0 |
| Queue Length 95th (m) | 63.0 | 41.3 | 93.6 | 64.8 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1016 | 522 | 2021 | 2021 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.60 | 0.41 | 0.59 | 0.45 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 605 | 216 | 1197 | 0 | 0 | 915 |
| Future Volume (vph) | 605 | 216 | 1197 | 0 | 0 | 915 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 605 | 216 | 1197 | 0 | 0 | 915 |
| RTOR Reduction (vph) | 0 | 39 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 605 | 177 | 1197 | 0 | 0 | 915 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 22.7 | 22.7 | 48.2 | | | 48.2 |
| Effective Green, g (s) | 22.7 | 22.7 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.58 | | | 0.58 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 779 | 374 | 2022 | | | 2022 |
| v/s Ratio Prot | c0.21 | | c0.34 | | | 0.26 |
| v/s Ratio Perm | | 0.13 | | | | |
| v/c Ratio | 0.78 | 0.47 | 0.59 | | | 0.45 |
| Uniform Delay, d1 | 28.0 | 25.3 | 11.3 | | | 10.1 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 4.9 | 0.9 | 1.3 | | | 0.7 |
| Delay (s) | 32.9 | 26.3 | 12.6 | | | 10.8 |
| Level of Service | C | C | B | | | B |
| Approach Delay (s/veh) | 31.2 | | 12.6 | | | 10.8 |
| Approach LOS | C | | B | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 17.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 83.4 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 62.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

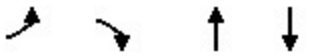
c Critical Lane Group

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| Future Volume (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.980 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1603 | 1414 | 0 | 3433 | 3298 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1603 | 1414 | 0 | 3433 | 3298 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 38 | | | 29 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Adj. Flow (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 515 | 548 | 0 | 1179 | 1528 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 54.0 | 42.0 | |
| Total Split (s) | 36.0 | 36.0 | | 54.0 | 54.0 | |
| Total Split (%) | 40.0% | 40.0% | | 60.0% | 60.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 10.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 19.5 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| v/c Ratio | 0.98 | 1.12 | | 0.64 | 0.86 | |
| Control Delay (s/veh) | 66.8 | 107.0 | | 17.0 | 24.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 66.8 | 107.0 | | 17.0 | 24.3 | |
| LOS | E | F | | B | C | |
| Approach Delay (s/veh) | 87.5 | | | 17.0 | 24.3 | |
| Approach LOS | F | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.12 | | | |
| Intersection Signal Delay (s/veh): 39.8 | | Intersection LOS: D | |
| Intersection Capacity Utilization 90.3% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp



| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 515 | 548 | 1179 | 1528 |
| v/c Ratio | 0.98 | 1.12 | 0.64 | 0.86 |
| Control Delay (s/veh) | 66.8 | 107.0 | 17.0 | 24.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 66.8 | 107.0 | 17.0 | 24.3 |
| Queue Length 50th (m) | 87.4 | ~105.9 | 71.8 | 111.4 |
| Queue Length 95th (m) | #150.2 | #167.2 | 92.6 | 144.8 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 525 | 489 | 1830 | 1772 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.98 | 1.12 | 0.64 | 0.86 |

Intersection Summary

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

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| Future Volume (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1603 | 1414 | | 3433 | 3299 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1603 | 1414 | | 3433 | 3299 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| RTOR Reduction (vph) | 0 | 26 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 515 | 522 | 0 | 1179 | 1514 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Effective Green, g (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 525 | 463 | | 1830 | 1759 | |
| v/s Ratio Prot | 0.32 | | | 0.34 | c0.46 | |
| v/s Ratio Perm | | c0.37 | | | | |
| v/c Ratio | 0.98 | 1.13 | | 0.64 | 0.86 | |
| Uniform Delay, d1 | 30.0 | 30.3 | | 14.9 | 18.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 34.2 | 81.9 | | 1.8 | 5.8 | |
| Delay (s) | 64.2 | 112.1 | | 16.7 | 23.9 | |
| Level of Service | E | F | | B | C | |
| Approach Delay (s/veh) | 88.9 | | | 16.7 | 23.9 | |
| Approach LOS | F | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 40.0 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.96 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 90.3% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

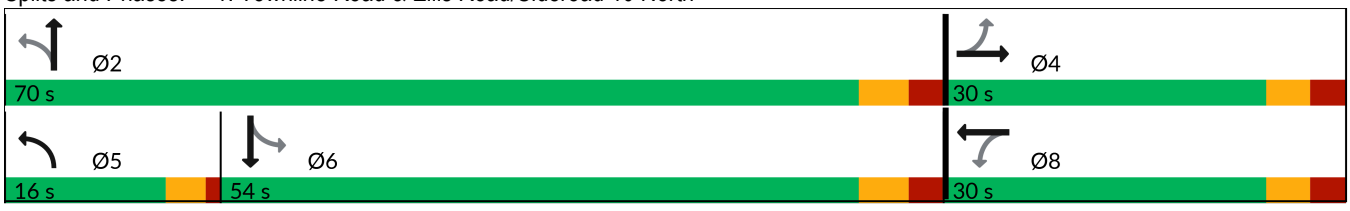
c Critical Lane Group

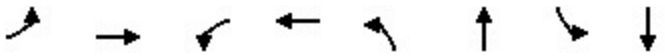
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| Future Volume (vph) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.868 | | | 0.969 | | | 0.987 | | | 0.985 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1392 | 0 | 1635 | 1581 | 0 | 1668 | 1596 | 0 | 1668 | 1548 | 0 |
| Flt Permitted | 0.719 | | | 0.460 | | | 0.174 | | | 0.084 | | |
| Satd. Flow (perm) | 1262 | 1392 | 0 | 792 | 1581 | 0 | 305 | 1596 | 0 | 147 | 1548 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 189 | | | 12 | | | 9 | | | 7 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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 (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 49 | 214 | 0 | 112 | 59 | 0 | 442 | 1276 | 0 | 10 | 735 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 9.0 | 54.0 | | 54.0 | 54.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 16.0 | 70.0 | | 54.0 | 54.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 16.0% | 70.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 12.0 | 63.7 | | 47.7 | 47.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 39.7 | | 39.7 | 39.7 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 66.2 | 63.9 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.71 | 0.69 | | 0.52 | 0.52 | |
| v/c Ratio | 0.22 | 0.54 | | 0.81 | 0.20 | | 1.12 | 1.16 | | 0.13 | 0.92 | |
| Control Delay (s/veh) | 34.1 | 12.2 | | 74.3 | 27.9 | | 100.2 | 99.0 | | 19.4 | 40.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.2 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 34.1 | 12.2 | | 74.3 | 27.9 | | 100.2 | 99.2 | | 19.4 | 40.0 | |
| LOS | C | B | | E | C | | F | F | | B | D | |
| Approach Delay (s/veh) | | 16.3 | | | 58.3 | | | 99.5 | | | 39.7 | |
| Approach LOS | | B | | | E | | | F | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 92.6 | | | |
| Natural Cycle: 145 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.16 | | | |
| Intersection Signal Delay (s/veh): 74.1 | | Intersection LOS: E | |
| Intersection Capacity Utilization 124.6% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North



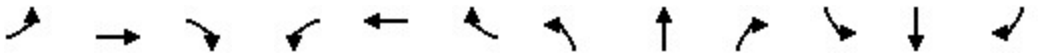


| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 49 | 214 | 112 | 59 | 442 | 1276 | 10 | 735 |
| v/c Ratio | 0.22 | 0.54 | 0.81 | 0.20 | 1.12 | 1.16 | 0.13 | 0.92 |
| Control Delay (s/veh) | 34.1 | 12.2 | 74.3 | 27.9 | 100.2 | 99.0 | 19.4 | 40.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.1 | 12.2 | 74.3 | 27.9 | 100.2 | 99.2 | 19.4 | 40.0 |
| Queue Length 50th (m) | 7.5 | 3.8 | 19.3 | 7.2 | ~36.6 | ~273.6 | 0.9 | 114.2 |
| Queue Length 95th (m) | 17.1 | 22.5 | #39.0 | 17.5 | #112.4 | #390.7 | 4.8 | #216.3 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 328 | 502 | 206 | 420 | 395 | 1104 | 76 | 803 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.15 | 0.43 | 0.54 | 0.14 | 1.12 | 1.20 | 0.13 | 0.92 |

Intersection Summary

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

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| Future Volume (vph) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1391 | | 1635 | 1582 | | 1668 | 1596 | | 1668 | 1549 | |
| Flt Permitted | 0.72 | 1.00 | | 0.46 | 1.00 | | 0.17 | 1.00 | | 0.08 | 1.00 | |
| Satd. Flow (perm) | 1261 | 1391 | | 792 | 1582 | | 306 | 1596 | | 147 | 1549 | |
| 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) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| RTOR Reduction (vph) | 0 | 156 | 0 | 0 | 10 | 0 | 0 | 3 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 49 | 58 | 0 | 112 | 49 | 0 | 442 | 1273 | 0 | 10 | 732 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Effective Green, g (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.69 | 0.69 | | 0.52 | 0.52 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 222 | 245 | | 139 | 278 | | 388 | 1102 | | 76 | 802 | |
| v/s Ratio Prot | | 0.04 | | | 0.03 | | 0.15 | c0.80 | | | 0.47 | |
| v/s Ratio Perm | 0.04 | | | c0.14 | | | 0.64 | | | 0.07 | | |
| v/c Ratio | 0.22 | 0.24 | | 0.81 | 0.18 | | 1.14 | 1.16 | | 0.13 | 0.91 | |
| Uniform Delay, d1 | 32.7 | 32.8 | | 36.6 | 32.4 | | 19.8 | 14.3 | | 11.5 | 20.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.5 | | 27.7 | 0.3 | | 89.3 | 80.5 | | 3.6 | 16.5 | |
| Delay (s) | 33.2 | 33.3 | | 64.3 | 32.7 | | 109.0 | 94.8 | | 15.1 | 36.8 | |
| Level of Service | C | C | | E | C | | F | F | | B | D | |
| Approach Delay (s/veh) | | 33.2 | | | 53.4 | | | 98.4 | | | 36.6 | |
| Approach LOS | | C | | | D | | | F | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 73.9 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 1.14 | | |
| Actuated Cycle Length (s) | 92.5 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 124.6% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |

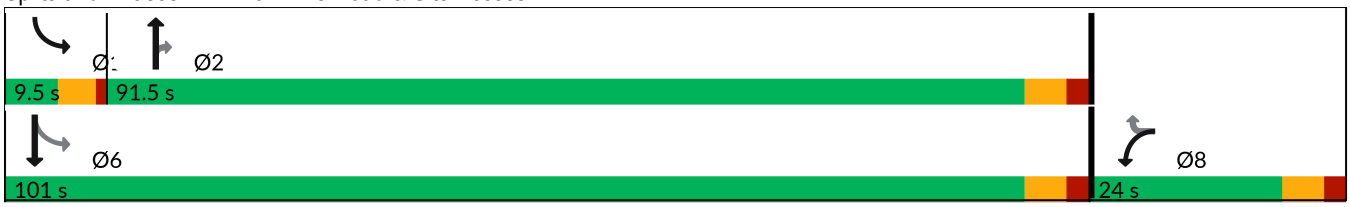
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| Future Volume (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.041 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 76 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 25 | | 15 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | 24.0 | 9.5 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 91.5 | 91.5 | 9.5 | 101.0 |
| Total Split (%) | 19.2% | 19.2% | 73.2% | 73.2% | 7.6% | 80.8% |
| Maximum Green (s) | 18.0 | 18.0 | 85.5 | 85.5 | 5.0 | 95.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 3.5 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 4.5 | 6.0 |
| Lead/Lag | | | Lag | Lag | Lead | |
| 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 | Max | Max | None | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | | 0 |
| Act Effct Green (s) | 9.4 | 9.4 | 95.0 | 95.0 | 100.9 | 100.7 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.80 | 0.80 | 0.85 | 0.85 |
| v/c Ratio | 0.43 | 0.18 | 1.23 | 0.02 | 0.27 | 0.59 |
| Control Delay (s/veh) | 61.6 | 20.8 | 127.0 | 2.8 | 7.4 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 |
| Total Delay (s/veh) | 61.6 | 20.8 | 127.0 | 2.8 | 7.4 | 7.0 |
| LOS | E | C | F | A | A | A |
| Approach Delay (s/veh) | 48.9 | | 125.2 | | | 7.0 |
| Approach LOS | D | | F | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 125 | | | |
| Actuated Cycle Length: 118.4 | | | |
| Natural Cycle: 150 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.23 | | | |
| Intersection Signal Delay (s/veh): 81.8 | | Intersection LOS: F | |
| Intersection Capacity Utilization 109.6% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| v/c Ratio | 0.43 | 0.18 | 1.23 | 0.02 | 0.27 | 0.59 |
| Control Delay (s/veh) | 61.6 | 20.8 | 127.0 | 2.8 | 7.4 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 |
| Total Delay (s/veh) | 61.6 | 20.8 | 127.0 | 2.8 | 7.4 | 7.0 |
| Queue Length 50th (m) | 12.4 | 0.0 | ~510.9 | 0.5 | 1.1 | 61.0 |
| Queue Length 95th (m) | 25.2 | 8.3 | #611.3 | 3.0 | 4.2 | 105.9 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 247 | 242 | 1380 | 1176 | 135 | 1566 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 393 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.10 | 1.23 | 0.02 | 0.27 | 0.79 |

Intersection Summary

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| Future Volume (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 4.5 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.04 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 75 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| RTOR Reduction (vph) | 0 | 23 | 0 | 3 | 0 | 0 |
| Lane Group Flow (vph) | 55 | 2 | 1694 | 22 | 36 | 928 |
| Turn Type | Prot | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 8.2 | 8.2 | 93.8 | 93.8 | 101.3 | 101.3 |
| Effective Green, g (s) | 8.2 | 8.2 | 93.8 | 93.8 | 101.3 | 101.3 |
| Actuated g/C Ratio | 0.07 | 0.07 | 0.77 | 0.77 | 0.83 | 0.83 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 4.5 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 109 | 98 | 1328 | 1129 | 103 | 1535 |
| v/s Ratio Prot | c0.03 | | c0.98 | | 0.01 | c0.50 |
| v/s Ratio Perm | | 0.00 | | 0.01 | 0.28 | |
| v/c Ratio | 0.50 | 0.02 | 1.28 | 0.02 | 0.35 | 0.60 |
| Uniform Delay, d1 | 54.7 | 52.9 | 13.9 | 3.2 | 39.0 | 3.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 3.6 | 0.1 | 130.0 | 0.0 | 2.1 | 1.8 |
| Delay (s) | 58.3 | 53.0 | 143.9 | 3.2 | 41.1 | 5.2 |
| Level of Service | E | D | F | A | D | A |
| Approach Delay (s/veh) | 56.7 | | 141.8 | | | 6.5 |
| Approach LOS | E | | F | | | A |

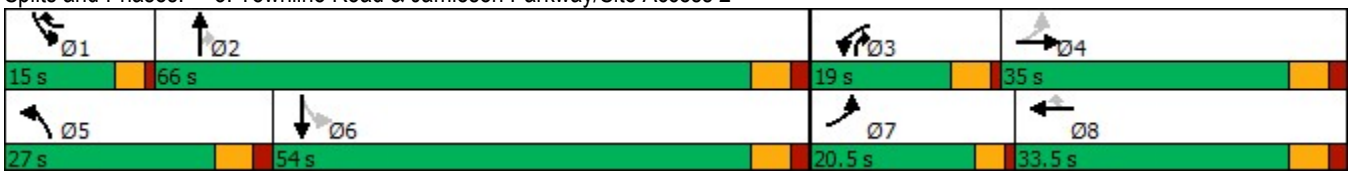
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 92.1 | HCM 2000 Level of Service | F |
| HCM 2000 Volume to Capacity ratio | 1.21 | | |
| Actuated Cycle Length (s) | 121.5 | Sum of lost time (s) | 16.5 |
| Intersection Capacity Utilization | 109.6% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 270 | 27 | 457 | 310 | 147 | 338 | 455 | 1072 | 453 | 113 | 688 | 173 |
| Future Volume (vph) | 270 | 27 | 457 | 310 | 147 | 338 | 455 | 1072 | 453 | 113 | 688 | 173 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 1 | 2 | | 1 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.858 | | | | 0.850 | | | 0.850 | | 0.970 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1400 | 0 | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3123 | 0 |
| Flt Permitted | 0.544 | | | 0.950 | | | 0.950 | | | 0.197 | | |
| Satd. Flow (perm) | 955 | 1400 | 0 | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 346 | 3123 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 289 | | | | 113 | | | 453 | | 26 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 157.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 9.4 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 270 | 27 | 457 | 310 | 147 | 338 | 455 | 1072 | 453 | 113 | 688 | 173 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 270 | 484 | 0 | 310 | 147 | 338 | 455 | 1072 | 453 | 113 | 861 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | Prot | NA | pm+ov | Prot | NA | pm+ov | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | 4 | | | | | 8 | | | 2 | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | | 5.0 | 8.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 9.5 | 31.0 | | 10.0 | 31.0 | 9.0 | 11.0 | 50.4 | 10.0 | 9.0 | 50.4 | |
| Total Split (s) | 20.5 | 35.0 | | 19.0 | 33.5 | 15.0 | 27.0 | 66.0 | 19.0 | 15.0 | 54.0 | |
| Total Split (%) | 15.2% | 25.9% | | 14.1% | 24.8% | 11.1% | 20.0% | 48.9% | 14.1% | 11.1% | 40.0% | |
| Maximum Green (s) | 16.5 | 29.0 | | 14.0 | 27.5 | 11.0 | 21.0 | 60.0 | 14.0 | 11.0 | 48.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 4.0 | 4.0 | 3.0 | 4.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 6.0 | | 5.0 | 6.0 | 4.0 | 6.0 | 6.0 | 5.0 | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | None | None | Max | None | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 23.4 | | | 23.4 | |
| Flash Dont Walk (s) | | 18.0 | | | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 43.6 | 25.5 | | 14.0 | 24.5 | 39.7 | 20.5 | 61.4 | 81.4 | 59.4 | 48.1 | |
| Actuated g/C Ratio | 0.33 | 0.19 | | 0.11 | 0.19 | 0.30 | 0.16 | 0.47 | 0.62 | 0.45 | 0.37 | |
| v/c Ratio | 0.67 | 0.96 | | 0.90 | 0.48 | 0.68 | 0.91 | 0.69 | 0.41 | 0.45 | 0.74 | |
| Control Delay | 42.0 | 52.3 | | 86.6 | 53.5 | 33.3 | 78.2 | 31.4 | 2.3 | 20.7 | 40.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 42.0 | 52.3 | | 86.6 | 53.5 | 33.3 | 78.2 | 31.4 | 2.3 | 20.7 | 40.4 | |
| LOS | D | D | | F | D | C | E | C | A | C | D | |
| Approach Delay | | 48.6 | | | 57.8 | | | 35.5 | | | 38.1 | |
| Approach LOS | | D | | | E | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 135 | | | |
| Actuated Cycle Length: 131.2 | | | |
| Natural Cycle: 115 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.96 | | | |
| Intersection Signal Delay: 42.2 | | Intersection LOS: D | |
| Intersection Capacity Utilization 103.0% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

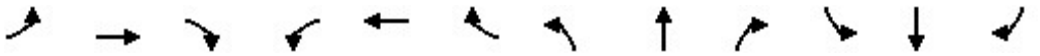
Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 270 | 484 | 310 | 147 | 338 | 455 | 1072 | 453 | 113 | 861 |
| v/c Ratio | 0.67 | 0.96 | 0.90 | 0.48 | 0.68 | 0.91 | 0.69 | 0.41 | 0.45 | 0.74 |
| Control Delay | 42.0 | 52.3 | 86.6 | 53.5 | 33.3 | 78.2 | 31.4 | 2.3 | 20.7 | 40.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.0 | 52.3 | 86.6 | 53.5 | 33.3 | 78.2 | 31.4 | 2.3 | 20.7 | 40.4 |
| Queue Length 50th (m) | 53.8 | 57.4 | 42.9 | 34.6 | 52.0 | 62.3 | 119.5 | 0.0 | 13.3 | 103.5 |
| Queue Length 95th (m) | 79.0 | #124.2 | #70.2 | 55.9 | 85.1 | #92.1 | 147.4 | 13.3 | 22.6 | 128.5 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | | 133.4 | | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | | 115.0 | | | 115.0 | |
| Base Capacity (vph) | 410 | 535 | 346 | 343 | 515 | 514 | 1544 | 1097 | 272 | 1162 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.66 | 0.90 | 0.90 | 0.43 | 0.66 | 0.89 | 0.69 | 0.41 | 0.42 | 0.74 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 270 | 27 | 457 | 310 | 147 | 338 | 455 | 1072 | 453 | 113 | 688 | 173 |
| Future Volume (vph) | 270 | 27 | 457 | 310 | 147 | 338 | 455 | 1072 | 453 | 113 | 688 | 173 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.0 | 6.0 | | 5.0 | 6.0 | 4.0 | 6.0 | 6.0 | 5.0 | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.86 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1401 | | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 1668 | 3122 | |
| Flt Permitted | 0.54 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.20 | 1.00 | |
| Satd. Flow (perm) | 956 | 1401 | | 3235 | 1632 | 1387 | 3203 | 3302 | 1492 | 346 | 3122 | |
| 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) | 270 | 27 | 457 | 310 | 147 | 338 | 455 | 1072 | 453 | 113 | 688 | 173 |
| RTOR Reduction (vph) | 0 | 233 | 0 | 0 | 0 | 84 | 0 | 0 | 193 | 0 | 16 | 0 |
| Lane Group Flow (vph) | 270 | 251 | 0 | 310 | 147 | 254 | 455 | 1072 | 260 | 113 | 845 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | pm+pt | NA | | Prot | NA | pm+ov | Prot | NA | pm+ov | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | 4 | | | | | 8 | | | 2 | 6 | | |
| Actuated Green, G (s) | 41.7 | 25.6 | | 14.0 | 24.5 | 33.7 | 20.5 | 61.4 | 75.4 | 57.3 | 48.1 | |
| Effective Green, g (s) | 41.7 | 25.6 | | 14.0 | 24.5 | 33.7 | 20.5 | 61.4 | 75.4 | 57.3 | 48.1 | |
| Actuated g/C Ratio | 0.32 | 0.20 | | 0.11 | 0.19 | 0.26 | 0.16 | 0.47 | 0.57 | 0.44 | 0.37 | |
| Clearance Time (s) | 4.0 | 6.0 | | 5.0 | 6.0 | 4.0 | 6.0 | 6.0 | 5.0 | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 391 | 273 | | 345 | 304 | 356 | 500 | 1545 | 857 | 243 | 1144 | |
| v/s Ratio Prot | 0.08 | c0.18 | | c0.10 | 0.09 | 0.05 | c0.14 | 0.32 | 0.03 | 0.03 | c0.27 | |
| v/s Ratio Perm | 0.13 | | | | | 0.13 | | | 0.14 | 0.17 | | |
| v/c Ratio | 0.69 | 0.92 | | 0.90 | 0.48 | 0.71 | 0.91 | 0.69 | 0.30 | 0.47 | 0.74 | |
| Uniform Delay, d1 | 36.8 | 51.8 | | 57.9 | 47.7 | 44.4 | 54.4 | 27.5 | 14.4 | 23.1 | 36.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 5.2 | 34.1 | | 24.7 | 1.2 | 6.6 | 20.6 | 2.6 | 0.2 | 1.4 | 4.3 | |
| Delay (s) | 42.0 | 86.0 | | 82.6 | 48.9 | 51.0 | 75.1 | 30.1 | 14.6 | 24.5 | 40.4 | |
| Level of Service | D | F | | F | D | D | E | C | B | C | D | |
| Approach Delay (s) | | 70.2 | | | 62.9 | | | 36.9 | | | 38.5 | |
| Approach LOS | | E | | | E | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 47.4 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.83 | | |
| Actuated Cycle Length (s) | 131.2 | Sum of lost time (s) | 23.0 |
| Intersection Capacity Utilization | 103.0% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |

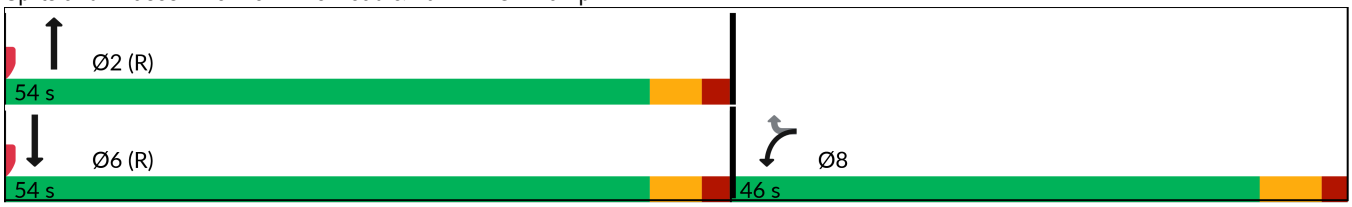
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 607 | 436 | 1665 | 0 | 0 | 1034 |
| Future Volume (vph) | 607 | 436 | 1665 | 0 | 0 | 1034 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 9 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 607 | 436 | 1665 | 0 | 0 | 1034 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 607 | 436 | 1665 | 0 | 0 | 1034 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Minimum Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (%) | 46.0% | 46.0% | 54.0% | | | 54.0% |
| Maximum Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 29.5 | 29.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| v/c Ratio | 0.52 | 0.75 | 0.99 | | | 0.62 |
| Control Delay (s/veh) | 25.1 | 35.2 | 46.6 | | | 21.2 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 25.1 | 35.2 | 46.6 | | | 21.2 |
| LOS | C | D | D | | | C |
| Approach Delay (s/veh) | 29.3 | | 46.6 | | | 21.2 |
| Approach LOS | C | | D | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 100 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.99 | | | |
| Intersection Signal Delay (s/veh): 34.7 | | Intersection LOS: C | |
| Intersection Capacity Utilization 85.8% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 607 | 436 | 1665 | 1034 |
| v/c Ratio | 0.52 | 0.75 | 0.99 | 0.62 |
| Control Delay (s/veh) | 25.1 | 35.2 | 46.6 | 21.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 25.1 | 35.2 | 46.6 | 21.2 |
| Queue Length 50th (m) | 45.4 | 70.1 | 162.3 | 75.1 |
| Queue Length 95th (m) | 61.3 | 108.5 | #217.9 | 95.2 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1161 | 580 | 1680 | 1680 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.52 | 0.75 | 0.99 | 0.62 |

Intersection Summary

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 607 | 436 | 1665 | 0 | 0 | 1034 |
| Future Volume (vph) | 607 | 436 | 1665 | 0 | 0 | 1034 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 607 | 436 | 1665 | 0 | 0 | 1034 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 607 | 431 | 1665 | 0 | 0 | 1034 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Effective Green, g (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Grp Cap (vph) | 1161 | 575 | 1680 | | | 1680 |
| v/s Ratio Prot | 0.21 | | c0.48 | | | 0.30 |
| v/s Ratio Perm | | c0.30 | | | | |
| v/c Ratio | 0.52 | 0.75 | 0.99 | | | 0.62 |
| Uniform Delay, d1 | 23.1 | 26.0 | 25.8 | | | 19.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.7 | 8.7 | 19.9 | | | 1.7 |
| Delay (s) | 24.7 | 34.7 | 45.7 | | | 20.9 |
| Level of Service | C | C | D | | | C |
| Approach Delay (s/veh) | 28.9 | | 45.7 | | | 20.9 |
| Approach LOS | C | | D | | | C |

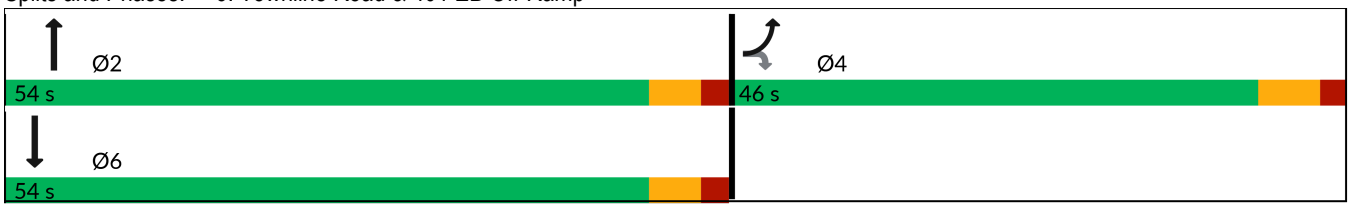
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 34.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 85.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

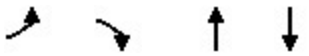
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| Future Volume (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.981 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1619 | 1442 | 0 | 3535 | 3356 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1619 | 1442 | 0 | 3535 | 3356 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 16 | | | 22 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Adj. Flow (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 521 | 548 | 0 | 1435 | 1700 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (%) | 46.0% | 46.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 39.5 | 39.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 42.0 | |
| Flash Don't Walk (s) | 29.5 | 29.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 38.3 | 38.3 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.39 | 0.39 | | 0.49 | 0.49 | |
| v/c Ratio | 0.83 | 0.96 | | 0.84 | 1.04 | |
| Control Delay (s/veh) | 40.5 | 60.0 | | 27.8 | 58.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 40.5 | 60.0 | | 27.8 | 58.1 | |
| LOS | D | E | | C | E | |
| Approach Delay (s/veh) | 50.5 | | | 27.8 | 58.1 | |
| Approach LOS | D | | | C | E | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 98.8 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.04 | | | |
| Intersection Signal Delay (s/veh): 45.8 | | Intersection LOS: D | |
| Intersection Capacity Utilization 95.2% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 521 | 548 | 1435 | 1700 |
| v/c Ratio | 0.83 | 0.96 | 0.84 | 1.04 |
| Control Delay (s/veh) | 40.5 | 60.0 | 27.8 | 58.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.5 | 60.0 | 27.8 | 58.1 |
| Queue Length 50th (m) | 88.5 | 98.6 | 123.4 | ~188.7 |
| Queue Length 95th (m) | #142.5 | #165.8 | 154.4 | #231.4 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 647 | 586 | 1717 | 1642 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.81 | 0.94 | 0.84 | 1.04 |

Intersection Summary

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

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| Future Volume (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1619 | 1442 | | 3535 | 3355 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1619 | 1442 | | 3535 | 3355 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| RTOR Reduction (vph) | 0 | 10 | 0 | 0 | 11 | 0 |
| Lane Group Flow (vph) | 521 | 538 | 0 | 1435 | 1689 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 38.3 | 38.3 | | 48.0 | 48.0 | |
| Effective Green, g (s) | 38.3 | 38.3 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.39 | 0.39 | | 0.49 | 0.49 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 627 | 558 | | 1717 | 1629 | |
| v/s Ratio Prot | 0.32 | | | 0.41 | c0.50 | |
| v/s Ratio Perm | | c0.37 | | | | |
| v/c Ratio | 0.83 | 0.96 | | 0.84 | 1.04 | |
| Uniform Delay, d1 | 27.3 | 29.6 | | 22.0 | 25.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 9.2 | 29.1 | | 5.0 | 32.4 | |
| Delay (s) | 36.5 | 58.7 | | 27.0 | 57.8 | |
| Level of Service | D | E | | C | E | |
| Approach Delay (s/veh) | 47.9 | | | 27.0 | 57.8 | |
| Approach LOS | D | | | C | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 44.8 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.00 | | |
| Actuated Cycle Length (s) | 98.8 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 95.2% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

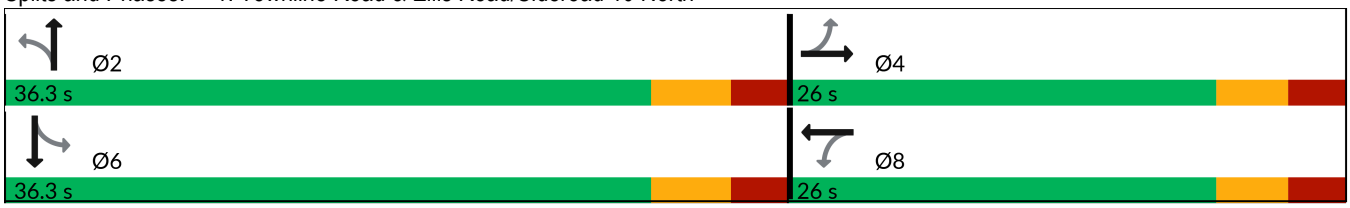
c Critical Lane Group

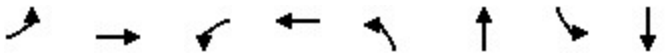
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| Future Volume (vph) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.867 | | | 0.975 | | | 0.985 | | | 0.990 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1415 | 0 | 1668 | 1583 | 0 | 1651 | 1579 | 0 | 1668 | 1600 | 0 |
| Flt Permitted | 0.742 | | | 0.449 | | | 0.322 | | | 0.201 | | |
| Satd. Flow (perm) | 1290 | 1415 | 0 | 788 | 1583 | 0 | 560 | 1579 | 0 | 353 | 1600 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 210 | | | 4 | | | 13 | | | 8 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Adj. Flow (vph) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 60 | 299 | 0 | 75 | 24 | 0 | 246 | 818 | 0 | 3 | 650 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (%) | 41.7% | 41.7% | | 41.7% | 41.7% | | 58.3% | 58.3% | | 58.3% | 58.3% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.7 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 2.6 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Max | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Flash Don't Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 11.1 | 11.1 | | 11.1 | 11.1 | | 30.2 | 30.2 | | 30.2 | 30.2 | |
| Actuated g/C Ratio | 0.21 | 0.21 | | 0.21 | 0.21 | | 0.56 | 0.56 | | 0.56 | 0.56 | |
| v/c Ratio | 0.23 | 0.65 | | 0.46 | 0.07 | | 0.78 | 0.91 | | 0.02 | 0.72 | |
| Control Delay (s/veh) | 19.2 | 13.7 | | 27.9 | 15.0 | | 33.4 | 30.5 | | 7.3 | 16.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 19.2 | 13.7 | | 27.9 | 15.0 | | 33.4 | 30.5 | | 7.3 | 16.3 | |
| LOS | B | B | | C | B | | C | C | | A | B | |
| Approach Delay (s/veh) | | 14.6 | | | 24.8 | | | 31.2 | | | 16.3 | |
| Approach LOS | | B | | | C | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 62.3 | | | |
| Actuated Cycle Length: 53.6 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.91 | | | |
| Intersection Signal Delay (s/veh): 23.7 | | Intersection LOS: C | |
| Intersection Capacity Utilization 105.1% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 60 | 299 | 75 | 24 | 246 | 818 | 3 | 650 |
| v/c Ratio | 0.23 | 0.65 | 0.46 | 0.07 | 0.78 | 0.91 | 0.02 | 0.72 |
| Control Delay (s/veh) | 19.2 | 13.7 | 27.9 | 15.0 | 33.4 | 30.5 | 7.3 | 16.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 19.2 | 13.7 | 27.9 | 15.0 | 33.4 | 30.5 | 7.3 | 16.3 |
| Queue Length 50th (m) | 4.8 | 7.3 | 6.4 | 1.6 | 14.8 | 55.8 | 0.1 | 36.2 |
| Queue Length 95th (m) | 12.3 | 25.4 | 16.1 | 5.9 | #63.2 | #162.7 | 1.3 | #115.7 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 483 | 662 | 295 | 596 | 314 | 894 | 198 | 903 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.12 | 0.45 | 0.25 | 0.04 | 0.78 | 0.91 | 0.02 | 0.72 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| Future Volume (vph) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.98 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1414 | | 1668 | 1583 | | 1651 | 1578 | | 1668 | 1600 | |
| Flt Permitted | 0.74 | 1.00 | | 0.45 | 1.00 | | 0.32 | 1.00 | | 0.20 | 1.00 | |
| Satd. Flow (perm) | 1289 | 1414 | | 789 | 1583 | | 560 | 1578 | | 353 | 1600 | |
| 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) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| RTOR Reduction (vph) | 0 | 167 | 0 | 0 | 3 | 0 | 0 | 6 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 60 | 132 | 0 | 75 | 21 | 0 | 246 | 812 | 0 | 3 | 647 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 11.1 | 11.1 | | 11.1 | 11.1 | | 30.2 | 30.2 | | 30.2 | 30.2 | |
| Effective Green, g (s) | 11.1 | 11.1 | | 11.1 | 11.1 | | 30.2 | 30.2 | | 30.2 | 30.2 | |
| Actuated g/C Ratio | 0.21 | 0.21 | | 0.21 | 0.21 | | 0.56 | 0.56 | | 0.56 | 0.56 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 266 | 292 | | 163 | 327 | | 315 | 889 | | 198 | 901 | |
| v/s Ratio Prot | | 0.09 | | | 0.01 | | | c0.51 | | | 0.40 | |
| v/s Ratio Perm | 0.05 | | | c0.10 | | | 0.44 | | | 0.01 | | |
| v/c Ratio | 0.23 | 0.45 | | 0.46 | 0.06 | | 0.78 | 0.91 | | 0.02 | 0.72 | |
| Uniform Delay, d1 | 17.7 | 18.6 | | 18.6 | 17.1 | | 9.1 | 10.5 | | 5.2 | 8.6 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | 1.1 | | 2.1 | 0.1 | | 17.3 | 15.4 | | 0.1 | 4.9 | |
| Delay (s) | 18.1 | 19.7 | | 20.7 | 17.2 | | 26.4 | 25.9 | | 5.3 | 13.5 | |
| Level of Service | B | B | | C | B | | C | C | | A | B | |
| Approach Delay (s/veh) | | 19.4 | | | 19.8 | | | 26.0 | | | 13.4 | |
| Approach LOS | | B | | | B | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 20.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.79 | | |
| Actuated Cycle Length (s) | 53.6 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 105.1% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |

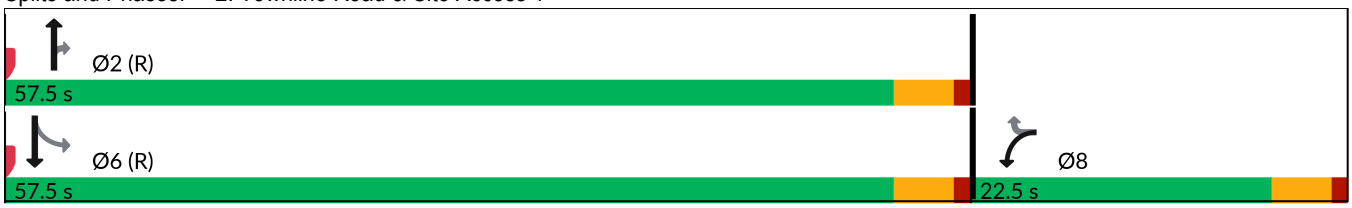
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| Future Volume (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.233 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 429 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 5 | | 12 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 57.5 | 57.5 | 57.5 | 57.5 |
| Total Split (%) | 28.1% | 28.1% | 71.9% | 71.9% | 71.9% | 71.9% |
| Maximum Green (s) | 18.0 | 18.0 | 53.0 | 53.0 | 53.0 | 53.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 6.2 | 6.2 | 73.6 | 73.6 | 73.6 | 73.6 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.92 | 0.92 | 0.92 | 0.92 |
| v/c Ratio | 0.09 | 0.04 | 0.67 | 0.01 | 0.05 | 0.55 |
| Control Delay (s/veh) | 35.4 | 22.2 | 5.2 | 0.9 | 1.7 | 3.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 22.2 | 5.2 | 0.9 | 1.7 | 3.3 |
| LOS | D | C | A | A | A | A |
| Approach Delay (s/veh) | 31.3 | | 5.2 | | | 3.3 |
| Approach LOS | C | | A | | | A |

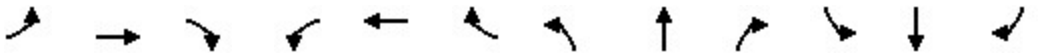
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.67 | | | |
| Intersection Signal Delay (s/veh): 4.5 | | Intersection LOS: A | |
| Intersection Capacity Utilization 71.4% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| v/c Ratio | 0.09 | 0.04 | 0.67 | 0.01 | 0.05 | 0.55 |
| Control Delay (s/veh) | 35.4 | 22.2 | 5.2 | 0.9 | 1.7 | 3.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 22.2 | 5.2 | 0.9 | 1.7 | 3.3 |
| Queue Length 50th (m) | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Queue Length 95th (m) | 6.2 | 3.2 | 109.1 | 0.7 | 1.7 | 65.7 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 365 | 331 | 1584 | 1347 | 395 | 1695 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 61 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.03 | 0.02 | 0.67 | 0.01 | 0.05 | 0.57 |

Intersection Summary

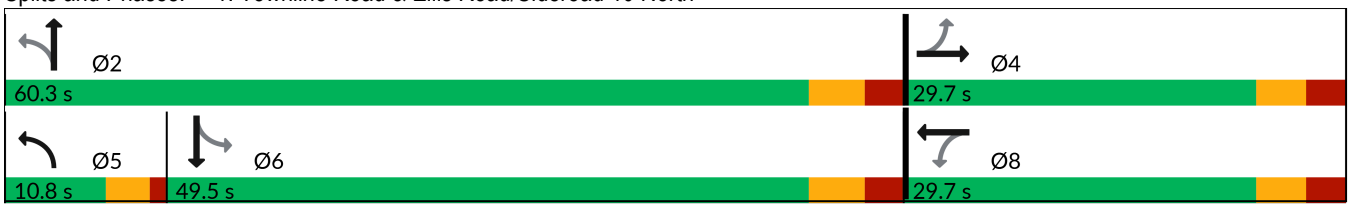


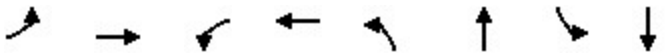
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 82 | 29 | 244 | 61 | 10 | 4 | 118 | 574 | 66 | 4 | 680 | 29 |
| Future Volume (vph) | 82 | 29 | 244 | 61 | 10 | 4 | 118 | 574 | 66 | 4 | 680 | 29 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.866 | | | 0.957 | | | 0.985 | | | 0.994 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1388 | 0 | 1668 | 1562 | 0 | 1603 | 1544 | 0 | 1334 | 1577 | 0 |
| Flt Permitted | 0.748 | | | 0.348 | | | 0.243 | | | 0.422 | | |
| Satd. Flow (perm) | 1300 | 1388 | 0 | 611 | 1562 | 0 | 410 | 1544 | 0 | 593 | 1577 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 244 | | | 4 | | | 11 | | | 3 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Adj. Flow (vph) | 82 | 29 | 244 | 61 | 10 | 4 | 118 | 574 | 66 | 4 | 680 | 29 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 82 | 273 | 0 | 61 | 14 | 0 | 118 | 640 | 0 | 4 | 709 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 9.0 | 49.5 | | 49.5 | 49.5 | |
| Total Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 10.8 | 60.3 | | 49.5 | 49.5 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 12.0% | 67.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 23.7 | 23.7 | | 23.7 | 23.7 | | 6.8 | 54.0 | | 43.2 | 43.2 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 35.2 | | 35.2 | 35.2 | |
| Flash Don't Walk (s) | 13.7 | 13.7 | | 13.7 | 13.7 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 11.5 | 11.5 | | 11.5 | 11.5 | | 56.5 | 54.2 | | 45.7 | 45.7 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.72 | 0.69 | | 0.59 | 0.59 | |
| v/c Ratio | 0.43 | 0.66 | | 0.69 | 0.06 | | 0.30 | 0.60 | | 0.01 | 0.77 | |
| Control Delay (s/veh) | 36.8 | 14.4 | | 67.0 | 23.9 | | 6.0 | 9.9 | | 9.8 | 21.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.1 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 36.8 | 14.4 | | 67.0 | 23.9 | | 6.0 | 10.0 | | 9.8 | 21.9 | |
| LOS | D | B | | E | C | | A | B | | A | C | |
| Approach Delay (s/veh) | | 19.6 | | | 59.0 | | | 9.4 | | | 21.9 | |
| Approach LOS | | B | | | E | | | A | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 78 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.77 | | | |
| Intersection Signal Delay (s/veh): 17.9 | | Intersection LOS: B | |
| Intersection Capacity Utilization 92.1% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

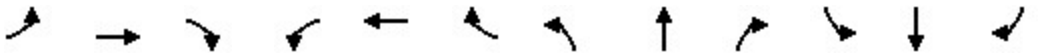




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 82 | 273 | 61 | 14 | 118 | 640 | 4 | 709 |
| v/c Ratio | 0.43 | 0.66 | 0.69 | 0.06 | 0.30 | 0.60 | 0.01 | 0.77 |
| Control Delay (s/veh) | 36.8 | 14.4 | 67.0 | 23.9 | 6.0 | 9.9 | 9.8 | 21.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.8 | 14.4 | 67.0 | 23.9 | 6.0 | 10.0 | 9.8 | 21.9 |
| Queue Length 50th (m) | 11.1 | 3.8 | 8.6 | 1.3 | 4.1 | 39.8 | 0.2 | 76.9 |
| Queue Length 95th (m) | 23.4 | 24.6 | 21.2 | 5.9 | 11.5 | 89.9 | 1.8 | #168.6 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 396 | 592 | 186 | 478 | 401 | 1075 | 347 | 925 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 52 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.21 | 0.46 | 0.33 | 0.03 | 0.29 | 0.63 | 0.01 | 0.77 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 82 | 29 | 244 | 61 | 10 | 4 | 118 | 574 | 66 | 4 | 680 | 29 |
| Future Volume (vph) | 82 | 29 | 244 | 61 | 10 | 4 | 118 | 574 | 66 | 4 | 680 | 29 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1388 | | 1668 | 1562 | | 1603 | 1543 | | 1334 | 1576 | |
| Flt Permitted | 0.75 | 1.00 | | 0.35 | 1.00 | | 0.24 | 1.00 | | 0.42 | 1.00 | |
| Satd. Flow (perm) | 1301 | 1388 | | 611 | 1562 | | 410 | 1543 | | 592 | 1576 | |
| 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) | 82 | 29 | 244 | 61 | 10 | 4 | 118 | 574 | 66 | 4 | 680 | 29 |
| RTOR Reduction (vph) | 0 | 208 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 82 | 65 | 0 | 61 | 11 | 0 | 118 | 637 | 0 | 4 | 708 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 11.5 | 11.5 | | 11.5 | 11.5 | | 55.0 | 55.0 | | 45.7 | 45.7 | |
| Effective Green, g (s) | 11.5 | 11.5 | | 11.5 | 11.5 | | 55.0 | 55.0 | | 45.7 | 45.7 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.70 | 0.70 | | 0.58 | 0.58 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 189 | 202 | | 89 | 227 | | 366 | 1076 | | 343 | 914 | |
| v/s Ratio Prot | | 0.05 | | | 0.01 | | 0.02 | c0.41 | | | c0.45 | |
| v/s Ratio Perm | 0.06 | | | c0.10 | | | 0.20 | | | 0.01 | | |
| v/c Ratio | 0.43 | 0.32 | | 0.69 | 0.05 | | 0.32 | 0.59 | | 0.01 | 0.77 | |
| Uniform Delay, d1 | 30.7 | 30.1 | | 31.9 | 28.9 | | 6.7 | 6.1 | | 7.0 | 12.6 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.6 | 0.9 | | 19.7 | 0.1 | | 0.5 | 2.4 | | 0.1 | 6.4 | |
| Delay (s) | 32.3 | 31.1 | | 51.6 | 29.0 | | 7.2 | 8.5 | | 7.1 | 19.0 | |
| Level of Service | C | C | | D | C | | A | A | | A | B | |
| Approach Delay (s/veh) | | 31.3 | | | 47.4 | | | 8.3 | | | 18.9 | |
| Approach LOS | | C | | | D | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 18.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.76 | | |
| Actuated Cycle Length (s) | 78.8 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 92.1% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

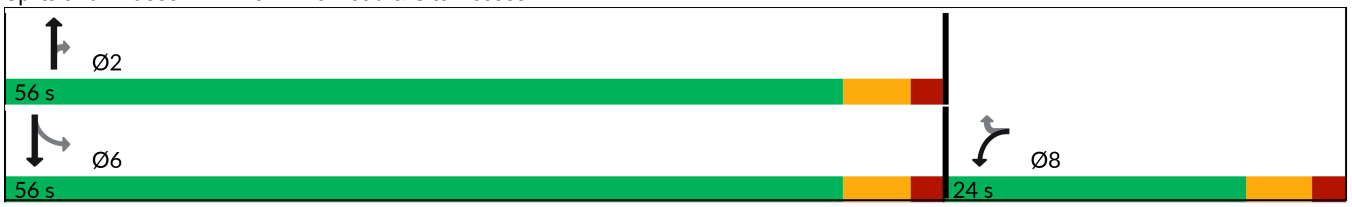
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 26 | 23 | 715 | 112 | 58 | 896 |
| Future Volume (vph) | 26 | 23 | 715 | 112 | 58 | 896 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.364 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 671 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 23 | | 112 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 26 | 23 | 715 | 112 | 58 | 896 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 26 | 23 | 715 | 112 | 58 | 896 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 29.0 | 29.0 | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | 70.0% | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | Max | Max | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 6.9 | 6.9 | 66.0 | 66.0 | 66.0 | 66.0 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.85 | 0.85 | 0.85 | 0.85 |
| v/c Ratio | 0.18 | 0.15 | 0.49 | 0.09 | 0.10 | 0.57 |
| Control Delay (s/veh) | 36.0 | 16.2 | 4.5 | 0.8 | 3.0 | 5.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 36.0 | 16.2 | 4.5 | 0.8 | 3.0 | 5.7 |
| LOS | D | B | A | A | A | A |
| Approach Delay (s/veh) | 26.7 | | 4.0 | | | 5.6 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 77.2 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.57 | | | |
| Intersection Signal Delay (s/veh): 5.4 | | Intersection LOS: A | |
| Intersection Capacity Utilization 62.4% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

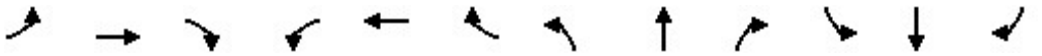


| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 26 | 23 | 715 | 112 | 58 | 896 |
| v/c Ratio | 0.18 | 0.15 | 0.49 | 0.09 | 0.10 | 0.57 |
| Control Delay (s/veh) | 36.0 | 16.2 | 4.5 | 0.8 | 3.0 | 5.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 36.0 | 16.2 | 4.5 | 0.8 | 3.0 | 5.7 |
| Queue Length 50th (m) | 4.0 | 0.0 | 32.8 | 0.0 | 1.7 | 47.0 |
| Queue Length 95th (m) | 10.3 | 6.1 | 60.6 | 3.2 | 5.0 | 86.7 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 381 | 358 | 1470 | 1266 | 573 | 1573 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 223 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.07 | 0.06 | 0.49 | 0.09 | 0.10 | 0.66 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 26 | 23 | 715 | 112 | 58 | 896 |
| Future Volume (vph) | 26 | 23 | 715 | 112 | 58 | 896 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.36 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 670 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 26 | 23 | 715 | 112 | 58 | 896 |
| RTOR Reduction (vph) | 0 | 22 | 0 | 23 | 0 | 0 |
| Lane Group Flow (vph) | 26 | 1 | 715 | 89 | 58 | 896 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 4.4 | 4.4 | 63.4 | 63.4 | 63.4 | 63.4 |
| Effective Green, g (s) | 4.4 | 4.4 | 63.4 | 63.4 | 63.4 | 63.4 |
| Actuated g/C Ratio | 0.06 | 0.06 | 0.79 | 0.79 | 0.79 | 0.79 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 89 | 80 | 1367 | 1162 | 532 | 1463 |
| v/s Ratio Prot | c0.02 | | 0.42 | | | c0.49 |
| v/s Ratio Perm | | 0.00 | | 0.06 | 0.09 | |
| v/c Ratio | 0.29 | 0.02 | 0.52 | 0.08 | 0.11 | 0.61 |
| Uniform Delay, d1 | 36.2 | 35.7 | 2.9 | 1.8 | 1.8 | 3.3 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.8 | 0.1 | 1.4 | 0.1 | 0.4 | 1.9 |
| Delay (s) | 38.0 | 35.7 | 4.3 | 1.9 | 2.3 | 5.2 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 37.0 | | 4.0 | | | 5.0 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 5.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.59 | | |
| Actuated Cycle Length (s) | 79.8 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 62.4% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

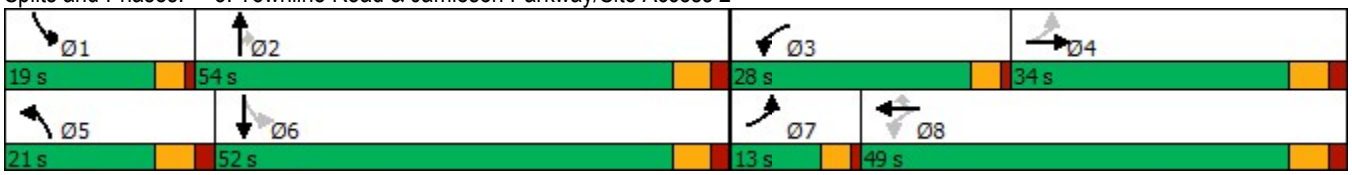


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| Future Volume (vph) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 1 | 2 | | 1 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.875 | | | | 0.850 | | | 0.850 | | 0.974 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1428 | 0 | 3235 | 1632 | 1387 | 3203 | 3270 | 1492 | 1668 | 3211 | 0 |
| Flt Permitted | 0.658 | | | 0.159 | | | 0.950 | | | 0.352 | | |
| Satd. Flow (perm) | 1155 | 1428 | 0 | 541 | 1632 | 1387 | 3203 | 3270 | 1492 | 618 | 3211 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 169 | | | | 247 | | | 420 | | 20 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 157.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 9.4 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Adj. Flow (vph) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 184 | 349 | 0 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 749 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | Right | Left | Thru | Right | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | pm+pt | NA | Perm | Prot | NA | Perm | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | 9.0 | 31.0 | | 9.0 | 31.0 | 31.0 | 11.0 | 50.4 | 50.4 | 9.0 | 41.0 | |
| Total Split (s) | 13.0 | 34.0 | | 28.0 | 49.0 | 49.0 | 21.0 | 54.0 | 54.0 | 19.0 | 52.0 | |
| Total Split (%) | 9.6% | 25.2% | | 20.7% | 36.3% | 36.3% | 15.6% | 40.0% | 40.0% | 14.1% | 38.5% | |
| Maximum Green (s) | 9.0 | 28.0 | | 24.0 | 43.0 | 43.0 | 15.0 | 48.0 | 48.0 | 15.0 | 46.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | None | None | Max | Max | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 14.0 | 14.0 | | 14.0 | |
| Flash Dont Walk (s) | | 18.0 | | | 18.0 | 18.0 | | 21.0 | 21.0 | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | 0 | | 0 | |
| Act Effct Green (s) | 32.3 | 21.2 | | 40.0 | 25.7 | 25.7 | 13.5 | 50.2 | 50.2 | 60.1 | 46.4 | |
| Actuated g/C Ratio | 0.28 | 0.18 | | 0.34 | 0.22 | 0.22 | 0.12 | 0.43 | 0.43 | 0.51 | 0.40 | |
| v/c Ratio | 0.51 | 0.88 | | 0.63 | 0.43 | 0.50 | 0.69 | 0.46 | 0.48 | 0.44 | 0.58 | |
| Control Delay | 35.1 | 47.4 | | 33.0 | 42.5 | 8.0 | 61.6 | 27.1 | 4.5 | 17.0 | 30.8 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 35.1 | 47.4 | | 33.0 | 42.5 | 8.0 | 61.6 | 27.1 | 4.5 | 17.0 | 30.8 | |
| LOS | D | D | | C | D | A | E | C | A | B | C | |
| Approach Delay | | 43.1 | | | 26.4 | | | 26.6 | | | 28.0 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 135 | | | |
| Actuated Cycle Length: 116.9 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay: 29.4 | | Intersection LOS: C | |
| Intersection Capacity Utilization 82.7% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

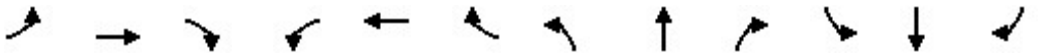
Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2



| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 184 | 349 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 749 |
| v/c Ratio | 0.51 | 0.88 | 0.63 | 0.43 | 0.50 | 0.69 | 0.46 | 0.48 | 0.44 | 0.58 |
| Control Delay | 35.1 | 47.4 | 33.0 | 42.5 | 8.0 | 61.6 | 27.1 | 4.5 | 17.0 | 30.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 35.1 | 47.4 | 33.0 | 42.5 | 8.0 | 61.6 | 27.1 | 4.5 | 17.0 | 30.8 |
| Queue Length 50th (m) | 31.0 | 42.9 | 27.0 | 31.3 | 0.0 | 30.0 | 57.5 | 0.0 | 20.2 | 71.8 |
| Queue Length 95th (m) | 48.7 | #89.9 | 37.5 | 50.8 | 19.8 | 46.8 | 85.6 | 21.0 | 37.2 | 101.5 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | | 133.4 | | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | | 115.0 | | | 115.0 | |
| Base Capacity (vph) | 358 | 473 | 747 | 605 | 670 | 414 | 1405 | 880 | 471 | 1286 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.51 | 0.74 | 0.42 | 0.26 | 0.37 | 0.62 | 0.46 | 0.48 | 0.40 | 0.58 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| Future Volume (vph) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.87 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1428 | | 3235 | 1632 | 1387 | 3203 | 3270 | 1492 | 1668 | 3211 | |
| Flt Permitted | 0.66 | 1.00 | | 0.16 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.35 | 1.00 | |
| Satd. Flow (perm) | 1155 | 1428 | | 541 | 1632 | 1387 | 3203 | 3270 | 1492 | 619 | 3211 | |
| 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) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| RTOR Reduction (vph) | 0 | 138 | 0 | 0 | 0 | 193 | 0 | 0 | 239 | 0 | 12 | 0 |
| Lane Group Flow (vph) | 184 | 211 | 0 | 315 | 156 | 54 | 256 | 653 | 181 | 188 | 737 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | Prot | NA | Perm | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | 8 | | | 2 | 6 | | |
| Actuated Green, G (s) | 30.3 | 21.2 | | 38.8 | 25.7 | 25.7 | 13.5 | 50.2 | 50.2 | 58.1 | 46.4 | |
| Effective Green, g (s) | 30.3 | 21.2 | | 38.8 | 25.7 | 25.7 | 13.5 | 50.2 | 50.2 | 58.1 | 46.4 | |
| Actuated g/C Ratio | 0.26 | 0.18 | | 0.33 | 0.22 | 0.22 | 0.12 | 0.43 | 0.43 | 0.50 | 0.40 | |
| Clearance Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 339 | 259 | | 493 | 359 | 305 | 370 | 1406 | 641 | 413 | 1276 | |
| v/s Ratio Prot | 0.04 | c0.15 | | c0.07 | 0.10 | | c0.08 | c0.20 | | 0.05 | c0.23 | |
| v/s Ratio Perm | 0.10 | | | 0.14 | | 0.04 | | | 0.12 | 0.18 | | |
| v/c Ratio | 0.54 | 0.81 | | 0.64 | 0.43 | 0.18 | 0.69 | 0.46 | 0.28 | 0.46 | 0.58 | |
| Uniform Delay, d1 | 36.0 | 45.9 | | 30.9 | 39.2 | 36.9 | 49.6 | 23.7 | 21.6 | 16.8 | 27.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.8 | 17.5 | | 2.7 | 0.8 | 0.3 | 5.5 | 1.1 | 1.1 | 0.8 | 1.9 | |
| Delay (s) | 37.8 | 63.3 | | 33.6 | 40.1 | 37.2 | 55.1 | 24.8 | 22.7 | 17.6 | 29.4 | |
| Level of Service | D | E | | C | D | D | E | C | C | B | C | |
| Approach Delay (s) | | 54.5 | | | 36.3 | | | 30.0 | | | 27.0 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 34.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 116.7 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 82.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

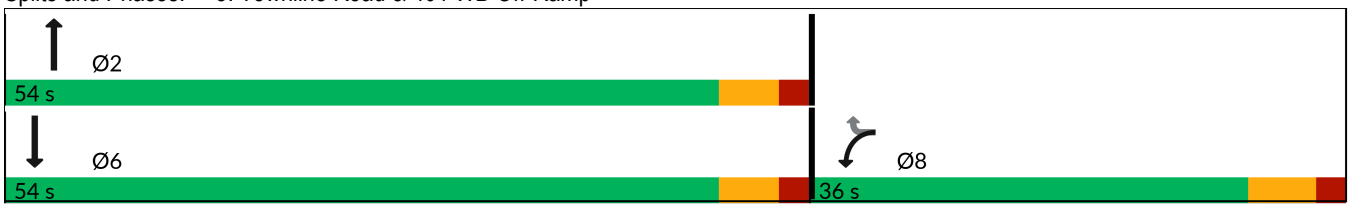
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 485 | 193 | 1012 | 0 | 0 | 721 |
| Future Volume (vph) | 485 | 193 | 1012 | 0 | 0 | 721 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 88 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 485 | 193 | 1012 | 0 | 0 | 721 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 485 | 193 | 1012 | 0 | 0 | 721 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (%) | 40.0% | 40.0% | 60.0% | | | 60.0% |
| Maximum Green (s) | 29.5 | 29.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 18.7 | 18.7 | 48.1 | | | 48.1 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.61 | | | 0.61 |
| v/c Ratio | 0.72 | 0.49 | 0.48 | | | 0.34 |
| Control Delay (s/veh) | 34.3 | 18.6 | 10.2 | | | 8.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 34.3 | 18.6 | 10.2 | | | 8.9 |
| LOS | C | B | B | | | A |
| Approach Delay (s/veh) | 29.8 | | 10.2 | | | 8.9 |
| Approach LOS | C | | B | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 79.4 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.72 | | | |
| Intersection Signal Delay (s/veh): 15.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 53.2% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 485 | 193 | 1012 | 721 |
| v/c Ratio | 0.72 | 0.49 | 0.48 | 0.34 |
| Control Delay (s/veh) | 34.3 | 18.6 | 10.2 | 8.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.3 | 18.6 | 10.2 | 8.9 |
| Queue Length 50th (m) | 34.6 | 13.1 | 39.3 | 25.0 |
| Queue Length 95th (m) | 49.5 | 31.1 | 66.2 | 43.4 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1067 | 567 | 2122 | 2122 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.45 | 0.34 | 0.48 | 0.34 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 485 | 193 | 1012 | 0 | 0 | 721 |
| Future Volume (vph) | 485 | 193 | 1012 | 0 | 0 | 721 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 485 | 193 | 1012 | 0 | 0 | 721 |
| RTOR Reduction (vph) | 0 | 67 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 485 | 126 | 1012 | 0 | 0 | 721 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 18.7 | 18.7 | 48.1 | | | 48.1 |
| Effective Green, g (s) | 18.7 | 18.7 | 48.1 | | | 48.1 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.61 | | | 0.61 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 675 | 324 | 2122 | | | 2122 |
| v/s Ratio Prot | c0.17 | | c0.29 | | | 0.21 |
| v/s Ratio Perm | | 0.09 | | | | |
| v/c Ratio | 0.72 | 0.39 | 0.48 | | | 0.34 |
| Uniform Delay, d1 | 27.9 | 25.5 | 8.6 | | | 7.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 3.7 | 0.8 | 0.8 | | | 0.4 |
| Delay (s) | 31.5 | 26.3 | 9.4 | | | 8.2 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 30.0 | | 9.4 | | | 8.2 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 14.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.54 | | |
| Actuated Cycle Length (s) | 79.3 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 53.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

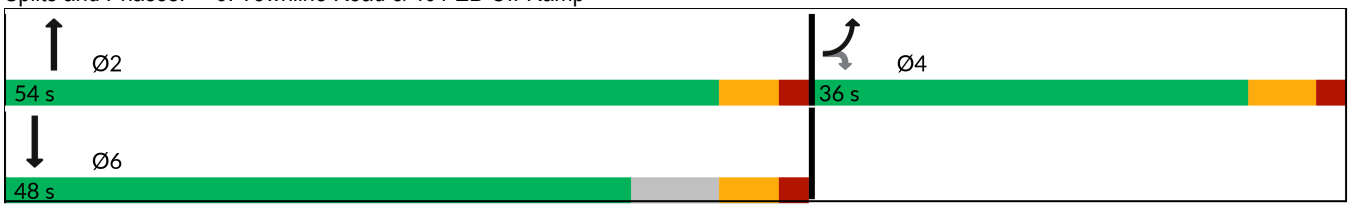
c Critical Lane Group

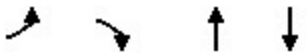
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 492 | 451 | 0 | 935 | 1045 | 160 |
| Future Volume (vph) | 492 | 451 | 0 | 935 | 1045 | 160 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.980 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1603 | 1414 | 0 | 3433 | 3298 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1603 | 1414 | 0 | 3433 | 3298 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 80 | | | 29 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Adj. Flow (vph) | 492 | 451 | 0 | 935 | 1045 | 160 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 492 | 451 | 0 | 935 | 1205 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 54.0 | 42.0 | |
| Total Split (s) | 36.0 | 36.0 | | 54.0 | 48.0 | |
| Total Split (%) | 40.0% | 40.0% | | 60.0% | 53.3% | |
| Maximum Green (s) | 29.5 | 29.5 | | 48.0 | 42.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 10.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 19.5 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 28.8 | 28.8 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.32 | 0.32 | | 0.54 | 0.54 | |
| v/c Ratio | 0.95 | 0.88 | | 0.51 | 0.67 | |
| Control Delay (s/veh) | 60.7 | 44.6 | | 14.5 | 17.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 60.7 | 44.6 | | 14.5 | 17.1 | |
| LOS | E | D | | B | B | |
| Approach Delay (s/veh) | 53.0 | | | 14.5 | 17.1 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 89.3 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.95 | | | |
| Intersection Signal Delay (s/veh): 27.3 | | Intersection LOS: C | |
| Intersection Capacity Utilization 74.7% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 492 | 451 | 935 | 1205 |
| v/c Ratio | 0.95 | 0.88 | 0.51 | 0.67 |
| Control Delay (s/veh) | 60.7 | 44.6 | 14.5 | 17.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 60.7 | 44.6 | 14.5 | 17.1 |
| Queue Length 50th (m) | 81.7 | 61.2 | 51.4 | 73.8 |
| Queue Length 95th (m) | #141.1 | #116.4 | 67.2 | 96.1 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 529 | 520 | 1844 | 1786 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.93 | 0.87 | 0.51 | 0.67 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 492 | 451 | 0 | 935 | 1045 | 160 |
| Future Volume (vph) | 492 | 451 | 0 | 935 | 1045 | 160 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1603 | 1414 | | 3433 | 3299 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1603 | 1414 | | 3433 | 3299 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 492 | 451 | 0 | 935 | 1045 | 160 |
| RTOR Reduction (vph) | 0 | 54 | 0 | 0 | 13 | 0 |
| Lane Group Flow (vph) | 492 | 397 | 0 | 935 | 1192 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 28.8 | 28.8 | | 48.0 | 48.0 | |
| Effective Green, g (s) | 28.8 | 28.8 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.32 | 0.32 | | 0.54 | 0.54 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 516 | 456 | | 1845 | 1773 | |
| v/s Ratio Prot | c0.31 | | | 0.27 | c0.36 | |
| v/s Ratio Perm | | 0.28 | | | | |
| v/c Ratio | 0.95 | 0.87 | | 0.51 | 0.67 | |
| Uniform Delay, d1 | 29.6 | 28.5 | | 13.1 | 15.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 28.1 | 16.4 | | 1.0 | 2.1 | |
| Delay (s) | 57.7 | 44.9 | | 14.1 | 17.0 | |
| Level of Service | E | D | | B | B | |
| Approach Delay (s/veh) | 51.6 | | | 14.1 | 17.0 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 26.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.78 | | |
| Actuated Cycle Length (s) | 89.3 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 74.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

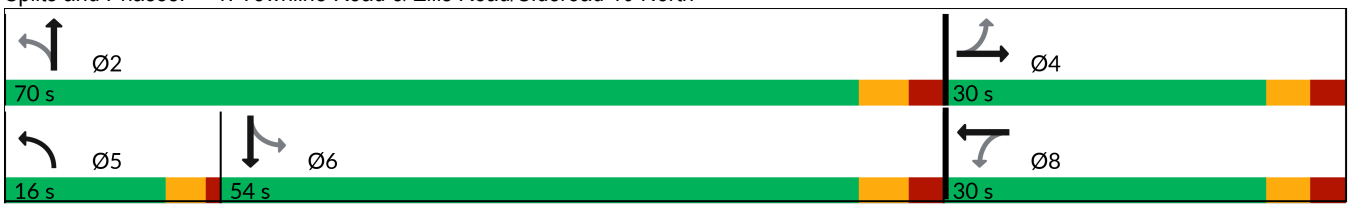
c Critical Lane Group

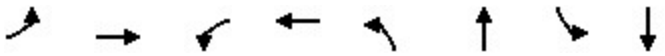
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 39 | 21 | 134 | 92 | 38 | 9 | 362 | 903 | 121 | 9 | 508 | 60 |
| Future Volume (vph) | 39 | 21 | 134 | 92 | 38 | 9 | 362 | 903 | 121 | 9 | 508 | 60 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.870 | | | 0.971 | | | 0.982 | | | 0.984 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1395 | 0 | 1635 | 1584 | 0 | 1668 | 1588 | 0 | 1668 | 1547 | 0 |
| Flt Permitted | 0.726 | | | 0.600 | | | 0.310 | | | 0.222 | | |
| Satd. Flow (perm) | 1274 | 1395 | 0 | 1033 | 1584 | 0 | 544 | 1588 | 0 | 390 | 1547 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 134 | | | 9 | | | 13 | | | 8 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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 (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 39 | 21 | 134 | 92 | 38 | 9 | 362 | 903 | 121 | 9 | 508 | 60 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 39 | 155 | 0 | 92 | 47 | 0 | 362 | 1024 | 0 | 9 | 568 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 9.0 | 54.0 | | 54.0 | 54.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 16.0 | 70.0 | | 54.0 | 54.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 16.0% | 70.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 12.0 | 63.7 | | 47.7 | 47.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 39.7 | | 39.7 | 39.7 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 13.1 | 13.1 | | 13.1 | 13.1 | | 66.1 | 63.8 | | 48.6 | 48.6 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.74 | 0.72 | | 0.54 | 0.54 | |
| v/c Ratio | 0.21 | 0.49 | | 0.61 | 0.20 | | 0.67 | 0.90 | | 0.04 | 0.67 | |
| Control Delay (s/veh) | 35.5 | 14.0 | | 52.8 | 29.6 | | 11.0 | 24.2 | | 12.3 | 20.5 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 6.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 35.5 | 14.0 | | 52.8 | 29.6 | | 11.0 | 30.1 | | 12.3 | 20.5 | |
| LOS | D | B | | D | C | | B | C | | B | C | |
| Approach Delay (s/veh) | | 18.3 | | | 45.0 | | | 25.1 | | | 20.4 | |
| Approach LOS | | B | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 89.2 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.90 | | | |
| Intersection Signal Delay (s/veh): 24.6 | | Intersection LOS: C | |
| Intersection Capacity Utilization 104.1% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

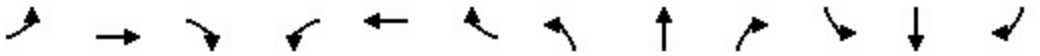




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 39 | 155 | 92 | 47 | 362 | 1024 | 9 | 568 |
| v/c Ratio | 0.21 | 0.49 | 0.61 | 0.20 | 0.67 | 0.90 | 0.04 | 0.67 |
| Control Delay (s/veh) | 35.5 | 14.0 | 52.8 | 29.6 | 11.0 | 24.2 | 12.3 | 20.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.5 | 14.0 | 52.8 | 29.6 | 11.0 | 30.1 | 12.3 | 20.5 |
| Queue Length 50th (m) | 6.0 | 3.2 | 14.9 | 5.8 | 16.5 | 114.7 | 0.7 | 65.5 |
| Queue Length 95th (m) | 14.7 | 19.4 | 30.1 | 14.9 | 35.7 | #264.3 | 3.4 | 120.1 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 343 | 473 | 278 | 433 | 554 | 1139 | 212 | 846 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 85 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.33 | 0.33 | 0.11 | 0.65 | 0.97 | 0.04 | 0.67 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 39 | 21 | 134 | 92 | 38 | 9 | 362 | 903 | 121 | 9 | 508 | 60 |
| Future Volume (vph) | 39 | 21 | 134 | 92 | 38 | 9 | 362 | 903 | 121 | 9 | 508 | 60 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1396 | | 1635 | 1585 | | 1668 | 1589 | | 1668 | 1547 | |
| Flt Permitted | 0.73 | 1.00 | | 0.60 | 1.00 | | 0.31 | 1.00 | | 0.22 | 1.00 | |
| Satd. Flow (perm) | 1275 | 1396 | | 1032 | 1585 | | 544 | 1589 | | 389 | 1547 | |
| 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) | 39 | 21 | 134 | 92 | 38 | 9 | 362 | 903 | 121 | 9 | 508 | 60 |
| RTOR Reduction (vph) | 0 | 114 | 0 | 0 | 8 | 0 | 0 | 4 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 39 | 41 | 0 | 92 | 39 | 0 | 362 | 1020 | 0 | 9 | 564 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 13.1 | 13.1 | | 13.1 | 13.1 | | 63.8 | 63.8 | | 48.6 | 48.6 | |
| Effective Green, g (s) | 13.1 | 13.1 | | 13.1 | 13.1 | | 63.8 | 63.8 | | 48.6 | 48.6 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.72 | 0.72 | | 0.54 | 0.54 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 187 | 205 | | 151 | 232 | | 530 | 1136 | | 211 | 842 | |
| v/s Ratio Prot | | 0.03 | | | 0.02 | | 0.09 | c0.64 | | | 0.36 | |
| v/s Ratio Perm | 0.03 | | | c0.09 | | | 0.40 | | | 0.02 | | |
| v/c Ratio | 0.21 | 0.20 | | 0.61 | 0.17 | | 0.68 | 0.90 | | 0.04 | 0.67 | |
| Uniform Delay, d1 | 33.5 | 33.4 | | 35.7 | 33.3 | | 7.4 | 10.1 | | 9.5 | 14.6 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.5 | | 6.8 | 0.3 | | 3.6 | 11.2 | | 0.4 | 4.2 | |
| Delay (s) | 34.0 | 33.9 | | 42.5 | 33.6 | | 11.0 | 21.3 | | 9.8 | 18.8 | |
| Level of Service | C | C | | D | C | | B | C | | A | B | |
| Approach Delay (s/veh) | | 33.9 | | | 39.5 | | | 18.6 | | | 18.6 | |
| Approach LOS | | C | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 21.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.89 | | |
| Actuated Cycle Length (s) | 89.2 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 104.1% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |

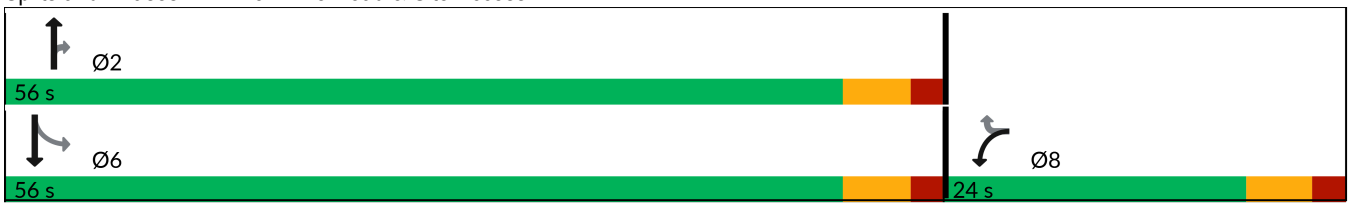
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 85 | 68 | 1318 | 54 | 24 | 718 |
| Future Volume (vph) | 85 | 68 | 1318 | 54 | 24 | 718 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.071 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 131 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 65 | | 54 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 85 | 68 | 1318 | 54 | 24 | 718 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 85 | 68 | 1318 | 54 | 24 | 718 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | 70.0% | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | Max | Max | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 9.3 | 9.3 | 57.6 | 57.6 | 57.6 | 57.6 |
| Actuated g/C Ratio | 0.12 | 0.12 | 0.77 | 0.77 | 0.77 | 0.77 |
| v/c Ratio | 0.43 | 0.29 | 1.00 | 0.05 | 0.24 | 0.51 |
| Control Delay (s/veh) | 36.2 | 11.9 | 40.0 | 1.4 | 12.0 | 6.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Total Delay (s/veh) | 36.2 | 11.9 | 40.0 | 1.4 | 12.0 | 6.8 |
| LOS | D | B | D | A | B | A |
| Approach Delay (s/veh) | 25.4 | | 38.5 | | | 7.0 |
| Approach LOS | C | | D | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 75.2 | | | |
| Natural Cycle: 120 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.00 | | | |
| Intersection Signal Delay (s/veh): 27.3 | | Intersection LOS: C | |
| Intersection Capacity Utilization 89.3% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 85 | 68 | 1318 | 54 | 24 | 718 |
| v/c Ratio | 0.43 | 0.29 | 1.00 | 0.05 | 0.24 | 0.51 |
| Control Delay (s/veh) | 36.2 | 11.9 | 40.0 | 1.4 | 12.0 | 6.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Total Delay (s/veh) | 36.2 | 11.9 | 40.0 | 1.4 | 12.0 | 6.8 |
| Queue Length 50th (m) | 11.1 | 0.4 | ~208.2 | 0.0 | 1.0 | 37.8 |
| Queue Length 95th (m) | 22.6 | 10.2 | #294.0 | 2.9 | 6.3 | 72.9 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 390 | 398 | 1318 | 1134 | 100 | 1411 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 154 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.17 | 1.00 | 0.05 | 0.24 | 0.57 |

Intersection Summary

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 85 | 68 | 1318 | 54 | 24 | 718 |
| Future Volume (vph) | 85 | 68 | 1318 | 54 | 24 | 718 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.07 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 131 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 85 | 68 | 1318 | 54 | 24 | 718 |
| RTOR Reduction (vph) | 0 | 58 | 0 | 14 | 0 | 0 |
| Lane Group Flow (vph) | 85 | 10 | 1318 | 40 | 24 | 718 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 8.1 | 8.1 | 56.4 | 56.4 | 56.4 | 56.4 |
| Effective Green, g (s) | 8.1 | 8.1 | 56.4 | 56.4 | 56.4 | 56.4 |
| Actuated g/C Ratio | 0.11 | 0.11 | 0.74 | 0.74 | 0.74 | 0.74 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 172 | 153 | 1268 | 1078 | 96 | 1358 |
| v/s Ratio Prot | c0.05 | | c0.77 | | | 0.39 |
| v/s Ratio Perm | | 0.01 | | 0.03 | 0.18 | |
| v/c Ratio | 0.49 | 0.06 | 1.04 | 0.04 | 0.25 | 0.53 |
| Uniform Delay, d1 | 32.3 | 30.8 | 10.1 | 2.7 | 3.2 | 4.3 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.2 | 0.2 | 36.1 | 0.1 | 6.1 | 1.5 |
| Delay (s) | 34.5 | 31.0 | 46.2 | 2.8 | 9.4 | 5.8 |
| Level of Service | C | C | D | A | A | A |
| Approach Delay (s/veh) | 32.9 | | 44.5 | | | 5.9 |
| Approach LOS | C | | D | | | A |

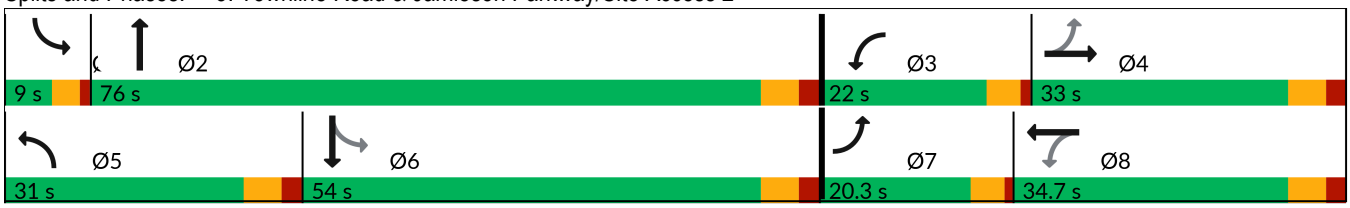
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 31.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.97 | | |
| Actuated Cycle Length (s) | 76.5 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 89.3% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

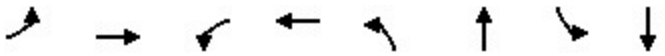
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 215 | 0 | 364 | 173 | 22 | 83 | 428 | 1034 | 72 | 18 | 629 | 149 |
| Future Volume (vph) | 215 | 0 | 364 | 173 | 22 | 83 | 428 | 1034 | 72 | 18 | 629 | 149 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.881 | | | 0.990 | | | 0.971 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 1668 | 1437 | 0 | 3203 | 3271 | 0 | 1668 | 3125 | 0 |
| Flt Permitted | 0.628 | | | 0.345 | | | 0.950 | | | 0.258 | | |
| Satd. Flow (perm) | 1102 | 1387 | 0 | 606 | 1437 | 0 | 3203 | 3271 | 0 | 453 | 3125 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 392 | | | 83 | | | 7 | | | 22 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 215 | 0 | 364 | 173 | 22 | 83 | 428 | 1034 | 72 | 18 | 629 | 149 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 215 | 364 | 0 | 173 | 105 | 0 | 428 | 1106 | 0 | 18 | 778 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | | 5.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 9.5 | 31.0 | | 9.5 | 31.0 | | 11.0 | 50.4 | | 9.0 | 50.4 | |
| Total Split (s) | 20.3 | 33.0 | | 22.0 | 34.7 | | 31.0 | 76.0 | | 9.0 | 54.0 | |
| Total Split (%) | 14.5% | 23.6% | | 15.7% | 24.8% | | 22.1% | 54.3% | | 6.4% | 38.6% | |
| Maximum Green (s) | 15.8 | 27.0 | | 17.5 | 28.7 | | 25.0 | 70.0 | | 5.0 | 48.0 | |
| Yellow Time (s) | 3.5 | 4.0 | | 3.5 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 23.4 | | | 23.4 | |
| Flash Don't Walk (s) | | 18.0 | | | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 28.4 | 11.9 | | 27.8 | 11.6 | | 20.2 | 71.9 | | 56.0 | 48.9 | |
| Actuated g/C Ratio | 0.24 | 0.10 | | 0.23 | 0.10 | | 0.17 | 0.61 | | 0.47 | 0.41 | |
| v/c Ratio | 0.64 | 0.74 | | 0.63 | 0.49 | | 0.78 | 0.56 | | 0.07 | 0.60 | |
| Control Delay (s/veh) | 45.7 | 13.3 | | 45.7 | 23.6 | | 58.5 | 16.7 | | 11.9 | 30.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 45.7 | 13.3 | | 45.7 | 23.6 | | 58.5 | 16.7 | | 11.9 | 30.1 | |
| LOS | D | B | | D | C | | E | B | | B | C | |
| Approach Delay (s/veh) | | 25.4 | | | 37.4 | | | 28.3 | | | 29.7 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 140 | | | |
| Actuated Cycle Length: 118.4 | | | |
| Natural Cycle: 115 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.78 | | | |
| Intersection Signal Delay (s/veh): 28.9 | | Intersection LOS: C | |
| Intersection Capacity Utilization 91.7% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

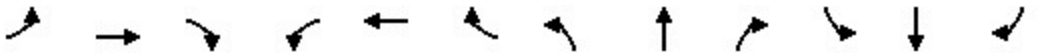
Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 215 | 364 | 173 | 105 | 428 | 1106 | 18 | 778 |
| v/c Ratio | 0.64 | 0.74 | 0.63 | 0.49 | 0.78 | 0.56 | 0.07 | 0.60 |
| Control Delay (s/veh) | 45.7 | 13.3 | 45.7 | 23.6 | 58.5 | 16.7 | 11.9 | 30.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.7 | 13.3 | 45.7 | 23.6 | 58.5 | 16.7 | 11.9 | 30.1 |
| Queue Length 50th (m) | 41.1 | 0.0 | 32.2 | 4.8 | 47.5 | 63.5 | 1.3 | 67.8 |
| Queue Length 95th (m) | 66.1 | 20.3 | 53.6 | 21.6 | 73.7 | 130.5 | 5.1 | 112.4 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | 261.4 | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | 115.0 | | 115.0 | |
| Base Capacity (vph) | 345 | 620 | 314 | 413 | 680 | 1987 | 265 | 1303 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.62 | 0.59 | 0.55 | 0.25 | 0.63 | 0.56 | 0.07 | 0.60 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 215 | 0 | 364 | 173 | 22 | 83 | 428 | 1034 | 72 | 18 | 629 | 149 |
| Future Volume (vph) | 215 | 0 | 364 | 173 | 22 | 83 | 428 | 1034 | 72 | 18 | 629 | 149 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.88 | | 1.00 | 0.99 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | 1668 | 1438 | | 3203 | 3272 | | 1668 | 3126 | |
| Flt Permitted | 0.63 | 1.00 | | 0.34 | 1.00 | | 0.95 | 1.00 | | 0.26 | 1.00 | |
| Satd. Flow (perm) | 1102 | 1387 | | 605 | 1438 | | 3203 | 3272 | | 453 | 3126 | |
| 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) | 215 | 0 | 364 | 173 | 22 | 83 | 428 | 1034 | 72 | 18 | 629 | 149 |
| RTOR Reduction (vph) | 0 | 328 | 0 | 0 | 75 | 0 | 0 | 3 | 0 | 0 | 13 | 0 |
| Lane Group Flow (vph) | 215 | 36 | 0 | 173 | 30 | 0 | 428 | 1103 | 0 | 18 | 765 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 26.9 | 11.9 | | 26.3 | 11.6 | | 20.2 | 71.8 | | 53.2 | 51.4 | |
| Effective Green, g (s) | 26.9 | 11.9 | | 26.3 | 11.6 | | 20.2 | 71.8 | | 53.2 | 51.4 | |
| Actuated g/C Ratio | 0.22 | 0.10 | | 0.22 | 0.10 | | 0.17 | 0.59 | | 0.44 | 0.43 | |
| Clearance Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 315 | 136 | | 261 | 138 | | 536 | 1946 | | 217 | 1331 | |
| v/s Ratio Prot | c0.08 | 0.03 | | 0.08 | 0.02 | | c0.13 | c0.34 | | 0.00 | 0.24 | |
| v/s Ratio Perm | c0.07 | | | 0.06 | | | | | | 0.04 | | |
| v/c Ratio | 0.68 | 0.26 | | 0.66 | 0.22 | | 0.80 | 0.57 | | 0.08 | 0.58 | |
| Uniform Delay, d1 | 41.8 | 50.3 | | 41.5 | 50.4 | | 48.3 | 14.9 | | 19.1 | 26.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 6.0 | 1.0 | | 6.2 | 0.8 | | 8.1 | 1.2 | | 0.2 | 1.8 | |
| Delay (s) | 47.8 | 51.4 | | 47.7 | 51.2 | | 56.4 | 16.1 | | 19.2 | 28.2 | |
| Level of Service | D | D | | D | D | | E | B | | B | C | |
| Approach Delay (s/veh) | | 50.1 | | | 49.0 | | | 27.4 | | | 28.0 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 33.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 120.7 | Sum of lost time (s) | 22.5 |
| Intersection Capacity Utilization | 91.7% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

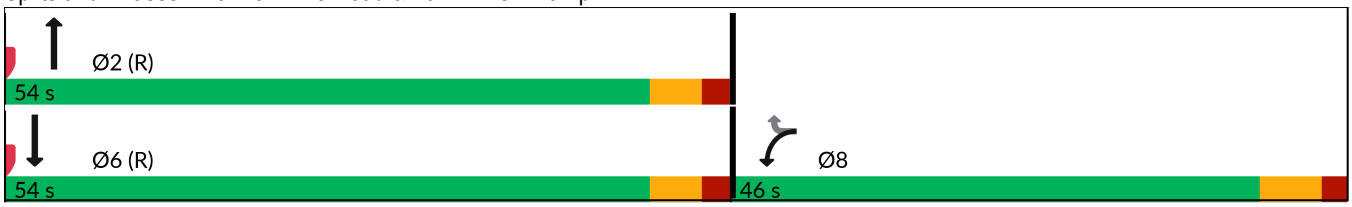
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 501 | 351 | 1288 | 0 | 0 | 823 |
| Future Volume (vph) | 501 | 351 | 1288 | 0 | 0 | 823 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 29 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 501 | 351 | 1288 | 0 | 0 | 823 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 501 | 351 | 1288 | 0 | 0 | 823 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Minimum Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (%) | 46.0% | 46.0% | 54.0% | | | 54.0% |
| Maximum Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 29.5 | 29.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| v/c Ratio | 0.43 | 0.59 | 0.77 | | | 0.49 |
| Control Delay (s/veh) | 23.5 | 26.8 | 25.2 | | | 18.9 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 23.5 | 26.8 | 25.2 | | | 18.9 |
| LOS | C | C | C | | | B |
| Approach Delay (s/veh) | 24.9 | | 25.2 | | | 18.9 |
| Approach LOS | C | | C | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 100 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.77 | | | |
| Intersection Signal Delay (s/veh): 23.4 | | Intersection LOS: C | |
| Intersection Capacity Utilization 69.6% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 501 | 351 | 1288 | 823 |
| v/c Ratio | 0.43 | 0.59 | 0.77 | 0.49 |
| Control Delay (s/veh) | 23.5 | 26.8 | 25.2 | 18.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 23.5 | 26.8 | 25.2 | 18.9 |
| Queue Length 50th (m) | 35.8 | 48.4 | 104.2 | 55.0 |
| Queue Length 95th (m) | 49.4 | 77.4 | 131.0 | 71.0 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1161 | 592 | 1680 | 1680 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.43 | 0.59 | 0.77 | 0.49 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 501 | 351 | 1288 | 0 | 0 | 823 |
| Future Volume (vph) | 501 | 351 | 1288 | 0 | 0 | 823 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 501 | 351 | 1288 | 0 | 0 | 823 |
| RTOR Reduction (vph) | 0 | 18 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 501 | 333 | 1288 | 0 | 0 | 823 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Effective Green, g (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Grp Cap (vph) | 1161 | 575 | 1680 | | | 1680 |
| v/s Ratio Prot | 0.17 | | c0.37 | | | 0.24 |
| v/s Ratio Perm | | c0.23 | | | | |
| v/c Ratio | 0.43 | 0.58 | 0.77 | | | 0.49 |
| Uniform Delay, d1 | 22.1 | 23.7 | 21.4 | | | 17.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.2 | 4.2 | 3.4 | | | 1.0 |
| Delay (s) | 23.2 | 28.0 | 24.8 | | | 18.7 |
| Level of Service | C | C | C | | | B |
| Approach Delay (s/veh) | 25.2 | | 24.8 | | | 18.7 |
| Approach LOS | C | | C | | | B |

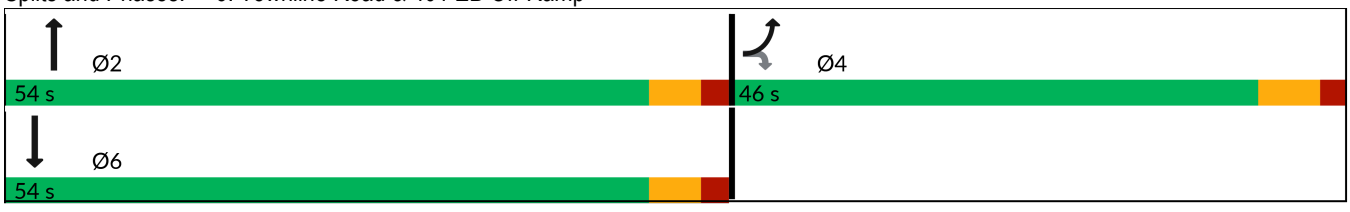
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 23.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 69.6% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

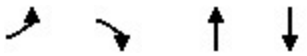
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 430 | 460 | 0 | 1097 | 1194 | 172 |
| Future Volume (vph) | 430 | 460 | 0 | 1097 | 1194 | 172 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.981 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1619 | 1442 | 0 | 3535 | 3355 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1619 | 1442 | 0 | 3535 | 3355 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 38 | | | 22 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Adj. Flow (vph) | 430 | 460 | 0 | 1097 | 1194 | 172 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 430 | 460 | 0 | 1097 | 1366 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (%) | 46.0% | 46.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 39.5 | 39.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 42.0 | |
| Flash Don't Walk (s) | 29.5 | 29.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 32.0 | 32.0 | | 48.3 | 48.3 | |
| Actuated g/C Ratio | 0.34 | 0.34 | | 0.52 | 0.52 | |
| v/c Ratio | 0.77 | 0.88 | | 0.60 | 0.78 | |
| Control Delay (s/veh) | 37.0 | 45.5 | | 18.4 | 23.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 37.0 | 45.5 | | 18.4 | 23.0 | |
| LOS | D | D | | B | C | |
| Approach Delay (s/veh) | 41.4 | | | 18.4 | 23.0 | |
| Approach LOS | D | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 92.9 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay (s/veh): 26.4 | | Intersection LOS: C | |
| Intersection Capacity Utilization 79.8% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 430 | 460 | 1097 | 1366 |
| v/c Ratio | 0.77 | 0.88 | 0.60 | 0.78 |
| Control Delay (s/veh) | 37.0 | 45.5 | 18.4 | 23.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.0 | 45.5 | 18.4 | 23.0 |
| Queue Length 50th (m) | 67.3 | 70.6 | 72.3 | 102.8 |
| Queue Length 95th (m) | 101.9 | #120.5 | 102.7 | 146.4 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 692 | 638 | 1837 | 1754 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.62 | 0.72 | 0.60 | 0.78 |

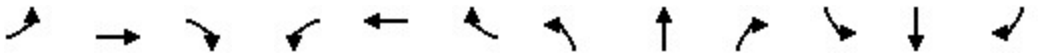
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 430 | 460 | 0 | 1097 | 1194 | 172 |
| Future Volume (vph) | 430 | 460 | 0 | 1097 | 1194 | 172 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1619 | 1442 | | 3535 | 3356 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1619 | 1442 | | 3535 | 3356 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 430 | 460 | 0 | 1097 | 1194 | 172 |
| RTOR Reduction (vph) | 0 | 25 | 0 | 0 | 11 | 0 |
| Lane Group Flow (vph) | 430 | 435 | 0 | 1097 | 1355 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 32.0 | 32.0 | | 48.3 | 48.3 | |
| Effective Green, g (s) | 32.0 | 32.0 | | 48.3 | 48.3 | |
| Actuated g/C Ratio | 0.34 | 0.34 | | 0.52 | 0.52 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 558 | 497 | | 1839 | 1746 | |
| v/s Ratio Prot | 0.27 | | | 0.31 | c0.40 | |
| v/s Ratio Perm | | c0.30 | | | | |
| v/c Ratio | 0.77 | 0.88 | | 0.60 | 0.78 | |
| Uniform Delay, d1 | 27.1 | 28.5 | | 15.5 | 17.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 6.5 | 15.7 | | 1.4 | 3.5 | |
| Delay (s) | 33.6 | 44.3 | | 16.9 | 21.4 | |
| Level of Service | C | D | | B | C | |
| Approach Delay (s/veh) | 39.1 | | | 16.9 | 21.4 | |
| Approach LOS | D | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 24.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.82 | | |
| Actuated Cycle Length (s) | 92.8 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 79.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

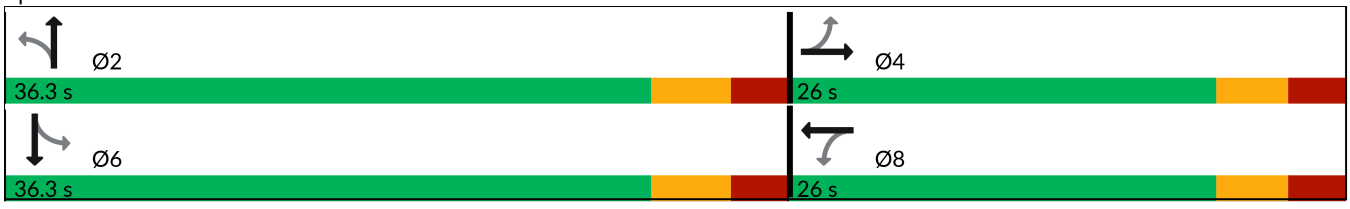


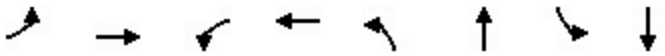
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 47 | 26 | 185 | 44 | 15 | 4 | 183 | 496 | 59 | 3 | 408 | 36 |
| Future Volume (vph) | 47 | 26 | 185 | 44 | 15 | 4 | 183 | 496 | 59 | 3 | 408 | 36 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.868 | | | 0.968 | | | 0.984 | | | 0.988 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1416 | 0 | 1668 | 1570 | 0 | 1651 | 1577 | 0 | 1668 | 1597 | 0 |
| Flt Permitted | 0.745 | | | 0.626 | | | 0.495 | | | 0.410 | | |
| Satd. Flow (perm) | 1295 | 1416 | 0 | 1099 | 1570 | 0 | 860 | 1577 | 0 | 720 | 1597 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 185 | | | 4 | | | 13 | | | 10 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Adj. Flow (vph) | 47 | 26 | 185 | 44 | 15 | 4 | 183 | 496 | 59 | 3 | 408 | 36 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 47 | 211 | 0 | 44 | 19 | 0 | 183 | 555 | 0 | 3 | 444 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (%) | 41.7% | 41.7% | | 41.7% | 41.7% | | 58.3% | 58.3% | | 58.3% | 58.3% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.7 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 2.6 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Max | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Flash Don't Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 9.0 | 9.0 | | 9.0 | 9.0 | | 31.2 | 31.2 | | 31.2 | 31.2 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.17 | 0.17 | | 0.59 | 0.59 | | 0.59 | 0.59 | |
| v/c Ratio | 0.21 | 0.53 | | 0.23 | 0.07 | | 0.36 | 0.59 | | 0.01 | 0.47 | |
| Control Delay (s/veh) | 20.4 | 10.3 | | 21.3 | 16.2 | | 8.6 | 10.2 | | 5.3 | 8.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 20.4 | 10.3 | | 21.3 | 16.2 | | 8.6 | 10.2 | | 5.3 | 8.3 | |
| LOS | C | B | | C | B | | A | B | | A | A | |
| Approach Delay (s/veh) | | 12.2 | | | 19.7 | | | 9.8 | | | 8.3 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 62.3 | | | |
| Actuated Cycle Length: 52.5 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.59 | | | |
| Intersection Signal Delay (s/veh): 10.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 82.7% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

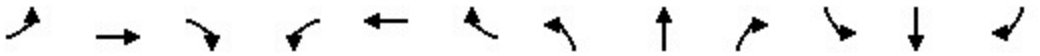
Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 47 | 211 | 44 | 19 | 183 | 555 | 3 | 444 |
| v/c Ratio | 0.21 | 0.53 | 0.23 | 0.07 | 0.36 | 0.59 | 0.01 | 0.47 |
| Control Delay (s/veh) | 20.4 | 10.3 | 21.3 | 16.2 | 8.6 | 10.2 | 5.3 | 8.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 20.4 | 10.3 | 21.3 | 16.2 | 8.6 | 10.2 | 5.3 | 8.3 |
| Queue Length 50th (m) | 3.8 | 2.0 | 3.5 | 1.2 | 7.0 | 25.1 | 0.1 | 18.0 |
| Queue Length 95th (m) | 10.5 | 15.8 | 10.2 | 5.2 | 21.0 | 60.3 | 0.9 | 43.0 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 494 | 654 | 419 | 601 | 509 | 941 | 427 | 951 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.10 | 0.32 | 0.11 | 0.03 | 0.36 | 0.59 | 0.01 | 0.47 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 47 | 26 | 185 | 44 | 15 | 4 | 183 | 496 | 59 | 3 | 408 | 36 |
| Future Volume (vph) | 47 | 26 | 185 | 44 | 15 | 4 | 183 | 496 | 59 | 3 | 408 | 36 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1417 | | 1668 | 1570 | | 1651 | 1577 | | 1668 | 1597 | |
| Flt Permitted | 0.75 | 1.00 | | 0.63 | 1.00 | | 0.49 | 1.00 | | 0.41 | 1.00 | |
| Satd. Flow (perm) | 1295 | 1417 | | 1099 | 1570 | | 860 | 1577 | | 719 | 1597 | |
| 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) | 47 | 26 | 185 | 44 | 15 | 4 | 183 | 496 | 59 | 3 | 408 | 36 |
| RTOR Reduction (vph) | 0 | 153 | 0 | 0 | 3 | 0 | 0 | 5 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 47 | 58 | 0 | 44 | 16 | 0 | 183 | 550 | 0 | 3 | 440 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 9.0 | 9.0 | | 9.0 | 9.0 | | 31.2 | 31.2 | | 31.2 | 31.2 | |
| Effective Green, g (s) | 9.0 | 9.0 | | 9.0 | 9.0 | | 31.2 | 31.2 | | 31.2 | 31.2 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.17 | 0.17 | | 0.59 | 0.59 | | 0.59 | 0.59 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 222 | 242 | | 188 | 269 | | 511 | 937 | | 427 | 949 | |
| v/s Ratio Prot | | c0.04 | | | 0.01 | | | c0.35 | | | 0.28 | |
| v/s Ratio Perm | 0.04 | | | 0.04 | | | 0.21 | | | 0.00 | | |
| v/c Ratio | 0.21 | 0.24 | | 0.23 | 0.06 | | 0.36 | 0.59 | | 0.01 | 0.46 | |
| Uniform Delay, d1 | 18.7 | 18.8 | | 18.8 | 18.2 | | 5.5 | 6.6 | | 4.3 | 6.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.5 | | 0.6 | 0.1 | | 2.0 | 2.7 | | 0.0 | 1.6 | |
| Delay (s) | 19.2 | 19.3 | | 19.4 | 18.3 | | 7.4 | 9.3 | | 4.4 | 7.6 | |
| Level of Service | B | B | | B | B | | A | A | | A | A | |
| Approach Delay (s/veh) | | 19.3 | | | 19.1 | | | 8.9 | | | 7.6 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 10.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 52.5 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 82.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

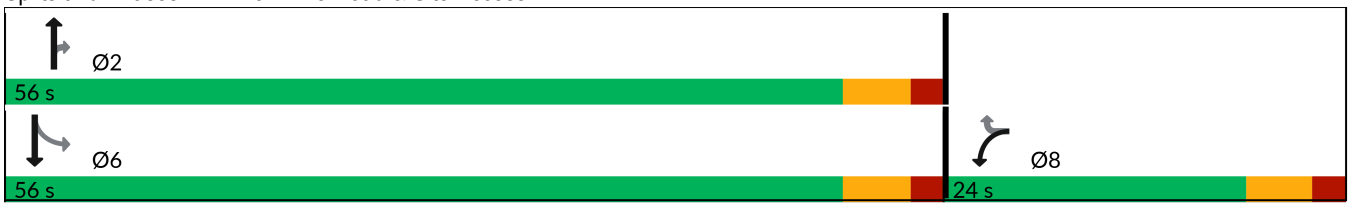
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 30 | 24 | 713 | 31 | 14 | 632 |
| Future Volume (vph) | 30 | 24 | 713 | 31 | 14 | 632 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.364 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 671 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 24 | | 31 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 24 | 713 | 31 | 14 | 632 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 30 | 24 | 713 | 31 | 14 | 632 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | 70.0% | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | Max | Max | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 7.0 | 7.0 | 65.6 | 65.6 | 65.6 | 65.6 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.85 | 0.85 | 0.85 | 0.85 |
| v/c Ratio | 0.20 | 0.16 | 0.49 | 0.02 | 0.02 | 0.40 |
| Control Delay (s/veh) | 36.0 | 15.9 | 4.6 | 1.2 | 2.9 | 3.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.0 | 15.9 | 4.6 | 1.2 | 2.9 | 3.8 |
| LOS | D | B | A | A | A | A |
| Approach Delay (s/veh) | 27.1 | | 4.5 | | | 3.8 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 77 | | | |
| Natural Cycle: 60 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.49 | | | |
| Intersection Signal Delay (s/veh): 5.0 | | Intersection LOS: A | |
| Intersection Capacity Utilization 54.3% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

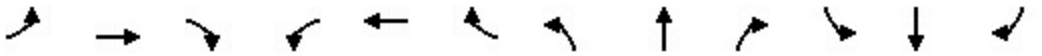


| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 30 | 24 | 713 | 31 | 14 | 632 |
| v/c Ratio | 0.20 | 0.16 | 0.49 | 0.02 | 0.02 | 0.40 |
| Control Delay (s/veh) | 36.0 | 15.9 | 4.6 | 1.2 | 2.9 | 3.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.0 | 15.9 | 4.6 | 1.2 | 2.9 | 3.8 |
| Queue Length 50th (m) | 4.6 | 0.0 | 33.2 | 0.0 | 0.4 | 26.2 |
| Queue Length 95th (m) | 11.2 | 6.3 | 61.8 | 1.8 | 1.8 | 47.4 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 382 | 360 | 1466 | 1250 | 571 | 1569 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.08 | 0.07 | 0.49 | 0.02 | 0.02 | 0.40 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 30 | 24 | 713 | 31 | 14 | 632 |
| Future Volume (vph) | 30 | 24 | 713 | 31 | 14 | 632 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.36 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 670 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 24 | 713 | 31 | 14 | 632 |
| RTOR Reduction (vph) | 0 | 23 | 0 | 6 | 0 | 0 |
| Lane Group Flow (vph) | 30 | 1 | 713 | 25 | 14 | 632 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 4.5 | 4.5 | 62.9 | 62.9 | 62.9 | 62.9 |
| Effective Green, g (s) | 4.5 | 4.5 | 62.9 | 62.9 | 62.9 | 62.9 |
| Actuated g/C Ratio | 0.06 | 0.06 | 0.79 | 0.79 | 0.79 | 0.79 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 92 | 82 | 1363 | 1158 | 530 | 1459 |
| v/s Ratio Prot | c0.02 | | c0.41 | | | 0.34 |
| v/s Ratio Perm | | 0.00 | | 0.02 | 0.02 | |
| v/c Ratio | 0.33 | 0.02 | 0.52 | 0.02 | 0.03 | 0.43 |
| Uniform Delay, d1 | 36.0 | 35.4 | 2.9 | 1.7 | 1.8 | 2.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.1 | 0.1 | 1.4 | 0.0 | 0.1 | 0.9 |
| Delay (s) | 38.1 | 35.4 | 4.4 | 1.8 | 1.8 | 3.5 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 36.9 | | 4.3 | | | 3.5 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 5.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 79.4 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 54.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

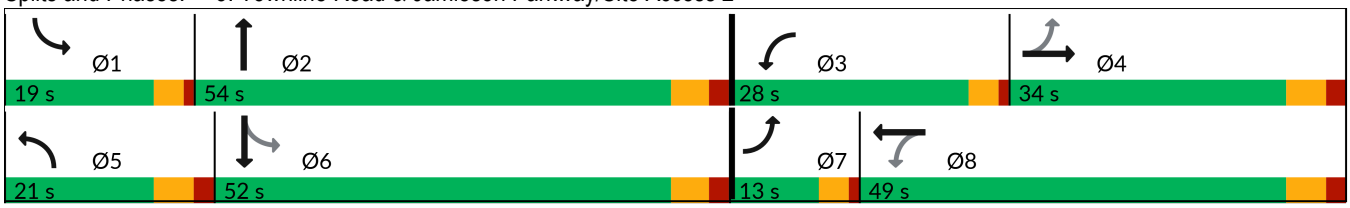


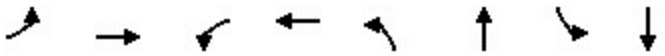
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 146 | 0 | 232 | 61 | 8 | 29 | 218 | 573 | 41 | 10 | 543 | 110 |
| Future Volume (vph) | 146 | 0 | 232 | 61 | 8 | 29 | 218 | 573 | 41 | 10 | 543 | 110 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.882 | | | 0.990 | | | 0.975 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 1668 | 1439 | 0 | 3203 | 3241 | 0 | 1668 | 3214 | 0 |
| Flt Permitted | 0.494 | | | 0.976 | | | 0.950 | | | 0.419 | | |
| Satd. Flow (perm) | 867 | 1387 | 0 | 1713 | 1439 | 0 | 3203 | 3241 | 0 | 735 | 3214 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 503 | | | 29 | | | 6 | | | 19 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Adj. Flow (vph) | 146 | 0 | 232 | 61 | 8 | 29 | 218 | 573 | 41 | 10 | 543 | 110 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 146 | 232 | 0 | 61 | 37 | 0 | 218 | 614 | 0 | 10 | 653 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 9.0 | 31.0 | | 9.0 | 31.0 | | 11.0 | 50.4 | | 9.0 | 41.0 | |
| Total Split (s) | 13.0 | 34.0 | | 28.0 | 49.0 | | 21.0 | 54.0 | | 19.0 | 52.0 | |
| Total Split (%) | 9.6% | 25.2% | | 20.7% | 36.3% | | 15.6% | 40.0% | | 14.1% | 38.5% | |
| Maximum Green (s) | 9.0 | 28.0 | | 24.0 | 43.0 | | 15.0 | 48.0 | | 15.0 | 46.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | | 18.0 | | | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 16.0 | 6.5 | | 13.6 | 6.6 | | 11.6 | 62.1 | | 54.1 | 46.3 | |
| Actuated g/C Ratio | 0.17 | 0.07 | | 0.15 | 0.07 | | 0.13 | 0.67 | | 0.58 | 0.50 | |
| v/c Ratio | 0.60 | 0.41 | | 0.25 | 0.29 | | 0.55 | 0.28 | | 0.02 | 0.40 | |
| Control Delay (s/veh) | 44.1 | 2.2 | | 34.3 | 25.6 | | 44.2 | 7.7 | | 6.0 | 16.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 44.1 | 2.2 | | 34.3 | 25.6 | | 44.2 | 7.7 | | 6.0 | 16.1 | |
| LOS | D | A | | C | C | | D | A | | A | B | |
| Approach Delay (s/veh) | | 18.4 | | | 31.0 | | | 17.3 | | | 16.0 | |
| Approach LOS | | B | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 135 | | | |
| Actuated Cycle Length: 92.6 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.60 | | | |
| Intersection Signal Delay (s/veh): 17.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 65.5% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2

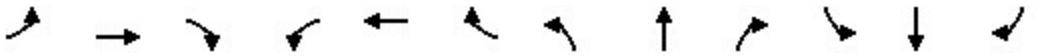




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 146 | 232 | 61 | 37 | 218 | 614 | 10 | 653 |
| v/c Ratio | 0.60 | 0.41 | 0.25 | 0.29 | 0.55 | 0.28 | 0.02 | 0.40 |
| Control Delay (s/veh) | 44.1 | 2.2 | 34.3 | 25.6 | 44.2 | 7.7 | 6.0 | 16.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.1 | 2.2 | 34.3 | 25.6 | 44.2 | 7.7 | 6.0 | 16.1 |
| Queue Length 50th (m) | 22.9 | 0.0 | 9.1 | 1.4 | 19.5 | 20.7 | 0.5 | 37.6 |
| Queue Length 95th (m) | #45.1 | 0.0 | 20.1 | 11.0 | 31.5 | 42.3 | 2.1 | 57.5 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | 261.4 | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | 115.0 | | 115.0 | |
| Base Capacity (vph) | 247 | 772 | 438 | 688 | 522 | 2176 | 654 | 1618 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.59 | 0.30 | 0.14 | 0.05 | 0.42 | 0.28 | 0.02 | 0.40 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 146 | 0 | 232 | 61 | 8 | 29 | 218 | 573 | 41 | 10 | 543 | 110 |
| Future Volume (vph) | 146 | 0 | 232 | 61 | 8 | 29 | 218 | 573 | 41 | 10 | 543 | 110 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.88 | | 1.00 | 0.99 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | 1668 | 1440 | | 3203 | 3241 | | 1668 | 3213 | |
| Flt Permitted | 0.49 | 1.00 | | 0.98 | 1.00 | | 0.95 | 1.00 | | 0.42 | 1.00 | |
| Satd. Flow (perm) | 867 | 1387 | | 1712 | 1440 | | 3203 | 3241 | | 736 | 3213 | |
| 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) | 146 | 0 | 232 | 61 | 8 | 29 | 218 | 573 | 41 | 10 | 543 | 110 |
| RTOR Reduction (vph) | 0 | 213 | 0 | 0 | 28 | 0 | 0 | 2 | 0 | 0 | 9 | 0 |
| Lane Group Flow (vph) | 146 | 19 | 0 | 61 | 9 | 0 | 218 | 612 | 0 | 10 | 644 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 19.1 | 8.2 | | 11.0 | 4.1 | | 11.6 | 62.1 | | 50.7 | 49.6 | |
| Effective Green, g (s) | 19.1 | 8.2 | | 11.0 | 4.1 | | 11.6 | 62.1 | | 50.7 | 49.6 | |
| Actuated g/C Ratio | 0.19 | 0.08 | | 0.11 | 0.04 | | 0.12 | 0.63 | | 0.52 | 0.50 | |
| Clearance Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 258 | 115 | | 188 | 60 | | 377 | 2047 | | 390 | 1621 | |
| v/s Ratio Prot | c0.06 | 0.01 | | 0.02 | 0.01 | | c0.07 | 0.19 | | 0.00 | c0.20 | |
| v/s Ratio Perm | c0.05 | | | 0.01 | | | | | | 0.01 | | |
| v/c Ratio | 0.57 | 0.17 | | 0.32 | 0.15 | | 0.58 | 0.30 | | 0.03 | 0.40 | |
| Uniform Delay, d1 | 35.1 | 41.9 | | 40.2 | 45.4 | | 41.0 | 8.2 | | 11.6 | 15.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.8 | 0.7 | | 1.0 | 1.2 | | 2.1 | 0.4 | | 0.0 | 0.7 | |
| Delay (s) | 37.9 | 42.6 | | 41.2 | 46.6 | | 43.2 | 8.6 | | 11.6 | 15.8 | |
| Level of Service | D | D | | D | D | | D | A | | B | B | |
| Approach Delay (s/veh) | | 40.8 | | | 43.3 | | | 17.7 | | | 15.8 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 22.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.48 | | |
| Actuated Cycle Length (s) | 98.3 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 65.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

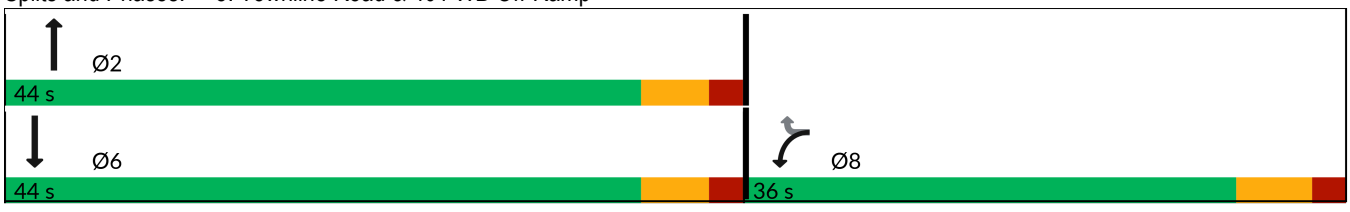
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 378 | 169 | 664 | 0 | 0 | 579 |
| Future Volume (vph) | 378 | 169 | 664 | 0 | 0 | 579 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 169 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 378 | 169 | 664 | 0 | 0 | 579 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 378 | 169 | 664 | 0 | 0 | 579 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (%) | 45.0% | 45.0% | 55.0% | | | 55.0% |
| Maximum Green (s) | 29.5 | 29.5 | 38.0 | | | 38.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 33.0 | | | 33.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 13.2 | 13.2 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.60 | | | 0.60 |
| v/c Ratio | 0.59 | 0.39 | 0.31 | | | 0.28 |
| Control Delay (s/veh) | 26.9 | 6.8 | 7.3 | | | 7.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 26.9 | 6.8 | 7.3 | | | 7.0 |
| LOS | C | A | A | | | A |
| Approach Delay (s/veh) | 20.7 | | 7.3 | | | 7.0 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 63.8 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.59 | | | |
| Intersection Signal Delay (s/veh): 11.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 40.3% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 378 | 169 | 664 | 579 |
| v/c Ratio | 0.59 | 0.39 | 0.31 | 0.28 |
| Control Delay (s/veh) | 26.9 | 6.8 | 7.3 | 7.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 26.9 | 6.8 | 7.3 | 7.0 |
| Queue Length 50th (m) | 20.8 | 0.0 | 17.5 | 14.9 |
| Queue Length 95th (m) | 32.3 | 12.6 | 31.4 | 27.0 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1427 | 765 | 2109 | 2088 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.26 | 0.22 | 0.31 | 0.28 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 378 | 169 | 664 | 0 | 0 | 579 |
| Future Volume (vph) | 378 | 169 | 664 | 0 | 0 | 579 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 378 | 169 | 664 | 0 | 0 | 579 |
| RTOR Reduction (vph) | 0 | 134 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 378 | 35 | 664 | 0 | 0 | 579 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 13.2 | 13.2 | 38.1 | | | 38.1 |
| Effective Green, g (s) | 13.2 | 13.2 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.60 | | | 0.60 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 637 | 301 | 2111 | | | 2090 |
| v/s Ratio Prot | c0.12 | | c0.19 | | | 0.17 |
| v/s Ratio Perm | | 0.02 | | | | |
| v/c Ratio | 0.59 | 0.12 | 0.31 | | | 0.28 |
| Uniform Delay, d1 | 22.9 | 20.6 | 6.4 | | | 6.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.5 | 0.2 | 0.4 | | | 0.3 |
| Delay (s) | 24.4 | 20.7 | 6.8 | | | 6.5 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 23.2 | | 6.8 | | | 6.5 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 11.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.39 | | |
| Actuated Cycle Length (s) | 63.8 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 40.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

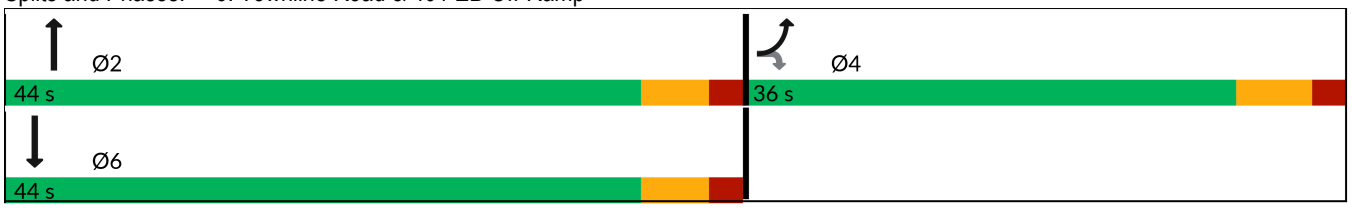
c Critical Lane Group

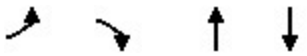
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 320 | 421 | 0 | 523 | 822 | 136 |
| Future Volume (vph) | 320 | 421 | 0 | 523 | 822 | 136 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.979 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1456 | 0 | 3500 | 3436 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1635 | 1456 | 0 | 3500 | 3436 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 110 | | | 32 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Adj. Flow (vph) | 320 | 421 | 0 | 523 | 822 | 136 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 320 | 421 | 0 | 523 | 958 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (%) | 45.0% | 45.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 32.0 | 32.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 21.2 | 21.2 | | 38.3 | 38.3 | |
| Actuated g/C Ratio | 0.29 | 0.29 | | 0.53 | 0.53 | |
| v/c Ratio | 0.67 | 0.83 | | 0.28 | 0.52 | |
| Control Delay (s/veh) | 29.1 | 32.0 | | 11.0 | 13.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 29.1 | 32.0 | | 11.0 | 13.0 | |
| LOS | C | C | | B | B | |
| Approach Delay (s/veh) | 30.8 | | | 11.0 | 13.0 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 72.2 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.83 | | | |
| Intersection Signal Delay (s/veh): 18.4 | | Intersection LOS: B | |
| Intersection Capacity Utilization 65.8% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





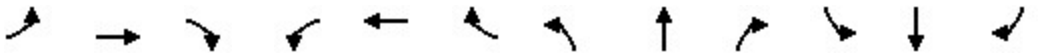
| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 320 | 421 | 523 | 958 |
| v/c Ratio | 0.67 | 0.83 | 0.28 | 0.52 |
| Control Delay (s/veh) | 29.1 | 32.0 | 11.0 | 13.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 29.1 | 32.0 | 11.0 | 13.0 |
| Queue Length 50th (m) | 37.4 | 39.2 | 19.7 | 40.9 |
| Queue Length 95th (m) | 61.1 | 71.6 | 34.8 | 68.7 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 673 | 665 | 1858 | 1839 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.48 | 0.63 | 0.28 | 0.52 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 320 | 421 | 0 | 523 | 822 | 136 |
| Future Volume (vph) | 320 | 421 | 0 | 523 | 822 | 136 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1456 | | 3500 | 3435 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1635 | 1456 | | 3500 | 3435 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 320 | 421 | 0 | 523 | 822 | 136 |
| RTOR Reduction (vph) | 0 | 78 | 0 | 0 | 15 | 0 |
| Lane Group Flow (vph) | 320 | 343 | 0 | 523 | 943 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 21.2 | 21.2 | | 38.3 | 38.3 | |
| Effective Green, g (s) | 21.2 | 21.2 | | 38.3 | 38.3 | |
| Actuated g/C Ratio | 0.29 | 0.29 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 481 | 428 | | 1861 | 1827 | |
| v/s Ratio Prot | 0.20 | | | 0.15 | c0.27 | |
| v/s Ratio Perm | | c0.24 | | | | |
| v/c Ratio | 0.67 | 0.80 | | 0.28 | 0.52 | |
| Uniform Delay, d1 | 22.3 | 23.5 | | 9.3 | 10.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.5 | 10.4 | | 0.4 | 1.0 | |
| Delay (s) | 25.7 | 33.9 | | 9.7 | 11.9 | |
| Level of Service | C | C | | A | B | |
| Approach Delay (s/veh) | 30.4 | | | 9.7 | 11.9 | |
| Approach LOS | C | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 17.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 72.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 65.8% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

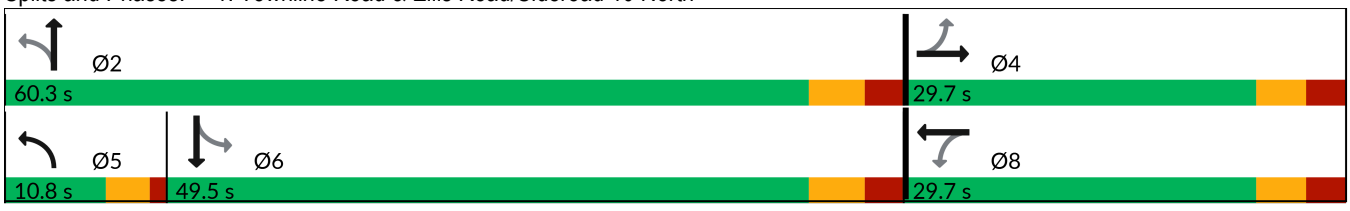


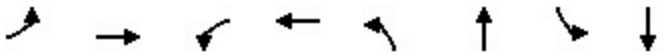
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 30 | 255 | 62 | 11 | 4 | 131 | 639 | 71 | 4 | 753 | 32 |
| Future Volume (vph) | 86 | 30 | 255 | 62 | 11 | 4 | 131 | 639 | 71 | 4 | 753 | 32 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.866 | | | 0.960 | | | 0.985 | | | 0.994 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1388 | 0 | 1668 | 1566 | 0 | 1603 | 1544 | 0 | 1334 | 1577 | 0 |
| Flt Permitted | 0.748 | | | 0.336 | | | 0.178 | | | 0.395 | | |
| Satd. Flow (perm) | 1300 | 1388 | 0 | 590 | 1566 | 0 | 300 | 1544 | 0 | 555 | 1577 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 255 | | | 4 | | | 11 | | | 3 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Adj. Flow (vph) | 86 | 30 | 255 | 62 | 11 | 4 | 131 | 639 | 71 | 4 | 753 | 32 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 86 | 285 | 0 | 62 | 15 | 0 | 131 | 710 | 0 | 4 | 785 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 9.0 | 49.5 | | 49.5 | 49.5 | |
| Total Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 10.8 | 60.3 | | 49.5 | 49.5 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 12.0% | 67.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 23.7 | 23.7 | | 23.7 | 23.7 | | 6.8 | 54.0 | | 43.2 | 43.2 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 35.2 | | 35.2 | 35.2 | |
| Flash Don't Walk (s) | 13.7 | 13.7 | | 13.7 | 13.7 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 11.9 | 11.9 | | 11.9 | 11.9 | | 56.5 | 54.2 | | 43.5 | 43.5 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.72 | 0.69 | | 0.55 | 0.55 | |
| v/c Ratio | 0.44 | 0.67 | | 0.70 | 0.06 | | 0.40 | 0.66 | | 0.01 | 0.90 | |
| Control Delay (s/veh) | 36.7 | 14.2 | | 68.7 | 23.7 | | 7.9 | 11.8 | | 10.0 | 32.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.2 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 36.7 | 14.2 | | 68.7 | 23.7 | | 7.9 | 12.0 | | 10.0 | 32.3 | |
| LOS | D | B | | E | C | | A | B | | A | C | |
| Approach Delay (s/veh) | | 19.4 | | | 59.9 | | | 11.4 | | | 32.2 | |
| Approach LOS | | B | | | E | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 78.4 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.90 | | | |
| Intersection Signal Delay (s/veh): 22.5 | | Intersection LOS: C | |
| Intersection Capacity Utilization 98.3% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

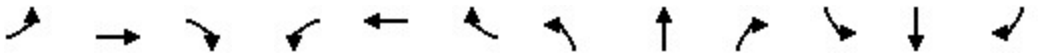




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 86 | 285 | 62 | 15 | 131 | 710 | 4 | 785 |
| v/c Ratio | 0.44 | 0.67 | 0.70 | 0.06 | 0.40 | 0.66 | 0.01 | 0.90 |
| Control Delay (s/veh) | 36.7 | 14.2 | 68.7 | 23.7 | 7.9 | 11.8 | 10.0 | 32.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.7 | 14.2 | 68.7 | 23.7 | 7.9 | 12.0 | 10.0 | 32.3 |
| Queue Length 50th (m) | 11.7 | 3.9 | 8.8 | 1.4 | 4.8 | 49.1 | 0.3 | 94.7 |
| Queue Length 95th (m) | 24.4 | 25.3 | 21.4 | 6.0 | 13.1 | 113.9 | 1.9 | #200.7 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 394 | 598 | 178 | 477 | 329 | 1069 | 308 | 877 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.48 | 0.35 | 0.03 | 0.40 | 0.70 | 0.01 | 0.90 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 30 | 255 | 62 | 11 | 4 | 131 | 639 | 71 | 4 | 753 | 32 |
| Future Volume (vph) | 86 | 30 | 255 | 62 | 11 | 4 | 131 | 639 | 71 | 4 | 753 | 32 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1388 | | 1668 | 1566 | | 1603 | 1544 | | 1334 | 1576 | |
| Flt Permitted | 0.75 | 1.00 | | 0.34 | 1.00 | | 0.18 | 1.00 | | 0.40 | 1.00 | |
| Satd. Flow (perm) | 1299 | 1388 | | 590 | 1566 | | 300 | 1544 | | 555 | 1576 | |
| 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) | 86 | 30 | 255 | 62 | 11 | 4 | 131 | 639 | 71 | 4 | 753 | 32 |
| RTOR Reduction (vph) | 0 | 216 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 86 | 69 | 0 | 62 | 12 | 0 | 131 | 707 | 0 | 4 | 784 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 11.9 | 11.9 | | 11.9 | 11.9 | | 54.2 | 54.2 | | 43.6 | 43.6 | |
| Effective Green, g (s) | 11.9 | 11.9 | | 11.9 | 11.9 | | 54.2 | 54.2 | | 43.6 | 43.6 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.69 | 0.69 | | 0.56 | 0.56 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 197 | 210 | | 89 | 237 | | 317 | 1067 | | 308 | 876 | |
| v/s Ratio Prot | | 0.05 | | | 0.01 | | 0.03 | c0.46 | | | c0.50 | |
| v/s Ratio Perm | 0.07 | | | c0.11 | | | 0.25 | | | 0.01 | | |
| v/c Ratio | 0.44 | 0.33 | | 0.70 | 0.05 | | 0.41 | 0.66 | | 0.01 | 0.89 | |
| Uniform Delay, d1 | 30.2 | 29.7 | | 31.5 | 28.4 | | 9.0 | 6.9 | | 7.8 | 15.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.5 | 0.9 | | 21.1 | 0.1 | | 0.9 | 3.2 | | 0.1 | 13.6 | |
| Delay (s) | 31.8 | 30.6 | | 52.6 | 28.5 | | 9.8 | 10.1 | | 7.9 | 28.9 | |
| Level of Service | C | C | | D | C | | A | B | | A | C | |
| Approach Delay (s/veh) | | 30.9 | | | 47.9 | | | 10.1 | | | 28.8 | |
| Approach LOS | | C | | | D | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 22.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.85 | | |
| Actuated Cycle Length (s) | 78.4 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 98.3% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

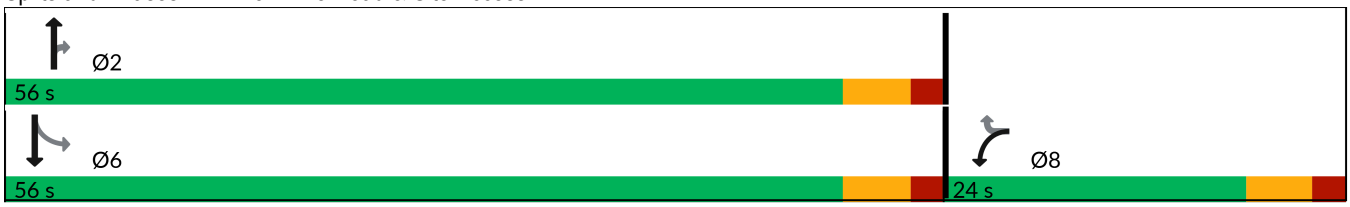
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 26 | 23 | 798 | 112 | 58 | 997 |
| Future Volume (vph) | 26 | 23 | 798 | 112 | 58 | 997 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.324 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 597 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 23 | | 112 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 26 | 23 | 798 | 112 | 58 | 997 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 26 | 23 | 798 | 112 | 58 | 997 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 29.0 | 29.0 | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | 70.0% | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | Max | Max | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 6.9 | 6.9 | 66.0 | 66.0 | 66.0 | 66.0 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.85 | 0.85 | 0.85 | 0.85 |
| v/c Ratio | 0.18 | 0.15 | 0.54 | 0.09 | 0.11 | 0.63 |
| Control Delay (s/veh) | 36.0 | 16.2 | 5.2 | 0.8 | 3.1 | 6.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 |
| Total Delay (s/veh) | 36.0 | 16.2 | 5.2 | 0.8 | 3.1 | 6.9 |
| LOS | D | B | A | A | A | A |
| Approach Delay (s/veh) | 26.7 | | 4.6 | | | 6.7 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 77.2 | | | |
| Natural Cycle: 75 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.63 | | | |
| Intersection Signal Delay (s/veh): 6.3 | | Intersection LOS: A | |
| Intersection Capacity Utilization 66.6% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

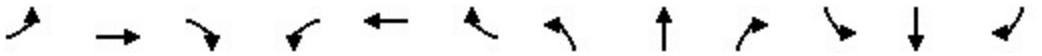


| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 26 | 23 | 798 | 112 | 58 | 997 |
| v/c Ratio | 0.18 | 0.15 | 0.54 | 0.09 | 0.11 | 0.63 |
| Control Delay (s/veh) | 36.0 | 16.2 | 5.2 | 0.8 | 3.1 | 6.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 |
| Total Delay (s/veh) | 36.0 | 16.2 | 5.2 | 0.8 | 3.1 | 6.9 |
| Queue Length 50th (m) | 4.0 | 0.0 | 40.0 | 0.0 | 1.8 | 58.4 |
| Queue Length 95th (m) | 10.3 | 6.1 | 74.7 | 3.2 | 5.1 | 111.9 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 381 | 358 | 1470 | 1266 | 510 | 1573 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 197 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.07 | 0.06 | 0.54 | 0.09 | 0.11 | 0.72 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 26 | 23 | 798 | 112 | 58 | 997 |
| Future Volume (vph) | 26 | 23 | 798 | 112 | 58 | 997 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.32 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 596 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 26 | 23 | 798 | 112 | 58 | 997 |
| RTOR Reduction (vph) | 0 | 22 | 0 | 23 | 0 | 0 |
| Lane Group Flow (vph) | 26 | 1 | 798 | 89 | 58 | 997 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 4.4 | 4.4 | 63.4 | 63.4 | 63.4 | 63.4 |
| Effective Green, g (s) | 4.4 | 4.4 | 63.4 | 63.4 | 63.4 | 63.4 |
| Actuated g/C Ratio | 0.06 | 0.06 | 0.79 | 0.79 | 0.79 | 0.79 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 89 | 80 | 1367 | 1162 | 473 | 1463 |
| v/s Ratio Prot | c0.02 | | 0.46 | | | c0.54 |
| v/s Ratio Perm | | 0.00 | | 0.06 | 0.10 | |
| v/c Ratio | 0.29 | 0.02 | 0.58 | 0.08 | 0.12 | 0.68 |
| Uniform Delay, d1 | 36.2 | 35.7 | 3.1 | 1.8 | 1.9 | 3.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.8 | 0.1 | 1.8 | 0.1 | 0.5 | 2.6 |
| Delay (s) | 38.0 | 35.7 | 5.0 | 1.9 | 2.4 | 6.3 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 37.0 | | 4.6 | | | 6.0 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 6.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 79.8 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 66.6% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

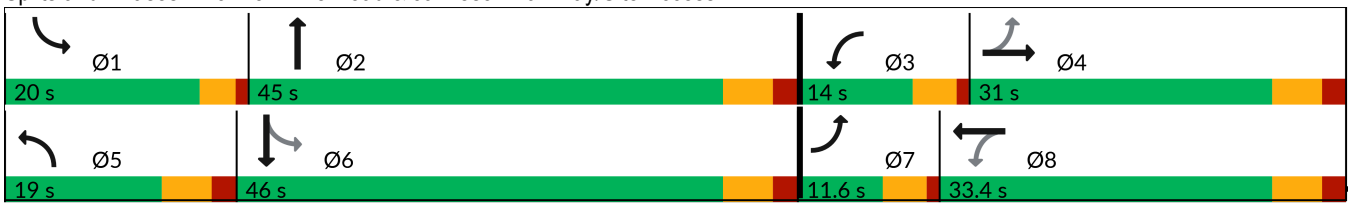


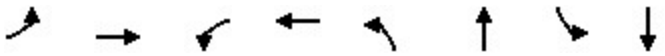
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 140 | 0 | 298 | 53 | 7 | 23 | 333 | 728 | 228 | 55 | 807 | 177 |
| Future Volume (vph) | 140 | 0 | 298 | 53 | 7 | 23 | 333 | 728 | 228 | 55 | 807 | 177 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | | | | | 1.00 | | | | 1.00 | |
| Frt | | 0.850 | | | 0.885 | | | 0.964 | | | 0.973 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1635 | 1347 | 0 | 1668 | 1444 | 0 | 3203 | 3191 | 0 | 1668 | 3168 | 0 |
| Flt Permitted | 0.441 | | | 0.656 | | | 0.950 | | | 0.292 | | |
| Satd. Flow (perm) | 759 | 1347 | 0 | 1151 | 1444 | 0 | 3202 | 3191 | 0 | 513 | 3168 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 378 | | | 23 | | | 42 | | | 27 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| 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% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Adj. Flow (vph) | 140 | 0 | 298 | 53 | 7 | 23 | 333 | 728 | 228 | 55 | 807 | 177 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 140 | 298 | 0 | 53 | 30 | 0 | 333 | 956 | 0 | 55 | 984 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | | 5.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 9.5 | 31.0 | | 9.5 | 31.0 | | 11.0 | 41.0 | | 9.0 | 41.0 | |
| Total Split (s) | 11.6 | 31.0 | | 14.0 | 33.4 | | 19.0 | 45.0 | | 20.0 | 46.0 | |
| Total Split (%) | 10.5% | 28.2% | | 12.7% | 30.4% | | 17.3% | 40.9% | | 18.2% | 41.8% | |
| Maximum Green (s) | 7.1 | 25.0 | | 9.5 | 27.4 | | 13.0 | 39.0 | | 16.0 | 40.0 | |
| Yellow Time (s) | 3.5 | 4.0 | | 3.5 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | | 18.0 | | | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 16.5 | 8.6 | | 14.6 | 9.5 | | 12.7 | 50.5 | | 48.8 | 40.2 | |
| Actuated g/C Ratio | 0.18 | 0.10 | | 0.16 | 0.11 | | 0.14 | 0.56 | | 0.55 | 0.45 | |
| v/c Ratio | 0.58 | 0.63 | | 0.23 | 0.17 | | 0.74 | 0.53 | | 0.15 | 0.68 | |
| Control Delay (s/veh) | 40.9 | 7.8 | | 30.8 | 20.8 | | 48.6 | 14.6 | | 7.7 | 23.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 40.9 | 7.8 | | 30.8 | 20.8 | | 48.6 | 14.6 | | 7.7 | 23.0 | |
| LOS | D | A | | C | C | | D | B | | A | C | |
| Approach Delay (s/veh) | | 18.4 | | | 27.2 | | | 23.4 | | | 22.2 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 110 | | | |
| Actuated Cycle Length: 89.5 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.74 | | | |
| Intersection Signal Delay (s/veh): 22.3 | | Intersection LOS: C | |
| Intersection Capacity Utilization 84.3% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2

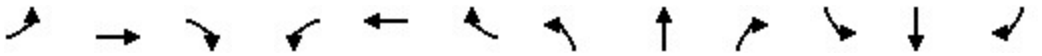




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 140 | 298 | 53 | 30 | 333 | 956 | 55 | 984 |
| v/c Ratio | 0.58 | 0.63 | 0.23 | 0.17 | 0.74 | 0.53 | 0.15 | 0.68 |
| Control Delay (s/veh) | 40.9 | 7.8 | 30.8 | 20.8 | 48.6 | 14.6 | 7.7 | 23.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.9 | 7.8 | 30.8 | 20.8 | 48.6 | 14.6 | 7.7 | 23.0 |
| Queue Length 50th (m) | 20.5 | 0.0 | 7.3 | 1.1 | 29.1 | 52.8 | 2.9 | 69.4 |
| Queue Length 95th (m) | #39.1 | 8.1 | 16.3 | 9.1 | #49.8 | 81.3 | 7.8 | 100.8 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | 261.4 | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | 115.0 | | 115.0 | |
| Base Capacity (vph) | 242 | 650 | 267 | 460 | 467 | 1820 | 542 | 1439 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.58 | 0.46 | 0.20 | 0.07 | 0.71 | 0.53 | 0.10 | 0.68 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 140 | 0 | 298 | 53 | 7 | 23 | 333 | 728 | 228 | 55 | 807 | 177 |
| Future Volume (vph) | 140 | 0 | 298 | 53 | 7 | 23 | 333 | 728 | 228 | 55 | 807 | 177 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.89 | | 1.00 | 0.96 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1347 | | 1668 | 1444 | | 3203 | 3191 | | 1668 | 3169 | |
| Flt Permitted | 0.44 | 1.00 | | 0.66 | 1.00 | | 0.95 | 1.00 | | 0.29 | 1.00 | |
| Satd. Flow (perm) | 759 | 1347 | | 1151 | 1444 | | 3203 | 3191 | | 512 | 3169 | |
| 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) | 140 | 0 | 298 | 53 | 7 | 23 | 333 | 728 | 228 | 55 | 807 | 177 |
| RTOR Reduction (vph) | 0 | 265 | 0 | 0 | 21 | 0 | 0 | 19 | 0 | 0 | 15 | 0 |
| Lane Group Flow (vph) | 140 | 33 | 0 | 53 | 9 | 0 | 333 | 937 | 0 | 55 | 969 | 0 |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| Heavy Vehicles (%) | 2% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 20.7 | 10.2 | | 12.5 | 6.1 | | 12.7 | 50.5 | | 46.4 | 41.1 | |
| Effective Green, g (s) | 20.7 | 10.2 | | 12.5 | 6.1 | | 12.7 | 50.5 | | 46.4 | 41.1 | |
| Actuated g/C Ratio | 0.22 | 0.11 | | 0.13 | 0.07 | | 0.14 | 0.54 | | 0.50 | 0.44 | |
| Clearance Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 268 | 147 | | 190 | 94 | | 437 | 1734 | | 321 | 1402 | |
| v/s Ratio Prot | c0.06 | 0.02 | | 0.02 | 0.01 | | c0.10 | 0.29 | | 0.01 | c0.31 | |
| v/s Ratio Perm | c0.06 | | | 0.02 | | | | | | 0.08 | | |
| v/c Ratio | 0.52 | 0.22 | | 0.28 | 0.09 | | 0.76 | 0.54 | | 0.17 | 0.69 | |
| Uniform Delay, d1 | 30.8 | 37.7 | | 36.0 | 40.8 | | 38.6 | 13.7 | | 12.0 | 20.8 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.8 | 0.8 | | 0.8 | 0.4 | | 7.7 | 1.2 | | 0.3 | 2.8 | |
| Delay (s) | 32.6 | 38.5 | | 36.8 | 41.2 | | 46.3 | 14.9 | | 12.3 | 23.6 | |
| Level of Service | C | D | | D | D | | D | B | | B | C | |
| Approach Delay (s/veh) | | 36.6 | | | 38.4 | | | 23.0 | | | 23.0 | |
| Approach LOS | | D | | | D | | | C | | | C | |

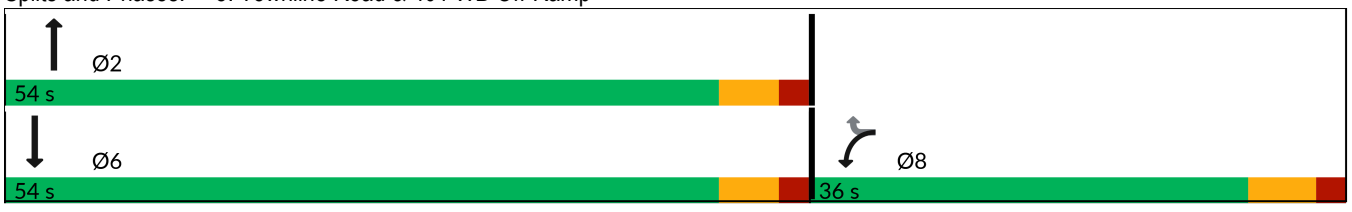
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 25.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.69 | | |
| Actuated Cycle Length (s) | 92.9 | Sum of lost time (s) | 22.5 |
| Intersection Capacity Utilization | 84.3% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 535 | 206 | 1101 | 0 | 0 | 801 |
| Future Volume (vph) | 535 | 206 | 1101 | 0 | 0 | 801 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 69 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 535 | 206 | 1101 | 0 | 0 | 801 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 535 | 206 | 1101 | 0 | 0 | 801 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (%) | 40.0% | 40.0% | 60.0% | | | 60.0% |
| Maximum Green (s) | 29.5 | 29.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 20.7 | 20.7 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.59 | | | 0.59 |
| v/c Ratio | 0.73 | 0.51 | 0.53 | | | 0.39 |
| Control Delay (s/veh) | 34.2 | 21.4 | 11.9 | | | 10.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 34.2 | 21.4 | 11.9 | | | 10.2 |
| LOS | C | C | B | | | B |
| Approach Delay (s/veh) | 30.6 | | 11.9 | | | 10.2 |
| Approach LOS | C | | B | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 81.4 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.73 | | | |
| Intersection Signal Delay (s/veh): 16.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 57.2% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 535 | 206 | 1101 | 801 |
| v/c Ratio | 0.73 | 0.51 | 0.53 | 0.39 |
| Control Delay (s/veh) | 34.2 | 21.4 | 11.9 | 10.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.2 | 21.4 | 11.9 | 10.2 |
| Queue Length 50th (m) | 39.0 | 17.5 | 49.0 | 31.6 |
| Queue Length 95th (m) | 54.8 | 36.5 | 81.3 | 53.7 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1041 | 543 | 2070 | 2070 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.51 | 0.38 | 0.53 | 0.39 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 535 | 206 | 1101 | 0 | 0 | 801 |
| Future Volume (vph) | 535 | 206 | 1101 | 0 | 0 | 801 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 535 | 206 | 1101 | 0 | 0 | 801 |
| RTOR Reduction (vph) | 0 | 51 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 535 | 155 | 1101 | 0 | 0 | 801 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 20.7 | 20.7 | 48.2 | | | 48.2 |
| Effective Green, g (s) | 20.7 | 20.7 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.59 | | | 0.59 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 728 | 349 | 2072 | | | 2072 |
| v/s Ratio Prot | c0.19 | | c0.31 | | | 0.23 |
| v/s Ratio Perm | | 0.11 | | | | |
| v/c Ratio | 0.73 | 0.44 | 0.53 | | | 0.39 |
| Uniform Delay, d1 | 27.8 | 25.5 | 9.9 | | | 8.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 3.9 | 0.9 | 1.0 | | | 0.5 |
| Delay (s) | 31.7 | 26.4 | 10.9 | | | 9.3 |
| Level of Service | C | C | B | | | A |
| Approach Delay (s/veh) | 30.2 | | 10.9 | | | 9.3 |
| Approach LOS | C | | B | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 15.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.59 | | |
| Actuated Cycle Length (s) | 81.4 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 57.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

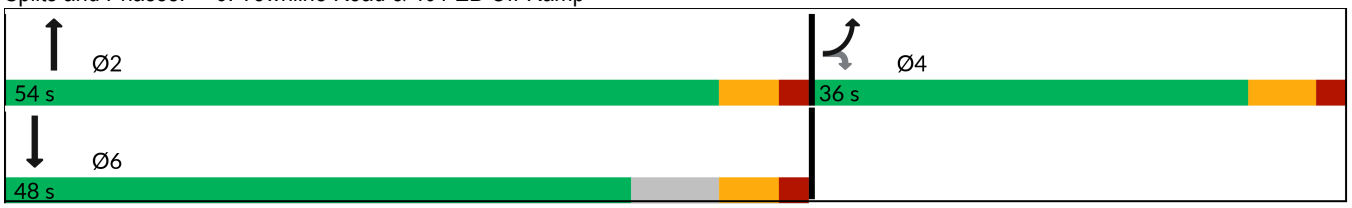
c Critical Lane Group

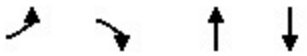
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 529 | 498 | 0 | 1031 | 1167 | 177 |
| Future Volume (vph) | 529 | 498 | 0 | 1031 | 1167 | 177 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.980 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1603 | 1414 | 0 | 3433 | 3298 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1603 | 1414 | 0 | 3433 | 3298 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 58 | | | 29 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Adj. Flow (vph) | 529 | 498 | 0 | 1031 | 1167 | 177 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 529 | 498 | 0 | 1031 | 1344 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 54.0 | 42.0 | |
| Total Split (s) | 36.0 | 36.0 | | 54.0 | 48.0 | |
| Total Split (%) | 40.0% | 40.0% | | 60.0% | 53.3% | |
| Maximum Green (s) | 29.5 | 29.5 | | 48.0 | 42.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 10.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 19.5 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| v/c Ratio | 1.01 | 0.99 | | 0.56 | 0.76 | |
| Control Delay (s/veh) | 73.3 | 67.0 | | 15.5 | 19.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 73.3 | 67.0 | | 15.5 | 19.6 | |
| LOS | E | E | | B | B | |
| Approach Delay (s/veh) | 70.3 | | | 15.5 | 19.6 | |
| Approach LOS | E | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.01 | | | |
| Intersection Signal Delay (s/veh): 33.6 | | Intersection LOS: C | |
| Intersection Capacity Utilization 81.8% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 529 | 498 | 1031 | 1344 |
| v/c Ratio | 1.01 | 0.99 | 0.56 | 0.76 |
| Control Delay (s/veh) | 73.3 | 67.0 | 15.5 | 19.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 73.3 | 67.0 | 15.5 | 19.6 |
| Queue Length 50th (m) | ~91.9 | 77.1 | 58.9 | 88.4 |
| Queue Length 95th (m) | #155.6 | #141.3 | 76.6 | 114.8 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 525 | 502 | 1830 | 1772 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.01 | 0.99 | 0.56 | 0.76 |

Intersection Summary

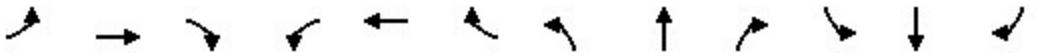
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 529 | 498 | 0 | 1031 | 1167 | 177 |
| Future Volume (vph) | 529 | 498 | 0 | 1031 | 1167 | 177 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1603 | 1414 | | 3433 | 3299 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1603 | 1414 | | 3433 | 3299 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 529 | 498 | 0 | 1031 | 1167 | 177 |
| RTOR Reduction (vph) | 0 | 39 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 529 | 459 | 0 | 1031 | 1330 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Effective Green, g (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 525 | 463 | | 1830 | 1759 | |
| v/s Ratio Prot | c0.33 | | | 0.30 | c0.40 | |
| v/s Ratio Perm | | 0.32 | | | | |
| v/c Ratio | 1.01 | 0.99 | | 0.56 | 0.76 | |
| Uniform Delay, d1 | 30.3 | 30.1 | | 14.0 | 16.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 41.2 | 39.4 | | 1.3 | 3.1 | |
| Delay (s) | 71.4 | 69.5 | | 15.3 | 19.5 | |
| Level of Service | E | E | | B | B | |
| Approach Delay (s/veh) | 70.5 | | | 15.3 | 19.5 | |
| Approach LOS | E | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 33.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.85 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 81.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

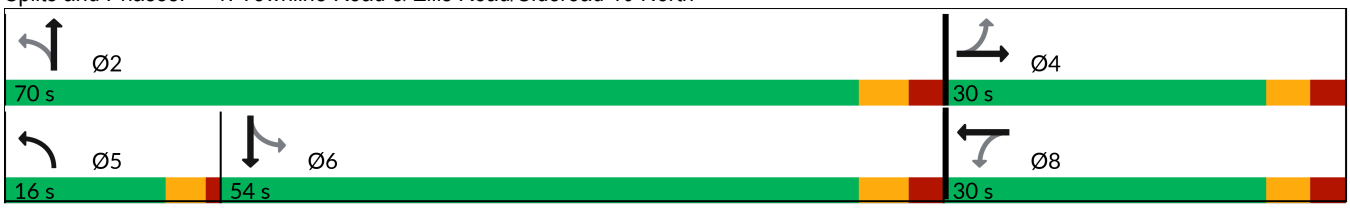


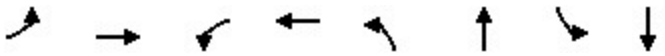
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 41 | 22 | 141 | 95 | 40 | 9 | 403 | 1007 | 125 | 10 | 567 | 67 |
| Future Volume (vph) | 41 | 22 | 141 | 95 | 40 | 9 | 403 | 1007 | 125 | 10 | 567 | 67 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.870 | | | 0.972 | | | 0.983 | | | 0.984 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1395 | 0 | 1635 | 1586 | 0 | 1668 | 1590 | 0 | 1668 | 1547 | 0 |
| Flt Permitted | 0.725 | | | 0.577 | | | 0.257 | | | 0.147 | | |
| Satd. Flow (perm) | 1273 | 1395 | 0 | 993 | 1586 | 0 | 451 | 1590 | 0 | 258 | 1547 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 141 | | | 9 | | | 12 | | | 8 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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 (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 41 | 22 | 141 | 95 | 40 | 9 | 403 | 1007 | 125 | 10 | 567 | 67 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 41 | 163 | 0 | 95 | 49 | 0 | 403 | 1132 | 0 | 10 | 634 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 9.0 | 54.0 | | 54.0 | 54.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 16.0 | 70.0 | | 54.0 | 54.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 16.0% | 70.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 12.0 | 63.7 | | 47.7 | 47.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 39.7 | | 39.7 | 39.7 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 13.5 | 13.5 | | 13.5 | 13.5 | | 66.2 | 63.9 | | 47.8 | 47.8 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.74 | 0.71 | | 0.53 | 0.53 | |
| v/c Ratio | 0.21 | 0.49 | | 0.64 | 0.20 | | 0.81 | 1.00 | | 0.07 | 0.77 | |
| Control Delay (s/veh) | 35.3 | 13.7 | | 54.9 | 29.6 | | 21.5 | 41.8 | | 13.9 | 25.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 19.6 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 35.3 | 13.7 | | 54.9 | 29.6 | | 21.5 | 61.4 | | 13.9 | 25.2 | |
| LOS | D | B | | D | C | | C | E | | B | C | |
| Approach Delay (s/veh) | | 18.1 | | | 46.3 | | | 51.0 | | | 25.0 | |
| Approach LOS | | B | | | D | | | D | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 89.7 | | | |
| Natural Cycle: 115 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.00 | | | |
| Intersection Signal Delay (s/veh): 41.4 | | Intersection LOS: D | |
| Intersection Capacity Utilization 111.4% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

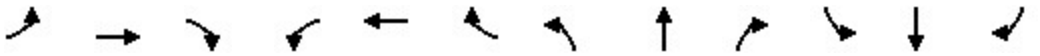




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 41 | 163 | 95 | 49 | 403 | 1132 | 10 | 634 |
| v/c Ratio | 0.21 | 0.49 | 0.64 | 0.20 | 0.81 | 1.00 | 0.07 | 0.77 |
| Control Delay (s/veh) | 35.3 | 13.7 | 54.9 | 29.6 | 21.5 | 41.8 | 13.9 | 25.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19.6 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.3 | 13.7 | 54.9 | 29.6 | 21.5 | 61.4 | 13.9 | 25.2 |
| Queue Length 50th (m) | 6.3 | 3.3 | 15.5 | 6.1 | 19.4 | 160.8 | 0.8 | 79.7 |
| Queue Length 95th (m) | 15.2 | 19.8 | 31.2 | 15.5 | #63.0 | #313.1 | 4.0 | #161.4 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 341 | 477 | 266 | 431 | 495 | 1135 | 137 | 828 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 66 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.12 | 0.34 | 0.36 | 0.11 | 0.81 | 1.06 | 0.07 | 0.77 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 41 | 22 | 141 | 95 | 40 | 9 | 403 | 1007 | 125 | 10 | 567 | 67 |
| Future Volume (vph) | 41 | 22 | 141 | 95 | 40 | 9 | 403 | 1007 | 125 | 10 | 567 | 67 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1396 | | 1635 | 1587 | | 1668 | 1590 | | 1668 | 1547 | |
| Flt Permitted | 0.73 | 1.00 | | 0.58 | 1.00 | | 0.26 | 1.00 | | 0.15 | 1.00 | |
| Satd. Flow (perm) | 1273 | 1396 | | 993 | 1587 | | 451 | 1590 | | 258 | 1547 | |
| 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) | 41 | 22 | 141 | 95 | 40 | 9 | 403 | 1007 | 125 | 10 | 567 | 67 |
| RTOR Reduction (vph) | 0 | 120 | 0 | 0 | 8 | 0 | 0 | 3 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 41 | 43 | 0 | 95 | 41 | 0 | 403 | 1129 | 0 | 10 | 630 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 13.5 | 13.5 | | 13.5 | 13.5 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Effective Green, g (s) | 13.5 | 13.5 | | 13.5 | 13.5 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.15 | 0.15 | | 0.15 | 0.15 | | 0.71 | 0.71 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 191 | 210 | | 149 | 238 | | 484 | 1132 | | 137 | 826 | |
| v/s Ratio Prot | | 0.03 | | | 0.03 | | 0.11 | c0.71 | | | 0.41 | |
| v/s Ratio Perm | 0.03 | | | c0.10 | | | 0.48 | | | 0.04 | | |
| v/c Ratio | 0.21 | 0.21 | | 0.64 | 0.17 | | 0.83 | 1.00 | | 0.07 | 0.76 | |
| Uniform Delay, d1 | 33.4 | 33.4 | | 35.8 | 33.2 | | 10.0 | 12.8 | | 10.1 | 16.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.5 | | 8.6 | 0.3 | | 11.7 | 26.0 | | 1.0 | 6.6 | |
| Delay (s) | 34.0 | 33.9 | | 44.4 | 33.6 | | 21.6 | 38.8 | | 11.2 | 23.0 | |
| Level of Service | C | C | | D | C | | C | D | | B | C | |
| Approach Delay (s/veh) | | 33.9 | | | 40.7 | | | 34.3 | | | 22.9 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 31.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.98 | | |
| Actuated Cycle Length (s) | 89.7 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 111.4% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |

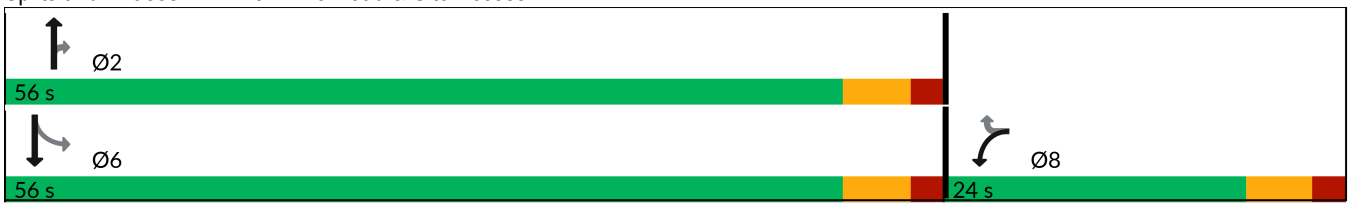
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 85 | 68 | 1467 | 54 | 24 | 802 |
| Future Volume (vph) | 85 | 68 | 1467 | 54 | 24 | 802 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.071 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 131 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 47 | | 49 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 85 | 68 | 1467 | 54 | 24 | 802 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 85 | 68 | 1467 | 54 | 24 | 802 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | 70.0% | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | Max | Max | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 9.3 | 9.3 | 57.6 | 57.6 | 57.6 | 57.6 |
| Actuated g/C Ratio | 0.12 | 0.12 | 0.77 | 0.77 | 0.77 | 0.77 |
| v/c Ratio | 0.43 | 0.31 | 1.11 | 0.05 | 0.24 | 0.57 |
| Control Delay (s/veh) | 36.2 | 16.9 | 78.3 | 1.6 | 12.0 | 7.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Total Delay (s/veh) | 36.2 | 16.9 | 78.3 | 1.6 | 12.0 | 7.7 |
| LOS | D | B | E | A | B | A |
| Approach Delay (s/veh) | 27.6 | | 75.5 | | | 7.8 |
| Approach LOS | C | | E | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 75.2 | | | |
| Natural Cycle: 150 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.11 | | | |
| Intersection Signal Delay (s/veh): 50.2 | | Intersection LOS: D | |
| Intersection Capacity Utilization 97.7% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 85 | 68 | 1467 | 54 | 24 | 802 |
| v/c Ratio | 0.43 | 0.31 | 1.11 | 0.05 | 0.24 | 0.57 |
| Control Delay (s/veh) | 36.2 | 16.9 | 78.3 | 1.6 | 12.0 | 7.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Total Delay (s/veh) | 36.2 | 16.9 | 78.3 | 1.6 | 12.0 | 7.7 |
| Queue Length 50th (m) | 11.1 | 2.7 | ~252.3 | 0.2 | 1.0 | 45.6 |
| Queue Length 95th (m) | 22.6 | 12.6 | #340.0 | 3.1 | 6.3 | 88.9 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 390 | 385 | 1318 | 1132 | 100 | 1411 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 142 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.18 | 1.11 | 0.05 | 0.24 | 0.63 |

Intersection Summary

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 85 | 68 | 1467 | 54 | 24 | 802 |
| Future Volume (vph) | 85 | 68 | 1467 | 54 | 24 | 802 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.07 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 131 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 85 | 68 | 1467 | 54 | 24 | 802 |
| RTOR Reduction (vph) | 0 | 42 | 0 | 13 | 0 | 0 |
| Lane Group Flow (vph) | 85 | 26 | 1467 | 41 | 24 | 802 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 8.1 | 8.1 | 56.4 | 56.4 | 56.4 | 56.4 |
| Effective Green, g (s) | 8.1 | 8.1 | 56.4 | 56.4 | 56.4 | 56.4 |
| Actuated g/C Ratio | 0.11 | 0.11 | 0.74 | 0.74 | 0.74 | 0.74 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 172 | 153 | 1268 | 1078 | 96 | 1358 |
| v/s Ratio Prot | c0.05 | | c0.85 | | | 0.44 |
| v/s Ratio Perm | | 0.02 | | 0.03 | 0.18 | |
| v/c Ratio | 0.49 | 0.17 | 1.16 | 0.04 | 0.25 | 0.59 |
| Uniform Delay, d1 | 32.3 | 31.1 | 10.1 | 2.7 | 3.2 | 4.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.2 | 0.5 | 79.9 | 0.1 | 6.1 | 1.9 |
| Delay (s) | 34.5 | 31.7 | 89.9 | 2.8 | 9.4 | 6.6 |
| Level of Service | C | C | F | A | A | A |
| Approach Delay (s/veh) | 33.2 | | 86.8 | | | 6.7 |
| Approach LOS | C | | F | | | A |

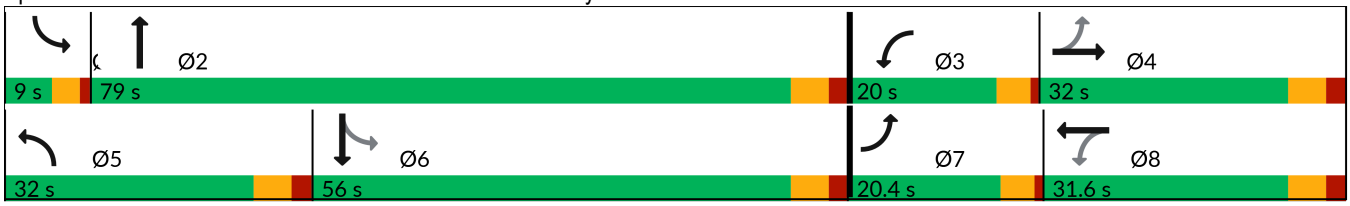
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 57.1 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 1.07 | | |
| Actuated Cycle Length (s) | 76.5 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 97.7% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

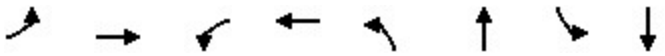
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 226 | 0 | 383 | 173 | 22 | 83 | 480 | 1152 | 72 | 18 | 695 | 167 |
| Future Volume (vph) | 226 | 0 | 383 | 173 | 22 | 83 | 480 | 1152 | 72 | 18 | 695 | 167 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.881 | | | 0.991 | | | 0.971 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 1668 | 1437 | 0 | 3203 | 3274 | 0 | 1668 | 3125 | 0 |
| Flt Permitted | 0.581 | | | 0.323 | | | 0.950 | | | 0.229 | | |
| Satd. Flow (perm) | 1020 | 1387 | 0 | 567 | 1437 | 0 | 3203 | 3274 | 0 | 402 | 3125 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 375 | | | 83 | | | 7 | | | 23 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 226 | 0 | 383 | 173 | 22 | 83 | 480 | 1152 | 72 | 18 | 695 | 167 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 226 | 383 | 0 | 173 | 105 | 0 | 480 | 1224 | 0 | 18 | 862 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | | 5.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 9.5 | 31.0 | | 9.5 | 31.0 | | 11.0 | 50.4 | | 9.0 | 50.4 | |
| Total Split (s) | 20.4 | 32.0 | | 20.0 | 31.6 | | 32.0 | 79.0 | | 9.0 | 56.0 | |
| Total Split (%) | 14.6% | 22.9% | | 14.3% | 22.6% | | 22.9% | 56.4% | | 6.4% | 40.0% | |
| Maximum Green (s) | 15.9 | 26.0 | | 15.5 | 25.6 | | 26.0 | 73.0 | | 5.0 | 50.0 | |
| Yellow Time (s) | 3.5 | 4.0 | | 3.5 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 23.4 | | | 23.4 | |
| Flash Don't Walk (s) | | 18.0 | | | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 30.3 | 13.5 | | 28.0 | 12.3 | | 22.5 | 75.6 | | 57.4 | 50.4 | |
| Actuated g/C Ratio | 0.25 | 0.11 | | 0.23 | 0.10 | | 0.18 | 0.61 | | 0.47 | 0.41 | |
| v/c Ratio | 0.68 | 0.79 | | 0.68 | 0.48 | | 0.82 | 0.61 | | 0.08 | 0.67 | |
| Control Delay (s/veh) | 49.4 | 18.1 | | 50.4 | 23.4 | | 61.4 | 18.0 | | 12.6 | 33.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 49.4 | 18.1 | | 50.4 | 23.4 | | 61.4 | 18.0 | | 12.6 | 33.4 | |
| LOS | D | B | | D | C | | E | B | | B | C | |
| Approach Delay (s/veh) | | 29.7 | | | 40.2 | | | 30.3 | | | 33.0 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 140 | | | |
| Actuated Cycle Length: 123.2 | | | |
| Natural Cycle: 115 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.82 | | | |
| Intersection Signal Delay (s/veh): 31.7 | | Intersection LOS: C | |
| Intersection Capacity Utilization 97.2% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2

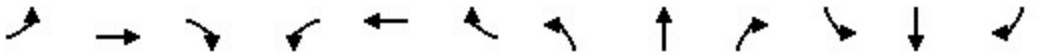




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 226 | 383 | 173 | 105 | 480 | 1224 | 18 | 862 |
| v/c Ratio | 0.68 | 0.79 | 0.68 | 0.48 | 0.82 | 0.61 | 0.08 | 0.67 |
| Control Delay (s/veh) | 49.4 | 18.1 | 50.4 | 23.4 | 61.4 | 18.0 | 12.6 | 33.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.4 | 18.1 | 50.4 | 23.4 | 61.4 | 18.0 | 12.6 | 33.4 |
| Queue Length 50th (m) | 46.2 | 1.8 | 34.1 | 5.0 | 55.5 | 74.2 | 1.3 | 81.6 |
| Queue Length 95th (m) | 71.2 | 33.7 | 55.0 | 21.7 | #86.7 | 157.7 | 5.2 | 133.1 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | 261.4 | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | 115.0 | | 115.0 | |
| Base Capacity (vph) | 339 | 590 | 275 | 366 | 680 | 2012 | 238 | 1290 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.67 | 0.65 | 0.63 | 0.29 | 0.71 | 0.61 | 0.08 | 0.67 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 226 | 0 | 383 | 173 | 22 | 83 | 480 | 1152 | 72 | 18 | 695 | 167 |
| Future Volume (vph) | 226 | 0 | 383 | 173 | 22 | 83 | 480 | 1152 | 72 | 18 | 695 | 167 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.88 | | 1.00 | 0.99 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | 1668 | 1438 | | 3203 | 3275 | | 1668 | 3125 | |
| Flt Permitted | 0.58 | 1.00 | | 0.32 | 1.00 | | 0.95 | 1.00 | | 0.23 | 1.00 | |
| Satd. Flow (perm) | 1020 | 1387 | | 566 | 1438 | | 3203 | 3275 | | 402 | 3125 | |
| 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) | 226 | 0 | 383 | 173 | 22 | 83 | 480 | 1152 | 72 | 18 | 695 | 167 |
| RTOR Reduction (vph) | 0 | 335 | 0 | 0 | 75 | 0 | 0 | 3 | 0 | 0 | 13 | 0 |
| Lane Group Flow (vph) | 226 | 48 | 0 | 173 | 30 | 0 | 480 | 1221 | 0 | 18 | 849 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 28.8 | 13.5 | | 26.6 | 12.4 | | 22.5 | 75.6 | | 54.7 | 52.9 | |
| Effective Green, g (s) | 28.8 | 13.5 | | 26.6 | 12.4 | | 22.5 | 75.6 | | 54.7 | 52.9 | |
| Actuated g/C Ratio | 0.23 | 0.11 | | 0.21 | 0.10 | | 0.18 | 0.60 | | 0.44 | 0.42 | |
| Clearance Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 312 | 149 | | 244 | 141 | | 573 | 1971 | | 193 | 1316 | |
| v/s Ratio Prot | c0.09 | 0.03 | | 0.08 | 0.02 | | c0.15 | c0.37 | | 0.00 | 0.27 | |
| v/s Ratio Perm | c0.08 | | | 0.07 | | | | | | 0.04 | | |
| v/c Ratio | 0.72 | 0.32 | | 0.71 | 0.21 | | 0.84 | 0.62 | | 0.09 | 0.64 | |
| Uniform Delay, d1 | 43.2 | 51.8 | | 43.8 | 52.1 | | 49.8 | 15.9 | | 20.2 | 28.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 8.1 | 1.3 | | 9.1 | 0.8 | | 10.3 | 1.5 | | 0.2 | 2.4 | |
| Delay (s) | 51.3 | 53.1 | | 52.9 | 52.9 | | 60.1 | 17.3 | | 20.4 | 31.3 | |
| Level of Service | D | D | | D | D | | E | B | | C | C | |
| Approach Delay (s/veh) | | 52.4 | | | 52.9 | | | 29.4 | | | 31.1 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 35.8 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.72 | | |
| Actuated Cycle Length (s) | 125.6 | Sum of lost time (s) | 22.5 |
| Intersection Capacity Utilization | 97.2% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

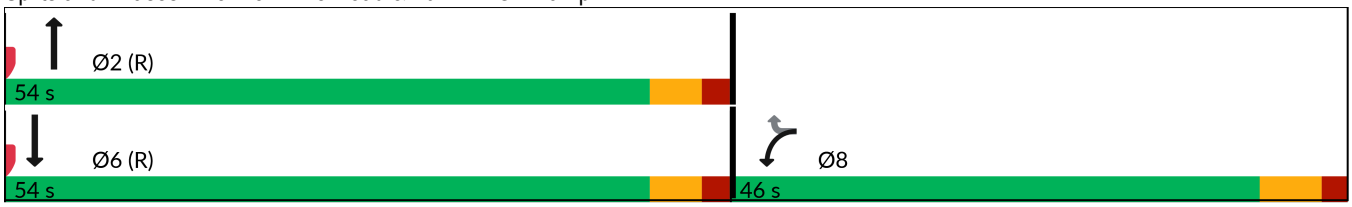
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 553 | 385 | 1431 | 0 | 0 | 901 |
| Future Volume (vph) | 553 | 385 | 1431 | 0 | 0 | 901 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 19 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 553 | 385 | 1431 | 0 | 0 | 901 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 553 | 385 | 1431 | 0 | 0 | 901 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Minimum Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (%) | 46.0% | 46.0% | 54.0% | | | 54.0% |
| Maximum Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 29.5 | 29.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| v/c Ratio | 0.48 | 0.66 | 0.85 | | | 0.54 |
| Control Delay (s/veh) | 24.2 | 29.9 | 29.1 | | | 19.7 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 24.2 | 29.9 | 29.1 | | | 19.7 |
| LOS | C | C | C | | | B |
| Approach Delay (s/veh) | 26.6 | | 29.1 | | | 19.7 |
| Approach LOS | C | | C | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 100 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.85 | | | |
| Intersection Signal Delay (s/veh): 25.8 | | Intersection LOS: C | |
| Intersection Capacity Utilization 75.9% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 553 | 385 | 1431 | 901 |
| v/c Ratio | 0.48 | 0.66 | 0.85 | 0.54 |
| Control Delay (s/veh) | 24.2 | 29.9 | 29.1 | 19.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 24.2 | 29.9 | 29.1 | 19.7 |
| Queue Length 50th (m) | 40.4 | 57.0 | 123.7 | 62.0 |
| Queue Length 95th (m) | 55.2 | 89.6 | 155.1 | 79.6 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1161 | 586 | 1680 | 1680 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.48 | 0.66 | 0.85 | 0.54 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 553 | 385 | 1431 | 0 | 0 | 901 |
| Future Volume (vph) | 553 | 385 | 1431 | 0 | 0 | 901 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 553 | 385 | 1431 | 0 | 0 | 901 |
| RTOR Reduction (vph) | 0 | 11 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 553 | 374 | 1431 | 0 | 0 | 901 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Effective Green, g (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Grp Cap (vph) | 1161 | 575 | 1680 | | | 1680 |
| v/s Ratio Prot | 0.19 | | c0.41 | | | 0.26 |
| v/s Ratio Perm | | c0.26 | | | | |
| v/c Ratio | 0.48 | 0.65 | 0.85 | | | 0.54 |
| Uniform Delay, d1 | 22.5 | 24.6 | 22.9 | | | 18.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.4 | 5.6 | 5.7 | | | 1.2 |
| Delay (s) | 23.9 | 30.2 | 28.5 | | | 19.4 |
| Level of Service | C | C | C | | | B |
| Approach Delay (s/veh) | 26.5 | | 28.5 | | | 19.4 |
| Approach LOS | C | | C | | | B |

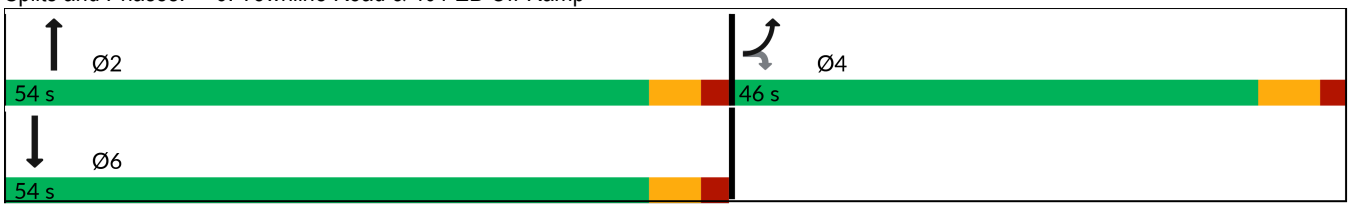
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 25.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.76 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 75.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

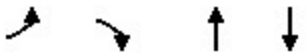
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 470 | 508 | 0 | 1223 | 1325 | 185 |
| Future Volume (vph) | 470 | 508 | 0 | 1223 | 1325 | 185 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.982 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1619 | 1442 | 0 | 3535 | 3358 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1619 | 1442 | 0 | 3535 | 3358 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 26 | | | 21 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Adj. Flow (vph) | 470 | 508 | 0 | 1223 | 1325 | 185 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 470 | 508 | 0 | 1223 | 1510 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (%) | 46.0% | 46.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 39.5 | 39.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 42.0 | |
| Flash Don't Walk (s) | 29.5 | 29.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 35.7 | 35.7 | | 48.2 | 48.2 | |
| Actuated g/C Ratio | 0.37 | 0.37 | | 0.50 | 0.50 | |
| v/c Ratio | 0.78 | 0.92 | | 0.69 | 0.89 | |
| Control Delay (s/veh) | 37.2 | 51.9 | | 21.8 | 30.9 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 37.2 | 51.9 | | 21.8 | 30.9 | |
| LOS | D | D | | C | C | |
| Approach Delay (s/veh) | 44.9 | | | 21.8 | 30.9 | |
| Approach LOS | D | | | C | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 96.4 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.92 | | | |
| Intersection Signal Delay (s/veh): 31.6 | | Intersection LOS: C | |
| Intersection Capacity Utilization 87.1% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 470 | 508 | 1223 | 1510 |
| v/c Ratio | 0.78 | 0.92 | 0.69 | 0.89 |
| Control Delay (s/veh) | 37.2 | 51.9 | 21.8 | 30.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.2 | 51.9 | 21.8 | 30.9 |
| Queue Length 50th (m) | 76.3 | 85.2 | 95.7 | 138.1 |
| Queue Length 95th (m) | 114.5 | #145.0 | 120.0 | #189.8 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 665 | 608 | 1766 | 1688 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.71 | 0.84 | 0.69 | 0.89 |

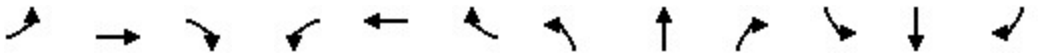
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 470 | 508 | 0 | 1223 | 1325 | 185 |
| Future Volume (vph) | 470 | 508 | 0 | 1223 | 1325 | 185 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1619 | 1442 | | 3535 | 3357 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1619 | 1442 | | 3535 | 3357 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 470 | 508 | 0 | 1223 | 1325 | 185 |
| RTOR Reduction (vph) | 0 | 16 | 0 | 0 | 11 | 0 |
| Lane Group Flow (vph) | 470 | 492 | 0 | 1223 | 1500 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 35.7 | 35.7 | | 48.2 | 48.2 | |
| Effective Green, g (s) | 35.7 | 35.7 | | 48.2 | 48.2 | |
| Actuated g/C Ratio | 0.37 | 0.37 | | 0.50 | 0.50 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 599 | 534 | | 1767 | 1678 | |
| v/s Ratio Prot | 0.29 | | | 0.35 | c0.45 | |
| v/s Ratio Perm | | c0.34 | | | | |
| v/c Ratio | 0.78 | 0.92 | | 0.69 | 0.89 | |
| Uniform Delay, d1 | 26.9 | 29.0 | | 18.4 | 21.8 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 6.7 | 21.3 | | 2.3 | 7.8 | |
| Delay (s) | 33.6 | 50.3 | | 20.7 | 29.5 | |
| Level of Service | C | D | | C | C | |
| Approach Delay (s/veh) | 42.3 | | | 20.7 | 29.5 | |
| Approach LOS | D | | | C | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 30.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 96.4 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 87.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

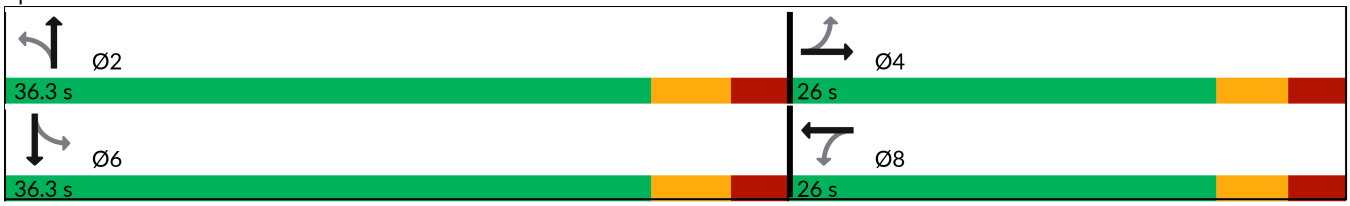


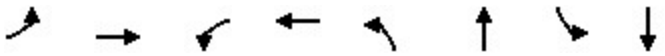
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 27 | 194 | 46 | 16 | 4 | 204 | 554 | 62 | 3 | 456 | 40 |
| Future Volume (vph) | 49 | 27 | 194 | 46 | 16 | 4 | 204 | 554 | 62 | 3 | 456 | 40 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.868 | | | 0.970 | | | 0.985 | | | 0.988 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1416 | 0 | 1668 | 1573 | 0 | 1651 | 1579 | 0 | 1668 | 1597 | 0 |
| Flt Permitted | 0.744 | | | 0.620 | | | 0.452 | | | 0.361 | | |
| Satd. Flow (perm) | 1293 | 1416 | 0 | 1088 | 1573 | 0 | 786 | 1579 | 0 | 634 | 1597 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 194 | | | 4 | | | 12 | | | 10 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Adj. Flow (vph) | 49 | 27 | 194 | 46 | 16 | 4 | 204 | 554 | 62 | 3 | 456 | 40 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 49 | 221 | 0 | 46 | 20 | 0 | 204 | 616 | 0 | 3 | 496 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (%) | 41.7% | 41.7% | | 41.7% | 41.7% | | 58.3% | 58.3% | | 58.3% | 58.3% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.7 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 2.6 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Max | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Flash Don't Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 9.3 | 9.3 | | 9.3 | 9.3 | | 30.5 | 30.5 | | 30.5 | 30.5 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.59 | 0.59 | | 0.59 | 0.59 | |
| v/c Ratio | 0.21 | 0.54 | | 0.24 | 0.07 | | 0.44 | 0.66 | | 0.01 | 0.53 | |
| Control Delay (s/veh) | 20.2 | 10.1 | | 21.2 | 16.1 | | 10.6 | 12.4 | | 5.7 | 9.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 20.2 | 10.1 | | 21.2 | 16.1 | | 10.6 | 12.4 | | 5.7 | 9.4 | |
| LOS | C | B | | C | B | | B | B | | A | A | |
| Approach Delay (s/veh) | | 11.9 | | | 19.6 | | | 11.9 | | | 9.4 | |
| Approach LOS | | B | | | B | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 62.3 | | | |
| Actuated Cycle Length: 52.1 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.66 | | | |
| Intersection Signal Delay (s/veh): 11.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 87.2% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 49 | 221 | 46 | 20 | 204 | 616 | 3 | 496 |
| v/c Ratio | 0.21 | 0.54 | 0.24 | 0.07 | 0.44 | 0.66 | 0.01 | 0.53 |
| Control Delay (s/veh) | 20.2 | 10.1 | 21.2 | 16.1 | 10.6 | 12.4 | 5.7 | 9.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 20.2 | 10.1 | 21.2 | 16.1 | 10.6 | 12.4 | 5.7 | 9.4 |
| Queue Length 50th (m) | 3.9 | 2.1 | 3.7 | 1.3 | 8.3 | 29.7 | 0.1 | 21.2 |
| Queue Length 95th (m) | 10.8 | 15.9 | 10.5 | 5.4 | 27.2 | 76.7 | 1.0 | 53.3 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 497 | 663 | 418 | 607 | 460 | 929 | 371 | 939 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.10 | 0.33 | 0.11 | 0.03 | 0.44 | 0.66 | 0.01 | 0.53 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 27 | 194 | 46 | 16 | 4 | 204 | 554 | 62 | 3 | 456 | 40 |
| Future Volume (vph) | 49 | 27 | 194 | 46 | 16 | 4 | 204 | 554 | 62 | 3 | 456 | 40 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1417 | | 1668 | 1573 | | 1651 | 1579 | | 1668 | 1597 | |
| Flt Permitted | 0.74 | 1.00 | | 0.62 | 1.00 | | 0.45 | 1.00 | | 0.36 | 1.00 | |
| Satd. Flow (perm) | 1294 | 1417 | | 1089 | 1573 | | 785 | 1579 | | 634 | 1597 | |
| 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) | 49 | 27 | 194 | 46 | 16 | 4 | 204 | 554 | 62 | 3 | 456 | 40 |
| RTOR Reduction (vph) | 0 | 159 | 0 | 0 | 3 | 0 | 0 | 5 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 49 | 62 | 0 | 46 | 17 | 0 | 204 | 611 | 0 | 3 | 492 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 9.3 | 9.3 | | 9.3 | 9.3 | | 30.5 | 30.5 | | 30.5 | 30.5 | |
| Effective Green, g (s) | 9.3 | 9.3 | | 9.3 | 9.3 | | 30.5 | 30.5 | | 30.5 | 30.5 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.59 | 0.59 | | 0.59 | 0.59 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 230 | 252 | | 194 | 280 | | 459 | 924 | | 371 | 934 | |
| v/s Ratio Prot | | c0.04 | | | 0.01 | | | c0.39 | | | 0.31 | |
| v/s Ratio Perm | 0.04 | | | 0.04 | | | 0.26 | | | 0.00 | | |
| v/c Ratio | 0.21 | 0.24 | | 0.24 | 0.06 | | 0.44 | 0.66 | | 0.01 | 0.53 | |
| Uniform Delay, d1 | 18.3 | 18.4 | | 18.4 | 17.8 | | 6.1 | 7.3 | | 4.5 | 6.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.5 | | 0.6 | 0.1 | | 3.1 | 3.7 | | 0.0 | 2.1 | |
| Delay (s) | 18.7 | 18.9 | | 19.0 | 17.9 | | 9.2 | 11.0 | | 4.5 | 8.6 | |
| Level of Service | B | B | | B | B | | A | B | | A | A | |
| Approach Delay (s/veh) | | 18.9 | | | 18.6 | | | 10.6 | | | 8.6 | |
| Approach LOS | | B | | | B | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 11.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.56 | | |
| Actuated Cycle Length (s) | 52.1 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 87.2% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

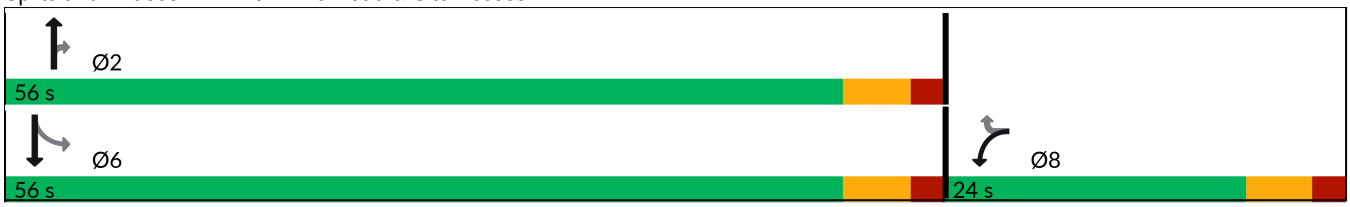
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 30 | 24 | 795 | 31 | 14 | 707 |
| Future Volume (vph) | 30 | 24 | 795 | 31 | 14 | 707 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.324 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 597 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 24 | | 31 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 24 | 795 | 31 | 14 | 707 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 30 | 24 | 795 | 31 | 14 | 707 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | 70.0% | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | Max | Max | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 7.0 | 7.0 | 65.6 | 65.6 | 65.6 | 65.6 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.85 | 0.85 | 0.85 | 0.85 |
| v/c Ratio | 0.20 | 0.16 | 0.54 | 0.02 | 0.03 | 0.45 |
| Control Delay (s/veh) | 36.0 | 15.9 | 5.3 | 1.2 | 2.9 | 4.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Total Delay (s/veh) | 36.0 | 15.9 | 5.3 | 1.2 | 2.9 | 4.4 |
| LOS | D | B | A | A | A | A |
| Approach Delay (s/veh) | 27.1 | | 5.1 | | | 4.4 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 77 | | | |
| Natural Cycle: 60 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.54 | | | |
| Intersection Signal Delay (s/veh): 5.5 | | Intersection LOS: A | |
| Intersection Capacity Utilization 59.0% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

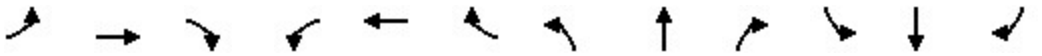


| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 30 | 24 | 795 | 31 | 14 | 707 |
| v/c Ratio | 0.20 | 0.16 | 0.54 | 0.02 | 0.03 | 0.45 |
| Control Delay (s/veh) | 36.0 | 15.9 | 5.3 | 1.2 | 2.9 | 4.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Total Delay (s/veh) | 36.0 | 15.9 | 5.3 | 1.2 | 2.9 | 4.4 |
| Queue Length 50th (m) | 4.6 | 0.0 | 40.4 | 0.0 | 0.4 | 31.3 |
| Queue Length 95th (m) | 11.2 | 6.3 | 76.1 | 1.8 | 1.8 | 56.7 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 382 | 360 | 1466 | 1250 | 508 | 1569 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 267 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.08 | 0.07 | 0.54 | 0.02 | 0.03 | 0.54 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 30 | 24 | 795 | 31 | 14 | 707 |
| Future Volume (vph) | 30 | 24 | 795 | 31 | 14 | 707 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.32 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 597 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 24 | 795 | 31 | 14 | 707 |
| RTOR Reduction (vph) | 0 | 23 | 0 | 6 | 0 | 0 |
| Lane Group Flow (vph) | 30 | 1 | 795 | 25 | 14 | 707 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 4.5 | 4.5 | 62.9 | 62.9 | 62.9 | 62.9 |
| Effective Green, g (s) | 4.5 | 4.5 | 62.9 | 62.9 | 62.9 | 62.9 |
| Actuated g/C Ratio | 0.06 | 0.06 | 0.79 | 0.79 | 0.79 | 0.79 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 92 | 82 | 1363 | 1158 | 472 | 1459 |
| v/s Ratio Prot | c0.02 | | c0.46 | | | 0.38 |
| v/s Ratio Perm | | 0.00 | | 0.02 | 0.02 | |
| v/c Ratio | 0.33 | 0.02 | 0.58 | 0.02 | 0.03 | 0.48 |
| Uniform Delay, d1 | 36.0 | 35.4 | 3.2 | 1.7 | 1.8 | 2.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.1 | 0.1 | 1.8 | 0.0 | 0.1 | 1.2 |
| Delay (s) | 38.1 | 35.4 | 5.0 | 1.8 | 1.9 | 3.9 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 36.9 | | 4.9 | | | 3.9 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 5.5 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.57 | | |
| Actuated Cycle Length (s) | 79.4 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 59.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

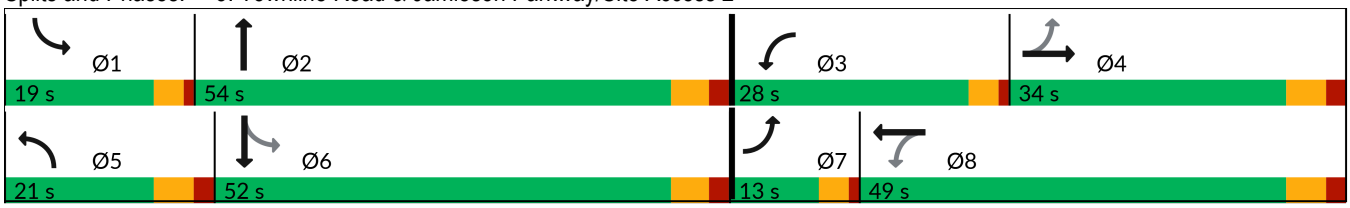


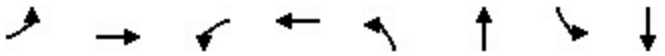
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 153 | 0 | 244 | 61 | 8 | 29 | 244 | 638 | 41 | 10 | 605 | 123 |
| Future Volume (vph) | 153 | 0 | 244 | 61 | 8 | 29 | 244 | 638 | 41 | 10 | 605 | 123 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.882 | | | 0.991 | | | 0.975 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 1668 | 1439 | 0 | 3203 | 3244 | 0 | 1668 | 3214 | 0 |
| Flt Permitted | 0.488 | | | 0.952 | | | 0.950 | | | 0.393 | | |
| Satd. Flow (perm) | 857 | 1387 | 0 | 1671 | 1439 | 0 | 3203 | 3244 | 0 | 690 | 3214 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 486 | | | 29 | | | 5 | | | 19 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Adj. Flow (vph) | 153 | 0 | 244 | 61 | 8 | 29 | 244 | 638 | 41 | 10 | 605 | 123 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 153 | 244 | 0 | 61 | 37 | 0 | 244 | 679 | 0 | 10 | 728 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 9.0 | 31.0 | | 9.0 | 31.0 | | 11.0 | 50.4 | | 9.0 | 41.0 | |
| Total Split (s) | 13.0 | 34.0 | | 28.0 | 49.0 | | 21.0 | 54.0 | | 19.0 | 52.0 | |
| Total Split (%) | 9.6% | 25.2% | | 20.7% | 36.3% | | 15.6% | 40.0% | | 14.1% | 38.5% | |
| Maximum Green (s) | 9.0 | 28.0 | | 24.0 | 43.0 | | 15.0 | 48.0 | | 15.0 | 46.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | | 18.0 | | | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 16.1 | 6.5 | | 13.7 | 6.5 | | 12.2 | 62.6 | | 54.0 | 46.3 | |
| Actuated g/C Ratio | 0.17 | 0.07 | | 0.15 | 0.07 | | 0.13 | 0.67 | | 0.58 | 0.50 | |
| v/c Ratio | 0.63 | 0.44 | | 0.25 | 0.29 | | 0.58 | 0.31 | | 0.02 | 0.45 | |
| Control Delay (s/veh) | 46.2 | 2.6 | | 34.6 | 25.7 | | 45.0 | 7.9 | | 6.0 | 17.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 46.2 | 2.6 | | 34.6 | 25.7 | | 45.0 | 7.9 | | 6.0 | 17.1 | |
| LOS | D | A | | C | C | | D | A | | A | B | |
| Approach Delay (s/veh) | | 19.4 | | | 31.2 | | | 17.7 | | | 16.9 | |
| Approach LOS | | B | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 135 | | | |
| Actuated Cycle Length: 93.2 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.63 | | | |
| Intersection Signal Delay (s/veh): 18.4 | | Intersection LOS: B | |
| Intersection Capacity Utilization 69.4% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2

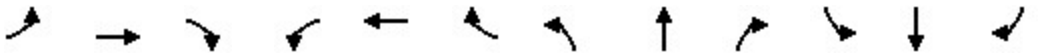




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 153 | 244 | 61 | 37 | 244 | 679 | 10 | 728 |
| v/c Ratio | 0.63 | 0.44 | 0.25 | 0.29 | 0.58 | 0.31 | 0.02 | 0.45 |
| Control Delay (s/veh) | 46.2 | 2.6 | 34.6 | 25.7 | 45.0 | 7.9 | 6.0 | 17.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 46.2 | 2.6 | 34.6 | 25.7 | 45.0 | 7.9 | 6.0 | 17.1 |
| Queue Length 50th (m) | 24.4 | 0.0 | 9.2 | 1.4 | 22.1 | 23.6 | 0.5 | 44.2 |
| Queue Length 95th (m) | #49.3 | 0.0 | 20.1 | 11.0 | 35.0 | 47.5 | 2.1 | 65.5 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | 261.4 | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | 115.0 | | 115.0 | |
| Base Capacity (vph) | 244 | 758 | 432 | 683 | 518 | 2181 | 627 | 1606 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.63 | 0.32 | 0.14 | 0.05 | 0.47 | 0.31 | 0.02 | 0.45 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 153 | 0 | 244 | 61 | 8 | 29 | 244 | 638 | 41 | 10 | 605 | 123 |
| Future Volume (vph) | 153 | 0 | 244 | 61 | 8 | 29 | 244 | 638 | 41 | 10 | 605 | 123 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.88 | | 1.00 | 0.99 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | 1668 | 1440 | | 3203 | 3244 | | 1668 | 3213 | |
| Flt Permitted | 0.49 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.39 | 1.00 | |
| Satd. Flow (perm) | 856 | 1387 | | 1672 | 1440 | | 3203 | 3244 | | 691 | 3213 | |
| 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) | 153 | 0 | 244 | 61 | 8 | 29 | 244 | 638 | 41 | 10 | 605 | 123 |
| RTOR Reduction (vph) | 0 | 224 | 0 | 0 | 28 | 0 | 0 | 2 | 0 | 0 | 9 | 0 |
| Lane Group Flow (vph) | 153 | 20 | 0 | 61 | 9 | 0 | 244 | 677 | 0 | 10 | 719 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 19.3 | 8.3 | | 11.2 | 4.2 | | 12.2 | 62.7 | | 50.7 | 49.6 | |
| Effective Green, g (s) | 19.3 | 8.3 | | 11.2 | 4.2 | | 12.2 | 62.7 | | 50.7 | 49.6 | |
| Actuated g/C Ratio | 0.19 | 0.08 | | 0.11 | 0.04 | | 0.12 | 0.63 | | 0.51 | 0.50 | |
| Clearance Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 257 | 116 | | 188 | 61 | | 394 | 2052 | | 364 | 1608 | |
| v/s Ratio Prot | c0.07 | 0.01 | | 0.02 | 0.01 | | c0.08 | 0.21 | | 0.00 | c0.22 | |
| v/s Ratio Perm | c0.05 | | | 0.01 | | | | | | 0.01 | | |
| v/c Ratio | 0.60 | 0.18 | | 0.32 | 0.15 | | 0.62 | 0.33 | | 0.03 | 0.45 | |
| Uniform Delay, d1 | 35.5 | 42.2 | | 40.5 | 45.7 | | 41.2 | 8.4 | | 11.9 | 15.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.7 | 0.7 | | 1.0 | 1.2 | | 2.9 | 0.4 | | 0.0 | 0.9 | |
| Delay (s) | 39.1 | 42.9 | | 41.5 | 46.9 | | 44.1 | 8.9 | | 11.9 | 16.8 | |
| Level of Service | D | D | | D | D | | D | A | | B | B | |
| Approach Delay (s/veh) | | 41.5 | | | 43.5 | | | 18.2 | | | 16.8 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 23.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.53 | | |
| Actuated Cycle Length (s) | 99.1 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 69.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

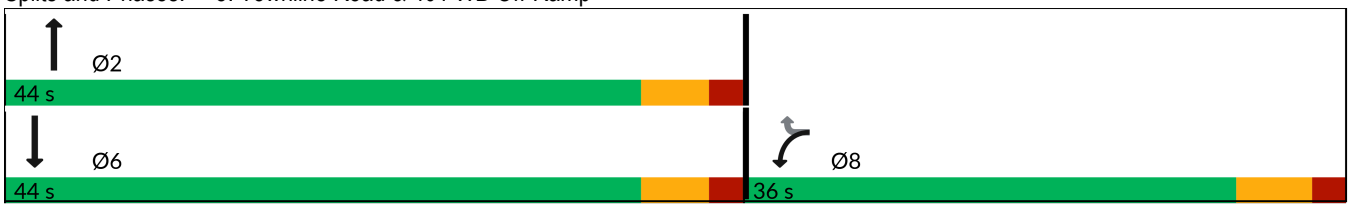
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 417 | 185 | 737 | 0 | 0 | 641 |
| Future Volume (vph) | 417 | 185 | 737 | 0 | 0 | 641 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 141 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 417 | 185 | 737 | 0 | 0 | 641 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 417 | 185 | 737 | 0 | 0 | 641 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (%) | 45.0% | 45.0% | 55.0% | | | 55.0% |
| Maximum Green (s) | 29.5 | 29.5 | 38.0 | | | 38.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 33.0 | | | 33.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 14.0 | 14.0 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.59 | | | 0.59 |
| v/c Ratio | 0.63 | 0.44 | 0.35 | | | 0.31 |
| Control Delay (s/veh) | 27.3 | 10.3 | 7.9 | | | 7.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 27.3 | 10.3 | 7.9 | | | 7.6 |
| LOS | C | B | A | | | A |
| Approach Delay (s/veh) | 22.1 | | 7.9 | | | 7.6 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 64.6 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.63 | | | |
| Intersection Signal Delay (s/veh): 12.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 43.5% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 417 | 185 | 737 | 641 |
| v/c Ratio | 0.63 | 0.44 | 0.35 | 0.31 |
| Control Delay (s/veh) | 27.3 | 10.3 | 7.9 | 7.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.3 | 10.3 | 7.9 | 7.6 |
| Queue Length 50th (m) | 23.4 | 4.3 | 20.9 | 17.6 |
| Queue Length 95th (m) | 35.6 | 18.1 | 37.1 | 31.7 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1410 | 743 | 2085 | 2064 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.30 | 0.25 | 0.35 | 0.31 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 417 | 185 | 737 | 0 | 0 | 641 |
| Future Volume (vph) | 417 | 185 | 737 | 0 | 0 | 641 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 417 | 185 | 737 | 0 | 0 | 641 |
| RTOR Reduction (vph) | 0 | 111 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 417 | 74 | 737 | 0 | 0 | 641 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 13.9 | 13.9 | 38.1 | | | 38.1 |
| Effective Green, g (s) | 13.9 | 13.9 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.59 | | | 0.59 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 663 | 313 | 2088 | | | 2067 |
| v/s Ratio Prot | c0.14 | | c0.21 | | | 0.18 |
| v/s Ratio Perm | | 0.05 | | | | |
| v/c Ratio | 0.63 | 0.24 | 0.35 | | | 0.31 |
| Uniform Delay, d1 | 23.0 | 20.9 | 6.8 | | | 6.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.9 | 0.4 | 0.5 | | | 0.4 |
| Delay (s) | 24.8 | 21.3 | 7.3 | | | 7.0 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 23.8 | | 7.3 | | | 7.0 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 12.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.43 | | |
| Actuated Cycle Length (s) | 64.5 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 43.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

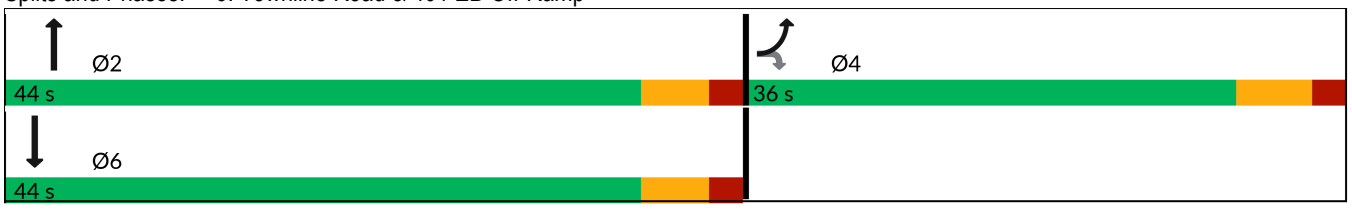
c Critical Lane Group

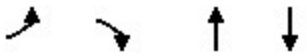
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 350 | 465 | 0 | 582 | 916 | 150 |
| Future Volume (vph) | 350 | 465 | 0 | 582 | 916 | 150 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.979 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1456 | 0 | 3500 | 3436 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1635 | 1456 | 0 | 3500 | 3436 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 84 | | | 31 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Adj. Flow (vph) | 350 | 465 | 0 | 582 | 916 | 150 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 350 | 465 | 0 | 582 | 1066 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (%) | 45.0% | 45.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 32.0 | 32.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 24.5 | 24.5 | | 38.2 | 38.2 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.51 | 0.51 | |
| v/c Ratio | 0.66 | 0.88 | | 0.33 | 0.61 | |
| Control Delay (s/veh) | 28.0 | 38.5 | | 12.5 | 15.5 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 28.0 | 38.5 | | 12.5 | 15.5 | |
| LOS | C | D | | B | B | |
| Approach Delay (s/veh) | 34.0 | | | 12.5 | 15.5 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 75.3 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay (s/veh): 20.9 | | Intersection LOS: C | |
| Intersection Capacity Utilization 71.8% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 350 | 465 | 582 | 1066 |
| v/c Ratio | 0.66 | 0.88 | 0.33 | 0.61 |
| Control Delay (s/veh) | 28.0 | 38.5 | 12.5 | 15.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 28.0 | 38.5 | 12.5 | 15.5 |
| Queue Length 50th (m) | 41.9 | 51.1 | 26.7 | 57.4 |
| Queue Length 95th (m) | 67.7 | #99.9 | 39.0 | 79.7 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 644 | 624 | 1776 | 1759 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.54 | 0.75 | 0.33 | 0.61 |

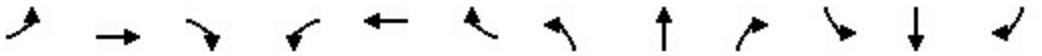
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 350 | 465 | 0 | 582 | 916 | 150 |
| Future Volume (vph) | 350 | 465 | 0 | 582 | 916 | 150 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1456 | | 3500 | 3435 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1635 | 1456 | | 3500 | 3435 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 350 | 465 | 0 | 582 | 916 | 150 |
| RTOR Reduction (vph) | 0 | 57 | 0 | 0 | 15 | 0 |
| Lane Group Flow (vph) | 350 | 408 | 0 | 582 | 1051 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 24.5 | 24.5 | | 38.2 | 38.2 | |
| Effective Green, g (s) | 24.5 | 24.5 | | 38.2 | 38.2 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.51 | 0.51 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 532 | 474 | | 1777 | 1744 | |
| v/s Ratio Prot | 0.21 | | | 0.17 | c0.31 | |
| v/s Ratio Perm | | c0.28 | | | | |
| v/c Ratio | 0.66 | 0.86 | | 0.33 | 0.60 | |
| Uniform Delay, d1 | 21.8 | 23.8 | | 10.9 | 13.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.9 | 14.8 | | 0.5 | 1.6 | |
| Delay (s) | 24.7 | 38.6 | | 11.4 | 14.7 | |
| Level of Service | C | D | | B | B | |
| Approach Delay (s/veh) | 32.6 | | | 11.4 | 14.7 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 19.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.70 | | |
| Actuated Cycle Length (s) | 75.2 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 71.8% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

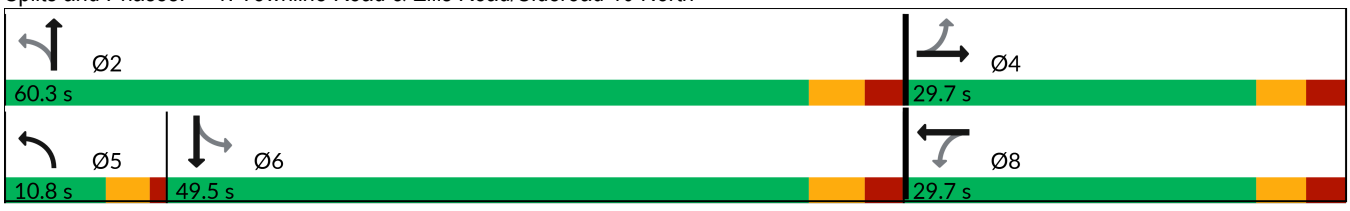


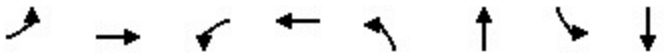
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| Future Volume (vph) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.866 | | | 0.962 | | | 0.985 | | | 0.994 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1388 | 0 | 1668 | 1570 | 0 | 1603 | 1544 | 0 | 1334 | 1577 | 0 |
| Flt Permitted | 0.747 | | | 0.323 | | | 0.118 | | | 0.349 | | |
| Satd. Flow (perm) | 1298 | 1388 | 0 | 567 | 1570 | 0 | 199 | 1544 | 0 | 490 | 1577 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 242 | | | 4 | | | 11 | | | 3 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Adj. Flow (vph) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 90 | 298 | 0 | 63 | 16 | 0 | 146 | 789 | 0 | 4 | 871 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 9.0 | 49.5 | | 49.5 | 49.5 | |
| Total Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 10.8 | 60.3 | | 49.5 | 49.5 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 12.0% | 67.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 23.7 | 23.7 | | 23.7 | 23.7 | | 6.8 | 54.0 | | 43.2 | 43.2 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 35.2 | | 35.2 | 35.2 | |
| Flash Don't Walk (s) | 13.7 | 13.7 | | 13.7 | 13.7 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 12.4 | 12.4 | | 12.4 | 12.4 | | 56.5 | 54.2 | | 43.4 | 43.4 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.72 | 0.69 | | 0.55 | 0.55 | |
| v/c Ratio | 0.44 | 0.71 | | 0.71 | 0.06 | | 0.56 | 0.74 | | 0.01 | 1.00 | |
| Control Delay (s/veh) | 36.4 | 17.2 | | 70.3 | 23.6 | | 15.2 | 15.0 | | 10.5 | 52.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.3 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 36.4 | 17.2 | | 70.3 | 23.6 | | 15.2 | 15.3 | | 10.5 | 52.7 | |
| LOS | D | B | | E | C | | B | B | | B | D | |
| Approach Delay (s/veh) | | 21.6 | | | 60.9 | | | 15.3 | | | 52.5 | |
| Approach LOS | | C | | | E | | | B | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 79 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.00 | | | |
| Intersection Signal Delay (s/veh): 32.3 | | Intersection LOS: C | |
| Intersection Capacity Utilization 105.4% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North



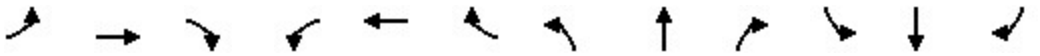


| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 90 | 298 | 63 | 16 | 146 | 789 | 4 | 871 |
| v/c Ratio | 0.44 | 0.71 | 0.71 | 0.06 | 0.56 | 0.74 | 0.01 | 1.00 |
| Control Delay (s/veh) | 36.4 | 17.2 | 70.3 | 23.6 | 15.2 | 15.0 | 10.5 | 52.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.4 | 17.2 | 70.3 | 23.6 | 15.2 | 15.3 | 10.5 | 52.7 |
| Queue Length 50th (m) | 12.3 | 7.4 | 9.0 | 1.5 | 5.5 | 62.0 | 0.3 | ~120.8 |
| Queue Length 95th (m) | 25.1 | 30.9 | 21.9 | 6.3 | #24.0 | #156.1 | 1.9 | #237.5 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 390 | 587 | 170 | 475 | 263 | 1063 | 269 | 868 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 42 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.23 | 0.51 | 0.37 | 0.03 | 0.56 | 0.77 | 0.01 | 1.00 |

Intersection Summary

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

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| Future Volume (vph) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1388 | | 1668 | 1570 | | 1603 | 1544 | | 1334 | 1576 | |
| Flt Permitted | 0.75 | 1.00 | | 0.32 | 1.00 | | 0.12 | 1.00 | | 0.35 | 1.00 | |
| Satd. Flow (perm) | 1298 | 1388 | | 566 | 1570 | | 199 | 1544 | | 490 | 1576 | |
| 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) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| RTOR Reduction (vph) | 0 | 204 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 90 | 94 | 0 | 63 | 13 | 0 | 146 | 786 | 0 | 4 | 870 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 12.4 | 12.4 | | 12.4 | 12.4 | | 54.2 | 54.2 | | 43.4 | 43.4 | |
| Effective Green, g (s) | 12.4 | 12.4 | | 12.4 | 12.4 | | 54.2 | 54.2 | | 43.4 | 43.4 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.69 | 0.69 | | 0.55 | 0.55 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 203 | 218 | | 88 | 246 | | 257 | 1060 | | 269 | 866 | |
| v/s Ratio Prot | | 0.07 | | | 0.01 | | 0.05 | c0.51 | | | c0.55 | |
| v/s Ratio Perm | 0.07 | | | c0.11 | | | 0.34 | | | 0.01 | | |
| v/c Ratio | 0.44 | 0.43 | | 0.72 | 0.05 | | 0.57 | 0.74 | | 0.01 | 1.00 | |
| Uniform Delay, d1 | 30.1 | 30.1 | | 31.6 | 28.3 | | 12.4 | 7.9 | | 8.1 | 17.8 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.5 | 1.4 | | 24.0 | 0.1 | | 2.9 | 4.7 | | 0.1 | 31.6 | |
| Delay (s) | 31.7 | 31.4 | | 55.6 | 28.3 | | 15.3 | 12.5 | | 8.2 | 49.4 | |
| Level of Service | C | C | | E | C | | B | B | | A | D | |
| Approach Delay (s/veh) | | 31.5 | | | 50.1 | | | 13.0 | | | 49.2 | |
| Approach LOS | | C | | | D | | | B | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 31.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.93 | | |
| Actuated Cycle Length (s) | 78.9 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 105.4% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |

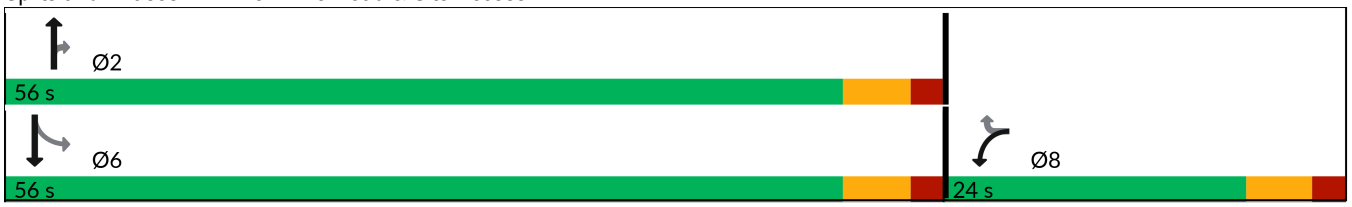
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| Future Volume (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.281 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 518 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 23 | | 112 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 29.0 | 29.0 | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | 70.0% | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | Max | Max | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 6.9 | 6.9 | 66.0 | 66.0 | 66.0 | 66.0 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.85 | 0.85 | 0.85 | 0.85 |
| v/c Ratio | 0.18 | 0.15 | 0.61 | 0.09 | 0.13 | 0.71 |
| Control Delay (s/veh) | 36.0 | 16.2 | 6.2 | 0.8 | 3.4 | 8.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Total Delay (s/veh) | 36.0 | 16.2 | 6.2 | 0.8 | 3.4 | 9.0 |
| LOS | D | B | A | A | A | A |
| Approach Delay (s/veh) | 26.7 | | 5.6 | | | 8.8 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 77.2 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.71 | | | |
| Intersection Signal Delay (s/veh): 7.7 | | Intersection LOS: A | |
| Intersection Capacity Utilization 72.6% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| v/c Ratio | 0.18 | 0.15 | 0.61 | 0.09 | 0.13 | 0.71 |
| Control Delay (s/veh) | 36.0 | 16.2 | 6.2 | 0.8 | 3.4 | 8.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Total Delay (s/veh) | 36.0 | 16.2 | 6.2 | 0.8 | 3.4 | 9.0 |
| Queue Length 50th (m) | 4.0 | 0.0 | 49.6 | 0.0 | 1.8 | 75.1 |
| Queue Length 95th (m) | 10.3 | 6.1 | 95.9 | 3.2 | 5.4 | 152.0 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 381 | 358 | 1470 | 1266 | 442 | 1573 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 167 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.07 | 0.06 | 0.61 | 0.09 | 0.13 | 0.79 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| Future Volume (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.28 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 517 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| RTOR Reduction (vph) | 0 | 22 | 0 | 23 | 0 | 0 |
| Lane Group Flow (vph) | 26 | 1 | 891 | 89 | 58 | 1110 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 4.4 | 4.4 | 63.4 | 63.4 | 63.4 | 63.4 |
| Effective Green, g (s) | 4.4 | 4.4 | 63.4 | 63.4 | 63.4 | 63.4 |
| Actuated g/C Ratio | 0.06 | 0.06 | 0.79 | 0.79 | 0.79 | 0.79 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 89 | 80 | 1367 | 1162 | 410 | 1463 |
| v/s Ratio Prot | c0.02 | | 0.52 | | | c0.60 |
| v/s Ratio Perm | | 0.00 | | 0.06 | 0.11 | |
| v/c Ratio | 0.29 | 0.02 | 0.65 | 0.08 | 0.14 | 0.76 |
| Uniform Delay, d1 | 36.2 | 35.7 | 3.5 | 1.8 | 1.9 | 4.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.8 | 0.1 | 2.4 | 0.1 | 0.7 | 3.7 |
| Delay (s) | 38.0 | 35.7 | 5.9 | 1.9 | 2.6 | 8.0 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 37.0 | | 5.5 | | | 7.7 |
| Approach LOS | D | | A | | | A |

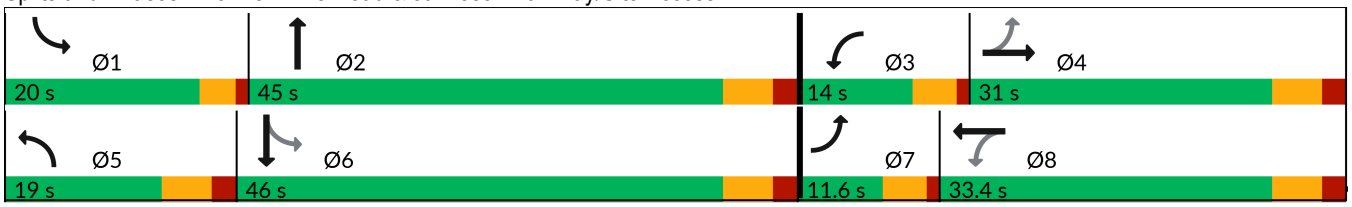
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 7.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 79.8 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 72.6% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

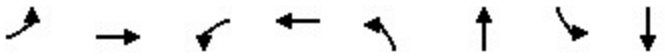
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 147 | 0 | 313 | 53 | 7 | 23 | 373 | 802 | 228 | 55 | 901 | 198 |
| Future Volume (vph) | 147 | 0 | 313 | 53 | 7 | 23 | 373 | 802 | 228 | 55 | 901 | 198 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Ped Bike Factor | | | | | | | 1.00 | | | | 1.00 | |
| Frt | | 0.850 | | | 0.885 | | | 0.967 | | | 0.973 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1635 | 1347 | 0 | 1668 | 1444 | 0 | 3203 | 3200 | 0 | 1668 | 3168 | 0 |
| Flt Permitted | 0.455 | | | 0.606 | | | 0.950 | | | 0.260 | | |
| Satd. Flow (perm) | 783 | 1347 | 0 | 1064 | 1444 | 0 | 3202 | 3200 | 0 | 456 | 3168 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 366 | | | 23 | | | 37 | | | 27 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 157.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 9.4 | | | 20.1 | |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| 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% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Adj. Flow (vph) | 147 | 0 | 313 | 53 | 7 | 23 | 373 | 802 | 228 | 55 | 901 | 198 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 147 | 313 | 0 | 53 | 30 | 0 | 373 | 1030 | 0 | 55 | 1099 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | | 5.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 9.5 | 31.0 | | 9.5 | 31.0 | | 11.0 | 41.0 | | 9.0 | 41.0 | |
| Total Split (s) | 11.6 | 31.0 | | 14.0 | 33.4 | | 19.0 | 45.0 | | 20.0 | 46.0 | |
| Total Split (%) | 10.5% | 28.2% | | 12.7% | 30.4% | | 17.3% | 40.9% | | 18.2% | 41.8% | |
| Maximum Green (s) | 7.1 | 25.0 | | 9.5 | 27.4 | | 13.0 | 39.0 | | 16.0 | 40.0 | |
| Yellow Time (s) | 3.5 | 4.0 | | 3.5 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | | 18.0 | | | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 17.1 | 9.2 | | 15.2 | 10.1 | | 13.1 | 50.9 | | 48.8 | 40.2 | |
| Actuated g/C Ratio | 0.19 | 0.10 | | 0.17 | 0.11 | | 0.14 | 0.56 | | 0.54 | 0.44 | |
| v/c Ratio | 0.60 | 0.67 | | 0.23 | 0.17 | | 0.81 | 0.57 | | 0.16 | 0.77 | |
| Control Delay (s/veh) | 41.2 | 9.8 | | 30.5 | 20.2 | | 53.6 | 15.9 | | 8.3 | 26.5 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 41.2 | 9.8 | | 30.5 | 20.2 | | 53.6 | 15.9 | | 8.3 | 26.5 | |
| LOS | D | A | | C | C | | D | B | | A | C | |
| Approach Delay (s/veh) | | 19.8 | | | 26.8 | | | 25.9 | | | 25.7 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 110 | | | |
| Actuated Cycle Length: 90.5 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.81 | | | |
| Intersection Signal Delay (s/veh): 24.9 | | Intersection LOS: C | |
| Intersection Capacity Utilization 90.1% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2

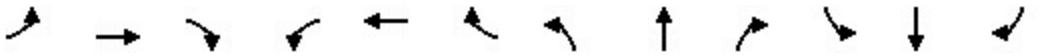




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 147 | 313 | 53 | 30 | 373 | 1030 | 55 | 1099 |
| v/c Ratio | 0.60 | 0.67 | 0.23 | 0.17 | 0.81 | 0.57 | 0.16 | 0.77 |
| Control Delay (s/veh) | 41.2 | 9.8 | 30.5 | 20.2 | 53.6 | 15.9 | 8.3 | 26.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 41.2 | 9.8 | 30.5 | 20.2 | 53.6 | 15.9 | 8.3 | 26.5 |
| Queue Length 50th (m) | 21.6 | 0.0 | 7.3 | 1.1 | 33.1 | 59.4 | 2.9 | 82.1 |
| Queue Length 95th (m) | 37.7 | 12.9 | 16.3 | 8.9 | #62.0 | 97.5 | 8.5 | 125.2 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | 133.4 | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | 115.0 | | 115.0 | |
| Base Capacity (vph) | 246 | 638 | 264 | 455 | 462 | 1815 | 509 | 1423 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.60 | 0.49 | 0.20 | 0.07 | 0.81 | 0.57 | 0.11 | 0.77 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 147 | 0 | 313 | 53 | 7 | 23 | 373 | 802 | 228 | 55 | 901 | 198 |
| Future Volume (vph) | 147 | 0 | 313 | 53 | 7 | 23 | 373 | 802 | 228 | 55 | 901 | 198 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 0.95 | | 1.00 | 0.95 | |
| Frpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.89 | | 1.00 | 0.97 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1347 | | 1668 | 1444 | | 3203 | 3199 | | 1668 | 3168 | |
| Flt Permitted | 0.45 | 1.00 | | 0.61 | 1.00 | | 0.95 | 1.00 | | 0.26 | 1.00 | |
| Satd. Flow (perm) | 783 | 1347 | | 1064 | 1444 | | 3203 | 3199 | | 456 | 3168 | |
| 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) | 147 | 0 | 313 | 53 | 7 | 23 | 373 | 802 | 228 | 55 | 901 | 198 |
| RTOR Reduction (vph) | 0 | 277 | 0 | 0 | 21 | 0 | 0 | 17 | 0 | 0 | 15 | 0 |
| Lane Group Flow (vph) | 147 | 36 | 0 | 53 | 9 | 0 | 373 | 1013 | 0 | 55 | 1084 | 0 |
| Confl. Peds. (#/hr) | | | | | | | 1 | | | | | 1 |
| Heavy Vehicles (%) | 2% | 0% | 3% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 2% | 3% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 21.2 | 10.7 | | 13.0 | 6.6 | | 13.1 | 50.9 | | 46.4 | 41.1 | |
| Effective Green, g (s) | 21.2 | 10.7 | | 13.0 | 6.6 | | 13.1 | 50.9 | | 46.4 | 41.1 | |
| Actuated g/C Ratio | 0.23 | 0.11 | | 0.14 | 0.07 | | 0.14 | 0.54 | | 0.49 | 0.44 | |
| Clearance Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 272 | 153 | | 188 | 101 | | 447 | 1735 | | 294 | 1388 | |
| v/s Ratio Prot | c0.06 | 0.03 | | 0.02 | 0.01 | | c0.12 | 0.32 | | 0.01 | c0.34 | |
| v/s Ratio Perm | c0.06 | | | 0.02 | | | | | | 0.08 | | |
| v/c Ratio | 0.54 | 0.23 | | 0.28 | 0.09 | | 0.83 | 0.58 | | 0.19 | 0.78 | |
| Uniform Delay, d1 | 31.0 | 37.8 | | 36.0 | 40.8 | | 39.3 | 14.4 | | 12.4 | 22.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.2 | 0.8 | | 0.8 | 0.4 | | 12.6 | 1.4 | | 0.3 | 4.4 | |
| Delay (s) | 33.2 | 38.6 | | 36.8 | 41.1 | | 51.9 | 15.8 | | 12.7 | 26.9 | |
| Level of Service | C | D | | D | D | | D | B | | B | C | |
| Approach Delay (s/veh) | | 36.9 | | | 38.4 | | | 25.4 | | | 26.3 | |
| Approach LOS | | D | | | D | | | C | | | C | |

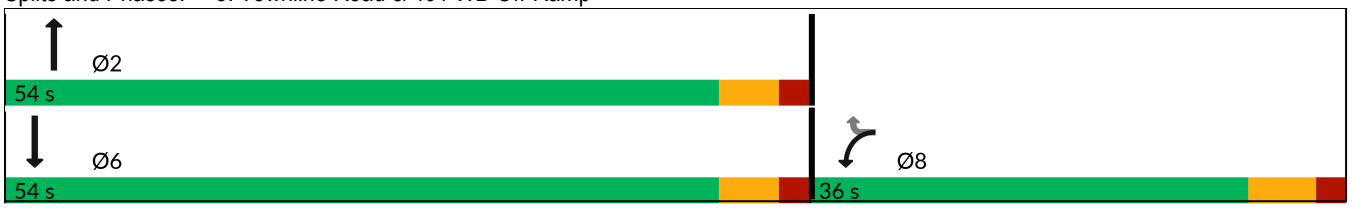
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 27.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.76 | | |
| Actuated Cycle Length (s) | 93.8 | Sum of lost time (s) | 22.5 |
| Intersection Capacity Utilization | 90.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 591 | 220 | 1201 | 0 | 0 | 891 |
| Future Volume (vph) | 591 | 220 | 1201 | 0 | 0 | 891 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 53 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 128.0 |
| Travel Time (s) | 8.5 | | 24.7 | | | 7.7 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 591 | 220 | 1201 | 0 | 0 | 891 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 591 | 220 | 1201 | 0 | 0 | 891 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 0.0 | | | 0.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (s) | 36.0 | 36.0 | 54.0 | | | 54.0 |
| Total Split (%) | 40.0% | 40.0% | 60.0% | | | 60.0% |
| Maximum Green (s) | 29.5 | 29.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 22.3 | 22.3 | 48.1 | | | 48.1 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.58 | | | 0.58 |
| v/c Ratio | 0.77 | 0.54 | 0.59 | | | 0.44 |
| Control Delay (s/veh) | 35.1 | 24.3 | 13.5 | | | 11.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 35.1 | 24.3 | 13.5 | | | 11.4 |
| LOS | D | C | B | | | B |
| Approach Delay (s/veh) | 32.2 | | 13.5 | | | 11.4 |
| Approach LOS | C | | B | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 83 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.77 | | | |
| Intersection Signal Delay (s/veh): 18.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 61.7% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 591 | 220 | 1201 | 891 |
| v/c Ratio | 0.77 | 0.54 | 0.59 | 0.44 |
| Control Delay (s/veh) | 35.1 | 24.3 | 13.5 | 11.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.1 | 24.3 | 13.5 | 11.4 |
| Queue Length 50th (m) | 44.1 | 22.1 | 59.5 | 38.9 |
| Queue Length 95th (m) | 61.3 | 42.4 | 94.1 | 62.6 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 104.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1020 | 524 | 2030 | 2030 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.58 | 0.42 | 0.59 | 0.44 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 591 | 220 | 1201 | 0 | 0 | 891 |
| Future Volume (vph) | 591 | 220 | 1201 | 0 | 0 | 891 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2863 | 1375 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2863 | 1375 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 591 | 220 | 1201 | 0 | 0 | 891 |
| RTOR Reduction (vph) | 0 | 39 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 591 | 181 | 1201 | 0 | 0 | 891 |
| Heavy Vehicles (%) | 13% | 7% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 22.3 | 22.3 | 48.2 | | | 48.2 |
| Effective Green, g (s) | 22.3 | 22.3 | 48.2 | | | 48.2 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.58 | | | 0.58 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 769 | 369 | 2032 | | | 2032 |
| v/s Ratio Prot | c0.21 | | c0.34 | | | 0.25 |
| v/s Ratio Perm | | 0.13 | | | | |
| v/c Ratio | 0.77 | 0.49 | 0.59 | | | 0.44 |
| Uniform Delay, d1 | 28.0 | 25.6 | 11.1 | | | 9.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 4.6 | 1.0 | 1.3 | | | 0.7 |
| Delay (s) | 32.6 | 26.6 | 12.4 | | | 10.5 |
| Level of Service | C | C | B | | | B |
| Approach Delay (s/veh) | 31.0 | | 12.4 | | | 10.5 |
| Approach LOS | C | | B | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 17.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 83.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 61.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

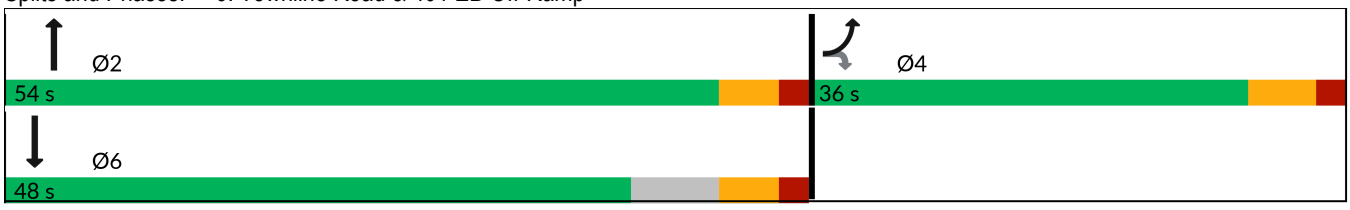
c Critical Lane Group

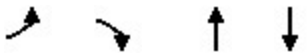
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| Future Volume (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.980 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1603 | 1414 | 0 | 3433 | 3298 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1603 | 1414 | 0 | 3433 | 3298 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 41 | | | 28 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Adj. Flow (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 570 | 550 | 0 | 1139 | 1500 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 54.0 | 42.0 | |
| Total Split (s) | 36.0 | 36.0 | | 54.0 | 48.0 | |
| Total Split (%) | 40.0% | 40.0% | | 60.0% | 53.3% | |
| Maximum Green (s) | 29.5 | 29.5 | | 48.0 | 42.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 10.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 19.5 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| v/c Ratio | 1.09 | 1.12 | | 0.62 | 0.85 | |
| Control Delay (s/veh) | 95.7 | 106.6 | | 16.6 | 23.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 95.7 | 106.6 | | 16.6 | 23.3 | |
| LOS | F | F | | B | C | |
| Approach Delay (s/veh) | 101.1 | | | 16.6 | 23.3 | |
| Approach LOS | F | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 90 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.12 | | | |
| Intersection Signal Delay (s/veh): 44.4 | | Intersection LOS: D | |
| Intersection Capacity Utilization 89.7% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 570 | 550 | 1139 | 1500 |
| v/c Ratio | 1.09 | 1.12 | 0.62 | 0.85 |
| Control Delay (s/veh) | 95.7 | 106.6 | 16.6 | 23.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 95.7 | 106.6 | 16.6 | 23.3 |
| Queue Length 50th (m) | ~111.7 | ~105.9 | 68.2 | 107.6 |
| Queue Length 95th (m) | #172.0 | #167.2 | 88.1 | 140.0 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 525 | 491 | 1830 | 1772 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.09 | 1.12 | 0.62 | 0.85 |

Intersection Summary

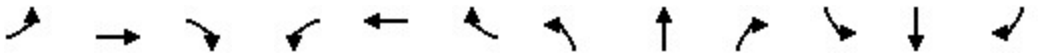
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| Future Volume (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1603 | 1414 | | 3433 | 3299 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1603 | 1414 | | 3433 | 3299 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| RTOR Reduction (vph) | 0 | 28 | 0 | 0 | 13 | 0 |
| Lane Group Flow (vph) | 570 | 522 | 0 | 1139 | 1487 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Effective Green, g (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.33 | 0.33 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 525 | 463 | | 1830 | 1759 | |
| v/s Ratio Prot | 0.36 | | | 0.33 | c0.45 | |
| v/s Ratio Perm | | c0.37 | | | | |
| v/c Ratio | 1.09 | 1.13 | | 0.62 | 0.85 | |
| Uniform Delay, d1 | 30.3 | 30.3 | | 14.7 | 17.8 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 64.5 | 81.9 | | 1.6 | 5.2 | |
| Delay (s) | 94.8 | 112.1 | | 16.3 | 23.0 | |
| Level of Service | F | F | | B | C | |
| Approach Delay (s/veh) | 103.3 | | | 16.3 | 23.0 | |
| Approach LOS | F | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 44.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.95 | | |
| Actuated Cycle Length (s) | 90.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 89.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

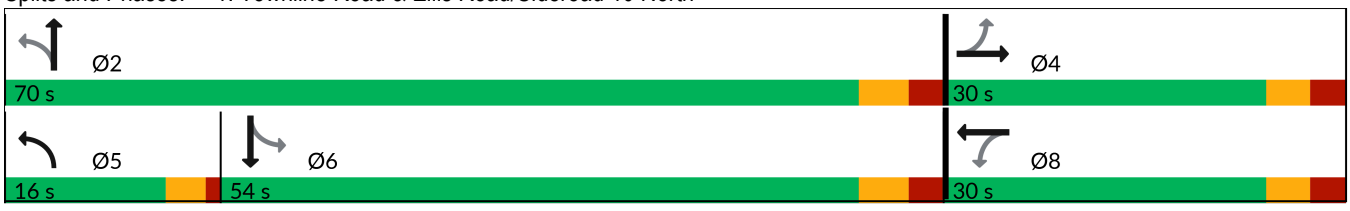


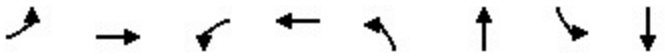
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| Future Volume (vph) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.870 | | | 0.974 | | | 0.984 | | | 0.984 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1395 | 0 | 1635 | 1589 | 0 | 1668 | 1591 | 0 | 1668 | 1547 | 0 |
| Flt Permitted | 0.724 | | | 0.557 | | | 0.204 | | | 0.084 | | |
| Satd. Flow (perm) | 1271 | 1395 | 0 | 959 | 1589 | 0 | 358 | 1591 | 0 | 147 | 1547 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 148 | | | 9 | | | 11 | | | 8 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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 (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 43 | 171 | 0 | 99 | 51 | 0 | 449 | 1253 | 0 | 11 | 708 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 9.0 | 54.0 | | 54.0 | 54.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 16.0 | 70.0 | | 54.0 | 54.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 16.0% | 70.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 12.0 | 63.7 | | 47.7 | 47.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 39.7 | | 39.7 | 39.7 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 66.2 | 63.9 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.73 | 0.71 | | 0.53 | 0.53 | |
| v/c Ratio | 0.22 | 0.50 | | 0.66 | 0.20 | | 1.03 | 1.11 | | 0.14 | 0.86 | |
| Control Delay (s/veh) | 35.1 | 13.5 | | 57.0 | 29.5 | | 65.8 | 79.5 | | 18.5 | 32.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.2 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 35.1 | 13.5 | | 57.0 | 29.5 | | 65.8 | 79.7 | | 18.5 | 32.1 | |
| LOS | D | B | | E | C | | E | E | | B | C | |
| Approach Delay (s/veh) | | 17.8 | | | 47.6 | | | 76.0 | | | 31.9 | |
| Approach LOS | | B | | | D | | | E | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 90.3 | | | |
| Natural Cycle: 145 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.11 | | | |
| Intersection Signal Delay (s/veh): 58.6 | | Intersection LOS: E | |
| Intersection Capacity Utilization 119.6% | | ICU Level of Service H | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North



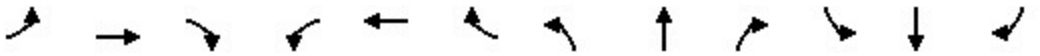


| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 43 | 171 | 99 | 51 | 449 | 1253 | 11 | 708 |
| v/c Ratio | 0.22 | 0.50 | 0.66 | 0.20 | 1.03 | 1.11 | 0.14 | 0.86 |
| Control Delay (s/veh) | 35.1 | 13.5 | 57.0 | 29.5 | 65.8 | 79.5 | 18.5 | 32.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.1 | 13.5 | 57.0 | 29.5 | 65.8 | 79.7 | 18.5 | 32.1 |
| Queue Length 50th (m) | 6.6 | 3.5 | 16.3 | 6.4 | ~42.6 | ~249.5 | 0.9 | 98.3 |
| Queue Length 95th (m) | 15.5 | 20.5 | 32.3 | 16.0 | #100.2 | #368.5 | 5.1 | #197.0 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 338 | 480 | 255 | 430 | 437 | 1129 | 77 | 823 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 44 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.36 | 0.39 | 0.12 | 1.03 | 1.15 | 0.14 | 0.86 |

Intersection Summary

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

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| Future Volume (vph) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1396 | | 1635 | 1588 | | 1668 | 1592 | | 1668 | 1547 | |
| Flt Permitted | 0.72 | 1.00 | | 0.56 | 1.00 | | 0.20 | 1.00 | | 0.08 | 1.00 | |
| Satd. Flow (perm) | 1270 | 1396 | | 959 | 1588 | | 358 | 1592 | | 147 | 1547 | |
| 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) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| RTOR Reduction (vph) | 0 | 125 | 0 | 0 | 8 | 0 | 0 | 3 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 43 | 46 | 0 | 99 | 43 | 0 | 449 | 1250 | 0 | 11 | 704 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Effective Green, g (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.71 | 0.71 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 198 | 217 | | 149 | 247 | | 427 | 1126 | | 77 | 820 | |
| v/s Ratio Prot | | 0.03 | | | 0.03 | | 0.14 | c0.79 | | | 0.46 | |
| v/s Ratio Perm | 0.03 | | | c0.10 | | | 0.60 | | | 0.08 | | |
| v/c Ratio | 0.22 | 0.21 | | 0.66 | 0.18 | | 1.05 | 1.11 | | 0.14 | 0.86 | |
| Uniform Delay, d1 | 33.3 | 33.3 | | 35.9 | 33.1 | | 17.1 | 13.2 | | 10.8 | 18.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.5 | | 10.6 | 0.3 | | 57.7 | 62.3 | | 3.9 | 11.3 | |
| Delay (s) | 33.8 | 33.7 | | 46.5 | 33.4 | | 74.9 | 75.5 | | 14.6 | 29.6 | |
| Level of Service | C | C | | D | C | | E | E | | B | C | |
| Approach Delay (s/veh) | | 33.8 | | | 42.1 | | | 75.3 | | | 29.4 | |
| Approach LOS | | C | | | D | | | E | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 58.5 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 1.08 | | |
| Actuated Cycle Length (s) | 90.3 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 119.6% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |

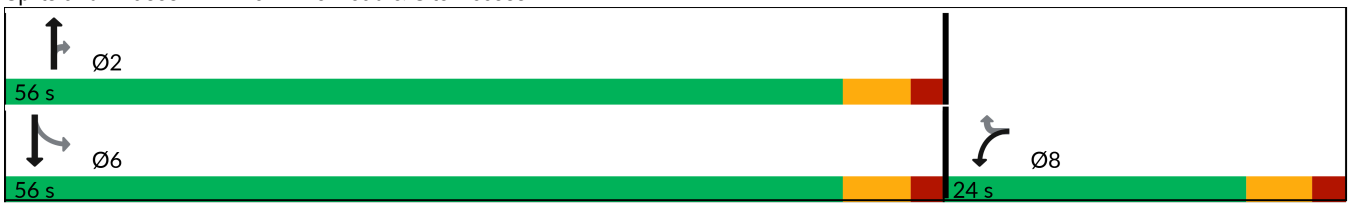
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| Future Volume (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.071 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 131 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 32 | | 44 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | 70.0% | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | Max | Max | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 9.3 | 9.3 | 57.6 | 57.6 | 57.6 | 57.6 |
| Actuated g/C Ratio | 0.12 | 0.12 | 0.77 | 0.77 | 0.77 | 0.77 |
| v/c Ratio | 0.43 | 0.33 | 1.24 | 0.05 | 0.24 | 0.64 |
| Control Delay (s/veh) | 36.2 | 22.1 | 131.7 | 1.8 | 12.0 | 8.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 36.2 | 22.1 | 131.7 | 1.8 | 12.0 | 9.0 |
| LOS | D | C | F | A | B | A |
| Approach Delay (s/veh) | 29.9 | | 127.6 | | | 9.1 |
| Approach LOS | C | | F | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 75.2 | | | |
| Natural Cycle: 150 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.24 | | | |
| Intersection Signal Delay (s/veh): 82.7 | | Intersection LOS: F | |
| Intersection Capacity Utilization 107.1% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| v/c Ratio | 0.43 | 0.33 | 1.24 | 0.05 | 0.24 | 0.64 |
| Control Delay (s/veh) | 36.2 | 22.1 | 131.7 | 1.8 | 12.0 | 8.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 36.2 | 22.1 | 131.7 | 1.8 | 12.0 | 9.0 |
| Queue Length 50th (m) | 11.1 | 4.6 | ~301.7 | 0.3 | 1.0 | 56.1 |
| Queue Length 95th (m) | 22.6 | 14.7 | #391.4 | 3.4 | 6.3 | 111.4 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 390 | 373 | 1318 | 1131 | 100 | 1411 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 127 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.18 | 1.24 | 0.05 | 0.24 | 0.70 |

Intersection Summary

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

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| Future Volume (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.07 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 131 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| RTOR Reduction (vph) | 0 | 29 | 0 | 12 | 0 | 0 |
| Lane Group Flow (vph) | 85 | 39 | 1634 | 42 | 24 | 896 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 8.1 | 8.1 | 56.4 | 56.4 | 56.4 | 56.4 |
| Effective Green, g (s) | 8.1 | 8.1 | 56.4 | 56.4 | 56.4 | 56.4 |
| Actuated g/C Ratio | 0.11 | 0.11 | 0.74 | 0.74 | 0.74 | 0.74 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 172 | 153 | 1268 | 1078 | 96 | 1358 |
| v/s Ratio Prot | c0.05 | | c0.95 | | | 0.49 |
| v/s Ratio Perm | | 0.03 | | 0.03 | 0.18 | |
| v/c Ratio | 0.49 | 0.26 | 1.29 | 0.04 | 0.25 | 0.66 |
| Uniform Delay, d1 | 32.3 | 31.4 | 10.1 | 2.7 | 3.2 | 5.1 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.2 | 0.9 | 135.9 | 0.1 | 6.1 | 2.5 |
| Delay (s) | 34.5 | 32.3 | 146.0 | 2.8 | 9.4 | 7.7 |
| Level of Service | C | C | F | A | A | A |
| Approach Delay (s/veh) | 33.5 | | 141.4 | | | 7.7 |
| Approach LOS | C | | F | | | A |

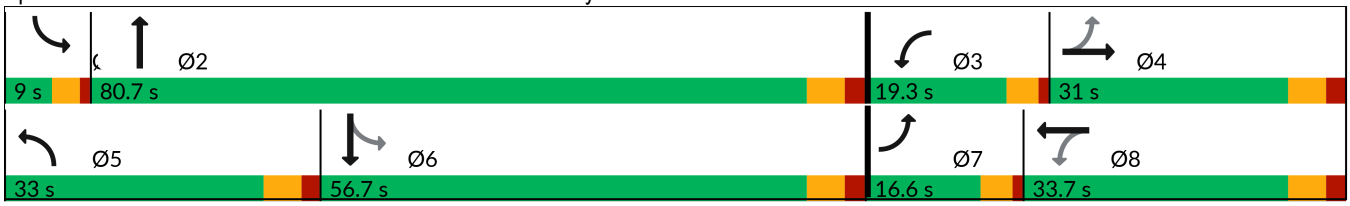
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 90.9 | HCM 2000 Level of Service | F |
| HCM 2000 Volume to Capacity ratio | 1.19 | | |
| Actuated Cycle Length (s) | 76.5 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 107.1% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

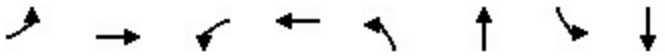
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 238 | 0 | 403 | 173 | 22 | 83 | 538 | 1284 | 72 | 18 | 768 | 187 |
| Future Volume (vph) | 238 | 0 | 403 | 173 | 22 | 83 | 538 | 1284 | 72 | 18 | 768 | 187 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.881 | | | 0.992 | | | 0.971 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 1668 | 1437 | 0 | 3203 | 3277 | 0 | 1668 | 3126 | 0 |
| Flt Permitted | 0.689 | | | 0.258 | | | 0.950 | | | 0.193 | | |
| Satd. Flow (perm) | 1209 | 1387 | 0 | 453 | 1437 | 0 | 3203 | 3277 | 0 | 339 | 3126 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 369 | | | 83 | | | 6 | | | 24 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 238 | 0 | 403 | 173 | 22 | 83 | 538 | 1284 | 72 | 18 | 768 | 187 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 238 | 403 | 0 | 173 | 105 | 0 | 538 | 1356 | 0 | 18 | 955 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 8.0 | | 5.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 9.5 | 31.0 | | 9.5 | 31.0 | | 11.0 | 50.4 | | 9.0 | 50.4 | |
| Total Split (s) | 16.6 | 31.0 | | 19.3 | 33.7 | | 33.0 | 80.7 | | 9.0 | 56.7 | |
| Total Split (%) | 11.9% | 22.1% | | 13.8% | 24.1% | | 23.6% | 57.6% | | 6.4% | 40.5% | |
| Maximum Green (s) | 12.1 | 25.0 | | 14.8 | 27.7 | | 27.0 | 74.7 | | 5.0 | 50.7 | |
| Yellow Time (s) | 3.5 | 4.0 | | 3.5 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 23.4 | | | 23.4 | |
| Flash Don't Walk (s) | | 18.0 | | | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 27.4 | 13.7 | | 30.9 | 15.5 | | 24.7 | 78.4 | | 58.1 | 51.0 | |
| Actuated g/C Ratio | 0.22 | 0.11 | | 0.25 | 0.12 | | 0.20 | 0.62 | | 0.46 | 0.40 | |
| v/c Ratio | 0.78 | 0.84 | | 0.71 | 0.42 | | 0.86 | 0.66 | | 0.09 | 0.75 | |
| Control Delay (s/veh) | 59.4 | 24.1 | | 54.1 | 20.4 | | 63.8 | 19.3 | | 13.0 | 37.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 59.4 | 24.1 | | 54.1 | 20.4 | | 63.8 | 19.3 | | 13.0 | 37.0 | |
| LOS | E | C | | D | C | | E | B | | B | D | |
| Approach Delay (s/veh) | | 37.2 | | | 41.4 | | | 31.9 | | | 36.6 | |
| Approach LOS | | D | | | D | | | C | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 140 | | | |
| Actuated Cycle Length: 126 | | | |
| Natural Cycle: 115 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.86 | | | |
| Intersection Signal Delay (s/veh): 34.7 | | Intersection LOS: C | |
| Intersection Capacity Utilization 103.3% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 238 | 403 | 173 | 105 | 538 | 1356 | 18 | 955 |
| v/c Ratio | 0.78 | 0.84 | 0.71 | 0.42 | 0.86 | 0.66 | 0.09 | 0.75 |
| Control Delay (s/veh) | 59.4 | 24.1 | 54.1 | 20.4 | 63.8 | 19.3 | 13.0 | 37.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 59.4 | 24.1 | 54.1 | 20.4 | 63.8 | 19.3 | 13.0 | 37.0 |
| Queue Length 50th (m) | 51.6 | 8.0 | 35.8 | 5.0 | 65.2 | 91.8 | 1.3 | 102.1 |
| Queue Length 95th (m) | 76.6 | 45.2 | 56.1 | 21.2 | #103.4 | 180.7 | 5.0 | 151.6 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | 261.4 | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | 115.0 | | 115.0 | |
| Base Capacity (vph) | 307 | 571 | 258 | 382 | 690 | 2042 | 209 | 1280 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.78 | 0.71 | 0.67 | 0.27 | 0.78 | 0.66 | 0.09 | 0.75 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 238 | 0 | 403 | 173 | 22 | 83 | 538 | 1284 | 72 | 18 | 768 | 187 |
| Future Volume (vph) | 238 | 0 | 403 | 173 | 22 | 83 | 538 | 1284 | 72 | 18 | 768 | 187 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.88 | | 1.00 | 0.99 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | 1668 | 1438 | | 3203 | 3277 | | 1668 | 3124 | |
| Flt Permitted | 0.69 | 1.00 | | 0.26 | 1.00 | | 0.95 | 1.00 | | 0.19 | 1.00 | |
| Satd. Flow (perm) | 1210 | 1387 | | 453 | 1438 | | 3203 | 3277 | | 339 | 3124 | |
| 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) | 238 | 0 | 403 | 173 | 22 | 83 | 538 | 1284 | 72 | 18 | 768 | 187 |
| RTOR Reduction (vph) | 0 | 329 | 0 | 0 | 73 | 0 | 0 | 2 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 238 | 74 | 0 | 173 | 32 | 0 | 538 | 1354 | 0 | 18 | 941 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 26.0 | 13.8 | | 29.4 | 15.5 | | 24.7 | 78.4 | | 55.3 | 53.5 | |
| Effective Green, g (s) | 26.0 | 13.8 | | 29.4 | 15.5 | | 24.7 | 78.4 | | 55.3 | 53.5 | |
| Actuated g/C Ratio | 0.20 | 0.11 | | 0.23 | 0.12 | | 0.19 | 0.61 | | 0.43 | 0.42 | |
| Clearance Time (s) | 4.5 | 6.0 | | 4.5 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 288 | 149 | | 235 | 173 | | 616 | 2000 | | 164 | 1301 | |
| v/s Ratio Prot | 0.08 | 0.05 | | c0.08 | 0.02 | | c0.17 | 0.41 | | 0.00 | c0.30 | |
| v/s Ratio Perm | 0.09 | | | c0.09 | | | | | | 0.05 | | |
| v/c Ratio | 0.83 | 0.49 | | 0.74 | 0.19 | | 0.87 | 0.68 | | 0.11 | 0.72 | |
| Uniform Delay, d1 | 47.9 | 54.0 | | 43.2 | 50.8 | | 50.3 | 16.6 | | 21.1 | 31.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 17.3 | 2.6 | | 11.4 | 0.5 | | 13.0 | 1.9 | | 0.3 | 3.5 | |
| Delay (s) | 65.2 | 56.6 | | 54.5 | 51.3 | | 63.3 | 18.5 | | 21.3 | 34.8 | |
| Level of Service | E | E | | D | D | | E | B | | C | C | |
| Approach Delay (s/veh) | | 59.8 | | | 53.3 | | | 31.2 | | | 34.5 | |
| Approach LOS | | E | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 38.5 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.77 | | |
| Actuated Cycle Length (s) | 128.4 | Sum of lost time (s) | 22.5 |
| Intersection Capacity Utilization | 103.3% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |

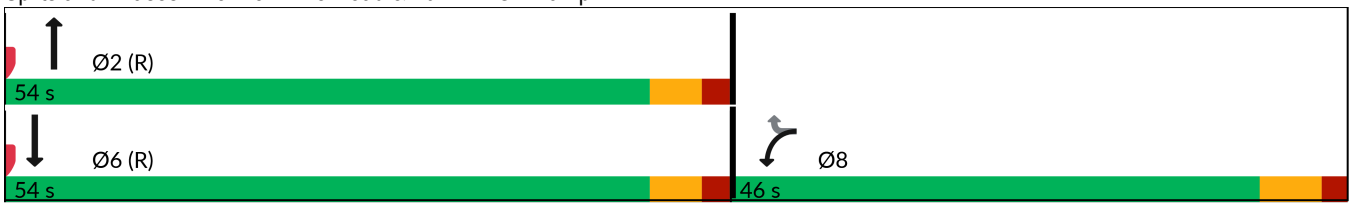
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 611 | 422 | 1591 | 0 | 0 | 989 |
| Future Volume (vph) | 611 | 422 | 1591 | 0 | 0 | 989 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 12 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Adj. Flow (vph) | 611 | 422 | 1591 | 0 | 0 | 989 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 611 | 422 | 1591 | 0 | 0 | 989 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Minimum Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (s) | 46.0 | 46.0 | 54.0 | | | 54.0 |
| Total Split (%) | 46.0% | 46.0% | 54.0% | | | 54.0% |
| Maximum Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 10.0 | 10.0 | 43.0 | | | 43.0 |
| Flash Don't Walk (s) | 29.5 | 29.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| v/c Ratio | 0.53 | 0.73 | 0.95 | | | 0.59 |
| Control Delay (s/veh) | 25.1 | 33.5 | 38.1 | | | 20.6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 25.1 | 33.5 | 38.1 | | | 20.6 |
| LOS | C | C | D | | | C |
| Approach Delay (s/veh) | 28.5 | | 38.1 | | | 20.6 |
| Approach LOS | C | | D | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 100 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.95 | | | |
| Intersection Signal Delay (s/veh): 30.6 | | Intersection LOS: C | |
| Intersection Capacity Utilization 82.8% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 611 | 422 | 1591 | 989 |
| v/c Ratio | 0.53 | 0.73 | 0.95 | 0.59 |
| Control Delay (s/veh) | 25.1 | 33.5 | 38.1 | 20.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 25.1 | 33.5 | 38.1 | 20.6 |
| Queue Length 50th (m) | 45.7 | 66.2 | 149.1 | 70.5 |
| Queue Length 95th (m) | 61.9 | 103.2 | #202.1 | 89.6 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1161 | 582 | 1680 | 1680 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.53 | 0.73 | 0.95 | 0.59 |

Intersection Summary

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

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 611 | 422 | 1591 | 0 | 0 | 989 |
| Future Volume (vph) | 611 | 422 | 1591 | 0 | 0 | 989 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 2941 | 1456 | 3500 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 2941 | 1456 | 3500 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 611 | 422 | 1591 | 0 | 0 | 989 |
| RTOR Reduction (vph) | 0 | 7 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 611 | 415 | 1591 | 0 | 0 | 989 |
| Heavy Vehicles (%) | 10% | 1% | 2% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Effective Green, g (s) | 39.5 | 39.5 | 48.0 | | | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.48 | | | 0.48 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Grp Cap (vph) | 1161 | 575 | 1680 | | | 1680 |
| v/s Ratio Prot | 0.21 | | c0.45 | | | 0.28 |
| v/s Ratio Perm | | c0.28 | | | | |
| v/c Ratio | 0.53 | 0.72 | 0.95 | | | 0.59 |
| Uniform Delay, d1 | 23.1 | 25.6 | 24.8 | | | 18.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.7 | 7.6 | 12.5 | | | 1.5 |
| Delay (s) | 24.8 | 33.2 | 37.3 | | | 20.4 |
| Level of Service | C | C | D | | | C |
| Approach Delay (s/veh) | 28.3 | | 37.3 | | | 20.4 |
| Approach LOS | C | | D | | | C |

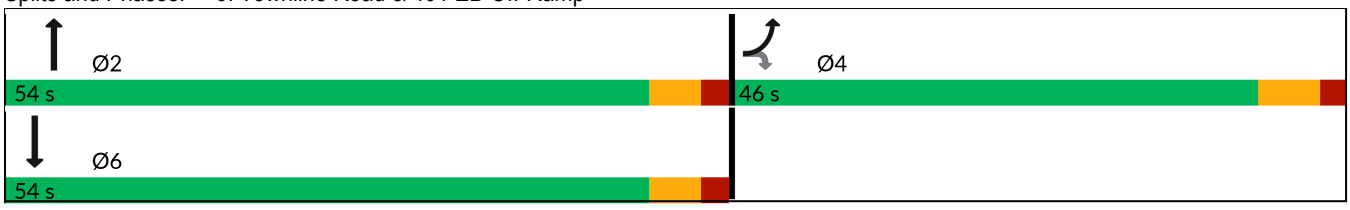
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 30.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.85 | | |
| Actuated Cycle Length (s) | 100.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 82.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

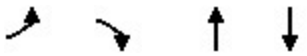
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| Future Volume (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.982 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1619 | 1442 | 0 | 3535 | 3358 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1619 | 1442 | 0 | 3535 | 3358 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 17 | | | 20 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Adj. Flow (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 514 | 561 | 0 | 1364 | 1671 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (%) | 46.0% | 46.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 39.5 | 39.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 42.0 | |
| Flash Don't Walk (s) | 29.5 | 29.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 39.1 | 39.1 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.39 | 0.39 | | 0.48 | 0.48 | |
| v/c Ratio | 0.81 | 0.98 | | 0.80 | 1.03 | |
| Control Delay (s/veh) | 38.7 | 62.3 | | 26.3 | 55.5 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 38.7 | 62.3 | | 26.3 | 55.5 | |
| LOS | D | E | | C | E | |
| Approach Delay (s/veh) | 51.0 | | | 26.3 | 55.5 | |
| Approach LOS | D | | | C | E | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 99.6 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.03 | | | |
| Intersection Signal Delay (s/veh): 44.6 | | Intersection LOS: D | |
| Intersection Capacity Utilization 95.2% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 514 | 561 | 1364 | 1671 |
| v/c Ratio | 0.81 | 0.98 | 0.80 | 1.03 |
| Control Delay (s/veh) | 38.7 | 62.3 | 26.3 | 55.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 38.7 | 62.3 | 26.3 | 55.5 |
| Queue Length 50th (m) | 86.8 | 102.1 | 113.5 | ~182.5 |
| Queue Length 95th (m) | #139.6 | #171.8 | 142.2 | #225.3 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 642 | 582 | 1704 | 1629 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 0.96 | 0.80 | 1.03 |

Intersection Summary

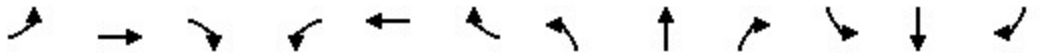
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| Future Volume (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1619 | 1442 | | 3535 | 3358 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1619 | 1442 | | 3535 | 3358 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| RTOR Reduction (vph) | 0 | 10 | 0 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 514 | 551 | 0 | 1364 | 1661 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 39.1 | 39.1 | | 48.0 | 48.0 | |
| Effective Green, g (s) | 39.1 | 39.1 | | 48.0 | 48.0 | |
| Actuated g/C Ratio | 0.39 | 0.39 | | 0.48 | 0.48 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 635 | 566 | | 1703 | 1618 | |
| v/s Ratio Prot | 0.32 | | | 0.39 | c0.49 | |
| v/s Ratio Perm | | c0.38 | | | | |
| v/c Ratio | 0.81 | 0.97 | | 0.80 | 1.03 | |
| Uniform Delay, d1 | 26.9 | 29.7 | | 21.8 | 25.8 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 7.5 | 30.8 | | 4.1 | 29.4 | |
| Delay (s) | 34.5 | 60.6 | | 25.8 | 55.2 | |
| Level of Service | C | E | | C | E | |
| Approach Delay (s/veh) | 48.1 | | | 25.8 | 55.2 | |
| Approach LOS | D | | | C | E | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 43.6 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.00 | | |
| Actuated Cycle Length (s) | 99.6 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 95.2% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

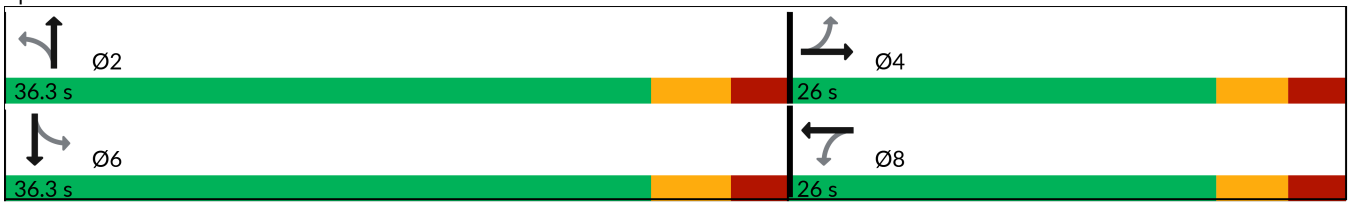


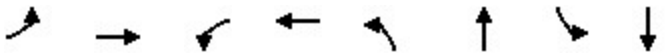
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| Future Volume (vph) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.868 | | | 0.971 | | | 0.986 | | | 0.988 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1416 | 0 | 1668 | 1575 | 0 | 1651 | 1580 | 0 | 1668 | 1597 | 0 |
| Flt Permitted | 0.744 | | | 0.596 | | | 0.406 | | | 0.311 | | |
| Satd. Flow (perm) | 1293 | 1416 | 0 | 1046 | 1575 | 0 | 706 | 1580 | 0 | 546 | 1597 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 204 | | | 4 | | | 12 | | | 10 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Adj. Flow (vph) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 51 | 232 | 0 | 48 | 21 | 0 | 228 | 685 | 0 | 3 | 555 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (%) | 41.7% | 41.7% | | 41.7% | 41.7% | | 58.3% | 58.3% | | 58.3% | 58.3% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.7 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 2.6 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Max | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Flash Don't Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 9.3 | 9.3 | | 9.3 | 9.3 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.58 | 0.58 | | 0.58 | 0.58 | |
| v/c Ratio | 0.22 | 0.55 | | 0.26 | 0.07 | | 0.56 | 0.74 | | 0.01 | 0.60 | |
| Control Delay (s/veh) | 20.2 | 10.1 | | 21.6 | 16.0 | | 14.3 | 15.6 | | 5.7 | 10.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 20.2 | 10.1 | | 21.6 | 16.0 | | 14.3 | 15.6 | | 5.7 | 10.7 | |
| LOS | C | B | | C | B | | B | B | | A | B | |
| Approach Delay (s/veh) | | 11.9 | | | 19.9 | | | 15.3 | | | 10.7 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 62.3 | | | |
| Actuated Cycle Length: 51.7 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.74 | | | |
| Intersection Signal Delay (s/veh): 13.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 92.2% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 51 | 232 | 48 | 21 | 228 | 685 | 3 | 555 |
| v/c Ratio | 0.22 | 0.55 | 0.26 | 0.07 | 0.56 | 0.74 | 0.01 | 0.60 |
| Control Delay (s/veh) | 20.2 | 10.1 | 21.6 | 16.0 | 14.3 | 15.6 | 5.7 | 10.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 20.2 | 10.1 | 21.6 | 16.0 | 14.3 | 15.6 | 5.7 | 10.7 |
| Queue Length 50th (m) | 4.1 | 2.2 | 3.9 | 1.3 | 10.2 | 35.7 | 0.1 | 25.1 |
| Queue Length 95th (m) | 11.2 | 16.3 | 10.9 | 5.5 | #37.7 | #111.4 | 1.0 | 64.7 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 501 | 673 | 404 | 612 | 410 | 923 | 317 | 932 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.10 | 0.34 | 0.12 | 0.03 | 0.56 | 0.74 | 0.01 | 0.60 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| Future Volume (vph) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1416 | | 1668 | 1576 | | 1651 | 1580 | | 1668 | 1597 | |
| Flt Permitted | 0.74 | 1.00 | | 0.60 | 1.00 | | 0.41 | 1.00 | | 0.31 | 1.00 | |
| Satd. Flow (perm) | 1292 | 1416 | | 1046 | 1576 | | 705 | 1580 | | 546 | 1597 | |
| 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) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| RTOR Reduction (vph) | 0 | 167 | 0 | 0 | 3 | 0 | 0 | 5 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 51 | 65 | 0 | 48 | 18 | 0 | 228 | 680 | 0 | 3 | 551 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 9.3 | 9.3 | | 9.3 | 9.3 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Effective Green, g (s) | 9.3 | 9.3 | | 9.3 | 9.3 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.58 | 0.58 | | 0.58 | 0.58 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 232 | 254 | | 188 | 283 | | 410 | 919 | | 317 | 929 | |
| v/s Ratio Prot | | 0.05 | | | 0.01 | | | c0.43 | | | 0.34 | |
| v/s Ratio Perm | 0.04 | | | c0.05 | | | 0.32 | | | 0.01 | | |
| v/c Ratio | 0.22 | 0.25 | | 0.26 | 0.06 | | 0.56 | 0.74 | | 0.01 | 0.59 | |
| Uniform Delay, d1 | 18.1 | 18.2 | | 18.2 | 17.6 | | 6.7 | 7.9 | | 4.5 | 6.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.5 | | 0.7 | 0.1 | | 5.4 | 5.3 | | 0.1 | 2.8 | |
| Delay (s) | 18.6 | 18.8 | | 18.9 | 17.7 | | 12.0 | 13.3 | | 4.6 | 9.7 | |
| Level of Service | B | B | | B | B | | B | B | | A | A | |
| Approach Delay (s/veh) | | 18.7 | | | 18.6 | | | 12.9 | | | 9.6 | |
| Approach LOS | | B | | | B | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 13.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 51.7 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 92.2% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

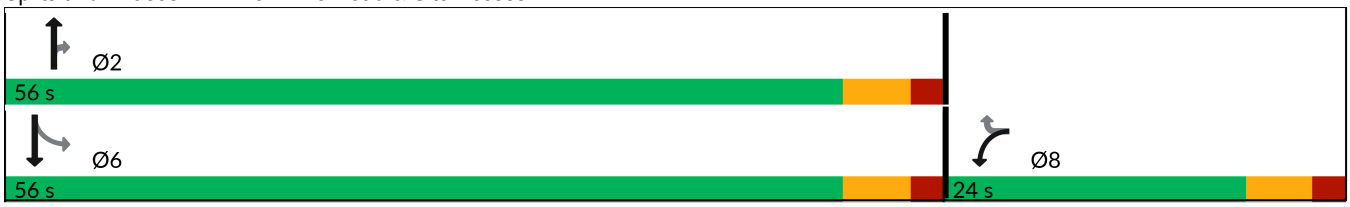
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| Future Volume (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.282 | |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 519 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 24 | | 31 | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | 1 | 1 | 2 |
| Detector Template | Left | Right | Thru | Right | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | 6.1 | 6.1 | 30.5 |
| 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) | 6.1 | 6.1 | 1.8 | 6.1 | 6.1 | 1.8 |
| 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) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Detector Phase | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | 56.0 | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | 70.0% | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | None | Max | Max | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 7.0 | 7.0 | 65.6 | 65.6 | 65.6 | 65.6 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.85 | 0.85 | 0.85 | 0.85 |
| v/c Ratio | 0.20 | 0.16 | 0.61 | 0.02 | 0.03 | 0.50 |
| Control Delay (s/veh) | 36.0 | 15.9 | 6.3 | 1.2 | 2.9 | 4.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 36.0 | 15.9 | 6.3 | 1.2 | 2.9 | 5.0 |
| LOS | D | B | A | A | A | A |
| Approach Delay (s/veh) | 27.1 | | 6.1 | | | 4.9 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 77 | | | |
| Natural Cycle: 70 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.61 | | | |
| Intersection Signal Delay (s/veh): 6.2 | | Intersection LOS: A | |
| Intersection Capacity Utilization 64.1% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1

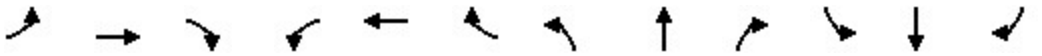


| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| v/c Ratio | 0.20 | 0.16 | 0.61 | 0.02 | 0.03 | 0.50 |
| Control Delay (s/veh) | 36.0 | 15.9 | 6.3 | 1.2 | 2.9 | 4.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 36.0 | 15.9 | 6.3 | 1.2 | 2.9 | 5.0 |
| Queue Length 50th (m) | 4.6 | 0.0 | 50.1 | 0.0 | 0.4 | 38.0 |
| Queue Length 95th (m) | 11.2 | 6.3 | 97.1 | 1.8 | 1.8 | 69.2 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | | 161.7 |
| Turn Bay Length (m) | | | | | | |
| Base Capacity (vph) | 382 | 360 | 1466 | 1250 | 442 | 1569 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 246 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.08 | 0.07 | 0.61 | 0.02 | 0.03 | 0.60 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| Future Volume (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.28 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 519 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| RTOR Reduction (vph) | 0 | 23 | 0 | 6 | 0 | 0 |
| Lane Group Flow (vph) | 30 | 1 | 887 | 25 | 14 | 791 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 4.5 | 4.5 | 62.9 | 62.9 | 62.9 | 62.9 |
| Effective Green, g (s) | 4.5 | 4.5 | 62.9 | 62.9 | 62.9 | 62.9 |
| Actuated g/C Ratio | 0.06 | 0.06 | 0.79 | 0.79 | 0.79 | 0.79 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 92 | 82 | 1363 | 1158 | 411 | 1459 |
| v/s Ratio Prot | c0.02 | | c0.52 | | | 0.43 |
| v/s Ratio Perm | | 0.00 | | 0.02 | 0.03 | |
| v/c Ratio | 0.33 | 0.02 | 0.65 | 0.02 | 0.03 | 0.54 |
| Uniform Delay, d1 | 36.0 | 35.4 | 3.5 | 1.7 | 1.8 | 3.0 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.1 | 0.1 | 2.4 | 0.0 | 0.2 | 1.5 |
| Delay (s) | 38.1 | 35.4 | 6.0 | 1.8 | 1.9 | 4.5 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 36.9 | | 5.8 | | | 4.4 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 6.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 79.4 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 64.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

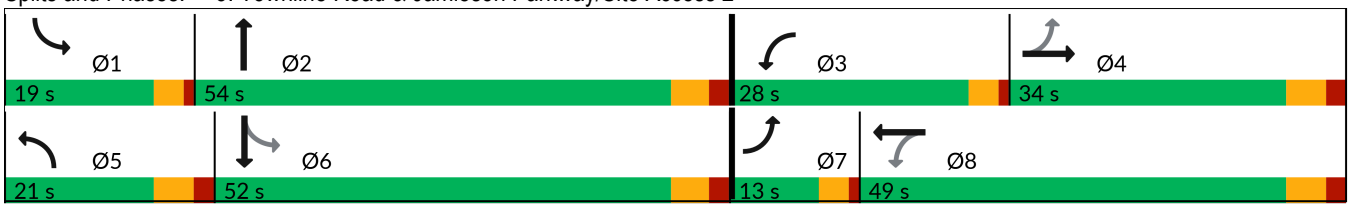


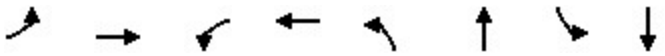
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 161 | 0 | 256 | 61 | 8 | 29 | 273 | 711 | 41 | 10 | 674 | 138 |
| Future Volume (vph) | 161 | 0 | 256 | 61 | 8 | 29 | 273 | 711 | 41 | 10 | 674 | 138 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.882 | | | 0.992 | | | 0.975 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1387 | 0 | 1668 | 1439 | 0 | 3203 | 3247 | 0 | 1668 | 3214 | 0 |
| Flt Permitted | 0.488 | | | 0.952 | | | 0.950 | | | 0.366 | | |
| Satd. Flow (perm) | 857 | 1387 | 0 | 1671 | 1439 | 0 | 3203 | 3247 | 0 | 642 | 3214 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 471 | | | 29 | | | 5 | | | 19 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Adj. Flow (vph) | 161 | 0 | 256 | 61 | 8 | 29 | 273 | 711 | 41 | 10 | 674 | 138 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 161 | 256 | 0 | 61 | 37 | 0 | 273 | 752 | 0 | 10 | 812 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 9.0 | 31.0 | | 9.0 | 31.0 | | 11.0 | 50.4 | | 9.0 | 41.0 | |
| Total Split (s) | 13.0 | 34.0 | | 28.0 | 49.0 | | 21.0 | 54.0 | | 19.0 | 52.0 | |
| Total Split (%) | 9.6% | 25.2% | | 20.7% | 36.3% | | 15.6% | 40.0% | | 14.1% | 38.5% | |
| Maximum Green (s) | 9.0 | 28.0 | | 24.0 | 43.0 | | 15.0 | 48.0 | | 15.0 | 46.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | | 18.0 | | | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 16.1 | 6.6 | | 13.7 | 6.6 | | 13.0 | 63.5 | | 54.0 | 46.3 | |
| Actuated g/C Ratio | 0.17 | 0.07 | | 0.15 | 0.07 | | 0.14 | 0.67 | | 0.57 | 0.49 | |
| v/c Ratio | 0.67 | 0.48 | | 0.25 | 0.29 | | 0.62 | 0.34 | | 0.02 | 0.51 | |
| Control Delay (s/veh) | 48.9 | 3.1 | | 35.0 | 25.9 | | 45.5 | 8.1 | | 6.1 | 18.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 48.9 | 3.1 | | 35.0 | 25.9 | | 45.5 | 8.1 | | 6.1 | 18.3 | |
| LOS | D | A | | C | C | | D | A | | A | B | |
| Approach Delay (s/veh) | | 20.7 | | | 31.6 | | | 18.1 | | | 18.2 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 135 | | | |
| Actuated Cycle Length: 94.1 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.67 | | | |
| Intersection Signal Delay (s/veh): 19.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 73.7% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2

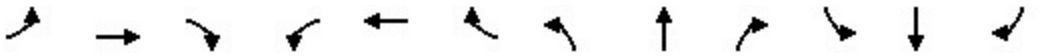




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 161 | 256 | 61 | 37 | 273 | 752 | 10 | 812 |
| v/c Ratio | 0.67 | 0.48 | 0.25 | 0.29 | 0.62 | 0.34 | 0.02 | 0.51 |
| Control Delay (s/veh) | 48.9 | 3.1 | 35.0 | 25.9 | 45.5 | 8.1 | 6.1 | 18.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.9 | 3.1 | 35.0 | 25.9 | 45.5 | 8.1 | 6.1 | 18.3 |
| Queue Length 50th (m) | 26.2 | 0.0 | 9.3 | 1.4 | 25.0 | 26.9 | 0.5 | 52.5 |
| Queue Length 95th (m) | #53.3 | 0.0 | 20.1 | 11.0 | 38.8 | 53.7 | 2.1 | 75.1 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | 261.4 | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | 115.0 | | 115.0 | |
| Base Capacity (vph) | 242 | 745 | 428 | 677 | 513 | 2191 | 596 | 1590 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.67 | 0.34 | 0.14 | 0.05 | 0.53 | 0.34 | 0.02 | 0.51 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 161 | 0 | 256 | 61 | 8 | 29 | 273 | 711 | 41 | 10 | 674 | 138 |
| Future Volume (vph) | 161 | 0 | 256 | 61 | 8 | 29 | 273 | 711 | 41 | 10 | 674 | 138 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.88 | | 1.00 | 0.99 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1387 | | 1668 | 1440 | | 3203 | 3246 | | 1668 | 3212 | |
| Flt Permitted | 0.49 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.37 | 1.00 | |
| Satd. Flow (perm) | 856 | 1387 | | 1672 | 1440 | | 3203 | 3246 | | 643 | 3212 | |
| 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) | 161 | 0 | 256 | 61 | 8 | 29 | 273 | 711 | 41 | 10 | 674 | 138 |
| RTOR Reduction (vph) | 0 | 235 | 0 | 0 | 28 | 0 | 0 | 2 | 0 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 161 | 21 | 0 | 61 | 9 | 0 | 273 | 750 | 0 | 10 | 802 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 19.3 | 8.3 | | 11.2 | 4.2 | | 13.0 | 63.5 | | 50.7 | 49.6 | |
| Effective Green, g (s) | 19.3 | 8.3 | | 11.2 | 4.2 | | 13.0 | 63.5 | | 50.7 | 49.6 | |
| Actuated g/C Ratio | 0.19 | 0.08 | | 0.11 | 0.04 | | 0.13 | 0.64 | | 0.51 | 0.50 | |
| Clearance Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 255 | 115 | | 187 | 60 | | 416 | 2063 | | 337 | 1594 | |
| v/s Ratio Prot | c0.07 | 0.02 | | 0.02 | 0.01 | | c0.09 | 0.23 | | 0.00 | c0.25 | |
| v/s Ratio Perm | c0.05 | | | 0.01 | | | | | | 0.01 | | |
| v/c Ratio | 0.63 | 0.18 | | 0.33 | 0.15 | | 0.66 | 0.36 | | 0.03 | 0.50 | |
| Uniform Delay, d1 | 36.1 | 42.7 | | 40.9 | 46.1 | | 41.3 | 8.6 | | 12.2 | 16.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 5.0 | 0.8 | | 1.0 | 1.2 | | 3.7 | 0.5 | | 0.0 | 1.1 | |
| Delay (s) | 41.1 | 43.4 | | 41.9 | 47.3 | | 45.0 | 9.1 | | 12.2 | 18.0 | |
| Level of Service | D | D | | D | D | | D | A | | B | B | |
| Approach Delay (s/veh) | | 42.5 | | | 43.9 | | | 18.7 | | | 18.0 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 23.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 99.9 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 73.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

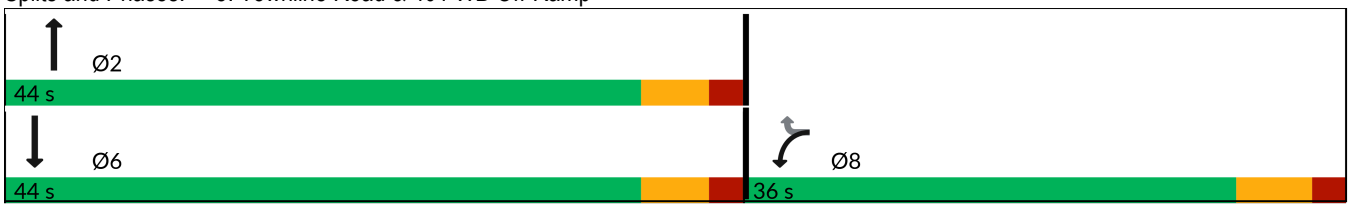
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 460 | 203 | 819 | 0 | 0 | 711 |
| Future Volume (vph) | 460 | 203 | 819 | 0 | 0 | 711 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 111 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 460 | 203 | 819 | 0 | 0 | 711 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 460 | 203 | 819 | 0 | 0 | 711 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (%) | 45.0% | 45.0% | 55.0% | | | 55.0% |
| Maximum Green (s) | 29.5 | 29.5 | 38.0 | | | 38.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 33.0 | | | 33.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 15.2 | 15.2 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.58 | | | 0.58 |
| v/c Ratio | 0.65 | 0.48 | 0.40 | | | 0.35 |
| Control Delay (s/veh) | 27.3 | 14.4 | 8.9 | | | 8.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 27.3 | 14.4 | 8.9 | | | 8.5 |
| LOS | C | B | A | | | A |
| Approach Delay (s/veh) | 23.4 | | 8.9 | | | 8.5 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 65.8 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.65 | | | |
| Intersection Signal Delay (s/veh): 13.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 47.1% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 460 | 203 | 819 | 711 |
| v/c Ratio | 0.65 | 0.48 | 0.40 | 0.35 |
| Control Delay (s/veh) | 27.3 | 14.4 | 8.9 | 8.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.3 | 14.4 | 8.9 | 8.5 |
| Queue Length 50th (m) | 26.2 | 9.2 | 25.2 | 21.1 |
| Queue Length 95th (m) | 39.1 | 25.3 | 44.1 | 37.5 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1384 | 715 | 2046 | 2026 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.33 | 0.28 | 0.40 | 0.35 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 460 | 203 | 819 | 0 | 0 | 711 |
| Future Volume (vph) | 460 | 203 | 819 | 0 | 0 | 711 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 460 | 203 | 819 | 0 | 0 | 711 |
| RTOR Reduction (vph) | 0 | 85 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 460 | 118 | 819 | 0 | 0 | 711 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 15.2 | 15.2 | 38.1 | | | 38.1 |
| Effective Green, g (s) | 15.2 | 15.2 | 38.1 | | | 38.1 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.58 | | | 0.58 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 711 | 336 | 2046 | | | 2026 |
| v/s Ratio Prot | c0.15 | | c0.23 | | | 0.20 |
| v/s Ratio Perm | | 0.08 | | | | |
| v/c Ratio | 0.65 | 0.35 | 0.40 | | | 0.35 |
| Uniform Delay, d1 | 22.9 | 21.2 | 7.6 | | | 7.3 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 2.0 | 0.6 | 0.6 | | | 0.5 |
| Delay (s) | 24.9 | 21.8 | 8.2 | | | 7.8 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 24.0 | | 8.2 | | | 7.8 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 12.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.47 | | |
| Actuated Cycle Length (s) | 65.8 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 47.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

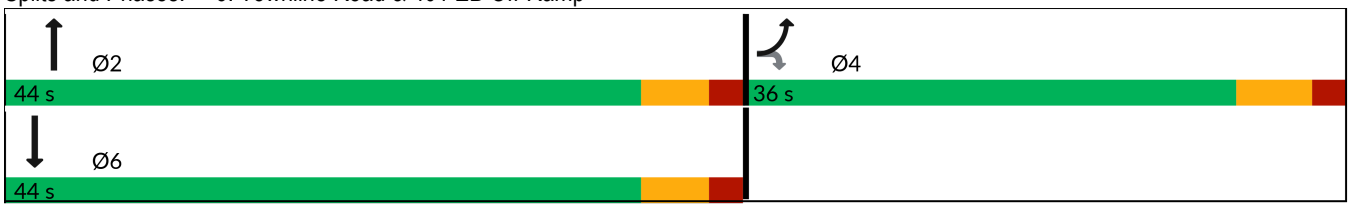
c Critical Lane Group

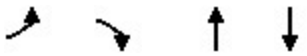
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| Future Volume (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.979 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1456 | 0 | 3500 | 3436 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1635 | 1456 | 0 | 3500 | 3436 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 61 | | | 31 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Adj. Flow (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 383 | 513 | 0 | 649 | 1187 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (%) | 45.0% | 45.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 32.0 | 32.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 27.7 | 27.7 | | 38.1 | 38.1 | |
| Actuated g/C Ratio | 0.35 | 0.35 | | 0.49 | 0.49 | |
| v/c Ratio | 0.66 | 0.93 | | 0.38 | 0.70 | |
| Control Delay (s/veh) | 27.7 | 46.9 | | 13.9 | 18.5 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 27.7 | 46.9 | | 13.9 | 18.5 | |
| LOS | C | D | | B | B | |
| Approach Delay (s/veh) | 38.7 | | | 13.9 | 18.5 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 78.3 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.93 | | | |
| Intersection Signal Delay (s/veh): 24.0 | | Intersection LOS: C | |
| Intersection Capacity Utilization 78.4% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 383 | 513 | 649 | 1187 |
| v/c Ratio | 0.66 | 0.93 | 0.38 | 0.70 |
| Control Delay (s/veh) | 27.7 | 46.9 | 13.9 | 18.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.7 | 46.9 | 13.9 | 18.5 |
| Queue Length 50th (m) | 47.0 | 64.5 | 31.8 | 70.3 |
| Queue Length 95th (m) | 75.6 | #122.6 | 44.0 | 93.2 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 616 | 587 | 1702 | 1686 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.62 | 0.87 | 0.38 | 0.70 |

Intersection Summary

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

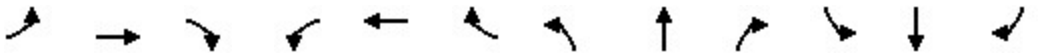
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| Future Volume (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1456 | | 3500 | 3436 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1635 | 1456 | | 3500 | 3436 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| RTOR Reduction (vph) | 0 | 39 | 0 | 0 | 16 | 0 |
| Lane Group Flow (vph) | 383 | 474 | 0 | 649 | 1171 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 27.7 | 27.7 | | 38.1 | 38.1 | |
| Effective Green, g (s) | 27.7 | 27.7 | | 38.1 | 38.1 | |
| Actuated g/C Ratio | 0.35 | 0.35 | | 0.49 | 0.49 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 578 | 515 | | 1703 | 1671 | |
| v/s Ratio Prot | 0.23 | | | 0.19 | c0.34 | |
| v/s Ratio Perm | | c0.33 | | | | |
| v/c Ratio | 0.66 | 0.92 | | 0.38 | 0.70 | |
| Uniform Delay, d1 | 21.4 | 24.2 | | 12.7 | 15.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.9 | 21.5 | | 0.6 | 2.5 | |
| Delay (s) | 24.2 | 45.7 | | 13.3 | 18.1 | |
| Level of Service | C | D | | B | B | |
| Approach Delay (s/veh) | 36.5 | | | 13.3 | 18.1 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 23.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.79 | | |
| Actuated Cycle Length (s) | 78.3 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 78.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| Future Volume (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 1721 | 1463 | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.23 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 1721 | 1463 | 429 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 2 | 0 | 0 |
| Lane Group Flow (vph) | 11 | 0 | 1060 | 10 | 21 | 927 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 2.8 | 2.8 | 68.2 | 68.2 | 68.2 | 68.2 |
| Effective Green, g (s) | 2.8 | 2.8 | 68.2 | 68.2 | 68.2 | 68.2 |
| Actuated g/C Ratio | 0.03 | 0.03 | 0.85 | 0.85 | 0.85 | 0.85 |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 56 | 50 | 1467 | 1247 | 365 | 1570 |
| v/s Ratio Prot | c0.01 | | c0.62 | | | 0.50 |
| v/s Ratio Perm | | 0.00 | | 0.01 | 0.05 | |
| v/c Ratio | 0.20 | 0.00 | 0.72 | 0.01 | 0.06 | 0.59 |
| Uniform Delay, d1 | 37.5 | 37.3 | 2.3 | 0.9 | 0.9 | 1.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.7 | 0.0 | 3.1 | 0.0 | 0.3 | 1.6 |
| Delay (s) | 39.2 | 37.3 | 5.4 | 0.9 | 1.2 | 3.4 |
| Level of Service | D | D | A | A | A | A |
| Approach Delay (s/veh) | 38.6 | | 5.3 | | | 3.3 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 4.7 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.70 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 71.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

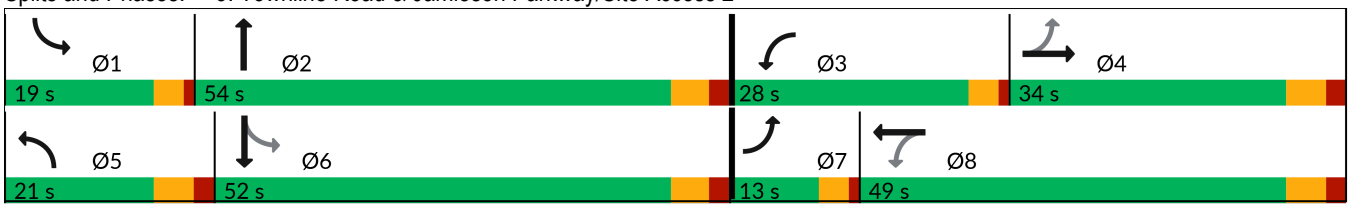


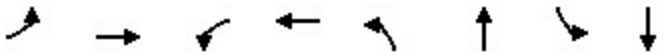
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| Future Volume (vph) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 45.0 | | 0.0 | 45.0 | | 0.0 | 115.0 | | 0.0 | 115.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 2 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 1.00 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.875 | | | 0.908 | | | 0.941 | | | 0.974 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1428 | 0 | 3235 | 1482 | 0 | 3203 | 3101 | 0 | 1668 | 3211 | 0 |
| Flt Permitted | 0.246 | | | 0.208 | | | 0.950 | | | 0.114 | | |
| Satd. Flow (perm) | 432 | 1428 | 0 | 708 | 1482 | 0 | 3203 | 3101 | 0 | 200 | 3211 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 169 | | | 62 | | | 120 | | | 20 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 114.3 | | | 135.6 | | | 285.4 | | | 335.6 | |
| Travel Time (s) | | 8.2 | | | 9.8 | | | 17.1 | | | 20.1 | |
| 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 (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Adj. Flow (vph) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 184 | 349 | 0 | 315 | 403 | 0 | 256 | 1073 | 0 | 188 | 749 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 | 1.11 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| 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 | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 9.0 | 31.0 | | 9.0 | 31.0 | | 11.0 | 50.4 | | 9.0 | 41.0 | |
| Total Split (s) | 13.0 | 34.0 | | 28.0 | 49.0 | | 21.0 | 54.0 | | 19.0 | 52.0 | |
| Total Split (%) | 9.6% | 25.2% | | 20.7% | 36.3% | | 15.6% | 40.0% | | 14.1% | 38.5% | |
| Maximum Green (s) | 9.0 | 28.0 | | 24.0 | 43.0 | | 15.0 | 48.0 | | 15.0 | 46.0 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 4.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | | 2.0 | 2.0 | | 1.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | 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 | |
| Recall Mode | None | None | | None | None | | None | Max | | None | Max | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 14.0 | | | 14.0 | |
| Flash Don't Walk (s) | | 18.0 | | | 18.0 | | | 21.0 | | | 21.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 40.7 | 29.6 | | 48.5 | 34.2 | | 13.7 | 48.8 | | 61.5 | 46.3 | |
| Actuated g/C Ratio | 0.32 | 0.24 | | 0.39 | 0.27 | | 0.11 | 0.39 | | 0.49 | 0.37 | |
| v/c Ratio | 0.80 | 0.75 | | 0.57 | 0.90 | | 0.73 | 0.84 | | 0.75 | 0.63 | |
| Control Delay (s/veh) | 55.5 | 33.4 | | 29.7 | 60.4 | | 68.3 | 39.2 | | 42.3 | 35.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 55.5 | 33.4 | | 29.7 | 60.4 | | 68.3 | 39.2 | | 42.3 | 35.7 | |
| LOS | E | C | | C | E | | E | D | | D | D | |
| Approach Delay (s/veh) | | 41.0 | | | 46.9 | | | 44.8 | | | 37.0 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 135 | | | |
| Actuated Cycle Length: 125.4 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.90 | | | |
| Intersection Signal Delay (s/veh): 42.6 | | Intersection LOS: D | |
| Intersection Capacity Utilization 99.4% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Townline Road & Jamieson Parkway/Site Access 2

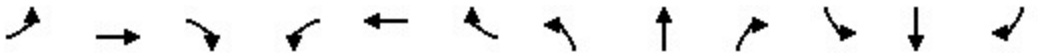




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 184 | 349 | 315 | 403 | 256 | 1073 | 188 | 749 |
| v/c Ratio | 0.80 | 0.75 | 0.57 | 0.90 | 0.73 | 0.84 | 0.75 | 0.63 |
| Control Delay (s/veh) | 55.5 | 33.4 | 29.7 | 60.4 | 68.3 | 39.2 | 42.3 | 35.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.5 | 33.4 | 29.7 | 60.4 | 68.3 | 39.2 | 42.3 | 35.7 |
| Queue Length 50th (m) | 31.0 | 42.9 | 27.0 | 84.0 | 32.4 | 118.5 | 24.9 | 80.1 |
| Queue Length 95th (m) | #60.7 | 81.2 | 37.1 | #127.0 | 49.2 | #170.8 | #60.5 | 109.6 |
| Internal Link Dist (m) | | 90.3 | | 111.6 | | 261.4 | | 311.6 |
| Turn Bay Length (m) | 45.0 | | 45.0 | | 115.0 | | 115.0 | |
| Base Capacity (vph) | 229 | 486 | 765 | 552 | 385 | 1279 | 278 | 1198 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 0.72 | 0.41 | 0.73 | 0.66 | 0.84 | 0.68 | 0.63 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| Future Volume (vph) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1775 | 1775 | 1775 | 1775 | 1775 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.97 | 1.00 | | 0.97 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.91 | | 1.00 | 0.94 | | 1.00 | 0.97 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1428 | | 3235 | 1482 | | 3203 | 3101 | | 1668 | 3211 | |
| Flt Permitted | 0.25 | 1.00 | | 0.21 | 1.00 | | 0.95 | 1.00 | | 0.11 | 1.00 | |
| Satd. Flow (perm) | 432 | 1428 | | 708 | 1482 | | 3203 | 3101 | | 200 | 3211 | |
| 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) | 184 | 58 | 291 | 315 | 156 | 247 | 256 | 653 | 420 | 188 | 620 | 129 |
| RTOR Reduction (vph) | 0 | 129 | 0 | 0 | 45 | 0 | 0 | 73 | 0 | 0 | 13 | 0 |
| Lane Group Flow (vph) | 184 | 220 | 0 | 315 | 358 | 0 | 256 | 1000 | 0 | 188 | 736 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 0% | 0% | 1% | 2% |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Prot | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | | | | 6 | | |
| Actuated Green, G (s) | 38.8 | 29.7 | | 47.3 | 34.2 | | 13.7 | 48.8 | | 59.5 | 46.3 | |
| Effective Green, g (s) | 38.8 | 29.7 | | 47.3 | 34.2 | | 13.7 | 48.8 | | 59.5 | 46.3 | |
| Actuated g/C Ratio | 0.31 | 0.24 | | 0.38 | 0.27 | | 0.11 | 0.39 | | 0.47 | 0.37 | |
| Clearance Time (s) | 4.0 | 6.0 | | 4.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 223 | 338 | | 541 | 404 | | 350 | 1207 | | 249 | 1186 | |
| v/s Ratio Prot | c0.06 | 0.15 | | c0.06 | c0.24 | | c0.08 | c0.32 | | 0.08 | 0.23 | |
| v/s Ratio Perm | 0.20 | | | 0.16 | | | | | | 0.28 | | |
| v/c Ratio | 0.83 | 0.65 | | 0.58 | 0.89 | | 0.73 | 0.83 | | 0.76 | 0.62 | |
| Uniform Delay, d1 | 37.0 | 43.1 | | 29.0 | 43.7 | | 54.0 | 34.5 | | 24.1 | 32.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 21.3 | 4.4 | | 1.6 | 20.1 | | 7.7 | 6.6 | | 12.2 | 2.5 | |
| Delay (s) | 58.3 | 47.6 | | 30.6 | 63.8 | | 61.7 | 41.1 | | 36.4 | 34.8 | |
| Level of Service | E | D | | C | E | | E | D | | D | C | |
| Approach Delay (s/veh) | | 51.3 | | | 49.2 | | | 45.1 | | | 35.1 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 44.2 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.86 | | |
| Actuated Cycle Length (s) | 125.3 | Sum of lost time (s) | 22.0 |
| Intersection Capacity Utilization | 99.4% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

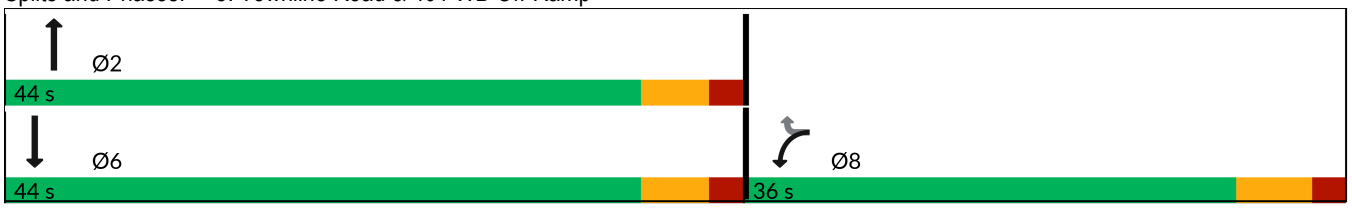
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 449 | 254 | 1074 | 0 | 0 | 887 |
| Future Volume (vph) | 449 | 254 | 1074 | 0 | 0 | 887 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | 0 | 0 | 3500 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 53 | | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 117.7 | | 411.0 | | | 285.4 |
| Travel Time (s) | 8.5 | | 24.7 | | | 17.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Adj. Flow (vph) | 449 | 254 | 1074 | 0 | 0 | 887 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 449 | 254 | 1074 | 0 | 0 | 887 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 7.0 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 |
| Detector Template | Left | Right | Thru | | | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Detector Phase | 8 | 8 | 2 | | | 6 |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 8.0 | | | 8.0 |
| Minimum Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (s) | 36.0 | 36.0 | 44.0 | | | 44.0 |
| Total Split (%) | 45.0% | 45.0% | 55.0% | | | 55.0% |
| Maximum Green (s) | 29.5 | 29.5 | 38.0 | | | 38.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.0 | | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Recall Mode | None | None | Max | | | Max |
| Walk Time (s) | 10.0 | 10.0 | 33.0 | | | 33.0 |
| Flash Don't Walk (s) | 19.5 | 19.5 | 5.0 | | | 5.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 15.8 | 15.8 | 38.2 | | | 38.2 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.57 | | | 0.57 |
| v/c Ratio | 0.61 | 0.66 | 0.53 | | | 0.44 |
| Control Delay (s/veh) | 26.1 | 26.3 | 10.7 | | | 9.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 26.1 | 26.3 | 10.7 | | | 9.8 |
| LOS | C | C | B | | | A |
| Approach Delay (s/veh) | 26.2 | | 10.7 | | | 9.8 |
| Approach LOS | C | | B | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 66.6 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.66 | | | |
| Intersection Signal Delay (s/veh): 14.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 57.2% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: Townline Road & 401 WB Off-Ramp



| Lane Group | WBL | WBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 449 | 254 | 1074 | 887 |
| v/c Ratio | 0.61 | 0.66 | 0.53 | 0.44 |
| Control Delay (s/veh) | 26.1 | 26.3 | 10.7 | 9.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 26.1 | 26.3 | 10.7 | 9.8 |
| Queue Length 50th (m) | 25.4 | 22.1 | 36.0 | 27.7 |
| Queue Length 95th (m) | 37.7 | 42.6 | 70.7 | 55.2 |
| Internal Link Dist (m) | 93.7 | | 387.0 | 261.4 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1372 | 677 | 2027 | 2008 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.33 | 0.38 | 0.53 | 0.44 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 449 | 254 | 1074 | 0 | 0 | 887 |
| Future Volume (vph) | 449 | 254 | 1074 | 0 | 0 | 887 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Lane Util. Factor | 0.97 | 1.00 | 0.95 | | | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 3081 | 1456 | 3535 | | | 3500 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 3081 | 1456 | 3535 | | | 3500 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 449 | 254 | 1074 | 0 | 0 | 887 |
| RTOR Reduction (vph) | 0 | 40 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 449 | 214 | 1074 | 0 | 0 | 887 |
| Heavy Vehicles (%) | 5% | 1% | 1% | 0% | 0% | 2% |
| Turn Type | Prot | Perm | NA | | | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | | |
| Actuated Green, G (s) | 15.8 | 15.8 | 38.2 | | | 38.2 |
| Effective Green, g (s) | 15.8 | 15.8 | 38.2 | | | 38.2 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.57 | | | 0.57 |
| Clearance Time (s) | 6.5 | 6.5 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | 3.0 |
| Lane Grp Cap (vph) | 732 | 345 | 2030 | | | 2010 |
| v/s Ratio Prot | 0.15 | | c0.30 | | | 0.25 |
| v/s Ratio Perm | | c0.15 | | | | |
| v/c Ratio | 0.61 | 0.62 | 0.53 | | | 0.44 |
| Uniform Delay, d1 | 22.6 | 22.7 | 8.7 | | | 8.1 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.5 | 3.3 | 1.0 | | | 0.7 |
| Delay (s) | 24.2 | 26.0 | 9.6 | | | 8.8 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s/veh) | 24.8 | | 9.6 | | | 8.8 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 13.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.55 | | |
| Actuated Cycle Length (s) | 66.5 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 57.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

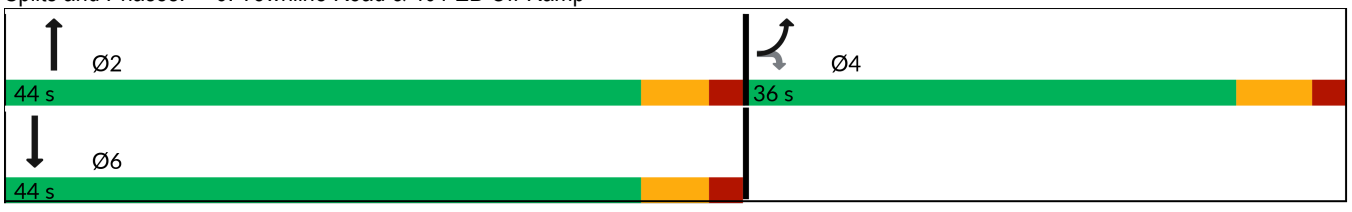
c Critical Lane Group

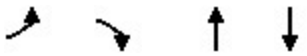
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| Future Volume (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.850 | | | 0.978 | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1635 | 1456 | 0 | 3500 | 3433 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1635 | 1456 | 0 | 3500 | 3433 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 42 | | | 32 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Adj. Flow (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 504 | 581 | 0 | 833 | 1344 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 3.5 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (%) | 45.0% | 45.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 32.0 | 32.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Actuated g/C Ratio | 0.37 | 0.37 | | 0.48 | 0.48 | |
| v/c Ratio | 0.84 | 1.03 | | 0.50 | 0.82 | |
| Control Delay (s/veh) | 37.7 | 72.3 | | 15.8 | 22.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 37.7 | 72.3 | | 15.8 | 22.6 | |
| LOS | D | E | | B | C | |
| Approach Delay (s/veh) | 56.3 | | | 15.8 | 22.6 | |
| Approach LOS | E | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 1.03 | | | |
| Intersection Signal Delay (s/veh): 32.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 87.4% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 504 | 581 | 833 | 1344 |
| v/c Ratio | 0.84 | 1.03 | 0.50 | 0.82 |
| Control Delay (s/veh) | 37.7 | 72.3 | 15.8 | 22.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.7 | 72.3 | 15.8 | 22.6 |
| Queue Length 50th (m) | 68.5 | ~91.8 | 43.7 | 85.9 |
| Queue Length 95th (m) | #120.6 | #151.4 | 58.8 | 113.6 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 602 | 563 | 1662 | 1647 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.84 | 1.03 | 0.50 | 0.82 |

Intersection Summary

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

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| Future Volume (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1635 | 1456 | | 3500 | 3434 | |
| Flt Permitted | 0.95 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1635 | 1456 | | 3500 | 3434 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| RTOR Reduction (vph) | 0 | 27 | 0 | 0 | 17 | 0 |
| Lane Group Flow (vph) | 504 | 554 | 0 | 833 | 1327 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Effective Green, g (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Actuated g/C Ratio | 0.37 | 0.37 | | 0.48 | 0.48 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 602 | 536 | | 1662 | 1631 | |
| v/s Ratio Prot | 0.31 | | | 0.24 | c0.39 | |
| v/s Ratio Perm | | c0.38 | | | | |
| v/c Ratio | 0.84 | 1.03 | | 0.50 | 0.81 | |
| Uniform Delay, d1 | 23.1 | 25.3 | | 14.5 | 18.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 9.9 | 48.1 | | 1.1 | 4.6 | |
| Delay (s) | 32.9 | 73.3 | | 15.6 | 22.5 | |
| Level of Service | C | E | | B | C | |
| Approach Delay (s/veh) | 54.5 | | | 15.6 | 22.5 | |
| Approach LOS | D | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 31.4 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.91 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 87.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

# E-1 Site Access 1 and Townline Road Signal Warrant

# Justification 7 - Projected Volumes

Intersection: Site Access 1 and Townline Road Alt A  Count Date: 2026-02-18

Return to Justifications 1 - 6

## INPUT

**PRIOR TO START - FILL OUT GEOMETRY INPUTS IN THE INPUT DATA SPREADSHEET - STEPS A to D**

a.- Both Intersection Roads Exist? No

b.- What kind of count estimate available? AM PM Peak Hour  **Proceed to c2**

**c1**.- 8-Hour Count Estimate

| Hour Ending | Main Northbound Approach | | | Minor Eastbound Approach | | | Main Southbound Approach | | | Minor Westbound Approach | | | Pedestrians Crossing Main Road |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | |
| 7:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 8:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 9:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 15:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 16:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 17:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 18:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

**c2**.- Peak Hour Estimate

| Peak Hour | Main Northbound Approach | | | Minor Eastbound Approach | | | Main Southbound Approach | | | Minor Westbound Approach | | | Pedestrians Crossing Main Road |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | |
| AM Peak Hour | 0 | 723 | 75 | 0 | 0 | 0 | 100 | 901 | 0 | 15 | 0 | 7 | 0 |
| PM Peak Hour | 0 | 1,426 | 25 | 0 | 0 | 0 | 36 | 776 | 0 | 55 | 0 | 25 | 0 |
| **AHV** | 0 | 537 | 25 | 0 | 0 | 0 | 34 | 419 | 0 | 18 | 0 | 8 | 0 |
| | **Main Street AHV Sum** | | | **Minor Street AHV Sum** | | | | | | | | | |
| | **1,016** | | | **26** | | | | | | | | | |

**c3**.- AADT Estimate - can leave movements without data blank. If midblock reading, can assign demand to through movement.

| AADT | Main Northbound Approach | | | Minor Eastbound Approach | | | Main Southbound Approach | | | Minor Westbound Approach | | | Pedestrians Crossing Main Road |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | |
| | | | | | | | | | | | | | |
| **AHV** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Main Street AHV Sum** | | | **Minor Street AHV Sum** | | | | | | | | | |
| | **0** | | | **0** | | | | | | | | | |

d. Justification 7 Result

| Justification | Description | Minimum Requirement 1 Lane Highways | | Minimum Requirement 2 or more lanes | | Compliance | | Case? |
|---|---|---|---|---|---|---|---|---|
| | | Free Flow | Restr. Flow | Free Flow | Restr. Flow | Numerical | % | |
| 1. Minimum Vehicular Volume | A. Vehicle volume, all approaches (average hour) | - | - | - | 900 | 1041 | 115.7 | **Case 2 - Might be Warranted** |
| | B. Vehicle volume, along minor streets (average hour) | - | - | - | 255 | 26 | 10.0 | |
| 2. Delay to cross Traffic | A. Vehicle volume, major street (average hour) | - | - | - | 900 | 1016 | 112.8 | |
| | B. Combined vehicle and pedestrian volume crossing | - | - | - | 75 | 18 | 23.3 | |

# Justification 7 - Projected Volumes

Intersection: Site Access 1 and Townline Road Alt B  Count Date: 2026-02-18

Return to Justifications 1 - 6

## INPUT

**PRIOR TO START - FILL OUT GEOMETRY INPUTS IN THE INPUT DATA SPREADSHEET - STEPS A to D**

a.- Both Intersection Roads Exist? No

b.- What kind of count estimate available? AM PM Peak Hour  Proceed to c2

**c1**.- 8-Hour Count Estimate

| Hour Ending | Main Northbound Approach | | | Minor Eastbound Approach | | | Main Southbound Approach | | | Minor Westbound Approach | | | Pedestrians Crossing Main Road |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | |
| 7:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 8:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 9:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 10:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 15:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 16:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 17:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 18:00 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

**c2**.- Peak Hour Estimate

| Peak Hour | Main Northbound Approach | | | Minor Eastbound Approach | | | Main Southbound Approach | | | Minor Westbound Approach | | | Pedestrians Crossing Main Road |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | |
| AM Peak Hour | 0 | 721 | 112 | 0 | 0 | 0 | 58 | 903 | 0 | 26 | 0 | 23 | 0 |
| PM Peak Hour | 0 | 1,316 | 54 | 0 | 0 | 0 | 24 | 713 | 0 | 85 | 0 | 68 | 0 |
| **AHV** | 0 | 509 | 42 | 0 | 0 | 0 | 21 | 404 | 0 | 28 | 0 | 23 | 0 |
| | **Main Street AHV Sum** | | | **Minor Street AHV Sum** | | | | | | | | | |
| | **975** | | | **51** | | | | | | | | | |

**c3**.- AADT Estimate - can leave movements without data blank. If midblock reading, can assign demand to through movement.

| AADT | Main Northbound Approach | | | Minor Eastbound Approach | | | Main Southbound Approach | | | Minor Westbound Approach | | | Pedestrians Crossing Main Road |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | TH | RT | LT | TH | RT | LT | TH | RT | LT | TH | RT | |
| | | | | | | | | | | | | | |
| **AHV** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **Main Street AHV Sum** | | | **Minor Street AHV Sum** | | | | | | | | | |
| | **0** | | | **0** | | | | | | | | | |

d. Justification 7 Result

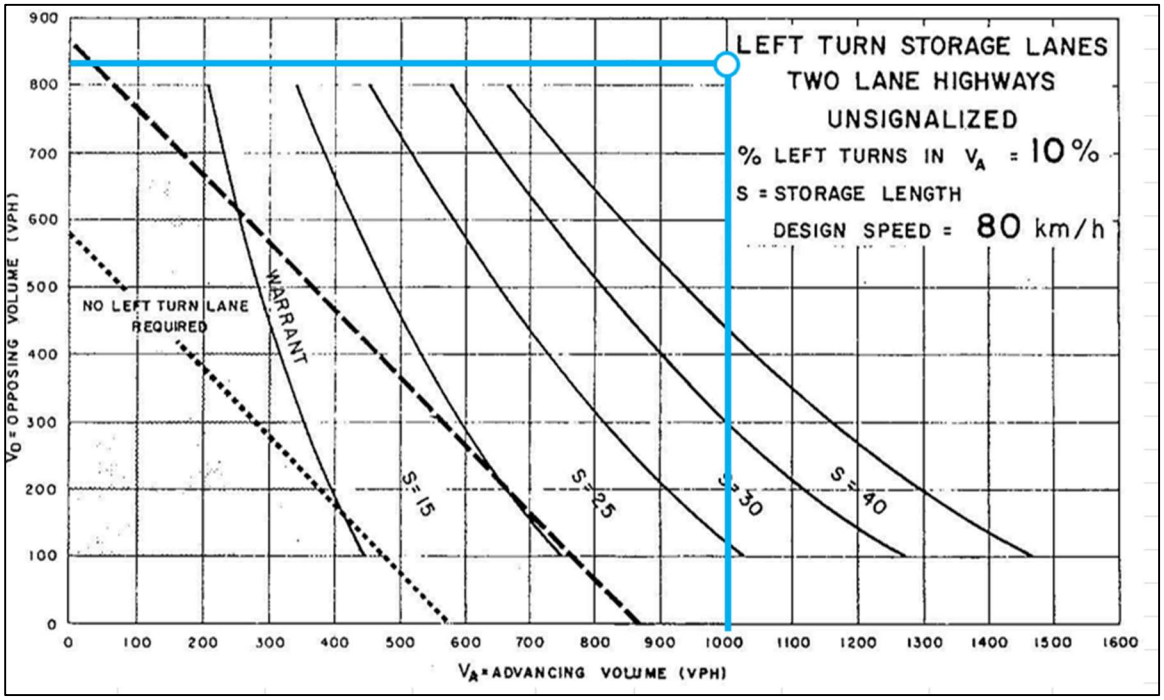
| Justification | Description | Minimum Requirement 1 Lane Highways | | Minimum Requirement 2 or more lanes | | Compliance | | Case? |
|---|---|---|---|---|---|---|---|---|
| | | Free Flow | Restr. Flow | Free Flow | Restr. Flow | Numerical | % | |
| 1. Minimum Vehicular Volume | A. Vehicle volume, all approaches (average hour) | - | - | - | 900 | 1026 | 114.0 | **Case 2 - Might be Warranted** |
| | B. Vehicle volume, along minor streets (average hour) | - | - | - | 255 | 51 | 19.8 | |
| 2. Delay to cross Traffic | A. Vehicle volume, major street (average hour) | - | - | - | 900 | 975 | 108.4 | |
| | B. Combined vehicle and pedestrian volume crossing | - | - | - | 75 | 28 | 37.0 | |

# E-2 Site Access 1 and Townline Road Left-Turn Lane Warrant

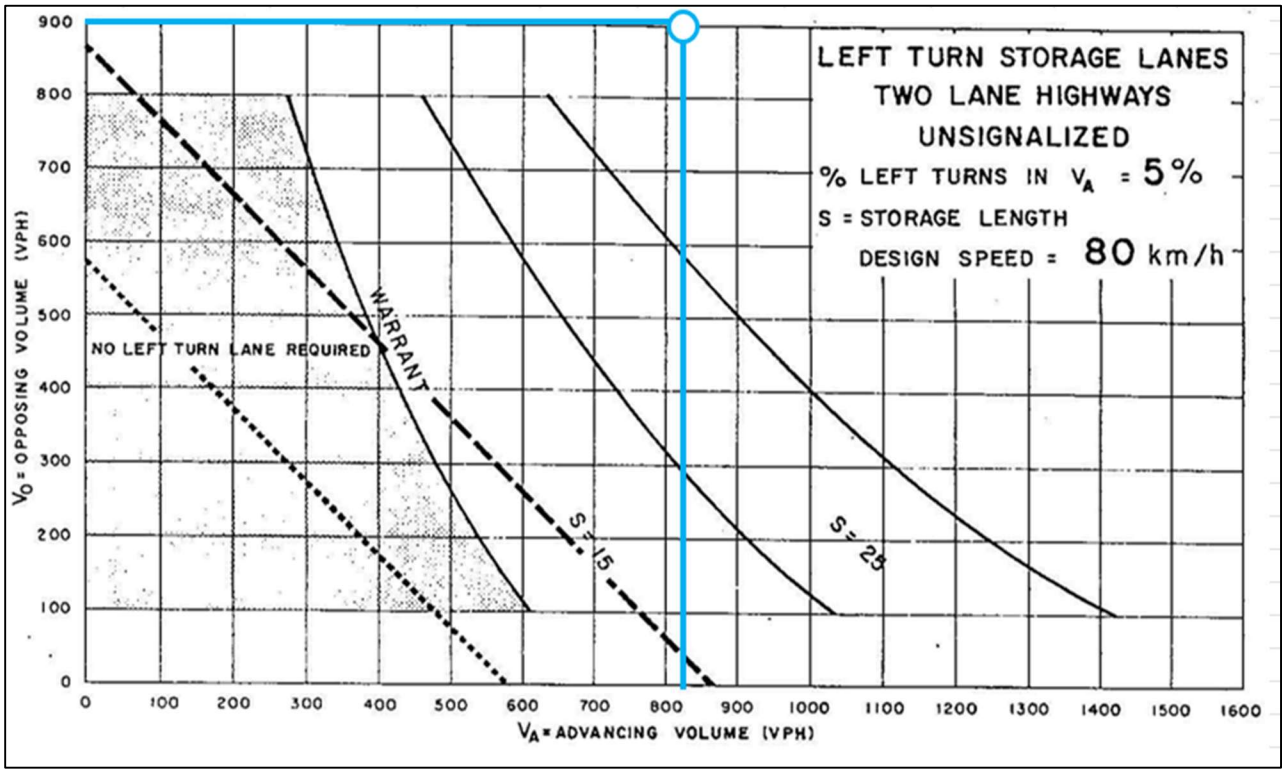
Site Access 1 and Townline Road – Future Total 2028 Site Plan A

| Peak Hour | AM | PM | Saturday |
|---|---|---|---|
| Advancing Traffic Volume $V_a$ | 1001 | 812 | 813 |
| Opposing Traffic Volume $V_O$ | 833 | 1451 | 923 |
| Left Turn Traffic | 100 | 36 | 21 |
| Left Turn Traffic Percentage | 10% | 4.4% | 2.6% |
| Left Turn Warrant | Yes | Yes | Yes |

AM PEAK HOUR



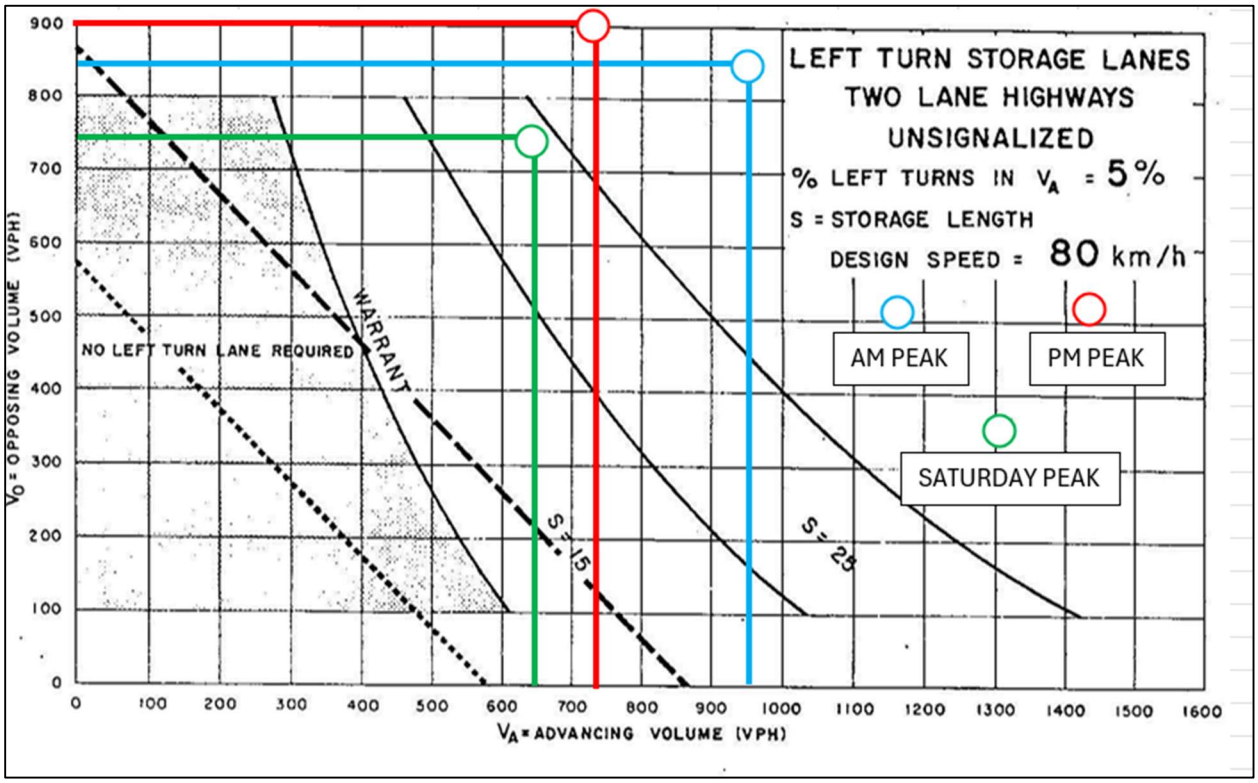
PM PEAK HOUR AND SATURDAY PEAK



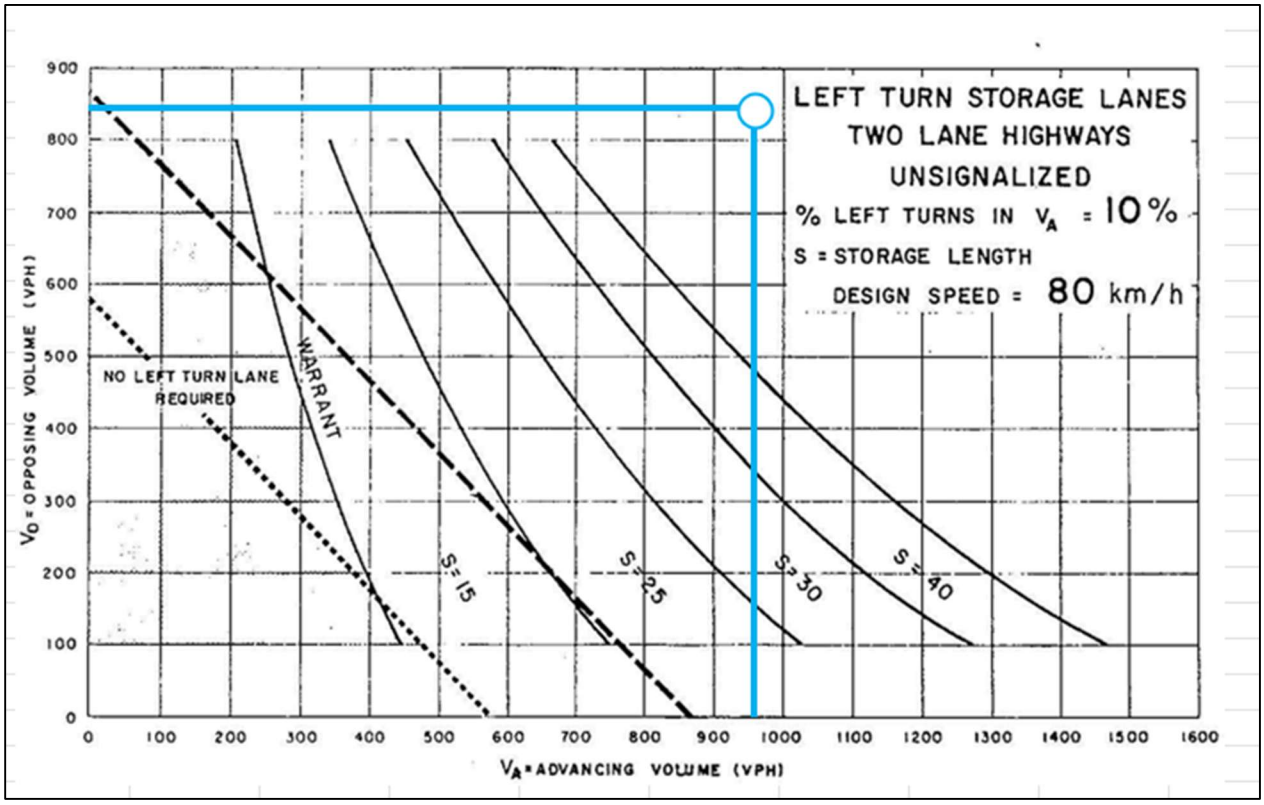

Site Access 1 and Townline Road – Future Total 2028 Site Plan B

| Peak Hour | AM | PM | Saturday |
|---|---|---|---|
| Advancing Traffic Volume $V_a$ | 961 | 737 | 641 |
| Opposing Traffic Volume $V_O$ | 833 | 1370 | 730 |
| Left Turn Traffic | 58 | 24 | 14 |
| Left Turn Traffic Percentage | 6% | 3.3% | 2.2% |
| Left Turn Warrant | Yes | Yes | Yes |

AM PEAK, PM PEAK AND SATURDAY PEAK

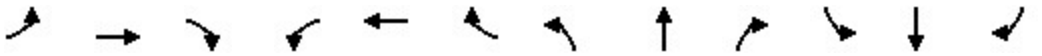



AM PEAK HOUR (10% LEFT TURN GRAPH)



# Appendix F

## Intersection Improvement Synchro Reports

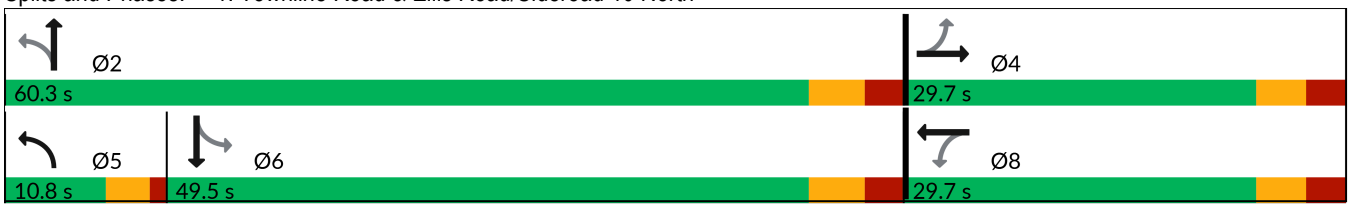


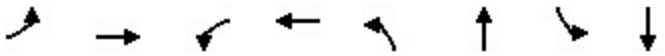
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| Future Volume (vph) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.866 | | | 0.965 | | | 0.985 | | | 0.994 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1388 | 0 | 1668 | 1575 | 0 | 1603 | 2933 | 0 | 1334 | 2995 | 0 |
| Flt Permitted | 0.746 | | | 0.284 | | | 0.261 | | | 0.358 | | |
| Satd. Flow (perm) | 1296 | 1388 | 0 | 498 | 1575 | 0 | 441 | 2933 | 0 | 503 | 2995 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 246 | | | 4 | | | 23 | | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Adj. Flow (vph) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 104 | 335 | 0 | 66 | 17 | 0 | 140 | 775 | 0 | 4 | 856 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 9.0 | 49.5 | | 49.5 | 49.5 | |
| Total Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 10.8 | 60.3 | | 49.5 | 49.5 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 12.0% | 67.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 23.7 | 23.7 | | 23.7 | 23.7 | | 6.8 | 54.0 | | 43.2 | 43.2 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 35.2 | | 35.2 | 35.2 | |
| Flash Don't Walk (s) | 13.7 | 13.7 | | 13.7 | 13.7 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 56.6 | 54.3 | | 43.6 | 43.6 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.17 | 0.17 | | 0.70 | 0.67 | | 0.54 | 0.54 | |
| v/c Ratio | 0.46 | 0.75 | | 0.76 | 0.06 | | 0.35 | 0.39 | | 0.01 | 0.53 | |
| Control Delay (s/veh) | 35.8 | 20.4 | | 78.5 | 22.7 | | 7.5 | 7.3 | | 11.5 | 14.5 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 35.8 | 20.4 | | 78.5 | 22.7 | | 7.5 | 7.3 | | 11.5 | 14.5 | |
| LOS | D | C | | E | C | | A | A | | B | B | |
| Approach Delay (s/veh) | | 24.0 | | | 67.0 | | | 7.3 | | | 14.4 | |
| Approach LOS | | C | | | E | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 80.8 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.76 | | | |
| Intersection Signal Delay (s/veh): 15.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 81.9% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

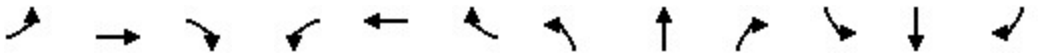




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 104 | 335 | 66 | 17 | 140 | 775 | 4 | 856 |
| v/c Ratio | 0.46 | 0.75 | 0.76 | 0.06 | 0.35 | 0.39 | 0.01 | 0.53 |
| Control Delay (s/veh) | 35.8 | 20.4 | 78.5 | 22.7 | 7.5 | 7.3 | 11.5 | 14.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.8 | 20.4 | 78.5 | 22.7 | 7.5 | 7.3 | 11.5 | 14.5 |
| Queue Length 50th (m) | 14.4 | 12.1 | 9.7 | 1.7 | 5.8 | 22.7 | 0.3 | 41.0 |
| Queue Length 95th (m) | 28.2 | 39.1 | #25.6 | 6.6 | 16.3 | 46.1 | 2.1 | 72.2 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 382 | 582 | 147 | 467 | 407 | 1979 | 271 | 1620 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.27 | 0.58 | 0.45 | 0.04 | 0.34 | 0.39 | 0.01 | 0.53 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| Future Volume (vph) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1388 | | 1668 | 1574 | | 1603 | 2934 | | 1334 | 2995 | |
| Flt Permitted | 0.75 | 1.00 | | 0.28 | 1.00 | | 0.26 | 1.00 | | 0.36 | 1.00 | |
| Satd. Flow (perm) | 1297 | 1388 | | 498 | 1574 | | 440 | 2934 | | 503 | 2995 | |
| 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) | 104 | 36 | 299 | 66 | 13 | 4 | 140 | 699 | 76 | 4 | 821 | 35 |
| RTOR Reduction (vph) | 0 | 203 | 0 | 0 | 3 | 0 | 0 | 8 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 104 | 132 | 0 | 66 | 14 | 0 | 140 | 767 | 0 | 4 | 853 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 54.3 | 54.3 | | 43.7 | 43.7 | |
| Effective Green, g (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 54.3 | 54.3 | | 43.7 | 43.7 | |
| Actuated g/C Ratio | 0.17 | 0.17 | | 0.17 | 0.17 | | 0.67 | 0.67 | | 0.54 | 0.54 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 226 | 242 | | 87 | 275 | | 391 | 1974 | | 272 | 1621 | |
| v/s Ratio Prot | | 0.10 | | | 0.01 | | 0.03 | c0.26 | | | c0.28 | |
| v/s Ratio Perm | 0.08 | | | c0.13 | | | 0.21 | | | 0.01 | | |
| v/c Ratio | 0.46 | 0.55 | | 0.76 | 0.05 | | 0.36 | 0.39 | | 0.01 | 0.53 | |
| Uniform Delay, d1 | 29.9 | 30.4 | | 31.7 | 27.7 | | 5.6 | 5.8 | | 8.6 | 11.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.5 | 2.5 | | 30.9 | 0.1 | | 0.6 | 0.6 | | 0.1 | 1.2 | |
| Delay (s) | 31.4 | 32.9 | | 62.6 | 27.8 | | 6.1 | 6.4 | | 8.6 | 13.1 | |
| Level of Service | C | C | | E | C | | A | A | | A | B | |
| Approach Delay (s/veh) | | 32.5 | | | 55.4 | | | 6.4 | | | 13.1 | |
| Approach LOS | | C | | | E | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 15.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.57 | | |
| Actuated Cycle Length (s) | 80.7 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 81.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

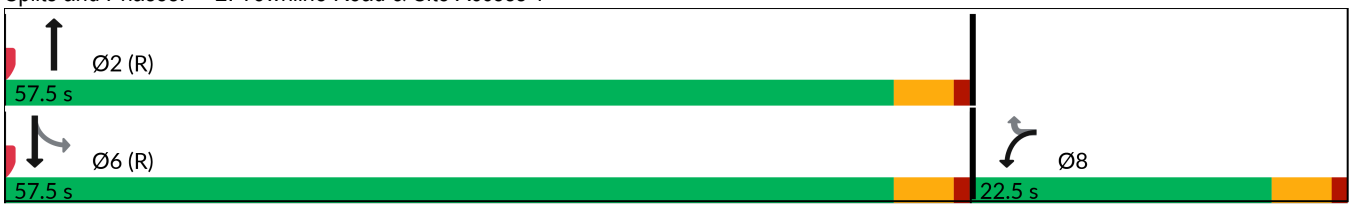
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| Future Volume (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 |
| Frt | | 0.850 | 0.989 | | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 3234 | 0 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.290 | |
| Satd. Flow (perm) | 1626 | 1454 | 3234 | 0 | 534 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 7 | 23 | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 15 | 7 | 983 | 0 | 100 | 1084 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Right | Thru | | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 2 | | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 57.5 | | 57.5 | 57.5 |
| Total Split (%) | 28.1% | 28.1% | 71.9% | | 71.9% | 71.9% |
| Maximum Green (s) | 18.0 | 18.0 | 53.0 | | 53.0 | 53.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | 0 | 0 |
| Act Effct Green (s) | 6.3 | 6.3 | 73.5 | | 73.5 | 73.5 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.92 | | 0.92 | 0.92 |
| v/c Ratio | 0.12 | 0.06 | 0.33 | | 0.20 | 0.64 |
| Control Delay (s/veh) | 35.7 | 21.0 | 1.5 | | 2.5 | 4.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.1 |
| Total Delay (s/veh) | 35.7 | 21.0 | 1.5 | | 2.5 | 4.6 |
| LOS | D | C | A | | A | A |
| Approach Delay (s/veh) | 31.0 | | 1.5 | | | 4.4 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.64 | | | |
| Intersection Signal Delay (s/veh): 3.4 | | Intersection LOS: A | |
| Intersection Capacity Utilization 68.7% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 15 | 7 | 983 | 100 | 1084 |
| v/c Ratio | 0.12 | 0.06 | 0.33 | 0.20 | 0.64 |
| Control Delay (s/veh) | 35.7 | 21.0 | 1.5 | 2.5 | 4.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Total Delay (s/veh) | 35.7 | 21.0 | 1.5 | 2.5 | 4.6 |
| Queue Length 50th (m) | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Queue Length 95th (m) | 7.5 | 3.6 | 21.9 | 6.7 | 101.0 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | 161.7 |
| Turn Bay Length (m) | | | | | |
| Base Capacity (vph) | 365 | 332 | 2973 | 490 | 1692 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 44 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.04 | 0.02 | 0.33 | 0.20 | 0.66 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| Future Volume (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 3232 | | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | 0.29 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 3232 | | 535 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 15 | 7 | 908 | 75 | 100 | 1084 |
| RTOR Reduction (vph) | 0 | 7 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 15 | 0 | 980 | 0 | 100 | 1084 |
| Turn Type | Prot | Perm | NA | | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Actuated Green, G (s) | 2.9 | 2.9 | 68.1 | | 68.1 | 68.1 |
| Effective Green, g (s) | 2.9 | 2.9 | 68.1 | | 68.1 | 68.1 |
| Actuated g/C Ratio | 0.04 | 0.04 | 0.85 | | 0.85 | 0.85 |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 58 | 52 | 2751 | | 455 | 1568 |
| v/s Ratio Prot | c0.01 | | 0.30 | | | c0.59 |
| v/s Ratio Perm | | 0.00 | | | 0.19 | |
| v/c Ratio | 0.26 | 0.00 | 0.36 | | 0.22 | 0.69 |
| Uniform Delay, d1 | 37.5 | 37.2 | 1.3 | | 1.1 | 2.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.4 | 0.0 | 0.4 | | 1.1 | 2.5 |
| Delay (s) | 39.9 | 37.2 | 1.6 | | 2.2 | 4.7 |
| Level of Service | D | D | A | | A | A |
| Approach Delay (s/veh) | 39.0 | | 1.6 | | | 4.5 |
| Approach LOS | D | | A | | | A |

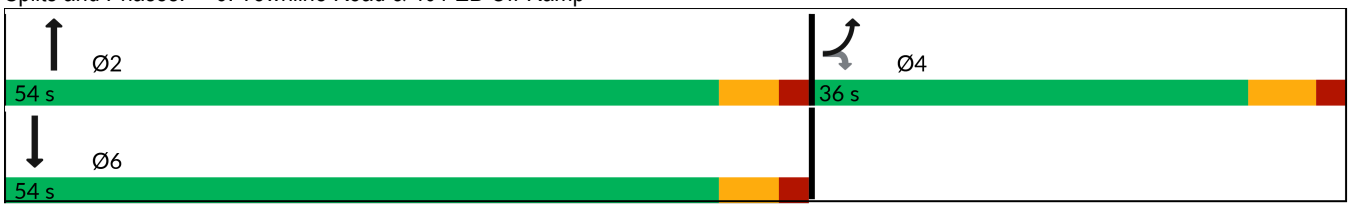
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 3.5 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 68.7% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

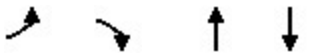
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| Future Volume (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | 0.956 | 0.850 | | | 0.980 | |
| Flt Protected | 0.966 | | | | | |
| Satd. Flow (prot) | 3024 | 1287 | 0 | 3433 | 3298 | 0 |
| Flt Permitted | 0.966 | | | | | |
| Satd. Flow (perm) | 3024 | 1287 | 0 | 3433 | 3298 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 38 | 38 | | | 29 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Adj. Flow (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| Shared Lane Traffic (%) | | 39% | | | | |
| Lane Group Flow (vph) | 729 | 334 | 0 | 1179 | 1528 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 7.0 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 54.0 | 42.0 | |
| Total Split (s) | 36.0 | 36.0 | | 54.0 | 54.0 | |
| Total Split (%) | 40.0% | 40.0% | | 60.0% | 60.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 10.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 19.5 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 25.1 | 25.1 | | 48.2 | 48.2 | |
| Actuated g/C Ratio | 0.29 | 0.29 | | 0.56 | 0.56 | |
| v/c Ratio | 0.80 | 0.83 | | 0.61 | 0.82 | |
| Control Delay (s/veh) | 33.8 | 43.4 | | 15.0 | 20.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 33.8 | 43.4 | | 15.0 | 20.7 | |
| LOS | C | D | | B | C | |
| Approach Delay (s/veh) | 36.8 | | | 15.0 | 20.7 | |
| Approach LOS | D | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 85.8 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.83 | | | |
| Intersection Signal Delay (s/veh): 23.4 | | Intersection LOS: C | |
| Intersection Capacity Utilization 78.1% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 729 | 334 | 1179 | 1528 |
| v/c Ratio | 0.80 | 0.83 | 0.61 | 0.82 |
| Control Delay (s/veh) | 33.8 | 43.4 | 15.0 | 20.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 33.8 | 43.4 | 15.0 | 20.7 |
| Queue Length 50th (m) | 53.7 | 49.7 | 68.4 | 106.1 |
| Queue Length 95th (m) | 73.6 | #94.0 | 92.6 | 144.8 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1068 | 468 | 1927 | 1864 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.68 | 0.71 | 0.61 | 0.82 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| Future Volume (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 0.97 | 0.91 | | 0.95 | 0.95 | |
| Frt | 0.96 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 3023 | 1287 | | 3433 | 3299 | |
| Flt Permitted | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 3023 | 1287 | | 3433 | 3299 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 515 | 548 | 0 | 1179 | 1326 | 202 |
| RTOR Reduction (vph) | 27 | 27 | 0 | 0 | 13 | 0 |
| Lane Group Flow (vph) | 702 | 307 | 0 | 1179 | 1515 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 25.1 | 25.1 | | 48.2 | 48.2 | |
| Effective Green, g (s) | 25.1 | 25.1 | | 48.2 | 48.2 | |
| Actuated g/C Ratio | 0.29 | 0.29 | | 0.56 | 0.56 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 884 | 376 | | 1928 | 1853 | |
| v/s Ratio Prot | 0.23 | | | 0.34 | c0.46 | |
| v/s Ratio Perm | | c0.24 | | | | |
| v/c Ratio | 0.79 | 0.82 | | 0.61 | 0.82 | |
| Uniform Delay, d1 | 28.0 | 28.2 | | 12.6 | 15.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 5.0 | 12.9 | | 1.5 | 4.1 | |
| Delay (s) | 32.9 | 41.1 | | 14.0 | 19.4 | |
| Level of Service | C | D | | B | B | |
| Approach Delay (s/veh) | 35.5 | | | 14.0 | 19.4 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 22.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.82 | | |
| Actuated Cycle Length (s) | 85.8 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 78.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

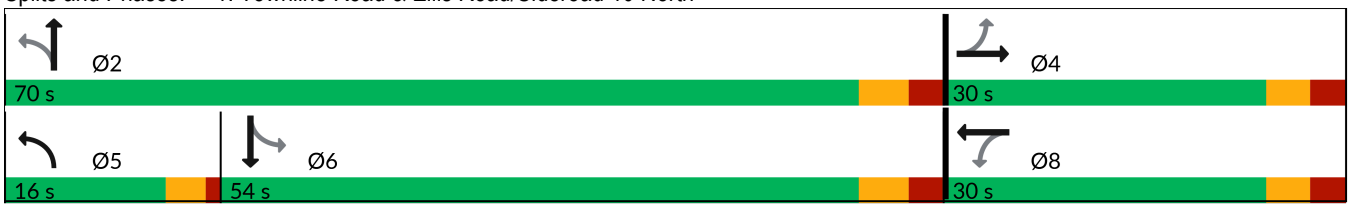
c Critical Lane Group

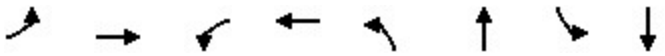
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| Future Volume (vph) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.868 | | | 0.969 | | | 0.987 | | | 0.985 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1392 | 0 | 1635 | 1581 | 0 | 1668 | 3032 | 0 | 1668 | 2942 | 0 |
| Flt Permitted | 0.719 | | | 0.460 | | | 0.301 | | | 0.217 | | |
| Satd. Flow (perm) | 1262 | 1392 | 0 | 792 | 1581 | 0 | 528 | 3032 | 0 | 381 | 2942 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 189 | | | 12 | | | 20 | | | 16 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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 (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 49 | 214 | 0 | 112 | 59 | 0 | 442 | 1276 | 0 | 10 | 735 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 9.0 | 54.0 | | 54.0 | 54.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 16.0 | 70.0 | | 54.0 | 54.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 16.0% | 70.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 12.0 | 63.7 | | 47.7 | 47.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 39.7 | | 39.7 | 39.7 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 66.2 | 63.9 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.71 | 0.69 | | 0.52 | 0.52 | |
| v/c Ratio | 0.22 | 0.54 | | 0.81 | 0.20 | | 0.84 | 0.61 | | 0.05 | 0.48 | |
| Control Delay (s/veh) | 34.1 | 12.2 | | 74.3 | 27.9 | | 24.3 | 9.9 | | 14.3 | 16.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.2 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 34.1 | 12.2 | | 74.3 | 27.9 | | 24.3 | 10.2 | | 14.3 | 16.2 | |
| LOS | C | B | | E | C | | C | B | | B | B | |
| Approach Delay (s/veh) | | 16.3 | | | 58.3 | | | 13.8 | | | 16.2 | |
| Approach LOS | | B | | | E | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 92.6 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.84 | | | |
| Intersection Signal Delay (s/veh): 17.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 90.1% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

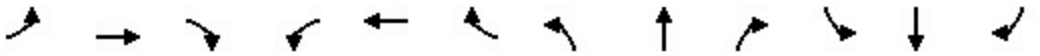




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 49 | 214 | 112 | 59 | 442 | 1276 | 10 | 735 |
| v/c Ratio | 0.22 | 0.54 | 0.81 | 0.20 | 0.84 | 0.61 | 0.05 | 0.48 |
| Control Delay (s/veh) | 34.1 | 12.2 | 74.3 | 27.9 | 24.3 | 9.9 | 14.3 | 16.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.1 | 12.2 | 74.3 | 27.9 | 24.3 | 10.2 | 14.3 | 16.2 |
| Queue Length 50th (m) | 7.5 | 3.8 | 19.3 | 7.2 | 26.5 | 55.4 | 0.9 | 41.4 |
| Queue Length 95th (m) | 17.1 | 22.5 | #39.0 | 17.5 | #80.1 | 94.2 | 4.0 | 65.7 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 328 | 502 | 206 | 420 | 525 | 2099 | 196 | 1528 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 242 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.15 | 0.43 | 0.54 | 0.14 | 0.84 | 0.69 | 0.05 | 0.48 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| Future Volume (vph) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1391 | | 1635 | 1582 | | 1668 | 3032 | | 1668 | 2943 | |
| Flt Permitted | 0.72 | 1.00 | | 0.46 | 1.00 | | 0.30 | 1.00 | | 0.22 | 1.00 | |
| Satd. Flow (perm) | 1261 | 1391 | | 792 | 1582 | | 529 | 3032 | | 382 | 2943 | |
| 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) | 49 | 25 | 189 | 112 | 47 | 12 | 442 | 1165 | 111 | 10 | 663 | 72 |
| RTOR Reduction (vph) | 0 | 156 | 0 | 0 | 10 | 0 | 0 | 6 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 49 | 58 | 0 | 112 | 49 | 0 | 442 | 1270 | 0 | 10 | 727 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Effective Green, g (s) | 16.3 | 16.3 | | 16.3 | 16.3 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.69 | 0.69 | | 0.52 | 0.52 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 222 | 245 | | 139 | 278 | | 513 | 2094 | | 197 | 1523 | |
| v/s Ratio Prot | | 0.04 | | | 0.03 | | c0.11 | 0.42 | | | 0.25 | |
| v/s Ratio Perm | 0.04 | | | c0.14 | | | c0.48 | | | 0.03 | | |
| v/c Ratio | 0.22 | 0.24 | | 0.81 | 0.18 | | 0.86 | 0.61 | | 0.05 | 0.48 | |
| Uniform Delay, d1 | 32.7 | 32.8 | | 36.6 | 32.4 | | 7.7 | 7.6 | | 11.0 | 14.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.5 | | 27.7 | 0.3 | | 13.9 | 1.3 | | 0.5 | 1.1 | |
| Delay (s) | 33.2 | 33.3 | | 64.3 | 32.7 | | 21.5 | 8.9 | | 11.5 | 15.4 | |
| Level of Service | C | C | | E | C | | C | A | | B | B | |
| Approach Delay (s/veh) | | 33.2 | | | 53.4 | | | 12.2 | | | 15.3 | |
| Approach LOS | | C | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 17.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 92.5 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 90.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

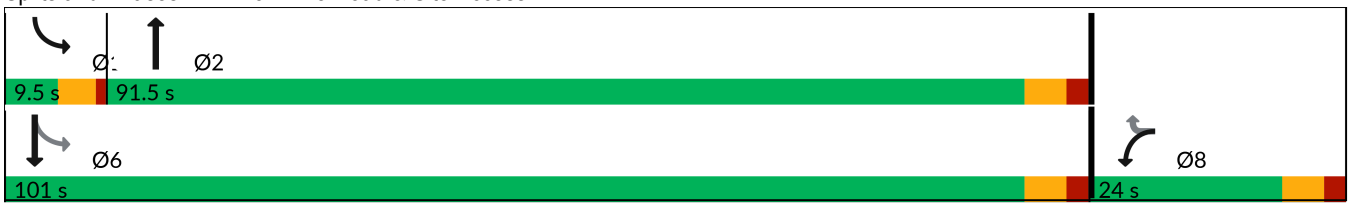
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| Future Volume (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 |
| Frt | | 0.850 | 0.998 | | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 3263 | 0 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.101 | |
| Satd. Flow (perm) | 1626 | 1454 | 3263 | 0 | 186 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 25 | 3 | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 55 | 25 | 1719 | 0 | 36 | 928 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Right | Thru | | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | pm+pt | NA |
| Protected Phases | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 2 | | 1 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | | 9.5 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 91.5 | | 9.5 | 101.0 |
| Total Split (%) | 19.2% | 19.2% | 73.2% | | 7.6% | 80.8% |
| Maximum Green (s) | 18.0 | 18.0 | 85.5 | | 5.0 | 95.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 3.5 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 1.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | | 4.5 | 6.0 |
| Lead/Lag | | | Lag | | Lead | |
| Lead-Lag Optimize? | | | Yes | | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Recall Mode | None | None | Max | | None | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | | | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | 0 |
| Act Effct Green (s) | 9.4 | 9.4 | 95.0 | | 100.9 | 100.7 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.80 | | 0.85 | 0.85 |
| v/c Ratio | 0.43 | 0.18 | 0.66 | | 0.16 | 0.59 |
| Control Delay (s/veh) | 61.6 | 20.8 | 8.8 | | 3.6 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 1.2 |
| Total Delay (s/veh) | 61.6 | 20.8 | 8.8 | | 3.6 | 7.0 |
| LOS | E | C | A | | A | A |
| Approach Delay (s/veh) | 48.9 | | 8.8 | | | 6.8 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 125 | | | |
| Actuated Cycle Length: 118.4 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.66 | | | |
| Intersection Signal Delay (s/veh): 9.3 | | Intersection LOS: A | |
| Intersection Capacity Utilization 65.1% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 55 | 25 | 1719 | 36 | 928 |
| v/c Ratio | 0.43 | 0.18 | 0.66 | 0.16 | 0.59 |
| Control Delay (s/veh) | 61.6 | 20.8 | 8.8 | 3.6 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 |
| Total Delay (s/veh) | 61.6 | 20.8 | 8.8 | 3.6 | 7.0 |
| Queue Length 50th (m) | 12.4 | 0.0 | 100.4 | 1.1 | 61.0 |
| Queue Length 95th (m) | 25.2 | 8.3 | 141.4 | 3.2 | 105.9 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | 161.7 |
| Turn Bay Length (m) | | | | | |
| Base Capacity (vph) | 247 | 242 | 2618 | 224 | 1566 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 393 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.10 | 0.66 | 0.16 | 0.79 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| Future Volume (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | | 4.5 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 3263 | | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | 0.10 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 3263 | | 187 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 55 | 25 | 1694 | 25 | 36 | 928 |
| RTOR Reduction (vph) | 0 | 23 | 1 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 55 | 2 | 1718 | 0 | 36 | 928 |
| Turn Type | Prot | Perm | NA | | pm+pt | NA |
| Protected Phases | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Actuated Green, G (s) | 8.2 | 8.2 | 93.8 | | 101.3 | 101.3 |
| Effective Green, g (s) | 8.2 | 8.2 | 93.8 | | 101.3 | 101.3 |
| Actuated g/C Ratio | 0.07 | 0.07 | 0.77 | | 0.83 | 0.83 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | | 4.5 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 109 | 98 | 2519 | | 194 | 1535 |
| v/s Ratio Prot | c0.03 | | c0.53 | | 0.00 | c0.50 |
| v/s Ratio Perm | | 0.00 | | | 0.15 | |
| v/c Ratio | 0.50 | 0.02 | 0.68 | | 0.19 | 0.60 |
| Uniform Delay, d1 | 54.7 | 52.9 | 6.7 | | 5.1 | 3.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 3.6 | 0.1 | 1.5 | | 0.5 | 1.8 |
| Delay (s) | 58.3 | 53.0 | 8.2 | | 5.5 | 5.2 |
| Level of Service | E | D | A | | A | A |
| Approach Delay (s/veh) | 56.7 | | 8.2 | | | 5.2 |
| Approach LOS | E | | A | | | A |

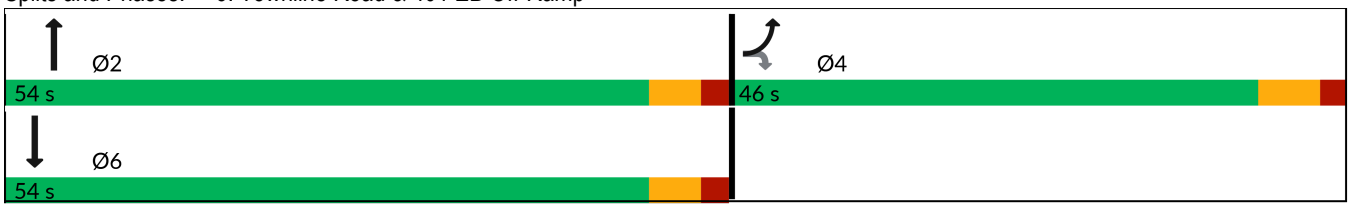
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 8.5 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 121.5 | Sum of lost time (s) | 16.5 |
| Intersection Capacity Utilization | 65.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

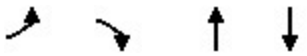
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| Future Volume (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | 0.957 | 0.850 | | | 0.981 | |
| Flt Protected | 0.965 | | | | | |
| Satd. Flow (prot) | 3062 | 1312 | 0 | 3535 | 3356 | 0 |
| Flt Permitted | 0.965 | | | | | |
| Satd. Flow (perm) | 3062 | 1312 | 0 | 3535 | 3356 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 16 | 16 | | | 22 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Adj. Flow (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| Shared Lane Traffic (%) | | 38% | | | | |
| Lane Group Flow (vph) | 729 | 340 | 0 | 1435 | 1700 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 7.0 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (%) | 46.0% | 46.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 39.5 | 39.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 42.0 | |
| Flash Don't Walk (s) | 29.5 | 29.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 28.1 | 28.1 | | 48.3 | 48.3 | |
| Actuated g/C Ratio | 0.32 | 0.32 | | 0.54 | 0.54 | |
| v/c Ratio | 0.75 | 0.80 | | 0.75 | 0.93 | |
| Control Delay (s/veh) | 31.4 | 41.1 | | 20.3 | 30.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 31.4 | 41.1 | | 20.3 | 30.7 | |
| LOS | C | D | | C | C | |
| Approach Delay (s/veh) | 34.5 | | | 20.3 | 30.7 | |
| Approach LOS | C | | | C | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 89 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.93 | | | |
| Intersection Signal Delay (s/veh): 28.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 82.9% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 729 | 340 | 1435 | 1700 |
| v/c Ratio | 0.75 | 0.80 | 0.75 | 0.93 |
| Control Delay (s/veh) | 31.4 | 41.1 | 20.3 | 30.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 31.4 | 41.1 | 20.3 | 30.7 |
| Queue Length 50th (m) | 55.4 | 54.9 | 94.0 | 132.0 |
| Queue Length 95th (m) | 73.6 | 89.2 | 154.4 | #231.4 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1377 | 595 | 1920 | 1833 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.53 | 0.57 | 0.75 | 0.93 |

Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| Future Volume (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 0.97 | 0.91 | | 0.95 | 0.95 | |
| Frt | 0.96 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 3064 | 1312 | | 3535 | 3355 | |
| Flt Permitted | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 3064 | 1312 | | 3535 | 3355 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 521 | 548 | 0 | 1435 | 1484 | 216 |
| RTOR Reduction (vph) | 11 | 11 | 0 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 718 | 329 | 0 | 1435 | 1690 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 28.1 | 28.1 | | 48.4 | 48.4 | |
| Effective Green, g (s) | 28.1 | 28.1 | | 48.4 | 48.4 | |
| Actuated g/C Ratio | 0.32 | 0.32 | | 0.54 | 0.54 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 967 | 414 | | 1922 | 1824 | |
| v/s Ratio Prot | 0.23 | | | 0.41 | c0.50 | |
| v/s Ratio Perm | | c0.25 | | | | |
| v/c Ratio | 0.74 | 0.79 | | 0.75 | 0.93 | |
| Uniform Delay, d1 | 27.2 | 27.8 | | 15.6 | 18.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.1 | 10.1 | | 2.7 | 9.6 | |
| Delay (s) | 30.3 | 37.9 | | 18.3 | 28.3 | |
| Level of Service | C | D | | B | C | |
| Approach Delay (s/veh) | 32.7 | | | 18.3 | 28.3 | |
| Approach LOS | C | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 26.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 89.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 82.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

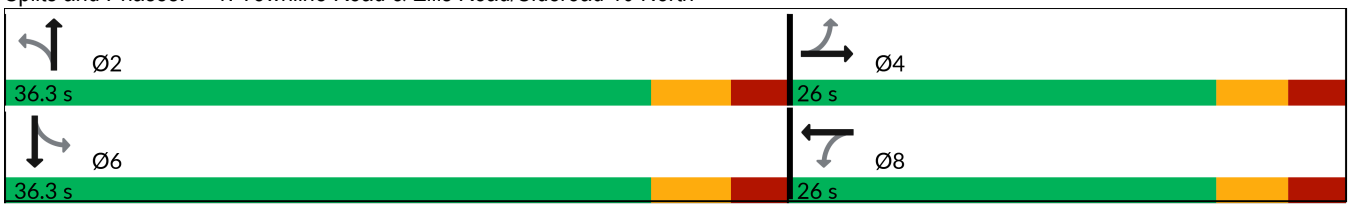
c Critical Lane Group

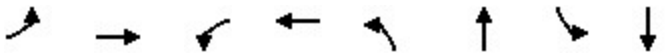
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| Future Volume (vph) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.867 | | | 0.975 | | | 0.985 | | | 0.990 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1415 | 0 | 1668 | 1583 | 0 | 1651 | 3000 | 0 | 1668 | 3041 | 0 |
| Flt Permitted | 0.742 | | | 0.449 | | | 0.405 | | | 0.331 | | |
| Satd. Flow (perm) | 1290 | 1415 | 0 | 788 | 1583 | 0 | 704 | 3000 | 0 | 581 | 3041 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 210 | | | 4 | | | 27 | | | 16 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Adj. Flow (vph) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 60 | 299 | 0 | 75 | 24 | 0 | 246 | 818 | 0 | 3 | 650 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (%) | 41.7% | 41.7% | | 41.7% | 41.7% | | 58.3% | 58.3% | | 58.3% | 58.3% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.7 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 2.6 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Max | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Flash Don't Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 11.1 | 11.1 | | 11.1 | 11.1 | | 30.2 | 30.2 | | 30.2 | 30.2 | |
| Actuated g/C Ratio | 0.21 | 0.21 | | 0.21 | 0.21 | | 0.56 | 0.56 | | 0.56 | 0.56 | |
| v/c Ratio | 0.23 | 0.65 | | 0.46 | 0.07 | | 0.62 | 0.48 | | 0.01 | 0.38 | |
| Control Delay (s/veh) | 19.2 | 13.7 | | 27.9 | 15.0 | | 19.4 | 8.7 | | 7.0 | 7.8 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 19.2 | 13.7 | | 27.9 | 15.0 | | 19.4 | 8.7 | | 7.0 | 7.8 | |
| LOS | B | B | | C | B | | B | A | | A | A | |
| Approach Delay (s/veh) | | 14.6 | | | 24.8 | | | 11.2 | | | 7.8 | |
| Approach LOS | | B | | | C | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 62.3 | | | |
| Actuated Cycle Length: 53.6 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.65 | | | |
| Intersection Signal Delay (s/veh): 11.4 | | Intersection LOS: B | |
| Intersection Capacity Utilization 83.6% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 60 | 299 | 75 | 24 | 246 | 818 | 3 | 650 |
| v/c Ratio | 0.23 | 0.65 | 0.46 | 0.07 | 0.62 | 0.48 | 0.01 | 0.38 |
| Control Delay (s/veh) | 19.2 | 13.7 | 27.9 | 15.0 | 19.4 | 8.7 | 7.0 | 7.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 19.2 | 13.7 | 27.9 | 15.0 | 19.4 | 8.7 | 7.0 | 7.8 |
| Queue Length 50th (m) | 4.8 | 7.3 | 6.4 | 1.6 | 12.7 | 19.0 | 0.1 | 14.2 |
| Queue Length 95th (m) | 12.3 | 25.4 | 16.1 | 5.9 | #54.7 | 44.1 | 1.3 | 33.3 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 483 | 662 | 295 | 596 | 395 | 1699 | 326 | 1718 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.12 | 0.45 | 0.25 | 0.04 | 0.62 | 0.48 | 0.01 | 0.38 |

Intersection Summary

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

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| Future Volume (vph) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.98 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1414 | | 1668 | 1583 | | 1651 | 2999 | | 1668 | 3040 | |
| Flt Permitted | 0.74 | 1.00 | | 0.45 | 1.00 | | 0.40 | 1.00 | | 0.33 | 1.00 | |
| Satd. Flow (perm) | 1289 | 1414 | | 789 | 1583 | | 704 | 2999 | | 581 | 3040 | |
| 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) | 60 | 33 | 266 | 75 | 20 | 4 | 246 | 734 | 84 | 3 | 606 | 44 |
| RTOR Reduction (vph) | 0 | 167 | 0 | 0 | 3 | 0 | 0 | 12 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 60 | 132 | 0 | 75 | 21 | 0 | 246 | 806 | 0 | 3 | 643 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 11.1 | 11.1 | | 11.1 | 11.1 | | 30.2 | 30.2 | | 30.2 | 30.2 | |
| Effective Green, g (s) | 11.1 | 11.1 | | 11.1 | 11.1 | | 30.2 | 30.2 | | 30.2 | 30.2 | |
| Actuated g/C Ratio | 0.21 | 0.21 | | 0.21 | 0.21 | | 0.56 | 0.56 | | 0.56 | 0.56 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 266 | 292 | | 163 | 327 | | 396 | 1689 | | 327 | 1712 | |
| v/s Ratio Prot | | 0.09 | | | 0.01 | | | 0.27 | | | 0.21 | |
| v/s Ratio Perm | 0.05 | | | c0.10 | | | c0.35 | | | 0.01 | | |
| v/c Ratio | 0.23 | 0.45 | | 0.46 | 0.06 | | 0.62 | 0.48 | | 0.01 | 0.38 | |
| Uniform Delay, d1 | 17.7 | 18.6 | | 18.6 | 17.1 | | 7.9 | 7.0 | | 5.1 | 6.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | 1.1 | | 2.1 | 0.1 | | 7.2 | 1.0 | | 0.1 | 0.6 | |
| Delay (s) | 18.1 | 19.7 | | 20.7 | 17.2 | | 15.0 | 8.0 | | 5.2 | 7.1 | |
| Level of Service | B | B | | C | B | | B | A | | A | A | |
| Approach Delay (s/veh) | | 19.4 | | | 19.8 | | | 9.6 | | | 7.1 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 10.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 53.6 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 83.6% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

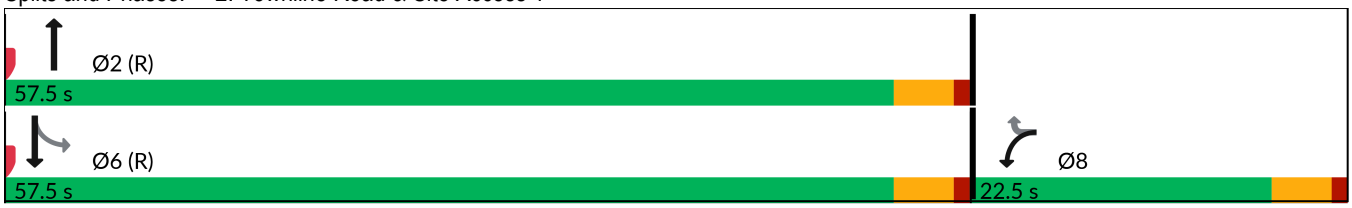
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| Future Volume (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 |
| Frt | | 0.850 | 0.998 | | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 3263 | 0 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.263 | |
| Satd. Flow (perm) | 1626 | 1454 | 3263 | 0 | 484 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 5 | 3 | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 11 | 5 | 1072 | 0 | 21 | 927 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Right | Thru | | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 2 | | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | | 22.5 | 22.5 |
| Total Split (s) | 22.5 | 22.5 | 57.5 | | 57.5 | 57.5 |
| Total Split (%) | 28.1% | 28.1% | 71.9% | | 71.9% | 71.9% |
| Maximum Green (s) | 18.0 | 18.0 | 53.0 | | 53.0 | 53.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Recall Mode | None | None | C-Max | | C-Max | C-Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | 0 | 0 |
| Act Effct Green (s) | 6.2 | 6.2 | 73.6 | | 73.6 | 73.6 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.92 | | 0.92 | 0.92 |
| v/c Ratio | 0.09 | 0.04 | 0.36 | | 0.05 | 0.55 |
| Control Delay (s/veh) | 35.4 | 22.2 | 1.6 | | 1.6 | 3.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 22.2 | 1.6 | | 1.6 | 3.3 |
| LOS | D | C | A | | A | A |
| Approach Delay (s/veh) | 31.3 | | 1.6 | | | 3.3 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 80 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 65 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.55 | | | |
| Intersection Signal Delay (s/veh): 2.6 | | Intersection LOS: A | |
| Intersection Capacity Utilization 60.5% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 11 | 5 | 1072 | 21 | 927 |
| v/c Ratio | 0.09 | 0.04 | 0.36 | 0.05 | 0.55 |
| Control Delay (s/veh) | 35.4 | 22.2 | 1.6 | 1.6 | 3.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 22.2 | 1.6 | 1.6 | 3.3 |
| Queue Length 50th (m) | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| Queue Length 95th (m) | 6.2 | 3.2 | 24.6 | 1.7 | 65.7 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | 161.7 |
| Turn Bay Length (m) | | | | | |
| Base Capacity (vph) | 365 | 331 | 3003 | 445 | 1695 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 61 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.03 | 0.02 | 0.36 | 0.05 | 0.57 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| Future Volume (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 3264 | | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | 0.26 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 3264 | | 485 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 11 | 5 | 1060 | 12 | 21 | 927 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 11 | 0 | 1072 | 0 | 21 | 927 |
| Turn Type | Prot | Perm | NA | | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Actuated Green, G (s) | 2.8 | 2.8 | 68.2 | | 68.2 | 68.2 |
| Effective Green, g (s) | 2.8 | 2.8 | 68.2 | | 68.2 | 68.2 |
| Actuated g/C Ratio | 0.03 | 0.03 | 0.85 | | 0.85 | 0.85 |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 56 | 50 | 2782 | | 413 | 1570 |
| v/s Ratio Prot | c0.01 | | 0.33 | | | c0.50 |
| v/s Ratio Perm | | 0.00 | | | 0.04 | |
| v/c Ratio | 0.20 | 0.00 | 0.39 | | 0.05 | 0.59 |
| Uniform Delay, d1 | 37.5 | 37.3 | 1.3 | | 0.9 | 1.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.7 | 0.0 | 0.4 | | 0.2 | 1.6 |
| Delay (s) | 39.2 | 37.3 | 1.7 | | 1.1 | 3.4 |
| Level of Service | D | D | A | | A | A |
| Approach Delay (s/veh) | 38.6 | | 1.7 | | | 3.3 |
| Approach LOS | D | | A | | | A |

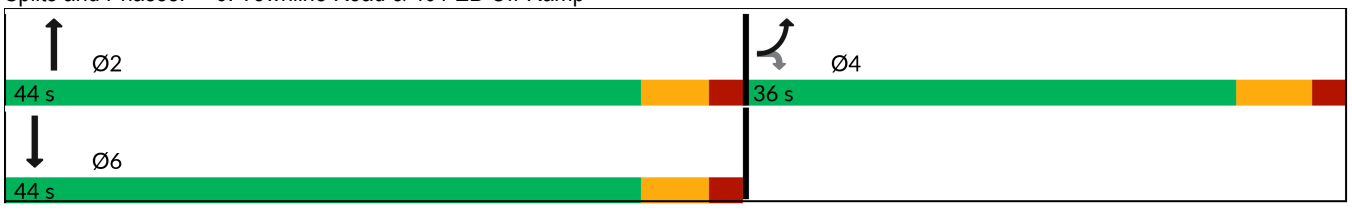
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 2.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.57 | | |
| Actuated Cycle Length (s) | 80.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 60.5% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

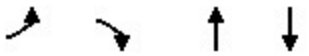
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| Future Volume (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | 0.952 | 0.850 | | | 0.978 | |
| Flt Protected | 0.967 | | | | | |
| Satd. Flow (prot) | 3083 | 1325 | 0 | 3500 | 3433 | 0 |
| Flt Permitted | 0.967 | | | | | |
| Satd. Flow (perm) | 3083 | 1325 | 0 | 3500 | 3433 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 42 | 42 | | | 32 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Adj. Flow (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| Shared Lane Traffic (%) | | 41% | | | | |
| Lane Group Flow (vph) | 742 | 343 | 0 | 833 | 1344 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 7.0 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (%) | 45.0% | 45.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 32.0 | 32.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 23.0 | 23.0 | | 38.2 | 38.2 | |
| Actuated g/C Ratio | 0.31 | 0.31 | | 0.52 | 0.52 | |
| v/c Ratio | 0.75 | 0.78 | | 0.46 | 0.75 | |
| Control Delay (s/veh) | 26.4 | 32.9 | | 13.2 | 18.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 26.4 | 32.9 | | 13.2 | 18.1 | |
| LOS | C | C | | B | B | |
| Approach Delay (s/veh) | 28.5 | | | 13.2 | 18.1 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 73.8 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.78 | | | |
| Intersection Signal Delay (s/veh): 20.3 | | Intersection LOS: C | |
| Intersection Capacity Utilization 74.4% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





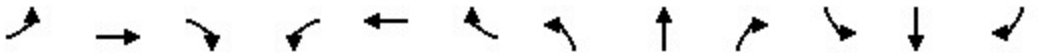
| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 742 | 343 | 833 | 1344 |
| v/c Ratio | 0.75 | 0.78 | 0.46 | 0.75 |
| Control Delay (s/veh) | 26.4 | 32.9 | 13.2 | 18.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 26.4 | 32.9 | 13.2 | 18.1 |
| Queue Length 50th (m) | 44.3 | 41.0 | 36.6 | 72.1 |
| Queue Length 95th (m) | 62.1 | 72.9 | 58.8 | 113.6 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1264 | 557 | 1812 | 1793 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.59 | 0.62 | 0.46 | 0.75 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| Future Volume (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 0.97 | 0.91 | | 0.95 | 0.95 | |
| Frt | 0.95 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 3083 | 1325 | | 3500 | 3434 | |
| Flt Permitted | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 3083 | 1325 | | 3500 | 3434 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 504 | 581 | 0 | 833 | 1150 | 194 |
| RTOR Reduction (vph) | 29 | 29 | 0 | 0 | 15 | 0 |
| Lane Group Flow (vph) | 713 | 314 | 0 | 833 | 1329 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 23.0 | 23.0 | | 38.2 | 38.2 | |
| Effective Green, g (s) | 23.0 | 23.0 | | 38.2 | 38.2 | |
| Actuated g/C Ratio | 0.31 | 0.31 | | 0.52 | 0.52 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 962 | 413 | | 1814 | 1779 | |
| v/s Ratio Prot | 0.23 | | | 0.24 | c0.39 | |
| v/s Ratio Perm | | c0.24 | | | | |
| v/c Ratio | 0.74 | 0.76 | | 0.46 | 0.75 | |
| Uniform Delay, d1 | 22.7 | 22.9 | | 11.2 | 13.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.1 | 8.0 | | 0.8 | 2.9 | |
| Delay (s) | 25.8 | 30.9 | | 12.1 | 16.9 | |
| Level of Service | C | C | | B | B | |
| Approach Delay (s/veh) | 27.4 | | | 12.1 | 16.9 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 19.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 73.7 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 74.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

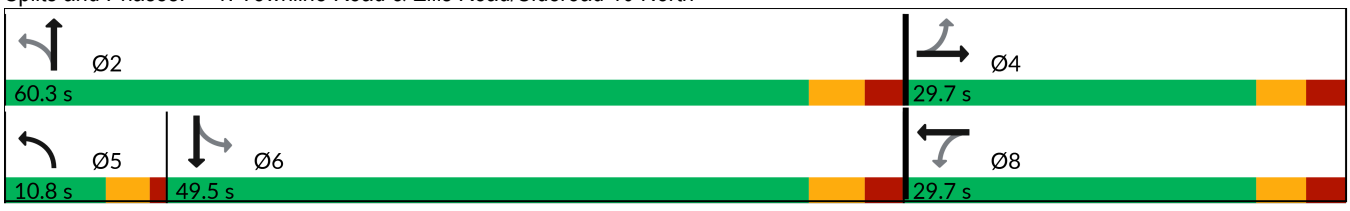


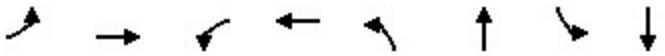
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| Future Volume (vph) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.866 | | | 0.962 | | | 0.985 | | | 0.994 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1388 | 0 | 1668 | 1570 | 0 | 1603 | 2933 | 0 | 1334 | 2995 | 0 |
| Flt Permitted | 0.747 | | | 0.323 | | | 0.259 | | | 0.353 | | |
| Satd. Flow (perm) | 1298 | 1388 | 0 | 567 | 1570 | 0 | 437 | 2933 | 0 | 496 | 2995 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 243 | | | 4 | | | 23 | | | 7 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Adj. Flow (vph) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 90 | 298 | 0 | 63 | 16 | 0 | 146 | 789 | 0 | 4 | 871 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 9.0 | 49.5 | | 49.5 | 49.5 | |
| Total Split (s) | 29.7 | 29.7 | | 29.7 | 29.7 | | 10.8 | 60.3 | | 49.5 | 49.5 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 12.0% | 67.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 23.7 | 23.7 | | 23.7 | 23.7 | | 6.8 | 54.0 | | 43.2 | 43.2 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 35.2 | | 35.2 | 35.2 | |
| Flash Don't Walk (s) | 13.7 | 13.7 | | 13.7 | 13.7 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 12.4 | 12.4 | | 12.4 | 12.4 | | 56.5 | 54.2 | | 43.6 | 43.6 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.72 | 0.69 | | 0.55 | 0.55 | |
| v/c Ratio | 0.44 | 0.71 | | 0.71 | 0.06 | | 0.36 | 0.39 | | 0.01 | 0.53 | |
| Control Delay (s/veh) | 36.4 | 17.0 | | 70.3 | 23.6 | | 6.9 | 6.5 | | 10.5 | 13.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 36.4 | 17.0 | | 70.3 | 23.6 | | 6.9 | 6.5 | | 10.5 | 13.4 | |
| LOS | D | B | | E | C | | A | A | | B | B | |
| Approach Delay (s/veh) | | 21.5 | | | 60.9 | | | 6.6 | | | 13.4 | |
| Approach LOS | | C | | | E | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 79 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.71 | | | |
| Intersection Signal Delay (s/veh): 13.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 80.2% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

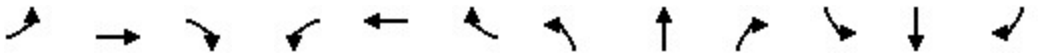
Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 90 | 298 | 63 | 16 | 146 | 789 | 4 | 871 |
| v/c Ratio | 0.44 | 0.71 | 0.71 | 0.06 | 0.36 | 0.39 | 0.01 | 0.53 |
| Control Delay (s/veh) | 36.4 | 17.0 | 70.3 | 23.6 | 6.9 | 6.5 | 10.5 | 13.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.4 | 17.0 | 70.3 | 23.6 | 6.9 | 6.5 | 10.5 | 13.4 |
| Queue Length 50th (m) | 12.3 | 7.3 | 9.0 | 1.5 | 5.5 | 21.3 | 0.3 | 39.6 |
| Queue Length 95th (m) | 25.1 | 30.7 | 21.9 | 6.3 | 15.1 | 42.6 | 1.9 | 68.6 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 390 | 587 | 170 | 475 | 413 | 2020 | 273 | 1655 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.23 | 0.51 | 0.37 | 0.03 | 0.35 | 0.39 | 0.01 | 0.53 |

Intersection Summary



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| Future Volume (vph) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.96 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1388 | | 1668 | 1570 | | 1603 | 2935 | | 1334 | 2995 | |
| Flt Permitted | 0.75 | 1.00 | | 0.32 | 1.00 | | 0.26 | 1.00 | | 0.35 | 1.00 | |
| Satd. Flow (perm) | 1298 | 1388 | | 566 | 1570 | | 437 | 2935 | | 496 | 2995 | |
| 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) | 90 | 32 | 266 | 63 | 12 | 4 | 146 | 712 | 77 | 4 | 835 | 36 |
| RTOR Reduction (vph) | 0 | 205 | 0 | 0 | 3 | 0 | 0 | 7 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 90 | 93 | 0 | 63 | 13 | 0 | 146 | 782 | 0 | 4 | 868 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 2% | 0% | 0% | 0% | 4% | 4% | 5% | 25% | 3% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 12.4 | 12.4 | | 12.4 | 12.4 | | 54.2 | 54.2 | | 43.6 | 43.6 | |
| Effective Green, g (s) | 12.4 | 12.4 | | 12.4 | 12.4 | | 54.2 | 54.2 | | 43.6 | 43.6 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.69 | 0.69 | | 0.55 | 0.55 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 203 | 218 | | 88 | 246 | | 397 | 2016 | | 274 | 1655 | |
| v/s Ratio Prot | | 0.07 | | | 0.01 | | 0.03 | c0.27 | | | c0.29 | |
| v/s Ratio Perm | 0.07 | | | c0.11 | | | 0.22 | | | 0.01 | | |
| v/c Ratio | 0.44 | 0.43 | | 0.72 | 0.05 | | 0.37 | 0.39 | | 0.01 | 0.52 | |
| Uniform Delay, d1 | 30.1 | 30.0 | | 31.6 | 28.3 | | 5.1 | 5.3 | | 8.0 | 11.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.5 | 1.3 | | 24.0 | 0.1 | | 0.6 | 0.6 | | 0.1 | 1.2 | |
| Delay (s) | 31.7 | 31.4 | | 55.6 | 28.3 | | 5.7 | 5.8 | | 8.1 | 12.3 | |
| Level of Service | C | C | | E | C | | A | A | | A | B | |
| Approach Delay (s/veh) | | 31.5 | | | 50.1 | | | 5.8 | | | 12.3 | |
| Approach LOS | | C | | | D | | | A | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 14.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.56 | | |
| Actuated Cycle Length (s) | 78.9 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 80.2% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

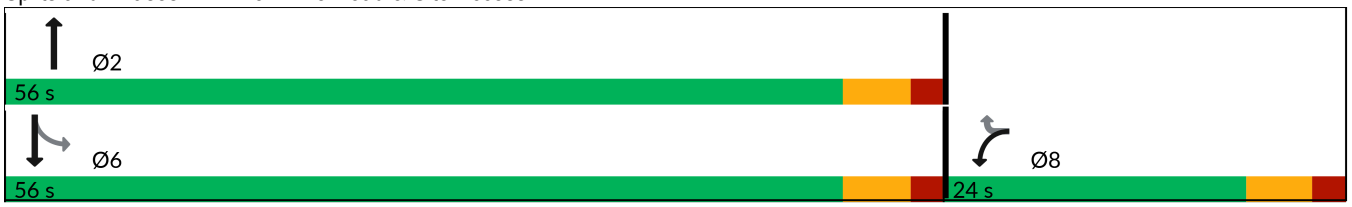
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| Future Volume (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 |
| Frt | | 0.850 | 0.983 | | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 3214 | 0 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.282 | |
| Satd. Flow (perm) | 1626 | 1454 | 3214 | 0 | 519 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 23 | 32 | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 26 | 23 | 1003 | 0 | 58 | 1110 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Right | Thru | | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 2 | | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 29.0 | | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Recall Mode | None | None | Max | | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | 0 | 0 |
| Act Effct Green (s) | 6.9 | 6.9 | 66.0 | | 66.0 | 66.0 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.85 | | 0.85 | 0.85 |
| v/c Ratio | 0.18 | 0.15 | 0.36 | | 0.13 | 0.71 |
| Control Delay (s/veh) | 36.0 | 16.2 | 2.9 | | 3.4 | 8.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.6 |
| Total Delay (s/veh) | 36.0 | 16.2 | 2.9 | | 3.4 | 9.0 |
| LOS | D | B | A | | A | A |
| Approach Delay (s/veh) | 26.7 | | 2.9 | | | 8.8 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 77.2 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.71 | | | |
| Intersection Signal Delay (s/veh): 6.5 | | Intersection LOS: A | |
| Intersection Capacity Utilization 72.6% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 26 | 23 | 1003 | 58 | 1110 |
| v/c Ratio | 0.18 | 0.15 | 0.36 | 0.13 | 0.71 |
| Control Delay (s/veh) | 36.0 | 16.2 | 2.9 | 3.4 | 8.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 |
| Total Delay (s/veh) | 36.0 | 16.2 | 2.9 | 3.4 | 9.0 |
| Queue Length 50th (m) | 4.0 | 0.0 | 19.6 | 1.8 | 75.1 |
| Queue Length 95th (m) | 10.3 | 6.1 | 30.9 | 5.3 | 152.0 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | 161.7 |
| Turn Bay Length (m) | | | | | |
| Base Capacity (vph) | 381 | 358 | 2750 | 443 | 1573 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 167 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.07 | 0.06 | 0.36 | 0.13 | 0.79 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| Future Volume (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 0.98 | | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 3215 | | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | 0.28 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 3215 | | 520 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 26 | 23 | 891 | 112 | 58 | 1110 |
| RTOR Reduction (vph) | 0 | 22 | 7 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 26 | 1 | 996 | 0 | 58 | 1110 |
| Turn Type | Prot | Perm | NA | | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Actuated Green, G (s) | 4.4 | 4.4 | 63.4 | | 63.4 | 63.4 |
| Effective Green, g (s) | 4.4 | 4.4 | 63.4 | | 63.4 | 63.4 |
| Actuated g/C Ratio | 0.06 | 0.06 | 0.79 | | 0.79 | 0.79 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 89 | 80 | 2554 | | 413 | 1463 |
| v/s Ratio Prot | c0.02 | | 0.31 | | | c0.60 |
| v/s Ratio Perm | | 0.00 | | | 0.11 | |
| v/c Ratio | 0.29 | 0.02 | 0.39 | | 0.14 | 0.76 |
| Uniform Delay, d1 | 36.2 | 35.7 | 2.4 | | 1.9 | 4.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.8 | 0.1 | 0.5 | | 0.7 | 3.7 |
| Delay (s) | 38.0 | 35.7 | 2.9 | | 2.6 | 8.0 |
| Level of Service | D | D | A | | A | A |
| Approach Delay (s/veh) | 37.0 | | 2.9 | | | 7.7 |
| Approach LOS | D | | A | | | A |

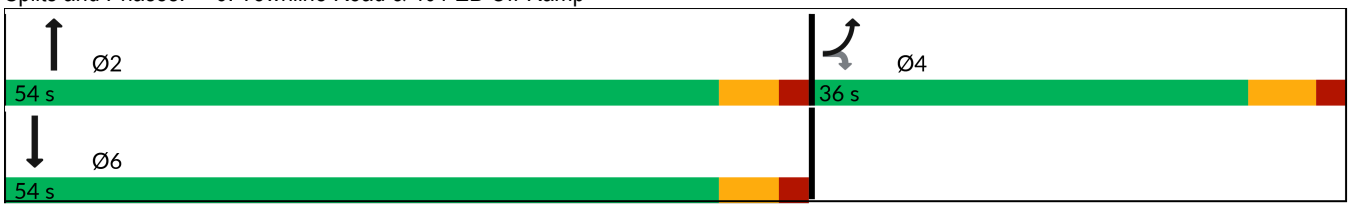
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 6.2 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 79.8 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 72.6% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

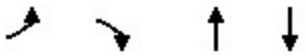
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| Future Volume (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | 0.961 | 0.850 | | | 0.980 | |
| Flt Protected | 0.964 | | | | | |
| Satd. Flow (prot) | 3033 | 1287 | 0 | 3433 | 3298 | 0 |
| Flt Permitted | 0.964 | | | | | |
| Satd. Flow (perm) | 3033 | 1287 | 0 | 3433 | 3298 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 41 | 41 | | | 28 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Adj. Flow (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| Shared Lane Traffic (%) | | 36% | | | | |
| Lane Group Flow (vph) | 768 | 352 | 0 | 1139 | 1500 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 7.0 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 54.0 | 42.0 | |
| Total Split (s) | 36.0 | 36.0 | | 54.0 | 54.0 | |
| Total Split (%) | 40.0% | 40.0% | | 60.0% | 60.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 10.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 19.5 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 26.1 | 26.1 | | 48.1 | 48.1 | |
| Actuated g/C Ratio | 0.30 | 0.30 | | 0.55 | 0.55 | |
| v/c Ratio | 0.82 | 0.85 | | 0.60 | 0.81 | |
| Control Delay (s/veh) | 34.4 | 44.9 | | 15.1 | 20.7 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 34.4 | 44.9 | | 15.1 | 20.7 | |
| LOS | C | D | | B | C | |
| Approach Delay (s/veh) | 37.7 | | | 15.1 | 20.7 | |
| Approach LOS | D | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 86.7 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.85 | | | |
| Intersection Signal Delay (s/veh): 24.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 77.4% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 768 | 352 | 1139 | 1500 |
| v/c Ratio | 0.82 | 0.85 | 0.60 | 0.81 |
| Control Delay (s/veh) | 34.4 | 44.9 | 15.1 | 20.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.4 | 44.9 | 15.1 | 20.7 |
| Queue Length 50th (m) | 57.4 | 53.2 | 68.2 | 107.6 |
| Queue Length 95th (m) | 78.1 | #101.3 | 88.1 | 140.0 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1061 | 466 | 1904 | 1842 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.72 | 0.76 | 0.60 | 0.81 |

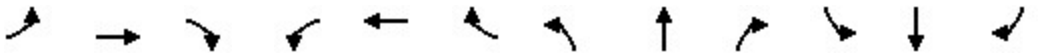
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| Future Volume (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 0.97 | 0.91 | | 0.95 | 0.95 | |
| Frt | 0.96 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.96 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 3035 | 1287 | | 3433 | 3299 | |
| Flt Permitted | 0.96 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 3035 | 1287 | | 3433 | 3299 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 570 | 550 | 0 | 1139 | 1304 | 196 |
| RTOR Reduction (vph) | 29 | 29 | 0 | 0 | 12 | 0 |
| Lane Group Flow (vph) | 739 | 323 | 0 | 1139 | 1488 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 0% | 4% | 7% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 26.1 | 26.1 | | 48.1 | 48.1 | |
| Effective Green, g (s) | 26.1 | 26.1 | | 48.1 | 48.1 | |
| Actuated g/C Ratio | 0.30 | 0.30 | | 0.55 | 0.55 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 913 | 387 | | 1904 | 1830 | |
| v/s Ratio Prot | 0.24 | | | 0.33 | c0.45 | |
| v/s Ratio Perm | | c0.25 | | | | |
| v/c Ratio | 0.81 | 0.84 | | 0.60 | 0.81 | |
| Uniform Delay, d1 | 28.0 | 28.3 | | 12.9 | 15.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 5.4 | 14.4 | | 1.4 | 4.1 | |
| Delay (s) | 33.4 | 42.7 | | 14.3 | 19.7 | |
| Level of Service | C | D | | B | B | |
| Approach Delay (s/veh) | 36.3 | | | 14.3 | 19.7 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 23.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.82 | | |
| Actuated Cycle Length (s) | 86.7 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 77.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

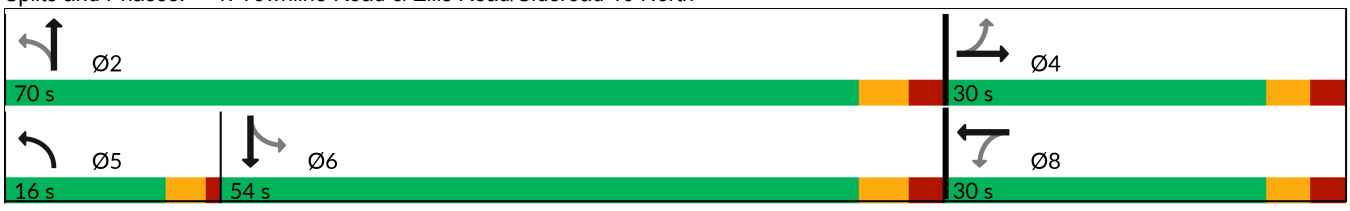


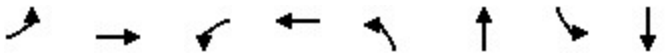
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| Future Volume (vph) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.870 | | | 0.974 | | | 0.984 | | | 0.984 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1668 | 1395 | 0 | 1635 | 1589 | 0 | 1668 | 3023 | 0 | 1668 | 2939 | 0 |
| Flt Permitted | 0.724 | | | 0.557 | | | 0.318 | | | 0.223 | | |
| Satd. Flow (perm) | 1271 | 1395 | 0 | 959 | 1589 | 0 | 558 | 3023 | 0 | 391 | 2939 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 148 | | | 9 | | | 24 | | | 17 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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 (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Adj. Flow (vph) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 43 | 171 | 0 | 99 | 51 | 0 | 449 | 1253 | 0 | 11 | 708 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 5 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 9.0 | 54.0 | | 54.0 | 54.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 16.0 | 70.0 | | 54.0 | 54.0 | |
| Total Split (%) | 30.0% | 30.0% | | 30.0% | 30.0% | | 16.0% | 70.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 12.0 | 63.7 | | 47.7 | 47.7 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.0 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 1.0 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| 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 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | None | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | | 39.7 | | 39.7 | 39.7 | |
| Flash Don't Walk (s) | 14.0 | 14.0 | | 14.0 | 14.0 | | | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | | 0 | | 0 | 0 | |
| Act Effct Green (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 66.2 | 63.9 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.73 | 0.71 | | 0.53 | 0.53 | |
| v/c Ratio | 0.22 | 0.50 | | 0.66 | 0.20 | | 0.81 | 0.58 | | 0.05 | 0.45 | |
| Control Delay (s/veh) | 35.1 | 13.5 | | 57.0 | 29.5 | | 19.6 | 8.5 | | 13.2 | 14.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.2 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 35.1 | 13.5 | | 57.0 | 29.5 | | 19.6 | 8.7 | | 13.2 | 14.6 | |
| LOS | D | B | | E | C | | B | A | | B | B | |
| Approach Delay (s/veh) | | 17.8 | | | 47.6 | | | 11.6 | | | 14.6 | |
| Approach LOS | | B | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 90.3 | | | |
| Natural Cycle: 95 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.81 | | | |
| Intersection Signal Delay (s/veh): 14.8 | | Intersection LOS: B | |
| Intersection Capacity Utilization 85.9% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North

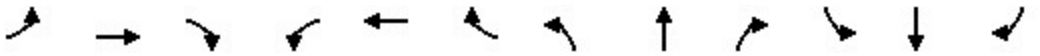




| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 43 | 171 | 99 | 51 | 449 | 1253 | 11 | 708 |
| v/c Ratio | 0.22 | 0.50 | 0.66 | 0.20 | 0.81 | 0.58 | 0.05 | 0.45 |
| Control Delay (s/veh) | 35.1 | 13.5 | 57.0 | 29.5 | 19.6 | 8.5 | 13.2 | 14.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.1 | 13.5 | 57.0 | 29.5 | 19.6 | 8.7 | 13.2 | 14.6 |
| Queue Length 50th (m) | 6.6 | 3.5 | 16.3 | 6.4 | 23.1 | 46.7 | 0.9 | 36.3 |
| Queue Length 95th (m) | 15.5 | 20.5 | 32.3 | 16.0 | #71.5 | 84.5 | 4.1 | 59.7 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 338 | 480 | 255 | 430 | 557 | 2146 | 207 | 1565 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 250 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.36 | 0.39 | 0.12 | 0.81 | 0.66 | 0.05 | 0.45 |

Intersection Summary

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



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| Future Volume (vph) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1668 | 1396 | | 1635 | 1588 | | 1668 | 3025 | | 1668 | 2940 | |
| Flt Permitted | 0.72 | 1.00 | | 0.56 | 1.00 | | 0.32 | 1.00 | | 0.22 | 1.00 | |
| Satd. Flow (perm) | 1270 | 1396 | | 959 | 1588 | | 558 | 3025 | | 391 | 2940 | |
| 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) | 43 | 23 | 148 | 99 | 42 | 9 | 449 | 1123 | 130 | 11 | 633 | 75 |
| RTOR Reduction (vph) | 0 | 125 | 0 | 0 | 8 | 0 | 0 | 7 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 43 | 46 | 0 | 99 | 43 | 0 | 449 | 1246 | 0 | 11 | 700 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 2% | 2% | 0% | 0% | 0% | 1% | 0% | 0% | 4% | 2% |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Effective Green, g (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 63.9 | 63.9 | | 47.9 | 47.9 | |
| Actuated g/C Ratio | 0.16 | 0.16 | | 0.16 | 0.16 | | 0.71 | 0.71 | | 0.53 | 0.53 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 198 | 217 | | 149 | 247 | | 542 | 2140 | | 207 | 1559 | |
| v/s Ratio Prot | | 0.03 | | | 0.03 | | c0.11 | 0.41 | | | 0.24 | |
| v/s Ratio Perm | 0.03 | | | c0.10 | | | c0.48 | | | 0.03 | | |
| v/c Ratio | 0.22 | 0.21 | | 0.66 | 0.18 | | 0.83 | 0.58 | | 0.05 | 0.45 | |
| Uniform Delay, d1 | 33.3 | 33.3 | | 35.9 | 33.1 | | 6.6 | 6.6 | | 10.2 | 13.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.5 | | 10.6 | 0.3 | | 10.1 | 1.2 | | 0.5 | 0.9 | |
| Delay (s) | 33.8 | 33.7 | | 46.5 | 33.4 | | 16.7 | 7.7 | | 10.7 | 14.0 | |
| Level of Service | C | C | | D | C | | B | A | | B | B | |
| Approach Delay (s/veh) | | 33.8 | | | 42.1 | | | 10.1 | | | 14.0 | |
| Approach LOS | | C | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 14.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.83 | | |
| Actuated Cycle Length (s) | 90.3 | Sum of lost time (s) | 16.3 |
| Intersection Capacity Utilization | 85.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

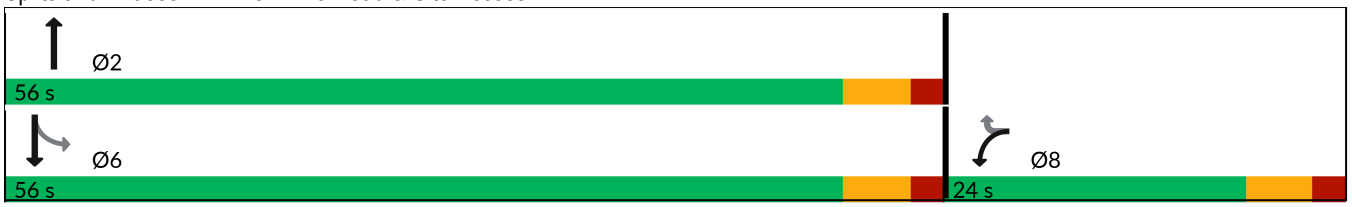
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| Future Volume (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 |
| Frt | | 0.850 | 0.995 | | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 3253 | 0 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.109 | |
| Satd. Flow (perm) | 1626 | 1454 | 3253 | 0 | 201 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 32 | 8 | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 85 | 68 | 1688 | 0 | 24 | 896 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Right | Thru | | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 2 | | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Recall Mode | None | None | Max | | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | 0 | 0 |
| Act Effct Green (s) | 9.3 | 9.3 | 57.6 | | 57.6 | 57.6 |
| Actuated g/C Ratio | 0.12 | 0.12 | 0.77 | | 0.77 | 0.77 |
| v/c Ratio | 0.43 | 0.33 | 0.68 | | 0.16 | 0.64 |
| Control Delay (s/veh) | 36.2 | 22.1 | 8.0 | | 7.2 | 8.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.3 |
| Total Delay (s/veh) | 36.2 | 22.1 | 8.0 | | 7.2 | 9.0 |
| LOS | D | C | A | | A | A |
| Approach Delay (s/veh) | 29.9 | | 8.0 | | | 9.0 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 75.2 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.68 | | | |
| Intersection Signal Delay (s/veh): 9.5 | | Intersection LOS: A | |
| Intersection Capacity Utilization 65.3% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 85 | 68 | 1688 | 24 | 896 |
| v/c Ratio | 0.43 | 0.33 | 0.68 | 0.16 | 0.64 |
| Control Delay (s/veh) | 36.2 | 22.1 | 8.0 | 7.2 | 8.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 36.2 | 22.1 | 8.0 | 7.2 | 9.0 |
| Queue Length 50th (m) | 11.1 | 4.6 | 59.0 | 0.9 | 56.1 |
| Queue Length 95th (m) | 22.6 | 14.7 | 99.5 | 4.4 | 111.4 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | 161.7 |
| Turn Bay Length (m) | | | | | |
| Base Capacity (vph) | 390 | 373 | 2495 | 154 | 1411 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 127 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.18 | 0.68 | 0.16 | 0.70 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| Future Volume (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 3254 | | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | 0.11 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 3254 | | 200 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 85 | 68 | 1634 | 54 | 24 | 896 |
| RTOR Reduction (vph) | 0 | 29 | 2 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 85 | 39 | 1686 | 0 | 24 | 896 |
| Turn Type | Prot | Perm | NA | | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Actuated Green, G (s) | 8.1 | 8.1 | 56.4 | | 56.4 | 56.4 |
| Effective Green, g (s) | 8.1 | 8.1 | 56.4 | | 56.4 | 56.4 |
| Actuated g/C Ratio | 0.11 | 0.11 | 0.74 | | 0.74 | 0.74 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 172 | 153 | 2399 | | 147 | 1358 |
| v/s Ratio Prot | c0.05 | | c0.52 | | | 0.49 |
| v/s Ratio Perm | | 0.03 | | | 0.12 | |
| v/c Ratio | 0.49 | 0.26 | 0.70 | | 0.16 | 0.66 |
| Uniform Delay, d1 | 32.3 | 31.4 | 5.5 | | 3.0 | 5.1 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.2 | 0.9 | 1.8 | | 2.4 | 2.5 |
| Delay (s) | 34.5 | 32.3 | 7.2 | | 5.4 | 7.7 |
| Level of Service | C | C | A | | A | A |
| Approach Delay (s/veh) | 33.5 | | 7.2 | | | 7.6 |
| Approach LOS | C | | A | | | A |

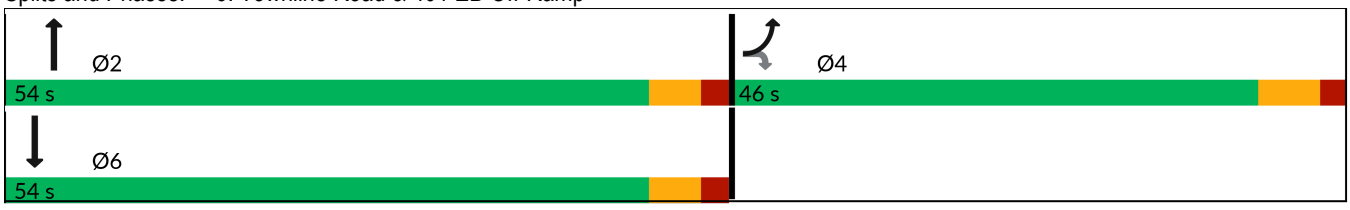
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 8.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 76.5 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 65.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

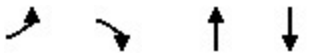
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| Future Volume (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | 0.955 | 0.850 | | | 0.982 | |
| Flt Protected | 0.966 | | | | | |
| Satd. Flow (prot) | 3059 | 1312 | 0 | 3535 | 3358 | 0 |
| Flt Permitted | 0.966 | | | | | |
| Satd. Flow (perm) | 3059 | 1312 | 0 | 3535 | 3358 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 17 | 17 | | | 20 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Adj. Flow (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| Shared Lane Traffic (%) | | 39% | | | | |
| Lane Group Flow (vph) | 733 | 342 | 0 | 1364 | 1671 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 7.0 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (s) | 46.0 | 46.0 | | 54.0 | 54.0 | |
| Total Split (%) | 46.0% | 46.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 39.5 | 39.5 | | 48.0 | 48.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 42.0 | 42.0 | |
| Flash Don't Walk (s) | 29.5 | 29.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 28.2 | 28.2 | | 48.4 | 48.4 | |
| Actuated g/C Ratio | 0.32 | 0.32 | | 0.54 | 0.54 | |
| v/c Ratio | 0.75 | 0.80 | | 0.71 | 0.91 | |
| Control Delay (s/veh) | 31.5 | 41.1 | | 19.2 | 29.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 31.5 | 41.1 | | 19.2 | 29.2 | |
| LOS | C | D | | B | C | |
| Approach Delay (s/veh) | 34.5 | | | 19.2 | 29.2 | |
| Approach LOS | C | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 89.1 | | | |
| Natural Cycle: 100 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.91 | | | |
| Intersection Signal Delay (s/veh): 27.3 | | Intersection LOS: C | |
| Intersection Capacity Utilization 82.6% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 733 | 342 | 1364 | 1671 |
| v/c Ratio | 0.75 | 0.80 | 0.71 | 0.91 |
| Control Delay (s/veh) | 31.5 | 41.1 | 19.2 | 29.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 31.5 | 41.1 | 19.2 | 29.2 |
| Queue Length 50th (m) | 55.7 | 55.2 | 86.7 | 128.0 |
| Queue Length 95th (m) | 74.0 | 89.8 | 142.2 | #225.3 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1375 | 595 | 1918 | 1831 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.53 | 0.57 | 0.71 | 0.91 |

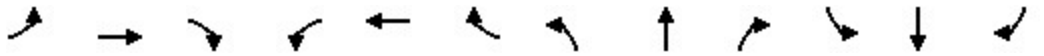
Intersection Summary

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

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| Future Volume (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 0.97 | 0.91 | | 0.95 | 0.95 | |
| Frt | 0.96 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 3060 | 1312 | | 3535 | 3358 | |
| Flt Permitted | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 3060 | 1312 | | 3535 | 3358 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 514 | 561 | 0 | 1364 | 1472 | 199 |
| RTOR Reduction (vph) | 12 | 12 | 0 | 0 | 9 | 0 |
| Lane Group Flow (vph) | 721 | 330 | 0 | 1364 | 1662 | 0 |
| Heavy Vehicles (%) | 3% | 2% | 0% | 1% | 5% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 28.2 | 28.2 | | 48.4 | 48.4 | |
| Effective Green, g (s) | 28.2 | 28.2 | | 48.4 | 48.4 | |
| Actuated g/C Ratio | 0.32 | 0.32 | | 0.54 | 0.54 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 968 | 415 | | 1920 | 1824 | |
| v/s Ratio Prot | 0.24 | | | 0.39 | c0.49 | |
| v/s Ratio Perm | | c0.25 | | | | |
| v/c Ratio | 0.75 | 0.80 | | 0.71 | 0.91 | |
| Uniform Delay, d1 | 27.2 | 27.8 | | 15.1 | 18.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.2 | 10.2 | | 2.3 | 8.4 | |
| Delay (s) | 30.4 | 38.0 | | 17.4 | 26.8 | |
| Level of Service | C | D | | B | C | |
| Approach Delay (s/veh) | 32.8 | | | 17.4 | 26.8 | |
| Approach LOS | C | | | B | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 25.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.87 | | |
| Actuated Cycle Length (s) | 89.1 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 82.6% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

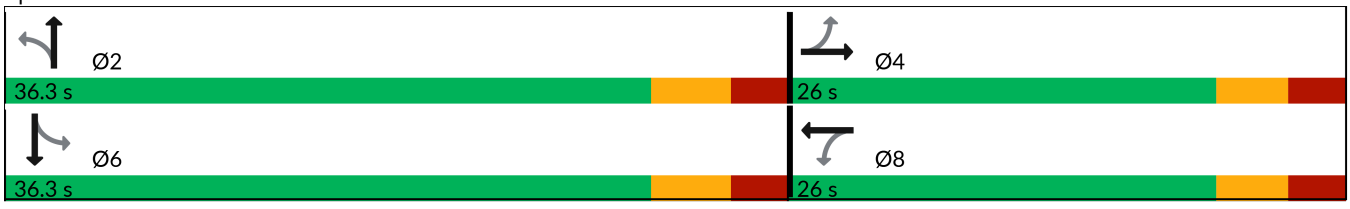


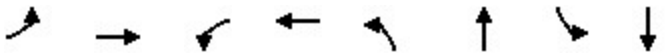
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| Future Volume (vph) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 30.0 | | 0.0 | 40.0 | | 0.0 | 55.0 | | 0.0 | 50.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 2.5 | | | 2.5 | | | 2.5 | | | 2.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.868 | | | 0.971 | | | 0.986 | | | 0.988 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1651 | 1416 | 0 | 1668 | 1575 | 0 | 1651 | 3003 | 0 | 1668 | 3035 | 0 |
| Flt Permitted | 0.744 | | | 0.596 | | | 0.444 | | | 0.391 | | |
| Satd. Flow (perm) | 1293 | 1416 | 0 | 1046 | 1575 | 0 | 772 | 3003 | 0 | 686 | 3035 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 204 | | | 4 | | | 25 | | | 20 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 137.8 | | | 144.0 | | | 185.7 | | | 162.4 | |
| Travel Time (s) | | 9.9 | | | 10.4 | | | 11.1 | | | 9.7 | |
| 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% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Adj. Flow (vph) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 51 | 232 | 0 | 48 | 21 | 0 | 228 | 685 | 0 | 3 | 555 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 3.5 | | | 3.5 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 1.6 | | | 1.6 | | | 1.6 | | | 1.6 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 | 1.11 | 1.21 | 1.21 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 36.3 | 36.3 | | 36.3 | 36.3 | |
| Total Split (%) | 41.7% | 41.7% | | 41.7% | 41.7% | | 58.3% | 58.3% | | 58.3% | 58.3% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Yellow Time (s) | 3.3 | 3.3 | | 3.3 | 3.3 | | 3.7 | 3.7 | | 3.7 | 3.7 | |
| All-Red Time (s) | 2.7 | 2.7 | | 2.7 | 2.7 | | 2.6 | 2.6 | | 2.6 | 2.6 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Max | Max | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.0 | 22.0 | | 22.0 | 22.0 | |
| Flash Don't Walk (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 9.3 | 9.3 | | 9.3 | 9.3 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.58 | 0.58 | | 0.58 | 0.58 | |
| v/c Ratio | 0.22 | 0.55 | | 0.26 | 0.07 | | 0.51 | 0.39 | | 0.01 | 0.31 | |
| Control Delay (s/veh) | 20.2 | 10.1 | | 21.6 | 16.0 | | 12.3 | 6.8 | | 5.7 | 6.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 20.2 | 10.1 | | 21.6 | 16.0 | | 12.3 | 6.8 | | 5.7 | 6.3 | |
| LOS | C | B | | C | B | | B | A | | A | A | |
| Approach Delay (s/veh) | | 11.9 | | | 19.9 | | | 8.1 | | | 6.3 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 62.3 | | | |
| Actuated Cycle Length: 51.7 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.55 | | | |
| Intersection Signal Delay (s/veh): 8.6 | | Intersection LOS: A | |
| Intersection Capacity Utilization 74.8% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: Townline Road & Ellis Road/Sideroad 10 North





| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 51 | 232 | 48 | 21 | 228 | 685 | 3 | 555 |
| v/c Ratio | 0.22 | 0.55 | 0.26 | 0.07 | 0.51 | 0.39 | 0.01 | 0.31 |
| Control Delay (s/veh) | 20.2 | 10.1 | 21.6 | 16.0 | 12.3 | 6.8 | 5.7 | 6.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 20.2 | 10.1 | 21.6 | 16.0 | 12.3 | 6.8 | 5.7 | 6.3 |
| Queue Length 50th (m) | 4.1 | 2.2 | 3.9 | 1.3 | 9.8 | 13.4 | 0.1 | 10.3 |
| Queue Length 95th (m) | 11.2 | 16.3 | 10.9 | 5.5 | 32.8 | 29.2 | 1.0 | 23.0 |
| Internal Link Dist (m) | | 113.8 | | 120.0 | | 161.7 | | 138.4 |
| Turn Bay Length (m) | 30.0 | | 40.0 | | 55.0 | | 50.0 | |
| Base Capacity (vph) | 501 | 673 | 404 | 612 | 448 | 1756 | 398 | 1772 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.10 | 0.34 | 0.12 | 0.03 | 0.51 | 0.39 | 0.01 | 0.31 |

Intersection Summary

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| Future Volume (vph) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| Ideal Flow (vphpl) | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 | 1775 | 1650 | 1650 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.97 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1651 | 1416 | | 1668 | 1576 | | 1651 | 3001 | | 1668 | 3035 | |
| Flt Permitted | 0.74 | 1.00 | | 0.60 | 1.00 | | 0.44 | 1.00 | | 0.39 | 1.00 | |
| Satd. Flow (perm) | 1292 | 1416 | | 1046 | 1576 | | 772 | 3001 | | 687 | 3035 | |
| 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) | 51 | 28 | 204 | 48 | 17 | 4 | 228 | 619 | 66 | 3 | 510 | 45 |
| RTOR Reduction (vph) | 0 | 167 | 0 | 0 | 3 | 0 | 0 | 10 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 51 | 65 | 0 | 48 | 18 | 0 | 228 | 675 | 0 | 3 | 547 | 0 |
| Heavy Vehicles (%) | 1% | 0% | 0% | 0% | 0% | 3% | 1% | 2% | 0% | 0% | 1% | 0% |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 9.3 | 9.3 | | 9.3 | 9.3 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Effective Green, g (s) | 9.3 | 9.3 | | 9.3 | 9.3 | | 30.1 | 30.1 | | 30.1 | 30.1 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.58 | 0.58 | | 0.58 | 0.58 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 232 | 254 | | 188 | 283 | | 449 | 1747 | | 399 | 1766 | |
| v/s Ratio Prot | | 0.05 | | | 0.01 | | | 0.22 | | | 0.18 | |
| v/s Ratio Perm | 0.04 | | | c0.05 | | | c0.30 | | | 0.00 | | |
| v/c Ratio | 0.22 | 0.25 | | 0.26 | 0.06 | | 0.51 | 0.39 | | 0.01 | 0.31 | |
| Uniform Delay, d1 | 18.1 | 18.2 | | 18.2 | 17.6 | | 6.4 | 5.8 | | 4.5 | 5.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.5 | | 0.7 | 0.1 | | 4.1 | 0.6 | | 0.0 | 0.5 | |
| Delay (s) | 18.6 | 18.8 | | 18.9 | 17.7 | | 10.5 | 6.5 | | 4.6 | 6.0 | |
| Level of Service | B | B | | B | B | | B | A | | A | A | |
| Approach Delay (s/veh) | | 18.7 | | | 18.6 | | | 7.5 | | | 6.0 | |
| Approach LOS | | B | | | B | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 9.2 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.45 | | |
| Actuated Cycle Length (s) | 51.7 | Sum of lost time (s) | 12.3 |
| Intersection Capacity Utilization | 74.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

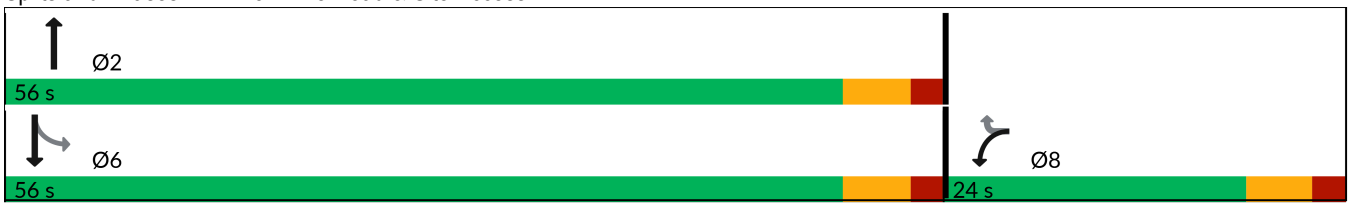
c Critical Lane Group

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| Future Volume (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 |
| Frt | | 0.850 | 0.995 | | | |
| Flt Protected | 0.950 | | | | 0.950 | |
| Satd. Flow (prot) | 1626 | 1454 | 3253 | 0 | 1750 | 1842 |
| Flt Permitted | 0.950 | | | | 0.311 | |
| Satd. Flow (perm) | 1626 | 1454 | 3253 | 0 | 573 | 1842 |
| Right Turn on Red | | Yes | | Yes | | |
| Satd. Flow (RTOR) | | 24 | 8 | | | |
| Link Speed (k/h) | 50 | | 60 | | | 60 |
| Link Distance (m) | 104.2 | | 335.6 | | | 185.7 |
| Travel Time (s) | 7.5 | | 20.1 | | | 11.1 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 30 | 24 | 918 | 0 | 14 | 791 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(m) | 3.5 | | 7.0 | | | 7.0 |
| Link Offset(m) | 0.0 | | 0.0 | | | 0.0 |
| Crosswalk Width(m) | 1.6 | | 1.6 | | | 1.6 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.12 | 1.12 | 1.11 | 1.11 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | | 14 | 24 | |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Right | Thru | | Left | Thru |
| Leading Detector (m) | 6.1 | 6.1 | 30.5 | | 6.1 | 30.5 |
| Trailing Detector (m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Position(m) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Size(m) | 6.1 | 6.1 | 1.8 | | 6.1 | 1.8 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(m) | | | 28.7 | | | 28.7 |
| Detector 2 Size(m) | | | 1.8 | | | 1.8 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 |
| Turn Type | Prot | Perm | NA | | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Detector Phase | 8 | 8 | 2 | | 6 | 6 |
| Switch Phase | | | | | | |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | | 24.0 | 24.0 |
| Total Split (s) | 24.0 | 24.0 | 56.0 | | 56.0 | 56.0 |
| Total Split (%) | 30.0% | 30.0% | 70.0% | | 70.0% | 70.0% |
| Maximum Green (s) | 18.0 | 18.0 | 50.0 | | 50.0 | 50.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Recall Mode | None | None | Max | | Max | Max |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 7.0 | 7.0 |
| Flash Don't Walk (s) | 11.0 | 11.0 | 11.0 | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | 0 | 0 |
| Act Effct Green (s) | 7.0 | 7.0 | 65.6 | | 65.6 | 65.6 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.85 | | 0.85 | 0.85 |
| v/c Ratio | 0.20 | 0.16 | 0.33 | | 0.03 | 0.50 |
| Control Delay (s/veh) | 36.0 | 15.9 | 2.8 | | 2.9 | 4.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.3 |
| Total Delay (s/veh) | 36.0 | 15.9 | 2.8 | | 2.9 | 5.0 |
| LOS | D | B | A | | A | A |
| Approach Delay (s/veh) | 27.1 | | 2.8 | | | 4.9 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 77 | | | |
| Natural Cycle: 60 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.50 | | | |
| Intersection Signal Delay (s/veh): 4.5 | | Intersection LOS: A | |
| Intersection Capacity Utilization 55.8% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 2: Townline Road & Site Access 1



| Lane Group | WBL | WBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 30 | 24 | 918 | 14 | 791 |
| v/c Ratio | 0.20 | 0.16 | 0.33 | 0.03 | 0.50 |
| Control Delay (s/veh) | 36.0 | 15.9 | 2.8 | 2.9 | 4.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 36.0 | 15.9 | 2.8 | 2.9 | 5.0 |
| Queue Length 50th (m) | 4.6 | 0.0 | 18.1 | 0.4 | 38.0 |
| Queue Length 95th (m) | 11.2 | 6.3 | 28.6 | 1.8 | 69.2 |
| Internal Link Dist (m) | 80.2 | | 311.6 | | 161.7 |
| Turn Bay Length (m) | | | | | |
| Base Capacity (vph) | 382 | 360 | 2772 | 488 | 1569 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 246 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.08 | 0.07 | 0.33 | 0.03 | 0.60 |

Intersection Summary

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| Future Volume (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| Ideal Flow (vphpl) | 1765 | 1765 | 1775 | 1775 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1626 | 1454 | 3253 | | 1750 | 1842 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | 0.31 | 1.00 |
| Satd. Flow (perm) | 1626 | 1454 | 3253 | | 572 | 1842 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 24 | 887 | 31 | 14 | 791 |
| RTOR Reduction (vph) | 0 | 23 | 2 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 30 | 1 | 916 | 0 | 14 | 791 |
| Turn Type | Prot | Perm | NA | | Perm | NA |
| Protected Phases | 8 | | 2 | | | 6 |
| Permitted Phases | | 8 | | | 6 | |
| Actuated Green, G (s) | 4.5 | 4.5 | 62.9 | | 62.9 | 62.9 |
| Effective Green, g (s) | 4.5 | 4.5 | 62.9 | | 62.9 | 62.9 |
| Actuated g/C Ratio | 0.06 | 0.06 | 0.79 | | 0.79 | 0.79 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 92 | 82 | 2576 | | 453 | 1459 |
| v/s Ratio Prot | c0.02 | | 0.28 | | | c0.43 |
| v/s Ratio Perm | | 0.00 | | | 0.02 | |
| v/c Ratio | 0.33 | 0.02 | 0.36 | | 0.03 | 0.54 |
| Uniform Delay, d1 | 36.0 | 35.4 | 2.4 | | 1.8 | 3.0 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 2.1 | 0.1 | 0.4 | | 0.1 | 1.5 |
| Delay (s) | 38.1 | 35.4 | 2.8 | | 1.9 | 4.5 |
| Level of Service | D | D | A | | A | A |
| Approach Delay (s/veh) | 36.9 | | 2.8 | | | 4.4 |
| Approach LOS | D | | A | | | A |

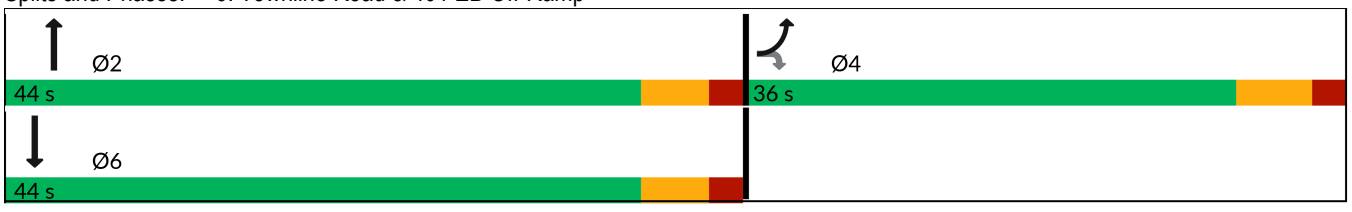
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 4.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.53 | | |
| Actuated Cycle Length (s) | 79.4 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 55.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

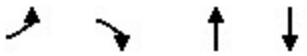
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| Future Volume (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | 0.944 | 0.850 | | | 0.979 | |
| Flt Protected | 0.970 | | | | | |
| Satd. Flow (prot) | 3068 | 1325 | 0 | 3500 | 3436 | 0 |
| Flt Permitted | 0.970 | | | | | |
| Satd. Flow (perm) | 3068 | 1325 | 0 | 3500 | 3436 | 0 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | 61 | 61 | | | 31 | |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 147.9 | | | 97.7 | 411.0 | |
| Travel Time (s) | 10.6 | | | 5.9 | 24.7 | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Adj. Flow (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| Shared Lane Traffic (%) | | 44% | | | | |
| Lane Group Flow (vph) | 609 | 287 | 0 | 649 | 1187 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(m) | 7.0 | | | 0.0 | 0.0 | |
| Link Offset(m) | 0.0 | | | 0.0 | 0.0 | |
| Crosswalk Width(m) | 1.6 | | | 1.6 | 1.6 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.11 | 1.13 | 1.01 | 1.01 | 1.01 | 1.01 |
| Turning Speed (k/h) | 24 | 14 | 24 | | | 14 |
| Number of Detectors | 1 | 1 | | 2 | 2 | |
| Detector Template | Left | Right | | Thru | Thru | |
| Leading Detector (m) | 6.1 | 6.1 | | 30.5 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 6.1 | | 1.8 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | | | 28.7 | 28.7 | |
| Detector 2 Size(m) | | | | 1.8 | 1.8 | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | |
| Detector 2 Channel | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Detector Phase | 4 | 4 | | 2 | 6 | |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Switch Phase | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (s) | 36.0 | 36.0 | | 44.0 | 44.0 | |
| Total Split (%) | 45.0% | 45.0% | | 55.0% | 55.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 38.0 | 38.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | Max | Max | |
| Walk Time (s) | 10.0 | 10.0 | | 32.0 | 32.0 | |
| Flash Don't Walk (s) | 19.5 | 19.5 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | 19.4 | 19.4 | | 38.3 | 38.3 | |
| Actuated g/C Ratio | 0.28 | 0.28 | | 0.54 | 0.54 | |
| v/c Ratio | 0.68 | 0.70 | | 0.34 | 0.63 | |
| Control Delay (s/veh) | 24.1 | 27.1 | | 10.6 | 13.8 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay (s/veh) | 24.1 | 27.1 | | 10.6 | 13.8 | |
| LOS | C | C | | B | B | |
| Approach Delay (s/veh) | 25.1 | | | 10.6 | 13.8 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 70.3 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.70 | | | |
| Intersection Signal Delay (s/veh): 16.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 66.9% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Townline Road & 401 EB Off-Ramp





| Lane Group | EBL | EBR | NBT | SBT |
|---|---|---|---|---|
| Lane Group Flow (vph) | 609 | 287 | 649 | 1187 |
| v/c Ratio | 0.68 | 0.70 | 0.34 | 0.63 |
| Control Delay (s/veh) | 24.1 | 27.1 | 10.6 | 13.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 24.1 | 27.1 | 10.6 | 13.8 |
| Queue Length 50th (m) | 32.6 | 28.6 | 21.9 | 48.4 |
| Queue Length 95th (m) | 47.2 | 54.5 | 44.0 | 93.2 |
| Internal Link Dist (m) | 123.9 | | 73.7 | 387.0 |
| Turn Bay Length (m) | | | | |
| Base Capacity (vph) | 1332 | 595 | 1906 | 1885 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.46 | 0.48 | 0.34 | 0.63 |

Intersection Summary

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| Future Volume (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| Ideal Flow (vphpl) | 1775 | 1750 | 1900 | 1900 | 1900 | 1900 |
| Lane Width | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Total Lost time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Lane Util. Factor | 0.97 | 0.91 | | 0.95 | 0.95 | |
| Frt | 0.94 | 0.85 | | 1.00 | 0.98 | |
| Flt Protected | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (prot) | 3068 | 1325 | | 3500 | 3436 | |
| Flt Permitted | 0.97 | 1.00 | | 1.00 | 1.00 | |
| Satd. Flow (perm) | 3068 | 1325 | | 3500 | 3436 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 383 | 513 | 0 | 649 | 1022 | 165 |
| RTOR Reduction (vph) | 44 | 44 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 565 | 243 | 0 | 649 | 1173 | 0 |
| Heavy Vehicles (%) | 2% | 1% | 0% | 2% | 2% | 0% |
| Turn Type | Prot | Perm | | NA | NA | |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 19.4 | 19.4 | | 38.3 | 38.3 | |
| Effective Green, g (s) | 19.4 | 19.4 | | 38.3 | 38.3 | |
| Actuated g/C Ratio | 0.28 | 0.28 | | 0.55 | 0.55 | |
| Clearance Time (s) | 6.5 | 6.5 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 847 | 366 | | 1909 | 1874 | |
| v/s Ratio Prot | c0.18 | | | 0.19 | c0.34 | |
| v/s Ratio Perm | | 0.18 | | | | |
| v/c Ratio | 0.67 | 0.66 | | 0.34 | 0.63 | |
| Uniform Delay, d1 | 22.5 | 22.5 | | 8.9 | 11.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.0 | 4.5 | | 0.5 | 1.6 | |
| Delay (s) | 24.5 | 27.0 | | 9.4 | 12.6 | |
| Level of Service | C | C | | A | B | |
| Approach Delay (s/veh) | 25.3 | | | 9.4 | 12.6 | |
| Approach LOS | C | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay (s/veh) | 16.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.64 | | |
| Actuated Cycle Length (s) | 70.2 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 66.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

# Appendix G

## Transportation Tomorrow Survey 2022

AM INBOUND
Mon Nov 10 2025 13:37:37 GMT-0500 (Eastern Standard Time) - Run Time: 3088ms

Cross Tabulation Query Form - Trip - 2022

Row: Planning district of origin - pd_orig
Column: 2006 GTA zone of destination - gta06_dest

RowG:
ColG:(7313,7322,7353,7354,7355,7356,7478,8304)
TblG:

Filters:
Start time of trip - start_time In 600-900
and
Trip Purpose of Destination - purp_dest In W

Trip 2022
Table:

AM OUTBOUND
Mon Nov 10 2025 15:16:46 GMT-0500 (Eastern Standard Time) - Run Time: 2984ms

Cross Tabulation Query Form - Trip - 2022

Row: Planning district of destination - pd_dest
Column: 2006 GTA zone of origin - gta06_orig

RowG:
ColG:(7313,7322,7353,7354,7355,7356,7478,8304)
TblG:

Filters:
Start time of trip - start_time In 600-900
and
Trip Purpose of Origin - purp_orig In W

Trip 2022
Table:

,1

Cambridge,33

PM INBOUND
Mon Nov 10 2025 15:12:37 GMT-0500 (Eastern Standard Time) - Run Time: 2955ms

Cross Tabulation Query Form - Trip - 2022

Row: Planning district of origin - pd_orig
Column: 2006 GTA zone of destination - gta06_dest

RowG:
ColG:(7313,7322,7353,7354,7355,7356,7478,8304)
TblG:

Filters:
Start time of trip - start_time In 1600-1900
and
Trip Purpose of Destination - purp_dest In W

Trip 2022
Table:

,1

Cambridge,7

PM OUTBOUND
Mon Nov 10 2025 15:17:49 GMT-0500 (Eastern Standard Time) - Run Time: 2941ms

Cross Tabulation Query Form - Trip - 2022

Row: Planning district of destination - pd_dest
Column: 2006 GTA zone of origin - gta06_orig

RowG:
ColG:(7313,7322,7353,7354,7355,7356,7478,8304)
TblG:

Filters:
Start time of trip - start_time In 1600-1900
and
Trip Purpose of Origin - purp_orig In W

Trip 2022
Table:

| ,1 | N Townline | S Townline | E Ellis Road | W Ellis Road | W Jamieson Parkway | W EB Off Ramp | E WB Off ramp | W WB On Ramp | W EB On Ramp | N Townline | S Townline | E Ellis Road | W Ellis Road | W Jamieson Parkway | W EB Off Ramp | E WB Off ramp | W WB On Ramp | W EB On Ramp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PD 1 of T | 41 | | | | | | 1 | | | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 0 | 0 |
| Vaughan | 13 | | | | | | 1 | | | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 |
| Bramptor | 88 | | | | | | 1 | | | 0 | 0 | 0 | 0 | 0 | 0 | 88 | 0 | 0 |
| Mississa | 13 | | | | | | 1 | | | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 |
| Oakville | 25 | | | | | | 1 | | | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 |
| Burlingto | 13 | | | | | | 1 | | | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 |
| Flamboro | 25 | 0.5 | | | | | 0.5 | | | 12.5 | 0 | 0 | 0 | 0 | 0 | 12.5 | 0 | 0 |
| Ancaster | 61 | | 0.5 | | | | 0.5 | | | 0 | 30.5 | 0 | 0 | 0 | 0 | 30.5 | 0 | 0 |
| Glanbroo | 137 | | 0.5 | | | | 0.5 | | | 0 | 68.5 | 0 | 0 | 0 | 0 | 68.5 | 0 | 0 |
| Stoney C | 23 | | 0.5 | | | | 0.5 | | | 0 | 11.5 | 0 | 0 | 0 | 0 | 11.5 | 0 | 0 |
| Hamilton | 35 | 0.5 | | | | | 0.5 | | | 17.5 | 0 | 0 | 0 | 0 | 0 | 17.5 | 0 | 0 |
| Lincoln | 29 | | 0.5 | | | | 0.5 | | | 0 | 14.5 | 0 | 0 | 0 | 0 | 14.5 | 0 | 0 |
| Waterloo | 261 | | | | | 1 | | | | 0 | 0 | 0 | 0 | 0 | 261 | 0 | 0 | 0 |
| Kitchener | 1073 | | | | | 1 | | | | 0 | 0 | 0 | 0 | 0 | 1073 | 0 | 0 | 0 |
| Cambridg | 2169 | | 1 | | | | | | | 0 | 2169 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| North Du | 43 | | 0.5 | | | 0.5 | | | | 0 | 21.5 | 0 | 0 | 0 | 21.5 | 0 | 0 | 0 |
| Wilmot | 48 | | | | | 1 | | | | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 |
| Woolwich | 141 | 0.5 | | | | 0.5 | | | | 70.5 | 0 | 0 | 0 | 0 | 70.5 | 0 | 0 | 0 |
| Guelph | 320 | 0.5 | | | | | 0.5 | | | 160 | 0 | 0 | 0 | 0 | 0 | 160 | 0 | 0 |
| Puslinch | 46 | 0.5 | | | | | 0.5 | | | 23 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 |
| Oxford | 74 | | | | | 1 | | | | 0 | 0 | 0 | 0 | 0 | 74 | 0 | 0 | 0 |
| Brant | 23 | | 1 | | | | | | | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brantford | 18 | | 0.5 | | | 0.5 | | | | 0 | 9 | 0 | 0 | 0 | 9 | 0 | 0 | 0 |
| Chatswo | 18 | 1 | | | | | | | | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4737 | | | | | | | | | 301.5 | 2347.5 | 0 | 0 | 0 | 1557 | 531 | 0 | 0 |
| | | | | | | | | | | 6% | 50% | 0% | 0% | 0% | 33% | 11% | 0% | 0% |

| ,1 | N Townline | S Townline | E Ellis Road | W Ellis Road | W Jamieson Parkway | W EB Off Ramp | E WB Off ramp | W WB On Ramp | W EB On Ramp | N Townline | S Townline | E Ellis Road | W Ellis Road | W Jamieson Parkway | W EB Off Ramp | E WB Off ramp | W WB On Ramp | W EB On Ramp |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PD 1 of Tc | 78 | | | | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 78 |
| Vaughan | 13 | | | | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| Brampton | 88 | | | | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 88 |
| Mississau | 22 | | | | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| Oakville | 25 | | | | | | | | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| Flamboro | 13 | 0.333 | 0.333 | | | | | | | 0.333 | 4.329 | 4.329 | 0 | 0 | 0 | 0 | 0 | 4.329 |
| Glanbrook | 84 | 0.333 | 0.333 | | | | | | | 0.333 | 27.972 | 27.972 | 0 | 0 | 0 | 0 | 0 | 27.972 |
| Hamilton | 88 | 0.333 | 0.333 | | | | | | | 0.333 | 29.304 | 29.304 | 0 | 0 | 0 | 0 | 0 | 29.304 |
| Waterloo | 213 | | | | | | | | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 213 | 0 |
| Kitchener | 911 | | | | | | | | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 911 | 0 |
| Cambridg | 1966 | | 1 | | | | | | | | 0 | 1966 | 0 | 0 | 0 | 0 | 0 | 0 |
| North Dun | 66 | | | | | | | | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 66 | 0 |
| Wilmot | 14 | | | | | | | | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 |
| Wellesley | 39 | | | | | | | | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 0 |
| Woolwich | 141 | | | | | | | | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 141 | 0 |
| Guelph | 196 | 1 | | | | | | | | | 196 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Puslinch | 80 | 0.5 | | | | | | | | 0.5 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 40 |
| Oxford | 74 | | | | | | | | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 74 | 0 |
| Brant | 23 | | 1 | | | | | | | | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brantford | 37 | | 1 | | | | | | | | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4171 | | | | | | | | | | 297.605 | 2087.605 | 0 | 0 | 0 | 0 | 1458 | 327.605 |
| | | | | | | | | | | | 7% | 50% | 0% | 0% | 0% | 0% | 35% | 8% |

TTS

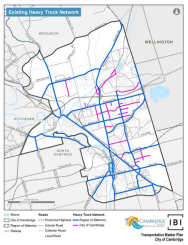
| | | N Townline | S Townline | E Ellis | W Ellis | W Jamieson | W EB Off Ramp | E WB Off ramp | W WB On Ramp | W EB On Ramp | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | INBOUND | 6% | 50% | 0% | 0% | 0% | 33% | 11% | 0% | 0% | **100%** |
| | OUTBOUND | | | | | | | | | | **0%** |
| PM | INBOUND | | | | | | | | | | **0%** |
| | OUTBOUND | 7% | 50% | 0% | 0% | 0% | 0% | 0% | 35% | 8% | **100%** |

Existing

| | | N Townline | S Townline | E Ellis | W Ellis | W Jamieson | W EB Off Ramp | E WB Off ramp | W WB On Ramp | W EB On Ramp | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | INBOUND | 24% | 31% | 1% | 9% | 17% | 14% | 5% | 0% | 0% | **100%** |
| | OUTBOUN | 24% | 45% | 2% | 5% | 0% | 0% | 0% | 17% | 6% | **100%** |
| PM | INBOUND | 20% | 43% | 3% | 6% | 0% | 16% | 13% | 0% | 0% | **100%** |
| | OUTBOUN | 31% | 39% | 1% | 12% | 0% | 0% | 0% | 13% | 4% | **100%** |
| SAT | INBOUND | 25% | 32% | 2% | 12% | 0% | 19% | 10% | 0% | 0% | **100%** |
| | OUTBOUN | 26% | 42% | 2% | 9% | 0% | 0% | 0% | 15% | 6% | **100%** |



**Exhibit 2.5: Existing Cambridge Goods Movement Network**



ghd.com

The Power of Commitment