



BURNSIDE

## Sheridan Park Drive Extension Transportation Report

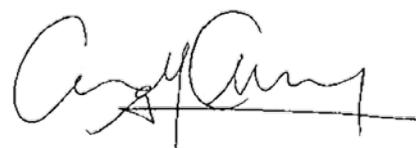
**City of Mississauga**

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January 2018  
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## Executive Summary

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

As part of the EA Study, Burnside has completed a transportation analysis to identify whether the proposed Sheridan Park Drive Extension will impact transportation within the Study Area and determine if any potential mitigation measures are required. The results of this analysis is documented in the *Sheridan Park Drive Extension Transportation Report*.

### Description of Study Area

The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive/Homelands Drive to the east and naturalized private lands to the south. The proposed extension of Sheridan Park Drive falls within the existing City of Mississauga owned right-of-way (ROW), which runs through the centre part of the Study Area.

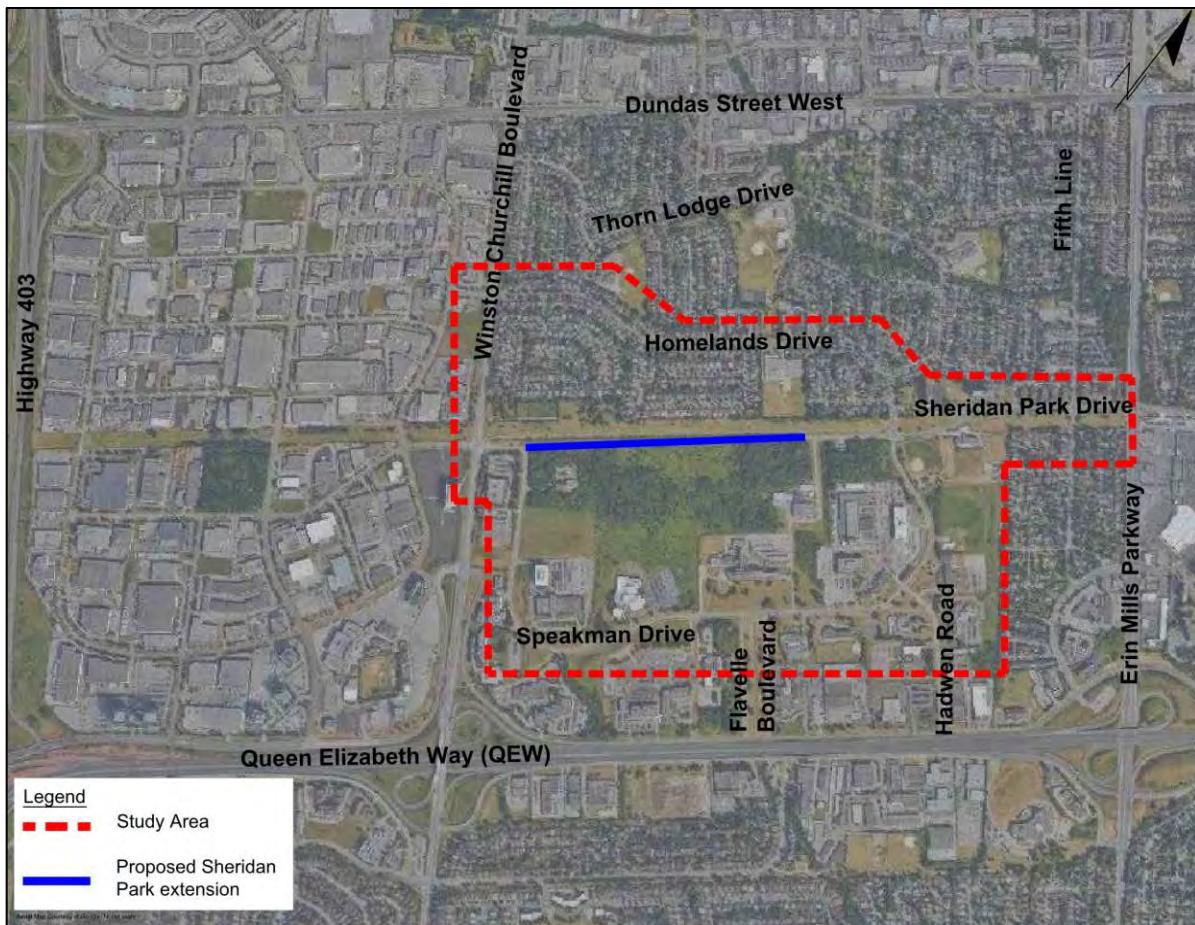
The study area for the traffic analysis is shown in Figure A.

The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail (MUT) and the Sheridan Homelands residential neighbourhood. The City's Official Plan (MOP) has identified the completion of Sheridan Park Drive segment as a future major collector road, which is shown on Schedule 5 in the MOP.

Sheridan Park Drive is a two-lane major collector road located in the southwest quadrant of the City. The existing Sheridan Park Drive to the east of the subject area terminates approximately 275 meters west of Sheridan Park Drive / Speakman Drive / Homelands Drive intersection. From the west of the study area, Sheridan Park Drive terminates approximately 160 meters east of Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection. As a result, there is an approximate 850 meter gap between the two terminuses. The City owns the property between the existing terminuses.

R. J. Burnside & Associates Limited (Burnside) was retained by the City to undertake a study providing a comprehensive and environmentally sound planning process that incorporates the interest of the public and differing parties. This report is the existing and future transportation study and forms one of the background reports to the overall Project Report File for the study.

**Figure A: Traffic Study Area**



### **Existing Transportation System**

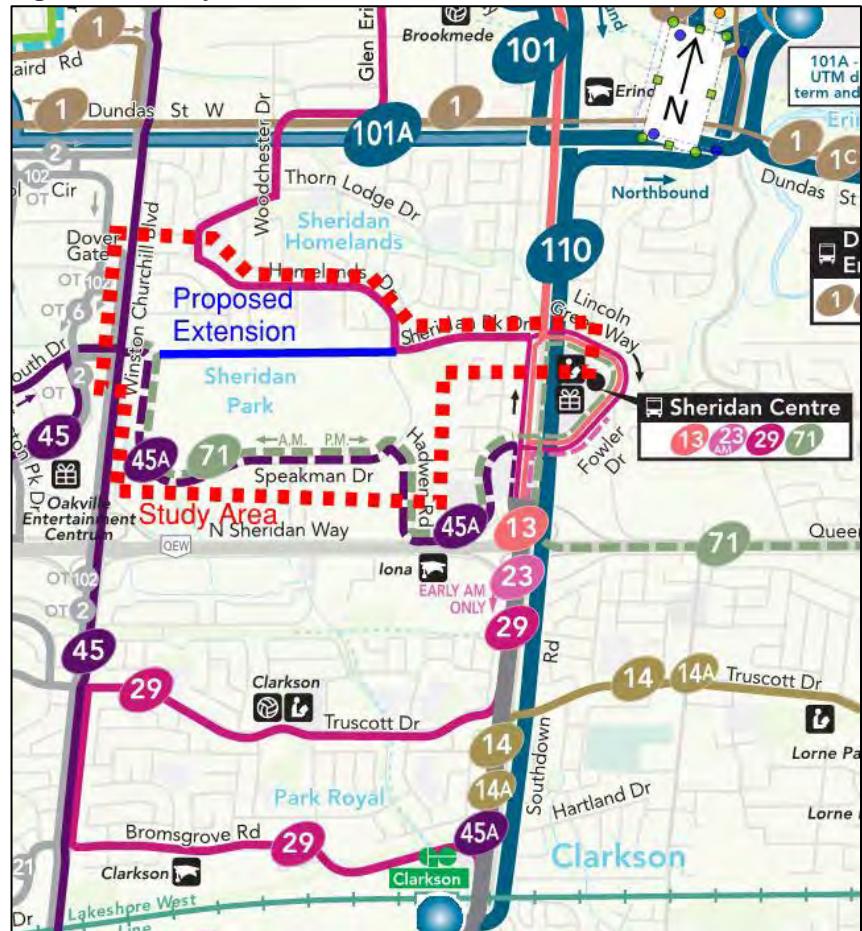
As part of the transportation analysis, the existing transportation system within the transportation study area was evaluated. Sheridan Park Drive is discontinuous through the area shown for the proposed extension and this is a missing link in the roadway network to provide east-west connectivity.

Cycling and pedestrian movement is accommodated by a MUT within the utility corridor along the north side of the Sheridan Park corridor. Sheridan Park Drive east of Homelands Drive has a sidewalk on the north side and east of the west leg of Speakman Drive, the sidewalk is on the south side of the street. Residents and employees currently walk through the MUT area.

Transit service is provided in the area by MiWay with routes shown in Figure B.

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**Figure B: MiWay Transit Service**



The Sheridan Homelands neighbourhood is serviced by transit on the arterial road network and within the neighbourhood via Route 29. Sheridan Park is serviced internally by Routes 45A and 71.

Key study area intersections were assessed to evaluate operations during the weekday morning (AM) and afternoon (PM) peak hours. Signalized intersections are operating at an overall level of service C during the weekday AM and PM peak hours. Priority for green time has been given to the north-south roads of Winston Churchill Boulevard and Erin Mills Parkway. This can result in lower operations on the side streets, but the movements are operating within capacity.

During the PM period, it is common to observe queues within employment areas as employees typically exit around similar times especially if the employment use is similar within in the area (e.g. majority office). This is the case at the Winston Churchill Boulevard / Plymouth Drive / Sheridan Park Drive intersection where westbound queues from Winston Churchill Boulevard were observed for through right turn movements.

Through previous work undertaken by the Region of Peel, the need for an exclusive westbound right turn lane was identified and has been added to their Development Charges Study. This improvement would reduce queues and improve operations for vehicles exiting Sheridan Park during the weekday PM peak hour.

For the unsignalized two-way stop intersections assessed in the study area, the critical movements are operating with level of service C or better and no changes are identified for these intersections.

The unsignalized four-way stop intersection movements are operating at level of service C or better with the exceptions of eastbound movements at the Fifth Line / Sheridan Park Drive intersection. This intersection has been identified as needing traffic signals in the future.

The City is undertaking a separate study to address Sheridan Homelands neighbourhood residents' concerns with respect to operations on their streets including speeding. The effect that the Sheridan Park extension could have on the neighbourhood in the future conditions has been considered.

Based on the traffic data available, it is observed that trucks (which includes buses) are using Homelands Drive; however, there is no evidence that the trucks are using the route to access Sheridan Park Corporate Centre or the employment lands on the west side of Winston Churchill Boulevard. Included in the traffic data numbers are trucks and buses that would have a destination / purpose within the neighbourhood such as garbage pick-up and home delivery services. There is some evidence that trucks might be using Homelands Drive and Sheridan Park Drive (east of Homelands Drive) as an east-west route between Winston Churchill Boulevard and Erin Mills Parkway.

Some of the key findings are shown in Figure C.

**Figure C: Key Findings**



### EMME Travel Demand Traffic Volume Projections

To assess effects of the various network scenarios, the City's EMME Travel Demand Model was utilized to project traffic volumes for 2021 and 2031 horizon years. In addition, the model was also utilized to assess the impact of the various network scenarios on travel along Homelands Drive/ the Sheridan residential neighbourhood. This assessment was completed for the 2021 horizon year and examined the following:

1. How much traffic utilizes Homelands Drive when comparing the following scenarios:
  - a) Do-nothing scenario – the Do-nothing scenario (assumes four (4) lanes only on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).
  - b) Sheridan Park Drive Extension (with four (4) lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).
  - c) Speakman Drive widening to four (4) lanes (no Sheridan Park Drive extension, four (4) lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).
2. Origin and destination of trips utilizing Homelands Drive.
3. Origin and destination of trips utilizing the Sheridan Park Drive Extension.

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It should be noted that the EMME model is used for macro analysis to provide analysis/results generally at a higher level, i.e. freeways, arterials and major collectors. As such the numbers presented in this document should not be taken for exact but are intended to help in comparing how the various scenarios impact travel demand in the area.

The 2021 horizon year model runs were utilized to compare the impacts of the various road network options assumed as identified above. The key findings are as follows:

**AM Peak Hour**

- With the Sheridan Park Drive Extension, the model shows a decrease in traffic along Homelands Drive by approximately 2% (four (4) vehicles) in the eastbound direction and 16% (38 vehicles) in the westbound direction compared to the Do-nothing scenario.
- The widening of Speakman Drive to four (4) lanes generally results in an increase in traffic along Homelands Drive as compared to the Sheridan Park Drive Extension scenario with approximately 16% (40 vehicles) more traffic in the eastbound direction and 18% (36 vehicles) in the westbound direction.
- With the Sheridan Park Drive Extension scenario, the greatest reduction in traffic will occur on the western end of Homelands Drive (west of the Thorn Lodge Drive east intersection) with volumes decreasing by approximately 29% (average for both directions) in the AM peak hour as compared to the Do-nothing scenario.
- With the Sheridan Park Drive Extension in place, the number of through trips ('cut through' traffic) utilizing Homelands Drive is projected to decrease by approximately 17% in the AM peak hour as compared to the Do-nothing scenario. This in comparison to the Speakman Drive widening to four (4) lanes scenario, which results in a 22% increase in the number of through trips using Homelands Drive as compared to the Do-nothing scenario.
- The Sheridan Park Drive Extension will play an important role in providing additional access to and from the Sheridan Homelands Residential Community. During the AM peak hour approximately 77% of the trips that utilize the Sheridan Park Drive Extension either originate from or are destined to the residential area to the north of Sheridan Park Drive. This results in an increase in traffic on the eastern end of Homelands Drive (east of Thorn Lodge Drive east intersection) by approximately 24% (average for both directions) as the residential communities' travel patterns change and they divert to this section of Homelands Drive to access the extension. However, there is a corresponding drop in traffic on the western section of Homelands Drive.

**PM Peak Hour**

- During the PM peak hour, the Sheridan Park Drive Extension results in an average decrease in traffic along Homelands Drive by approximately 3% (ten (10) vehicles) in the eastbound direction and 4% (14 vehicles) in the westbound direction compared to the Do-nothing scenario.

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- Comparing the Speakman Drive widening to four (4) lanes scenario against the Sheridan Park Drive Extension scenario, the widening of Speakman Drive to four (4) lanes results in an increase in traffic along Homelands Drive by approximately 3% (ten (10) vehicles) in the eastbound direction and 9% (31 vehicles) in the westbound direction.
- As a result of the Sheridan Park Drive Extension, the greatest traffic reductions will be experienced on the western end of Homelands Drive with volumes decreasing by approximately 25% (average for both directions).
- Because of the Sheridan Park Drive Extension, the number of through trips utilizing Homelands Drive is projected to decrease by approximately 13% as compared to the Do-nothing scenario. With the Speakman Drive widening to four (4) lanes scenario, the model projects an increase in the number of through trips along Homelands Drive by approximately 9% as compared to the Do-nothing scenario.
- Similar to the AM Peak Hour, the Sheridan Park Drive Extension will have an important role in serving the Sheridan Homelands Residential Community to the north with approximately 72% of the traffic using the extension having an origin or destination in the residential community. This again results in a diversion in traffic in the residential community which can be seen by the 40% increase (average for both directions) in traffic utilizing the eastern end of Homelands Drive. There is an associated drop in traffic to the west on Homelands Drive.

In conclusion, the results indicate that the Sheridan Park Drive Extension will play an important role in providing additional opportunities for residents living in the Sheridan Homelands neighbourhood to access their neighbourhood. The extension results in an overall reduction in traffic along sections of Homelands Drive and in addition results in a decrease in through traffic on Homelands Drive. The widening of Speakman Drive to four (4) lanes generally does not provide a benefit to the residents living to in the Sheridan Homelands neighbourhood as it does not reduce the amount of traffic utilizing Homelands Drive.

## **2021 Road Network**

As identified for existing conditions, the addition of the westbound right turn lane has been assumed as part of the road network at the Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection.

A traffic operations analysis was conducted for 2021 traffic conditions for the AM and PM peak hours. To accommodate the 2021 traffic forecasts, the following improvements to the road network are recommended:

- The Sheridan Park Drive / Speakman Drive (west leg) intersection will have a volume to capacity ratio of 0.78. To improve intersection operations, a roundabout is recommended to be installed with the Sheridan Park Drive Extension.

- The Sheridan Park Drive / Speakman Drive / Homelands Drive intersection will experience delays with or without Sheridan Park Drive Extension. Eastbound and westbound left turn lanes could be installed to improve operations; however, the best improvement would be a roundabout that would result in improving the level of service to B or better for each leg. Even if the extension was not in place, a roundabout would be required by 2031.
- At the Sheridan Park Drive / Fifth Line intersection, delays will be experienced with or without the Sheridan Park Drive Extension. However, with the Sheridan Park Drive Extension a left turn in the east and westbound directions would be required plus the installation of traffic signals. Without the Extension, installation of traffic signals would be required by 2031.

At the signalized intersections of Winston Churchill Boulevard and Erin Mills Parkway, delays will be experienced for some movements and some movements will approach capacity; however, there is sufficient capacity to accommodate the demand.

### **2031 Road Network**

A traffic operations analysis was conducted for the 2031 traffic projections. In addition to the transportation improvements identified for existing and 2021 traffic conditions, the following additional improvements are identified:

- The Sheridan Park Drive / Fifth Line intersection will require traffic signals to be installed prior to 2031 without the Sheridan Park Drive Extension. It was previously identified as needing traffic signals by 2021 with the extension.

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## 1.0 Introduction

### 1.1 Introduction

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

The EA Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighbourhood and business area, create options for alternative routes and improve multi-modal network connectivity. The EA Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act*.

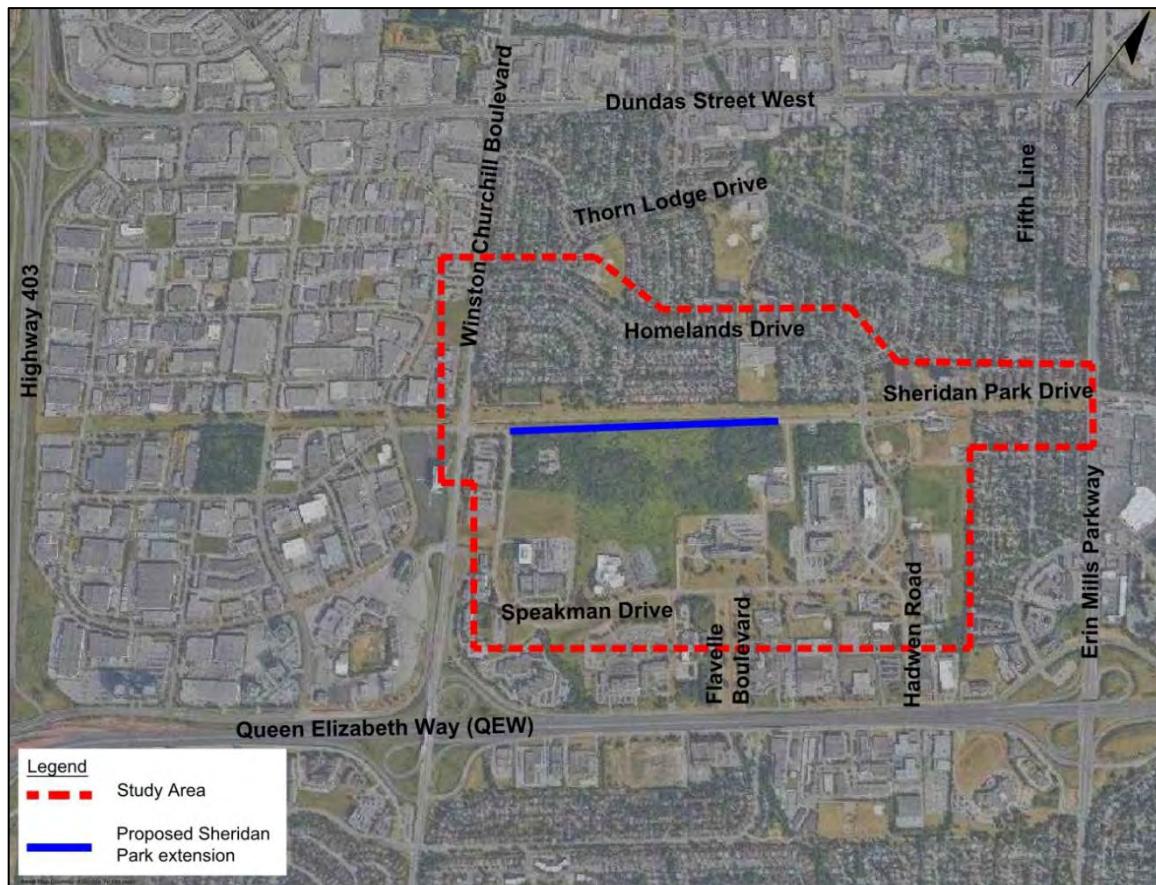
As part of the EA Study, Burnside has completed a transportation analysis to identify whether the proposed Sheridan Park Drive extension will impact transportation within the Study Area and determine if any potential mitigation measures are required. This report provides a summary of existing and future transportation conditions and forms one of the background reports required for the Project Report File for the study. The focus of this report is to examine the existing transportation system, existing traffic operations within the subject area, identify preliminary concerns to establish the Problem / Opportunity Statement, assess future transportation operations, and identify the preferred transportation network.

### 1.2 Description of Study Area

The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive/Homelands Drive to the east and naturalized private lands to the south. The proposed extension of Sheridan Park Drive falls within the existing City of Mississauga owned right-of-way (ROW), which runs through the centre part of the Study Area.

The study area for the traffic analysis is shown in Figure 1.

The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail (MUT) and the Sheridan Homelands residential neighbourhood.

**Figure 1: Study Area**

Sheridan Park is a 340-acre corporate centre, which is primarily designated Business Employment in the City of Mississauga's Official Plan (MOP). The majority of Sheridan Park is occupied by private industries and businesses, which include in their landholdings significant natural areas particularly on the north side of corporate centre, within the Study Area. These naturalized areas include two wooded areas that are identified as Significant Natural Areas in the City's Natural Areas Survey (2016 Update). Sheridan Park is also identified as one of the City's cultural landscape due to its scenic and distinct visual qualities.

The City maintains a paved MUT through the utility corridor from Winston Churchill Boulevard to Homelands Drive/Speakman Drive. The trail then continues east along the south side of Sheridan Park Drive to Erin Mills Parkway. To the west of Winston Churchill Boulevard, the trail continues through the hydro corridor in Oakville. The trail provides recreational opportunities to the local residents and commuter cyclists.

Sheridan Park Drive is a two-lane major collector road located in the southwest quadrant of Mississauga. It extends between Winston Churchill Boulevard and Erin Mills Parkway with a missing connection between approximately 275 meters west of the Speakman

Drive / Homelands Drive intersection and the west leg of Speakman Drive. The missing link is identified as a future major collector in the MOP as illustrated on Schedule 5 Long Term Road Network from the MOP.

According to the “*Sheridan Park Corporate Centre Draft Land Use Master Plan*” (the Park’s Master Plan) completed by Urban Strategies Inc. dated December 2014, the Sheridan Park area is proposed to intensify and diversify the existing dominant land uses of science and technology facilities and office uses. The renewed focus of Sheridan Park is on pilot plants, innovation and science and technology; however, future land uses also include offices, daycare, utility and open spaces with schools permitted on a site specific basis. In order to accommodate the future development of the park, the Park’s Master Plan has identified the need for the missing Sheridan Park Drive segment. This segment is also recommended by the MOP as an important link in the road network to serve a significantly larger area. A connection between the west and east sections of Sheridan Park Drive would improve access for the Corporate Centre and the Sheridan Homelands residential neighbourhood to the north.

### **1.3 Traffic Study Area**

The overall study area is generally bound by Homelands Drive to the north, the Speakman Drive to the south, Erin Mills Parkway to the east and Winston Churchill Boulevard to the west. This study focuses on the following key roadways:

- Sheridan Park Drive
- Erin Mills Parkway
- Winston Churchill Boulevard
- Homelands Drive
- Speakman Drive

The study includes the following intersections:

- Winston Churchill Boulevard / Homelands Drive / Dover Gate
- Homelands Drive / Thorn Lodge Drive
- Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive
- Sheridan Park Drive / Homelands Drive / Speakman Drive
- Sheridan Park Drive / Fifth Line
- Erin Mills Parkway / Sheridan Park Drive
- Speakman Drive / Hadwen Road
- Speakman Drive / Flavelle Boulevard
- Proposed Sheridan Park Extension

## 1.4 Study Approach / Scope of Work

This existing conditions study provides a preliminary assessment of the key transportation related issues, including a review of all relevant background reports / studies and existing traffic data.

This study also includes an evaluation of the existing traffic operations in the study area and based on that identifies opportunities to improve traffic operations. This provides the City an opportunity to:

- Review road and access options for potential development in the Sheridan Park area.
- Facilitate an improved active transportation network for pedestrians and cyclists by connecting the residential area in the north to the business corporate area in the south.
- Provide a multi-modal facility that is safe and efficient and can be shared by all modes of travel.

Future horizon year operations were assessed for 2021 and 2031 traffic conditions with the recommended lane needs identified.

## 1.5 Intersection Analysis Methodology

Intersection operations were assessed for the intersections in the study area using the software program Synchro 9, which employs methodology from the *Highway Capacity Manual (HCM2000 and HCM 2010)*, published by the Transportation Research Board National Research Council. Synchro 9 can analyze both signalized and unsignalized intersections in a road corridor or network taking into account the spacing, interaction, queues and operations between intersections. The analysis has utilized the HCM2000 methodology.

The signalized intersection analysis considers two separate measures of performance:

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

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| <b>Level of Service</b> | <b>Control Delay per Vehicle(s)</b> |
|-------------------------|-------------------------------------|
| A                       | $\leq 10$                           |
| B                       | $> 10 - 20$                         |
| C                       | $> 20 - 35$                         |
| D                       | $> 35 - 55$                         |
| E                       | $> 55 - 80$                         |
| F                       | $> 80$                              |

The two-way stop and all-way stop unsignalized intersection analysis considers two separate measures of performance:

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

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

Intersections operations for roundabouts were assessed using Arcady. The operational analysis takes into account geometries such as entry width, approach width, flare length, conflict angle, inscribed circle diameter and entry radius, which is linked to driver behavior. The output results in predicted capacities, queues, delays and level of service.

The level of service ranges for a roundabout are as follows:

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

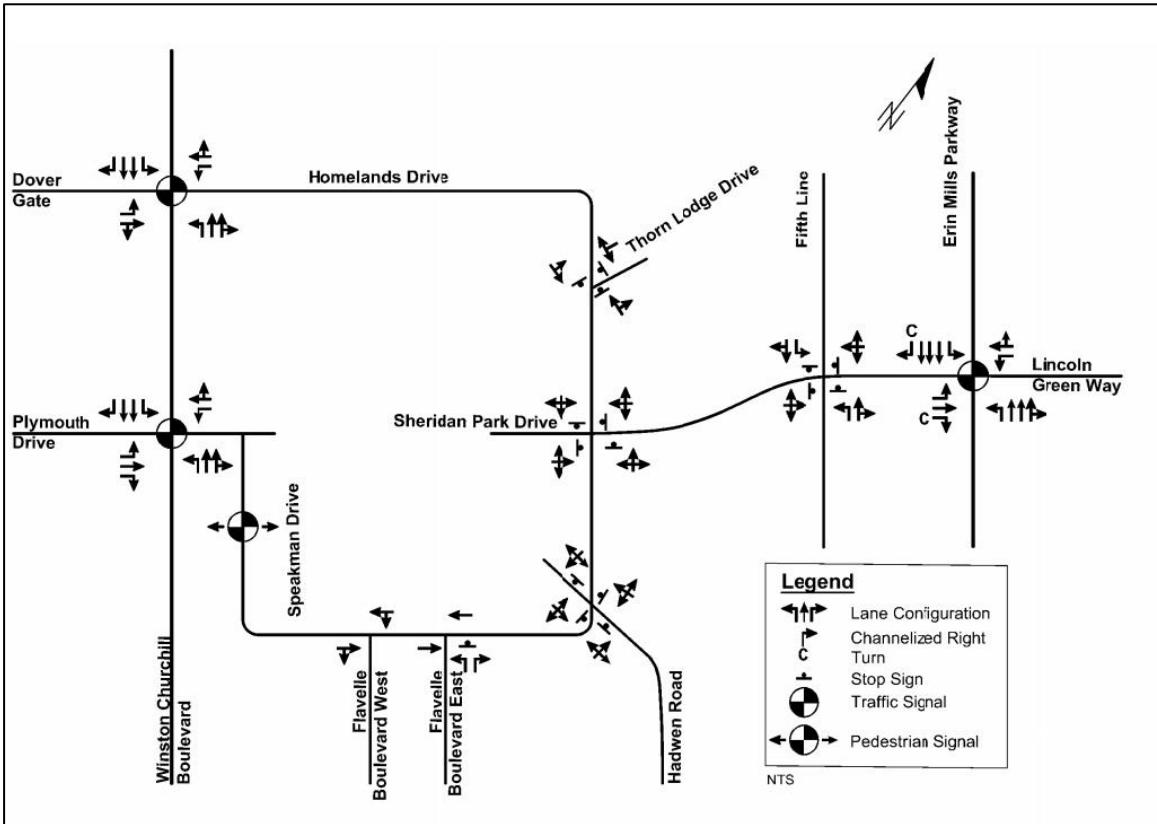
## 2.0 Existing Conditions

### 2.1 Road Network

The existing road network is described below and is illustrated in Figure 2, including existing traffic control. All roadways are under the jurisdiction of the City with the exception of Winston Churchill Boulevard and Erin Mills Parkway, which are under the jurisdiction of the Region of Peel.

|                             |   |
|-----------------------------|---|
| Sheridan Park Drive         | Sheridan Park Drive is a two-lane east-west major collector road. The road extends west from Erin Mills Parkway and terminates at approximately 275 m west of Speakman Drive (east leg) / Homelands Drive. The road is discontinuous west of that point, but then continues approximately 150 m east of Winston Churchill Boulevard at Speakman Drive (west leg). The posted speed limit is 50 km/h and parking is prohibited on both sides of the road. A MUT is provided on the south side of the road between Erin Mills Parkway and Homelands Drive / Speakman Drive (east leg). The MUT then runs on the north side of the road between Homelands Drive / Speakman Drive (east leg) and Winston Churchill Boulevard within the utility corridor. A sidewalk is provided on the north side of the road between Erin Mills Parkway and Speakman Drive (east leg) / Homelands Drive and continues on the south side, between Winston Churchill Boulevard and Speakman Drive (west leg). |
| Winston Churchill Boulevard | Winston Churchill Boulevard is a north-south arterial road consisting of a 4-lane urban cross section with 2 lanes per direction. It has a posted speed limit of 60 km/h and sidewalks are provided on both sides of the road. Turn lanes are provided at intersections.  |
| Erin Mills Parkway          | Erin Mills Parkway is a north-south arterial road consisting of a 6-lane urban cross section with 3 lanes per direction. It has a posted speed limit of 70 km/h. A sidewalk is provided on both sides of the road and stopping is prohibited on both sides of the road. Turn lanes are provided at intersections.   |

Figure 2: Existing Road Network



- Homelands Drive** Homelands Drive is an east-west minor collector road that transitions into a north-south road, north of Sheridan Park Drive. It consists of a 2 lane urban cross section. The roadway commences at Winston Churchill Boulevard, opposite Dover Gate and transitions to Speakman Drive, south of Sheridan Park Drive. Homelands Drive has a posted speed limit of 50 km/h, except within the Homelands Senior School zone, where the posted speed limit is 40 km/h. A sidewalk is provided on both sides of the road. Stopping and U-turns are prohibited within the vicinity of the school zone. Homelands Drive serves the Sheridan Homelands residential neighborhood.
- Speakman Drive** Speakman Drive is a north-south and east-west minor collector road that forms a crescent connecting to Sheridan Park Drive. It consists of a 2-lane urban cross section and is the southerly continuation of Homelands Drive at its east leg. The roadway then terminates at the west segment of Sheridan Park Drive just east of Winston Churchill Boulevard. The road has a posted speed limit of 50 km/h, except within the Olive Grove School zone, where the posted speed limit is reduced to 40 km/h. A

sidewalk is provided on the south side, east side on the east leg and west side on the west leg of the road.

As well, a pedestrian signal is located approximately 265 meters south of Sheridan Park Drive on the west leg of Speakman Drive. Parking and stopping are prohibited on both sides of the road. Speakman Drive serves Sheridan Park.

|                    |   |
|--------------------|---|
| Fifth Line         | Fifth Line is a north-south road consisting of a 2-lane urban cross section. North of Sheridan Park Drive, it is a minor collector road. South of Sheridan Park Drive, it is a local road. It has a posted speed limit of 50 km/h. There are designated bicycle lanes provided on both sides of the road. Sidewalks are provided on both sides of the road north of Sheridan Park Drive and on the west side of the road south of Sheridan Park Drive. Parking is prohibited on both sides of the road. |
| Thorn Lodge Drive  | Thorn Lodge Drive is an east-west minor collector road consisting of a 2-lane urban cross section. It has a posted speed limit of 40 km/h. A sidewalk is provided on both sides of the road. Thorn Lodge Drive serves the residential Sheridan Homelands neighbourhood.   |
| Hadwen Road        | Hadwen Road is a north-south minor collector road consisting of a 2-lane urban cross section. Hadwen Road has an assumed speed limit of 50 km/h. A sidewalk is provided on the west side of the road and parking is prohibited on the west side.  |
| Flavelle Boulevard | Flavelle Boulevard is a north-south minor collector road that is separated into two one-way roads that are approximately 75 m apart. The west road is for southbound traffic only and the east road is for northbound traffic only. Both have assumed speed limits of 50 km/h. No pedestrian facilities are provided along the road.  |

## 2.2 Transit Network

The study area is currently well served by three main transit agencies. MiWay provides local bus service within Mississauga. Oakville Transit provides local bus service within Oakville along Winston Churchill Boulevard. GO Transit provides inter-regional connections.

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## 2.2.1 MiWay Transit

MiWay is operated by the City of Mississauga. There are several routes that run near or through the study area. Table 1 summarizes local MiWay routes within the vicinity of the study area and their service frequency. A route map is illustrated in Figure 3.

**Table 1: MiWay Transit Route Frequency**

| Transit Route                         | Weekday (mins) |                | Weekend (mins) |
|---------------------------------------|----------------|----------------|----------------|
|                                       | AM Peak Period | PM Peak Period |                |
| #13 Glen Erin                         | 16-23          | 10-23          | 33             |
| #23 Lakeshore <sup>1</sup>            | 8              | NA             | NA             |
| #29 Royal Park Homelands              | 23-30          | 23-30          | 33             |
| #45 Winston Churchill                 | 26-36          | 31-34          | 45             |
| #45A Winston Churchill-Speakman       | 28-40          | 15-30          | NA             |
| #71 Sheridan-Subway East <sup>2</sup> | NA             | 37             | NA             |
| #71 Sheridan-Subway West              | 50             | NA             | NA             |

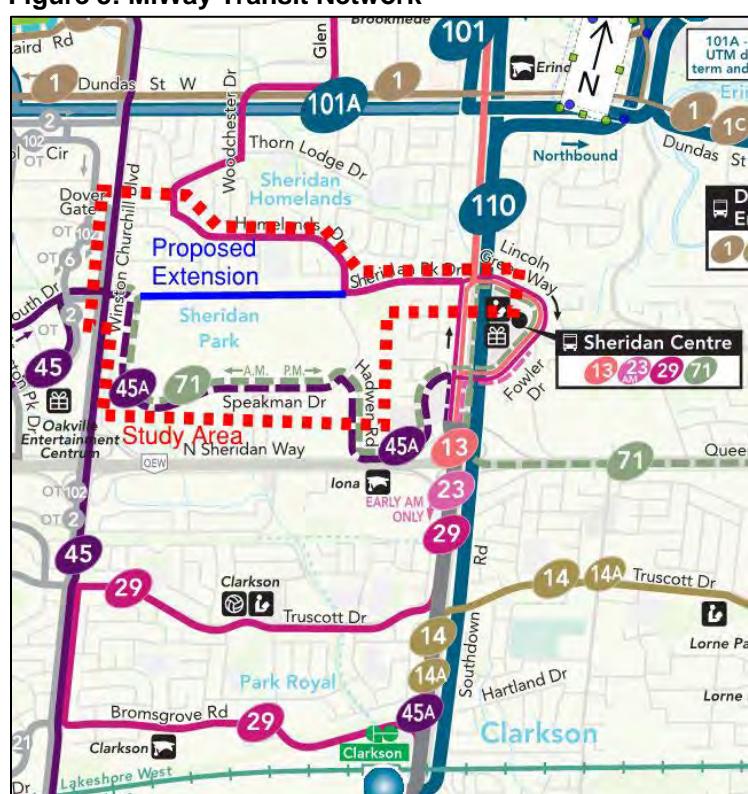
Notes: NA = Service not available

1. Route #23 Lakeshore only operates during the Weekday AM Peak Period and the service does not fall within the adjacent street peak hour of 7:00 AM to 9:00 AM. The frequency indicated in the table is the most frequent service for the duration of 4:00 AM to 5:15 AM

2. Route #71 Sheridan Subway East only operates during the Weekday PM Peak Period from 4:30PM to 5:30AM

3. Route #71 Sheridan Subway West only operates during the Weekday AM Peak hour from 8:00AM to 9:00AM

**Figure 3: MiWay Transit Network**



Reference: Miway Weekday System Map, January 2017

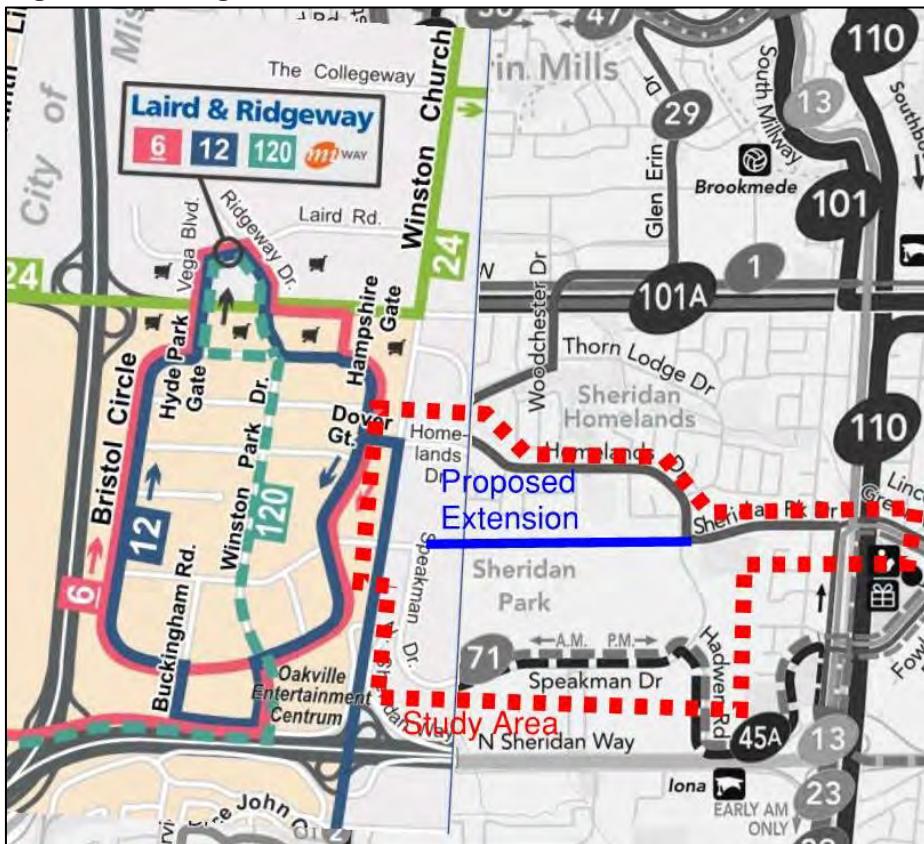
## 2.2.2 Oakville Transit

Oakville Transit is operated by the City of Oakville with transit routes #6 Upper Middle, #12 Winston Park and #120 Industrial Park that operate west of the study area. These routes are within 500 meters walking distance from the study area. Route #6 and Route #12 have a transit stop located approximately 220 meters from the study area. Route #120 has a transit stop located approximately 500 meters from the study area. Table 2 summarizes the routes within the vicinity of the study area and their service frequency. The route map is illustrated in Figure 4.

**Table 2: Oakville Transit Route Frequency**

| Transit Route        | Weekday AM and PM Peak hour (mins) | Weekend Frequency (mins)<br>Midday Period |
|----------------------|------------------------------------|---|
| #6 Upper Middle      | 60                                 | 60  |
| #12 Winston Park     | 30                                 | -   |
| #120 East Industrial | 30                                 | -   |

**Figure 4: Existing Oakville Transit Network**



Reference: Oakville Transit System Map, January 2017

### 2.2.3 GO Transit

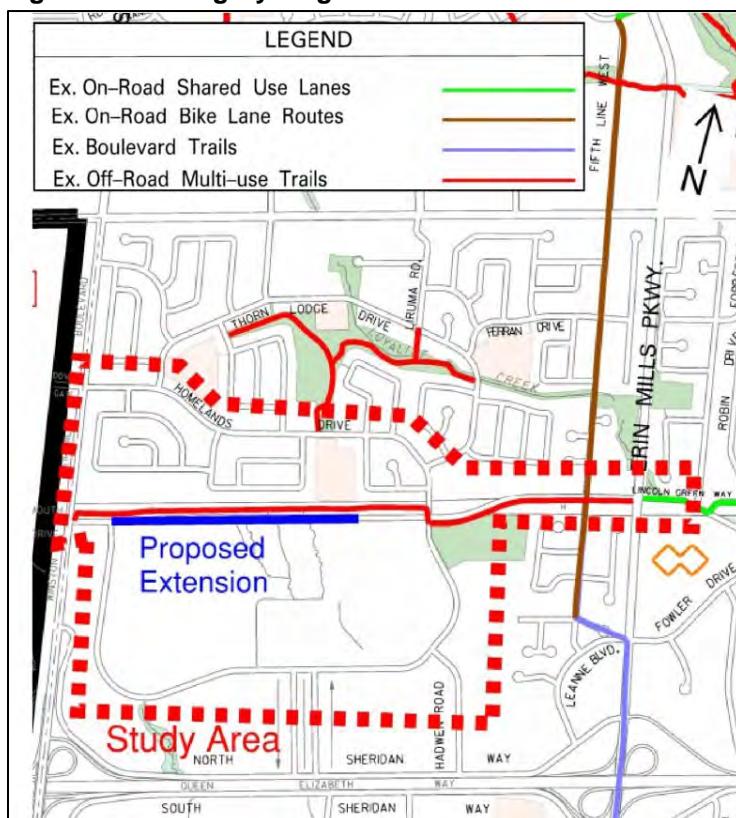
GO Transit, a division of Metrolinx, provides inter-regional commuter-based transit service for the Greater Toronto and Hamilton Area (GTHA) and has routes that extend to the communities across the Greater Golden Horseshoe. The closest GO Transit station is Clarkson GO station, which is located approximately 2.3 kilometers away from the study area. The station is a transit hub for the GO Rail Lakeshore West Line and a local bus terminal for both MiWay and Oakville Transit buses. MiWay routes provide connections between the bus terminal and the study area. During the AM peak period, train frequency is every 5 to 15 minutes towards Union Station and every 25 minutes towards Hamilton. During the PM peak period, train frequency is every 15 to 30 minutes towards Union Station and every 10 to 20 minutes towards Hamilton.

## 2.3 Active Transportation Network

### 2.3.1 Cycling Network

Existing cycling facilities are shown in Figure 5, which is an excerpt from the City's Cycling Master Plan.

**Figure 5: Existing Cycling Network**

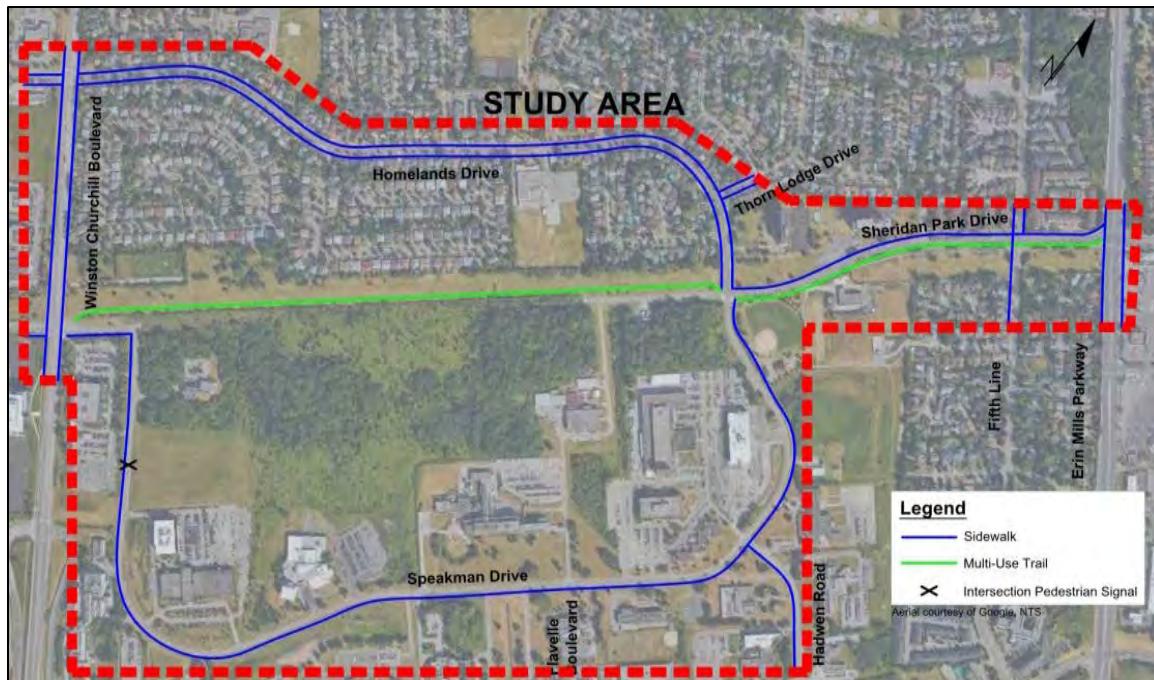


Reference: Mississauga Cycling Master Plan, iTRANS Consulting Inc., September 2010

### 2.3.2 Pedestrian Network

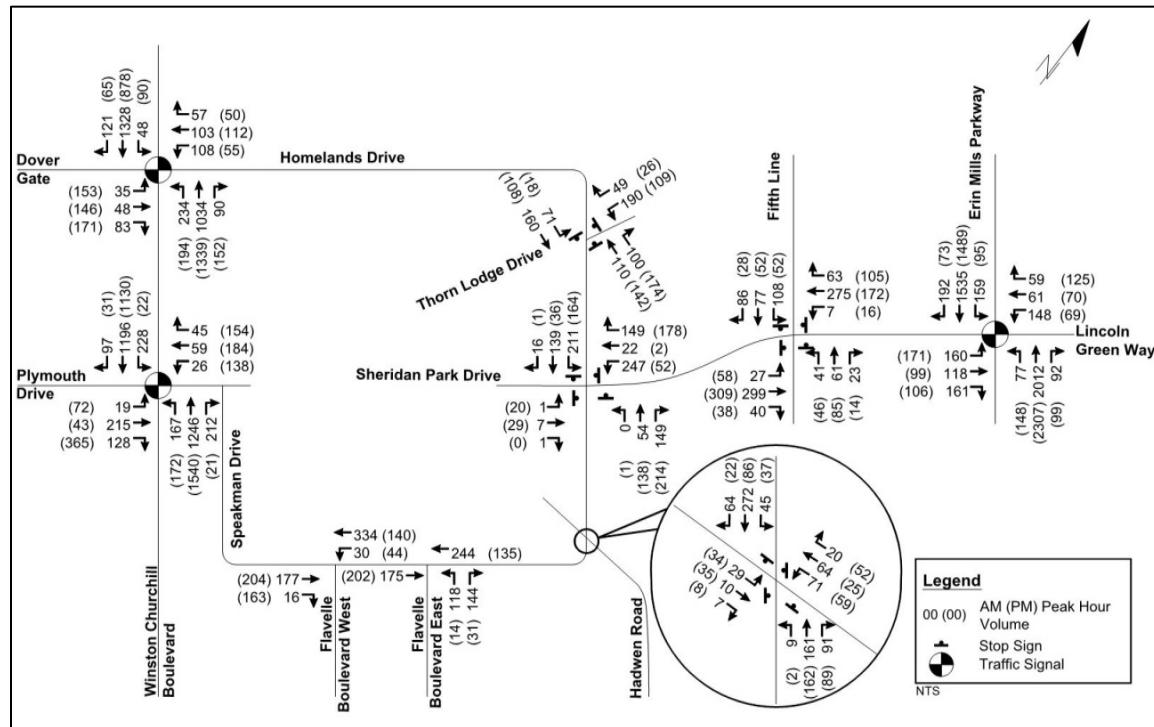
Existing pedestrian facilities are shown in Figure 6. The blue lines illustrate the sidewalk system and the green lines indicate the MUT.

**Figure 6: Existing Pedestrian Network**



### 2.4 Traffic Volumes

Existing traffic counts were conducted at study intersections by Accu-Traffic on behalf of Burnside, with the exception of the Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection and Speakman Drive / Hadwen Road intersection. Turning movement counts for these two intersections were provided by the City and were conducted on Thursday, January 14, 2016 and Wednesday, March 4, 2015, respectively. Burnside's traffic counts were conducted on Wednesday, November 23, 2016 during the weekday AM (7:00 - 9:00 AM) and PM (4:00 - 6:00 PM) peak periods. The weekday AM and PM peak hours were selected as these are the typical peak traffic periods. Summaries of the traffic counts are provided in Appendix A. Existing traffic volumes are shown in Figure 7.

**Figure 7: Existing Traffic Volumes**

## 2.5 Existing Operations

Existing traffic operations were assessed based on the existing road network shown in Figure 2 and the existing volumes shown in Figure 7. Existing traffic operations are provided in Table 3, Table 4, and Table 5 for signalized, two-way stop, and all-way stop intersections, respectively. Detail Synchro reports can be found in Appendix B.

Under existing conditions, all signalized study intersections are operating at an overall level of service C. Individual movements are operating with excess capacity and a level of service E or better, with the exception of the westbound left turn movement at the Winston Churchill Boulevard / Dover Gate / Homelands Drive intersection. Site observations were made on Thursday, January 26, 2017 during the PM peak hour for this movement. The westbound green time was sufficient to clear all westbound queued vehicles. Green priority has been given to north-south movements that have higher traffic volumes and results in better overall performance. There is capacity that additional time could be provided to the east-west movements, and would be further reviewed by the Region of Peel and City of Mississauga staff.

During the weekday PM peak hour, delays are seen for eastbound left turns onto Erin Mills Parkway from Sheridan Park Drive; however, the movement is operating within the available capacity.

**Table 3: Existing Signalized Intersection Operations**

| Intersection & Movement  | Weekday AM Peak Hour |     | Weekday PM Peak Hour |     |
|--|----------------------|-----|----------------------|-----|
|  | v/c                  | LOS | v/c                  | LOS |
| Winston Churchill Boulevard / Dover Gate / Homelands Drive         |                      |     |                      |     |
| Overall  | 0.74                 | C   | 0.75                 | C   |
| Eastbound Left   | 0.35                 | E   | 0.78                 | E   |
| Eastbound Through-Right  | 0.42                 | E   | 0.87                 | E   |
| Westbound Left   | 0.83                 | F   | 0.81                 | F   |
| Westbound Through-Right  | 0.67                 | E   | 0.43                 | D   |
| Northbound Left  | 0.70                 | E   | 0.51                 | A   |
| Northbound Through-Right   | 0.47                 | A   | 0.73                 | B   |
| Southbound Left  | 0.23                 | B   | 0.47                 | B   |
| Southbound Through   | 0.70                 | C   | 0.43                 | B   |
| Southbound Right   | 0.11                 | B   | 0.05                 | B   |
| Winston Churchill Boulevard / Plymouth Drive / Sheridan Park Drive |                      |     |                      |     |
| Overall  | 0.74                 | C   | 0.87                 | C   |
| Eastbound Left   | 0.10                 | D   | 0.43                 | D   |
| Eastbound Through  | 0.75                 | E   | 0.11                 | D   |
| Eastbound Right  | 0.26                 | D   | 0.89                 | E   |
| Westbound Left   | 0.29                 | D   | 0.38                 | D   |
| Westbound Through-Right  | 0.31                 | D   | 0.64                 | D   |
| Northbound Left  | 0.74                 | D   | 0.89                 | E   |
| Northbound Through-Right   | 0.75                 | C   | 0.80                 | C   |
| Southbound Left  | 0.69                 | E   | 0.20                 | B   |
| Southbound Through   | 0.47                 | A   | 0.59                 | B   |
| Southbound Right   | 0.06                 | A   | 0.02                 | A   |
| Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way       |                      |     |                      |     |
| Overall  | 0.78                 | C   | 0.86                 | C   |
| Eastbound Left   | 0.80                 | E   | 0.93                 | F   |
| Eastbound Through  | 0.38                 | D   | 0.26                 | D   |
| Eastbound Right  | 0.46                 | D   | 0.07                 | D   |
| Westbound Left   | 0.75                 | E   | 0.26                 | D   |
| Westbound Through-Right  | 0.36                 | D   | 0.43                 | D   |
| Northbound Left  | 0.48                 | C   | 0.62                 | B   |
| Northbound Through-Right   | 0.70                 | B   | 0.84                 | C   |
| Southbound Left  | 0.76                 | D   | 0.62                 | D   |
| Southbound Through   | 0.43                 | A   | 0.53                 | B   |
| Southbound Right   | 0.13                 | A   | 0.06                 | B   |

Notes: 1. v/c (volume to capacity), LOS (level of service)  
 2. Based on existing signal timings as provided by the City

Given the volume of traffic exiting Sheridan Park in the PM peak hour, delays were observed for traffic trying to turn onto Winston Churchill Boulevard as illustrated in Photo 1.

**Photo 1: PM Westbound Queues on Sheridan Park from Winston Churchill**

Queues in employment areas are not unusual when employees are trying to exit after the work day. The length of the through-right turn queue extended beyond where left turning vehicles could get into the left turn lane, which result in left turning vehicles be added as part of the queue. This was previously identified by the Region of Peel. They have identified that a westbound right turn lane would be beneficial at the Winston Churchill Boulevard / Plymouth Drive / Sheridan Park Drive intersection and have included this improvement as part of their development charges. This change is appropriate, as the right turn lane would provide additional capacity. Further calibration of the analysis model has not been undertaken.

**Table 4: Existing Two-Way Stop Intersection Operations**

| Intersection & Movement                  | Weekday AM Peak Hour |     | Weekday PM Peak Hour |     |
|--|----------------------|-----|----------------------|-----|
|  | v/c                  | LOS | v/c                  | LOS |
| Speakman Drive / Flavelle Boulevard West |                      |     |                      |     |
| Westbound Left-Through                   | 0.03                 | A   | 0.05                 | A   |
| Speakman Drive / Flavelle Boulevard East |                      |     |                      |     |
| Northbound Left-Right                    | 0.56                 | C   | 0.08                 | B   |

Notes: v/c (volume to capacity), LOS (level of service)

Under existing conditions, the two-way stop unsignalized study intersections have critical movements operating with excess capacity and with level of service C or better. No changes are necessary.

**Table 5: Existing All-way Stop Intersection Operations**

| Intersection & Movement                                       | Weekday AM Peak Hour |     | Weekday PM Peak Hour |     |
|---|----------------------|-----|----------------------|-----|
|   | v/c                  | LOS | v/c                  | LOS |
| <b>Homelands Drive / Thorn Lodge Drive</b>                    |                      |     |                      |     |
| Westbound Left-Right  | 0.47                 | B   | 0.22                 | A   |
| Northbound Through-Right                                      | 0.38                 | B   | 0.42                 | B   |
| Southbound Left-Through                                       | 0.44                 | B   | 0.19                 | A   |
| <b>Speakman Drive / Homelands Drive / Sheridan Park Drive</b> |                      |     |                      |     |
| Eastbound Left-Through-Right                                  | 0.02                 | B   | 0.10                 | A   |
| Westbound Left-Through-Right                                  | 0.85                 | D   | 0.39                 | B   |
| Northbound Left-Through-Right                                 | 0.42                 | B   | 0.55                 | B   |
| Southbound Left-Through-Right                                 | 0.78                 | D   | 0.36                 | B   |
| <b>Fifth Line / Sheridan Park Drive</b>                       |                      |     |                      |     |
| Eastbound Left-Through-Right                                  | 0.75                 | D   | 0.67                 | C   |
| Westbound Left-Through-Right                                  | 0.71                 | C   | 0.49                 | B   |
| Northbound Left   | 0.12                 | B   | 0.11                 | B   |
| Northbound Through-Right                                      | 0.21                 | B   | 0.20                 | B   |
| Southbound Left   | 0.28                 | B   | 0.12                 | B   |
| Southbound Through-Right                                      | 0.38                 | B   | 0.16                 | A   |
| <b>Speakman Drive / Hadwen Drive</b>                          |                      |     |                      |     |
| Eastbound Left-Through-Right                                  | 0.11                 | B   | 0.14                 | A   |
| Westbound Left-Through-Right                                  | 0.35                 | B   | 0.24                 | A   |
| Northbound Left-Through-Right                                 | 0.50                 | B   | 0.40                 | B   |
| Southbound Left-Through-Right                                 | 0.71                 | C   | 0.25                 | A   |

Notes: v/c (volume to capacity), LOS (level of service)

Under existing conditions, all all-way stop unsignalized study intersections have movements operating with excess capacity and with level of service D or better.

## 2.6 Queueing Analysis

Queueing was reviewed for critical movements under existing conditions during both AM and PM Peak periods. A comparison of the existing storage and analysed queue lengths for critical movements are summarized in Table 6. Detail Synchro outputs for the queuing results can be found in Appendix C.

**Table 6: Existing 95th Percentile Queueing Summary**

| <b>Intersection and Movement</b>                                   | <b>Existing Storage<br/>(m)</b> | <b>Existing Queue Length (m)</b> |                                |
|--|---------------------------------|----------------------------------|--------------------------------|
|  |                                 | <b>AM Peak Period<br/>Hour</b>   | <b>PM Peak Period<br/>Hour</b> |
| Winston Churchill Boulevard / Homelands Drive / Dover Gate         |                                 |                                  |                                |
| Eastbound Through-Right  | 100                             | 41                               | 123                            |
| Westbound Left   | 20                              | 52                               | 40                             |
| Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive |                                 |                                  |                                |
| Westbound Left   | 35                              | 15                               | 46                             |
| Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way       |                                 |                                  |                                |
| Eastbound Left   | 20                              | 65                               | 95                             |
| Eastbound Right  | 35                              | 47                               | 15                             |

The results of the queue length review are discussed below for each intersection.

#### **2.6.1 Winston Churchill Boulevard / Homelands Drive / Dover Gate**

The eastbound through movement, during the PM peak hour, is currently exceeding the existing distance to the upstream constraint (ie. length of lane or next intersection) by 23 m under existing conditions. The westbound left turn movement, during the AM peak hour, is also exceeding existing storage by 32 m. These queues can be reduced with improved signal timing as there is excess green time for north/south movements.

#### **2.6.2 Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive**

The westbound left turn movement is exceeding the provided storage by 11 m. Field observations found that queueing for the westbound left turn movement was being impacted by the longer westbound through-right queue. However, the westbound green time was sufficient to clear all westbound queued vehicles. As previously identified, a westbound right turn lane was identified as an improvement by the Region of Peel, which would improve intersection operations and queues.

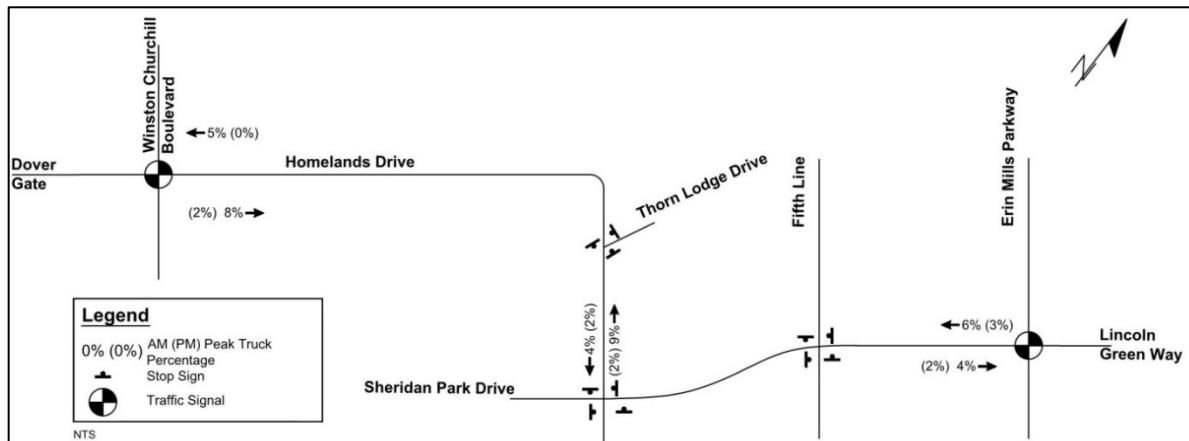
#### **2.6.3 Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way**

The eastbound left turn movement, during the PM peak hour, is exceeding the existing storage by 75 m. The storage length is also exceeded during the AM peak hour. Field observations found that there was sufficient green time allocated to clear the eastbound left turn queue. In addition, the eastbound right turn movement during the AM peak hour is exceeding the existing storage by 12 m. These queues can be reduced with improved signal timing as there is excess green time for north/south movements.

## 2.7 Truck Infiltration

Currently, there are posted signs prohibiting heavy trucks from 7:00 PM to 7:00 AM any day, along Sheridan Park Drive, between Erin Mills Parkway and the east terminus of the eastern section of Sheridan Park Drive. In addition, heavy trucks are prohibited at any time on Homelands Drive, north of Sheridan Park Drive. Despite these signed prohibitions, residents have reported truck traffic infiltrating the area. Existing truck traffic along Homelands Drive and Sheridan Park Drive was assessed. Figure 8 shows the percentage of truck traffic during the AM and PM peak hours traveling along Homelands Drive and Sheridan Park Drive, with the exception of the intersection of Sheridan Park Drive / Homelands Drive / Speakman Drive intersection where the percentages are based on 8 hour counts conducted by Accu-Traffic on behalf of Burnside on Wednesday, November 23, 2016 from 7:00 AM to 6:00 PM over eight hours. It should be noted that truck traffic would include buses and heavy trucks associated with home delivery services as well garbage pick-up, etc. Some truck traffic would have a purpose in the neighbourhood.

**Figure 8: Existing Truck Percentages**



The truck percentages appear to indicate that there could be some truck infiltration within the Sheridan Homelands neighbourhood. Truck volumes are lower during the weekday PM period, which is supported by field observations that were undertaken on Thursday, January 26, 2017.

Utilizing the traffic counts, truck traffic using Homelands Drive to access Sheridan Park were reviewed and there was only one southbound truck in the weekday AM peak hour and one northbound truck in the weekday PM peak hour. Trucks using Homelands Drive to access the employment lands west of Winston Churchill Boulevard was one eastbound truck in the AM peak hour and no trucks in the weekday PM peak hour. Therefore, it is not conclusive that trucks are using Homelands Drive to access the employment areas to the south or west.

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During the weekday AM peak hour, some trucks may be using Sheridan Park Drive and Homelands Drive to travel in a westerly direction between Erin Mills Parkway and Winston Churchill Boulevard. Some of this could be occurring in the weekday AM peak hour in the eastbound direction as well. There is insufficient evidence that this is occurring in the weekday PM peak period.

## 2.8 Homelands Drive

Sheridan Homelands residents expressed concerns regarding traffic volumes and speeding along Homelands Drive and within their neighbourhood. The City is undertaking another study that is addressing neighbourhood concerns regarding traffic calming in the neighbourhood.

This study has reviewed traffic volumes along Homelands Drive including trucks. The impact of the Sheridan Park Drive Extension on traffic volumes along Homelands Drive has also been reviewed and discussed below.

### 3.0 Future Traffic Projections

Future traffic volumes with and without Sheridan Park Drive Extension were developed from the City's EMME transportation model. The EMME traffic projection model results for 2011, 2021, and 2031 years are provided in Appendix D. To further understand how the Sheridan Park Drive Extension impacts the residential neighbourhood, the City's Travel Demand Model was utilized to assist in understanding how the travel patterns changed for each alternative transportation solutions proposed and to complete a number of sensitivity checks to assist in selecting a preferred solution for the study area. Specifically the model was utilized to assess the following:

1. How much traffic utilizes Homelands Drive when comparing the following scenarios:
  - a) Do-nothing scenario – the Do-nothing scenario (assumes four (4) lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).
  - b) Sheridan Park Drive Extension (with four (4) lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).
  - c) Speakman Drive widening to four (4) lanes (no Sheridan Park Drive Extension, four (4) lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection)

Note: For the purpose of the sensitivity analysis, as part of the Do-Nothing scenarios includes a 4-lane cross-section on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection as the modelling analysis indicated that with a 2 lane cross-section this section of Sheridan Park Drive experienced capacity constraints in the future horizon years which limited the amount of traffic demand which utilizes the Sheridan Park Drive extension/ Speakman Drive.

2. Origin and destination of trips utilizing Homelands Drive
3. Origin and destination of trips utilizing the Sheridan Park Drive Extension

It is important to note that the City's Travel Demand Model used in this work is developed to provide analysis/ results generally at a higher level, i.e. Freeways, Arterials and Major Collectors. Therefore, the numbers presented should not be taken as exact, but are intended to assist in comparing how the various scenarios impact travel demand in the area and thus help in selecting the preferred transportation solution for the area.

The following sections describe the results and approach taken to develop future traffic volumes.

### 3.1 Population and Employment Projections

The City provided population and employment forecast for the surrounding area. Table 7 summarizes the 2011, 2021 and 2031 projected population and employment within the Sheridan Homelands residential neighbourhood and Sheridan Park Corporate Centre.

**Table 7: Projected Population and Employment Within the Study Area**

|            | 2011 | 2021 | 2031 |
|------------|------|------|------|
| Population | 8500 | 8500 | 8540 |
| Employment | 7340 | 8650 | 9550 |

There is no population growth forecasted from year 2011 to 2021 and the growth from 2021 to 2031 is approximately 1% compounded annually for the residential. As the Sheridan Neighborhood is mainly developed, there is little to no space for new developments in the area. As a result, the population growth in the area is projected to be minimal.

Employment growth from year 2011 to 2021 is expected to be approximately 1.7% compounded annually and from 2021 to 2031 the rate is expected to be approximately 1% compounded annually. It is expected that the Sheridan Park Corporate Centre area will be the catalyst for growth within the study area.

### 3.2 Comparison between Traffic Counts and EMME Model

The 2011 estimated traffic from the City's EMME model was compared against observed 2016 traffic counts for traffic entering and exiting the Sheridan Park Corporate Centre. The results of this comparison are summarized in Table 8 for the weekday AM and PM peak hours.

**Table 8: Sheridan Park Corporate Centre Observed Counts Versus 2011 Model Estimates**

|            | Weekday AM Peak Hour |      |       | Weekday PM Peak Hour |      |       |
|------------|----------------------|------|-------|----------------------|------|-------|
|            | In                   | Out  | Total | In                   | Out  | Total |
| EMME Model | 1537                 | 6    | 1543  | 359                  | 1383 | 1742  |
| Observed   | 1459                 | 525  | 1984  | 355                  | 1197 | 1552  |
| Difference | 78                   | -519 | -441  | 4                    | 186  | 190   |

For the Sheridan Park Corporate Area, the model projected well with the exception of the weekday AM peak hour. The model did not project outbound trips for the area; however, outbound trips are occurring.

As the traffic count data did not encompass the Sheridan Homelands residential neighbourhood at all connection points to the neighbourhood, a review of trips for the Sheridan Homelands trip projections was not undertaken. However, a review of link volumes along Homelands Drive and the 2016 traffic counts determined that estimates were within a reasonable range of the traffic counts along Homelands Drive.

To project the future traffic projections for 2021 and 2031, the growth rates between the model existing traffic and the projected traffic was determined and applied to the existing traffic counts.

### **3.3 Traffic Patterns for Various Scenarios**

The following sections present the various scenarios reviewed to determine the traffic impacts along Homelands Drive.

#### **3.3.1 Impact of Scenarios on the Amount of Vehicles Travelling along Homelands Drive**

This section discusses the comparison of the Sheridan Park Drive Extension scenario and if it resulted in a reduction in overall traffic on Homelands Drive when compared to a Do-nothing scenario or the widening of Speakman Drive to four (4) lanes scenario. Table 9 depicts the 2021 horizon year simulated traffic along Homelands Drive for the three scenarios mentioned above with the traffic volumes summarized by direction for three separate segments along Homelands Drive. An average for the three segments is also provided. Based on the data, the following conclusions are made:

##### AM Peak Hour

- With the Sheridan Park Drive Extension, there will be an average decrease in traffic by approximately 2% (four (4) vehicles) in the eastbound direction and 16% (38 vehicles) in the westbound direction on Homelands Drive compared to the Do-nothing scenario.
- With the widening of Speakman Drive to four (4) lanes, there will be approximately 16% (40 vehicles) more traffic on Homelands Drive in the eastbound direction and 18% (36 vehicles) in the westbound direction as compared to the extension of Sheridan Park Drive scenario.
- With the Sheridan Park Drive Extension scenario, the greatest reductions in traffic will be experienced on the western end of Homelands Drive (west of the Thorn Lodge Drive east intersection) with volumes decreasing by approximately 29% (average for both directions).
- The eastern end of Homelands Drive (east of the Thorn Lodge Drive east intersection) will experience an increase in use (by approximately 24% - average for both directions) as the residential community is diverting to the extension. This results in the reduction in traffic volumes on Homelands Drive east of the Thorn Lodge Drive east intersection.

Table 9: Volumes Along Homelands Drive Between Winston Churchill Boulevard and Sheridan Park Drive (2021 Horizon Year)

| Scenarios  | AM Peak Hour                      |   |   |                                  |                                   |   |   |                                  |                       |     |
|--|-----------------------------------|---|---|----------------------------------|-----------------------------------|---|---|----------------------------------|-----------------------|-----|
|  | EB Direction                      |   |   |                                  | WB Direction                      |   |   |                                  |                       |     |
|  | Btwn WCB & Thorn Lodge            | Btwn Thorn Lodge & Thorn Lodge                                | Btwn Thorn Lodge & Sheridan Park            | Average for Direction            | Btwn WCB & Thorn Lodge            | Btwn Thorn Lodge & Thorn Lodge            | Btwn Thorn Lodge & Sheridan Park            | Average for Direction            |                       |     |
| Do-Nothing   | 223                               | 137   | 416   | 259                              | 447                               | 201                                       | 74  | 241                              |                       |     |
| Sheridan Park Dr Extension   | 178                               | 87  | 499   | 255                              | 396                               | 102                                       | 111   | 203                              |                       |     |
| Speakman widening to 4 Lanes   | 256                               | 172   | 457   | 295                              | 444                               | 196                                       | 78  | 239                              |                       |     |
| <b>Comparison between Scenarios</b>  | <b>Btwn WCB &amp; Thorn Lodge</b> | <b>Btwn Thorn Lodge &amp; Thorn Lodge</b>                     | <b>Btwn Thorn Lodge &amp; Sheridan Park</b> | <b>Average for Direction</b>     | <b>Btwn WCB &amp; Thorn Lodge</b> | <b>Btwn Thorn Lodge &amp; Thorn Lodge</b> | <b>Btwn Thorn Lodge &amp; Sheridan Park</b> | <b>Average for Direction</b>     |                       |     |
| Sheridan Park Dr Extension vs Do-Nothing   | -20%                              | -36%  | 20%   | -2%                              | -11%                              | -49%                                      | 50%   | -16%                             |                       |     |
| Speakman widening to 4 Lanes vs Sheridan Park Dr Extension   | 44%                               | 98%   | -8%   | 16%                              | 12%                               | 92%                                       | -30%  | 18%                              |                       |     |
| PM Peak Hour   |                                   |   |   |                                  |                                   |   |   |                                  |                       |     |
| Scenarios  | EB Direction                      |   |   |                                  | WB Direction                      |   |   |                                  |                       |     |
|  | Btwn WCB & Thorn Lodge            | Btwn Thorn Lodge & Thorn Lodge                                | Btwn Thorn Lodge & Sheridan Park            | Average for Direction            | Btwn WCB & Thorn Lodge            | Btwn Thorn Lodge & Thorn Lodge            | Btwn Thorn Lodge & Sheridan Park            | Average for Direction            |                       |     |
| Do-nothing   | 482                               | 247   | 142   | 290                              | 417                               | 230                                       | 396   | 348                              |                       |     |
| Sheridan Park Dr Extension   | 447                               | 150   | 244   | 280                              | 360                               | 133                                       | 509   | 334                              |                       |     |
| Speakman widening to 4 Lanes   | 487                               | 238   | 145   | 290                              | 427                               | 232                                       | 435   | 365                              |                       |     |
| <b>Comparison between Scenarios</b>  | <b>Btwn WCB &amp; Thorn Lodge</b> | <b>Btwn Thorn Lodge &amp; Thorn Lodge</b>                     | <b>Btwn Thorn Lodge &amp; Sheridan Park</b> | <b>Average for Direction</b>     | <b>Btwn WCB &amp; Thorn Lodge</b> | <b>Btwn Thorn Lodge &amp; Thorn Lodge</b> | <b>Btwn Thorn Lodge &amp; Sheridan Park</b> | <b>Average for Direction</b>     |                       |     |
| Sheridan Park Dr Extension vs Do-Nothing   | -7%                               | -39%  | 72%   | -3%                              | -14%                              | -42%                                      | 29%   | -4%                              |                       |     |
| Speakman widening to 4 Lanes vs Sheridan Park Dr Extension   | 9%                                | 59%   | -41%  | 3%                               | 19%                               | 74%                                       | -15%  | 9%                               |                       |     |
| <b>Absolute Difference</b>   |                                   | EB Direction  |   |                                  |                                   | WB Direction                              |   |                                  |                       |     |
|  |                                   | Btwn WCB & Thorn Lodge  | Btwn Thorn Lodge & Thorn Lodge              | Btwn Thorn Lodge & Sheridan Park | Average for Direction             | Btwn WCB & Thorn Lodge                    | Btwn Thorn Lodge & Thorn Lodge              | Btwn Thorn Lodge & Sheridan Park | Average for Direction |     |
|  |                                   | Sheridan Park Dr Extension vs Do-Nothing AM                   | -45   | -50                              | 83                                | -4  | -51   | -99                              | 37                    | -38 |
|  |                                   | Speakman widening to 4 Lanes vs Sheridan Park Dr Extension AM | 78  | 85                               | -42                               | 40  | 48  | 94                               | -33                   | 36  |
|  |                                   | Sheridan Park Dr Extension vs Do-Nothing PM                   | -35   | -97                              | 102                               | -10                                       | -57   | -97                              | 113                   | -14 |
|  |                                   | Speakman widening to 4 Lanes vs Sheridan Park Dr Extension PM | 40  | 88                               | -99                               | 10  | 67  | 99                               | -74                   | 31  |
| <b>Sheridan Park Drive Extension vs Do-Nothing Change along West End and East End of Homelands</b> |                                   | AM  | PM  |                                  |                                   |   |   |                                  |                       |     |
| Average for West End   |                                   | -29%  | -25%  |                                  |                                   |   |   |                                  |                       |     |
| Average for East End   |                                   | 24%   | 40%   |                                  |                                   |   |   |                                  |                       |     |

### PM Peak Hour

- Because of the Sheridan Park Drive Extension, Homelands Drive will experience an average decrease in traffic by approximately 3% (ten (10) vehicles) in the eastbound direction and 4% (14 vehicles) in the westbound direction.
- Comparing the Speakman Drive widening to four (4) lanes scenario against the Sheridan Park Drive Extension scenario, the widening will result in an increase in traffic along Homelands Drive by approximately 3% (10 vehicles) in the eastbound direction and 9% (31 vehicles) in the westbound direction.
- Similar to the AM peak hour, the Sheridan Park Drive Extension will result in the greatest traffic reduction on the western end of Homelands Drive with volumes decreasing by approximately 25% (average for both directions). The eastern end of Homelands Drive will see an increase in traffic by approximately 40% (average for both directions) as the residential community diverts to this link to access the extension.

Overall the results indicate that with the Sheridan Park Drive Extension, Homelands Drive will experience on average a decrease in traffic, while the Speakman Drive widening to four (4) lanes scenario will result in an overall increase in traffic on Homelands Drive. The Sheridan Park Drive Extension scenario leads to the residents living in the area to change their travel patterns to access the external road network via the extension. This in turn leads to a reduction in traffic in some sections of Homelands Drive while other sections experience an increase in neighbourhood traffic as residents utilize these sections to access the extension.

### 3.3.2 Origin and Destination of Trips Utilizing Homelands Drive

The previous analysis concluded that with the Sheridan Park Drive Extension in place, the number of vehicles utilizing sections of Homelands Drive will decrease. The origins and destination of trips utilizing Homelands Drive have been reviewed in this section and how those travel patterns changed between the scenarios analyzed. The objective of this analysis was to determine how the scenarios impact the number of trips utilizing Homelands Drive as a through route, i.e. not originating or destined to the residential area bounded by Dundas Street, Winston Churchill Boulevard, Erin Mills Parkway, and Sheridan Park Drive. A select link analysis was conducted using the City's model, where a select link analysis allows the user to select a link in the transportation network and review where the trips are coming from and going to using that link.

In this analysis, the link that was selected is located along Homelands Drive between Sheridan Park Drive and Thorn Lodge Drive (east intersection). The results of the select link analysis for the 2021 horizon year is summarized in Table 10. The table highlights the total number of vehicles that utilize the selected link and the number of vehicles that utilize the link but that are either originating/destined to the residential area or are originating/destined to an area outside the residential area.

**Table 10: Through Trips Along Homelands Drive (2021 Horizon Year)**

| <b>AM Peak Hour</b>  |                    |                            |                                |
|--|--------------------|----------------------------|--------------------------------|
| <b>Scenarios</b>   | <b>Total Trips</b> | <b>OD within Res. Area</b> | <b>OD outside of Res. Area</b> |
| Do-Nothing   | 491                | 279                        | 212                            |
| Sheridan Park Dr Extension   | 610                | 433                        | 176                            |
| Speakman widening to four (4) Lanes                                      | 535                | 277                        | 258                            |
| <b>Change in through traffic along Homelands Drive between Scenarios</b> |                    |                            |                                |
| Sheridan Park Dr Extension vs Do-nothing                                 |                    | -17%                       |                                |
| Speakman widening to four (4) Lanes vs Do-nothing                        |                    | 22%                        |                                |
| <b>PM Peak Hour</b>  |                    |                            |                                |
| <b>Scenarios</b>   | <b>Total Trips</b> | <b>OD within Res. Area</b> | <b>OD outside of Res. Area</b> |
| Do-nothing   | 538                | 251                        | 287                            |
| Sheridan Park Dr Extension   | 753                | 504                        | 249                            |
| Speakman widening to four (4) Lanes                                      | 580                | 268                        | 312                            |
| <b>Change in through traffic along Homelands Drive between Scenarios</b> |                    |                            |                                |
| Sheridan Park Dr Extension vs Do-nothing                                 |                    | -13%                       |                                |
| Speakman widening to four (4) Lanes vs Do-Nothing                        |                    | 9%                         |                                |

The results from the select link analysis indicate the following for Homelands Drive:

- With the Sheridan Park Drive Extension in place, the number of through trips utilizing Homelands Drive will decrease by approximately 17% in the AM peak hour and 13% in the PM peak hour as compared to the Do-nothing scenario.
- With the Speakman Drive widening to four 4 lanes scenario, there will be an increase in the number of through trips along Homelands Drive by approximately 22% in the AM peak hour and 9% in the PM peak hour as compared to the Do-nothing scenario.
- Generally, the results indicate that the Sheridan Park Drive Extension scenario has the greatest impact of reducing the number of trips utilizing Homelands Drive as a through route.

It is noted that the link traffic volumes analyzed for the scenario of Sheridan Park Extension or the Speakman Drive widening to four (4) lanes scenario had higher traffic volumes than the Do-nothing scenario. For the Sheridan Park Extension scenario, this is due to a change in residential traffic patterns and more residential traffic utilizing this section of the link rather than Homelands Drive further to the west.

### 3.3.3 Origin and Destination of Trips Utilizing Sheridan Park Drive Extension

Similar to the analysis presented in the previous section, a select link analysis was completed for the Sheridan Park Drive Extension. The purpose of the analysis was to understand where the trips are originating from and destined to that are using the Sheridan Park Drive Extension. The following three origin/destination areas were defined:

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- Sheridan Homelands Residential Neighbourhood bounded by Dundas Street, Winston Churchill Boulevard, Erin Mills Parkway and Sheridan Park Drive
- Corporate Park Area bounded by Sheridan Park Drive, Winston Churchill Boulevard, Erin Mills Parkway and Queen Elizabeth Way.
- All other Origin's and Destinations outside the Residential and Corporate Park areas.

The select link analysis for the 2021 horizon year for the Sheridan Park Drive Extension link is summarized in Table 11. The table shows both absolute values and what those values translate into as a percentage of the total trips.

**Table 11: Origin and Destination of Trips Using the Sheridan Park Drive Extension (2021 Horizon Year)**

| <b>AM Peak Hour</b>                          |                       |                        |
|--|-----------------------|------------------------|
|  | <b>Traffic Volume</b> | <b>as a percentage</b> |
| Total Trips                                  | 233                   |                        |
| OD within Residential Area                   | 179                   | 77%                    |
| OD within Corporate Park Area                | 15                    | 6%                     |
| OD outside of Residential and Corporate Area | 38                    | 16%                    |
| <b>PM Peak Hour</b>                          |                       |                        |
|  | <b>Traffic Volume</b> | <b>as a percentage</b> |
| Total Trips                                  | 383                   |                        |
| OD within Residential Area                   | 278                   | 72%                    |
| OD within Corporate Park Area                | 38                    | 10%                    |
| OD outside of Residential and Corporate Area | 68                    | 18%                    |

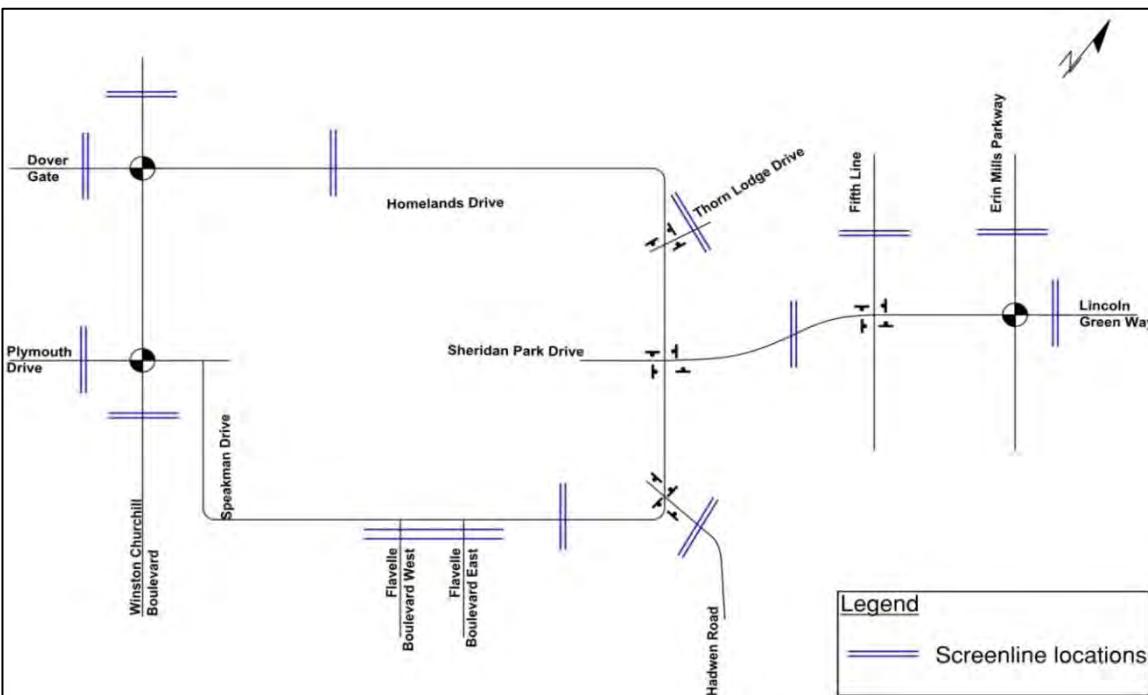
The results from the table indicate the following:

- For the AM peak hour, approximately 77% of the trips that utilize the Sheridan Park Drive Extension either originate from or are destined to the residential area to the north of Sheridan Park Drive. Only about 6% originate from or are destined to the Corporate Park, while approximately 16% of the traffic using the extension has neither an origin nor destination in the residential and Corporate Park areas.
- In the PM peak hour, approximately 72% of the traffic using the Sheridan Park Drive Extension has either an origin or destination in the residential area, 10% has an origin or destination in the Corporate Park area and approximately 18% of the traffic using the extension is originating from or are destined to areas outside of the residential and Corporate Park areas.
- The results indicate that the Sheridan Park Drive Extension will serve a large proportion of trips that are either originating from or are destined to the residential area to the north of the extension. The extension will provide additional network capacity in the area and provide additional opportunities for the residents living in the area to access and exit their neighbourhood.

### 3.4 Traffic Growth Rate

Based on the traffic projections from the City's EMME model for 2011, 2021 and 2031 traffic conditions during the weekday AM and PM peak hours, proposed growth rates along the study roadways have been identified. Note that the traffic projections provided included a with and without Sheridan Park Drive connection. To determine the projected traffic volume along the study roadways a screenline analysis was completed. A screenline analysis involves evaluating the total amount of traffic crossing a physical or imaginary boundary. Figure 9 illustrates the location of the traffic volumes screenlines that were considered in the analysis.

**Figure 9: Screenline Locations**



The total traffic volumes modelled at the screenlines were summarized for each of the study scenarios mentioned. A compounded annual growth rate at each screenline was determined based on the difference between the forecasted scenarios (projected EMME 2021 and 2031 with and without extension volumes) and the EMME 2011 modelled traffic volumes. The growth rates between weekday AM and PM peak hours were compared to determine a recommended growth rate along the main corridor.

The growth rates utilized by roadway are summarized in Table 12.

**Table 12: Roadway Annual Growth Rates**

| Street  | 2021  | 2031  |
|---|-------|-------|
| Winston Churchill Boulevard   | 0.5%  | 1.5%  |
| Dover Gate  | 0%    | 0%    |
| Plymouth Drive  | 3.5%  | 2.0%  |
| Speakman Drive  | 1.0%  | 1.0%  |
| Flavelle Boulevard  | 1.0%  | 1.0%  |
| Hadwen Road   | 0.5%  | 1.0%  |
| Erin Mills Parkway  | 0.5%  | 0.1%  |
| Lincoln Green Way   | 0%    | 0%    |
| Fifth Line  | 1.5%  | 0.5%  |
| Sheridan Park Drive between Homelands Drive and Erin Mills Parkway        |       |       |
| Without Extension   | 1.5%  | 1.5%  |
| With Extension  | 2.0%  | 1.5%  |
| Thorn Lodge Drive   |       |       |
| Without Extension   | 1.0%  | 0.5%  |
| With Extension  | 0.5%  | 0.5%  |
| Homelands Drive between Winston Churchill Boulevard and Thorn Lodge Drive |       |       |
| Without Extension   | 0.5%  | 1.0%  |
| With Extension  | -3.0% | -1.0% |

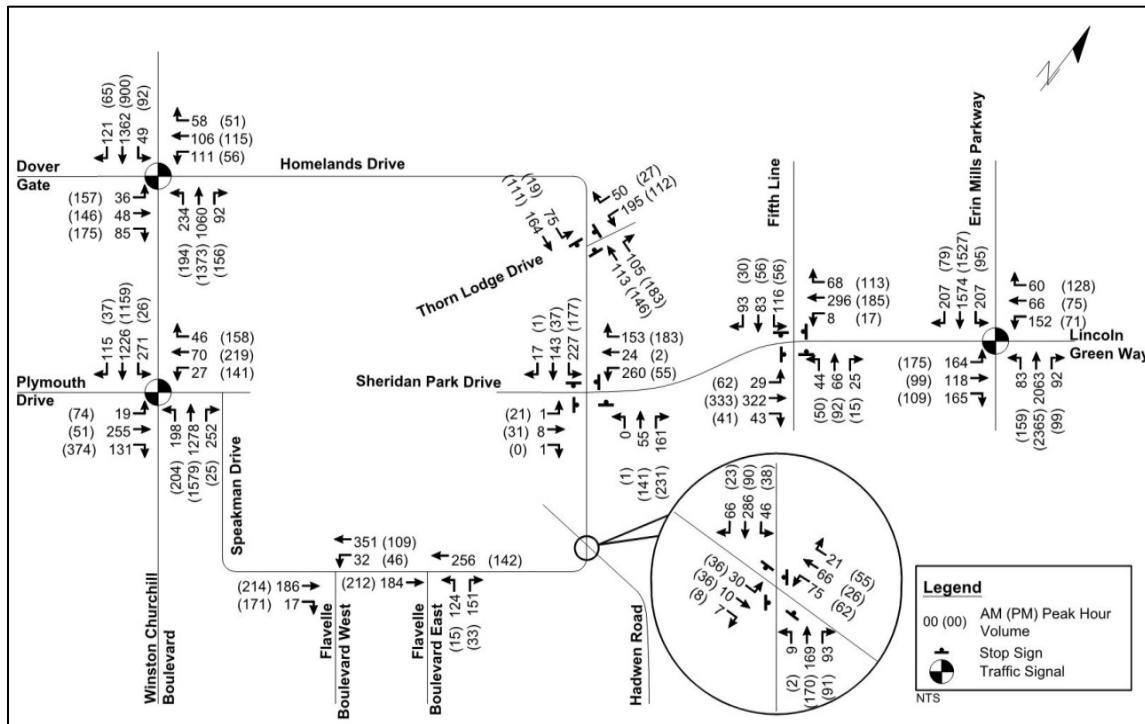
The changes in traffic volumes occurred internally within the study area with the Sheridan Park Drive extension and there was limited impact on the greater external road network. Hence growth rates were kept the same on the external road network. Growth rates increase on Winston Churchill Boulevard for 2031 as it is planned to widen Winston Churchill Boulevard to six lanes by 2031 and the modelled assumed the widening. This likely relates to the reduce growth on Erin Mills Parkway as there is more north-south capacity with the widening of Winston Churchill Boulevard.

The growth rates were then applied to the existing traffic volumes to obtain estimates of traffic volumes for 2021 and 2031.

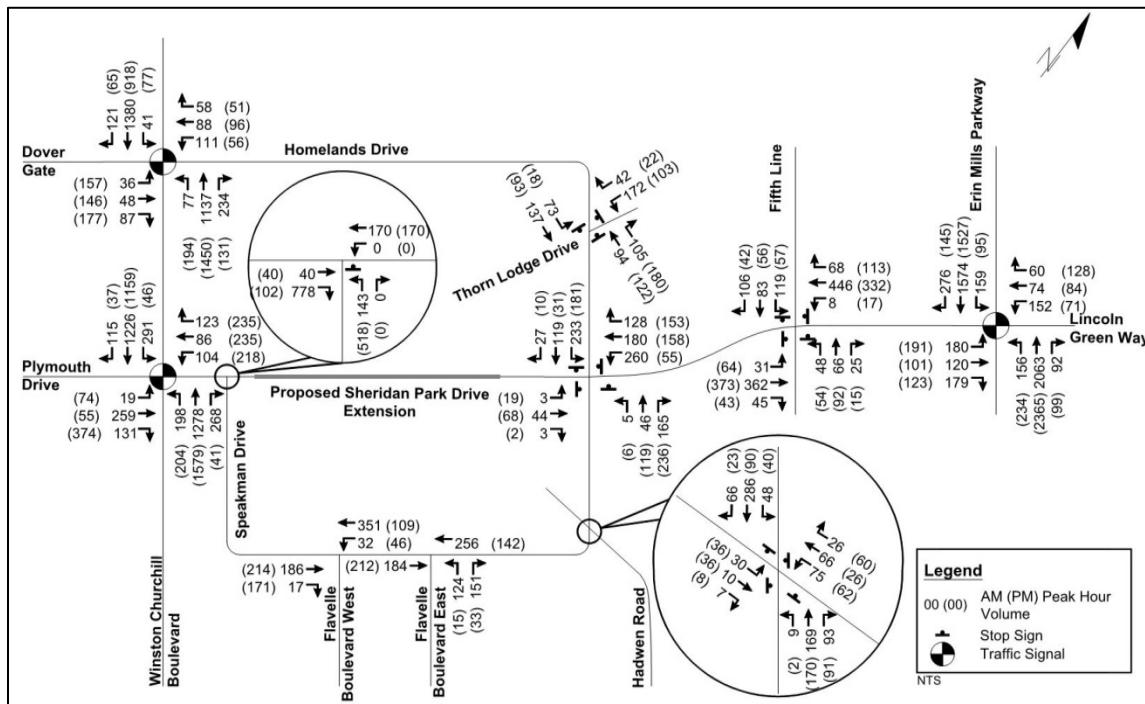
The projected 2021 and 2031 traffic volumes without and with Sheridan Park Drive Extension are shown in Figure 10 through Figure 13.

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**Figure 10: 2021 Traffic Volumes Without the Extension**

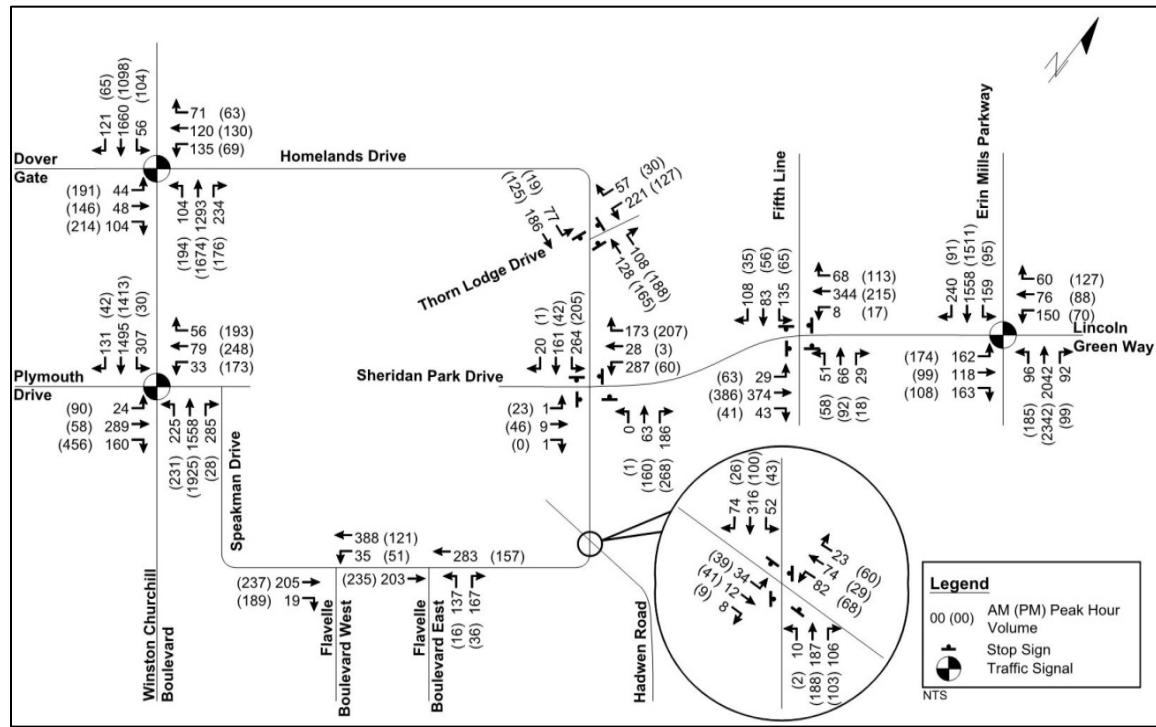


**Figure 11: 2021 Traffic Volumes With Sheridan Park Drive Extension**

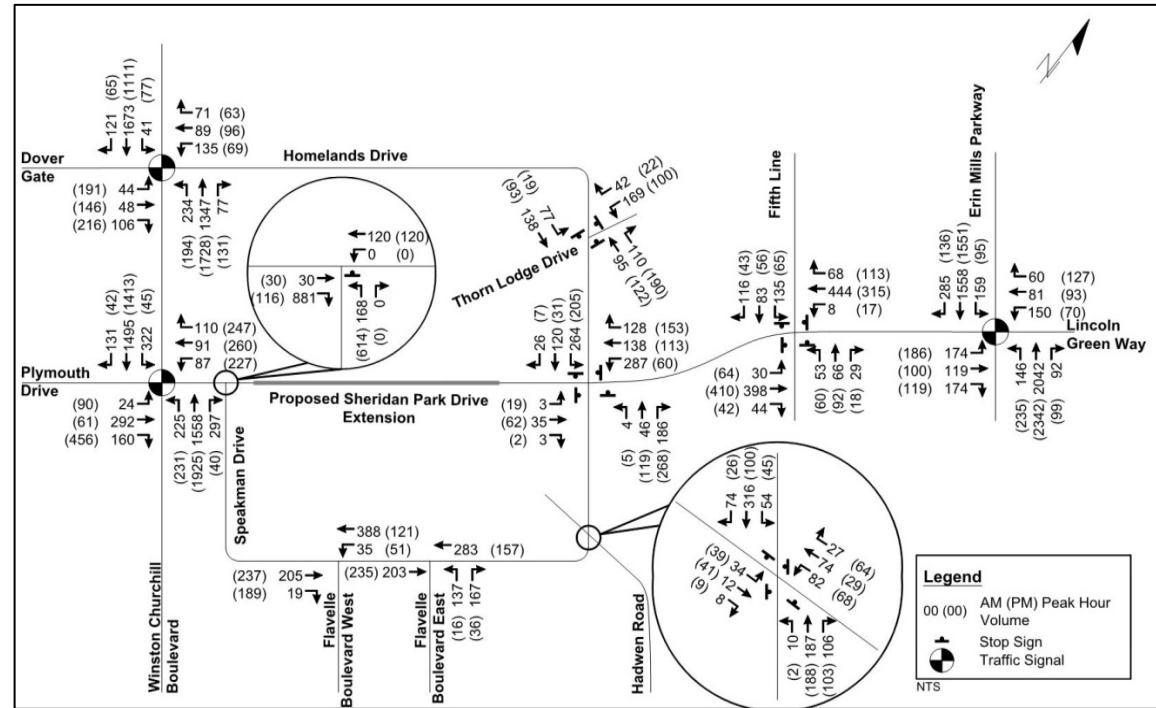


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**Figure 12: 2031 Traffic Volumes Without the Extension**



**Figure 13: 2031 Traffic Volumes With Sheridan Park Drive Extension**



### **3.5 Road Network Improvements for 2021 and 2031 Horizon Years**

Within the study area, the EMME model had Winston Churchill Boulevard improved to 3 lanes per direction by 2031. This improvement will be assumed for the 2031 analysis. The EMME model does not include any other roadway improvements within the study area and there are no other planned improvements.

## 4.0 Traffic Operations

### 4.1 2021 Conditions

Intersection operations were assessed for 2021 traffic conditions with and without extensions utilizing the volumes found in their respective figures. The results for all study intersections are summarized in Table 13 and Table 14 for weekday AM and PM peak hour respectively. Detailed Synchro and Arcady reports are provided in Appendix E for without Sheridan Park Extension and in Appendix F for with Sheridan Park Extension.

As identified for existing conditions, the addition of the westbound right turn lane has been assumed as part of the road network at the Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection.

The following improvements are recommended to accommodate 2021 traffic volumes:

- The Sheridan Park Drive / Speakman Drive (west leg) intersection will have a volume to capacity ratio of 0.78 during the PM peak hour. To improve intersection operations, a roundabout is recommended to be installed with the Sheridan Park Drive Extension.
- The Sheridan Park Drive / Speakman Drive / Homelands Drive intersection will experience delays with or without Sheridan Park Drive Extension. East and westbound left turn lanes could be installed to improve operations; however, the best improvement would be a roundabout that would result into improving level of service to B or better for each leg during both peak hours.
- At the Sheridan Park Drive / Fifth Line intersection, delays will be experienced with or without the Sheridan Park Drive Extension. However, with the Sheridan Park Drive Extension a left turn in the east and westbound directions would be required plus the installation of traffic signals.

At the signalized intersections to Winston Churchill Boulevard and Erin Mills Parkway, delays will be experienced for some movements; however, there is sufficient capacity to accommodate the demand.

**Table 13: 2021 AM Peak Hour Intersection Operations**

| Intersection  | Two-way Stop      |     |                |     | All-way Stop      |     |                |     | Roundabout        |     |                |     | Signalized        |     |                |     |
|---|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|
|   | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     |
|   | v/c               | LOS | v/c            | LOS |
| <b>Flavelle Boulevard West / Speakman Drive</b>         |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Westbound Left-Through                                  | 0.03              | A   | 0.03           | A   |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| <b>Flavelle Boulevard East / Speakman Drive</b>         |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Northbound Left   | 0.35              | C   | 0.35           | C   |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Northbound Right  | 0.25              | B   | 0.25           | B   |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| <b>Speakman Drive / Sheridan Park Drive Extension</b>   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Westbound Left-Through                                  | N/A               |     | 0.01           | A   |                   |     |                |     |                   |     |                |     | 0.19              | A   |                |     |
| Northbound Left-Right                                   | N/A               |     | 0.22           | B   |                   |     |                |     |                   |     |                |     | 0.15              | A   |                |     |
| Eastbound   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.63              | A   |                |     |
| <b>Homelands Drive / Thorn Lodge Drive</b>              |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Westbound Left-Right                                    |                   |     |                |     | 0.48              | B   | 0.41           | B   |                   |     |                |     |                   |     |                |     |
| Northbound Through-Right                                |                   |     |                |     | 0.40              | B   | 0.35           | B   |                   |     |                |     |                   |     |                |     |
| Southbound Left-Through                                 |                   |     |                |     | 0.46              | B   | 0.39           | B   |                   |     |                |     |                   |     |                |     |
| <b>Sheridan Park Dr. / Speakman Dr. / Homelands Dr.</b> |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left-Through-Right                            |                   |     |                |     | 0.03              | B   | N/A            |     | 0.02              | A   | 0.09           | A   |                   |     |                |     |
| Eastbound Left  |                   |     |                |     | N/A               |     | 0.01           | B   |                   |     |                |     |                   |     |                |     |
| Eastbound Through-Right                                 |                   |     |                |     |                   |     | 0.13           | B   |                   |     |                |     |                   |     |                |     |
| Westbound Left-Through-Right                            |                   |     |                |     | 0.92              | E   | N/A            |     | 0.48              | A   | 0.61           | A   |                   |     |                |     |
| Westbound Left  |                   |     |                |     | N/A               |     | 0.66           | C   |                   |     |                |     |                   |     |                |     |
| Westbound Through-Right                                 |                   |     |                |     |                   |     | 0.71           | C   |                   |     |                |     |                   |     |                |     |
| Northbound Left-Through-Right                           |                   |     |                |     | 0.46              | B   | 0.47           | C   | 0.29              | A   | 0.31           | A   |                   |     |                |     |
| Southbound Left-Through-Right                           |                   |     |                |     | 0.84              | E   | 0.84           | D   | 0.46              | A   | 0.54           | A   |                   |     |                |     |
| <b>Sheridan Park Drive / Fifth Line</b>                 |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left-Through-Right                            |                   |     |                |     | 0.85              | E   | N/A            |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     | N/A               |     | 0.08           | F   |                   |     |                |     |                   |     | 0.12           | A   |
| Eastbound Through-Right                                 |                   |     |                |     |                   |     | 0.96           | F   |                   |     |                |     |                   |     | 0.53           | A   |
| Westbound Left-Through-Right                            |                   |     |                |     | 0.81              | D   | N/A            |     |                   |     |                |     |                   |     |                |     |
| Westbound Left  |                   |     |                |     | N/A               |     | 0.02           | F   |                   |     |                |     |                   |     | 0.03           | A   |
| Westbound Through-Right                                 |                   |     |                |     |                   |     | 1.21           | F   |                   |     |                |     |                   |     | 0.68           | A   |
| Northbound Left   |                   |     |                |     | 0.13              | B   | 0.14           | B   |                   |     |                |     |                   |     | 0.20           | B   |
| Northbound Through-Right                                |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.22           | B   |
| Southbound Left   |                   |     |                |     | 0.32              | B   | 0.32           | C   |                   |     |                |     |                   |     | 0.40           | B   |
| Southbound Through-Right                                |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.44           | B   |
| <b>Speakman Drive / Hadwen Drive</b>                    |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left-Through-Right                            |                   |     |                |     | 0.12              | B   | 0.12           | B   |                   |     |                |     |                   |     |                |     |
| Westbound Left-Through-Right                            |                   |     |                |     | 0.37              | B   | 0.38           | B   |                   |     |                |     |                   |     |                |     |
| Northbound Left-Through-Right                           |                   |     |                |     | 0.53              | B   | 0.53           | B   |                   |     |                |     |                   |     |                |     |
| Southbound Left-Through-Right                           |                   |     |                |     | 0.76              | C   | 0.77           | C   |                   |     |                |     |                   |     |                |     |

**Table 13: 2021 AM Peak Hour Intersection Operations continued**

| Intersection  | Two-way Stop      |     |                |     | All-way Stop      |     |                |     | Roundabout        |     |                |     | Signalized        |     |                |     |
|---|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|
|   | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     |
|   | v/c               | LOS | v/c            | LOS |
| <b>Winston Churchill Blvd. / Dover Gate / Homelands Dr.</b>   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.35              | E   | 0.31           | E   |
| Eastbound Through-Right                                       |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.52              | D   | 0.52           | D   |
| Westbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.83              | F   | 0.84           | F   |
| Westbound Through-Right                                       |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.69              | E   | 0.61           | E   |
| Northbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.72              | D   | 0.73           | D   |
| Northbound Through-Right                                      |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.49              | A   | 0.51           | A   |
| Southbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.24              | B   | 0.22           | B   |
| Southbound Through  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.72              | C   | 0.73           | C   |
| Southbound Right  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.14              | A   | 0.14           | A   |
| <b>Winston Churchill / Plymouth Dr. / Sheridan Park Dr.</b>   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.09              | D   | 0.09           | D   |
| Eastbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.78              | E   | 0.78           | E   |
| Eastbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.41              | D   | 0.39           | B   |
| Westbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.31              | E   | 0.67           | E   |
| Westbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.21              | D   | 0.19           | D   |
| Westbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.15              | B   | 0.26           | A   |
| Northbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.95              | E   | 0.72           | C   |
| Northbound Through-Right                                      |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.82              | C   | 0.98           | D   |
| Southbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.89              | E   | 0.93           | E   |
| Southbound Through  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.50              | A   | 0.70           | C   |
| Southbound Right  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.10              | A   | 0.14           | A   |
| <b>Erin Mills Parkway / Sheridan Park / Lincoln Green Way</b> |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.81              | F   | 0.86           | F   |
| Eastbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.37              | D   | 0.35           | D   |
| Eastbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.54              | D   | 0.43           | A   |
| Westbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.74              | E   | 0.70           | E   |
| Westbound Through-Right                                       |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.42              | D   | 0.43           | D   |
| Northbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.54              | D   | 0.63           | C   |
| Northbound Through-Right                                      |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.72              | C   | 0.74           | C   |
| Southbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.77              | E   | 0.74           | D   |
| Southbound Through  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.45              | A   | 0.54           | B   |
| Southbound Right  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.18              | A   | 0.27           | A   |

Notes: v/c (volume-to-capacity ratio), LOS (level of service)

**Table 14: 2021 PM Peak Hour Intersection Operations**

| Intersection                                    | Two-way Stop      |     |                |     | All-way Stop      |     |                |     | Roundabout        |     |                |     | Signalized        |     |                |     |
|---|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|
|   | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     |
|   | v/c               | LOS | v/c            | LOS |
| <b>Flavelle Boulevard West / Speakman Drive</b> |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Westbound Left-Through                          | 0.06              | A   | 0.06           | A   |                   |     |                |     |                   |     |                |     |                   |     |                |     |

Table 14: 2021 PM Peak Hour Intersection Operations continued

| Intersection  | Two-way Stop      |      |                |     | All-way Stop      |     |                |     | Roundabout        |     |                |      | Signalized        |      |                |     |
|---|-------------------|------|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|------|-------------------|------|----------------|-----|
|   | Without Extension |      | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |      | Without Extension |      | With Extension |     |
|   | v/c               | LOS  | v/c            | LOS | v/c               | LOS | v/c            | LOS | v/c               | LOS | v/c            | LOS  | v/c               | LOS  | v/c            | LOS |
| <b>Flavelle Boulevard East / Speakman Drive</b>         |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |      |                |     |
| Northbound Left   | 0.03              | B    | 0.03           | B   |                   |     |                |     |                   |     |                |      |                   |      |                |     |
| Northbound Right  | 0.05              | A    | 0.05           | A   |                   |     |                |     |                   |     |                |      |                   |      |                |     |
| <b>Speakman Drive / Sheridan Park Drive Extension</b>   |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |      |                |     |
| Westbound Left-Through                                  | N/A               | 0.01 | A              |     |                   |     |                |     |                   |     |                | 0.24 | A                 |      |                |     |
| Northbound Left-Right                                   |                   | 0.78 | C              |     |                   |     |                |     |                   |     |                | 0.53 | A                 |      |                |     |
| Eastbound   |                   |      |                |     |                   |     |                |     |                   |     |                | 0.07 | A                 |      |                |     |
| <b>Homelands Drive / Thorn Lodge Drive</b>              |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |      |                |     |
| Westbound Left-Right                                    |                   |      |                |     | 0.23              | A   | 0.20           | A   |                   |     |                |      |                   |      |                |     |
| Northbound Through-Right                                |                   |      |                |     | 0.44              | B   | 0.40           | A   |                   |     |                |      |                   |      |                |     |
| Southbound Left-Through                                 |                   |      |                |     | 0.20              | A   | 0.17           | A   |                   |     |                |      |                   |      |                |     |
| <b>Sheridan Park Dr. / Speakman Dr. / Homelands Dr.</b> |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |      |                |     |
| Eastbound Left-Through-Right                            |                   |      |                |     | 0.11              | B   | NA             |     | 0.06              | A   | 0.11           | A    |                   |      |                |     |
| Eastbound Left  |                   |      |                |     | NA                |     | 0.05           | B   |                   |     |                |      |                   |      |                |     |
| Eastbound Through-Right                                 |                   |      |                |     |                   |     | 0.17           | B   |                   |     |                |      |                   |      |                |     |
| Westbound Left-Through-Right                            |                   |      |                |     | 0.42              | B   | NA             |     | 0.30              | A   | 0.44           | A    |                   |      |                |     |
| Westbound Left  |                   |      |                |     | NA                |     | 0.13           | B   |                   |     |                |      |                   |      |                |     |
| Westbound Through-Right                                 |                   |      |                |     |                   |     | 0.70           | C   |                   |     |                |      |                   |      |                |     |
| Northbound Left-Through-Right                           |                   |      |                |     | 0.60              | C   | 0.68           | C   | 0.51              | A   | 0.52           | B    |                   |      |                |     |
| Southbound Left-Through-Right                           |                   |      |                |     | 0.40              | B   | 0.47           | C   | 0.22              | A   | 0.27           | A    |                   |      |                |     |
| <b>Fifth Line / Sheridan Park Drive</b>                 |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |      |                |     |
| Eastbound Left-Through-Right                            |                   |      |                |     | 0.75              | C   | NA             |     |                   |     |                |      |                   |      |                |     |
| Eastbound Left  |                   |      |                |     | NA                |     | 0.14           | D   |                   |     |                |      |                   | 0.19 | A              |     |
| Eastbound Through-Right                                 |                   |      |                |     |                   |     | 0.82           | D   |                   |     |                |      |                   | 0.55 | A              |     |
| Westbound Left-Through-Right                            |                   |      |                |     | 0.54              | C   | NA             |     |                   |     |                |      |                   |      |                |     |
| Westbound Left  |                   |      |                |     | NA                |     | 0.4            | E   |                   |     |                |      |                   | 0.05 | A              |     |
| Westbound Through-Right                                 |                   |      |                |     |                   |     | 0.87           | E   |                   |     |                |      |                   | 0.59 | A              |     |
| Northbound Left   |                   |      |                |     | 0.12              | B   | 0.13           | B   |                   |     |                |      |                   | 0.18 | B              |     |
| Northbound Through-Right                                |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.25 | B              |     |
| Southbound Left   |                   |      |                |     | 0.13              | B   | 0.14           | B   |                   |     |                |      |                   | 0.20 | B              |     |
| Southbound Through-Right                                |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.23 | A              |     |
| <b>Speakman Drive / Hadwen Drive</b>                    |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |      |                |     |
| Eastbound Left-Through-Right                            |                   |      |                |     | 0.15              | A   | 0.15           | A   |                   |     |                |      |                   |      |                |     |
| Westbound Left-Through-Right                            |                   |      |                |     | 0.26              | A   | 0.26           | B   |                   |     |                |      |                   |      |                |     |
| Northbound Left-Through-Right                           |                   |      |                |     | 0.42              | B   | 0.43           | B   |                   |     |                |      |                   |      |                |     |
| Southbound Left-Through-Right                           |                   |      |                |     | 0.26              | A   | 0.27           | A   |                   |     |                |      |                   |      |                |     |

Table 14: 2021 PM Peak Hour Intersection Operations continued

| Intersection  | Two-way Stop      |     |                |     | All-way Stop      |     |                |     | Roundabout        |     |                |     | Signalized        |     |                |     |
|---|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|
|   | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     |
|   | v/c               | LOS | v/c            | LOS |
| <b>Winston Churchill Blvd. / Dover Gate / Homelands Dr.</b>   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.81           | F   |
| Eastbound Through-Right                                       |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.89           | E   |
| Westbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.83           | F   |
| Westbound Through-Right                                       |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.46           | D   |
| Northbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.51           | A   |
| Northbound Through-Right                                      |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.75           | B   |
| Southbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.49           | B   |
| Southbound Through  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.44           | B   |
| Southbound Right  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.07           | A   |
| <b>Winston Churchill / Plymouth Dr. / Sheridan Park Dr.</b>   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.43           | E   |
| Eastbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.18           | D   |
| Eastbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.88           | D   |
| Westbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.48           | D   |
| Westbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.53           | D   |
| Westbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.37           | B   |
| Northbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.66           | C   |
| Northbound Through-Right                                      |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.72           | C   |
| Southbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.16           | A   |
| Southbound Through  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.68           | B   |
| Southbound Right  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.04           | A   |
| <b>Erin Mills Parkway / Sheridan Park / Lincoln Green Way</b> |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.95           | F   |
| Eastbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.25           | D   |
| Eastbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.27           | A   |
| Westbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.26           | D   |
| Westbound Through-Right                                       |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.51           | D   |
| Northbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.66           | C   |
| Northbound Through-Right                                      |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.86           | C   |
| Southbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.62           | D   |
| Southbound Through  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.55           | C   |
| Southbound Right  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     | 0.09           | A   |

Notes: v/c (volume-to-capacity ratio), LOS (level of service)

The queues were reviewed with and without the extension with results summarized in Table 15 with details provided in Appendix G.

**Table 15: 2021 95<sup>th</sup> Percentile Queues**

| <b>Intersection and Movement<br/>(Peak Period)</b>                 | <b>Storage<br/>(m)</b> | <b>Without Extension</b> |                | <b>With Extension</b> |                |
|--|------------------------|--------------------------|----------------|-----------------------|----------------|
|  |                        | <b>AM Peak</b>           | <b>PM Peak</b> | <b>AM Peak</b>        | <b>PM Peak</b> |
| Winston Churchill Boulevard / Dover Gate / Homelands Drive         |                        |                          |                |                       |                |
| Eastbound Through-Right  | 100                    | 41                       | 125            | 42                    | 126            |
| Westbound Left   | 20                     | 53                       | 42             | 53                    | 42             |
| Winston Churchill Boulevard / Plymouth Drive / Sheridan Park Drive |                        |                          |                |                       |                |
| Westbound Left   | 59                     | 16                       | 47             | 37                    | 63             |
| Southbound Left  | 112                    | 141                      | 4              | 157                   | 14             |
| Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way       |                        |                          |                |                       |                |
| Eastbound Left   | 20                     | 66                       | 79             | 74                    | 79             |
| Eastbound Right  | 25                     | 48                       | 14             | 19                    | 15             |
| Westbound Left   | 35                     | 61                       | 29             | 62                    | 33             |

In general, the queues with and without the extension are similar.

## 4.2 2031 Intersection Operations

Intersection operations were assessed for 2031 traffic conditions with and without the Sheridan Park Drive Extension. The results for all study intersections are summarized in Table 16 and Table 17 for weekday AM and PM peak hour respectively. Detailed Synchro reports are provided in Appendix H for without Sheridan Park Extension and in Appendix I for with Sheridan Park Extension.

In addition to the transportation improvements identified for 2021 traffic conditions, the following additional improvements are identified:

- The Sheridan Park Drive / Fifth Line intersection will require traffic signals to be installed prior to 2031 without the Sheridan Park Drive Extension. It was previously identified as needing traffic signals by 2021 with the extension.

At the arterial intersections, some movements will approach capacity and experience delays; however, the intersection movements will operate within the available capacity.

**Table 16: 2031 AM Peak Hour Intersection Operations**

| Intersection  | Two-way Stop      |      |                |     | All-way Stop      |     |                |     | Roundabout        |     |                |      | Signalized        |       |                |      |   |
|---|-------------------|------|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|------|-------------------|-------|----------------|------|---|
|   | Without Extension |      | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |      | Without Extension |       | With Extension |      |   |
|   | v/c               | LOS  | v/c            | LOS | v/c               | LOS | v/c            | LOS | v/c               | LOS | v/c            | LOS  | v/c               | LOS   | v/c            | LOS  |   |
| <b>Flavelle Boulevard West / Speakman Drive</b>             |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |       |                |      |   |
| Westbound Left-Through                                      | 0.03              | A    | 0.03           | A   |                   |     |                |     |                   |     |                |      |                   |       |                |      |   |
| <b>Flavelle Boulevard East / Speakman Drive</b>             |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |       |                |      |   |
| Northbound Left   | 0.42              | C    | 0.42           | C   |                   |     |                |     |                   |     |                |      |                   |       |                |      |   |
| Northbound Right  | 0.29              | B    | 0.29           | B   |                   |     |                |     |                   |     |                |      |                   |       |                |      |   |
| <b>Speakman Drive / Sheridan Park Drive Extension</b>       |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |       |                |      |   |
| Westbound Left-Through                                      | N/A               | 0.02 | A              |     |                   |     |                |     |                   |     |                | 0.13 | A                 |       |                |      |   |
| Northbound Left-Right                                       |                   | 0.24 | B              |     |                   |     |                |     |                   |     |                | 0.16 | A                 |       |                |      |   |
| Eastbound   |                   |      |                |     |                   |     |                |     |                   |     |                | 0.73 | A                 |       |                |      |   |
| <b>Homelands Drive / Thorn Lodge Drive</b>                  |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |       |                |      |   |
| Westbound Left-Right  |                   |      |                |     | 0.57              | C   | 0.40           | B   |                   |     |                |      |                   |       |                |      |   |
| Northbound Through-Right                                    |                   |      |                |     | 0.46              | B   | 0.36           | B   |                   |     |                |      |                   |       |                |      |   |
| Southbound Left-Through                                     |                   |      |                |     | 0.53              | B   | 0.40           | B   |                   |     |                |      |                   |       |                |      |   |
| <b>Sheridan Park Dr. / Speakman Dr. / Homelands Dr.</b>     |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |       |                |      |   |
| Eastbound   |                   |      |                |     |                   |     |                |     |                   |     | 0.02           | A    | 0.07              | A     |                |      |   |
| Westbound   |                   |      |                |     |                   |     |                |     |                   |     | 0.51           | A    | 0.56              | A     |                |      |   |
| Northbound  |                   |      |                |     |                   |     |                |     |                   |     | 0.33           | A    | 0.33              | A     |                |      |   |
| Southbound  |                   |      |                |     |                   |     |                |     |                   |     | 0.51           | A    | 0.53              | A     |                |      |   |
| <b>Fifth Line / Sheridan Park Drive</b>                     |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |       |                |      |   |
| Eastbound Left  |                   |      |                |     | 0.07              | F   |                |     |                   |     |                |      |                   | 0.10  | A              | 0.12 | A |
| Eastbound Through-Right                                     |                   |      |                |     | 1.00              | F   |                |     |                   |     |                |      |                   | 0.60  | B              | 0.57 | B |
| Westbound Left  |                   |      |                |     | 0.02              | F   |                |     |                   |     |                |      |                   | 0.03  | A              | 0.03 | A |
| Westbound Through-Right                                     |                   |      |                |     | 0.99              | F   |                |     |                   |     |                |      |                   | 0.60  | B              | 0.67 | B |
| Northbound Left   |                   |      |                |     | 0.15              | B   |                |     |                   |     |                |      |                   | 0.19  | B              | 0.22 | B |
| Northbound Through-Right                                    |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.21  | B              | 0.22 | B |
| Southbound Left   |                   |      |                |     | 0.38              | C   |                |     |                   |     |                |      |                   | 0.41  | B              | 0.44 | B |
| Southbound Through-Right                                    |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.41  | B              | 0.46 | B |
| <b>Speakman Drive / Hadwen Drive</b>                        |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |       |                |      |   |
| Eastbound Left-Through-Right                                |                   |      |                |     | 0.14              | B   | 0.14           | B   |                   |     |                |      |                   |       |                |      |   |
| Westbound Left-Through-Right                                |                   |      |                |     | 0.44              | B   | 0.45           | C   |                   |     |                |      |                   |       |                |      |   |
| Northbound Left-Through-Right                               |                   |      |                |     | 0.63              | C   | 0.64           | C   |                   |     |                |      |                   |       |                |      |   |
| Southbound Left-Through-Right                               |                   |      |                |     | 0.90              | E   | 0.90           | E   |                   |     |                |      |                   |       |                |      |   |
| <b>Winston Churchill Blvd. / Dover Gate / Homelands Dr.</b> |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   |       |                |      |   |
| Eastbound Left  |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.40  | E              | 0.32 | D |
| Eastbound Through-Right                                     |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.51  | D              | 0.51 | C |
| Westbound Left  |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.90  | F              | 0.90 | F |
| Westbound Through-Right                                     |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.69  | E              | 0.57 | D |
| Northbound Left   |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.84  | E              | 0.80 | E |
| Northbound Through-Right                                    |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.463 | A              | 0.43 | A |
| Southbound Left   |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.40  | C              | 0.31 | C |
| Southbound Through  |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.62  | C              | 0.64 | C |
| Southbound Right  |                   |      |                |     |                   |     |                |     |                   |     |                |      |                   | 0.14  | A              | 0.15 | A |

**Table 16: 2031 AM Peak Hour Intersection Operations continued**

| Intersection  | Two-way Stop      |     |                |     | All-way Stop      |     |                |     | Roundabout        |     |                |     | Signalized        |     |                |     |
|---|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|
|   | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     |
|   | v/c               | LOS | v/c            | LOS |
| <b>Winston Churchill / Plymouth Dr. / Sheridan Park Dr.</b>   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.10              | D   | 0.10           | D   |
| Eastbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.81              | E   | 0.78           | E   |
| Eastbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.45              | C   | 0.43           | C   |
| Westbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.42              | E   | 0.82           | F   |
| Westbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.22              | D   | 0.30           | D   |
| Westbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.17              | B   | 0.32           | B   |
| Northbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.75              | C   | 0.72           | D   |
| Northbound Through-Right                                      |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.76              | C   | 0.81           | D   |
| Southbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.87              | E   | 0.82           | E   |
| Southbound Through  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.56              | C   | 0.57           | C   |
| Southbound Right  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.15              | A   | 0.15           | A   |
| <b>Erin Mills Parkway / Sheridan Park / Lincoln Green Way</b> |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.82              | F   | 0.82           | E   |
| Eastbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.36              | D   | 0.54           | E   |
| Eastbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.53              | D   | 0.53           | B   |
| Westbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.72              | E   | 0.65           | E   |
| Westbound Through-Right                                       |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.46              | D   | 0.71           | E   |
| Northbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.62              | D   | 0.58           | B   |
| Northbound Through-Right                                      |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.71              | C   | 0.75           | C   |
| Southbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.78              | E   | 0.71           | D   |
| Southbound Through  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.45              | A   | 0.55           | C   |
| Southbound Right  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.20              | A   | 0.29           | A   |

Notes: v/c (volume-to-capacity ratio), LOS (level of service)

**Table 17: 2031 PM Peak Hour Intersection Operations**

| Intersection  | Two-way Stop      |     |                |     | All-way Stop      |     |                |     | Roundabout        |     |                |     | Signalized        |     |                |     |
|---|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|
|   | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     |
|   | v/c               | LOS | v/c            | LOS |
| <b>Flavelle Boulevard West / Speakman Drive</b>       |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Westbound Left-Through                                | 0.07              | A   | 0.07           | A   |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| <b>Flavelle Boulevard East / Speakman Drive</b>       |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Northbound Left                                       | 0.07              | A   | 0.07           | A   |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Northbound Right                                      | 0.05              | A   | 0.05           | A   |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| <b>Speakman Drive / Sheridan Park Drive Extension</b> |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Westbound Left-Through                                | N/A               |     | 0.01           | A   |                   |     |                |     |                   |     |                |     | 0.17              | A   |                |     |
| Northbound Left-Right                                 |                   |     | 0.81           | B   |                   |     |                |     |                   |     |                |     | 0.59              | A   |                |     |
| Eastbound   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.07              | A   |                |     |

Table 17: 2031 PM Peak Hour Intersection Operations continued

| Intersection  | Two-way Stop      |     |                |     | All-way Stop      |     |                |     | Roundabout        |     |                |     | Signalized        |     |                |     |
|---|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|
|   | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     |
|   | v/c               | LOS | v/c            | LOS |
| <b>Homelands Drive / Thorn Lodge Drive</b>                  |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Westbound Left-Right  |                   |     |                |     | 0.26              | B   | 0.20           | A   |                   |     |                |     |                   |     |                |     |
| Northbound Through-Right                                    |                   |     |                |     | 0.49              | B   | 0.41           | A   |                   |     |                |     |                   |     |                |     |
| Southbound Left-Through                                     |                   |     |                |     | 0.23              | A   | 0.17           | A   |                   |     |                |     |                   |     |                |     |
| <b>Sheridan Park Dr. / Speakman Dr. / Homelands Dr.</b>     |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound   |                   |     |                |     |                   |     |                |     | 0.07              | A   | 0.10           | A   |                   |     |                |     |
| Westbound   |                   |     |                |     |                   |     |                |     | 0.33              | A   | 0.37           | A   |                   |     |                |     |
| Northbound  |                   |     |                |     |                   |     |                |     | 0.59              | B   | 0.55           | B   |                   |     |                |     |
| Southbound  |                   |     |                |     |                   |     |                |     | 0.24              | A   | 0.26           | A   |                   |     |                |     |
| <b>Fifth Line / Sheridan Park Drive</b>                     |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     | 0.13              | D   |                |     |                   |     |                |     | 0.15              | A   | 0.18           | A   |
| Eastbound Through-Right                                     |                   |     |                |     | 0.81              | D   |                |     |                   |     |                |     | 0.57              | A   | 0.58           | A   |
| Westbound Left  |                   |     |                |     | 0.04              | C   |                |     |                   |     |                |     | 0.05              | A   | 0.05           | A   |
| Westbound Through-Right                                     |                   |     |                |     | 0.63              | C   |                |     |                   |     |                |     | 0.44              | A   | 0.55           | A   |
| Northbound Left   |                   |     |                |     | 0.14              | B   |                |     |                   |     |                |     | 0.19              | B   | 0.21           | B   |
| Northbound Through-Right                                    |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.25              | B   | 0.26           | B   |
| Southbound Left   |                   |     |                |     | 0.16              | B   |                |     |                   |     |                |     | 0.22              | B   | 0.23           | B   |
| Southbound Through-Right                                    |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.21              | A   | 0.24           | A   |
| <b>Speakman Drive / Hadwen Drive</b>                        |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left-Through-Right                                |                   |     |                |     | 0.18              | A   | 0.18           | B   |                   |     |                |     |                   |     |                |     |
| Westbound Left-Through-Right                                |                   |     |                |     | 0.29              | B   | 0.30           | B   |                   |     |                |     |                   |     |                |     |
| Northbound Left-Through-Right                               |                   |     |                |     | 0.49              | B   | 0.49           | B   |                   |     |                |     |                   |     |                |     |
| Southbound Left-Through-Right                               |                   |     |                |     | 0.30              | B   | 0.31           | B   |                   |     |                |     |                   |     |                |     |
| <b>Winston Churchill Blvd. / Dover Gate / Homelands Dr.</b> |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.88              | F   | 0.77           | E   |
| Eastbound Through-Right                                     |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.85              | E   | 0.85           | E   |
| Westbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.86              | F   | 0.86           | F   |
| Westbound Through-Right                                     |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.46              | D   | 0.37           | D   |
| Northbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.58              | C   | 0.59           | C   |
| Northbound Through-Right                                    |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.68              | B   | 0.67           | B   |
| Southbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.60              | C   | 0.49           | C   |
| Southbound Through  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.41              | B   | 0.42           | B   |
| Southbound Right  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.08              | A   | 0.08           | A   |

**Table 17: 2031 PM Peak Hour Intersection Operations continued**

| Intersection  | Two-way Stop      |     |                |     | All-way Stop      |     |                |     | Roundabout        |     |                |     | Signalized        |     |                |     |
|---|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|-------------------|-----|----------------|-----|
|   | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     | Without Extension |     | With Extension |     |
|   | v/c               | LOS | v/c            | LOS |
| <b>Winston Churchill / Plymouth Dr. / Sheridan Park Dr.</b>   |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.49              | E   | 0.43           | D   |
| Eastbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.18              | D   | 0.17           | D   |
| Eastbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.91              | D   | 0.92           | D   |
| Westbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.53              | D   | 0.47           | C   |
| Westbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.54              | D   | 0.41           | D   |
| Westbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.42              | C   | 0.42           | B   |
| Northbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.74              | D   | 0.85           | E   |
| Northbound Through-Right                                      |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.64              | C   | 0.78           | C   |
| Southbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.21              | B   | 0.34           | C   |
| Southbound Through  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.64              | C   | 0.78           | C   |
| Southbound Right  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.05              | A   | 0.06           | A   |
| <b>Erin Mills Parkway / Sheridan Park / Lincoln Green Way</b> |                   |     |                |     |                   |     |                |     |                   |     |                |     |                   |     |                |     |
| Eastbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.97              | F   | 0.90           | F   |
| Eastbound Through   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.25              | D   | 0.22           | D   |
| Eastbound Right   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.27              | A   | 0.26           | A   |
| Westbound Left  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.26              | D   | 0.38           | E   |
| Westbound Through-Right                                       |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.54              | D   | 0.79           | E   |
| Northbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.72              | C   | 0.78           | D   |
| Northbound Through-Right                                      |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.86              | C   | 0.90           | C   |
| Southbound Left   |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.61              | D   | 0.62           | D   |
| Southbound Through  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.56              | C   | 0.64           | C   |
| Southbound Right  |                   |     |                |     |                   |     |                |     |                   |     |                |     | 0.11              | A   | 0.17           | A   |

Notes: v/c (volume-to-capacity ratio), LOS (level of service)

2. Optimized signal timing while maintaining the existing cycle length

Sheridan Park Drive Extension Transportation Report  
January 2018

The queues for 2031 conditions were reviewed and are summarized in Table 18 with the details provided in Appendix J.

**Table 18: 2031 95<sup>th</sup> Percentile Queues**

| <b>Intersection and Movement<br/>(Peak Period)</b>                 | <b>Storage<br/>(m)</b> | <b>Without Extension</b> |                | <b>With Extension</b> |                |
|--|------------------------|--------------------------|----------------|-----------------------|----------------|
|  |                        | <b>AM Peak</b>           | <b>PM Peak</b> | <b>AM Peak</b>        | <b>PM Peak</b> |
| Winston Churchill Boulevard / Dover Gate / Homelands Drive         |                        |                          |                |                       |                |
| Eastbound Left   | 100                    | 25                       | 105            | 23                    | 96             |
| Eastbound Through-Right  | 100                    | 47                       | 149            | 45                    | 151            |
| Westbound Left   | 20                     | 75                       | 55             | 68                    | 55             |
| Winston Churchill Boulevard / Plymouth Drive / Sheridan Park Drive |                        |                          |                |                       |                |
| Eastbound Left   | 28                     | 13                       | 53             | 12                    | 39             |
| Westbound Left   | 59                     | 20                       | 56             | 48                    | 64             |
| Northbound Left  | 98                     | 66                       | 118            | 70                    | 103            |
| Southbound Left  | 112                    | 115                      | 6              | 124                   | 16             |
| Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way       |                        |                          |                |                       |                |
| Eastbound Left   | 20                     | 65                       | 82             | 62                    | 74             |
| Eastbound Right  | 25                     | 47                       | 14             | 20                    | 14             |
| Westbound Left   | 35                     | 59                       | 29             | 54                    | 32             |

The queue lengths are similar with or without the Sheridan Park Drive extension.



## Appendix A

### Existing Traffic Counts and Signal Timing Plans

## Accu-Traffic Inc.

### Morning Peak Diagram

#### Specified Period

From: 7:00:00

To: 9:00:00

#### One Hour Peak

From: 8:00:00

To: 9:00:00

**Municipality:** Mississauga

**Site #:** 1618100001

**Intersection:** Winston Churchill Blvd & Homeland

**TFR File #:** 1

**Count date:** 23-Nov-16

#### Weather conditions:

**Person counted:**

**Person prepared:**

**Person checked:**

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

**Major Road:** Winston Churchill Blvd runs N/S

North Leg Total: 2623

North Entering: 1497

North Peds:

Peds Cross:

|        |     |      |    |      |
|--------|-----|------|----|------|
| Heavys | 1   | 31   | 4  | 36   |
| Trucks | 1   | 21   | 1  | 23   |
| Cars   | 119 | 1276 | 43 | 1438 |
| Totals | 121 | 1328 | 48 |      |

|        |      |
|--------|------|
| Heavys | 37   |
| Trucks | 20   |
| Cars   | 1069 |
| Totals | 1126 |

East Leg Total: 454

East Entering: 268

East Peds: 5

Peds Cross:

|        |   |   |     |     |
|--------|---|---|-----|-----|
| Heavys | 3 | 1 | 454 | 458 |
| Trucks |   |   |     |     |
| Cars   |   |   |     |     |
| Totals |   |   |     |     |



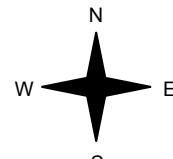
Winston Churchill Blvd

|        |   |   |     |     |
|--------|---|---|-----|-----|
| Heavys | 3 | 1 | 454 | 458 |
| Trucks |   |   |     |     |
| Cars   |   |   |     |     |
| Totals |   |   |     |     |

|        |   |   |     |    |
|--------|---|---|-----|----|
| Heavys | 1 | 2 | 32  | 35 |
| Trucks | 0 | 1 | 47  | 48 |
| Cars   | 7 | 2 | 74  | 83 |
| Totals | 8 | 5 | 153 |    |



Dover Gt



|        |     |   |    |     |
|--------|-----|---|----|-----|
| Cars   | 47  | 1 | 9  | 57  |
| Trucks | 103 | 0 | 0  | 103 |
| Heavys | 105 | 0 | 3  | 108 |
| Totals | 255 | 1 | 12 |     |

Homelands Dr



|        |     |   |    |     |
|--------|-----|---|----|-----|
| Cars   | 172 | 4 | 10 | 186 |
| Trucks |     |   |    |     |
| Heavys |     |   |    |     |
| Totals |     |   |    |     |

|                 |     |
|-----------------|-----|
| Peds Cross:     |     |
| West Peds:      | 7   |
| West Entering:  | 166 |
| West Leg Total: | 624 |

|        |      |
|--------|------|
| Cars   | 1455 |
| Trucks | 23   |
| Heavys | 41   |
| Totals | 1519 |

|        |     |      |    |      |
|--------|-----|------|----|------|
| Cars   | 232 | 990  | 82 | 1304 |
| Trucks | 0   | 17   | 2  | 19   |
| Heavys | 2   | 27   | 6  | 35   |
| Totals | 234 | 1034 | 90 |      |

|                  |      |
|------------------|------|
| Peds Cross:      |      |
| South Peds:      | 5    |
| South Entering:  | 1358 |
| South Leg Total: | 2877 |

#### Comments

## Accu-Traffic Inc.

| <b>Afternoon Peak Diagram</b>   |   | <b>Specified Period</b><br><b>From:</b> 16:00:00<br><b>To:</b> 18:00:00   | <b>One Hour Peak</b><br><b>From:</b> 16:30:00<br><b>To:</b> 17:30:00  |
|---|---|---|---|
| <b>Municipality:</b> Mississauga<br><b>Site #:</b> 1618100001<br><b>Intersection:</b> Winston Churchill Blvd & Homeland<br><b>TFR File #:</b> 1<br><b>Count date:</b> 23-Nov-16 |   | <b>Weather conditions:</b><br><br><b>Person counted:</b><br><b>Person prepared:</b><br><b>Person checked:</b>   |   |
| <b>** Signalized Intersection **</b>  |   | <b>Major Road:</b> Winston Churchill Blvd runs N/S  |   |
| North Leg Total: 2575<br>North Entering: 1033<br>North Peds: 4<br>Peds Cross:                  | Heavys 1 17 1 19<br>Trucks 0 14 2 16<br>Cars 64 847 87 998<br>Totals 65 878 90  | <br>Heavys 28<br>Trucks 8<br>Cars 1506<br>Totals 1542                                     | East Leg Total: 605<br>East Entering: 217<br>East Peds: 8<br>Peds Cross:         |
| Heavys Trucks Cars Totals<br>3 4 364 371<br><br><br>Dover Gt                                 |   <br>Winston Churchill Blvd       | <br>Cars Trucks Heavys Totals<br>50 0 0 50<br>112 0 0 112<br>54 1 0 55<br>216 1 0       | Homelands Dr<br>   |
| Heavys Trucks Cars Totals<br>2 0 151 153<br>0 0 146 146<br>3 0 168 171<br>5 0 465   |   <br>Winston Churchill Blvd | Cars Trucks Heavys Totals<br>382 5 1 388  |   |
| Peds Cross: <br>West Peds: 6<br>West Entering: 470<br>West Leg Total: 841                  | Cars 1069<br>Trucks 15<br>Heavys 20<br>Totals 1104  | <br>Cars 188 1305 149 1642<br>Trucks 4 8 3 15<br>Heavys 2 26 0 28<br>Totals 194 1339 152 | Peds Cross: <br>South Peds: 8<br>South Entering: 1685<br>South Leg Total: 2789 |
| <b>Comments</b>   |   |   |   |

## Accu-Traffic Inc.

### Morning Peak Diagram

#### Specified Period

From: 7:00:00

To: 9:00:00

#### One Hour Peak

From: 8:00:00

To: 9:00:00

**Municipality:** Mississauga

**Site #:** 1618100002

**Intersection:** Homelands Dr & Thorn Lodge Dr

**TFR File #:** 1

**Count date:** 23-Nov-16

#### Weather conditions:

#### Person counted:

#### Person prepared:

#### Person checked:

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

**Major Road:** Homelands Dr runs N/S

North Leg Total: 390

North Entering: 231

North Peds: 3

Peds Cross: 

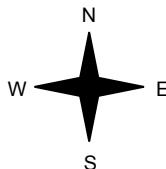
|        |     |    |     |
|--------|-----|----|-----|
| Heavys | 10  | 5  | 15  |
| Trucks | 1   | 0  | 1   |
| Cars   | 149 | 66 | 215 |
| Totals | 160 | 71 |     |

|        |     |  |  |
|--------|-----|--|--|
| Heavys | 20  |  |  |
| Trucks | 0   |  |  |
| Cars   | 139 |  |  |
| Totals | 159 |  |  |

|                 |   |  |  |
|-----------------|---|--|--|
| East Leg Total: | 410   |  |  |
| East Entering:  | 239   |  |  |
| East Peds:      | 10  |  |  |
| Peds Cross:     |  |  |  |



Homelands Dr



| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 45   | 0      | 4      | 49     |
| 187  | 0      | 3      | 190    |

Thorn Lodge Dr



Homelands Dr



| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 163  | 0      | 8      | 171    |

|        |     |  |  |
|--------|-----|--|--|
| Cars   | 336 |  |  |
| Trucks | 1   |  |  |
| Heavys | 13  |  |  |
| Totals | 350 |  |  |

|        |     |     |     |
|--------|-----|-----|-----|
| Cars   | 94  | 97  | 191 |
| Trucks | 0   | 0   | 0   |
| Heavys | 16  | 3   | 19  |
| Totals | 110 | 100 |     |

|                  |   |
|------------------|---|
| Peds Cross:      |  |
| South Peds:      | 11  |
| South Entering:  | 210   |
| South Leg Total: | 560   |

### Comments

## Accu-Traffic Inc.

### Afternoon Peak Diagram

#### Specified Period

From: 16:00:00

To: 18:00:00

#### One Hour Peak

From: 16:45:00

To: 17:45:00

**Municipality:** Mississauga

**Site #:** 1618100002

**Intersection:** Homelands Dr & Thorn Lodge Dr

**TFR File #:** 1

**Count date:** 23-Nov-16

#### Weather conditions:

#### Person counted:

#### Person prepared:

#### Person checked:

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

**Major Road:** Homelands Dr runs N/S

North Leg Total: 294

North Entering: 126

North Peds: 0

Peds Cross: 

|        |     |    |     |
|--------|-----|----|-----|
| Heavys | 3   | 0  | 3   |
| Trucks | 3   | 0  | 3   |
| Cars   | 102 | 18 | 120 |
| Totals | 108 | 18 |     |

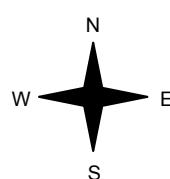
|        |     |  |  |
|--------|-----|--|--|
| Heavys | 3   |  |  |
| Trucks | 1   |  |  |
| Cars   | 164 |  |  |
| Totals | 168 |  |  |

East Leg Total: 327

East Entering: 135

East Peds: 2

Peds Cross: 



| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 26   | 0      | 0      | 26     |
| 109  | 0      | 0      | 109    |
| 135  | 0      | 0      |        |

Thorn Lodge Dr



| Cars   | Trucks | Heavys | Totals |
|--------|--------|--------|--------|
| 191    | 0      | 1      | 192    |
| Cars   | 138    | 173    | 311    |
| Trucks | 1      | 0      | 1      |
| Heavys | 3      | 1      | 4      |
| Totals | 142    | 174    |        |

Peds Cross:   
South Peds: 2  
South Entering: 316  
South Leg Total: 533

### Comments

## Accu-Traffic Inc.

### Morning Peak Diagram

#### Specified Period

From: 7:00:00

To: 10:00:00

#### One Hour Peak

From: 8:00:00

To: 9:00:00

**Municipality:** Mississauga

**Site #:** 1618100003

**Intersection:** Speakman Dr & Sheridan Park Dr

**TFR File #:** 1

**Count date:** 23-Nov-16

#### Weather conditions:

**Person counted:**

**Person prepared:**

**Person checked:**

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

**Major Road:** Speakman Dr runs N/S

North Leg Total: 570

North Entering: 366

North Peds:

Peds Cross:

Heavys 0 2 11 13

Trucks 0 0 1 1

Cars 16 137 199 352

Totals 16 139 211

Heavys 19

Trucks 0

Cars 185

Totals 204

East Leg Total: 785

East Entering: 418

East Peds:

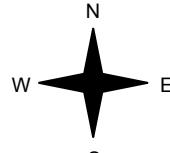
Peds Cross:

Heavys Trucks Cars Totals  
0 0 38 38



Homeland Dr

Sheridan Park Dr



Heavys Trucks Cars Totals  
0 0 1 1  
0 0 7 7  
0 0 1 1  
0 0 9



| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 130  | 0      | 19     | 149    |
| 22   | 0      | 0      | 22     |
| 246  | 1      | 0      | 247    |
| 398  | 1      | 19     |        |

Sheridan Park Dr

Cars Trucks Heavys Totals  
352 2 13 367

Peds Cross:   
West Peds: 1  
West Entering: 9  
West Leg Total: 47

Cars 384  
Trucks 1  
Heavys 2  
Totals 387

Cars 0 54 146 200  
Trucks 0 0 1 1  
Heavys 0 0 2 2  
Totals 0 54 149

Peds Cross:   
South Peds: 1  
South Entering: 203  
South Leg Total: 590

### Comments

## Accu-Traffic Inc.

### Afternoon Peak Diagram

#### Specified Period

From: 15:00:00

To: 18:00:00

#### One Hour Peak

From: 16:30:00

To: 17:30:00

**Municipality:** Mississauga

**Site #:** 1618100003

**Intersection:** Speakman Dr & Sheridan Park Dr

**TFR File #:** 1

**Count date:** 23-Nov-16

#### Weather conditions:

**Person counted:**

**Person prepared:**

**Person checked:**

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

**Major Road:** Speakman Dr runs N/S

North Leg Total: 537

North Entering: 201

North Peds:

Peds Cross:

Heavys 0 0 3 3

Trucks 0 0 1 1

Cars 1 36 160 197

Totals 1 36 164

Heavys 4

Trucks 1

Cars 331

Totals 336

East Leg Total: 639

East Entering: 232

East Peds: 0

Peds Cross:

Heavys Trucks Cars Totals

0 1 3 4



Homeland Dr

Heavys Trucks Cars Totals

0 0 20 20

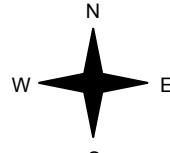
0 0 29 29

0 0 0 0

0 0 49



Sheridan Park Dr



| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 174  | 1      | 3      | 178    |
| 1    | 1      | 0      | 2      |
| 52   | 0      | 0      | 52     |

Sheridan Park Dr

| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 400  | 3      | 4      | 407    |

Peds Cross:

West Peds: 1

West Entering: 49

West Leg Total: 53

Cars 88

Trucks 0

Heavys 0

Totals 88

Cars 1 137 211 349

Trucks 0 0 2 2

Heavys 0 1 1 2

Totals 1 138 214

Peds Cross:

South Peds: 0

South Entering: 353

South Leg Total: 441

#### Comments

## Accu-Traffic Inc.

### Morning Peak Diagram

#### Specified Period

From: 7:00:00

To: 9:00:00

#### One Hour Peak

From: 8:00:00

To: 9:00:00

**Municipality:** Mississauga

**Site #:** 1618100004

**Intersection:** Sheridan Park Dr & Fifth Ln

**TFR File #:** 1

**Count date:** 23-Nov-16

#### Weather conditions:

#### Person counted:

#### Person prepared:

#### Person checked:

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

**Major Road:** Sheridan Park Dr runs W/E

North Leg Total: 422

North Entering: 271

North Peds:

Peds Cross:

|        |    |    |     |     |
|--------|----|----|-----|-----|
| Heavys | 2  | 2  | 1   | 5   |
| Trucks | 1  | 0  | 0   | 1   |
| Cars   | 83 | 75 | 107 | 265 |
| Totals | 86 | 77 | 108 |     |

Heavys 8

Trucks 0

Cars 143

Totals 151

East Leg Total: 775

East Entering: 345

East Peds:

Peds Cross:

Heavys Trucks Cars Totals

19 2 381 402



Fifth Ln

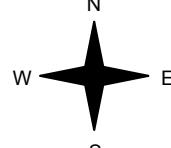
Heavys Trucks Cars Totals

0 0 27 27

12 2 285 299

1 0 39 40

13 2 351



Peds Cross:

West Peds: 9

West Entering: 366

West Leg Total: 768

|        |     |  |  |
|--------|-----|--|--|
| Cars   | 119 |  |  |
| Trucks | 1   |  |  |
| Heavys | 4   |  |  |
| Totals | 124 |  |  |

|        |    |    |    |     |
|--------|----|----|----|-----|
| Cars   | 36 | 58 | 23 | 117 |
| Trucks | 0  | 0  | 0  | 0   |
| Heavys | 5  | 3  | 0  | 8   |
| Totals | 41 | 61 | 23 |     |

Peds Cross:

South Peds: 8

South Entering: 125

South Leg Total: 249

#### Comments

## Accu-Traffic Inc.

### Afternoon Peak Diagram

#### Specified Period

From: 16:00:00

To: 18:00:00

#### One Hour Peak

From: 16:45:00

To: 17:45:00

**Municipality:** Mississauga

**Site #:** 1618100004

**Intersection:** Sheridan Park Dr & Fifth Ln

**TFR File #:** 1

**Count date:** 23-Nov-16

#### Weather conditions:

**Person counted:**

**Person prepared:**

**Person checked:**

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

**Major Road:** Sheridan Park Dr runs W/E

North Leg Total: 380

North Entering: 132

North Peds:

Peds Cross:

|        |    |    |    |     |
|--------|----|----|----|-----|
| Heavys | 0  | 0  | 0  | 0   |
| Trucks | 0  | 0  | 1  | 1   |
| Cars   | 28 | 52 | 51 | 131 |
| Totals | 28 | 52 | 52 |     |

Heavys 0

Trucks 0

Cars 248

Totals 248

East Leg Total: 668

East Entering: 293

East Peds:

Peds Cross:

Heavys Trucks Cars Totals

3 2 241 246



Fifth Ln

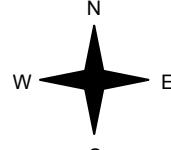
Heavys Trucks Cars Totals

0 0 58 58

4 3 302 309

0 2 36 38

4 5 396



Peds Cross:

West Peds: 6

West Entering: 405

West Leg Total: 651

|        |     |  |  |  |
|--------|-----|--|--|--|
| Cars   | 104 |  |  |  |
| Trucks | 2   |  |  |  |
| Heavys | 0   |  |  |  |
| Totals | 106 |  |  |  |

|        |    |    |    |     |
|--------|----|----|----|-----|
| Cars   | 46 | 85 | 14 | 145 |
| Trucks | 0  | 0  | 0  | 0   |
| Heavys | 0  | 0  | 0  | 0   |
| Totals | 46 | 85 | 14 |     |

|                  |     |  |  |  |
|------------------|-----|--|--|--|
| Peds Cross:      |     |  |  |  |
| South Peds:      | 9   |  |  |  |
| South Entering:  | 145 |  |  |  |
| South Leg Total: | 251 |  |  |  |

### Comments

## Accu-Traffic Inc.

### Morning Peak Diagram

#### Specified Period

From: 7:00:00

To: 9:00:00

#### One Hour Peak

From: 7:45:00

To: 8:45:00

**Municipality:** Mississauga

**Site #:** 1618100005

**Intersection:** Erin Mills Pkwy & Sheridan Park Dr

**TFR File #:** 1

**Count date:** 23-Nov-16

#### Weather conditions:

**Person counted:**

**Person prepared:**

**Person checked:**

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

**Major Road:** Erin Mills Pkwy runs N/S

North Leg Total: 4117

North Entering: 1886

North Peds:

Peds Cross:

Heavys 0 67 7 74

Trucks 0 25 1 26

Cars 192 1443 151 1786

Totals 192 1535 159

Heavys 68

Trucks 17

Cars 2146

Totals 2231

East Leg Total: 637

East Entering: 268

East Peds: 6

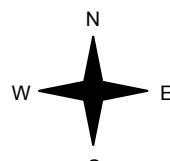
Peds Cross:

Heavys Trucks Cars Totals  
17 1 312 330



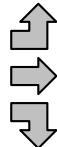
Erin Mills Pkwy

Sheridan Park Dr



| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 54   | 0      | 5      | 59     |
| 50   | 0      | 11     | 61     |
| 144  | 0      | 4      | 148    |
| 248  | 0      | 20     |        |

Heavys Trucks Cars Totals  
3 0 157 160  
4 1 113 118  
7 3 151 161  
14 4 421



Lincoln Green Way

Cars Trucks Heavys Totals  
346 5 18 369

Peds Cross:   
West Peds: 6  
West Entering: 439  
West Leg Total: 769

Cars 1738  
Trucks 28  
Heavys 78  
Totals 1844

Cars 70 1935 82 2087  
Trucks 1 17 3 21  
Heavys 6 60 7 73  
Totals 77 2012 92

Peds Cross:   
South Peds: 11  
South Entering: 2181  
South Leg Total: 4025

### Comments

## Accu-Traffic Inc.

### Afternoon Peak Diagram

#### Specified Period

From: 16:00:00

To: 18:00:00

#### One Hour Peak

From: 16:30:00

To: 17:30:00

**Municipality:** Mississauga

**Site #:** 1618100005

**Intersection:** Erin Mills Pkwy & Sheridan Park Dr

**TFR File #:** 1

**Count date:** 23-Nov-16

#### Weather conditions:

**Person counted:**

**Person prepared:**

**Person checked:**

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

**Major Road:** Erin Mills Pkwy runs N/S

North Leg Total: 4260

North Entering: 1657

North Peds:

Peds Cross:

Heavys 0 29 8 37

Trucks 0 15 1 16

Cars 73 1445 86 1604

Totals 73 1489 95

Heavys 41

Trucks 34

Cars 2528

Totals 2603

East Leg Total: 557

East Entering: 264

East Peds: 9

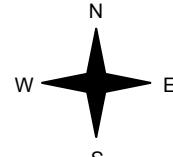
Peds Cross:

Heavys Trucks Cars Totals  
2 4 285 291



Erin Mills Pkwy

Heavys Trucks Cars Totals  
0 1 170 171  
2 0 97 99  
1 4 101 106  
3 5 368



Cars Trucks Heavys Totals  
122 2 1 125  
67 3 0 70  
68 0 1 69  
257 5 2

Lincoln Green Way



Cars Trucks Heavys Totals  
278 3 12 293

Peds Cross:   
West Peds: 9  
West Entering: 376  
West Leg Total: 667

Cars 1614  
Trucks 19  
Heavys 31  
Totals 1664

Cars 145 2236 95 2476  
Trucks 1 31 2 34  
Heavys 2 40 2 44  
Totals 148 2307 99

Peds Cross:   
South Peds: 13  
South Entering: 2554  
South Leg Total: 4218

### Comments

## Accu-Traffic Inc.

### Morning Peak Diagram

#### Specified Period

From: 7:00:00

To: 9:00:00

#### One Hour Peak

From: 8:00:00

To: 9:00:00

**Municipality:** Mississauga

**Site #:** 1618100006

**Intersection:** Speakman Dr & Flavelle Blvd\_East

**TFR File #:** 1

**Count date:** 23-Nov-16

#### Weather conditions:

**Person counted:**

**Person prepared:**

**Person checked:**

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

**Major Road:** Speakman Dr runs W/E

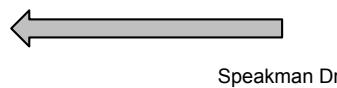
East Leg Total: 563

East Entering: 244

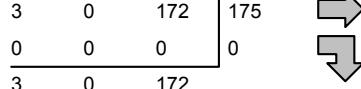
East Peds: 0

Peds Cross: X

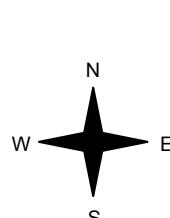
| Heavys | Trucks | Cars | Totals |
|--------|--------|------|--------|
| 4      | 1      | 357  | 362    |



| Heavys | Trucks | Cars | Totals |
|--------|--------|------|--------|
| 3      | 0      | 172  | 175    |
| 0      | 0      | 0    | 0      |
| 3      | 0      | 172  | 175    |



|                 |     |
|-----------------|-----|
| Peds Cross:     | X   |
| West Peds:      | 0   |
| West Entering:  | 175 |
| West Leg Total: | 537 |



| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 240  | 0      | 4      | 244    |
| 0    | 0      | 0      | 0      |
| 240  | 0      | 4      | 244    |



| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 315  | 0      | 4      | 319    |

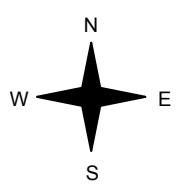
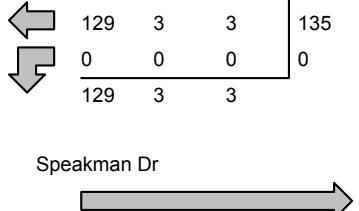
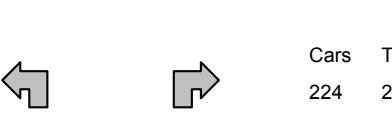
|        |   |
|--------|---|
| Cars   | 0 |
| Trucks | 0 |
| Heavys | 0 |
| Totals | 0 |

|        |     |     |     |
|--------|-----|-----|-----|
| Cars   | 117 | 143 | 260 |
| Trucks | 1   | 0   | 1   |
| Heavys | 0   | 1   | 1   |
| Totals | 118 | 144 | 262 |

|                  |     |
|------------------|-----|
| Peds Cross:      | XX  |
| South Peds:      | 0   |
| South Entering:  | 262 |
| South Leg Total: | 262 |

### Comments

## Accu-Traffic Inc.

|  |   |  |   |
|--|---|--|---|
| <b>Afternoon Peak Diagram</b>  |   | <b>Specified Period</b><br><b>From:</b> 16:00:00<br><b>To:</b> 18:00:00  | <b>One Hour Peak</b><br><b>From:</b> 16:30:00<br><b>To:</b> 17:30:00        |
| <b>Municipality:</b> Mississauga<br><b>Site #:</b> 1618100006<br><b>Intersection:</b> Speakman Dr & Flavelle Blvd_East<br><b>TFR File #:</b> 1<br><b>Count date:</b> 23-Nov-16 |   | <b>Weather conditions:</b><br><br><b>Person counted:</b><br><b>Person prepared:</b><br><b>Person checked:</b>                    |   |
| <b>** Non-Signalized Intersection **</b>   |   | <b>Major Road:</b> Speakman Dr runs W/E  |   |
|  |   | East Leg Total: 368<br>East Entering: 135<br>East Peds: 0<br>Peds Cross: X   |   |
| Heavys Trucks Cars Totals<br>3 3 143 149<br><br>Speakman Dr                                 |                        | Cars Trucks Heavys Totals<br><br>Speakman Dr | Cars Trucks Heavys Totals<br>129 3 3 135<br>0 0 0 0<br>129 3 3 135          |
| Heavys Trucks Cars Totals<br>7 2 193 202<br>0 0 0 0<br>7 2 193   | <br>Flavelle Blvd_East | <br>Flavelle Blvd_East                       | Cars Trucks Heavys Totals<br>224 2 7 233                                    |
| Peds Cross: X<br>West Peds: 0<br>West Entering: 202<br>West Leg Total: 351   | Cars 0<br>Trucks 0<br>Heavys 0<br>Totals 0  | Cars 14<br>Trucks 0<br>Heavys 0<br>Totals 14   | Cars 31<br>Trucks 0<br>Heavys 0<br>Totals 31                                |
|  |   |  | Peds Cross: X<br>South Peds: 1<br>South Entering: 45<br>South Leg Total: 45 |
| <b>Comments</b>  |   |  |   |

## Accu-Traffic Inc.

### Morning Peak Diagram

#### Specified Period

From: 7:00:00

To: 9:00:00

#### One Hour Peak

From: 8:00:00

To: 9:00:00

**Municipality:** Mississauga

**Site #:** 1618100006

**Intersection:** Speakman Dr & Flavelle Blvd\_West

**TFR File #:** 1

**Count date:** 23-Nov-16

#### Weather conditions:

**Person counted:**

**Person prepared:**

**Person checked:**

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

**Major Road:** Speakman Dr runs W/E

East Leg Total: 541

East Entering: 364

East Peds: 0

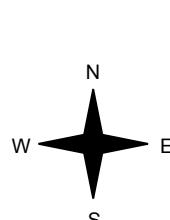
Peds Cross: X

| Heavys | Trucks | Cars | Totals |
|--------|--------|------|--------|
| 3      | 1      | 330  | 334    |

←  
Speakman Dr

| Heavys | Trucks | Cars | Totals |
|--------|--------|------|--------|
| 4      | 0      | 173  | 177    |
| 0      | 0      | 16   | 16     |
| 4      | 0      | 189  |        |

|                     |
|---------------------|
| Peds Cross: X       |
| West Peds: 0        |
| West Entering: 193  |
| West Leg Total: 527 |



| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 330  | 1      | 3      | 334    |
| 29   | 0      | 1      | 30     |
| 359  | 1      | 4      |        |

→  
Speakman Dr

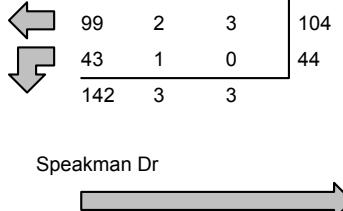
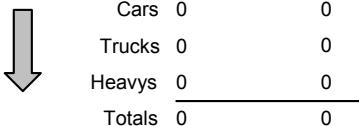
| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 173  | 0      | 4      | 177    |

| Cars | Trucks | Heavys | Totals |
|------|--------|--------|--------|
| 45   | 0      | 0      | 45     |
| 0    | 0      | 0      | 0      |
| 1    | 0      | 0      | 1      |
| 46   | 0      | 0      | 46     |

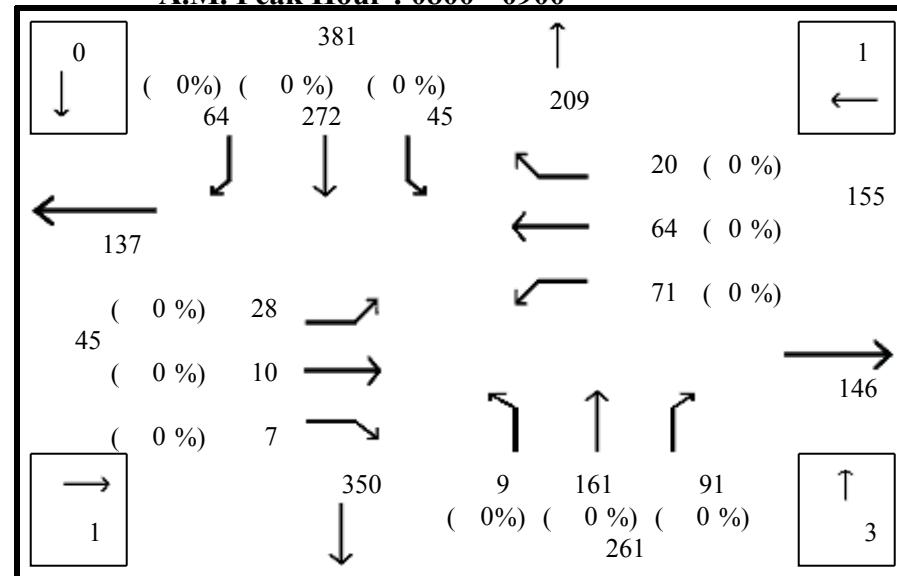
| Peds Cross:      | South Peds: |
|------------------|-------------|
| ►►               | 0           |
| South Entering:  | 0           |
| South Leg Total: | 46          |

#### Comments

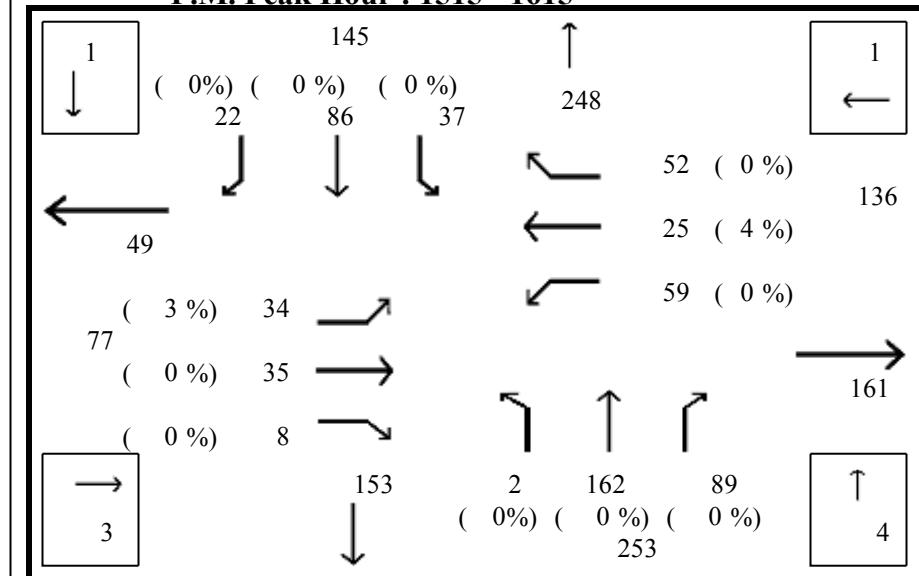
## Accu-Traffic Inc.

|  |  |  |  |
|--|--|--|--|
| <b>Afternoon Peak Diagram</b>  |  | <b>Specified Period</b><br><b>From:</b> 16:00:00<br><b>To:</b> 18:00:00  | <b>One Hour Peak</b><br><b>From:</b> 16:30:00<br><b>To:</b> 17:30:00       |
| <b>Municipality:</b> Mississauga<br><b>Site #:</b> 1618100006<br><b>Intersection:</b> Speakman Dr & Flavelle Blvd_West<br><b>TFR File #:</b> 1<br><b>Count date:</b> 23-Nov-16 |  | <b>Weather conditions:</b><br><br><b>Person counted:</b><br><b>Person prepared:</b><br><b>Person checked:</b>                    |  |
| <b>** Non-Signalized Intersection **</b>   |  | <b>Major Road:</b> Speakman Dr runs W/E  |  |
|  |  |  | East Leg Total: 352<br>East Entering: 148<br>East Peds: 0<br>Peds Cross: X |
|  |  |  |  |
| Heavys Trucks Cars Totals<br>3 2 99 104<br><br>Speakman Dr                                  |  | Cars Trucks Heavys Totals<br><br>Speakman Dr |  |
| Heavys Trucks Cars Totals<br>8 1 195 204<br>0 0 163 163<br>8 1 358   |  | <br>Flavelle Blvd_West                        |  |
| Peds Cross: X<br>West Peds: 0<br>West Entering: 367<br>West Leg Total: 471   |  | <br>Flavelle Blvd_West                       |  |
| Cars 206<br>Trucks 1<br>Heavys 0<br>Totals 207   |  | Cars 0 0 0<br>Trucks 0 0 0<br>Heavys 0 0 0<br>Totals 0 0 0   |  |
|  |  | Peds Cross: ►◄<br>South Peds: 3<br>South Entering: 0<br>South Leg Total: 207   |  |
| <b>Comments</b>  |  |  |  |

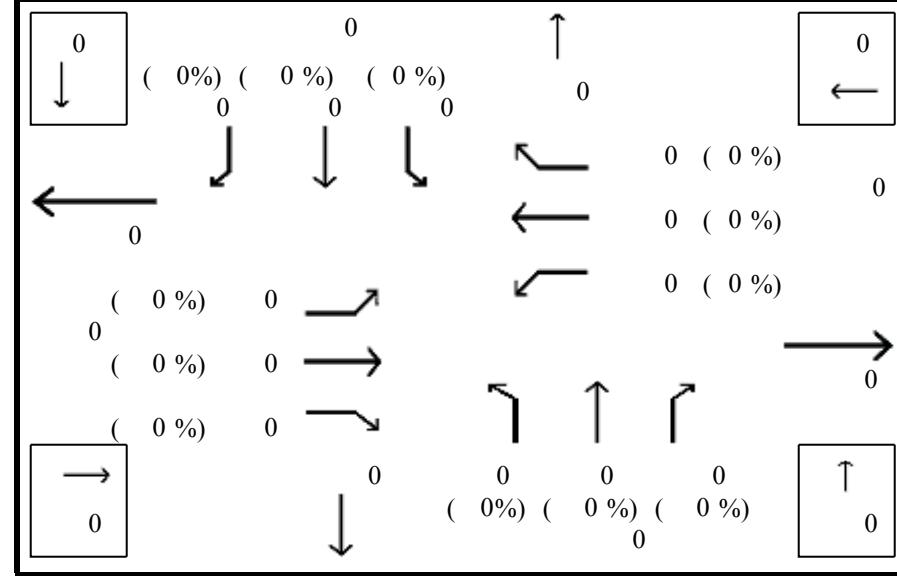
### A.M. Peak Hour : 0800 - 0900



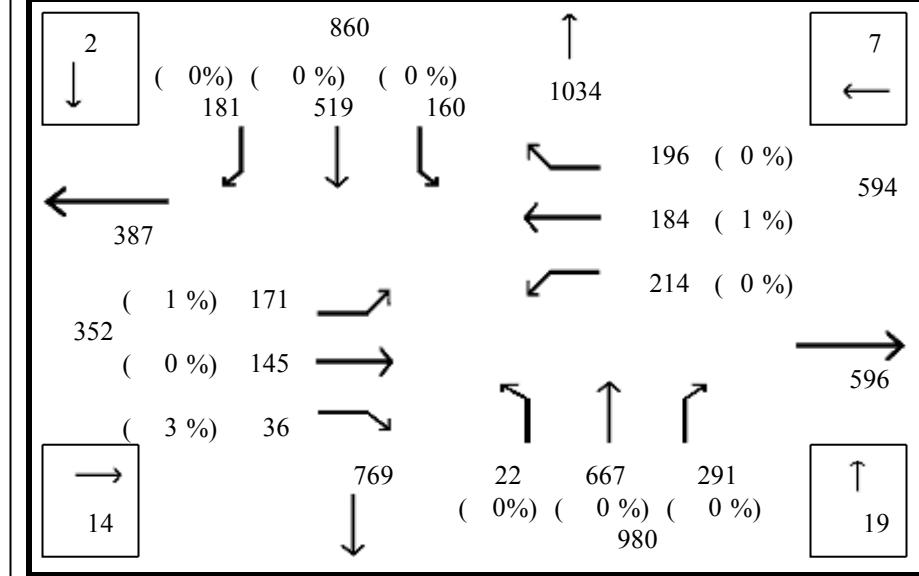
### P.M. Peak Hour : 1515 - 1615



### Average Offpeak Hour



### Total Hours Counts

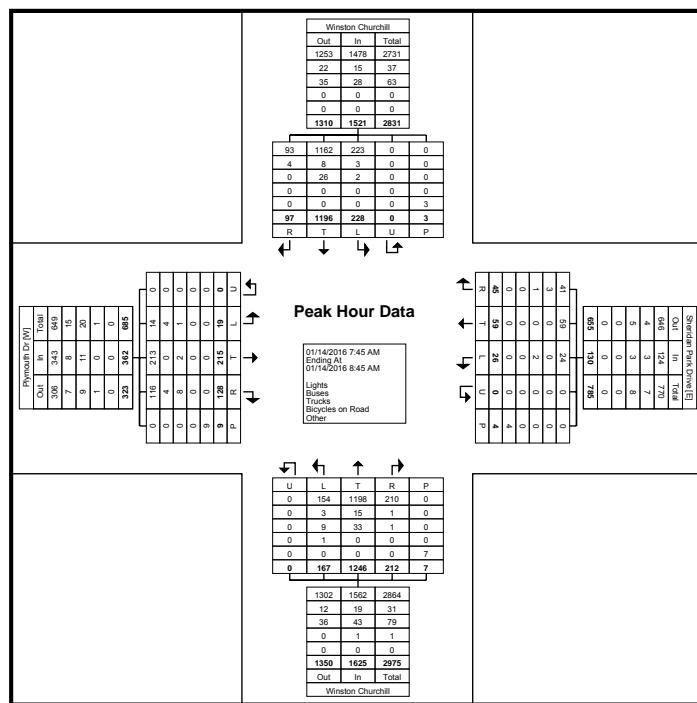


Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Region of Peel  
 10 Peel Centre Drive  
 Suite B - 4th Floor  
 Brampton, Ontario, Canada L6T 4B9  
 (905) 791-7800 Josh.DiRocco@peelregion.ca

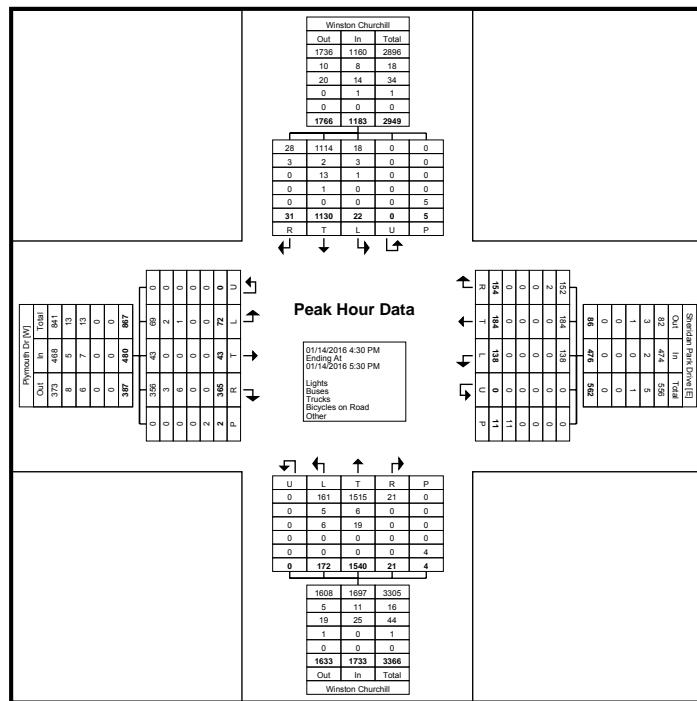
Count Name: Winston Churchill Boulevard at  
 Sheridan Park Drive/Plymouth Drive  
 Site Code: 01905013  
 Start Date: 01/14/2016  
 Page No: 5



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

Region of Peel  
 10 Peel Centre Drive  
 Suite B - 4th Floor  
 Brampton, Ontario, Canada L6T 4B9  
 (905) 791-7800 Josh.DiRocco@peelregion.ca

Count Name: Winston Churchill Boulevard at  
 Sheridan Park Drive/Plymouth Drive  
 Site Code: 01905013  
 Start Date: 01/14/2016  
 Page No: 11



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

07:47 USER 2/4 PRINT DAILY INT REP, INT 52 66 652, AS 1-3

DAILY INTERSECTION REPORT FOR ACT SCH 1 ( MON TUE WED THU FRI )

| INT | TIME  | SELECTION PLANS IN USE |            |            |             |              |             | ALTERNATES |            |            |             |              |             |
|-----|-------|------------------------|------------|------------|-------------|--------------|-------------|------------|------------|------------|-------------|--------------|-------------|
|     |       | MODE                   | CYC<br>LEN | OFF<br>NO. | SPLT<br>NO. | SPEC<br>FUNC | DUP<br>ISEC | MODE       | CYC<br>LEN | OFF<br>NO. | SPLT<br>NO. | SPEC<br>FUNC | DUP<br>ISEC |
| 52  | 00:00 | /                      | /          | /          | /           | /            | LO          | 101        | 2          | 2          | 2           |              |             |
| 52  | 06:00 | 1/1                    | /          | /          | /           | 1/1          | CC          | 140        | 1          | 1          | 1           | 1099         |             |
| 52  | 09:30 | 1/1                    | /          | /          | /           | 1/1          | CC          | 135        | 2          | 2          | 2           | 1099         |             |
| 52  | 15:00 | 1/1                    | /          | /          | /           | 1/1          | CC          | 140        | 3          | 3          | 3           | 1099         |             |
| 52  | 19:30 | 1/1                    | /          | /          | /           | 1/1          | CC          | 135        | 2          | 2          | 2           | 1099         |             |
| 66  | 00:00 | /                      | /          | /          | /           | /            | LO          | 101        | 2          | 2          | 2           |              |             |
| 66  | 06:00 | 1/1                    | /          | /          | /           | 1/1          | CC          | 140        | 1          | 1          | 1           | 1137         |             |
| 66  | 09:30 | 1/1                    | /          | /          | /           | 1/1          | CC          | 120        | 2          | 2          | 2           | 1137         |             |
| 66  | 15:00 | 1/1                    | /          | /          | /           | 1/1          | CC          | 140        | 3          | 3          | 3           | 1137         |             |
| 66  | 19:30 | 1/1                    | /          | /          | /           | 1/1          | CC          | 120        | 2          | 2          | 2           | 1137         |             |
| 652 | 00:00 | /                      | /          | /          | /           | /            | LO          | 101        | 2          | 2          | 2           |              |             |
| 652 | 06:00 | 1/1                    | /          | /          | /           | 1/1          | CC          | 140        | 1          | 1          | 1           | 1137         |             |
| 652 | 09:30 | 1/1                    | /          | /          | /           | 1/1          | CC          | 120        | 2          | 2          | 2           | 1137         |             |
| 652 | 15:00 | 1/1                    | /          | /          | /           | 1/1          | CC          | 140        | 3          | 3          | 3           | 1137         |             |
| 652 | 19:30 | 1/1                    | /          | /          | /           | 1/1          | CC          | 120        | 2          | 2          | 2           | 1137         |             |

DAILY INTERSECTION REPORT FOR ACT SCH 2 ( SAT )

|     |       |     |   |   |   |     |    |     |   |   |   |      |
|-----|-------|-----|---|---|---|-----|----|-----|---|---|---|------|
| 52  | 00:00 | /   | / | / | / | /   | LO | 101 | 2 | 2 | 2 |      |
| 52  | 07:00 | 1/1 | / | / | / | 1/1 | CC | 135 | 2 | 2 | 2 | 1099 |
| 66  | 00:00 | /   | / | / | / | /   | LO | 101 | 2 | 2 | 2 |      |
| 66  | 07:00 | 1/1 | / | / | / | 1/1 | CC | 100 | 4 | 4 | 4 |      |
| 652 | 00:00 | /   | / | / | / | /   | LO | 101 | 2 | 2 | 2 |      |
| 652 | 07:00 | 1/1 | / | / | / | 1/1 | CC | 120 | 2 | 2 | 2 | 1137 |

DAILY INTERSECTION REPORT FOR ACT SCH 3 ( SUN HOL )

|     |       |     |   |   |   |     |    |     |   |   |   |      |
|-----|-------|-----|---|---|---|-----|----|-----|---|---|---|------|
| 52  | 00:00 | /   | / | / | / | /   | LO | 101 | 2 | 2 | 2 |      |
| 52  | 08:00 | 1/1 | / | / | / | 1/1 | CC | 135 | 2 | 2 | 2 | 1099 |
| 52  | 23:00 | /   | / | / | / | /   | LO | 101 | 2 | 2 | 2 | 1099 |
| 66  | 00:00 | /   | / | / | / | /   | LO | 101 | 2 | 2 | 2 |      |
| 66  | 08:00 | 1/1 | / | / | / | 1/1 | CC | 100 | 4 | 4 | 4 |      |
| 66  | 23:00 | /   | / | / | / | /   | LO | 101 | 2 | 2 | 2 |      |
| 652 | 00:00 | /   | / | / | / | /   | LO | 101 | 2 | 2 | 2 |      |
| 652 | 08:00 | 1/1 | / | / | / | 1/1 | CC | 120 | 2 | 2 | 2 | 1137 |
| 652 | 23:00 | /   | / | / | / | /   | LO | 101 | 2 | 2 | 2 | 1137 |

07:49 USER 2/4 PRINT CDT 52 66 652

CYCLE DEFINITION TABLE: 52

| PHASE | DIR | VEH<br>MIN | PED<br>MIN | PED<br>CLEAR | AMBER | ALL<br>RED | COMM<br>DELAY | SPECIAL<br>FEATURE | STREET<br>NAME  |
|-------|-----|------------|------------|--------------|-------|------------|---------------|--------------------|-----------------|
| 1     | NBL | 5          |            |              | 3     |            | 1             |                    | ERIN MILLS PKWY |
| 2     | SB  |            | 12         | 19           | 5     | 2          | 1             | C                  | ERIN MILLS PKWY |
| 3     |     |            |            |              |       |            | 1             |                    |                 |
| 4     | WB  |            | 12         | 19           | 4     | 3          | 1             |                    | LINCOLN GREEN   |
| 5     | SBL | 5          |            |              | 3     |            | 1             |                    | ERIN MILLS PKWY |
| 6     | NB  |            | 12         | 19           | 5     | 2          | 1             | C                  | ERIN MILLS PKWY |
| 7     |     |            |            |              |       |            | 1             |                    |                 |
| 8     | EB  |            | 12         | 19           | 4     | 3          | 1             |                    | SHERIDAN PARK   |

VALID SPECIAL FUNCTIONS(Y/N)

|   |   |   |     |     |     |     |
|---|---|---|-----|-----|-----|-----|
| 1 | 2 | 3 | 1&2 | 1&3 | 2&3 | ALL |
| Y | Y | Y | Y   | Y   | Y   | Y   |

CYCLE DEFINITION TABLE: 66

| PHASE | DIR | VEH<br>MIN | PED<br>MIN | PED<br>CLEAR | AMBER | ALL<br>RED | COMM<br>DELAY | SPECIAL<br>FEATURE | STREET<br>NAME  |
|-------|-----|------------|------------|--------------|-------|------------|---------------|--------------------|-----------------|
| 1     | NBL | 5          |            |              | 3     |            | 1             |                    | WIN CHURCHILL B |
| 2     | SB  |            | 7          | 12           | 4     | 2          | 1             | C                  | WIN CHURCHILL B |
| 3     |     |            |            |              |       |            | 1             |                    |                 |
| 4     | WB  | 8          | 11         | 17           | 4     | 3          | 1             |                    | HOMELANDS DRIVE |
| 5     | SBL | 5          |            |              | 3     |            | 1             |                    | WIN CHURCHILL B |
| 6     | NB  |            | 7          | 12           | 4     | 2          | 1             | C                  | WIN CHURCHILL B |
| 7     |     |            |            |              |       |            | 1             |                    |                 |
| 8     | EB  | 8          | 11         | 17           | 4     | 3          | 1             |                    | HOMELANDS DRIVE |

VALID SPECIAL FUNCTIONS(Y/N)

|   |   |   |     |     |     |     |
|---|---|---|-----|-----|-----|-----|
| 1 | 2 | 3 | 1&2 | 1&3 | 2&3 | ALL |
| Y | Y | Y | Y   | Y   | Y   | Y   |

CYCLE DEFINITION TABLE: 652

| PHASE | DIR | VEH<br>MIN | PED<br>MIN | PED<br>CLEAR | AMBER | ALL<br>RED | COMM<br>DELAY | SPECIAL<br>FEATURE | STREET<br>NAME |
|-------|-----|------------|------------|--------------|-------|------------|---------------|--------------------|----------------|
| 1     |     |            |            |              |       |            | 1             |                    |                |
| 2     | SB  |            | 12         | 18           | 4     | 2          | 1             | C                  | WCB            |
| 3     |     |            |            |              |       |            | 1             |                    |                |
| 4     | WB  | 8          | 13         | 21           | 4     | 3          | 1             | E                  | SHERIDAN PARK  |
| 5     | SBL | 5          |            |              | 3     |            | 1             |                    | WCB            |
| 6     | NB  |            | 12         | 18           | 4     | 2          | 1             | C                  | WCB            |
| 7     | WBL | 5          |            |              | 3     |            | 1             |                    | SHERIDAN PARK  |
| 8     | EB  | 8          | 13         | 21           | 4     | 3          | 1             | E                  | SHERIDAN PARK  |

VALID SPECIAL FUNCTIONS(Y/N)

|   |   |   |     |     |     |     |
|---|---|---|-----|-----|-----|-----|
| 1 | 2 | 3 | 1&2 | 1&3 | 2&3 | ALL |
| Y | Y | Y | Y   | Y   | Y   | Y   |

07:50 USER 2/4 PRINT SPF 1-4, INT 52 66 652

SPECIAL FUNCTIONS

INTERSECTION 52 EMP@LINCOLN/SHERIDAN

SPECIAL IN(Y)/OUT(N)

FUNCTION # 1 2 3

NBL SBL CAL PHASE OMIT

|   |   |   |   |
|---|---|---|---|
| 1 | Y | N | N |
| 2 | N | N | N |
| 3 | N | N | N |
| 4 | N | N | N |

INTERSECTION 66 WCHURCH @ HOMELANDS

NBL SBL CAL PHASE OMIT

|   |   |   |   |
|---|---|---|---|
| 1 | N | Y | N |
| 2 | Y | Y | N |
| 3 | N | N | N |
| 4 | Y | N | N |

INTERSECTION 652 WCB @ SHER PARK/PLYM

SBL WBL CAL PHASE OMIT

|   |   |   |   |
|---|---|---|---|
| 1 | N | Y | N |
| 2 | Y | Y | N |
| 3 | N | N | N |
| 4 | N | N | N |

07:51 USER 2/4 PRINT OFFSET 1-4, INT 52 66 652

OFFSET TABLE

| INTERSECTION | 52       | EMP@LINCOLN/SHERIDAN |
|--------------|----------|----------------------|
| OFFSET #     | OFFSET % |                      |
| 1            | 99       |                      |
| 2            | 85       |                      |
| 3            | 63       |                      |
| 4            | 0        |                      |

| INTERSECTION | 66 | WCHURCH @ HOMELANDS |
|--------------|----|---------------------|
|              |    |                     |
| 1            | 66 |                     |
| 2            | 36 |                     |
| 3            | 77 |                     |
| 4            | 57 |                     |

| INTERSECTION | 652 | WCB @ SHER PARK/PLYM |
|--------------|-----|----------------------|
|              |     |                      |
| 1            | 79  |                      |
| 2            | 33  |                      |
| 3            | 64  |                      |
| 4            | 0   |                      |

07:51 USER 2/4 PRINT SPLIT 1-4, INT 52 66 652

SPLIT TABLE

| INTERSECTION |                 | EMP@LINCOLN/SHERIDAN |           |             |    |    |   |       |        |    |   |   |
|--------------|-----------------|----------------------|-----------|-------------|----|----|---|-------|--------|----|---|---|
| TABLE        | (SPLIT)         | PHASE                | NUMBER    | (MAX SPLIT) |    |    |   | PHASE | NUMBER |    |   |   |
| NO.          | 1 2 3 4 5 6 7 8 | NBL SB               | WB SBL NB | EB          | 1  | 2  | 3 | 4     | 5      | 6  | 7 | 8 |
| 1            | 0 69            |                      | 31 14 55  |             | 31 | 0  | 0 |       | 0      | 22 | 0 | 0 |
| 2            | 12 53           |                      | 35 15 50  |             | 35 | 15 | 0 |       | 0      | 19 | 0 | 0 |
| 3            | 13 53           |                      | 34 11 55  |             | 34 | 21 | 0 |       | 0      | 18 | 0 | 0 |
| 4            | 0 0             |                      | 0 0 0     |             | 0  | 0  | 0 |       | 0      | 0  | 0 | 0 |
| INTERSECTION |                 | WCHURCH @ HOMELANDS  |           |             |    |    |   |       |        |    |   |   |
|              | NBL SB          | WB                   | SBL NB    | EB          |    |    |   |       |        |    |   |   |
| 1            | 8 64            |                      | 28 0 72   |             | 28 | 0  | 0 |       | 0      | 0  | 0 | 0 |
| 2            | 0 67            |                      | 33 0 67   |             | 33 | 0  | 0 |       | 0      | 0  | 0 | 0 |
| 3            | 8 64            |                      | 28 11 61  |             | 28 | 0  | 0 |       | 0      | 0  | 0 | 0 |
| 4            | 0 67            |                      | 33 12 55  |             | 33 | 0  | 0 |       | 0      | 0  | 0 | 0 |
| INTERSECTION |                 | WCB @ SHER PARK/PLYM |           |             |    |    |   |       |        |    |   |   |
|              | SB              | WB                   | SBL NB    | WBL EB      |    |    |   |       |        |    |   |   |
| 1            | 77              |                      | 23 10 67  | 0 23        |    | 0  |   | 0     | 0      | 0  | 0 | 0 |
| 2            | 77              |                      | 23 0 77   | 0 23        |    | 0  |   | 0     | 0      | 0  | 0 | 0 |
| 3            | 63              |                      | 37 9 54   | 13 24       |    | 0  |   | 0     | 13     | 0  | 0 | 0 |
| 4            | 0               |                      | 0 0 0     | 0 0         |    | 0  |   | 0     | 0      | 0  | 0 | 0 |



---

## Appendix B

### Existing Traffic Operations

## Timings

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↓     | ↑     | ↓     | ↑     | ↑↓    | ↑     | ↑↓    | ↑     |
| Traffic Volume (vph) | 35    | 48    | 108   | 103   | 234   | 1034  | 48    | 1328  | 121   |
| Future Volume (vph)  | 35    | 48    | 108   | 103   | 234   | 1034  | 48    | 1328  | 121   |
| Turn Type            | Perm  | NA    | Perm  | NA    | pm+pt | NA    | Perm  | NA    | Perm  |
| Protected Phases     |       |       |       | 4     | 8     | 5     | 2     | 6     |       |
| Permitted Phases     | 4     |       |       |       | 2     |       | 6     |       | 6     |
| Detector Phase       | 4     | 4     | 8     | 8     | 5     | 2     | 6     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 35.0  | 35.0  | 35.0  | 35.0  | 9.5   | 25.0  | 25.0  | 25.0  | 25.0  |
| Total Split (s)      | 39.0  | 39.0  | 39.0  | 39.0  | 11.0  | 101.0 | 90.0  | 90.0  | 90.0  |
| Total Split (%)      | 27.9% | 27.9% | 27.9% | 27.9% | 7.9%  | 72.1% | 64.3% | 64.3% | 64.3% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 4.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 6.0   | 6.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       | Lead  |       | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?   |       |       |       |       | Yes   |       | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | C-Max | C-Max | C-Max |
| Act Effect Green (s) | 20.0  | 20.0  | 20.0  | 20.0  | 110.0 | 107.0 | 84.2  | 84.2  | 84.2  |
| Actuated g/C Ratio   | 0.14  | 0.14  | 0.14  | 0.14  | 0.79  | 0.76  | 0.60  | 0.60  | 0.60  |
| v/c Ratio            | 0.35  | 0.52  | 0.83  | 0.69  | 0.70  | 0.47  | 0.23  | 0.70  | 0.14  |
| Control Delay        | 60.0  | 38.3  | 96.9  | 63.7  | 46.3  | 6.0   | 16.1  | 21.5  | 5.7   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 60.0  | 38.3  | 96.9  | 63.7  | 46.3  | 6.0   | 16.1  | 21.5  | 5.7   |
| LOS                  | E     | D     | F     | E     | D     | A     | B     | C     | A     |
| Approach Delay       |       | 42.9  |       |       | 77.1  |       | 12.9  |       | 20.0  |
| Approach LOS         |       | D     |       |       | E     |       | B     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 22.9

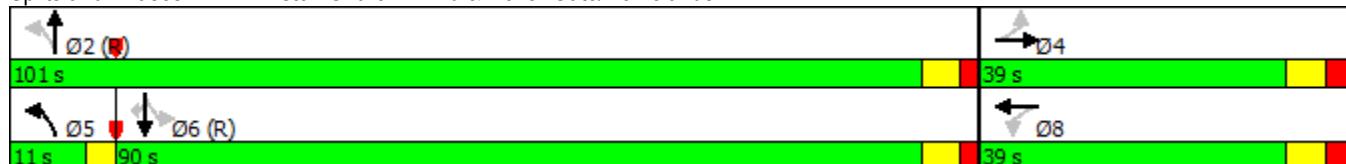
Intersection LOS: C

Intersection Capacity Utilization 86.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr



HCM Signalized Intersection Capacity Analysis  
1: Winston Churchill Blvd & Dover Gate/Homelands Dr

12/04/2017

| Movement                          | EBL  | EBT   | EBR   | WBL                       | WBT  | WBR   | NBL   | NBT   | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|-------|---------------------------|------|-------|-------|-------|------|------|------|------|
| Lane Configurations               | ↑    | ↑     |       | ↑                         | ↑    |       | ↑     | ↑↑    |      | ↑    | ↑↑   | ↑    |
| Traffic Volume (vph)              | 35   | 48    | 83    | 108                       | 103  | 57    | 234   | 1034  | 90   | 48   | 1328 | 121  |
| Future Volume (vph)               | 35   | 48    | 83    | 108                       | 103  | 57    | 234   | 1034  | 90   | 48   | 1328 | 121  |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900  | 1900                      | 1900 | 1900  | 1900  | 1900  | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s)               | 7.0  | 7.0   |       | 7.0                       | 7.0  |       | 3.0   | 6.0   |      | 6.0  | 6.0  | 6.0  |
| Lane Util. Factor                 | 1.00 | 1.00  |       | 1.00                      | 1.00 |       | 1.00  | 0.95  |      | 1.00 | 0.95 | 1.00 |
| Frpb, ped/bikes                   | 1.00 | 0.99  |       | 1.00                      | 0.99 |       | 1.00  | 1.00  |      | 1.00 | 1.00 | 0.95 |
| Flpb, ped/bikes                   | 1.00 | 1.00  |       | 0.99                      | 1.00 |       | 1.00  | 1.00  |      | 1.00 | 1.00 | 1.00 |
| Fr <sub>t</sub>                   | 1.00 | 0.90  |       | 1.00                      | 0.95 |       | 1.00  | 0.99  |      | 1.00 | 1.00 | 0.85 |
| Flt Protected                     | 0.95 | 1.00  |       | 0.95                      | 1.00 |       | 0.95  | 1.00  |      | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot)                 | 1669 | 1594  |       | 1762                      | 1699 |       | 1807  | 3444  |      | 1654 | 3510 | 1528 |
| Flt Permitted                     | 0.45 | 1.00  |       | 0.55                      | 1.00 |       | 0.10  | 1.00  |      | 0.22 | 1.00 | 1.00 |
| Satd. Flow (perm)                 | 789  | 1594  |       | 1016                      | 1699 |       | 185   | 3444  |      | 389  | 3510 | 1528 |
| Peak-hour factor, PHF             | 0.90 | 0.90  | 0.90  | 0.90                      | 0.90 | 0.90  | 0.90  | 0.90  | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph)                   | 39   | 53    | 92    | 120                       | 114  | 63    | 260   | 1149  | 100  | 53   | 1476 | 134  |
| RTOR Reduction (vph)              | 0    | 50    | 0     | 0                         | 15   | 0     | 0     | 3     | 0    | 0    | 0    | 31   |
| Lane Group Flow (vph)             | 39   | 95    | 0     | 120                       | 162  | 0     | 260   | 1246  | 0    | 53   | 1476 | 103  |
| Confl. Peds. (#/hr)               | 3    |       | 5     | 5                         |      | 3     | 7     |       | 5    | 5    |      | 7    |
| Heavy Vehicles (%)                | 9%   | 2%    | 11%   | 3%                        | 0%   | 18%   | 1%    | 4%    | 9%   | 10%  | 4%   | 2%   |
| Turn Type                         | Perm | NA    |       | Perm                      | NA   |       | pm+pt | NA    |      | Perm | NA   | Perm |
| Protected Phases                  |      | 4     |       |                           | 8    |       | 5     | 2     |      |      | 6    |      |
| Permitted Phases                  | 4    |       |       | 8                         |      |       | 2     |       |      | 6    |      | 6    |
| Actuated Green, G (s)             | 20.0 | 20.0  |       | 20.0                      | 20.0 |       | 107.0 | 107.0 |      | 84.2 | 84.2 | 84.2 |
| Effective Green, g (s)            | 20.0 | 20.0  |       | 20.0                      | 20.0 |       | 107.0 | 107.0 |      | 84.2 | 84.2 | 84.2 |
| Actuated g/C Ratio                | 0.14 | 0.14  |       | 0.14                      | 0.14 |       | 0.76  | 0.76  |      | 0.60 | 0.60 | 0.60 |
| Clearance Time (s)                | 7.0  | 7.0   |       | 7.0                       | 7.0  |       | 3.0   | 6.0   |      | 6.0  | 6.0  | 6.0  |
| Vehicle Extension (s)             | 3.0  | 3.0   |       | 3.0                       | 3.0  |       | 3.0   | 3.0   |      | 3.0  | 3.0  | 3.0  |
| Lane Grp Cap (vph)                | 112  | 227   |       | 145                       | 242  |       | 370   | 2632  |      | 233  | 2111 | 918  |
| v/s Ratio Prot                    |      | 0.06  |       |                           | 0.10 |       | c0.10 | 0.36  |      |      | 0.42 |      |
| v/s Ratio Perm                    | 0.05 |       | c0.12 |                           |      | c0.44 |       |       | 0.14 |      | 0.07 |      |
| v/c Ratio                         | 0.35 | 0.42  |       | 0.83                      | 0.67 |       | 0.70  | 0.47  |      | 0.23 | 0.70 | 0.11 |
| Uniform Delay, d1                 | 54.1 | 54.7  |       | 58.3                      | 56.9 |       | 28.3  | 6.1   |      | 12.9 | 19.2 | 11.9 |
| Progression Factor                | 1.00 | 1.00  |       | 1.00                      | 1.00 |       | 2.00  | 0.82  |      | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2             | 1.9  | 1.3   |       | 30.5                      | 6.8  |       | 4.5   | 0.5   |      | 2.3  | 2.0  | 0.2  |
| Delay (s)                         | 56.0 | 56.0  |       | 88.8                      | 63.7 |       | 61.2  | 5.4   |      | 15.1 | 21.1 | 12.2 |
| Level of Service                  | E    | E     |       | F                         | E    |       | E     | A     |      | B    | C    | B    |
| Approach Delay (s)                |      | 56.0  |       |                           | 73.8 |       |       | 15.0  |      |      | 20.2 |      |
| Approach LOS                      |      | E     |       |                           | E    |       |       | B     |      |      | C    |      |
| Intersection Summary              |      |       |       |                           |      |       |       |       |      |      |      |      |
| HCM 2000 Control Delay            |      | 24.2  |       | HCM 2000 Level of Service |      |       |       | C     |      |      |      |      |
| HCM 2000 Volume to Capacity ratio |      | 0.74  |       |                           |      |       |       |       |      |      |      |      |
| Actuated Cycle Length (s)         |      | 140.0 |       | Sum of lost time (s)      |      |       |       | 16.0  |      |      |      |      |
| Intersection Capacity Utilization |      | 86.0% |       | ICU Level of Service      |      |       |       | E     |      |      |      |      |
| Analysis Period (min)             |      | 15    |       |                           |      |       |       |       |      |      |      |      |
| c Critical Lane Group             |      |       |       |                           |      |       |       |       |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

2: Homelands Dr & Thorn Lodge Dr

12/04/2017

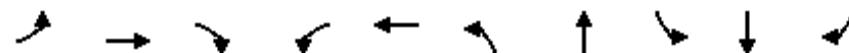


| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      |       |      |                      |      |      |
| Sign Control                      | Stop |       | Stop |                      |      | Stop |
| Traffic Volume (vph)              | 190  | 49    | 110  | 100                  | 71   | 160  |
| Future Volume (vph)               | 190  | 49    | 110  | 100                  | 71   | 160  |
| Peak Hour Factor                  | 0.78 | 0.78  | 0.78 | 0.78                 | 0.78 | 0.78 |
| Hourly flow rate (vph)            | 244  | 63    | 141  | 128                  | 91   | 205  |
| Direction, Lane #                 | WB 1 | NB 1  | SB 1 |                      |      |      |
| Volume Total (vph)                | 307  | 269   | 296  |                      |      |      |
| Volume Left (vph)                 | 244  | 0     | 91   |                      |      |      |
| Volume Right (vph)                | 63   | 128   | 0    |                      |      |      |
| Hadj (s)                          | 0.09 | -0.13 | 0.18 |                      |      |      |
| Departure Headway (s)             | 5.5  | 5.1   | 5.4  |                      |      |      |
| Degree Utilization, x             | 0.47 | 0.38  | 0.44 |                      |      |      |
| Capacity (veh/h)                  | 619  | 665   | 636  |                      |      |      |
| Control Delay (s)                 | 13.1 | 11.3  | 12.6 |                      |      |      |
| Approach Delay (s)                | 13.1 | 11.3  | 12.6 |                      |      |      |
| Approach LOS                      | B    | B     | B    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Delay                             |      |       | 12.4 |                      |      |      |
| Level of Service                  |      |       | B    |                      |      |      |
| Intersection Capacity Utilization |      | 48.6% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |       | 15   |                      |      |      |

## Timings

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↗ ↗   | ↖ ↗   | ↖ ↗   | ↖ ↗   | ↑ ↗   | ↖ ↗   | ↑ ↗   | ↖ ↗   |
| Traffic Volume (vph) | 19    | 215   | 128   | 26    | 59    | 167   | 1246  | 228   | 1196  | 97    |
| Future Volume (vph)  | 19    | 215   | 128   | 26    | 59    | 167   | 1246  | 228   | 1196  | 97    |
| Turn Type            | Perm  | NA    | Perm  | Perm  | NA    | Perm  | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 8     |       | 2     | 1     | 6     |       |
| Permitted Phases     | 4     |       |       | 4     | 8     |       | 2     |       | 6     |       |
| Detector Phase       | 4     | 4     | 4     | 8     | 8     | 2     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 36.0  | 36.0  | 9.5   | 36.0  | 36.0  |
| Total Split (s)      | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 85.0  | 85.0  | 14.0  | 99.0  | 99.0  |
| Total Split (%)      | 29.3% | 29.3% | 29.3% | 29.3% | 29.3% | 60.7% | 60.7% | 10.0% | 70.7% | 70.7% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 6.0   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       |       | Lag   | Lag   | Lead  |       |       |
| Lead-Lag Optimize?   |       |       |       |       |       | Yes   | Yes   | Yes   |       |       |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 22.1  | 22.1  | 22.1  | 22.1  | 22.1  | 82.2  | 82.2  | 107.9 | 104.9 | 104.9 |
| Actuated g/C Ratio   | 0.16  | 0.16  | 0.16  | 0.16  | 0.16  | 0.59  | 0.59  | 0.77  | 0.75  | 0.75  |
| v/c Ratio            | 0.10  | 0.75  | 0.44  | 0.29  | 0.36  | 0.74  | 0.75  | 0.69  | 0.47  | 0.08  |
| Control Delay        | 48.8  | 71.6  | 24.0  | 57.7  | 41.8  | 44.3  | 24.6  | 45.2  | 6.5   | 1.2   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 48.8  | 71.6  | 24.0  | 57.7  | 41.8  | 44.3  | 24.6  | 45.2  | 6.5   | 1.2   |
| LOS                  | D     | E     | C     | E     | D     | D     | C     | D     | A     | A     |
| Approach Delay       |       | 53.5  |       |       |       | 44.9  |       | 26.6  |       | 12.0  |
| Approach LOS         |       | D     |       |       |       | D     |       | C     |       | B     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 23.8

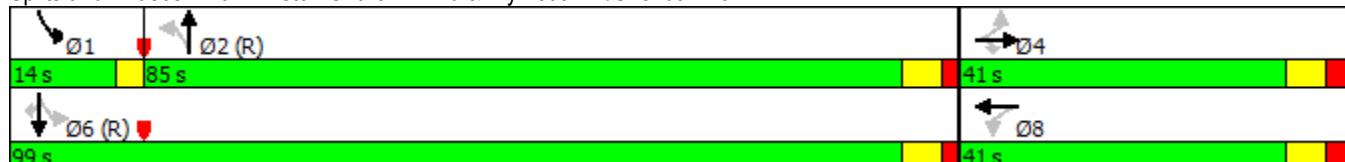
Intersection LOS: C

Intersection Capacity Utilization 90.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr



HCM Signalized Intersection Capacity Analysis  
3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr

12/04/2017

| Movement                          | EBL  | EBT   | EBC  | WBL  | WBT  | WBR  | NBL  | NBT   | NBR  | SBL   | SBT   | SBR   |
|-----------------------------------|------|-------|------|------|------|------|------|-------|------|-------|-------|-------|
| Lane Configurations               | ↑    | ↑     | ↑    | ↑    | ↑    | ↑    | ↑    | ↑     | ↑    | ↑     | ↑     | ↑     |
| Traffic Volume (vph)              | 19   | 215   | 128  | 26   | 59   | 45   | 167  | 1246  | 212  | 228   | 1196  | 97    |
| Future Volume (vph)               | 19   | 215   | 128  | 26   | 59   | 45   | 167  | 1246  | 212  | 228   | 1196  | 97    |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 | 1900  | 1900 | 1900  | 1900  | 1900  |
| Total Lost time (s)               | 7.0  | 7.0   | 7.0  | 7.0  | 7.0  |      | 6.0  | 6.0   |      | 3.0   | 6.0   | 6.0   |
| Lane Util. Factor                 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 |      | 1.00 | 0.95  |      | 1.00  | 0.95  | 1.00  |
| Frpb, ped/bikes                   | 1.00 | 1.00  | 0.98 | 1.00 | 0.99 |      | 1.00 | 0.99  |      | 1.00  | 1.00  | 0.97  |
| Flpb, ped/bikes                   | 1.00 | 1.00  | 1.00 | 0.99 | 1.00 |      | 1.00 | 1.00  |      | 1.00  | 1.00  | 1.00  |
| Fr <sub>t</sub>                   | 1.00 | 1.00  | 0.85 | 1.00 | 0.94 |      | 1.00 | 0.98  |      | 1.00  | 1.00  | 0.85  |
| Flt Protected                     | 0.95 | 1.00  | 1.00 | 0.95 | 1.00 |      | 0.95 | 1.00  |      | 0.95  | 1.00  | 1.00  |
| Satd. Flow (prot)                 | 1731 | 1902  | 1505 | 1678 | 1769 |      | 1736 | 3458  |      | 1807  | 3579  | 1589  |
| Flt Permitted                     | 0.67 | 1.00  | 1.00 | 0.34 | 1.00 |      | 0.22 | 1.00  |      | 0.08  | 1.00  | 1.00  |
| Satd. Flow (perm)                 | 1217 | 1902  | 1505 | 601  | 1769 |      | 404  | 3458  |      | 154   | 3579  | 1589  |
| Peak-hour factor, PHF             | 0.95 | 0.95  | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95  | 0.95 | 0.95  | 0.95  | 0.95  |
| Adj. Flow (vph)                   | 20   | 226   | 135  | 27   | 62   | 47   | 176  | 1312  | 223  | 240   | 1259  | 102   |
| RTOR Reduction (vph)              | 0    | 0     | 73   | 0    | 22   | 0    | 0    | 9     | 0    | 0     | 0     | 26    |
| Lane Group Flow (vph)             | 20   | 226   | 62   | 27   | 87   | 0    | 176  | 1526  | 0    | 240   | 1259  | 76    |
| Confl. Peds. (#/hr)               | 4    |       | 9    | 9    |      | 4    | 3    |       | 7    | 7     |       | 3     |
| Heavy Vehicles (%)                | 5%   | 1%    | 6%   | 8%   | 0%   | 2%   | 5%   | 3%    | 1%   | 1%    | 2%    | 0%    |
| Turn Type                         | Perm | NA    | Perm | Perm | NA   |      | Perm | NA    |      | pm+pt | NA    | Perm  |
| Protected Phases                  |      | 4     |      |      | 8    |      |      | 2     |      | 1     | 6     |       |
| Permitted Phases                  | 4    |       | 4    | 8    |      |      | 2    |       |      | 6     |       | 6     |
| Actuated Green, G (s)             | 22.1 | 22.1  | 22.1 | 22.1 | 22.1 |      | 82.2 | 82.2  |      | 104.9 | 104.9 | 104.9 |
| Effective Green, g (s)            | 22.1 | 22.1  | 22.1 | 22.1 | 22.1 |      | 82.2 | 82.2  |      | 104.9 | 104.9 | 104.9 |
| Actuated g/C Ratio                | 0.16 | 0.16  | 0.16 | 0.16 | 0.16 |      | 0.59 | 0.59  |      | 0.75  | 0.75  | 0.75  |
| Clearance Time (s)                | 7.0  | 7.0   | 7.0  | 7.0  | 7.0  |      | 6.0  | 6.0   |      | 3.0   | 6.0   | 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)                | 192  | 300   | 237  | 94   | 279  |      | 237  | 2030  |      | 347   | 2681  | 1190  |
| v/s Ratio Prot                    |      | c0.12 |      |      | 0.05 |      |      | c0.44 |      | c0.10 | 0.35  |       |
| v/s Ratio Perm                    | 0.02 |       | 0.04 | 0.04 |      |      | 0.44 |       |      | 0.42  |       | 0.05  |
| v/c Ratio                         | 0.10 | 0.75  | 0.26 | 0.29 | 0.31 |      | 0.74 | 0.75  |      | 0.69  | 0.47  | 0.06  |
| Uniform Delay, d1                 | 50.5 | 56.3  | 51.8 | 52.0 | 52.2 |      | 21.2 | 21.4  |      | 32.4  | 6.8   | 4.6   |
| Progression Factor                | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 |      | 1.00 | 1.00  |      | 1.57  | 0.82  | 0.91  |
| Incremental Delay, d2             | 0.2  | 10.2  | 0.6  | 1.7  | 0.6  |      | 18.8 | 2.6   |      | 4.4   | 0.4   | 0.1   |
| Delay (s)                         | 50.7 | 66.6  | 52.4 | 53.7 | 52.9 |      | 40.0 | 24.0  |      | 55.3  | 6.0   | 4.3   |
| Level of Service                  | D    | E     | D    | D    | D    |      | D    | C     |      | E     | A     | A     |
| Approach Delay (s)                |      | 60.7  |      |      | 53.0 |      |      | 25.6  |      |       | 13.3  |       |
| Approach LOS                      |      | E     |      |      | D    |      |      | C     |      |       | B     |       |
| Intersection Summary              |      |       |      |      |      |      |      |       |      |       |       |       |
| HCM 2000 Control Delay            |      | 24.9  |      |      |      |      |      |       |      |       | C     |       |
| HCM 2000 Volume to Capacity ratio |      | 0.74  |      |      |      |      |      |       |      |       |       |       |
| Actuated Cycle Length (s)         |      | 140.0 |      |      |      |      |      |       |      |       | 16.0  |       |
| Intersection Capacity Utilization |      | 90.6% |      |      |      |      |      |       |      |       | E     |       |
| Analysis Period (min)             |      | 15    |      |      |      |      |      |       |      |       |       |       |
| c Critical Lane Group             |      |       |      |      |      |      |      |       |      |       |       |       |

HCM Unsignalized Intersection Capacity Analysis  
4: Speakman Dr/Homelands Dr & Sheridan Park Dr

12/04/2017



| Movement                          | EBL   | EBT   | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|-------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |       |       |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |       | Stop  |       |       | Stop |                      |      | Stop |      |      | Stop |      |
| Traffic Volume (vph)              | 1     | 7     | 1     | 247   | 22   | 149                  | 0    | 54   | 149  | 211  | 139  | 16   |
| Future Volume (vph)               | 1     | 7     | 1     | 247   | 22   | 149                  | 0    | 54   | 149  | 211  | 139  | 16   |
| Peak Hour Factor                  | 0.82  | 0.82  | 0.82  | 0.82  | 0.82 | 0.82                 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph)            | 1     | 9     | 1     | 301   | 27   | 182                  | 0    | 66   | 182  | 257  | 170  | 20   |
| Direction, Lane #                 | EB 1  | WB 1  | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 11    | 510   | 248   | 447   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 1     | 301   | 0     | 257   |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 1     | 182   | 182   | 20    |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | -0.04 | -0.02 | -0.42 | 0.15  |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 7.4   | 6.0   | 6.1   | 6.2   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.02  | 0.85  | 0.42  | 0.78  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 417   | 585   | 538   | 549   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 10.5  | 34.1  | 13.5  | 27.5  |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 10.5  | 34.1  | 13.5  | 27.5  |      |                      |      |      |      |      |      |      |
| Approach LOS                      | B     | D     | B     | D     |      |                      |      |      |      |      |      |      |
| Intersection Summary              |       |       |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |       |       |       |       | 27.2 |                      |      |      |      |      |      |      |
| Level of Service                  |       |       |       |       | D    |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |       |       |       | 72.9% |      | ICU Level of Service |      |      |      | C    |      |      |
| Analysis Period (min)             |       |       |       | 15    |      |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

5: Fifth Line & Sheridan Park Dr

12/04/2017

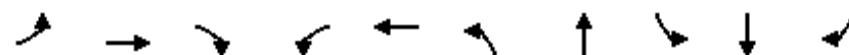


| Movement                          | EBL  | EBT  | EBR  | WBL   | WBT  | WBR   | NBL                  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|------|------|-------|------|-------|----------------------|------|------|------|------|------|
| Lane Configurations               |      |      |      |       |      |       |                      |      |      |      |      |      |
| Sign Control                      |      | Stop |      |       |      | Stop  |                      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 27   | 299  | 40   | 7     | 275  | 63    | 41                   | 61   | 23   | 108  | 77   | 86   |
| Future Volume (vph)               | 27   | 299  | 40   | 7     | 275  | 63    | 41                   | 61   | 23   | 108  | 77   | 86   |
| Peak Hour Factor                  | 0.86 | 0.86 | 0.86 | 0.86  | 0.86 | 0.86  | 0.86                 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph)            | 31   | 348  | 47   | 8     | 320  | 73    | 48                   | 71   | 27   | 126  | 90   | 100  |
| Direction, Lane #                 | EB 1 | WB 1 | NB 1 | NB 2  | SB 1 | SB 2  |                      |      |      |      |      |      |
| Volume Total (vph)                | 426  | 401  | 48   | 98    | 126  | 190   |                      |      |      |      |      |      |
| Volume Left (vph)                 | 31   | 8    | 48   | 0     | 126  | 0     |                      |      |      |      |      |      |
| Volume Right (vph)                | 47   | 73   | 0    | 27    | 0    | 100   |                      |      |      |      |      |      |
| Hadj (s)                          | 0.02 | 0.00 | 0.70 | -0.13 | 0.52 | -0.32 |                      |      |      |      |      |      |
| Departure Headway (s)             | 6.3  | 6.4  | 8.7  | 7.8   | 8.0  | 7.2   |                      |      |      |      |      |      |
| Degree Utilization, x             | 0.75 | 0.71 | 0.12 | 0.21  | 0.28 | 0.38  |                      |      |      |      |      |      |
| Capacity (veh/h)                  | 549  | 538  | 372  | 408   | 412  | 452   |                      |      |      |      |      |      |
| Control Delay (s)                 | 25.8 | 23.3 | 11.6 | 11.7  | 13.0 | 13.3  |                      |      |      |      |      |      |
| Approach Delay (s)                | 25.8 | 23.3 | 11.7 |       | 13.2 |       |                      |      |      |      |      |      |
| Approach LOS                      | D    | C    | B    |       | B    |       |                      |      |      |      |      |      |
| Intersection Summary              |      |      |      |       |      |       |                      |      |      |      |      |      |
| Delay                             |      |      |      |       |      |       | 20.3                 |      |      |      |      |      |
| Level of Service                  |      |      |      |       |      |       | C                    |      |      |      |      |      |
| Intersection Capacity Utilization |      |      |      | 56.8% |      |       | ICU Level of Service |      |      |      |      | B    |
| Analysis Period (min)             |      |      |      |       |      |       | 15                   |      |      |      |      |      |

## Timings

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑↑↑   | ↑     | ↑↑↑   | ↑     |
| Traffic Volume (vph) | 160   | 118   | 161   | 148   | 61    | 77    | 2012  | 159   | 1535  | 192   |
| Future Volume (vph)  | 160   | 118   | 161   | 148   | 61    | 77    | 2012  | 159   | 1535  | 192   |
| Turn Type            | Perm  | NA    | Perm  | Perm  | NA    | Perm  | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 8     |       | 2     | 1     | 6     |       |
| Permitted Phases     | 4     |       |       | 4     | 8     |       | 2     |       | 6     |       |
| Detector Phase       | 4     | 4     | 4     | 8     | 8     | 2     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 9.5   | 38.0  | 38.0  |
| Total Split (s)      | 43.0  | 43.0  | 43.0  | 43.0  | 43.0  | 77.0  | 77.0  | 20.0  | 97.0  | 97.0  |
| Total Split (%)      | 30.7% | 30.7% | 30.7% | 30.7% | 30.7% | 55.0% | 55.0% | 14.3% | 69.3% | 69.3% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 5.0   | 5.0   | 3.0   | 5.0   | 5.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 7.0   | 7.0   |
| Lead/Lag             |       |       |       |       |       | Lag   | Lag   | Lead  |       |       |
| Lead-Lag Optimize?   |       |       |       |       |       | Yes   | Yes   | Yes   |       |       |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 23.9  | 23.9  | 23.9  | 23.9  | 23.9  | 86.2  | 86.2  | 106.1 | 102.1 | 102.1 |
| Actuated g/C Ratio   | 0.17  | 0.17  | 0.17  | 0.17  | 0.17  | 0.62  | 0.62  | 0.76  | 0.73  | 0.73  |
| v/c Ratio            | 0.80  | 0.38  | 0.54  | 0.75  | 0.41  | 0.48  | 0.70  | 0.75  | 0.43  | 0.16  |
| Control Delay        | 81.3  | 53.1  | 40.1  | 76.1  | 39.9  | 32.5  | 21.7  | 52.4  | 8.6   | 1.6   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 81.3  | 53.1  | 40.1  | 76.1  | 39.9  | 32.5  | 21.7  | 52.4  | 8.6   | 1.6   |
| LOS                  | F     | D     | D     | E     | D     | C     | C     | D     | A     | A     |
| Approach Delay       |       | 58.6  |       |       |       | 59.9  |       | 22.1  |       | 11.6  |
| Approach LOS         |       | E     |       |       |       | E     |       | C     |       | B     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 23.4

Intersection LOS: C

Intersection Capacity Utilization 83.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way



HCM Signalized Intersection Capacity Analysis  
6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way

12/04/2017

| Movement                          | EBL   | EBT   | EBC  | WBL  | WBT  | WBR  | NBL                       | NBT  | NBR  | SBL   | SBT   | SBR   |
|-----------------------------------|-------|-------|------|------|------|------|---------------------------|------|------|-------|-------|-------|
| Lane Configurations               | ↑     | ↑     | ↑    | ↑    | ↑    | ↑    | ↑                         | ↑↑↑  |      | ↑     | ↑↑↑   | ↑     |
| Traffic Volume (vph)              | 160   | 118   | 161  | 148  | 61   | 59   | 77                        | 2012 | 92   | 159   | 1535  | 192   |
| Future Volume (vph)               | 160   | 118   | 161  | 148  | 61   | 59   | 77                        | 2012 | 92   | 159   | 1535  | 192   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900 | 1900 | 1900 | 1900 | 1900                      | 1900 | 1900 | 1900  | 1900  | 1900  |
| Total Lost time (s)               | 7.0   | 7.0   | 7.0  | 7.0  | 7.0  |      | 7.0                       | 7.0  |      | 3.0   | 7.0   | 7.0   |
| Lane Util. Factor                 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 |      | 1.00                      | 0.91 |      | 1.00  | 0.91  | 1.00  |
| Frpb, ped/bikes                   | 1.00  | 1.00  | 0.97 | 1.00 | 0.99 |      | 1.00                      | 1.00 |      | 1.00  | 1.00  | 0.97  |
| Flpb, ped/bikes                   | 1.00  | 1.00  | 1.00 | 0.99 | 1.00 |      | 1.00                      | 1.00 |      | 1.00  | 1.00  | 1.00  |
| Fr <sub>t</sub>                   | 1.00  | 1.00  | 0.85 | 1.00 | 0.93 |      | 1.00                      | 0.99 |      | 1.00  | 1.00  | 0.85  |
| Flt Protected                     | 0.95  | 1.00  | 1.00 | 0.95 | 1.00 |      | 0.95                      | 1.00 |      | 0.95  | 1.00  | 1.00  |
| Satd. Flow (prot)                 | 1787  | 1847  | 1500 | 1750 | 1563 |      | 1672                      | 4988 |      | 1738  | 4948  | 1579  |
| Flt Permitted                     | 0.64  | 1.00  | 1.00 | 0.64 | 1.00 |      | 0.15                      | 1.00 |      | 0.05  | 1.00  | 1.00  |
| Satd. Flow (perm)                 | 1200  | 1847  | 1500 | 1185 | 1563 |      | 266                       | 4988 |      | 85    | 4948  | 1579  |
| Peak-hour factor, PHF             | 0.98  | 0.98  | 0.98 | 0.98 | 0.98 | 0.98 | 0.98                      | 0.98 | 0.98 | 0.98  | 0.98  | 0.98  |
| Adj. Flow (vph)                   | 163   | 120   | 164  | 151  | 62   | 60   | 79                        | 2053 | 94   | 162   | 1566  | 196   |
| RTOR Reduction (vph)              | 0     | 0     | 46   | 0    | 27   | 0    | 0                         | 3    | 0    | 0     | 0     | 50    |
| Lane Group Flow (vph)             | 163   | 120   | 118  | 151  | 95   | 0    | 79                        | 2144 | 0    | 162   | 1566  | 146   |
| Confl. Peds. (#/hr)               | 1     |       | 11   | 11   |      | 1    | 6                         |      | 6    | 6     |       | 6     |
| Heavy Vehicles (%)                | 2%    | 4%    | 6%   | 3%   | 18%  | 8%   | 9%                        | 4%   | 11%  | 5%    | 6%    | 0%    |
| Turn Type                         | Perm  | NA    | Perm | Perm | NA   |      | Perm                      | NA   |      | pm+pt | NA    | Perm  |
| Protected Phases                  |       | 4     |      |      | 8    |      |                           | 2    |      | 1     | 6     |       |
| Permitted Phases                  | 4     |       | 4    | 8    |      |      | 2                         |      |      | 6     |       | 6     |
| Actuated Green, G (s)             | 23.9  | 23.9  | 23.9 | 23.9 | 23.9 |      | 86.2                      | 86.2 |      | 102.1 | 102.1 | 102.1 |
| Effective Green, g (s)            | 23.9  | 23.9  | 23.9 | 23.9 | 23.9 |      | 86.2                      | 86.2 |      | 102.1 | 102.1 | 102.1 |
| Actuated g/C Ratio                | 0.17  | 0.17  | 0.17 | 0.17 | 0.17 |      | 0.62                      | 0.62 |      | 0.73  | 0.73  | 0.73  |
| Clearance Time (s)                | 7.0   | 7.0   | 7.0  | 7.0  | 7.0  |      | 7.0                       | 7.0  |      | 3.0   | 7.0   | 7.0   |
| Vehicle Extension (s)             | 3.0   | 3.0   | 3.0  | 3.0  | 3.0  |      | 3.0                       | 3.0  |      | 3.0   | 3.0   | 3.0   |
| Lane Grp Cap (vph)                | 204   | 315   | 256  | 202  | 266  |      | 163                       | 3071 |      | 214   | 3608  | 1151  |
| v/s Ratio Prot                    |       | 0.06  |      |      | 0.06 |      |                           | 0.43 |      | c0.07 | 0.32  |       |
| v/s Ratio Perm                    | c0.14 |       | 0.08 | 0.13 |      |      | 0.30                      |      |      | c0.48 |       | 0.09  |
| v/c Ratio                         | 0.80  | 0.38  | 0.46 | 0.75 | 0.36 |      | 0.48                      | 0.70 |      | 0.76  | 0.43  | 0.13  |
| Uniform Delay, d1                 | 55.7  | 51.5  | 52.3 | 55.2 | 51.3 |      | 14.7                      | 18.1 |      | 38.7  | 7.5   | 5.7   |
| 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             | 19.3  | 0.8   | 1.3  | 14.0 | 0.8  |      | 10.0                      | 1.3  |      | 14.2  | 0.4   | 0.2   |
| Delay (s)                         | 75.0  | 52.3  | 53.6 | 69.2 | 52.1 |      | 24.7                      | 19.5 |      | 52.9  | 7.9   | 5.9   |
| Level of Service                  | E     | D     | D    | E    | D    |      | C                         | B    |      | D     | A     | A     |
| Approach Delay (s)                |       | 61.0  |      |      | 61.5 |      |                           | 19.7 |      |       | 11.5  |       |
| Approach LOS                      |       | E     |      |      | E    |      |                           | B    |      |       | B     |       |
| Intersection Summary              |       |       |      |      |      |      |                           |      |      |       |       |       |
| HCM 2000 Control Delay            |       | 22.6  |      |      |      |      | HCM 2000 Level of Service |      |      | C     |       |       |
| HCM 2000 Volume to Capacity ratio |       | 0.78  |      |      |      |      |                           |      |      |       |       |       |
| Actuated Cycle Length (s)         |       | 140.0 |      |      |      |      | Sum of lost time (s)      |      |      | 17.0  |       |       |
| Intersection Capacity Utilization |       | 83.5% |      |      |      |      | ICU Level of Service      |      |      | E     |       |       |
| Analysis Period (min)             |       | 15    |      |      |      |      |                           |      |      |       |       |       |
| c Critical Lane Group             |       |       |      |      |      |      |                           |      |      |       |       |       |

# HCM Unsignalized Intersection Capacity Analysis

7: Speakman Dr & Hadwen Dr

12/04/2017



| Movement                          | EBL  | EBT  | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |      |      |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |      | Stop |       |       | Stop |                      |      | Stop |      |      | Stop |      |
| Traffic Volume (vph)              | 29   | 10   | 7     | 71    | 64   | 20                   | 9    | 161  | 91   | 45   | 272  | 64   |
| Future Volume (vph)               | 29   | 10   | 7     | 71    | 64   | 20                   | 9    | 161  | 91   | 45   | 272  | 64   |
| Peak Hour Factor                  | 0.77 | 0.77 | 0.77  | 0.77  | 0.77 | 0.77                 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 |
| Hourly flow rate (vph)            | 38   | 13   | 9     | 92    | 83   | 26                   | 12   | 209  | 118  | 58   | 353  | 83   |
| Direction, Lane #                 | EB 1 | WB 1 | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 60   | 201  | 339   | 494   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 38   | 92   | 12    | 58    |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 9    | 26   | 118   | 83    |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | 0.04 | 0.01 | -0.20 | -0.08 |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 6.6  | 6.2  | 5.3   | 5.2   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.11 | 0.35 | 0.50  | 0.71  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 456  | 517  | 636   | 671   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 10.4 | 12.4 | 13.5  | 20.0  |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 10.4 | 12.4 | 13.5  | 20.0  |      |                      |      |      |      |      |      |      |
| Approach LOS                      | B    | B    | B     | C     |      |                      |      |      |      |      |      |      |
| <b>Intersection Summary</b>       |      |      |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |      |      |       |       | 16.1 |                      |      |      |      |      |      |      |
| Level of Service                  |      |      |       |       | C    |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |      |       | 54.4% |      | ICU Level of Service |      |      |      | A    |      |      |
| Analysis Period (min)             |      |      |       | 15    |      |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

8: Flavelle Blvd West & Speakman Dr

12/04/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      |       |      |                      |      |      |
| Traffic Volume (veh/h)            | 177  | 16    | 30   | 334                  | 0    | 0    |
| Future Volume (Veh/h)             | 177  | 16    | 30   | 334                  | 0    | 0    |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.80 | 0.80  | 0.80 | 0.80                 | 0.80 | 0.80 |
| Hourly flow rate (vph)            | 221  | 20    | 38   | 418                  | 0    | 0    |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       | None |                      |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 241   |      | 725                  | 231  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 241   |      | 725                  | 231  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 97    |      | 100                  | 100  |      |
| cM capacity (veh/h)               |      | 1320  |      | 384                  | 813  |      |
| Direction, Lane #                 | EB 1 | WB 1  |      |                      |      |      |
| Volume Total                      | 241  | 456   |      |                      |      |      |
| Volume Left                       | 0    | 38    |      |                      |      |      |
| Volume Right                      | 20   | 0     |      |                      |      |      |
| cSH                               | 1700 | 1320  |      |                      |      |      |
| Volume to Capacity                | 0.14 | 0.03  |      |                      |      |      |
| Queue Length 95th (m)             | 0.0  | 0.7   |      |                      |      |      |
| Control Delay (s)                 | 0.0  | 0.9   |      |                      |      |      |
| Lane LOS                          |      | A     |      |                      |      |      |
| Approach Delay (s)                | 0.0  | 0.9   |      |                      |      |      |
| Approach LOS                      |      |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 0.6   |      |                      |      |      |
| Intersection Capacity Utilization |      | 36.2% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

9: Flavelle Blvd East & Speakman Dr

12/04/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    |       |      | ↑                    | ↖    | ↖    |
| Traffic Volume (veh/h)            | 175  | 0     | 0    | 244                  | 118  | 144  |
| Future Volume (Veh/h)             | 175  | 0     | 0    | 244                  | 118  | 144  |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.75 | 0.75  | 0.75 | 0.75                 | 0.75 | 0.75 |
| Hourly flow rate (vph)            | 233  | 0     | 0    | 325                  | 157  | 192  |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 233   |      | 558                  | 233  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 233   |      | 558                  | 233  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 100   |      | 68                   | 76   |      |
| cM capacity (veh/h)               |      | 1346  |      | 492                  | 809  |      |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2                 |      |      |
| Volume Total                      | 233  | 325   | 157  | 192                  |      |      |
| Volume Left                       | 0    | 0     | 157  | 0                    |      |      |
| Volume Right                      | 0    | 0     | 0    | 192                  |      |      |
| cSH                               | 1700 | 1700  | 492  | 809                  |      |      |
| Volume to Capacity                | 0.14 | 0.19  | 0.32 | 0.24                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 10.3 | 7.0                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 15.7 | 10.8                 |      |      |
| Lane LOS                          |      |       | C    | B                    |      |      |
| Approach Delay (s)                | 0.0  | 0.0   | 13.0 |                      |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| <b>Intersection Summary</b>       |      |       |      |                      |      |      |
| Average Delay                     |      | 5.0   |      |                      |      |      |
| Intersection Capacity Utilization |      | 26.0% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

## Timings

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑↑    | ↑     | ↑↑    | ↑     |
| Traffic Volume (vph) | 153   | 146   | 55    | 112   | 194   | 1339  | 90    | 878   | 65    |
| Future Volume (vph)  | 153   | 146   | 55    | 112   | 194   | 1339  | 90    | 878   | 65    |
| Turn Type            | Perm  | NA    | Perm  | NA    | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       | 4     | 8     | 5     | 2     | 1     | 6     |
| Permitted Phases     |       |       |       | 4     | 8     | 2     | 6     |       | 6     |
| Detector Phase       |       |       |       | 4     | 4     | 8     | 5     | 2     | 1     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 35.0  | 35.0  | 35.0  | 35.0  | 9.5   | 25.0  | 9.5   | 25.0  | 25.0  |
| Total Split (s)      | 39.0  | 39.0  | 39.0  | 39.0  | 11.0  | 86.0  | 15.0  | 90.0  | 90.0  |
| Total Split (%)      | 27.9% | 27.9% | 27.9% | 27.9% | 7.9%  | 61.4% | 10.7% | 64.3% | 64.3% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   |       |       |       |       | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 28.5  | 28.5  | 28.5  | 28.5  | 98.5  | 87.2  | 98.3  | 87.2  | 87.2  |
| Actuated g/C Ratio   | 0.20  | 0.20  | 0.20  | 0.20  | 0.70  | 0.62  | 0.70  | 0.62  | 0.62  |
| v/c Ratio            | 0.79  | 0.88  | 0.81  | 0.45  | 0.50  | 0.73  | 0.46  | 0.43  | 0.07  |
| Control Delay        | 77.9  | 71.7  | 114.2 | 47.6  | 9.2   | 12.5  | 13.4  | 14.8  | 3.4   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 77.9  | 71.7  | 114.2 | 47.6  | 9.2   | 12.5  | 13.4  | 14.8  | 3.4   |
| LOS                  | E     | E     | F     | D     | A     | B     | B     | B     | A     |
| Approach Delay       |       |       |       | 73.7  | 64.6  |       | 12.1  |       | 14.0  |
| Approach LOS         |       |       |       | E     |       | B     |       | B     |       |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 24.5

Intersection LOS: C

Intersection Capacity Utilization 90.8%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr



HCM Signalized Intersection Capacity Analysis  
1: Winston Churchill Blvd & Dover Gate/Homelands Dr

12/04/2017

| Movement                          | EBL  | EBT   | EBR  | WBL  | WBT  | WBR  | NBL                       | NBT   | NBR  | SBL   | SBT  | SBR  |
|-----------------------------------|------|-------|------|------|------|------|---------------------------|-------|------|-------|------|------|
| Lane Configurations               | ↑    | ↑     |      | ↑    | ↑    |      | ↑                         | ↑↑    |      | ↑     | ↑↑   | ↑    |
| Traffic Volume (vph)              | 153  | 146   | 171  | 55   | 112  | 50   | 194                       | 1339  | 152  | 90    | 878  | 65   |
| Future Volume (vph)               | 153  | 146   | 171  | 55   | 112  | 50   | 194                       | 1339  | 152  | 90    | 878  | 65   |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 | 1900                      | 1900  | 1900 | 1900  | 1900 | 1900 |
| Total Lost time (s)               | 7.0  | 7.0   |      | 7.0  | 7.0  |      | 3.0                       | 6.0   |      | 3.0   | 6.0  | 6.0  |
| Lane Util. Factor                 | 1.00 | 1.00  |      | 1.00 | 1.00 |      | 1.00                      | 0.95  |      | 1.00  | 0.95 | 1.00 |
| Frpb, ped/bikes                   | 1.00 | 0.99  |      | 1.00 | 0.99 |      | 1.00                      | 1.00  |      | 1.00  | 1.00 | 0.96 |
| Flpb, ped/bikes                   | 1.00 | 1.00  |      | 0.99 | 1.00 |      | 1.00                      | 1.00  |      | 1.00  | 1.00 | 1.00 |
| Fr <sub>t</sub>                   | 1.00 | 0.92  |      | 1.00 | 0.95 |      | 1.00                      | 0.98  |      | 1.00  | 1.00 | 0.85 |
| Flt Protected                     | 0.95 | 1.00  |      | 0.95 | 1.00 |      | 0.95                      | 1.00  |      | 0.95  | 1.00 | 1.00 |
| Satd. Flow (prot)                 | 1799 | 1724  |      | 1780 | 1822 |      | 1770                      | 3476  |      | 1772  | 3510 | 1534 |
| Flt Permitted                     | 0.54 | 1.00  |      | 0.19 | 1.00 |      | 0.26                      | 1.00  |      | 0.09  | 1.00 | 1.00 |
| Satd. Flow (perm)                 | 1022 | 1724  |      | 360  | 1822 |      | 480                       | 3476  |      | 162   | 3510 | 1534 |
| Peak-hour factor, PHF             | 0.94 | 0.94  | 0.94 | 0.94 | 0.94 | 0.94 | 0.94                      | 0.94  | 0.94 | 0.94  | 0.94 | 0.94 |
| Adj. Flow (vph)                   | 163  | 155   | 182  | 59   | 119  | 53   | 206                       | 1424  | 162  | 96    | 934  | 69   |
| RTOR Reduction (vph)              | 0    | 31    | 0    | 0    | 12   | 0    | 0                         | 5     | 0    | 0     | 0    | 23   |
| Lane Group Flow (vph)             | 163  | 306   | 0    | 59   | 160  | 0    | 206                       | 1581  | 0    | 96    | 934  | 46   |
| Confl. Peds. (#/hr)               | 4    |       | 8    | 8    |      | 4    | 6                         |       | 8    | 8     |      | 6    |
| Heavy Vehicles (%)                | 1%   | 0%    | 2%   | 2%   | 0%   | 0%   | 3%                        | 3%    | 2%   | 3%    | 4%   | 2%   |
| Turn Type                         | Perm | NA    |      | Perm | NA   |      | pm+pt                     | NA    |      | pm+pt | NA   | Perm |
| Protected Phases                  |      | 4     |      |      | 8    |      | 5                         | 2     |      | 1     | 6    |      |
| Permitted Phases                  | 4    |       |      | 8    |      |      | 2                         |       |      | 6     |      | 6    |
| Actuated Green, G (s)             | 28.5 | 28.5  |      | 28.5 | 28.5 |      | 95.5                      | 87.2  |      | 95.5  | 87.2 | 87.2 |
| Effective Green, g (s)            | 28.5 | 28.5  |      | 28.5 | 28.5 |      | 95.5                      | 87.2  |      | 95.5  | 87.2 | 87.2 |
| Actuated g/C Ratio                | 0.20 | 0.20  |      | 0.20 | 0.20 |      | 0.68                      | 0.62  |      | 0.68  | 0.62 | 0.62 |
| Clearance Time (s)                | 7.0  | 7.0   |      | 7.0  | 7.0  |      | 3.0                       | 6.0   |      | 3.0   | 6.0  | 6.0  |
| Vehicle Extension (s)             | 3.0  | 3.0   |      | 3.0  | 3.0  |      | 3.0                       | 3.0   |      | 3.0   | 3.0  | 3.0  |
| Lane Grp Cap (vph)                | 208  | 350   |      | 73   | 370  |      | 403                       | 2165  |      | 205   | 2186 | 955  |
| v/s Ratio Prot                    |      | c0.18 |      |      | 0.09 |      | c0.03                     | c0.45 |      | 0.03  | 0.27 |      |
| v/s Ratio Perm                    | 0.16 |       |      | 0.16 |      |      | 0.32                      |       |      | 0.29  |      | 0.03 |
| v/c Ratio                         | 0.78 | 0.87  |      | 0.81 | 0.43 |      | 0.51                      | 0.73  |      | 0.47  | 0.43 | 0.05 |
| Uniform Delay, d1                 | 52.8 | 54.0  |      | 53.1 | 48.7 |      | 9.1                       | 18.3  |      | 15.8  | 13.6 | 10.3 |
| Progression Factor                | 1.00 | 1.00  |      | 1.00 | 1.00 |      | 0.94                      | 0.57  |      | 1.00  | 1.00 | 1.00 |
| Incremental Delay, d2             | 17.3 | 20.7  |      | 46.1 | 0.8  |      | 0.7                       | 1.4   |      | 1.7   | 0.6  | 0.1  |
| Delay (s)                         | 70.2 | 74.7  |      | 99.2 | 49.5 |      | 9.2                       | 11.8  |      | 17.5  | 14.2 | 10.4 |
| Level of Service                  | E    | E     |      | F    | D    |      | A                         | B     |      | B     | B    | B    |
| Approach Delay (s)                |      | 73.2  |      |      | 62.2 |      |                           | 11.5  |      |       | 14.2 |      |
| Approach LOS                      |      | E     |      |      | E    |      |                           | B     |      |       | B    |      |
| Intersection Summary              |      |       |      |      |      |      |                           |       |      |       |      |      |
| HCM 2000 Control Delay            |      | 24.1  |      |      |      |      | HCM 2000 Level of Service |       |      | C     |      |      |
| HCM 2000 Volume to Capacity ratio |      | 0.75  |      |      |      |      |                           |       |      |       |      |      |
| Actuated Cycle Length (s)         |      | 140.0 |      |      |      |      | Sum of lost time (s)      |       |      | 16.0  |      |      |
| Intersection Capacity Utilization |      | 90.8% |      |      |      |      | ICU Level of Service      |       |      | E     |      |      |
| Analysis Period (min)             |      | 15    |      |      |      |      |                           |       |      |       |      |      |
| c Critical Lane Group             |      |       |      |      |      |      |                           |       |      |       |      |      |

# HCM Unsignalized Intersection Capacity Analysis

2: Homelands Dr & Thorn Lodge Dr

12/04/2017

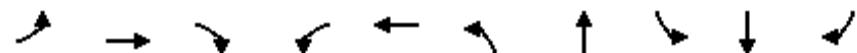


| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | Y    |       | ↑    |                      | ←    | ↑    |
| Sign Control                      | Stop |       | Stop |                      |      | Stop |
| Traffic Volume (vph)              | 109  | 26    | 142  | 174                  | 18   | 108  |
| Future Volume (vph)               | 109  | 26    | 142  | 174                  | 18   | 108  |
| Peak Hour Factor                  | 0.87 | 0.87  | 0.87 | 0.87                 | 0.87 | 0.87 |
| Hourly flow rate (vph)            | 125  | 30    | 163  | 200                  | 21   | 124  |
| Direction, Lane #                 | WB 1 | NB 1  | SB 1 |                      |      |      |
| Volume Total (vph)                | 155  | 363   | 145  |                      |      |      |
| Volume Left (vph)                 | 125  | 0     | 21   |                      |      |      |
| Volume Right (vph)                | 30   | 200   | 0    |                      |      |      |
| Hadj (s)                          | 0.05 | -0.30 | 0.12 |                      |      |      |
| Departure Headway (s)             | 5.1  | 4.2   | 4.8  |                      |      |      |
| Degree Utilization, x             | 0.22 | 0.42  | 0.19 |                      |      |      |
| Capacity (veh/h)                  | 650  | 828   | 705  |                      |      |      |
| Control Delay (s)                 | 9.5  | 10.3  | 9.0  |                      |      |      |
| Approach Delay (s)                | 9.5  | 10.3  | 9.0  |                      |      |      |
| Approach LOS                      | A    | B     | A    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Delay                             |      |       | 9.8  |                      |      |      |
| Level of Service                  |      |       | A    |                      |      |      |
| Intersection Capacity Utilization |      | 35.2% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |       | 15   |                      |      |      |

## Timings

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↗ ↙   | ↑ ↗   | ↑ ↘   | ↗ ↙   | ↑ ↗   | ↑ ↘   | ↑ ↙   | ↗ ↙   |
| Traffic Volume (vph) | 72    | 43    | 365   | 138   | 184   | 172   | 1540  | 22    | 1130  | 31    |
| Future Volume (vph)  | 72    | 43    | 365   | 138   | 184   | 172   | 1540  | 22    | 1130  | 31    |
| Turn Type            | Perm  | NA    | Perm  | pm+pt | NA    | Perm  | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 4     |       | 3     | 8     | 2     | 1     |
| Permitted Phases     |       |       |       |       |       | 4     | 8     | 2     | 6     | 6     |
| Detector Phase       |       |       |       |       |       | 4     | 3     | 8     | 2     | 1     |
| Switch Phase         |       |       |       |       |       |       |       |       | 6     | 6     |
| 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)    | 41.0  | 41.0  | 41.0  | 9.5   | 41.0  | 36.0  | 36.0  | 9.5   | 36.0  | 36.0  |
| Total Split (s)      | 41.0  | 41.0  | 41.0  | 11.0  | 52.0  | 75.0  | 75.0  | 13.0  | 88.0  | 88.0  |
| Total Split (%)      | 29.3% | 29.3% | 29.3% | 7.9%  | 37.1% | 53.6% | 53.6% | 9.3%  | 62.9% | 62.9% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 3.5   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 1.0   | 3.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 6.0   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             | Lag   | Lag   | Lag   | Lead  |       | Lag   | Lag   | Lead  |       |       |
| Lead-Lag Optimize?   | Yes   | Yes   | Yes   | Yes   |       | Yes   | Yes   | Yes   |       |       |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 29.7  | 29.7  | 29.7  | 43.2  | 40.7  | 80.5  | 80.5  | 89.3  | 86.3  | 86.3  |
| Actuated g/C Ratio   | 0.21  | 0.21  | 0.21  | 0.31  | 0.29  | 0.58  | 0.58  | 0.64  | 0.62  | 0.62  |
| v/c Ratio            | 0.43  | 0.11  | 0.91  | 0.36  | 0.66  | 0.87  | 0.78  | 0.16  | 0.59  | 0.03  |
| Control Delay        | 54.5  | 42.9  | 64.2  | 38.2  | 45.0  | 67.6  | 28.4  | 11.4  | 13.6  | 0.1   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 54.5  | 42.9  | 64.2  | 38.2  | 45.0  | 67.6  | 28.4  | 11.4  | 13.6  | 0.1   |
| LOS                  | D     | D     | E     | D     | D     | E     | C     | B     | B     | A     |
| Approach Delay       |       | 60.8  |       |       |       | 43.0  |       | 32.3  |       | 13.2  |
| Approach LOS         |       | E     |       |       |       | D     | C     |       | B     |       |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 31.3

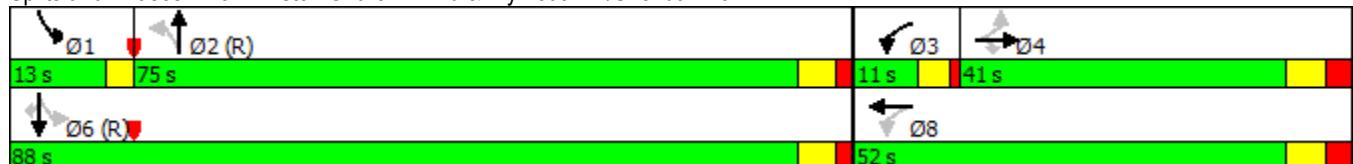
Intersection LOS: C

Intersection Capacity Utilization 93.9%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr



HCM Signalized Intersection Capacity Analysis  
3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr

12/04/2017

| Movement                          | EBL  | EBT   | EBC   | WBL   | WBT   | WBR  | NBL                       | NBT  | NBR  | SBL   | SBT   | SBR  |
|-----------------------------------|------|-------|-------|-------|-------|------|---------------------------|------|------|-------|-------|------|
| Lane Configurations               | ↑    | ↑     | ↑     | ↑     | ↑     | ↑    | ↑                         | ↑    | ↑    | ↑     | ↑     | ↑    |
| Traffic Volume (vph)              | 72   | 43    | 365   | 138   | 184   | 154  | 172                       | 1540 | 21   | 22    | 1130  | 31   |
| Future Volume (vph)               | 72   | 43    | 365   | 138   | 184   | 154  | 172                       | 1540 | 21   | 22    | 1130  | 31   |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900  | 1900  | 1900  | 1900 | 1900                      | 1900 | 1900 | 1900  | 1900  | 1900 |
| Total Lost time (s)               | 7.0  | 7.0   | 7.0   | 4.5   | 7.0   |      | 6.0                       | 6.0  |      | 3.0   | 6.0   | 6.0  |
| Lane Util. Factor                 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |      | 1.00                      | 0.95 |      | 1.00  | 0.95  | 1.00 |
| Frpb, ped/bikes                   | 1.00 | 1.00  | 0.99  | 1.00  | 0.99  |      | 1.00                      | 1.00 |      | 1.00  | 1.00  | 0.97 |
| Flpb, ped/bikes                   | 0.99 | 1.00  | 1.00  | 1.00  | 1.00  |      | 1.00                      | 1.00 |      | 1.00  | 1.00  | 1.00 |
| Fr <sub>t</sub>                   | 1.00 | 1.00  | 0.85  | 1.00  | 0.93  |      | 1.00                      | 1.00 |      | 1.00  | 1.00  | 0.85 |
| Flt Protected                     | 0.95 | 1.00  | 1.00  | 0.95  | 1.00  |      | 0.95                      | 1.00 |      | 0.95  | 1.00  | 1.00 |
| Satd. Flow (prot)                 | 1793 | 1921  | 1578  | 1823  | 1770  |      | 1752                      | 3606 |      | 1807  | 3230  | 1582 |
| Flt Permitted                     | 0.44 | 1.00  | 1.00  | 0.63  | 1.00  |      | 0.19                      | 1.00 |      | 0.06  | 1.00  | 1.00 |
| Satd. Flow (perm)                 | 824  | 1921  | 1578  | 1212  | 1770  |      | 358                       | 3606 |      | 107   | 3230  | 1582 |
| Peak-hour factor, PHF             | 0.96 | 0.96  | 0.96  | 0.96  | 0.96  | 0.96 | 0.96                      | 0.96 | 0.96 | 0.96  | 0.96  | 0.96 |
| Adj. Flow (vph)                   | 75   | 45    | 380   | 144   | 192   | 160  | 179                       | 1604 | 22   | 23    | 1177  | 32   |
| RTOR Reduction (vph)              | 0    | 0     | 84    | 0     | 23    | 0    | 0                         | 0    | 0    | 0     | 0     | 12   |
| Lane Group Flow (vph)             | 75   | 45    | 296   | 144   | 329   | 0    | 179                       | 1626 | 0    | 23    | 1177  | 20   |
| Confl. Peds. (#/hr)               | 11   |       | 2     | 2     |       | 11   | 5                         |      | 4    | 4     |       | 5    |
| Heavy Vehicles (%)                | 1%   | 0%    | 2%    | 0%    | 0%    | 0%   | 4%                        | 1%   | 0%   | 1%    | 13%   | 0%   |
| Turn Type                         | Perm | NA    | Perm  | pm+pt | NA    |      | Perm                      | NA   |      | pm+pt | NA    | Perm |
| Protected Phases                  |      | 4     |       | 3     | 8     |      |                           | 2    |      | 1     | 6     |      |
| Permitted Phases                  | 4    |       | 4     | 8     |       |      | 2                         |      |      | 6     |       | 6    |
| Actuated Green, G (s)             | 29.7 | 29.7  | 29.7  | 40.7  | 40.7  |      | 79.3                      | 79.3 |      | 86.3  | 86.3  | 86.3 |
| Effective Green, g (s)            | 29.7 | 29.7  | 29.7  | 40.7  | 40.7  |      | 79.3                      | 79.3 |      | 86.3  | 86.3  | 86.3 |
| Actuated g/C Ratio                | 0.21 | 0.21  | 0.21  | 0.29  | 0.29  |      | 0.57                      | 0.57 |      | 0.62  | 0.62  | 0.62 |
| Clearance Time (s)                | 7.0  | 7.0   | 7.0   | 4.5   | 7.0   |      | 6.0                       | 6.0  |      | 3.0   | 6.0   | 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)                | 174  | 407   | 334   | 380   | 514   |      | 202                       | 2042 |      | 114   | 1991  | 975  |
| v/s Ratio Prot                    |      | 0.02  |       | 0.02  | c0.19 |      |                           | 0.45 |      | 0.01  | c0.36 |      |
| v/s Ratio Perm                    | 0.09 |       | c0.19 | 0.09  |       |      | c0.50                     |      |      | 0.12  |       | 0.01 |
| v/c Ratio                         | 0.43 | 0.11  | 0.89  | 0.38  | 0.64  |      | 0.89                      | 0.80 |      | 0.20  | 0.59  | 0.02 |
| Uniform Delay, d1                 | 47.8 | 44.5  | 53.5  | 39.2  | 43.3  |      | 26.4                      | 24.0 |      | 20.9  | 16.2  | 10.4 |
| Progression Factor                | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  |      | 1.00                      | 1.00 |      | 0.86  | 0.72  | 0.00 |
| Incremental Delay, d2             | 1.7  | 0.1   | 23.5  | 0.6   | 2.7   |      | 39.3                      | 3.3  |      | 0.8   | 1.2   | 0.0  |
| Delay (s)                         | 49.5 | 44.6  | 77.0  | 39.9  | 46.0  |      | 65.7                      | 27.3 |      | 18.7  | 12.9  | 0.0  |
| Level of Service                  | D    | D     | E     | D     | D     |      | E                         | C    |      | B     | B     | A    |
| Approach Delay (s)                |      | 70.0  |       |       | 44.2  |      |                           | 31.1 |      |       | 12.6  |      |
| Approach LOS                      |      | E     |       |       | D     |      |                           | C    |      |       | B     |      |
| Intersection Summary              |      |       |       |       |       |      |                           |      |      |       |       |      |
| HCM 2000 Control Delay            |      | 31.9  |       |       |       |      | HCM 2000 Level of Service |      |      | C     |       |      |
| HCM 2000 Volume to Capacity ratio |      | 0.87  |       |       |       |      |                           |      |      |       |       |      |
| Actuated Cycle Length (s)         |      | 140.0 |       |       |       |      | Sum of lost time (s)      |      |      | 20.5  |       |      |
| Intersection Capacity Utilization |      | 93.9% |       |       |       |      | ICU Level of Service      |      |      | F     |       |      |
| Analysis Period (min)             |      | 15    |       |       |       |      |                           |      |      |       |       |      |
| c Critical Lane Group             |      |       |       |       |       |      |                           |      |      |       |       |      |

HCM Unsignalized Intersection Capacity Analysis  
4: Speakman Dr/Homelands Dr & Sheridan Park Dr

12/04/2017



| Movement                          | EBL  | EBT   | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |      |       |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |      | Stop  |       |       |      | Stop                 |      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 20   | 29    | 0     | 52    | 2    | 178                  | 1    | 138  | 214  | 164  | 36   | 1    |
| Future Volume (vph)               | 20   | 29    | 0     | 52    | 2    | 178                  | 1    | 138  | 214  | 164  | 36   | 1    |
| Peak Hour Factor                  | 0.86 | 0.86  | 0.86  | 0.86  | 0.86 | 0.86                 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph)            | 23   | 34    | 0     | 60    | 2    | 207                  | 1    | 160  | 249  | 191  | 42   | 1    |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 57   | 269   | 410   | 234   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 23   | 60    | 1     | 191   |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 0    | 207   | 249   | 1     |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | 0.08 | -0.38 | -0.35 | 0.19  |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 6.2  | 5.3   | 4.9   | 5.6   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.10 | 0.39  | 0.55  | 0.36  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 479  | 621   | 699   | 598   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 9.8  | 11.7  | 13.7  | 11.8  |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 9.8  | 11.7  | 13.7  | 11.8  |      |                      |      |      |      |      |      |      |
| Approach LOS                      | A    | B     | B     | B     |      |                      |      |      |      |      |      |      |
| Intersection Summary              |      |       |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |      |       |       |       | 12.5 |                      |      |      |      |      |      |      |
| Level of Service                  |      |       |       |       | B    |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |       |       | 59.7% |      | ICU Level of Service |      |      |      | B    |      |      |
| Analysis Period (min)             |      |       |       | 15    |      |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

5: Fifth Line & Sheridan Park Dr

12/04/2017

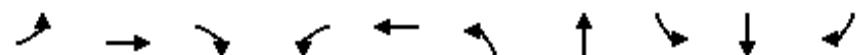


| Movement                          | EBL  | EBT   | EBR  | WBL   | WBT  | WBR   | NBL                  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|------|-------|------|-------|----------------------|------|------|------|------|------|
| Lane Configurations               |      |       |      |       |      |       |                      |      |      |      |      |      |
| Sign Control                      |      | Stop  |      |       |      | Stop  |                      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 58   | 309   | 38   | 16    | 172  | 105   | 46                   | 85   | 14   | 52   | 52   | 28   |
| Future Volume (vph)               | 58   | 309   | 38   | 16    | 172  | 105   | 46                   | 85   | 14   | 52   | 52   | 28   |
| Peak Hour Factor                  | 0.91 | 0.91  | 0.91 | 0.91  | 0.91 | 0.91  | 0.91                 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph)            | 64   | 340   | 42   | 18    | 189  | 115   | 51                   | 93   | 15   | 57   | 57   | 31   |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2  | SB 1 | SB 2  |                      |      |      |      |      |      |
| Volume Total (vph)                | 446  | 322   | 51   | 108   | 57   | 88    |                      |      |      |      |      |      |
| Volume Left (vph)                 | 64   | 18    | 51   | 0     | 57   | 0     |                      |      |      |      |      |      |
| Volume Right (vph)                | 42   | 115   | 0    | 15    | 0    | 31    |                      |      |      |      |      |      |
| Hadj (s)                          | 0.01 | -0.17 | 0.50 | -0.10 | 0.53 | -0.25 |                      |      |      |      |      |      |
| Departure Headway (s)             | 5.4  | 5.4   | 7.4  | 6.8   | 7.5  | 6.7   |                      |      |      |      |      |      |
| Degree Utilization, x             | 0.67 | 0.49  | 0.11 | 0.20  | 0.12 | 0.16  |                      |      |      |      |      |      |
| Capacity (veh/h)                  | 641  | 627   | 426  | 469   | 425  | 473   |                      |      |      |      |      |      |
| Control Delay (s)                 | 18.6 | 13.4  | 10.1 | 10.4  | 10.3 | 9.8   |                      |      |      |      |      |      |
| Approach Delay (s)                | 18.6 | 13.4  | 10.3 |       | 10.0 |       |                      |      |      |      |      |      |
| Approach LOS                      | C    | B     | B    |       | B    |       |                      |      |      |      |      |      |
| Intersection Summary              |      |       |      |       |      |       |                      |      |      |      |      |      |
| Delay                             |      |       |      |       |      |       | 14.7                 |      |      |      |      |      |
| Level of Service                  |      |       |      |       |      |       | B                    |      |      |      |      |      |
| Intersection Capacity Utilization |      |       |      | 55.8% |      |       | ICU Level of Service |      |      |      |      | B    |
| Analysis Period (min)             |      |       |      |       |      |       | 15                   |      |      |      |      |      |

## Timings

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↑ ↙   | ↑ ↗   | ↑ ↘   | ↑ ↙   | ↑ ↗   | ↑ ↘   | ↑ ↙   | ↑ ↗   |
| Traffic Volume (vph) | 171   | 99    | 106   | 69    | 70    | 148   | 2307  | 95    | 1489  | 73    |
| Future Volume (vph)  | 171   | 99    | 106   | 69    | 70    | 148   | 2307  | 95    | 1489  | 73    |
| Turn Type            | Perm  | NA    | Perm  | Perm  | NA    | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 8     | 5     | 2     | 1     | 6     |       |
| Permitted Phases     | 4     |       |       | 4     | 8     |       | 2     |       | 6     |       |
| Detector Phase       | 4     | 4     | 4     | 8     | 8     | 5     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 9.5   | 38.0  | 9.5   | 38.0  | 38.0  |
| Total Split (s)      | 48.0  | 48.0  | 48.0  | 48.0  | 48.0  | 18.0  | 77.0  | 15.0  | 74.0  | 74.0  |
| Total Split (%)      | 34.3% | 34.3% | 34.3% | 34.3% | 34.3% | 12.9% | 55.0% | 10.7% | 52.9% | 52.9% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 3.5   | 5.0   | 3.0   | 5.0   | 5.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 3.0   | 7.0   | 7.0   |
| Lead/Lag             |       |       |       |       |       | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   |       |       |       |       |       | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 30.0  | 30.0  | 30.0  | 30.0  | 30.0  | 96.5  | 83.8  | 94.5  | 81.4  | 81.4  |
| Actuated g/C Ratio   | 0.21  | 0.21  | 0.21  | 0.21  | 0.21  | 0.69  | 0.60  | 0.68  | 0.58  | 0.58  |
| v/c Ratio            | 0.93  | 0.26  | 0.27  | 0.26  | 0.50  | 0.61  | 0.84  | 0.62  | 0.53  | 0.08  |
| Control Delay        | 100.9 | 45.0  | 8.2   | 45.4  | 35.3  | 20.8  | 27.5  | 41.4  | 20.2  | 6.9   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 100.9 | 45.0  | 8.2   | 45.4  | 35.3  | 20.8  | 27.5  | 41.4  | 20.2  | 6.9   |
| LOS                  | F     | D     | A     | D     | D     | C     | C     | D     | C     | A     |
| Approach Delay       |       | 60.0  |       |       |       | 38.0  |       | 27.1  |       | 20.8  |
| Approach LOS         |       | E     |       |       |       | D     |       | C     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 28.1

Intersection LOS: C

Intersection Capacity Utilization 95.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way



HCM Signalized Intersection Capacity Analysis  
6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way

12/04/2017

| Movement                          | EBL   | EBT   | EBC  | WBL  | WBT  | WBR  | NBL                       | NBT   | NBR  | SBL   | SBT  | SBR  |
|-----------------------------------|-------|-------|------|------|------|------|---------------------------|-------|------|-------|------|------|
| Lane Configurations               | ↑ ↗   | ↑ ↘   | ↗ ↙  | ↖ ↗  | ↖ ↘  | ↖ ↙  | ↑ ↗                       | ↑ ↘   | ↑ ↙  | ↖ ↗   | ↑↑↑  | ↖    |
| Traffic Volume (vph)              | 171   | 99    | 106  | 69   | 70   | 125  | 148                       | 2307  | 99   | 95    | 1489 | 73   |
| Future Volume (vph)               | 171   | 99    | 106  | 69   | 70   | 125  | 148                       | 2307  | 99   | 95    | 1489 | 73   |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900 | 1900 | 1900 | 1900 | 1900                      | 1900  | 1900 | 1900  | 1900 | 1900 |
| Total Lost time (s)               | 7.0   | 7.0   | 7.0  | 7.0  | 7.0  |      | 4.5                       | 7.0   |      | 3.0   | 7.0  | 7.0  |
| Lane Util. Factor                 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 |      | 1.00                      | 0.91  |      | 1.00  | 0.91 | 1.00 |
| Frpb, ped/bikes                   | 1.00  | 1.00  | 0.97 | 1.00 | 0.99 |      | 1.00                      | 1.00  |      | 1.00  | 1.00 | 0.96 |
| Flpb, ped/bikes                   | 1.00  | 1.00  | 1.00 | 0.98 | 1.00 |      | 1.00                      | 1.00  |      | 1.00  | 1.00 | 1.00 |
| Fr <sub>t</sub>                   | 1.00  | 1.00  | 0.85 | 1.00 | 0.90 |      | 1.00                      | 0.99  |      | 1.00  | 1.00 | 0.85 |
| Flt Protected                     | 0.95  | 1.00  | 1.00 | 0.95 | 1.00 |      | 0.95                      | 1.00  |      | 0.95  | 1.00 | 1.00 |
| Satd. Flow (prot)                 | 1802  | 1883  | 1510 | 1779 | 1673 |      | 1789                      | 5050  |      | 1674  | 5092 | 1568 |
| Flt Permitted                     | 0.48  | 1.00  | 1.00 | 0.69 | 1.00 |      | 0.11                      | 1.00  |      | 0.05  | 1.00 | 1.00 |
| Satd. Flow (perm)                 | 906   | 1883  | 1510 | 1292 | 1673 |      | 207                       | 5050  |      | 87    | 5092 | 1568 |
| Peak-hour factor, PHF             | 0.95  | 0.95  | 0.95 | 0.95 | 0.95 | 0.95 | 0.95                      | 0.95  | 0.95 | 0.95  | 0.95 | 0.95 |
| Adj. Flow (vph)                   | 180   | 104   | 112  | 73   | 74   | 132  | 156                       | 2428  | 104  | 100   | 1567 | 77   |
| RTOR Reduction (vph)              | 0     | 0     | 88   | 0    | 51   | 0    | 0                         | 2     | 0    | 0     | 0    | 23   |
| Lane Group Flow (vph)             | 180   | 104   | 24   | 73   | 155  | 0    | 156                       | 2530  | 0    | 100   | 1567 | 54   |
| Confl. Peds. (#/hr)               | 3     |       | 13   | 13   |      | 3    | 9                         |       | 9    | 9     |      | 9    |
| Heavy Vehicles (%)                | 1%    | 2%    | 5%   | 1%   | 4%   | 2%   | 2%                        | 3%    | 4%   | 9%    | 3%   | 0%   |
| Turn Type                         | Perm  | NA    | Perm | Perm | NA   |      | pm+pt                     | NA    |      | pm+pt | NA   | Perm |
| Protected Phases                  |       | 4     |      |      | 8    |      | 5                         | 2     |      | 1     | 6    |      |
| Permitted Phases                  | 4     |       | 4    | 8    |      |      | 2                         |       |      | 6     |      | 6    |
| Actuated Green, G (s)             | 30.0  | 30.0  | 30.0 | 30.0 | 30.0 |      | 93.9                      | 83.8  |      | 90.6  | 81.4 | 81.4 |
| Effective Green, g (s)            | 30.0  | 30.0  | 30.0 | 30.0 | 30.0 |      | 93.9                      | 83.8  |      | 90.6  | 81.4 | 81.4 |
| Actuated g/C Ratio                | 0.21  | 0.21  | 0.21 | 0.21 | 0.21 |      | 0.67                      | 0.60  |      | 0.65  | 0.58 | 0.58 |
| Clearance Time (s)                | 7.0   | 7.0   | 7.0  | 7.0  | 7.0  |      | 4.5                       | 7.0   |      | 3.0   | 7.0  | 7.0  |
| Vehicle Extension (s)             | 3.0   | 3.0   | 3.0  | 3.0  | 3.0  |      | 3.0                       | 3.0   |      | 3.0   | 3.0  | 3.0  |
| Lane Grp Cap (vph)                | 194   | 403   | 323  | 276  | 358  |      | 252                       | 3022  |      | 160   | 2960 | 911  |
| v/s Ratio Prot                    |       | 0.06  |      |      | 0.09 |      | c0.04                     | c0.50 |      | 0.04  | 0.31 |      |
| v/s Ratio Perm                    | c0.20 |       | 0.02 | 0.06 |      |      | 0.37                      |       |      | 0.36  |      | 0.03 |
| v/c Ratio                         | 0.93  | 0.26  | 0.07 | 0.26 | 0.43 |      | 0.62                      | 0.84  |      | 0.62  | 0.53 | 0.06 |
| Uniform Delay, d1                 | 53.9  | 45.7  | 43.9 | 45.8 | 47.6 |      | 12.4                      | 22.6  |      | 29.2  | 17.7 | 12.7 |
| 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             | 44.1  | 0.3   | 0.1  | 0.5  | 0.8  |      | 4.5                       | 2.9   |      | 7.4   | 0.7  | 0.1  |
| Delay (s)                         | 98.0  | 46.1  | 44.0 | 46.3 | 48.5 |      | 16.9                      | 25.5  |      | 36.6  | 18.4 | 12.8 |
| Level of Service                  | F     | D     | D    | D    | D    |      | B                         | C     |      | D     | B    | B    |
| Approach Delay (s)                |       | 69.1  |      |      | 47.9 |      |                           | 25.0  |      |       | 19.2 |      |
| Approach LOS                      |       | E     |      |      | D    |      |                           | C     |      |       | B    |      |
| Intersection Summary              |       |       |      |      |      |      |                           |       |      |       |      |      |
| HCM 2000 Control Delay            |       | 27.7  |      |      |      |      | HCM 2000 Level of Service |       |      | C     |      |      |
| HCM 2000 Volume to Capacity ratio |       | 0.86  |      |      |      |      |                           |       |      |       |      |      |
| Actuated Cycle Length (s)         |       | 140.0 |      |      |      |      | Sum of lost time (s)      |       |      | 18.5  |      |      |
| Intersection Capacity Utilization |       | 95.3% |      |      |      |      | ICU Level of Service      |       |      | F     |      |      |
| Analysis Period (min)             |       | 15    |      |      |      |      |                           |       |      |       |      |      |
| c Critical Lane Group             |       |       |      |      |      |      |                           |       |      |       |      |      |

# HCM Unsignalized Intersection Capacity Analysis

7: Speakman Dr & Hadwen Dr

12/04/2017



| Movement                          | EBL  | EBT   | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |      |       |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |      | Stop  |       |       |      | Stop                 |      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 34   | 35    | 8     | 59    | 25   | 52                   | 2    | 162  | 89   | 37   | 86   | 22   |
| Future Volume (vph)               | 34   | 35    | 8     | 59    | 25   | 52                   | 2    | 162  | 89   | 37   | 86   | 22   |
| Peak Hour Factor                  | 0.81 | 0.81  | 0.81  | 0.81  | 0.81 | 0.81                 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Hourly flow rate (vph)            | 42   | 43    | 10    | 73    | 31   | 64                   | 2    | 200  | 110  | 46   | 106  | 27   |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 95   | 168   | 312   | 179   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 42   | 73    | 2     | 46    |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 10   | 64    | 110   | 27    |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | 0.05 | -0.13 | -0.21 | -0.04 |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 5.4  | 5.1   | 4.6   | 5.0   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.14 | 0.24  | 0.40  | 0.25  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 591  | 637   | 736   | 670   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 9.3  | 9.7   | 10.7  | 9.6   |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 9.3  | 9.7   | 10.7  | 9.6   |      |                      |      |      |      |      |      |      |
| Approach LOS                      | A    | A     | B     | A     |      |                      |      |      |      |      |      |      |
| <b>Intersection Summary</b>       |      |       |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |      |       |       |       | 10.1 |                      |      |      |      |      |      |      |
| Level of Service                  |      |       |       |       | B    |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |       |       | 42.3% |      | ICU Level of Service |      |      |      |      | A    |      |
| Analysis Period (min)             |      |       |       | 15    |      |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

8: Flavelle Blvd West & Speakman Dr

12/04/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    |       |      | ↑                    |      |      |
| Traffic Volume (veh/h)            | 204  | 163   | 44   | 104                  | 0    | 0    |
| Future Volume (Veh/h)             | 204  | 163   | 44   | 104                  | 0    | 0    |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.75 | 0.75  | 0.75 | 0.75                 | 0.75 | 0.75 |
| Hourly flow rate (vph)            | 272  | 217   | 59   | 139                  | 0    | 0    |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       | None |                      |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 489   |      | 638                  | 380  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 489   |      | 638                  | 380  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 95    |      | 100                  | 100  |      |
| cM capacity (veh/h)               |      | 1074  |      | 420                  | 671  |      |
| Direction, Lane #                 | EB 1 | WB 1  |      |                      |      |      |
| Volume Total                      | 489  | 198   |      |                      |      |      |
| Volume Left                       | 0    | 59    |      |                      |      |      |
| Volume Right                      | 217  | 0     |      |                      |      |      |
| cSH                               | 1700 | 1074  |      |                      |      |      |
| Volume to Capacity                | 0.29 | 0.05  |      |                      |      |      |
| Queue Length 95th (m)             | 0.0  | 1.3   |      |                      |      |      |
| Control Delay (s)                 | 0.0  | 2.9   |      |                      |      |      |
| Lane LOS                          |      | A     |      |                      |      |      |
| Approach Delay (s)                | 0.0  | 2.9   |      |                      |      |      |
| Approach LOS                      |      |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 0.8   |      |                      |      |      |
| Intersection Capacity Utilization |      | 35.3% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

9: Flavelle Blvd East & Speakman Dr

12/04/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    |       |      | ↑                    | ↖    | ↖    |
| Traffic Volume (veh/h)            | 202  | 0     | 0    | 135                  | 14   | 31   |
| Future Volume (Veh/h)             | 202  | 0     | 0    | 135                  | 14   | 31   |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.80 | 0.80  | 0.80 | 0.80                 | 0.80 | 0.80 |
| Hourly flow rate (vph)            | 253  | 0     | 0    | 169                  | 18   | 39   |
| Pedestrians                       |      |       |      |                      | 1    |      |
| Lane Width (m)                    |      |       |      |                      | 3.7  |      |
| Walking Speed (m/s)               |      |       |      |                      | 1.1  |      |
| Percent Blockage                  |      |       |      |                      | 0    |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 254   |      | 423                  | 254  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 254   |      | 423                  | 254  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 100   |      | 97                   | 95   |      |
| cM capacity (veh/h)               |      | 1322  |      | 591                  | 789  |      |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2                 |      |      |
| Volume Total                      | 253  | 169   | 18   | 39                   |      |      |
| Volume Left                       | 0    | 0     | 18   | 0                    |      |      |
| Volume Right                      | 0    | 0     | 0    | 39                   |      |      |
| cSH                               | 1700 | 1700  | 591  | 789                  |      |      |
| Volume to Capacity                | 0.15 | 0.10  | 0.03 | 0.05                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 0.7  | 1.2                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 11.3 | 9.8                  |      |      |
| Lane LOS                          |      |       | B    | A                    |      |      |
| Approach Delay (s)                | 0.0  | 0.0   | 10.3 |                      |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 1.2   |      |                      |      |      |
| Intersection Capacity Utilization |      | 20.7% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |



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## Appendix C

### Existing 95<sup>th</sup> Percentile Queues

## Queues

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group             | EBL  | EBT  | WBL  | WBT    | NBL    | NBT   | SBL  | SBT   | SBR  |
|------------------------|------|------|------|--------|--------|-------|------|-------|------|
| Lane Group Flow (vph)  | 39   | 145  | 120  | 177    | 260    | 1249  | 53   | 1476  | 134  |
| v/c Ratio              | 0.35 | 0.52 | 0.83 | 0.69   | 0.70   | 0.47  | 0.23 | 0.70  | 0.14 |
| Control Delay          | 60.0 | 38.3 | 96.9 | 63.7   | 46.3   | 6.0   | 16.1 | 21.5  | 5.7  |
| Queue Delay            | 0.0  | 0.0  | 0.0  | 0.0    | 0.0    | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 60.0 | 38.3 | 96.9 | 63.7   | 46.3   | 6.0   | 16.1 | 21.5  | 5.7  |
| Queue Length 50th (m)  | 9.9  | 22.2 | 32.7 | 42.4   | 50.9   | 40.4  | 6.5  | 141.6 | 6.3  |
| Queue Length 95th (m)  | 20.4 | 41.3 | 52.0 | 63.0   | m#91.3 | 60.1  | 14.8 | 166.3 | 15.2 |
| Internal Link Dist (m) |      | 99.2 |      | 1187.3 |        | 464.2 |      | 152.1 |      |
| Turn Bay Length (m)    |      |      | 15.0 |        | 126.0  |       | 75.0 |       | 45.0 |
| Base Capacity (vph)    | 180  | 409  | 232  | 402    | 374    | 2634  | 233  | 2111  | 949  |
| Starvation Cap Reductn | 0    | 0    | 0    | 0      | 0      | 0     | 0    | 0     | 0    |
| Spillback Cap Reductn  | 0    | 0    | 0    | 0      | 0      | 0     | 0    | 0     | 0    |
| Storage Cap Reductn    | 0    | 0    | 0    | 0      | 0      | 0     | 0    | 0     | 0    |
| Reduced v/c Ratio      | 0.22 | 0.35 | 0.52 | 0.44   | 0.70   | 0.47  | 0.23 | 0.70  | 0.14 |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

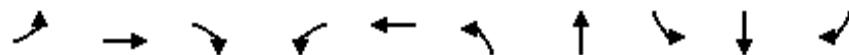
Queue shown is maximum after two cycles.

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

## Queues

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group             | EBL  | EBT   | EBC  | WBL  | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|------------------------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| Lane Group Flow (vph)  | 20   | 226   | 135  | 27   | 109   | 176   | 1535  | 240   | 1259  | 102   |
| v/c Ratio              | 0.10 | 0.75  | 0.44 | 0.29 | 0.36  | 0.74  | 0.75  | 0.69  | 0.47  | 0.08  |
| Control Delay          | 48.8 | 71.6  | 24.0 | 57.7 | 41.8  | 44.3  | 24.6  | 45.2  | 6.5   | 1.2   |
| Queue Delay            | 0.0  | 0.0   | 0.0  | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay            | 48.8 | 71.6  | 24.0 | 57.7 | 41.8  | 44.3  | 24.6  | 45.2  | 6.5   | 1.2   |
| Queue Length 50th (m)  | 4.8  | 60.7  | 11.7 | 6.7  | 20.6  | 35.1  | 161.0 | 46.4  | 43.2  | 0.0   |
| Queue Length 95th (m)  | 11.7 | 83.4  | 29.9 | 15.5 | 36.3  | #82.7 | 196.0 | #82.1 | 70.4  | m3.1  |
| Internal Link Dist (m) |      | 197.7 |      |      | 123.8 |       | 371.2 |       | 464.2 |       |
| Turn Bay Length (m)    | 32.0 |       | 30.0 | 30.0 |       | 170.0 |       | 78.0  |       | 130.0 |
| Base Capacity (vph)    | 295  | 461   | 431  | 145  | 449   | 237   | 2039  | 350   | 2681  | 1216  |
| Starvation Cap Reductn | 0    | 0     | 0    | 0    | 0     | 0     | 0     | 0     | 0     | 0     |
| Spillback Cap Reductn  | 0    | 0     | 0    | 0    | 0     | 0     | 0     | 0     | 0     | 0     |
| Storage Cap Reductn    | 0    | 0     | 0    | 0    | 0     | 0     | 0     | 0     | 0     | 0     |
| Reduced v/c Ratio      | 0.07 | 0.49  | 0.31 | 0.19 | 0.24  | 0.74  | 0.75  | 0.69  | 0.47  | 0.08  |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

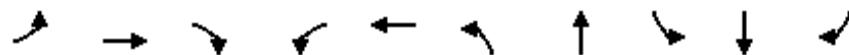
Queue shown is maximum after two cycles.

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

## Queues

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



| Lane Group             | EBL  | EBT   | EBR  | WBL  | WBT   | NBL   | NBT   | SBL   | SBT   | SBR  |
|------------------------|------|-------|------|------|-------|-------|-------|-------|-------|------|
| Lane Group Flow (vph)  | 163  | 120   | 164  | 151  | 122   | 79    | 2147  | 162   | 1566  | 196  |
| v/c Ratio              | 0.80 | 0.38  | 0.54 | 0.75 | 0.41  | 0.48  | 0.70  | 0.75  | 0.43  | 0.16 |
| Control Delay          | 81.3 | 53.1  | 40.1 | 76.1 | 39.9  | 32.5  | 21.7  | 52.4  | 8.6   | 1.6  |
| Queue Delay            | 0.0  | 0.0   | 0.0  | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0  |
| Total Delay            | 81.3 | 53.1  | 40.1 | 76.1 | 39.9  | 32.5  | 21.7  | 52.4  | 8.6   | 1.6  |
| Queue Length 50th (m)  | 44.0 | 29.9  | 27.8 | 40.4 | 22.1  | 11.2  | 137.4 | 27.0  | 55.8  | 0.7  |
| Queue Length 95th (m)  | 64.0 | 44.7  | 46.9 | 60.0 | 38.1  | #41.1 | 207.5 | 51.7  | 84.6  | 9.1  |
| Internal Link Dist (m) |      | 167.9 |      |      | 140.2 |       | 718.6 |       | 284.6 |      |
| Turn Bay Length (m)    | 31.0 |       | 35.0 | 45.0 |       | 120.0 |       | 112.0 |       | 50.0 |
| Base Capacity (vph)    | 308  | 474   | 426  | 304  | 426   | 163   | 3073  | 270   | 3607  | 1201 |
| 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      | 0.53 | 0.25  | 0.38 | 0.50 | 0.29  | 0.48  | 0.70  | 0.60  | 0.43  | 0.16 |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

## Queues

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group             | EBL   | EBT    | WBL    | WBT   | NBL   | NBT  | SBL   | SBT  | SBR  |
|------------------------|-------|--------|--------|-------|-------|------|-------|------|------|
| Lane Group Flow (vph)  | 163   | 337    | 59     | 172   | 206   | 1586 | 96    | 934  | 69   |
| v/c Ratio              | 0.79  | 0.88   | 0.81   | 0.45  | 0.50  | 0.73 | 0.46  | 0.43 | 0.07 |
| Control Delay          | 77.9  | 71.7   | 114.2  | 47.6  | 9.2   | 12.5 | 13.4  | 14.8 | 3.4  |
| Queue Delay            | 0.0   | 0.0    | 0.0    | 0.0   | 0.0   | 0.0  | 0.0   | 0.0  | 0.0  |
| Total Delay            | 77.9  | 71.7   | 114.2  | 47.6  | 9.2   | 12.5 | 13.4  | 14.8 | 3.4  |
| Queue Length 50th (m)  | 42.1  | 79.8   | 15.3   | 37.4  | 10.2  | 57.0 | 7.6   | 70.7 | 0.7  |
| Queue Length 95th (m)  | #71.9 | #122.8 | #40.1  | 59.3  | m19.6 | 92.2 | 13.4  | 85.5 | 6.8  |
| Internal Link Dist (m) | 99.2  |        | 1187.3 |       | 464.2 |      | 152.1 |      |      |
| Turn Bay Length (m)    |       | 15.0   |        | 126.0 |       | 75.0 |       | 45.0 |      |
| Base Capacity (vph)    | 233   | 424    | 82     | 428   | 413   | 2170 | 255   | 2186 | 978  |
| Starvation Cap Reductn | 0     | 0      | 0      | 0     | 0     | 0    | 0     | 0    | 0    |
| Spillback Cap Reductn  | 0     | 0      | 0      | 0     | 0     | 0    | 0     | 0    | 0    |
| Storage Cap Reductn    | 0     | 0      | 0      | 0     | 0     | 0    | 0     | 0    | 0    |
| Reduced v/c Ratio      | 0.70  | 0.79   | 0.72   | 0.40  | 0.50  | 0.73 | 0.38  | 0.43 | 0.07 |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

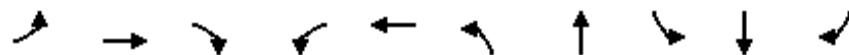
Queue shown is maximum after two cycles.

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

## Queues

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group             | EBL  | EBT  | EBR    | WBL  | WBT   | NBL   | NBT   | SBL   | SBT  | SBR   |
|------------------------|------|------|--------|------|-------|-------|-------|-------|------|-------|
| Lane Group Flow (vph)  | 75   | 45   | 380    | 144  | 352   | 179   | 1626  | 23    | 1177 | 32    |
| v/c Ratio              | 0.43 | 0.11 | 0.91   | 0.36 | 0.66  | 0.87  | 0.78  | 0.16  | 0.59 | 0.03  |
| Control Delay          | 54.5 | 42.9 | 64.2   | 38.2 | 45.0  | 67.6  | 28.4  | 11.4  | 13.6 | 0.1   |
| Queue Delay            | 0.0  | 0.0  | 0.0    | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0  | 0.0   |
| Total Delay            | 54.5 | 42.9 | 64.2   | 38.2 | 45.0  | 67.6  | 28.4  | 11.4  | 13.6 | 0.1   |
| Queue Length 50th (m)  | 17.6 | 9.8  | 75.2   | 28.9 | 75.4  | 45.4  | 197.3 | 1.7   | 77.6 | 0.0   |
| Queue Length 95th (m)  | 33.2 | 20.2 | #124.3 | 45.7 | 107.4 | #97.7 | 238.8 | m3.9  | 86.3 | m0.0  |
| Internal Link Dist (m) |      |      | 197.7  |      |       | 123.8 |       | 371.2 |      | 464.2 |
| Turn Bay Length (m)    | 32.0 |      | 30.0   | 30.0 |       | 170.0 |       | 78.0  |      | 130.0 |
| Base Capacity (vph)    | 199  | 466  | 463    | 402  | 590   | 205   | 2073  | 189   | 1990 | 999   |
| 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      | 0.38 | 0.10 | 0.82   | 0.36 | 0.60  | 0.87  | 0.78  | 0.12  | 0.59 | 0.03  |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

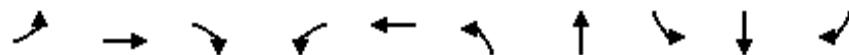
Queue shown is maximum after two cycles.

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

## Queues

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



| Lane Group             | EBL   | EBT   | EBR  | WBL  | WBT   | NBL   | NBT    | SBL   | SBT   | SBR  |
|------------------------|-------|-------|------|------|-------|-------|--------|-------|-------|------|
| Lane Group Flow (vph)  | 180   | 104   | 112  | 73   | 206   | 156   | 2532   | 100   | 1567  | 77   |
| v/c Ratio              | 0.93  | 0.26  | 0.27 | 0.26 | 0.50  | 0.61  | 0.84   | 0.62  | 0.53  | 0.08 |
| Control Delay          | 100.9 | 45.0  | 8.2  | 45.4 | 35.3  | 20.8  | 27.5   | 41.4  | 20.2  | 6.9  |
| Queue Delay            | 0.0   | 0.0   | 0.0  | 0.0  | 0.0   | 0.0   | 0.0    | 0.0   | 0.0   | 0.0  |
| Total Delay            | 100.9 | 45.0  | 8.2  | 45.4 | 35.3  | 20.8  | 27.5   | 41.4  | 20.2  | 6.9  |
| Queue Length 50th (m)  | 49.3  | 24.2  | 0.0  | 17.0 | 34.3  | 12.8  | 196.9  | 11.4  | 91.3  | 2.5  |
| Queue Length 95th (m)  | 72.8  | 36.7  | 14.0 | 28.4 | 53.3  | 32.0  | #293.1 | 32.9  | 133.1 | 11.9 |
| Internal Link Dist (m) |       | 167.9 |      |      | 140.2 |       | 718.6  |       | 284.6 |      |
| Turn Bay Length (m)    | 31.0  |       | 35.0 | 45.0 |       | 120.0 |        | 112.0 |       | 50.0 |
| Base Capacity (vph)    | 265   | 551   | 521  | 378  | 535   | 297   | 3027   | 195   | 2959  | 934  |
| 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      | 0.68  | 0.19  | 0.21 | 0.19 | 0.39  | 0.53  | 0.84   | 0.51  | 0.53  | 0.08 |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

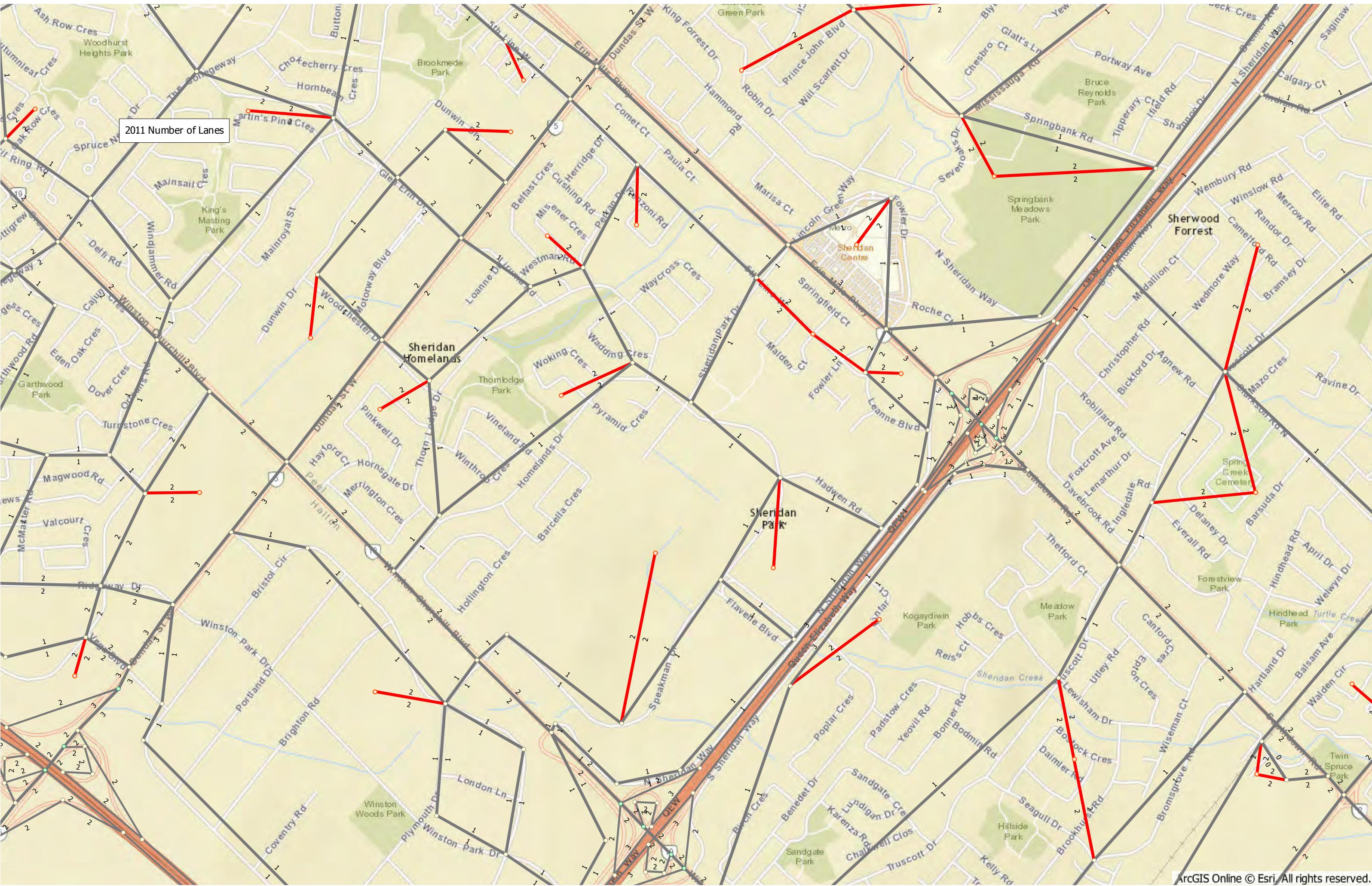


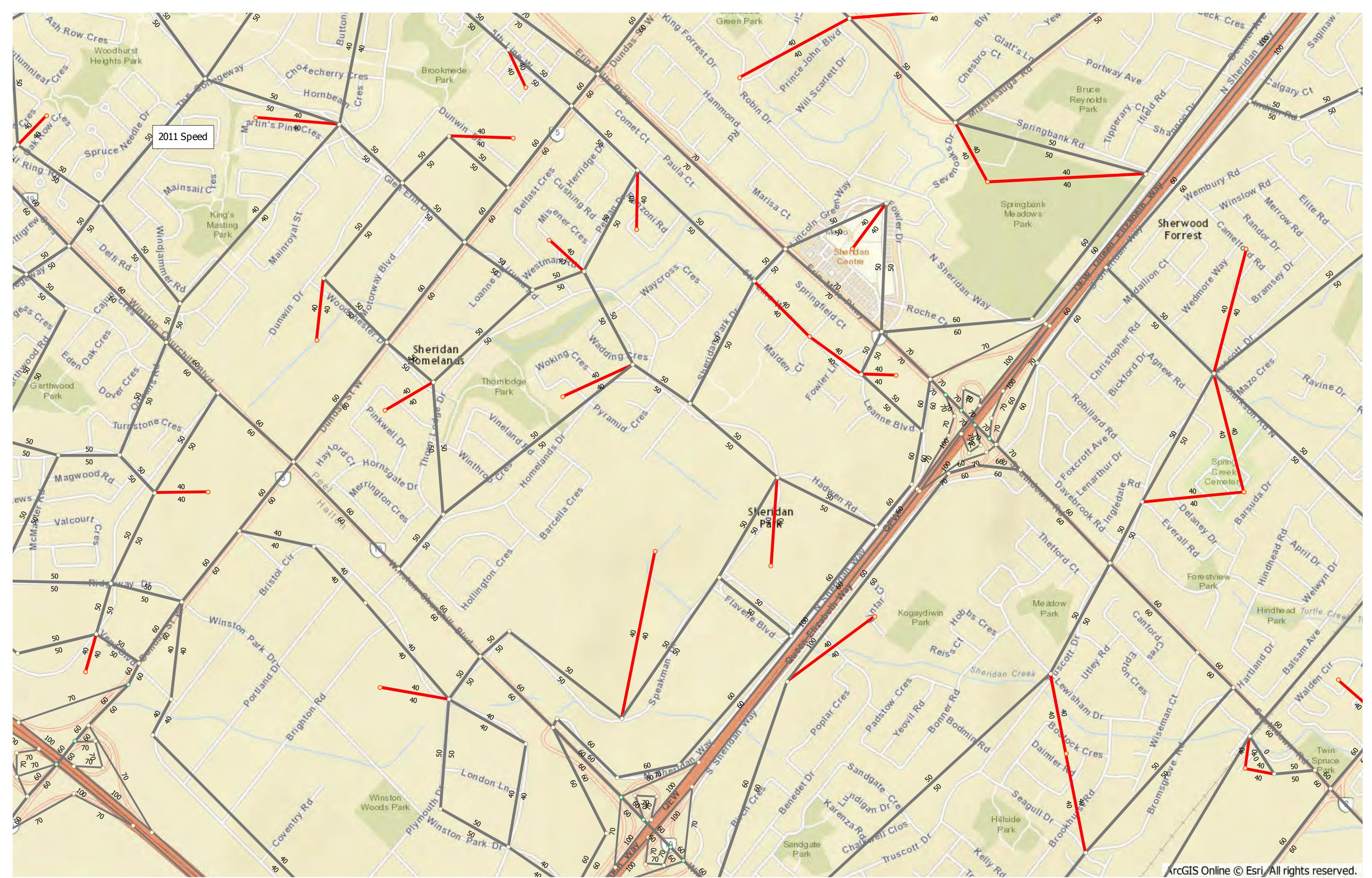
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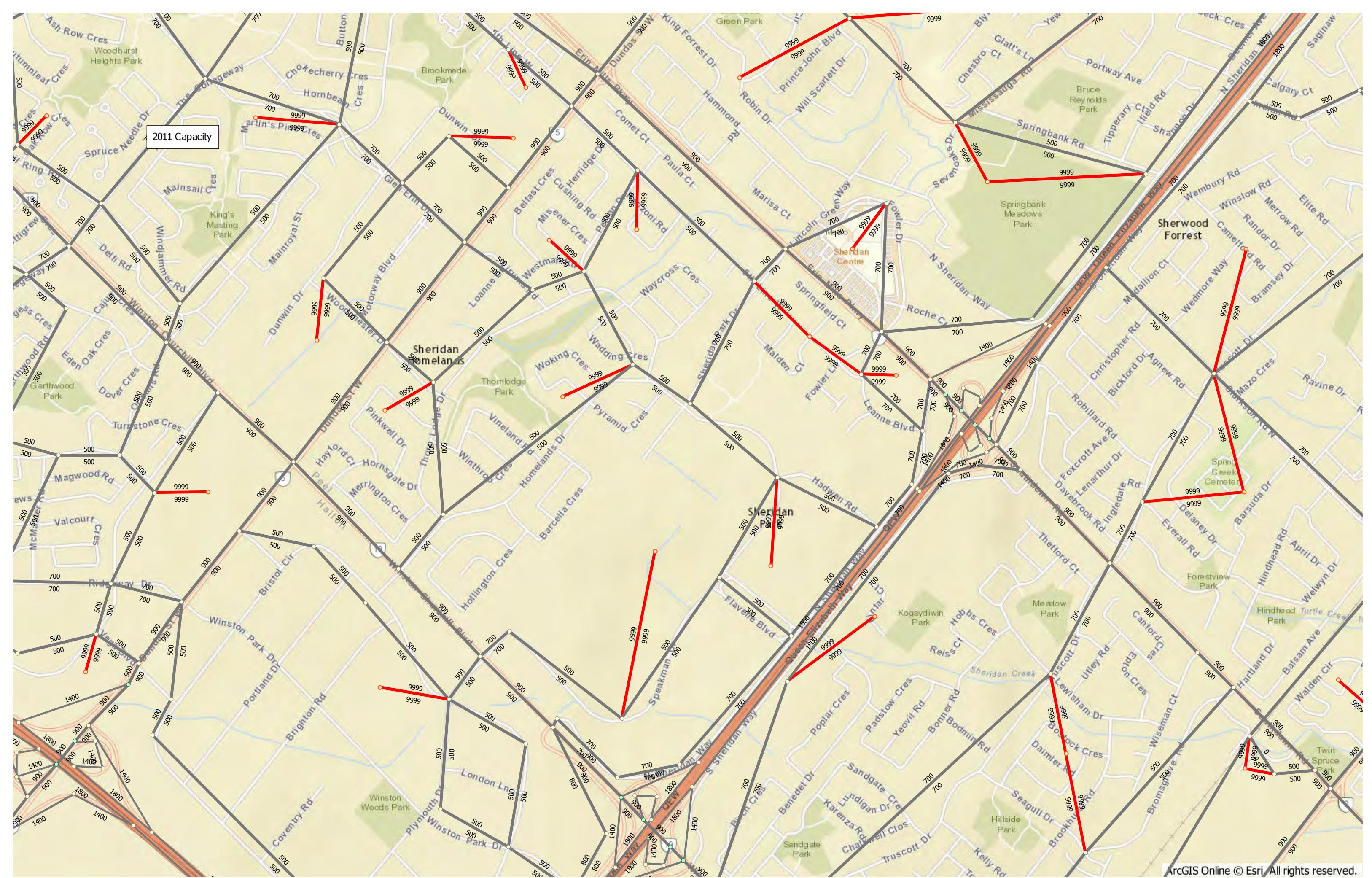
## Appendix D

### EMME Model Output

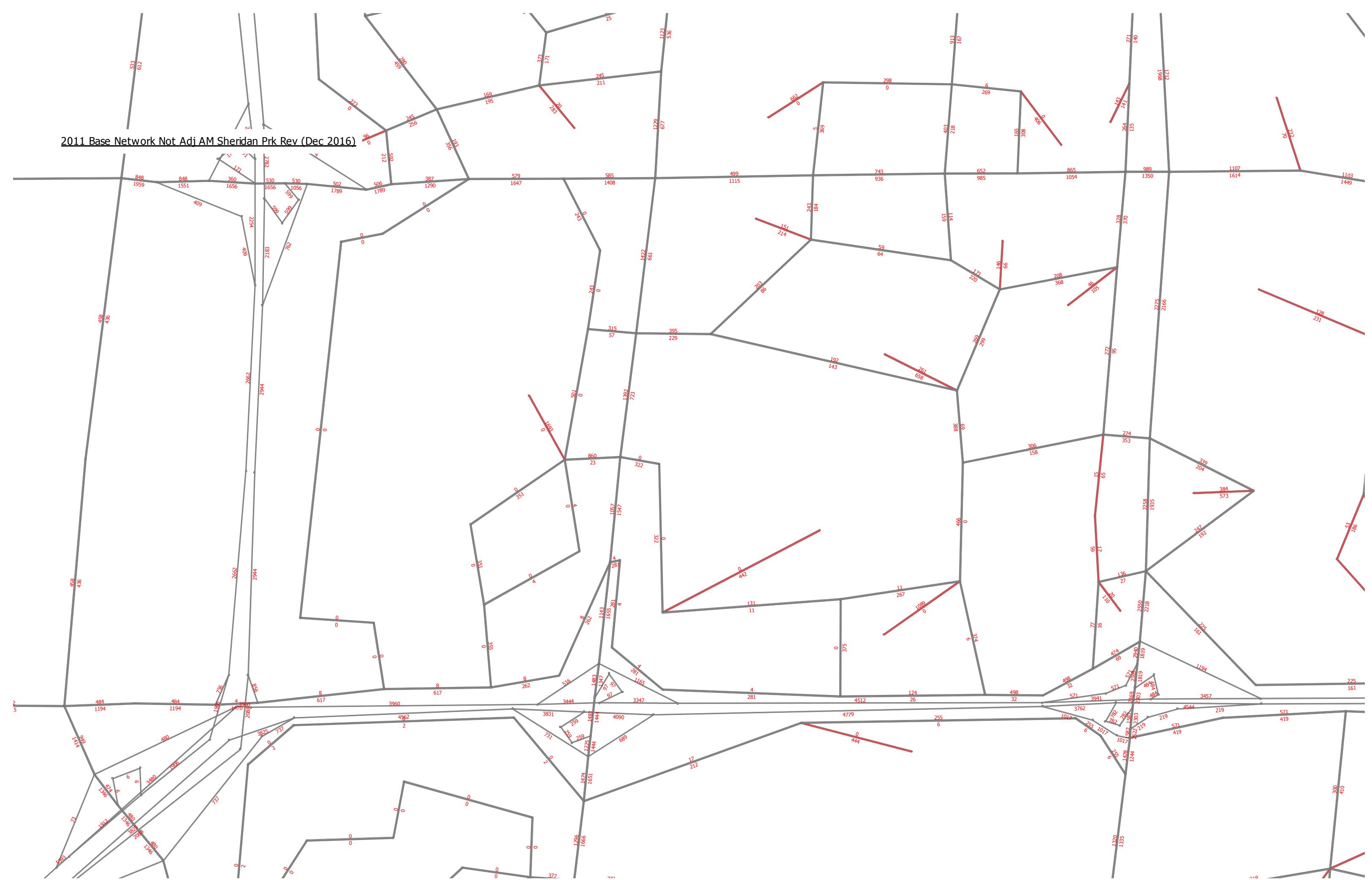
# **Existing Conditions**



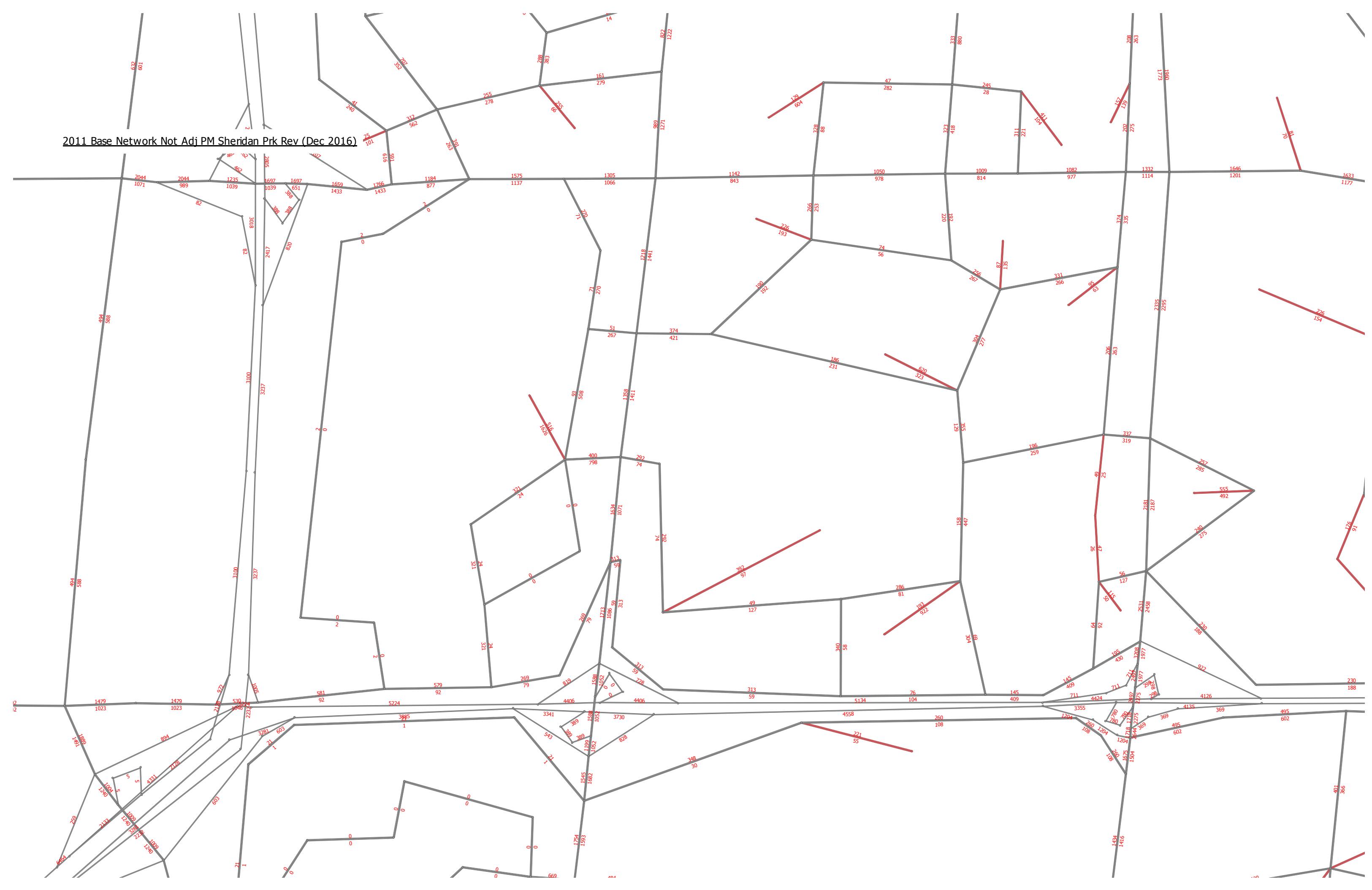




2011 Zone Boundaries



2011 Base Network Not Adj PM Sheridan Prk Rev (Dec 2010)

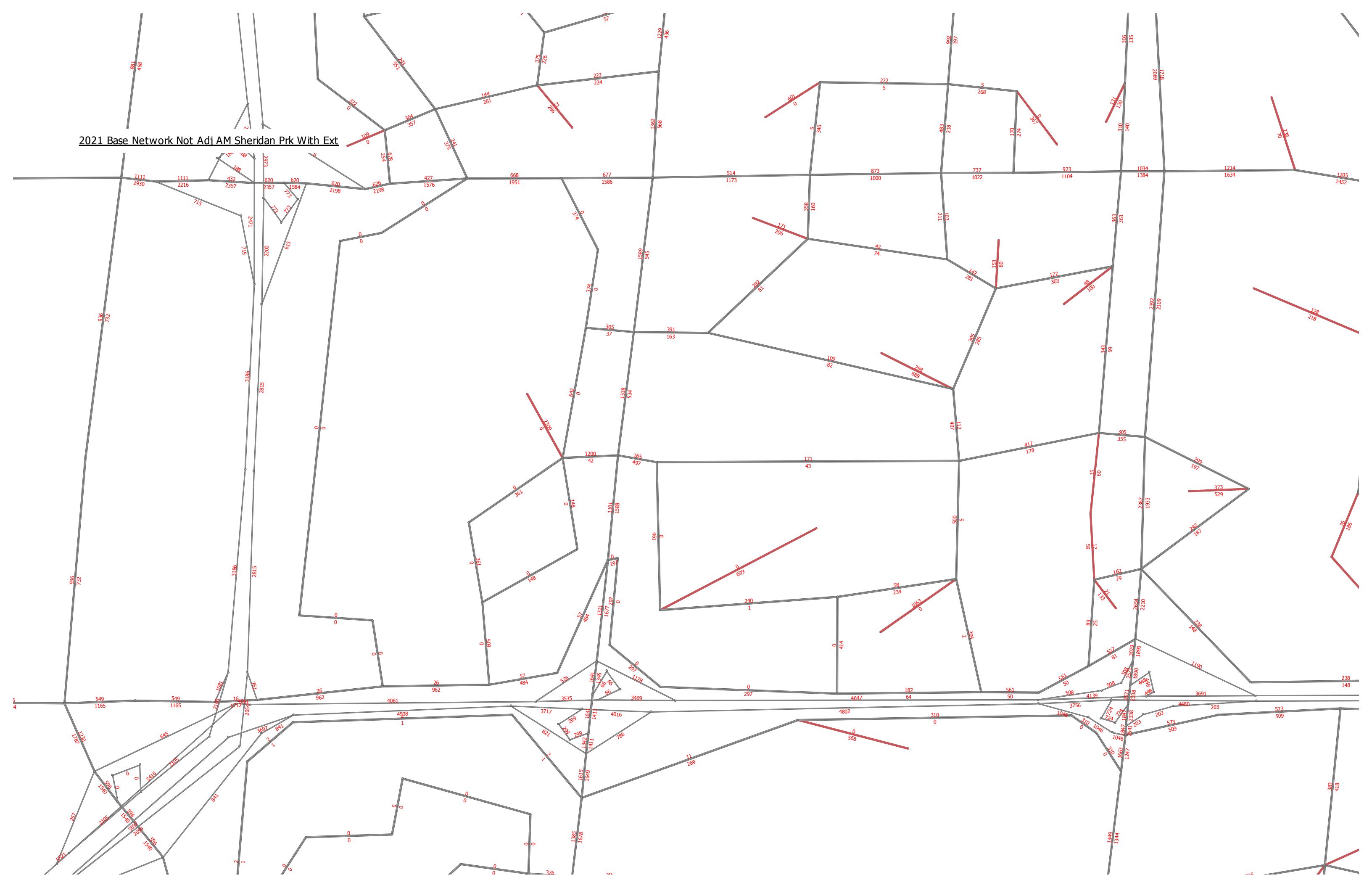


# **2021 Conditions**

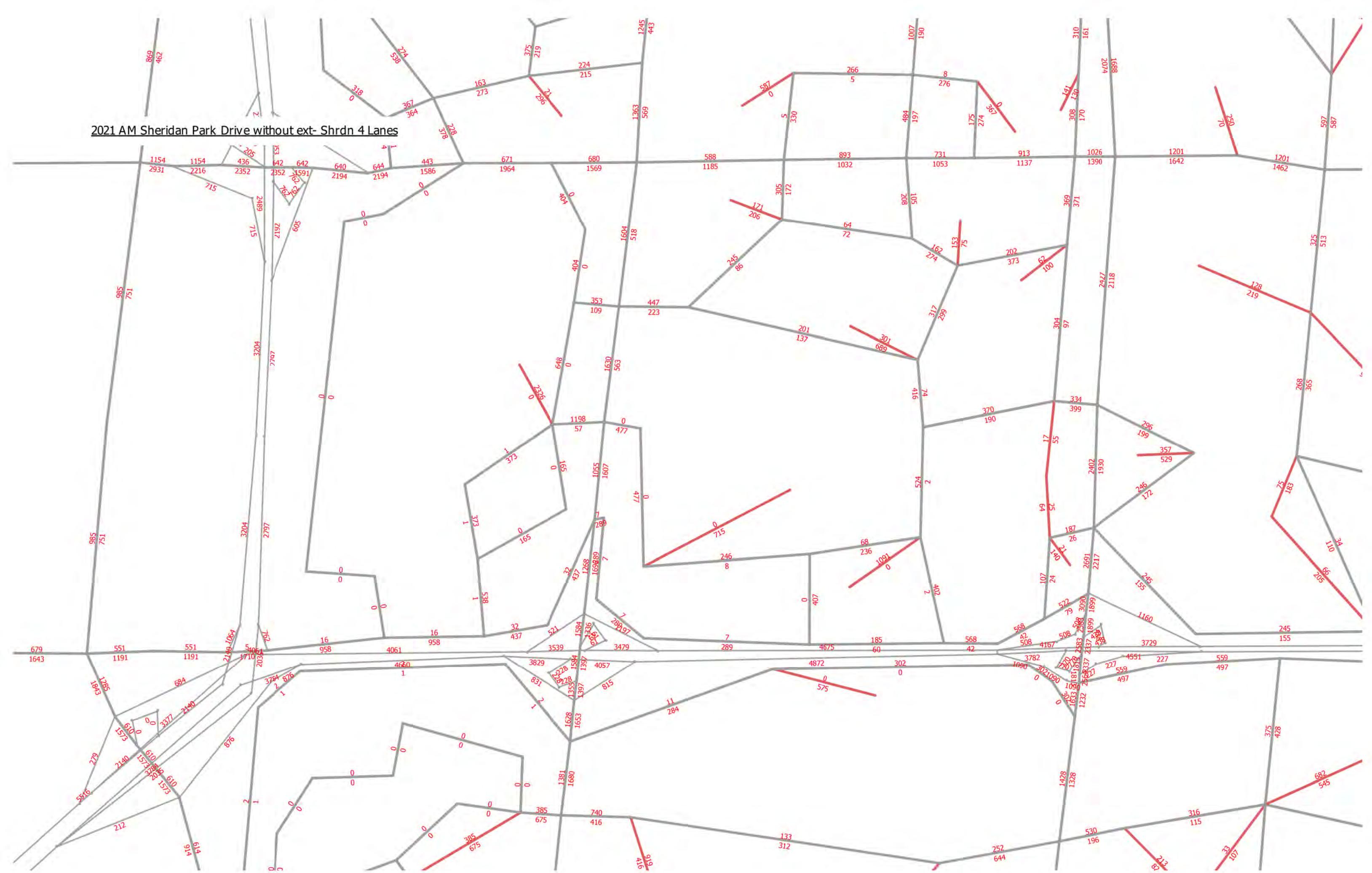
**AM**



2021 Base Network Not Adj AM Sheridan Prk With Ext



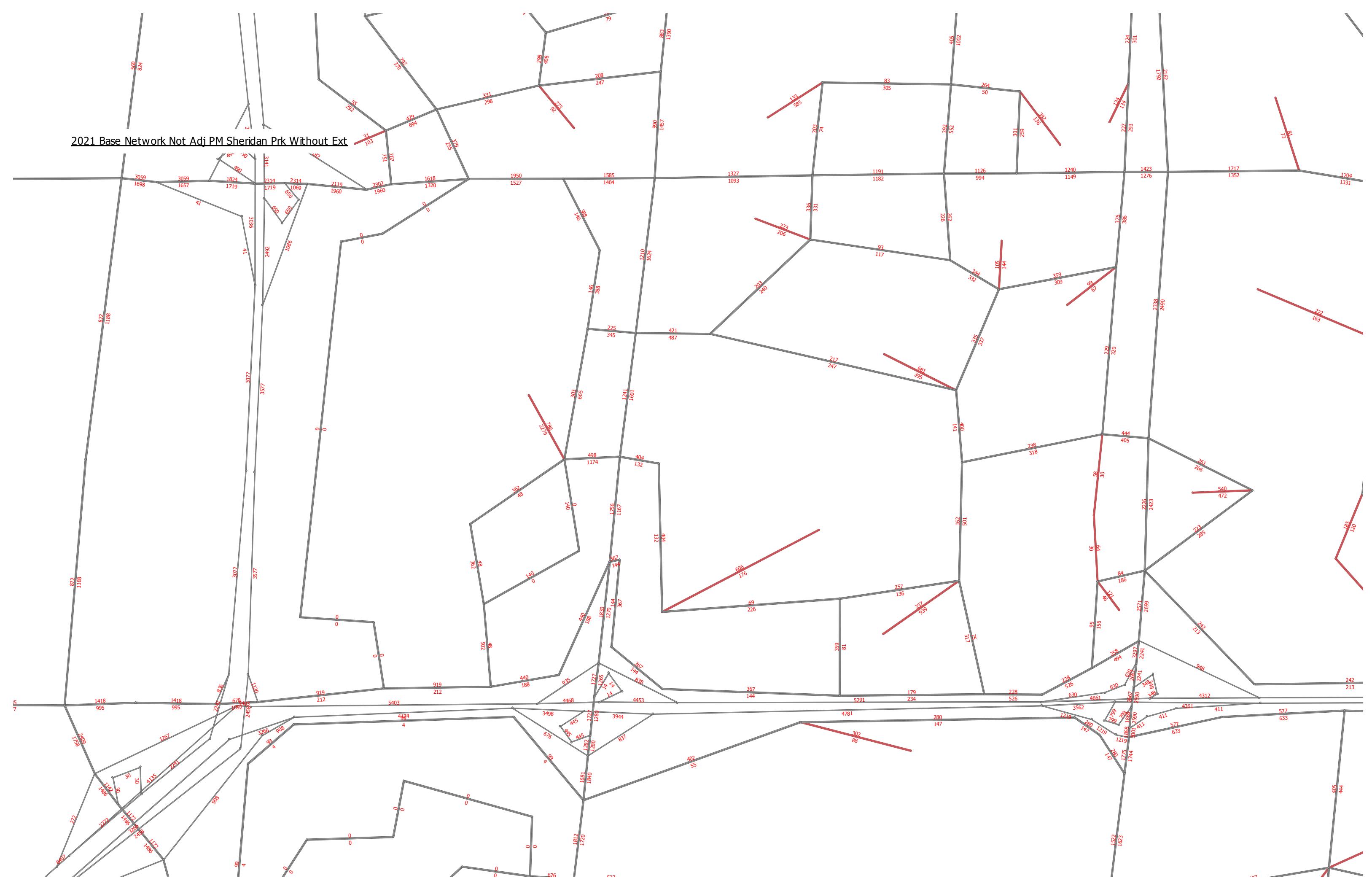
## 2021 AM Sheridan Park Drive without ext- Shrdn 4 Lanes



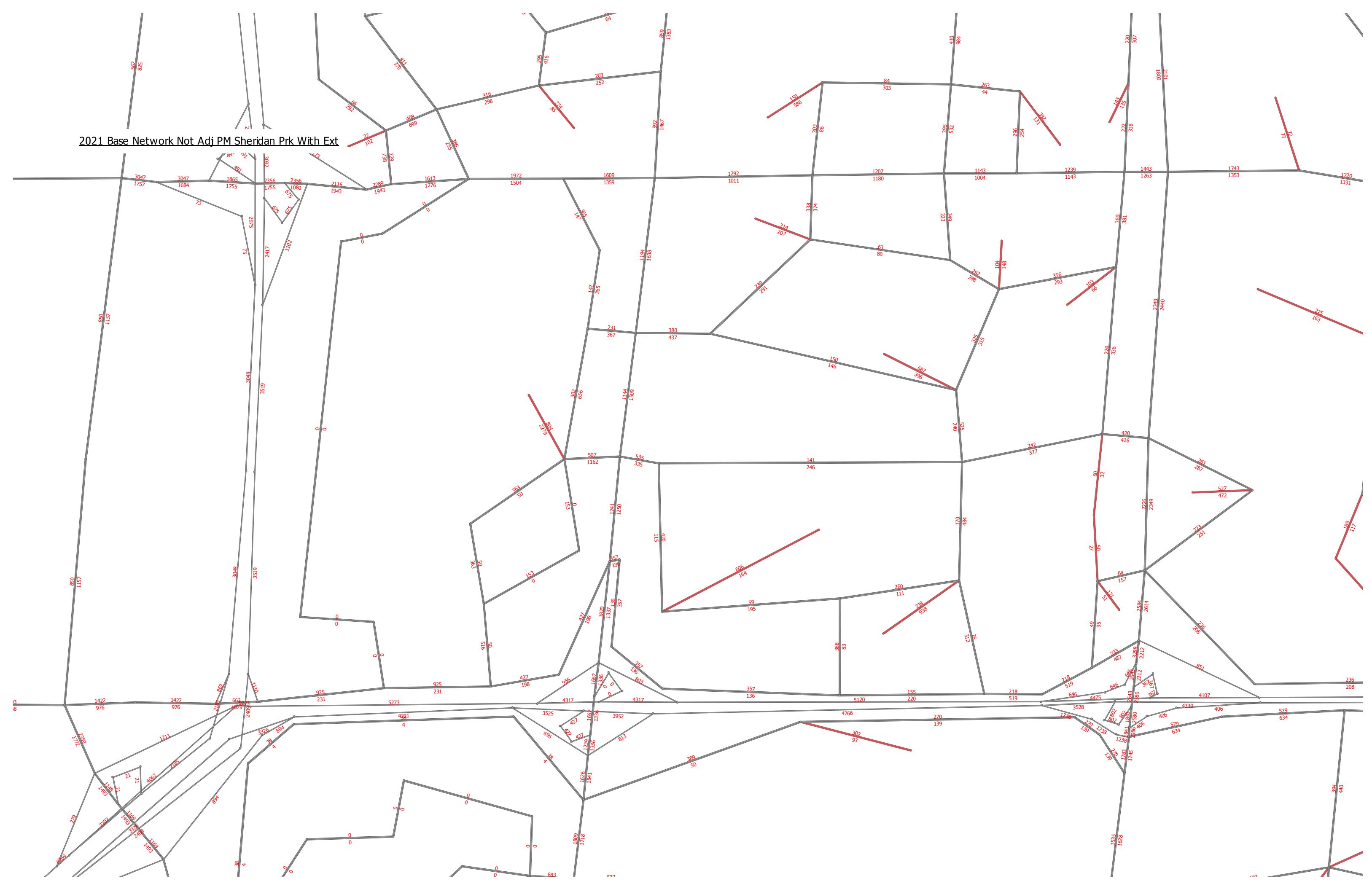
## 2021 AM Sheridan Park Drive With Ext-4 Lanes on SheridanPark



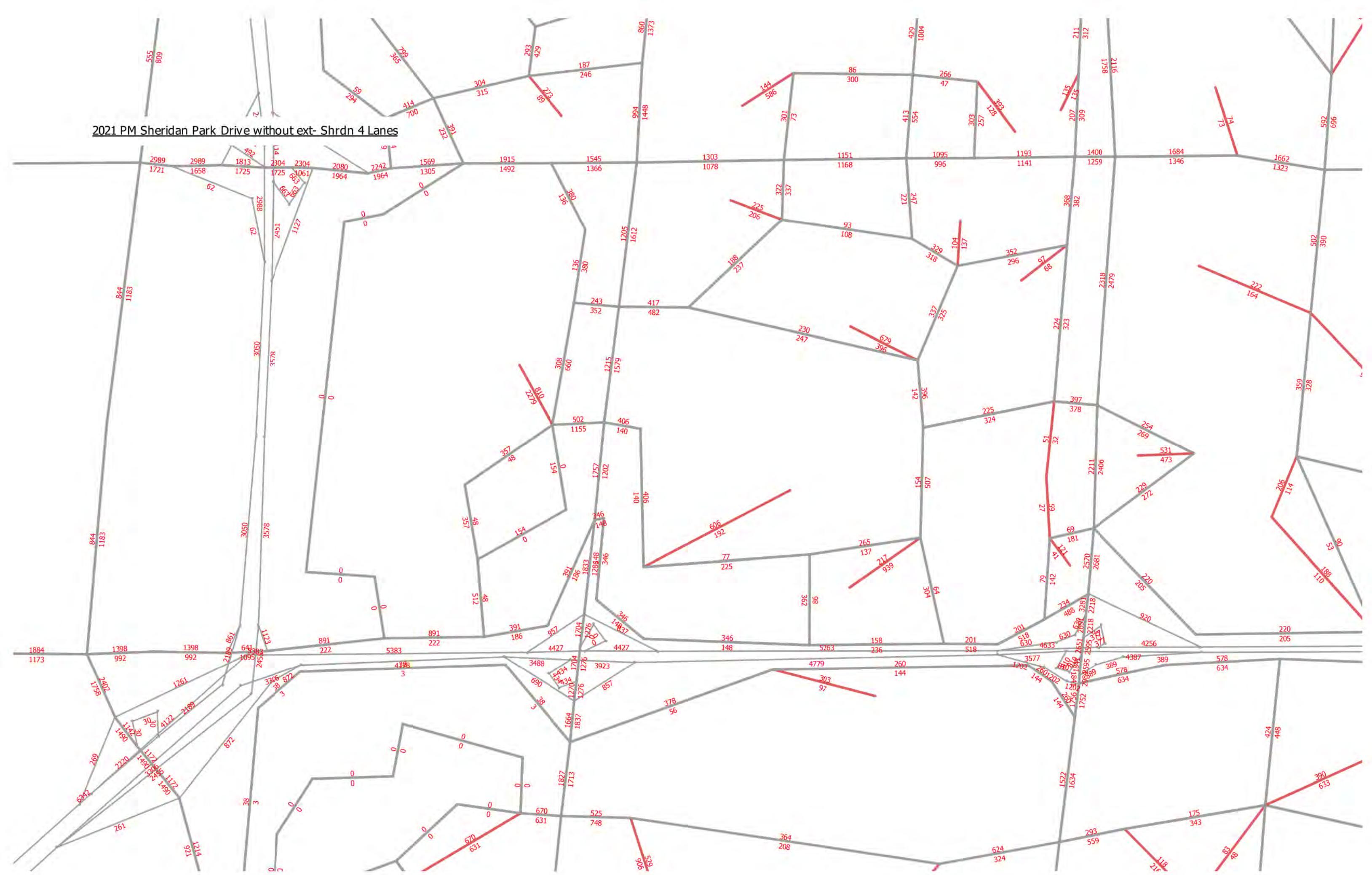
**PM**



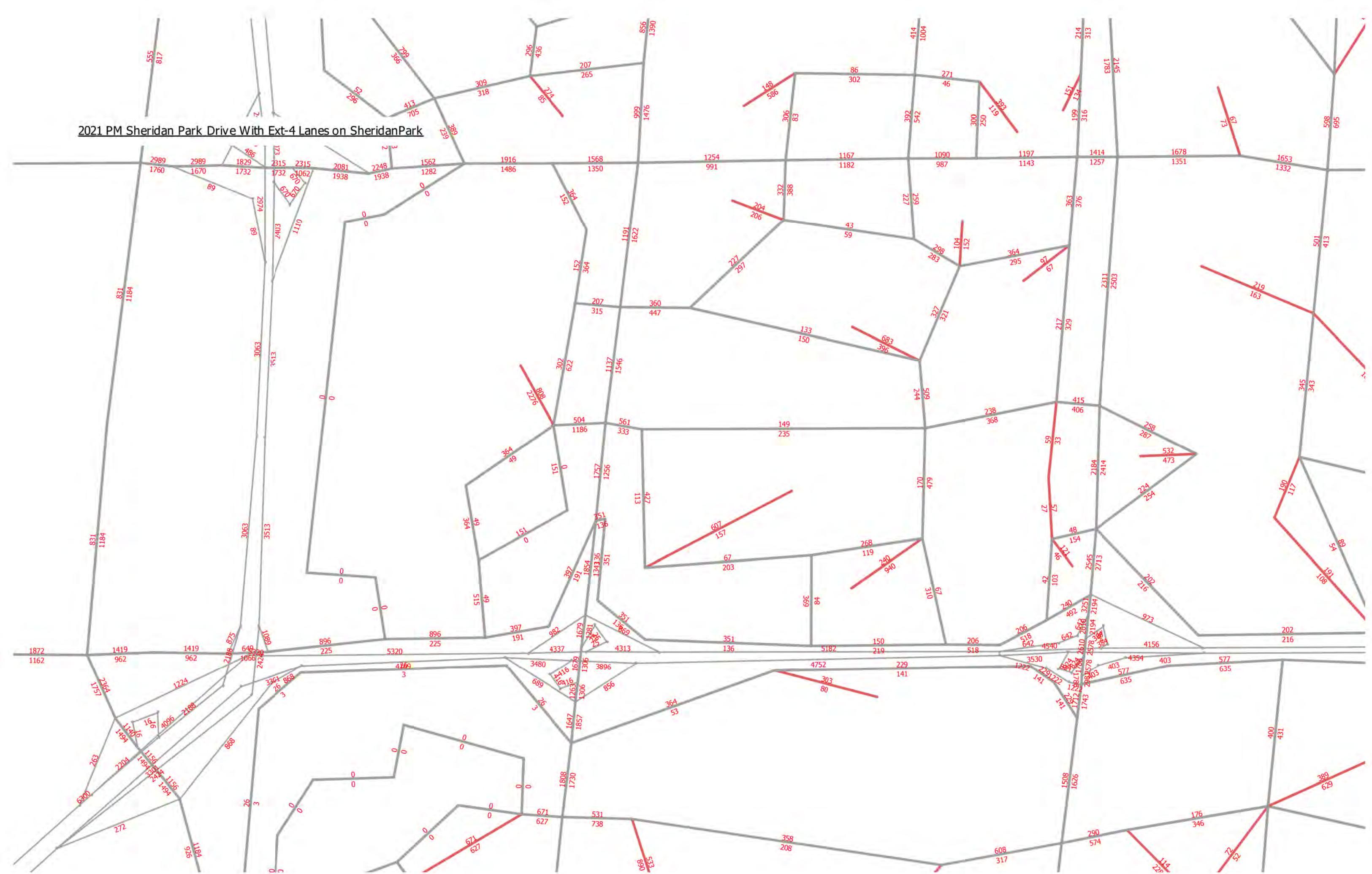
2021 Base Network Not Adj PM Sheridan Prk With Ext



## 2021 PM Sheridan Park Drive without ext- Shrdn 4 Lanes



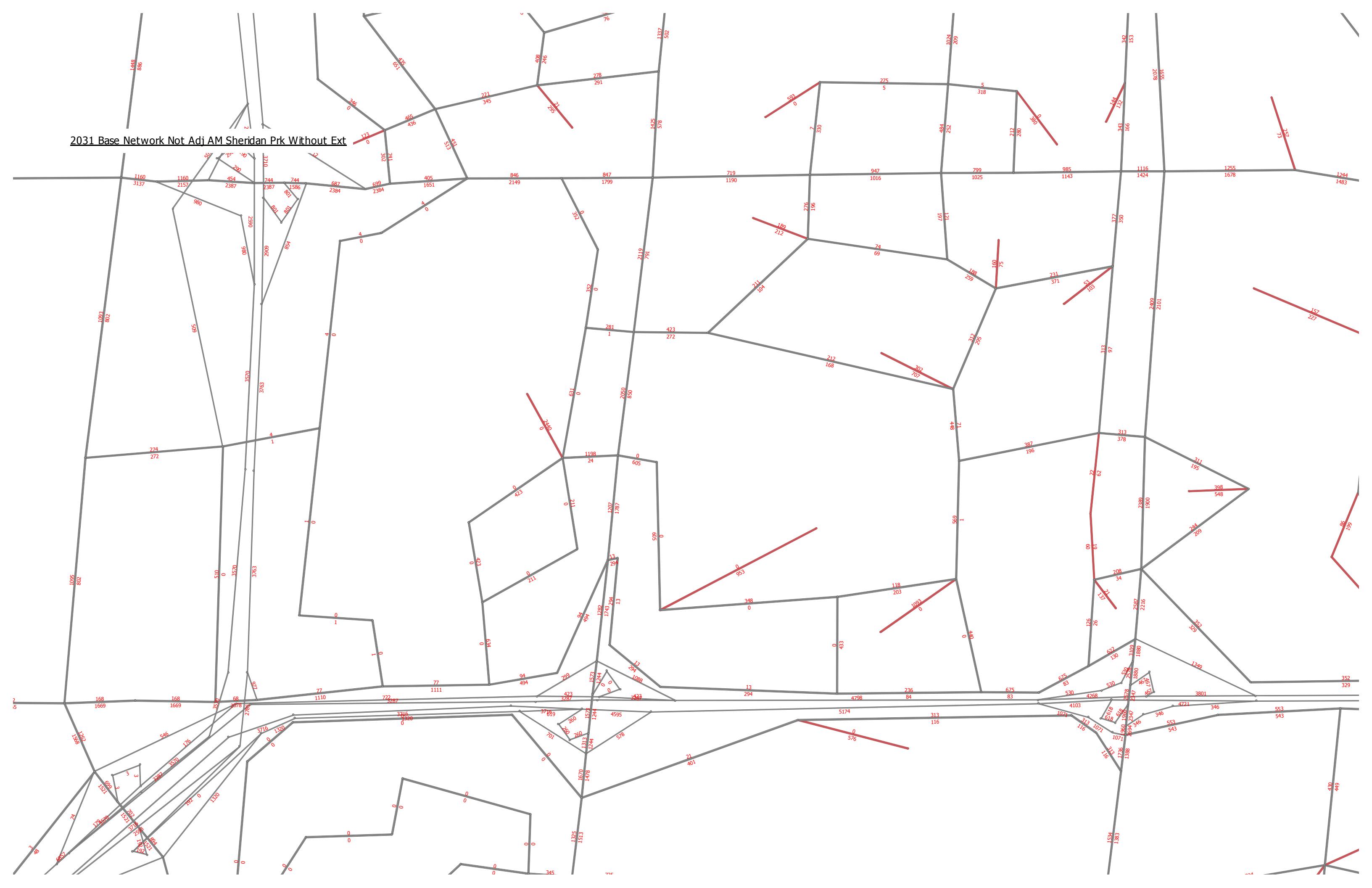
2021 PM Sheridan Park Drive With Ext-4 Lanes on SheridanPark



# **2031 Conditions**

**AM**

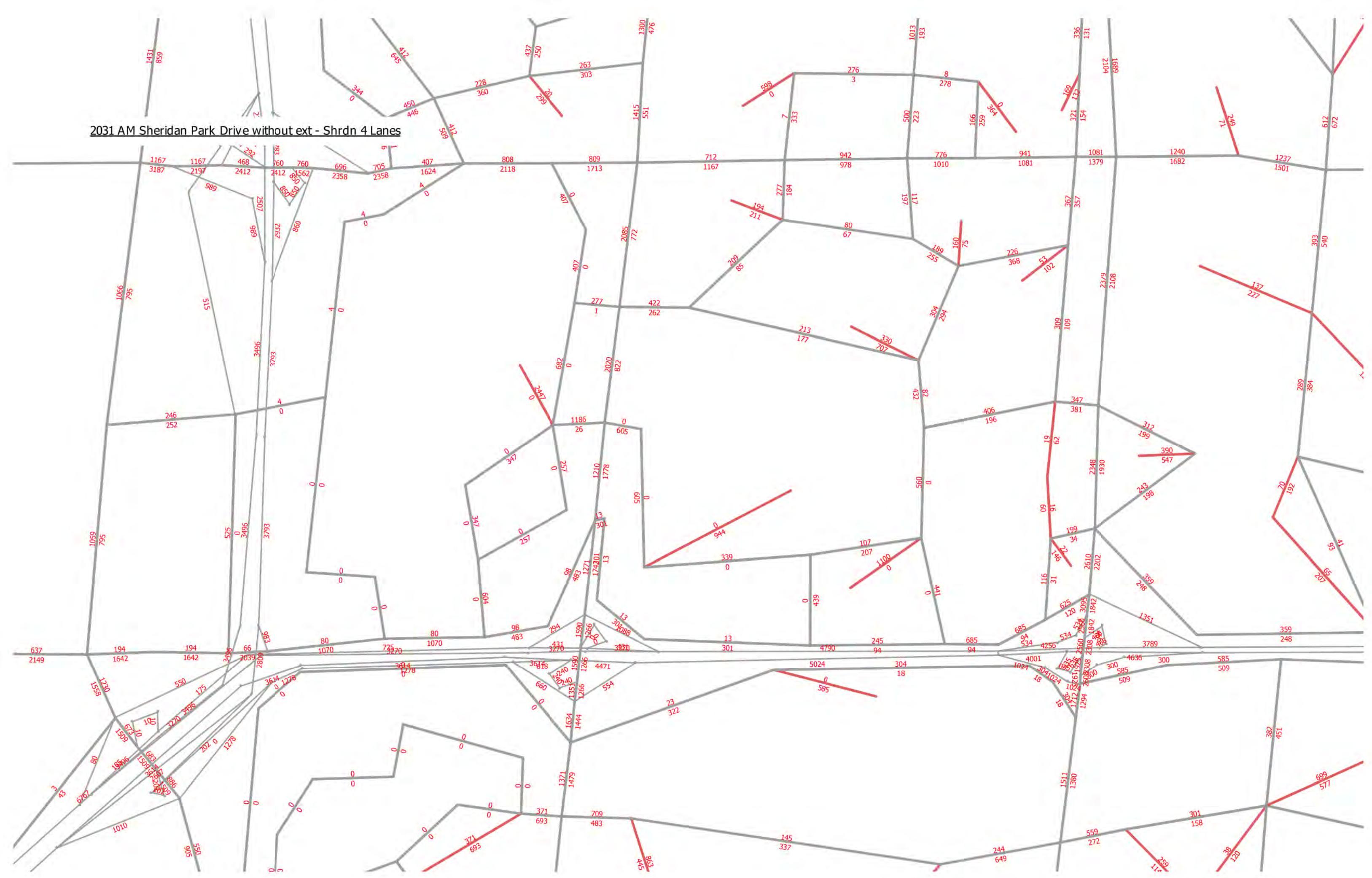
2031 Base Network Not Adj AM Sheridan Prk Without Ext



2031 Base Network Not Adj AM Sheridan Prk With Ex



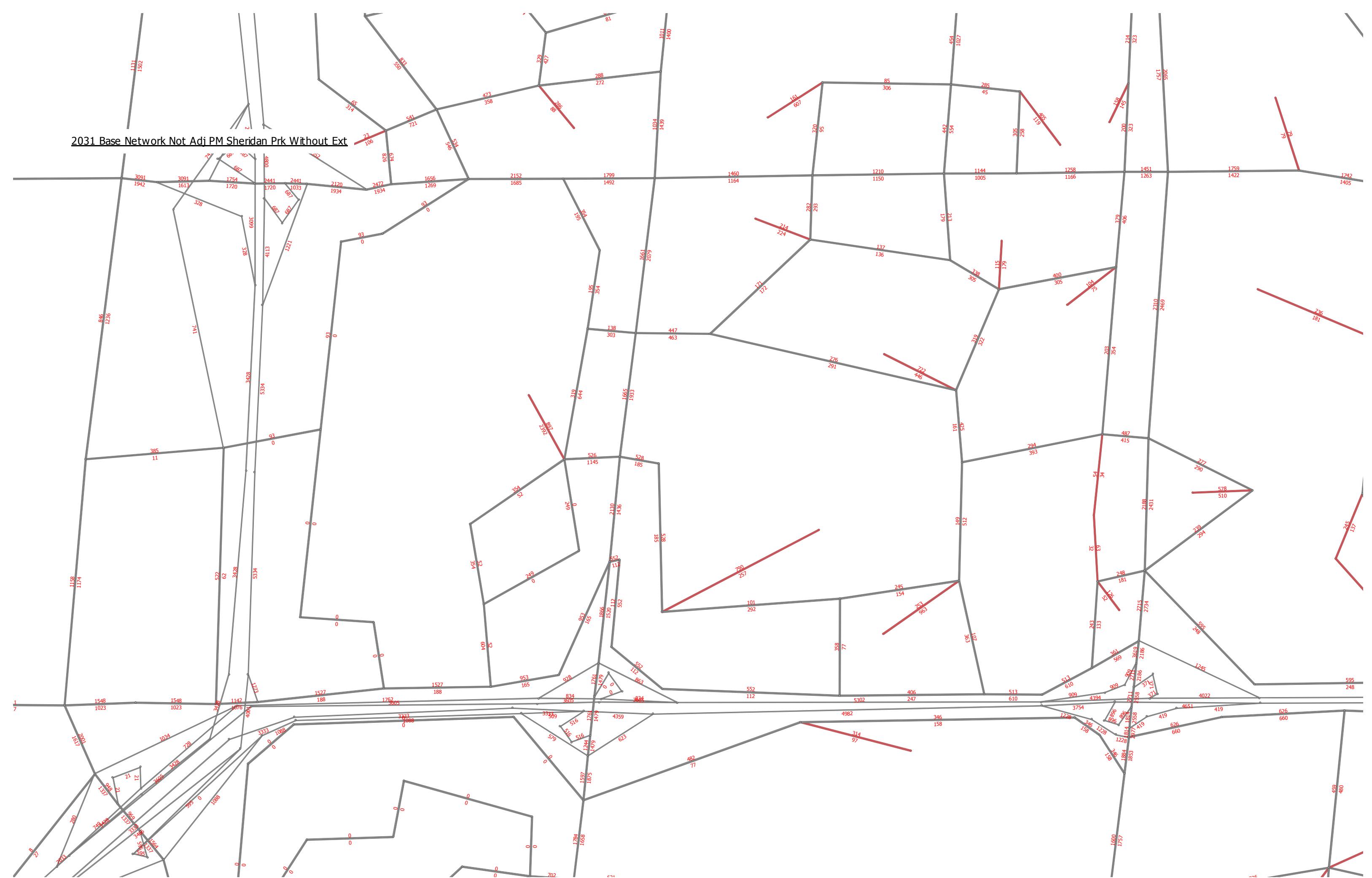
2031 AM Sheridan Park Drive without ext - Shrdn 4 Lanes



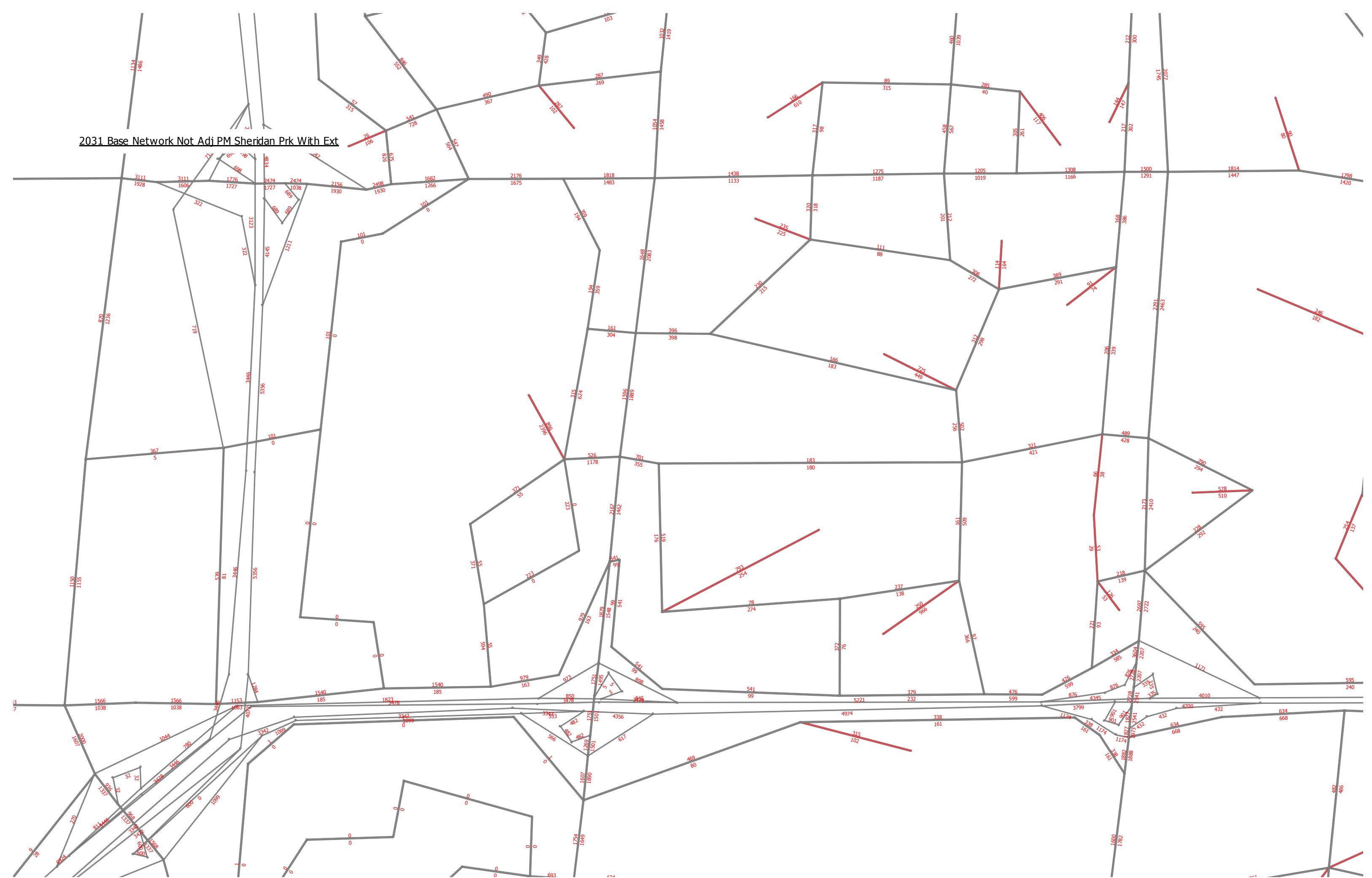
## 2031 AM Sheridan Park Drive With Ext-4 Lanes on SheridanPark



**PM**



2031 Base Network Not Adj PM Sheridan Prk With Ext





## 2031 PM Sheridan Park Drive With Ext-4 Lanes on SheridanPark





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## Appendix E

### 2021 Traffic Operations Without Sheridan Park Drive Extension

## Timings

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↑ ↗ ↘ | ↑ ↗   | ↑ ↗   | ↑ ↗   |
| Traffic Volume (vph) | 36    | 48    | 111   | 106   | 234   | 1060  | 49    | 1362  | 121   |
| Future Volume (vph)  | 36    | 48    | 111   | 106   | 234   | 1060  | 49    | 1362  | 121   |
| Turn Type            | Perm  | NA    | Perm  | NA    | pm+pt | NA    | Perm  | NA    | Perm  |
| Protected Phases     |       |       |       | 4     | 8     | 5     | 2     | 6     |       |
| Permitted Phases     |       |       |       | 4     | 8     | 2     | 6     | 6     |       |
| Detector Phase       | 4     | 4     | 8     | 8     | 5     | 2     | 6     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 35.0  | 35.0  | 35.0  | 35.0  | 9.5   | 25.0  | 25.0  | 25.0  | 25.0  |
| Total Split (s)      | 39.0  | 39.0  | 39.0  | 39.0  | 11.0  | 101.0 | 90.0  | 90.0  | 90.0  |
| Total Split (%)      | 27.9% | 27.9% | 27.9% | 27.9% | 7.9%  | 72.1% | 64.3% | 64.3% | 64.3% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 4.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 6.0   | 6.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       | Lead  |       | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?   |       |       |       |       | Yes   |       | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | C-Max | C-Max | C-Max |
| Act Effect Green (s) | 20.5  | 20.5  | 20.5  | 20.5  | 109.5 | 106.5 | 84.0  | 84.0  | 84.0  |
| Actuated g/C Ratio   | 0.15  | 0.15  | 0.15  | 0.15  | 0.78  | 0.76  | 0.60  | 0.60  | 0.60  |
| v/c Ratio            | 0.35  | 0.52  | 0.83  | 0.69  | 0.72  | 0.49  | 0.24  | 0.72  | 0.14  |
| Control Delay        | 59.9  | 37.8  | 96.6  | 63.5  | 48.1  | 6.7   | 16.5  | 22.2  | 5.9   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 59.9  | 37.8  | 96.6  | 63.5  | 48.1  | 6.7   | 16.5  | 22.2  | 5.9   |
| LOS                  | E     | D     | F     | E     | D     | A     | B     | C     | A     |
| Approach Delay       |       | 42.5  |       | 76.8  |       | 13.7  |       | 20.7  |       |
| Approach LOS         |       | D     |       | E     |       | B     |       | C     |       |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 23.5

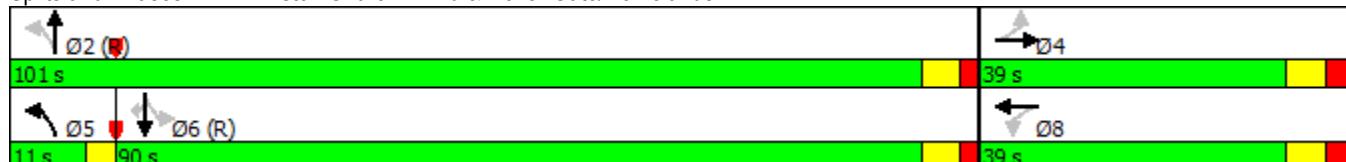
Intersection LOS: C

Intersection Capacity Utilization 87.2%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr



# HCM Unsignalized Intersection Capacity Analysis

2: Homelands Dr & Thorn Lodge Dr

12/04/2017



| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | Y    |       | Y    |                      | Y    |      |
| Sign Control                      | Stop |       | Stop |                      |      | Stop |
| Traffic Volume (vph)              | 195  | 50    | 113  | 105                  | 75   | 164  |
| Future Volume (vph)               | 195  | 50    | 113  | 105                  | 75   | 164  |
| Peak Hour Factor                  | 0.78 | 0.78  | 0.78 | 0.78                 | 0.78 | 0.78 |
| Hourly flow rate (vph)            | 250  | 64    | 145  | 135                  | 96   | 210  |
| Direction, Lane #                 | WB 1 | NB 1  | SB 1 |                      |      |      |
| Volume Total (vph)                | 314  | 280   | 306  |                      |      |      |
| Volume Left (vph)                 | 250  | 0     | 96   |                      |      |      |
| Volume Right (vph)                | 64   | 135   | 0    |                      |      |      |
| Hadj (s)                          | 0.09 | -0.13 | 0.18 |                      |      |      |
| Departure Headway (s)             | 5.5  | 5.2   | 5.4  |                      |      |      |
| Degree Utilization, x             | 0.48 | 0.40  | 0.46 |                      |      |      |
| Capacity (veh/h)                  | 612  | 659   | 630  |                      |      |      |
| Control Delay (s)                 | 13.6 | 11.6  | 13.0 |                      |      |      |
| Approach Delay (s)                | 13.6 | 11.6  | 13.0 |                      |      |      |
| Approach LOS                      | B    | B     | B    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Delay                             |      |       | 12.8 |                      |      |      |
| Level of Service                  |      |       | B    |                      |      |      |
| Intersection Capacity Utilization |      | 49.7% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |       | 15   |                      |      |      |

## Timings

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   |
| Traffic Volume (vph) | 19    | 255   | 131   | 27    | 70    | 46    | 198   | 1278  | 271   | 1226  | 115   |
| Future Volume (vph)  | 19    | 255   | 131   | 27    | 70    | 46    | 198   | 1278  | 271   | 1226  | 115   |
| Turn Type            | Perm  | NA    | Perm  | Perm  | NA    | Perm  | Perm  | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       |       | 8     |       |       | 2     | 1     | 6     |
| Permitted Phases     | 4     |       |       | 4     | 8     |       | 8     | 2     |       | 6     | 6     |
| Detector Phase       | 4     | 4     | 4     | 8     | 8     | 8     | 2     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 36.0  | 36.0  | 9.5   | 36.0  | 36.0  |
| Total Split (s)      | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 85.0  | 85.0  | 14.0  | 99.0  | 99.0  |
| Total Split (%)      | 29.3% | 29.3% | 29.3% | 29.3% | 29.3% | 29.3% | 60.7% | 60.7% | 10.0% | 70.7% | 70.7% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 6.0   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       |       |       | Lag   | Lag   | Lead  |       |       |
| Lead-Lag Optimize?   |       |       |       |       |       |       | Yes   | Yes   | Yes   |       |       |
| Recall Mode          | None  | None  | None  | None  | None  | None  | C-Max | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 25.3  | 25.3  | 25.3  | 25.3  | 25.3  | 25.3  | 79.0  | 79.0  | 104.7 | 101.7 | 101.7 |
| Actuated g/C Ratio   | 0.18  | 0.18  | 0.18  | 0.18  | 0.18  | 0.18  | 0.56  | 0.56  | 0.75  | 0.73  | 0.73  |
| v/c Ratio            | 0.09  | 0.78  | 0.41  | 0.31  | 0.21  | 0.15  | 0.95  | 0.82  | 0.89  | 0.50  | 0.10  |
| Control Delay        | 45.5  | 70.0  | 24.2  | 56.5  | 48.4  | 12.2  | 78.6  | 28.9  | 68.7  | 7.8   | 1.4   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 45.5  | 70.0  | 24.2  | 56.5  | 48.4  | 12.2  | 78.6  | 28.9  | 68.7  | 7.8   | 1.4   |
| LOS                  | D     | E     | C     | E     | D     | B     | E     | C     | E     | A     | A     |
| Approach Delay       |       | 54.0  |       |       |       | 38.3  |       |       | 34.6  |       | 17.6  |
| Approach LOS         |       | D     |       |       |       | D     |       |       | C     |       | B     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 29.7

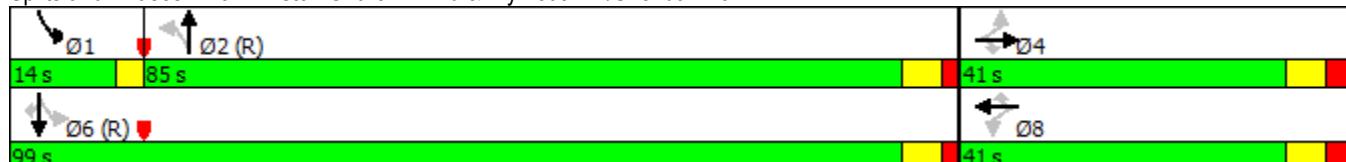
Intersection LOS: C

Intersection Capacity Utilization 95.8%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr



HCM Unsignalized Intersection Capacity Analysis  
4: Speakman Dr/Homelands Dr & Sheridan Park Dr

12/04/2017



| Movement                          | EBL   | EBT   | EBR   | WBL   | WBT  | WBR  | NBL                  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|-------|-------|-------|------|------|----------------------|------|------|------|------|------|
| Lane Configurations               |       |       |       |       |      |      |                      |      |      |      |      |      |
| Sign Control                      |       | Stop  |       |       |      | Stop |                      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 1     | 8     | 1     | 260   | 24   | 153  | 0                    | 55   | 161  | 227  | 143  | 17   |
| Future Volume (vph)               | 1     | 8     | 1     | 260   | 24   | 153  | 0                    | 55   | 161  | 227  | 143  | 17   |
| Peak Hour Factor                  | 0.82  | 0.82  | 0.82  | 0.82  | 0.82 | 0.82 | 0.82                 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph)            | 1     | 10    | 1     | 317   | 29   | 187  | 0                    | 67   | 196  | 277  | 174  | 21   |
| Direction, Lane #                 | EB 1  | WB 1  | NB 1  | SB 1  |      |      |                      |      |      |      |      |      |
| Volume Total (vph)                | 12    | 533   | 263   | 472   |      |      |                      |      |      |      |      |      |
| Volume Left (vph)                 | 1     | 317   | 0     | 277   |      |      |                      |      |      |      |      |      |
| Volume Right (vph)                | 1     | 187   | 196   | 21    |      |      |                      |      |      |      |      |      |
| Hadj (s)                          | -0.03 | -0.01 | -0.42 | 0.16  |      |      |                      |      |      |      |      |      |
| Departure Headway (s)             | 7.8   | 6.2   | 6.3   | 6.4   |      |      |                      |      |      |      |      |      |
| Degree Utilization, x             | 0.03  | 0.92  | 0.46  | 0.84  |      |      |                      |      |      |      |      |      |
| Capacity (veh/h)                  | 412   | 571   | 545   | 539   |      |      |                      |      |      |      |      |      |
| Control Delay (s)                 | 11.0  | 44.3  | 14.7  | 35.1  |      |      |                      |      |      |      |      |      |
| Approach Delay (s)                | 11.0  | 44.3  | 14.7  | 35.1  |      |      |                      |      |      |      |      |      |
| Approach LOS                      | B     | E     | B     | E     |      |      |                      |      |      |      |      |      |
| Intersection Summary              |       |       |       |       |      |      |                      |      |      |      |      |      |
| Delay                             |       |       |       |       | 34.5 |      |                      |      |      |      |      |      |
| Level of Service                  |       |       |       |       |      | D    |                      |      |      |      |      |      |
| Intersection Capacity Utilization |       |       |       | 75.9% |      |      | ICU Level of Service |      |      |      |      | D    |
| Analysis Period (min)             |       |       |       |       | 15   |      |                      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

5: Fifth Line & Sheridan Park Dr

12/04/2017

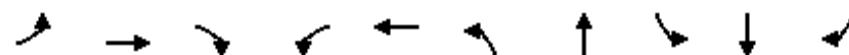


| Movement                          | EBL  | EBT  | EBR  | WBL   | WBT  | WBR   | NBL                  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|------|------|-------|------|-------|----------------------|------|------|------|------|------|
| Lane Configurations               |      |      |      |       |      |       |                      |      |      |      |      |      |
| Sign Control                      |      | Stop |      |       |      | Stop  |                      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 29   | 322  | 43   | 8     | 296  | 68    | 44                   | 66   | 25   | 116  | 83   | 93   |
| Future Volume (vph)               | 29   | 322  | 43   | 8     | 296  | 68    | 44                   | 66   | 25   | 116  | 83   | 93   |
| Peak Hour Factor                  | 0.86 | 0.86 | 0.86 | 0.86  | 0.86 | 0.86  | 0.86                 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph)            | 34   | 374  | 50   | 9     | 344  | 79    | 51                   | 77   | 29   | 135  | 97   | 108  |
| Direction, Lane #                 | EB 1 | WB 1 | NB 1 | NB 2  | SB 1 | SB 2  |                      |      |      |      |      |      |
| Volume Total (vph)                | 458  | 432  | 51   | 106   | 135  | 205   |                      |      |      |      |      |      |
| Volume Left (vph)                 | 34   | 9    | 51   | 0     | 135  | 0     |                      |      |      |      |      |      |
| Volume Right (vph)                | 50   | 79   | 0    | 29    | 0    | 108   |                      |      |      |      |      |      |
| Hadj (s)                          | 0.02 | 0.00 | 0.70 | -0.13 | 0.52 | -0.32 |                      |      |      |      |      |      |
| Departure Headway (s)             | 6.7  | 6.7  | 9.2  | 8.3   | 8.5  | 7.6   |                      |      |      |      |      |      |
| Degree Utilization, x             | 0.85 | 0.81 | 0.13 | 0.25  | 0.32 | 0.43  |                      |      |      |      |      |      |
| Capacity (veh/h)                  | 458  | 511  | 367  | 402   | 406  | 448   |                      |      |      |      |      |      |
| Control Delay (s)                 | 37.0 | 32.2 | 12.4 | 12.8  | 14.2 | 15.1  |                      |      |      |      |      |      |
| Approach Delay (s)                | 37.0 | 32.2 | 12.7 |       | 14.7 |       |                      |      |      |      |      |      |
| Approach LOS                      | E    | D    | B    |       | B    |       |                      |      |      |      |      |      |
| Intersection Summary              |      |      |      |       |      |       |                      |      |      |      |      |      |
| Delay                             |      |      |      |       |      |       | 27.3                 |      |      |      |      |      |
| Level of Service                  |      |      |      |       |      |       | D                    |      |      |      |      |      |
| Intersection Capacity Utilization |      |      |      | 59.5% |      |       | ICU Level of Service |      |      |      |      | B    |
| Analysis Period (min)             |      |      |      |       |      |       | 15                   |      |      |      |      |      |

## Timings

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑↑↑   | ↑ ↗   | ↑↑↑   | ↑ ↗   |
| Traffic Volume (vph) | 164   | 118   | 165   | 152   | 66    | 83    | 2063  | 159   | 1574  | 207   |
| Future Volume (vph)  | 164   | 118   | 165   | 152   | 66    | 83    | 2063  | 159   | 1574  | 207   |
| Turn Type            | Perm  | NA    | Perm  | Perm  | NA    | Perm  | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 8     |       | 2     | 1     | 6     |       |
| Permitted Phases     | 4     |       |       | 4     | 8     |       | 2     |       | 6     |       |
| Detector Phase       | 4     | 4     | 4     | 8     | 8     | 2     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 9.5   | 38.0  | 38.0  |
| Total Split (s)      | 43.0  | 43.0  | 43.0  | 43.0  | 43.0  | 77.0  | 77.0  | 20.0  | 97.0  | 97.0  |
| Total Split (%)      | 30.7% | 30.7% | 30.7% | 30.7% | 30.7% | 55.0% | 55.0% | 14.3% | 69.3% | 69.3% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 5.0   | 5.0   | 3.0   | 5.0   | 5.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 7.0   | 7.0   |
| Lead/Lag             |       |       |       |       |       | Lag   | Lag   | Lead  |       |       |
| Lead-Lag Optimize?   |       |       |       |       |       | Yes   | Yes   | Yes   |       |       |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 24.7  | 24.7  | 24.7  | 24.7  | 24.7  | 85.7  | 85.7  | 105.3 | 101.3 | 101.3 |
| Actuated g/C Ratio   | 0.18  | 0.18  | 0.18  | 0.18  | 0.18  | 0.61  | 0.61  | 0.75  | 0.72  | 0.72  |
| v/c Ratio            | 0.81  | 0.37  | 0.54  | 0.74  | 0.42  | 0.54  | 0.72  | 0.77  | 0.45  | 0.18  |
| Control Delay        | 81.8  | 52.2  | 40.0  | 74.3  | 40.6  | 37.2  | 22.6  | 56.0  | 9.1   | 1.7   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 81.8  | 52.2  | 40.0  | 74.3  | 40.6  | 37.2  | 22.6  | 56.0  | 9.1   | 1.7   |
| LOS                  | F     | D     | D     | E     | D     | D     | C     | E     | A     | A     |
| Approach Delay       |       | 58.6  |       |       | 59.1  |       | 23.1  |       | 12.2  |       |
| Approach LOS         |       | E     |       |       | E     |       | C     |       | B     |       |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 24.0

Intersection LOS: C

Intersection Capacity Utilization 92.2%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way



# HCM Unsignalized Intersection Capacity Analysis

7: Speakman Dr & Hadwen Dr

12/04/2017

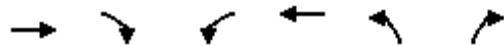


| Movement                          | EBL  | EBT  | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |      |      |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |      | Stop |       |       | Stop |                      |      | Stop |      |      | Stop |      |
| Traffic Volume (vph)              | 30   | 10   | 7     | 75    | 66   | 21                   | 9    | 169  | 93   | 46   | 286  | 66   |
| Future Volume (vph)               | 30   | 10   | 7     | 75    | 66   | 21                   | 9    | 169  | 93   | 46   | 286  | 66   |
| Peak Hour Factor                  | 0.77 | 0.77 | 0.77  | 0.77  | 0.77 | 0.77                 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 |
| Hourly flow rate (vph)            | 39   | 13   | 9     | 97    | 86   | 27                   | 12   | 219  | 121  | 60   | 371  | 86   |
| Direction, Lane #                 | EB 1 | WB 1 | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 61   | 210  | 352   | 517   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 39   | 97   | 12    | 60    |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 9    | 27   | 121   | 86    |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | 0.04 | 0.02 | -0.20 | -0.08 |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 6.8  | 6.4  | 5.4   | 5.3   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.12 | 0.37 | 0.53  | 0.76  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 440  | 504  | 624   | 662   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 10.7 | 13.0 | 14.4  | 23.2  |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 10.7 | 13.0 | 14.4  | 23.2  |      |                      |      |      |      |      |      |      |
| Approach LOS                      | B    | B    | B     | C     |      |                      |      |      |      |      |      |      |
| <b>Intersection Summary</b>       |      |      |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |      |      |       |       | 18.0 |                      |      |      |      |      |      |      |
| Level of Service                  |      |      |       |       | C    |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |      |       | 56.4% |      | ICU Level of Service |      |      |      | B    |      |      |
| Analysis Period (min)             |      |      |       | 15    |      |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

8: Flavelle Blvd West & Speakman Dr

12/04/2017

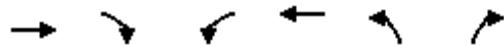


| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      |       |      |                      |      |      |
| Traffic Volume (veh/h)            | 186  | 17    | 32   | 351                  | 0    | 0    |
| Future Volume (Veh/h)             | 186  | 17    | 32   | 351                  | 0    | 0    |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.80 | 0.80  | 0.80 | 0.80                 | 0.80 | 0.80 |
| Hourly flow rate (vph)            | 233  | 21    | 40   | 439                  | 0    | 0    |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 254   |      | 762                  | 244  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 254   |      | 762                  | 244  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 97    |      | 100                  | 100  |      |
| cM capacity (veh/h)               |      | 1305  |      | 364                  | 800  |      |
| Direction, Lane #                 | EB 1 | WB 1  |      |                      |      |      |
| Volume Total                      | 254  | 479   |      |                      |      |      |
| Volume Left                       | 0    | 40    |      |                      |      |      |
| Volume Right                      | 21   | 0     |      |                      |      |      |
| cSH                               | 1700 | 1305  |      |                      |      |      |
| Volume to Capacity                | 0.15 | 0.03  |      |                      |      |      |
| Queue Length 95th (m)             | 0.0  | 0.7   |      |                      |      |      |
| Control Delay (s)                 | 0.0  | 1.0   |      |                      |      |      |
| Lane LOS                          |      | A     |      |                      |      |      |
| Approach Delay (s)                | 0.0  | 1.0   |      |                      |      |      |
| Approach LOS                      |      |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 0.6   |      |                      |      |      |
| Intersection Capacity Utilization |      | 37.7% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

9: Flavelle Blvd East & Speakman Dr

12/04/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    |       |      | ↑                    | ↑    | ↑    |
| Traffic Volume (veh/h)            | 184  | 0     | 0    | 256                  | 124  | 151  |
| Future Volume (Veh/h)             | 184  | 0     | 0    | 256                  | 124  | 151  |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.75 | 0.75  | 0.75 | 0.75                 | 0.75 | 0.75 |
| Hourly flow rate (vph)            | 245  | 0     | 0    | 341                  | 165  | 201  |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 245   |      | 586                  | 245  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 245   |      | 586                  | 245  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 100   |      | 65                   | 75   |      |
| cM capacity (veh/h)               |      | 1333  |      | 474                  | 796  |      |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2                 |      |      |
| Volume Total                      | 245  | 341   | 165  | 201                  |      |      |
| Volume Left                       | 0    | 0     | 165  | 0                    |      |      |
| Volume Right                      | 0    | 0     | 0    | 201                  |      |      |
| cSH                               | 1700 | 1700  | 474  | 796                  |      |      |
| Volume to Capacity                | 0.14 | 0.20  | 0.35 | 0.25                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 11.7 | 7.6                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 16.6 | 11.0                 |      |      |
| Lane LOS                          |      |       | C    | B                    |      |      |
| Approach Delay (s)                | 0.0  | 0.0   | 13.5 |                      |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| <b>Intersection Summary</b>       |      |       |      |                      |      |      |
| Average Delay                     |      | 5.2   |      |                      |      |      |
| Intersection Capacity Utilization |      | 27.0% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

## Timings

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑↑    | ↑     | ↑↑    | ↑     |
| Traffic Volume (vph) | 157   | 146   | 56    | 115   | 194   | 1373  | 92    | 900   | 65    |
| Future Volume (vph)  | 157   | 146   | 56    | 115   | 194   | 1373  | 92    | 900   | 65    |
| Turn Type            | Perm  | NA    | Perm  | NA    | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       | 4     | 8     | 5     | 2     | 1     | 6     |
| Permitted Phases     | 4     |       |       |       | 2     |       | 6     |       | 6     |
| Detector Phase       | 4     | 4     | 8     | 8     | 5     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 35.0  | 35.0  | 35.0  | 35.0  | 9.5   | 25.0  | 9.5   | 25.0  | 25.0  |
| Total Split (s)      | 39.0  | 39.0  | 39.0  | 39.0  | 11.0  | 86.0  | 15.0  | 90.0  | 90.0  |
| Total Split (%)      | 27.9% | 27.9% | 27.9% | 27.9% | 7.9%  | 61.4% | 10.7% | 64.3% | 64.3% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   |       |       |       |       | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 28.7  | 28.7  | 28.7  | 28.7  | 98.0  | 86.7  | 98.4  | 87.0  | 87.0  |
| Actuated g/C Ratio   | 0.20  | 0.20  | 0.20  | 0.20  | 0.70  | 0.62  | 0.70  | 0.62  | 0.62  |
| v/c Ratio            | 0.81  | 0.89  | 0.83  | 0.46  | 0.51  | 0.75  | 0.49  | 0.44  | 0.07  |
| Control Delay        | 80.8  | 71.9  | 120.4 | 47.7  | 8.9   | 10.7  | 16.6  | 15.0  | 3.5   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 80.8  | 71.9  | 120.4 | 47.7  | 8.9   | 10.7  | 16.6  | 15.0  | 3.5   |
| LOS                  | F     | E     | F     | D     | A     | B     | B     | B     | A     |
| Approach Delay       |       |       | 74.8  |       | 66.2  |       | 10.5  |       | 14.4  |
| Approach LOS         |       |       | E     |       | E     |       | B     |       | B     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 24.1

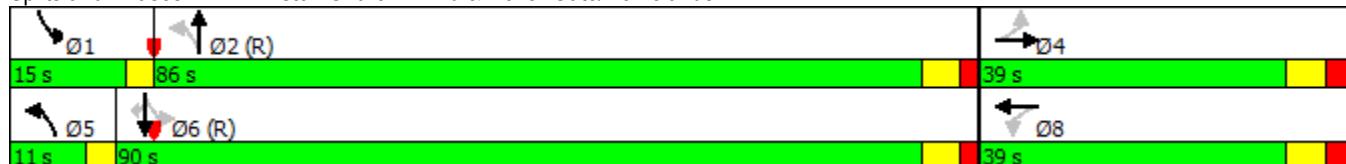
Intersection LOS: C

Intersection Capacity Utilization 92.2%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr



# HCM Unsignalized Intersection Capacity Analysis

2: Homelands Dr & Thorn Lodge Dr

12/04/2017



| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
| Sign Control                      | Stop |       | Stop |                      |      | Stop |
| Traffic Volume (vph)              | 112  | 27    | 146  | 183                  | 19   | 111  |
| Future Volume (vph)               | 112  | 27    | 146  | 183                  | 19   | 111  |
| Peak Hour Factor                  | 0.87 | 0.87  | 0.87 | 0.87                 | 0.87 | 0.87 |
| Hourly flow rate (vph)            | 129  | 31    | 168  | 210                  | 22   | 128  |
| Direction, Lane #                 | WB 1 | NB 1  | SB 1 |                      |      |      |
| Volume Total (vph)                | 160  | 378   | 150  |                      |      |      |
| Volume Left (vph)                 | 129  | 0     | 22   |                      |      |      |
| Volume Right (vph)                | 31   | 210   | 0    |                      |      |      |
| Hadj (s)                          | 0.05 | -0.30 | 0.12 |                      |      |      |
| Departure Headway (s)             | 5.1  | 4.2   | 4.9  |                      |      |      |
| Degree Utilization, x             | 0.23 | 0.44  | 0.20 |                      |      |      |
| Capacity (veh/h)                  | 644  | 824   | 699  |                      |      |      |
| Control Delay (s)                 | 9.6  | 10.6  | 9.1  |                      |      |      |
| Approach Delay (s)                | 9.6  | 10.6  | 9.1  |                      |      |      |
| Approach LOS                      | A    | B     | A    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Delay                             |      |       | 10.0 |                      |      |      |
| Level of Service                  |      |       | B    |                      |      |      |
| Intersection Capacity Utilization |      | 36.5% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |       | 15   |                      |      |      |

## Timings

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑↑    | ↑     | ↑↑    | ↑     |
| Traffic Volume (vph) | 74    | 51    | 374   | 141   | 219   | 158   | 204   | 1579  | 26    | 1159  | 37    |
| Future Volume (vph)  | 74    | 51    | 374   | 141   | 219   | 158   | 204   | 1579  | 26    | 1159  | 37    |
| Turn Type            | Perm  | NA    | Perm  | pm+pt | NA    | Perm  | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 4     | 3     | 8     | 5     | 2     | 1     | 6     |
| Permitted Phases     |       |       |       |       | 4     | 4     | 8     | 2     |       | 6     | 6     |
| Detector Phase       |       |       |       |       | 4     | 4     | 3     | 8     | 5     | 2     | 1     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 41.0  | 41.0  | 41.0  | 9.5   | 41.0  | 41.0  | 9.5   | 36.0  | 9.5   | 36.0  | 36.0  |
| Total Split (s)      | 41.0  | 41.0  | 41.0  | 9.8   | 50.8  | 50.8  | 21.0  | 79.7  | 9.5   | 68.2  | 68.2  |
| Total Split (%)      | 29.3% | 29.3% | 29.3% | 7.0%  | 36.3% | 36.3% | 15.0% | 56.9% | 6.8%  | 48.7% | 48.7% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 3.5   | 4.0   | 4.0   | 3.5   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 1.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 7.0   | 4.5   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             | Lag   | Lag   | Lag   | Lead  |       |       | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   | Yes   | Yes   | Yes   | Yes   |       |       | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 21.7  | 21.7  | 21.7  | 34.0  | 31.5  | 31.5  | 97.0  | 89.8  | 86.5  | 77.4  | 77.4  |
| Actuated g/C Ratio   | 0.16  | 0.16  | 0.16  | 0.24  | 0.22  | 0.22  | 0.69  | 0.64  | 0.62  | 0.55  | 0.55  |
| v/c Ratio            | 0.43  | 0.18  | 0.88  | 0.48  | 0.53  | 0.37  | 0.66  | 0.72  | 0.16  | 0.68  | 0.04  |
| Control Delay        | 57.8  | 48.7  | 43.7  | 47.6  | 50.6  | 17.6  | 21.3  | 21.9  | 9.6   | 19.7  | 0.1   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 57.8  | 48.7  | 43.7  | 47.6  | 50.6  | 17.6  | 21.3  | 21.9  | 9.6   | 19.7  | 0.1   |
| LOS                  | E     | D     | D     | D     | D     | B     | C     | C     | A     | B     | A     |
| Approach Delay       |       | 46.3  |       |       |       | 39.7  |       |       | 21.8  |       | 18.9  |
| Approach LOS         |       | D     |       |       |       | D     |       |       | C     |       | B     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 26.2

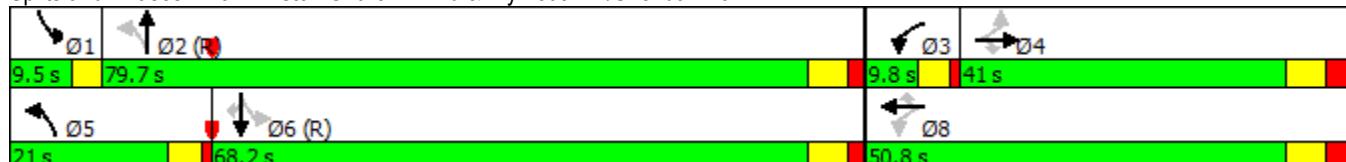
Intersection LOS: C

Intersection Capacity Utilization 89.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr



HCM Unsignalized Intersection Capacity Analysis  
4: Speakman Dr/Homelands Dr & Sheridan Park Dr

12/04/2017



| Movement                          | EBL  | EBT   | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |      |       |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |      | Stop  |       |       | Stop |                      |      | Stop |      |      | Stop |      |
| Traffic Volume (vph)              | 21   | 31    | 0     | 55    | 2    | 183                  | 1    | 141  | 231  | 177  | 37   | 1    |
| Future Volume (vph)               | 21   | 31    | 0     | 55    | 2    | 183                  | 1    | 141  | 231  | 177  | 37   | 1    |
| Peak Hour Factor                  | 0.86 | 0.86  | 0.86  | 0.86  | 0.86 | 0.86                 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph)            | 24   | 36    | 0     | 64    | 2    | 213                  | 1    | 164  | 269  | 206  | 43   | 1    |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 60   | 279   | 434   | 250   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 24   | 64    | 1     | 206   |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 0    | 213   | 269   | 1     |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | 0.08 | -0.38 | -0.35 | 0.19  |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 6.4  | 5.4   | 5.0   | 5.7   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.11 | 0.42  | 0.60  | 0.40  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 461  | 602   | 688   | 585   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 10.1 | 12.3  | 15.0  | 12.5  |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 10.1 | 12.3  | 15.0  | 12.5  |      |                      |      |      |      |      |      |      |
| Approach LOS                      | B    | B     | C     | B     |      |                      |      |      |      |      |      |      |
| Intersection Summary              |      |       |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |      |       |       |       |      |                      |      |      |      |      |      | 13.4 |
| Level of Service                  |      |       |       |       |      |                      |      |      |      |      |      | B    |
| Intersection Capacity Utilization |      |       |       | 61.8% |      | ICU Level of Service |      |      |      |      |      | B    |
| Analysis Period (min)             |      |       |       |       |      |                      |      |      |      |      |      | 15   |

# HCM Unsignalized Intersection Capacity Analysis

5: Fifth Line & Sheridan Park Dr

12/04/2017

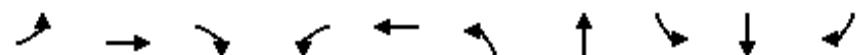


| Movement                          | EBL  | EBT   | EBR  | WBL   | WBT  | WBR   | NBL                  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|------|-------|------|-------|----------------------|------|------|------|------|------|
| Lane Configurations               |      |       |      |       |      |       |                      |      |      |      |      |      |
| Sign Control                      |      | Stop  |      |       |      | Stop  |                      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 62   | 333   | 41   | 17    | 185  | 113   | 50                   | 92   | 15   | 56   | 56   | 30   |
| Future Volume (vph)               | 62   | 333   | 41   | 17    | 185  | 113   | 50                   | 92   | 15   | 56   | 56   | 30   |
| Peak Hour Factor                  | 0.91 | 0.91  | 0.91 | 0.91  | 0.91 | 0.91  | 0.91                 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph)            | 68   | 366   | 45   | 19    | 203  | 124   | 55                   | 101  | 16   | 62   | 62   | 33   |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2  | SB 1 | SB 2  |                      |      |      |      |      |      |
| Volume Total (vph)                | 479  | 346   | 55   | 117   | 62   | 95    |                      |      |      |      |      |      |
| Volume Left (vph)                 | 68   | 19    | 55   | 0     | 62   | 0     |                      |      |      |      |      |      |
| Volume Right (vph)                | 45   | 124   | 0    | 16    | 0    | 33    |                      |      |      |      |      |      |
| Hadj (s)                          | 0.01 | -0.17 | 0.50 | -0.10 | 0.53 | -0.24 |                      |      |      |      |      |      |
| Departure Headway (s)             | 5.6  | 5.7   | 7.7  | 7.1   | 7.8  | 7.0   |                      |      |      |      |      |      |
| Degree Utilization, x             | 0.75 | 0.54  | 0.12 | 0.23  | 0.13 | 0.19  |                      |      |      |      |      |      |
| Capacity (veh/h)                  | 479  | 602   | 409  | 440   | 419  | 443   |                      |      |      |      |      |      |
| Control Delay (s)                 | 23.2 | 15.2  | 10.6 | 11.1  | 10.8 | 10.4  |                      |      |      |      |      |      |
| Approach Delay (s)                | 23.2 | 15.2  | 10.9 |       | 10.6 |       |                      |      |      |      |      |      |
| Approach LOS                      | C    | C     | B    |       | B    |       |                      |      |      |      |      |      |
| Intersection Summary              |      |       |      |       |      |       |                      |      |      |      |      |      |
| Delay                             |      |       |      |       |      |       | 17.3                 |      |      |      |      |      |
| Level of Service                  |      |       |      |       |      |       | C                    |      |      |      |      |      |
| Intersection Capacity Utilization |      |       |      | 59.0% |      |       | ICU Level of Service |      |      |      |      | B    |
| Analysis Period (min)             |      |       |      |       |      |       | 15                   |      |      |      |      |      |

## Timings

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑↑↗   | ↑ ↗   | ↑↑↗   | ↑ ↗   |
| Traffic Volume (vph) | 175   | 99    | 109   | 71    | 75    | 159   | 2365  | 95    | 1527  | 79    |
| Future Volume (vph)  | 175   | 99    | 109   | 71    | 75    | 159   | 2365  | 95    | 1527  | 79    |
| Turn Type            | Perm  | NA    | Perm  | Perm  | NA    | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 8     | 5     | 2     | 1     | 6     |       |
| Permitted Phases     | 4     |       |       | 4     | 8     |       | 2     |       | 6     |       |
| Detector Phase       | 4     | 4     | 4     | 8     | 8     | 5     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 9.5   | 38.0  | 9.5   | 38.0  | 38.0  |
| Total Split (s)      | 48.0  | 48.0  | 48.0  | 48.0  | 48.0  | 18.0  | 77.0  | 15.0  | 74.0  | 74.0  |
| Total Split (%)      | 34.3% | 34.3% | 34.3% | 34.3% | 34.3% | 12.9% | 55.0% | 10.7% | 52.9% | 52.9% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 3.5   | 5.0   | 3.0   | 5.0   | 5.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 3.0   | 7.0   | 7.0   |
| Lead/Lag             |       |       |       |       |       | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   |       |       |       |       |       | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 30.8  | 30.8  | 30.8  | 30.8  | 30.8  | 96.4  | 83.0  | 93.0  | 79.9  | 79.9  |
| Actuated g/C Ratio   | 0.22  | 0.22  | 0.22  | 0.22  | 0.22  | 0.69  | 0.59  | 0.66  | 0.57  | 0.57  |
| v/c Ratio            | 0.95  | 0.25  | 0.27  | 0.26  | 0.51  | 0.66  | 0.86  | 0.62  | 0.55  | 0.09  |
| Control Delay        | 104.5 | 44.3  | 8.0   | 45.0  | 36.5  | 25.8  | 29.3  | 41.4  | 21.4  | 7.7   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 104.5 | 44.3  | 8.0   | 45.0  | 36.5  | 25.8  | 29.3  | 41.4  | 21.4  | 7.7   |
| LOS                  | F     | D     | A     | D     | D     | C     | C     | D     | C     | A     |
| Approach Delay       |       | 61.5  |       |       |       | 38.7  |       | 29.1  |       | 21.9  |
| Approach LOS         |       | E     |       |       |       | D     |       | C     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 29.6

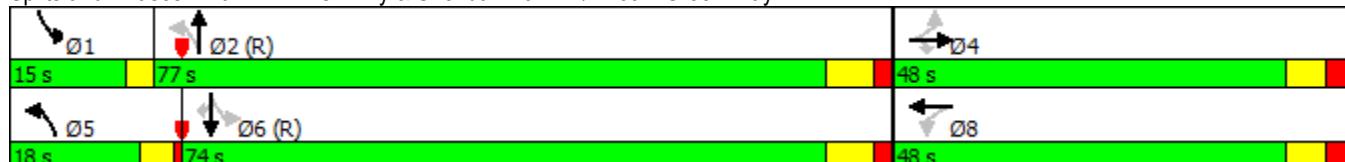
Intersection LOS: C

Intersection Capacity Utilization 97.0%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way



# HCM Unsignalized Intersection Capacity Analysis

7: Speakman Dr & Hadwen Dr

12/04/2017



| Movement                          | EBL  | EBT   | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |      |       |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |      | Stop  |       |       |      | Stop                 |      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 36   | 36    | 8     | 62    | 26   | 55                   | 2    | 170  | 91   | 38   | 90   | 23   |
| Future Volume (vph)               | 36   | 36    | 8     | 62    | 26   | 55                   | 2    | 170  | 91   | 38   | 90   | 23   |
| Peak Hour Factor                  | 0.81 | 0.81  | 0.81  | 0.81  | 0.81 | 0.81                 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Hourly flow rate (vph)            | 44   | 44    | 10    | 77    | 32   | 68                   | 2    | 210  | 112  | 47   | 111  | 28   |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 98   | 177   | 324   | 186   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 44   | 77    | 2     | 47    |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 10   | 68    | 112   | 28    |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | 0.05 | -0.13 | -0.21 | -0.04 |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 5.5  | 5.2   | 4.7   | 5.1   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.15 | 0.26  | 0.42  | 0.26  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 580  | 628   | 727   | 660   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 9.5  | 10.0  | 11.2  | 9.8   |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 9.5  | 10.0  | 11.2  | 9.8   |      |                      |      |      |      |      |      |      |
| Approach LOS                      | A    | A     | B     | A     |      |                      |      |      |      |      |      |      |
| <b>Intersection Summary</b>       |      |       |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |      |       |       |       | 10.4 |                      |      |      |      |      |      |      |
| Level of Service                  |      |       |       |       | B    |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |       |       | 43.6% |      | ICU Level of Service |      |      |      |      | A    |      |
| Analysis Period (min)             |      |       |       | 15    |      |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

8: Flavelle Blvd West & Speakman Dr

12/04/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      |       |      |                      |      |      |
| Traffic Volume (veh/h)            | 214  | 171   | 46   | 109                  | 0    | 0    |
| Future Volume (Veh/h)             | 214  | 171   | 46   | 109                  | 0    | 0    |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.75 | 0.75  | 0.75 | 0.75                 | 0.75 | 0.75 |
| Hourly flow rate (vph)            | 285  | 228   | 61   | 145                  | 0    | 0    |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 513   |      | 666                  | 399  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 513   |      | 666                  | 399  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 94    |      | 100                  | 100  |      |
| cM capacity (veh/h)               |      | 1052  |      | 403                  | 655  |      |
| Direction, Lane #                 | EB 1 | WB 1  |      |                      |      |      |
| Volume Total                      | 513  | 206   |      |                      |      |      |
| Volume Left                       | 0    | 61    |      |                      |      |      |
| Volume Right                      | 228  | 0     |      |                      |      |      |
| cSH                               | 1700 | 1052  |      |                      |      |      |
| Volume to Capacity                | 0.30 | 0.06  |      |                      |      |      |
| Queue Length 95th (m)             | 0.0  | 1.4   |      |                      |      |      |
| Control Delay (s)                 | 0.0  | 2.9   |      |                      |      |      |
| Lane LOS                          |      | A     |      |                      |      |      |
| Approach Delay (s)                | 0.0  | 2.9   |      |                      |      |      |
| Approach LOS                      |      |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 0.8   |      |                      |      |      |
| Intersection Capacity Utilization |      | 36.7% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

9: Flavelle Blvd East & Speakman Dr

12/04/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    |       |      | ↑                    | ↖    | ↖    |
| Traffic Volume (veh/h)            | 212  | 0     | 0    | 142                  | 15   | 33   |
| Future Volume (Veh/h)             | 212  | 0     | 0    | 142                  | 15   | 33   |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.80 | 0.80  | 0.80 | 0.80                 | 0.80 | 0.80 |
| Hourly flow rate (vph)            | 265  | 0     | 0    | 178                  | 19   | 41   |
| Pedestrians                       |      |       |      |                      | 1    |      |
| Lane Width (m)                    |      |       |      |                      | 3.7  |      |
| Walking Speed (m/s)               |      |       |      |                      | 1.1  |      |
| Percent Blockage                  |      |       |      |                      | 0    |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 266   |      | 444                  | 266  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 266   |      | 444                  | 266  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 100   |      | 97                   | 95   |      |
| cM capacity (veh/h)               |      | 1308  |      | 575                  | 777  |      |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2                 |      |      |
| Volume Total                      | 265  | 178   | 19   | 41                   |      |      |
| Volume Left                       | 0    | 0     | 19   | 0                    |      |      |
| Volume Right                      | 0    | 0     | 0    | 41                   |      |      |
| cSH                               | 1700 | 1700  | 575  | 777                  |      |      |
| Volume to Capacity                | 0.16 | 0.10  | 0.03 | 0.05                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 0.8  | 1.3                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 11.5 | 9.9                  |      |      |
| Lane LOS                          |      |       | B    | A                    |      |      |
| Approach Delay (s)                | 0.0  | 0.0   | 10.4 |                      |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 1.2   |      |                      |      |      |
| Intersection Capacity Utilization |      | 21.2% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

| Junctions 9   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ARCADY 9 - Roundabout Module  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Version: 9.0.0.4211  <br>© Copyright TRL Limited, 2017  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| <b>The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution</b>     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Filename: 039474\_Roundabout\_Analysis 85 BG.j9  
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady  
Report generation date: 7/25/2017 8:50:49 AM

## Summary of intersection performance

|   | AM          |                 |           |           |     |                        |                  |                                      | PM          |                 |           |           |     |                        |                  |                                     |
|---|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|--------------------------------------|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|-------------------------------------|
|   | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity            | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity           |
| <b>Single Lane Roundabout - 2021 Background</b> |             |                 |           |           |     |                        |                  |                                      |             |                 |           |           |     |                        |                  |                                     |
| <b>1 - Homelands Dr - N</b>                     | 0.9         | 2.7             | 7.44      | 0.46      | A   | 7.01                   | A                | 65 %<br>[1 -<br>Homelands<br>Dr - N] | 0.3         | 1.3             | 4.42      | 0.22      | A   | 6.88                   | A                | 40 %<br>[3 -<br>Speakman<br>Dr - S] |
| <b>2 - Sheridan Park Dr - E</b>                 | 0.9         | 2.3             | 7.01      | 0.48      | A   |                        |                  |                                      | 0.4         | 1.8             | 5.92      | 0.30      | A   |                        |                  |                                     |
| <b>3 - Speakman Dr - S</b>                      | 0.4         | 1.6             | 6.29      | 0.29      | A   |                        |                  |                                      | 1.1         | 3.0             | 9.31      | 0.51      | A   |                        |                  |                                     |
| <b>4 - Sheridan Park Dr - W</b>                 | 0.0         | 0.5             | 6.14      | 0.02      | A   |                        |                  |                                      | 0.1         | 0.5             | 4.27      | 0.06      | A   |                        |                  |                                     |

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

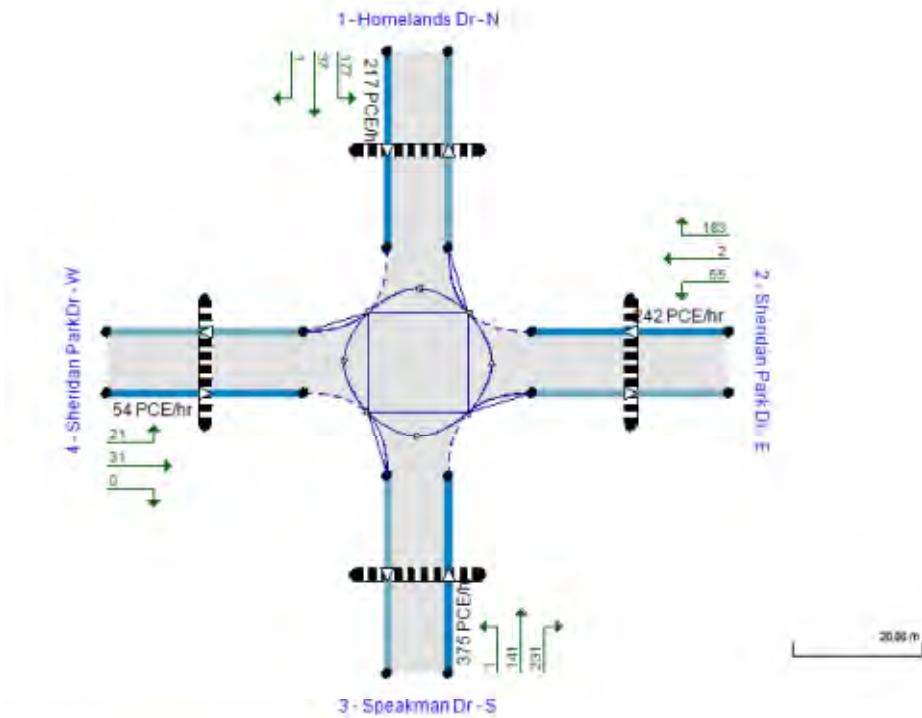
## File summary

### File Description

|             |   |
|-------------|---|
| Title       | Sheridan Park Drive 85 percent Capacity |
| Location    | Mississauga                             |
| Site number |   |
| Date        | 7/25/2017                               |
| Version     |   |
| Status      | (new file)                              |
| Identifier  |   |
| Client      |   |
| Jobnumber   |   |
| Analyst     | RJBURNSIDE"jester                       |
| Description |   |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|----------------|-------------|---------------------|-----------------------|------------|---------------------|-------------------|---------------------|
| m              | kph         | PCE                 | PCE                   | perHour    | s                   | -Min              | perMin              |



Showing original traffic demand (PCE/hr)

The intersection diagram reflects the last run of Intersections.

### Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | Residual capacity criteria type | V/C Ratio Threshold | Average Delay threshold (s) | Queue threshold (PCE) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------|---------------------|-----------------------------|-----------------------|
| 5.75               | ✓                           |                                   | ✓                           | Delay                           | 0.85                | 36.00                       | 20.00                 |

### Demand Set Summary

| Scenario name   | Time Period name | Traffic profile type | Model start time (HH:mm) | Model finish time (HH:mm) | Time segment length (min) | Run automatically |
|-----------------|------------------|----------------------|--------------------------|---------------------------|---------------------------|-------------------|
| 2021 Background | AM               | ONE HOUR             | 08:00                    | 09:30                     | 15                        | ✓                 |
| 2021 Background | PM               | ONE HOUR             | 16:00                    | 17:30                     | 15                        | ✓                 |

# Single Lane Roundabout - 2021 Background, AM

## Data Errors and Warnings

| Severity | Area             | Item             | Description   |
|----------|------------------|------------------|---|
| Warning  | Queue variations | Analysis Options | Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high. |

# Results

## Results Summary for whole modelled period

| Leg                      | Max V/C Ratio | Max delay (s) | Max Queue (PCE) | Max 95th percentile Queue (PCE) | Max LOS | Average Demand (PCE/hr) | Total Intersection Arrivals (PCE) |
|--------------------------|---------------|---------------|-----------------|---------------------------------|---------|-------------------------|-----------------------------------|
| 1 - Homelands Dr - N     | 0.46          | 7.44          | 0.9             | 2.7                             | A       | 356.95                  | 535.43                            |
| 2 - Sheridan Park Dr - E | 0.48          | 7.01          | 0.9             | 2.3                             | A       | 402.83                  | 604.25                            |
| 3 - Speakman Dr - S      | 0.29          | 6.29          | 0.4             | 1.6                             | A       | 200.04                  | 300.06                            |
| 4 - Sheridan Park Dr - W | 0.02          | 6.14          | 0.0             | 0.5                             | A       | 11.01                   | 16.52                             |

# Single Lane Roundabout - 2021 Background, PM

## Data Errors and Warnings

| Severity | Area             | Item             | Description   |
|----------|------------------|------------------|---|
| Warning  | Queue variations | Analysis Options | Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high. |

# Results

## Results Summary for whole modelled period

| Leg                      | Max V/C Ratio | Max delay (s) | Max Queue (PCE) | Max 95th percentile Queue (PCE) | Max LOS | Average Demand (PCE/hr) | Total Intersection Arrivals (PCE) |
|--------------------------|---------------|---------------|-----------------|---------------------------------|---------|-------------------------|-----------------------------------|
| 1 - Homelands Dr - N     | 0.22          | 4.42          | 0.3             | 1.3                             | A       | 199.12                  | 298.68                            |
| 2 - Sheridan Park Dr - E | 0.30          | 5.92          | 0.4             | 1.8                             | A       | 222.06                  | 333.10                            |
| 3 - Speakman Dr - S      | 0.51          | 9.31          | 1.1             | 3.0                             | A       | 344.11                  | 516.16                            |
| 4 - Sheridan Park Dr - W | 0.06          | 4.27          | 0.1             | 0.5                             | A       | 49.55                   | 74.33                             |



## Appendix F

### 2021 Traffic Operations with Sheridan Park Drive Extension

## Timings

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/19/2017



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↗ ↘   | ↖ ↗   | ↖ ↘   | ↑ ↗   | ↑ ↘   | ↖ ↗   | ↖ ↘   | ↑ ↗   |
| Traffic Volume (vph) | 36    | 48    | 111   | 88    | 234   | 1137  | 41    | 1380  | 121   |
| Future Volume (vph)  | 36    | 48    | 111   | 88    | 234   | 1137  | 41    | 1380  | 121   |
| Turn Type            | Perm  | NA    | Perm  | NA    | pm+pt | NA    | Perm  | NA    | Perm  |
| Protected Phases     |       |       |       | 4     | 8     | 5     | 2     | 6     |       |
| Permitted Phases     |       |       |       | 4     | 8     | 2     | 6     | 6     |       |
| Detector Phase       | 4     | 4     | 8     | 8     | 5     | 2     | 6     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 35.0  | 35.0  | 35.0  | 35.0  | 9.5   | 25.0  | 25.0  | 25.0  | 25.0  |
| Total Split (s)      | 39.0  | 39.0  | 39.0  | 39.0  | 11.0  | 101.0 | 90.0  | 90.0  | 90.0  |
| Total Split (%)      | 27.9% | 27.9% | 27.9% | 27.9% | 7.9%  | 72.1% | 64.3% | 64.3% | 64.3% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 4.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 6.0   | 6.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       | Lead  |       | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?   |       |       |       |       | Yes   |       | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | C-Max | C-Max | C-Max |
| Act Effect Green (s) | 20.7  | 20.7  | 20.7  | 20.7  | 109.3 | 106.3 | 84.0  | 84.0  | 84.0  |
| Actuated g/C Ratio   | 0.15  | 0.15  | 0.15  | 0.15  | 0.78  | 0.76  | 0.60  | 0.60  | 0.60  |
| v/c Ratio            | 0.31  | 0.52  | 0.84  | 0.61  | 0.73  | 0.51  | 0.22  | 0.73  | 0.14  |
| Control Delay        | 56.8  | 37.5  | 97.4  | 56.8  | 48.5  | 6.0   | 16.2  | 22.5  | 6.0   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 56.8  | 37.5  | 97.4  | 56.8  | 48.5  | 6.0   | 16.2  | 22.5  | 6.0   |
| LOS                  | E     | D     | F     | E     | D     | A     | B     | C     | A     |
| Approach Delay       |       | 41.6  |       |       | 74.3  |       | 12.9  |       | 21.0  |
| Approach LOS         |       | D     |       |       | E     |       | B     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 22.6

Intersection LOS: C

Intersection Capacity Utilization 87.8%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr



# HCM Unsignalized Intersection Capacity Analysis

2: Homelands Dr & Thorn Lodge Dr

12/19/2017



| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
| Sign Control                      | Stop |       | Stop |                      |      | Stop |
| Traffic Volume (vph)              | 172  | 42    | 94   | 105                  | 73   | 137  |
| Future Volume (vph)               | 172  | 42    | 94   | 105                  | 73   | 137  |
| Peak Hour Factor                  | 0.78 | 0.78  | 0.78 | 0.78                 | 0.78 | 0.78 |
| Hourly flow rate (vph)            | 221  | 54    | 121  | 135                  | 94   | 176  |
| Direction, Lane #                 | WB 1 | NB 1  | SB 1 |                      |      |      |
| Volume Total (vph)                | 275  | 256   | 270  |                      |      |      |
| Volume Left (vph)                 | 221  | 0     | 94   |                      |      |      |
| Volume Right (vph)                | 54   | 135   | 0    |                      |      |      |
| Hadj (s)                          | 0.10 | -0.17 | 0.19 |                      |      |      |
| Departure Headway (s)             | 5.3  | 4.9   | 5.2  |                      |      |      |
| Degree Utilization, x             | 0.41 | 0.35  | 0.39 |                      |      |      |
| Capacity (veh/h)                  | 633  | 694   | 653  |                      |      |      |
| Control Delay (s)                 | 11.9 | 10.5  | 11.5 |                      |      |      |
| Approach Delay (s)                | 11.9 | 10.5  | 11.5 |                      |      |      |
| Approach LOS                      | B    | B     | B    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Delay                             |      |       | 11.3 |                      |      |      |
| Level of Service                  |      |       | B    |                      |      |      |
| Intersection Capacity Utilization |      | 45.8% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |       | 15   |                      |      |      |

## Timings

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/19/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     |
| Traffic Volume (vph) | 19    | 259   | 131   | 104   | 86    | 123   | 198   | 1278  | 291   | 1226  | 115   |
| Future Volume (vph)  | 19    | 259   | 131   | 104   | 86    | 123   | 198   | 1278  | 291   | 1226  | 115   |
| Turn Type            | Perm  | NA    | Perm  | pm+pt | NA    | Perm  | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 4     | 3     | 8     | 5     | 2     | 1     | 6     |
| Permitted Phases     |       |       |       |       | 4     | 4     | 8     | 2     |       | 6     | 6     |
| Detector Phase       |       |       |       |       | 4     | 4     | 3     | 8     | 5     | 2     | 1     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 41.0  | 41.0  | 41.0  | 9.5   | 41.0  | 41.0  | 9.5   | 36.0  | 9.5   | 36.0  | 36.0  |
| Total Split (s)      | 41.0  | 41.0  | 41.0  | 9.8   | 50.8  | 50.8  | 16.0  | 73.2  | 16.0  | 73.2  | 73.2  |
| Total Split (%)      | 29.3% | 29.3% | 29.3% | 7.0%  | 36.3% | 36.3% | 11.4% | 52.3% | 11.4% | 52.3% | 52.3% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 3.5   | 4.0   | 4.0   | 3.5   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 1.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 7.0   | 4.5   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             | Lag   | Lag   | Lag   | Lead  |       |       | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   | Yes   | Yes   | Yes   | Yes   |       |       | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 25.6  | 25.6  | 25.6  | 37.9  | 35.4  | 35.4  | 83.2  | 67.2  | 93.3  | 72.6  | 72.6  |
| Actuated g/C Ratio   | 0.18  | 0.18  | 0.18  | 0.27  | 0.25  | 0.25  | 0.59  | 0.48  | 0.67  | 0.52  | 0.52  |
| v/c Ratio            | 0.09  | 0.78  | 0.39  | 0.67  | 0.19  | 0.26  | 0.72  | 0.98  | 0.93  | 0.70  | 0.14  |
| Control Delay        | 45.2  | 69.9  | 20.0  | 60.8  | 40.3  | 7.0   | 33.1  | 52.1  | 74.8  | 25.0  | 5.7   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 45.2  | 69.9  | 20.0  | 60.8  | 40.3  | 7.0   | 33.1  | 52.1  | 74.8  | 25.0  | 5.7   |
| LOS                  | D     | E     | B     | E     | D     | A     | C     | D     | E     | C     | A     |
| Approach Delay       |       | 52.8  |       |       |       | 34.1  |       |       | 49.9  |       | 32.5  |
| Approach LOS         |       | D     |       |       |       | C     |       |       | D     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 42.1

Intersection LOS: D

Intersection Capacity Utilization 101.2%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr



HCM Unsignalized Intersection Capacity Analysis  
4: Speakman Dr/Homelands Dr & Sheridan Park Dr

12/19/2017



| Movement                          | EBL  | EBT   | EBR  | WBL   | WBT   | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|------|-------|-------|----------------------|------|------|------|------|------|------|
| Lane Configurations               | ↑    | ↑     |      | ↑     | ↑     |                      |      | ↔    |      |      | ↔    |      |
| Sign Control                      |      | Stop  |      |       | Stop  |                      |      | Stop |      |      | Stop |      |
| Traffic Volume (vph)              | 3    | 44    | 3    | 260   | 180   | 128                  | 5    | 46   | 165  | 233  | 119  | 27   |
| Future Volume (vph)               | 3    | 44    | 3    | 260   | 180   | 128                  | 5    | 46   | 165  | 233  | 119  | 27   |
| Peak Hour Factor                  | 0.82 | 0.82  | 0.82 | 0.82  | 0.82  | 0.82                 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph)            | 4    | 54    | 4    | 317   | 220   | 156                  | 6    | 56   | 201  | 284  | 145  | 33   |
| Direction, Lane #                 | EB 1 | EB 2  | WB 1 | WB 2  | NB 1  | SB 1                 |      |      |      |      |      |      |
| Volume Total (vph)                | 4    | 58    | 317  | 376   | 263   | 462                  |      |      |      |      |      |      |
| Volume Left (vph)                 | 4    | 0     | 317  | 0     | 6     | 284                  |      |      |      |      |      |      |
| Volume Right (vph)                | 0    | 4     | 0    | 156   | 201   | 33                   |      |      |      |      |      |      |
| Hadj (s)                          | 0.50 | -0.05 | 0.50 | -0.20 | -0.43 | 0.15                 |      |      |      |      |      |      |
| Departure Headway (s)             | 8.8  | 8.3   | 7.5  | 6.8   | 6.5   | 6.5                  |      |      |      |      |      |      |
| Degree Utilization, x             | 0.01 | 0.13  | 0.66 | 0.71  | 0.47  | 0.84                 |      |      |      |      |      |      |
| Capacity (veh/h)                  | 378  | 402   | 467  | 513   | 521   | 543                  |      |      |      |      |      |      |
| Control Delay (s)                 | 10.7 | 11.3  | 23.0 | 23.7  | 15.1  | 34.6                 |      |      |      |      |      |      |
| Approach Delay (s)                | 11.3 |       | 23.4 |       | 15.1  | 34.6                 |      |      |      |      |      |      |
| Approach LOS                      | B    |       | C    |       | C     | D                    |      |      |      |      |      |      |
| Intersection Summary              |      |       |      |       |       |                      |      |      |      |      |      |      |
| Delay                             |      |       |      |       |       |                      |      |      |      |      |      |      |
| Level of Service                  |      |       |      |       |       |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |       |      | 64.8% |       | ICU Level of Service |      |      |      |      |      |      |
| Analysis Period (min)             |      |       |      |       | 15    |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

5: Fifth Line & Sheridan Park Dr

12/19/2017

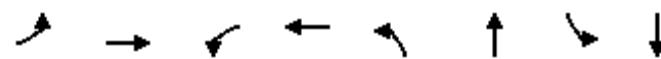


| Movement                          | EBL  | EBT  | EBR   | WBL   | WBT  | WBR   | NBL                  | NBT   | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|------|-------|-------|------|-------|----------------------|-------|------|------|------|------|
| Lane Configurations               | ↑    | ↑    |       | ↑     | ↑    |       | ↑                    | ↑     |      | ↑    | ↑    |      |
| Sign Control                      |      | Stop |       |       | Stop |       |                      | Stop  |      |      | Stop |      |
| Traffic Volume (vph)              | 31   | 362  | 45    | 8     | 446  | 68    | 48                   | 66    | 25   | 119  | 83   | 106  |
| Future Volume (vph)               | 31   | 362  | 45    | 8     | 446  | 68    | 48                   | 66    | 25   | 119  | 83   | 106  |
| Peak Hour Factor                  | 0.86 | 0.86 | 0.86  | 0.86  | 0.86 | 0.86  | 0.86                 | 0.86  | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph)            | 36   | 421  | 52    | 9     | 519  | 79    | 56                   | 77    | 29   | 138  | 97   | 123  |
| Direction, Lane #                 | EB 1 | EB 2 | WB 1  | WB 2  | NB 1 | NB 2  | SB 1                 | SB 2  |      |      |      |      |
| Volume Total (vph)                | 36   | 473  | 9     | 598   | 56   | 106   | 138                  | 220   |      |      |      |      |
| Volume Left (vph)                 | 36   | 0    | 9     | 0     | 56   | 0     | 138                  | 0     |      |      |      |      |
| Volume Right (vph)                | 0    | 52   | 0     | 79    | 0    | 29    | 0                    | 123   |      |      |      |      |
| Hadj (s)                          | 0.50 | 0.00 | 0.99  | 0.00  | 0.70 | -0.13 | 0.52                 | -0.34 |      |      |      |      |
| Departure Headway (s)             | 7.8  | 7.3  | 8.3   | 7.3   | 9.1  | 8.3   | 8.5                  | 7.6   |      |      |      |      |
| Degree Utilization, x             | 0.08 | 0.96 | 0.02  | 1.21  | 0.14 | 0.25  | 0.32                 | 0.47  |      |      |      |      |
| Capacity (veh/h)                  | 451  | 486  | 423   | 498   | 376  | 411   | 407                  | 454   |      |      |      |      |
| Control Delay (s)                 | 10.2 | 57.0 | 10.3  | 136.1 | 12.4 | 12.8  | 14.3                 | 16.0  |      |      |      |      |
| Approach Delay (s)                | 53.7 |      | 134.3 |       | 12.7 |       | 15.3                 |       |      |      |      |      |
| Approach LOS                      | F    |      | F     |       | B    |       | C                    |       |      |      |      |      |
| Intersection Summary              |      |      |       |       |      |       |                      |       |      |      |      |      |
| Delay                             |      |      |       |       |      |       |                      |       |      |      |      |      |
| Level of Service                  |      |      |       |       |      |       |                      |       |      |      |      |      |
| Intersection Capacity Utilization |      |      |       | 52.9% |      |       | ICU Level of Service |       |      |      |      |      |
| Analysis Period (min)             |      |      |       |       | 15   |       |                      |       |      |      |      |      |

## Timings

5: Fifth Line &amp; Sheridan Park Dr

01/18/2018



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   |
| Traffic Volume (vph) | 31    | 362   | 8     | 446   | 48    | 66    | 119   | 83    |
| Future Volume (vph)  | 31    | 362   | 8     | 446   | 48    | 66    | 119   | 83    |
| Turn Type            | Perm  | NA    | Perm  | NA    | Perm  | NA    | Perm  | NA    |
| Protected Phases     |       |       |       | 4     |       | 8     |       | 2     |
| Permitted Phases     |       |       |       |       | 2     |       | 6     |       |
| Detector Phase       | 4     | 4     | 8     | 8     | 2     | 2     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  |
| Total Split (s)      | 51.0  | 51.0  | 51.0  | 51.0  | 29.0  | 29.0  | 29.0  | 29.0  |
| Total Split (%)      | 63.8% | 63.8% | 63.8% | 63.8% | 36.3% | 36.3% | 36.3% | 36.3% |
| Yellow Time (s)      | 3.5   | 3.5   | 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   | 1.0   | 1.0   |
| 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   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   |
| Lead/Lag             |       |       |       |       |       |       |       |       |
| Lead-Lag Optimize?   |       |       |       |       |       |       |       |       |
| Recall Mode          | None  | None  | None  | None  | Min   | Min   | Min   | Min   |
| Act Effect Green (s) | 19.5  | 19.5  | 19.5  | 19.5  | 10.5  | 10.5  | 10.5  | 10.5  |
| Actuated g/C Ratio   | 0.49  | 0.49  | 0.49  | 0.49  | 0.26  | 0.26  | 0.26  | 0.26  |
| v/c Ratio            | 0.12  | 0.53  | 0.03  | 0.68  | 0.20  | 0.22  | 0.40  | 0.44  |
| Control Delay        | 6.8   | 9.3   | 5.9   | 12.1  | 15.8  | 12.4  | 18.2  | 12.4  |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 6.8   | 9.3   | 5.9   | 12.1  | 15.8  | 12.4  | 18.2  | 12.4  |
| LOS                  | A     | A     | A     | B     | B     | B     | B     | B     |
| Approach Delay       |       | 9.2   |       | 12.0  |       | 13.6  |       | 14.6  |
| Approach LOS         |       | A     |       | B     |       | B     |       | B     |

## Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 39.8

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 11.9

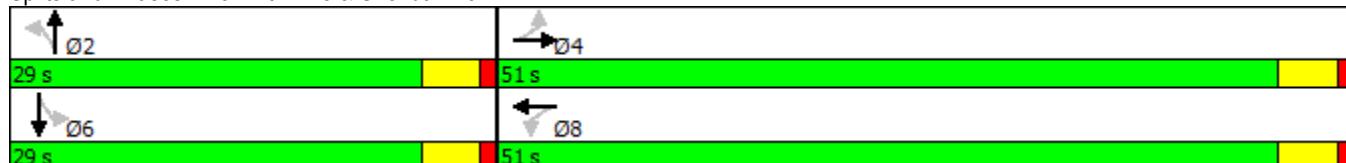
Intersection LOS: B

Intersection Capacity Utilization 55.4%

ICU Level of Service B

Analysis Period (min) 15

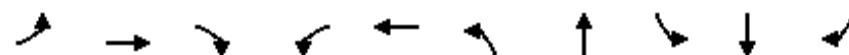
Splits and Phases: 5: Fifth Line &amp; Sheridan Park Dr



## Timings

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/19/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↑ ↙   | ↑ ↖   | ↑ ↗   | ↑ ↙   | ↑↑↑↗  | ↑ ↙   | ↑↑↑   | ↑ ↙   |
| Traffic Volume (vph) | 180   | 120   | 179   | 152   | 74    | 156   | 2063  | 159   | 1574  | 276   |
| Future Volume (vph)  | 180   | 120   | 179   | 152   | 74    | 156   | 2063  | 159   | 1574  | 276   |
| Turn Type            | Perm  | NA    | Perm  | Perm  | NA    | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 8     | 5     | 2     | 1     | 6     |       |
| Permitted Phases     | 4     |       |       | 4     | 8     |       | 2     |       | 6     |       |
| Detector Phase       | 4     | 4     | 4     | 8     | 8     | 5     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 9.5   | 38.0  | 9.5   | 38.0  | 38.0  |
| Total Split (s)      | 40.0  | 40.0  | 40.0  | 40.0  | 40.0  | 21.6  | 80.0  | 20.0  | 78.4  | 78.4  |
| Total Split (%)      | 28.6% | 28.6% | 28.6% | 28.6% | 28.6% | 15.4% | 57.1% | 14.3% | 56.0% | 56.0% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 3.5   | 5.0   | 3.0   | 5.0   | 5.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 3.0   | 7.0   | 7.0   |
| Lead/Lag             |       |       |       |       |       | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   |       |       |       |       |       | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 26.3  | 26.3  | 26.3  | 26.3  | 26.3  | 97.4  | 83.5  | 101.0 | 83.9  | 83.9  |
| Actuated g/C Ratio   | 0.19  | 0.19  | 0.19  | 0.19  | 0.19  | 0.70  | 0.60  | 0.72  | 0.60  | 0.60  |
| v/c Ratio            | 0.86  | 0.35  | 0.43  | 0.70  | 0.43  | 0.63  | 0.74  | 0.74  | 0.54  | 0.27  |
| Control Delay        | 87.5  | 50.8  | 9.0   | 68.6  | 42.9  | 22.7  | 23.9  | 52.8  | 18.9  | 6.1   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 87.5  | 50.8  | 9.0   | 68.6  | 42.9  | 22.7  | 23.9  | 52.8  | 18.9  | 6.1   |
| LOS                  | F     | D     | A     | E     | D     | C     | C     | D     | B     | A     |
| Approach Delay       |       | 48.9  |       |       |       | 56.5  |       | 23.8  |       | 19.8  |
| Approach LOS         |       | D     |       |       |       | E     |       | C     |       | B     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 26.4

Intersection LOS: C

Intersection Capacity Utilization 92.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way



# HCM Unsignalized Intersection Capacity Analysis

7: Speakman Dr & Hadwen Dr

12/19/2017

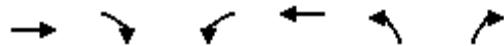


| Movement                          | EBL  | EBT  | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |      |      |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |      | Stop |       |       | Stop |                      |      | Stop |      |      | Stop |      |
| Traffic Volume (vph)              | 30   | 10   | 7     | 75    | 66   | 26                   | 9    | 169  | 93   | 48   | 286  | 66   |
| Future Volume (vph)               | 30   | 10   | 7     | 75    | 66   | 26                   | 9    | 169  | 93   | 48   | 286  | 66   |
| Peak Hour Factor                  | 0.77 | 0.77 | 0.77  | 0.77  | 0.77 | 0.77                 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 |
| Hourly flow rate (vph)            | 39   | 13   | 9     | 97    | 86   | 34                   | 12   | 219  | 121  | 62   | 371  | 86   |
| Direction, Lane #                 | EB 1 | WB 1 | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 61   | 217  | 352   | 519   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 39   | 97   | 12    | 62    |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 9    | 34   | 121   | 86    |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | 0.04 | 0.00 | -0.20 | -0.08 |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 6.9  | 6.4  | 5.5   | 5.3   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.12 | 0.38 | 0.53  | 0.77  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 437  | 505  | 620   | 658   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 10.8 | 13.2 | 14.6  | 23.9  |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 10.8 | 13.2 | 14.6  | 23.9  |      |                      |      |      |      |      |      |      |
| Approach LOS                      | B    | B    | B     | C     |      |                      |      |      |      |      |      |      |
| <b>Intersection Summary</b>       |      |      |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |      |      |       |       | 18.3 |                      |      |      |      |      |      |      |
| Level of Service                  |      |      |       |       | C    |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |      |       | 56.9% |      | ICU Level of Service |      |      |      | B    |      |      |
| Analysis Period (min)             |      |      |       | 15    |      |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

8: Flavelle Blvd West & Speakman Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      |       |      |                      |      |      |
| Traffic Volume (veh/h)            | 186  | 17    | 32   | 351                  | 0    | 0    |
| Future Volume (Veh/h)             | 186  | 17    | 32   | 351                  | 0    | 0    |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.80 | 0.80  | 0.80 | 0.80                 | 0.80 | 0.80 |
| Hourly flow rate (vph)            | 233  | 21    | 40   | 439                  | 0    | 0    |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 254   |      | 762                  | 244  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 254   |      | 762                  | 244  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 97    |      | 100                  | 100  |      |
| cM capacity (veh/h)               |      | 1305  |      | 364                  | 800  |      |
| Direction, Lane #                 | EB 1 | WB 1  |      |                      |      |      |
| Volume Total                      | 254  | 479   |      |                      |      |      |
| Volume Left                       | 0    | 40    |      |                      |      |      |
| Volume Right                      | 21   | 0     |      |                      |      |      |
| cSH                               | 1700 | 1305  |      |                      |      |      |
| Volume to Capacity                | 0.15 | 0.03  |      |                      |      |      |
| Queue Length 95th (m)             | 0.0  | 0.7   |      |                      |      |      |
| Control Delay (s)                 | 0.0  | 1.0   |      |                      |      |      |
| Lane LOS                          |      | A     |      |                      |      |      |
| Approach Delay (s)                | 0.0  | 1.0   |      |                      |      |      |
| Approach LOS                      |      |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 0.6   |      |                      |      |      |
| Intersection Capacity Utilization |      | 37.7% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

9: Flavelle Blvd East & Speakman Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    |       |      | ↑                    | ↑    | ↑    |
| Traffic Volume (veh/h)            | 184  | 0     | 0    | 256                  | 124  | 151  |
| Future Volume (Veh/h)             | 184  | 0     | 0    | 256                  | 124  | 151  |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.75 | 0.75  | 0.75 | 0.75                 | 0.75 | 0.75 |
| Hourly flow rate (vph)            | 245  | 0     | 0    | 341                  | 165  | 201  |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 245   |      | 586                  | 245  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 245   |      | 586                  | 245  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 100   |      | 65                   | 75   |      |
| cM capacity (veh/h)               |      | 1333  |      | 474                  | 796  |      |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2                 |      |      |
| Volume Total                      | 245  | 341   | 165  | 201                  |      |      |
| Volume Left                       | 0    | 0     | 165  | 0                    |      |      |
| Volume Right                      | 0    | 0     | 0    | 201                  |      |      |
| cSH                               | 1700 | 1700  | 474  | 796                  |      |      |
| Volume to Capacity                | 0.14 | 0.20  | 0.35 | 0.25                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 11.7 | 7.6                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 16.6 | 11.0                 |      |      |
| Lane LOS                          |      |       | C    | B                    |      |      |
| Approach Delay (s)                | 0.0  | 0.0   | 13.5 |                      |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| <b>Intersection Summary</b>       |      |       |      |                      |      |      |
| Average Delay                     |      | 5.2   |      |                      |      |      |
| Intersection Capacity Utilization |      | 27.0% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

10: Speakman Dr & Sheridan Park Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    | ↗     | ↖    | ↙                    | ↖    | ↗    |
| Traffic Volume (veh/h)            | 40   | 778   | 10   | 170                  | 143  | 10   |
| Future Volume (Veh/h)             | 40   | 778   | 10   | 170                  | 143  | 10   |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.92 | 0.92  | 0.92 | 0.92                 | 0.92 | 0.92 |
| Hourly flow rate (vph)            | 43   | 846   | 11   | 185                  | 155  | 11   |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       | None |                      |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               | 149  |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 889   |      | 250                  | 43   |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 889   |      | 250                  | 43   |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 99    |      | 79                   | 99   |      |
| cM capacity (veh/h)               |      | 762   |      | 728                  | 1027 |      |
| Direction, Lane #                 | EB 1 | EB 2  | WB 1 | NB 1                 |      |      |
| Volume Total                      | 43   | 846   | 196  | 166                  |      |      |
| Volume Left                       | 0    | 0     | 11   | 155                  |      |      |
| Volume Right                      | 0    | 846   | 0    | 11                   |      |      |
| cSH                               | 1700 | 1700  | 762  | 742                  |      |      |
| Volume to Capacity                | 0.03 | 0.50  | 0.01 | 0.22                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 0.3  | 6.5                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 0.7  | 11.2                 |      |      |
| Lane LOS                          |      |       | A    | B                    |      |      |
| Approach Delay (s)                | 0.0  |       | 0.7  | 11.2                 |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| <b>Intersection Summary</b>       |      |       |      |                      |      |      |
| Average Delay                     |      | 1.6   |      |                      |      |      |
| Intersection Capacity Utilization |      | 64.3% |      | ICU Level of Service |      | C    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

## Timings

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/19/2017



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↘   | ↑ ↗   | ↑ ↘   | ↑ ↗   | ↑ ↘   | ↑ ↗   | ↑ ↘   | ↑ ↗   | ↑ ↘   |
| Traffic Volume (vph) | 157   | 146   | 56    | 96    | 194   | 1450  | 77    | 918   | 65    |
| Future Volume (vph)  | 157   | 146   | 56    | 96    | 194   | 1450  | 77    | 918   | 65    |
| Turn Type            | Perm  | NA    | Perm  | NA    | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       | 4     |       | 8     | 5     | 2     | 1     |
| Permitted Phases     |       |       |       |       |       | 2     |       | 6     | 6     |
| Detector Phase       |       |       |       | 4     |       | 8     | 8     | 5     | 2     |
| Switch Phase         |       |       |       |       |       |       | 1     | 6     | 6     |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 35.0  | 35.0  | 35.0  | 35.0  | 9.5   | 25.0  | 9.5   | 25.0  | 25.0  |
| Total Split (s)      | 39.0  | 39.0  | 39.0  | 39.0  | 11.0  | 86.0  | 15.0  | 90.0  | 90.0  |
| Total Split (%)      | 27.9% | 27.9% | 27.9% | 27.9% | 7.9%  | 61.4% | 10.7% | 64.3% | 64.3% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       |       | Lead  | Lag   | Lead  | Lag   |
| Lead-Lag Optimize?   |       |       |       |       |       | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 28.8  | 28.8  | 28.8  | 28.8  | 98.1  | 86.9  | 98.0  | 86.9  | 86.9  |
| Actuated g/C Ratio   | 0.21  | 0.21  | 0.21  | 0.21  | 0.70  | 0.62  | 0.70  | 0.62  | 0.62  |
| v/c Ratio            | 0.74  | 0.89  | 0.85  | 0.40  | 0.52  | 0.78  | 0.44  | 0.45  | 0.07  |
| Control Delay        | 71.9  | 72.1  | 122.8 | 44.8  | 9.5   | 11.0  | 15.3  | 15.2  | 3.6   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 71.9  | 72.1  | 122.8 | 44.8  | 9.5   | 11.0  | 15.3  | 15.2  | 3.6   |
| LOS                  | E     | E     | F     | D     | A     | B     | B     | B     | A     |
| Approach Delay       |       |       | 72.0  |       | 66.5  |       | 10.8  |       | 14.5  |
| Approach LOS         |       |       | E     |       | E     |       | B     |       | B     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 23.5

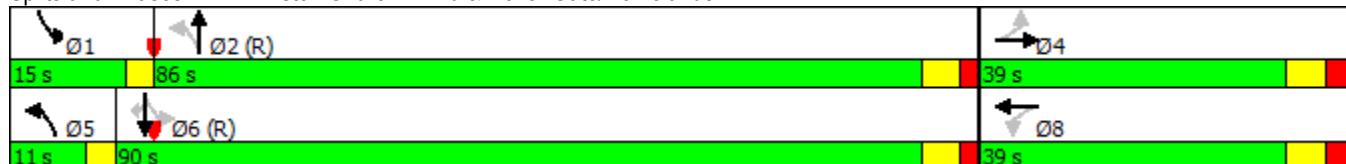
Intersection LOS: C

Intersection Capacity Utilization 92.8%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr



# HCM Unsignalized Intersection Capacity Analysis

2: Homelands Dr & Thorn Lodge Dr

12/19/2017



| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | Y    |       | Y    |                      | Y    |      |
| Sign Control                      | Stop |       | Stop |                      |      | Stop |
| Traffic Volume (vph)              | 103  | 22    | 122  | 180                  | 18   | 93   |
| Future Volume (vph)               | 103  | 22    | 122  | 180                  | 18   | 93   |
| Peak Hour Factor                  | 0.87 | 0.87  | 0.87 | 0.87                 | 0.87 | 0.87 |
| Hourly flow rate (vph)            | 118  | 25    | 140  | 207                  | 21   | 107  |
| Direction, Lane #                 | WB 1 | NB 1  | SB 1 |                      |      |      |
| Volume Total (vph)                | 143  | 347   | 128  |                      |      |      |
| Volume Left (vph)                 | 118  | 0     | 21   |                      |      |      |
| Volume Right (vph)                | 25   | 207   | 0    |                      |      |      |
| Hadj (s)                          | 0.06 | -0.33 | 0.12 |                      |      |      |
| Departure Headway (s)             | 5.0  | 4.1   | 4.8  |                      |      |      |
| Degree Utilization, x             | 0.20 | 0.40  | 0.17 |                      |      |      |
| Capacity (veh/h)                  | 661  | 847   | 715  |                      |      |      |
| Control Delay (s)                 | 9.2  | 9.8   | 8.7  |                      |      |      |
| Approach Delay (s)                | 9.2  | 9.8   | 8.7  |                      |      |      |
| Approach LOS                      | A    | A     | A    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Delay                             |      |       | 9.4  |                      |      |      |
| Level of Service                  |      |       | A    |                      |      |      |
| Intersection Capacity Utilization |      | 34.0% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |       | 15   |                      |      |      |

## Timings

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

01/18/2018



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑↑    | ↑     | ↑↑    | ↑     |
| Traffic Volume (vph) | 74    | 55    | 374   | 218   | 235   | 235   | 204   | 1579  | 46    | 1159  | 37    |
| Future Volume (vph)  | 74    | 55    | 374   | 218   | 235   | 235   | 204   | 1579  | 46    | 1159  | 37    |
| Turn Type            | Perm  | NA    | Perm  | pm+pt | NA    | Perm  | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 4     | 3     | 8     | 5     | 2     | 1     | 6     |
| Permitted Phases     |       |       |       |       | 4     | 4     | 8     | 2     |       | 6     | 6     |
| Detector Phase       |       |       |       |       | 4     | 4     | 3     | 8     | 5     | 2     | 1     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 41.0  | 41.0  | 41.0  | 9.5   | 41.0  | 41.0  | 9.5   | 36.0  | 9.5   | 36.0  | 36.0  |
| Total Split (s)      | 41.5  | 41.5  | 41.5  | 21.0  | 62.5  | 62.5  | 20.4  | 68.0  | 9.5   | 57.1  | 57.1  |
| Total Split (%)      | 29.6% | 29.6% | 29.6% | 15.0% | 44.6% | 44.6% | 14.6% | 48.6% | 6.8%  | 40.8% | 40.8% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 3.5   | 4.0   | 4.0   | 3.5   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 1.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 7.0   | 4.5   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             | Lag   | Lag   | Lag   | Lead  |       |       | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   | Yes   | Yes   | Yes   | Yes   |       |       | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 19.4  | 19.4  | 19.4  | 42.4  | 39.9  | 39.9  | 88.6  | 79.0  | 76.3  | 66.5  | 66.5  |
| Actuated g/C Ratio   | 0.14  | 0.14  | 0.14  | 0.30  | 0.28  | 0.28  | 0.63  | 0.56  | 0.54  | 0.48  | 0.48  |
| v/c Ratio            | 0.49  | 0.21  | 0.87  | 0.54  | 0.45  | 0.46  | 0.71  | 0.83  | 0.33  | 0.79  | 0.05  |
| Control Delay        | 63.0  | 51.5  | 37.6  | 42.1  | 42.0  | 21.9  | 33.3  | 31.8  | 26.3  | 28.8  | 0.1   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 63.0  | 51.5  | 37.6  | 42.1  | 42.0  | 21.9  | 33.3  | 31.8  | 26.3  | 28.8  | 0.1   |
| LOS                  | E     | D     | D     | D     | D     | C     | C     | C     | C     | C     | A     |
| Approach Delay       |       | 42.9  |       |       |       | 35.2  |       |       | 32.0  |       | 27.9  |
| Approach LOS         |       | D     |       |       |       | D     |       |       | C     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 32.6

Intersection LOS: C

Intersection Capacity Utilization 90.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr



HCM Unsignalized Intersection Capacity Analysis  
4: Speakman Dr/Homelands Dr & Sheridan Park Dr

12/19/2017

| Movement                          | EBL  | EBT   | EBR  | WBL   | WBT   | WBR  | NBL                  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|------|-------|-------|------|----------------------|------|------|------|------|------|
| Lane Configurations               | ↑    | ↑     |      | ↑     | ↑     |      |                      | ↔    |      |      | ↔    |      |
| Sign Control                      |      | Stop  |      |       | Stop  |      |                      | Stop |      |      | Stop |      |
| Traffic Volume (vph)              | 19   | 68    | 2    | 55    | 158   | 153  | 6                    | 119  | 236  | 181  | 31   | 10   |
| Future Volume (vph)               | 19   | 68    | 2    | 55    | 158   | 153  | 6                    | 119  | 236  | 181  | 31   | 10   |
| Peak Hour Factor                  | 0.86 | 0.86  | 0.86 | 0.86  | 0.86  | 0.86 | 0.86                 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph)            | 22   | 79    | 2    | 64    | 184   | 178  | 7                    | 138  | 274  | 210  | 36   | 12   |
| Direction, Lane #                 | EB 1 | EB 2  | WB 1 | WB 2  | NB 1  | SB 1 |                      |      |      |      |      |      |
| Volume Total (vph)                | 22   | 81    | 64   | 362   | 419   | 258  |                      |      |      |      |      |      |
| Volume Left (vph)                 | 22   | 0     | 64   | 0     | 7     | 210  |                      |      |      |      |      |      |
| Volume Right (vph)                | 0    | 2     | 0    | 178   | 274   | 12   |                      |      |      |      |      |      |
| Hadj (s)                          | 0.50 | -0.02 | 0.50 | 0.10  | -0.37 | 0.16 |                      |      |      |      |      |      |
| Departure Headway (s)             | 8.1  | 7.6   | 7.4  | 6.9   | 5.8   | 6.6  |                      |      |      |      |      |      |
| Degree Utilization, x             | 0.05 | 0.17  | 0.13 | 0.70  | 0.68  | 0.47 |                      |      |      |      |      |      |
| Capacity (veh/h)                  | 368  | 396   | 464  | 496   | 591   | 496  |                      |      |      |      |      |      |
| Control Delay (s)                 | 10.4 | 11.0  | 10.3 | 23.3  | 20.1  | 15.5 |                      |      |      |      |      |      |
| Approach Delay (s)                | 10.8 |       | 21.3 |       | 20.1  | 15.5 |                      |      |      |      |      |      |
| Approach LOS                      | B    |       | C    |       | C     |      |                      |      |      |      |      |      |
| Intersection Summary              |      |       |      |       |       |      |                      |      |      |      |      |      |
| Delay                             |      |       |      |       |       |      |                      |      |      |      |      | 18.7 |
| Level of Service                  |      |       |      |       |       |      |                      |      |      |      |      | C    |
| Intersection Capacity Utilization |      |       |      | 63.0% |       |      | ICU Level of Service |      |      |      |      | B    |
| Analysis Period (min)             |      |       |      |       |       |      |                      |      |      |      |      | 15   |

# HCM Unsignalized Intersection Capacity Analysis

5: Fifth Line & Sheridan Park Dr

12/19/2017

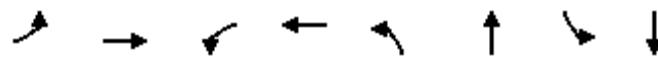


| Movement                          | EBL  | EBT   | EBR  | WBL   | WBT   | WBR   | NBL                  | NBT   | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|------|-------|-------|-------|----------------------|-------|------|------|------|------|
| Lane Configurations               | ↑    | ↑     |      | ↑     | ↑     |       | ↑                    | ↑     |      | ↑    | ↑    |      |
| Sign Control                      |      | Stop  |      |       | Stop  |       |                      | Stop  |      |      | Stop |      |
| Traffic Volume (vph)              | 64   | 373   | 43   | 17    | 332   | 113   | 54                   | 92    | 15   | 57   | 56   | 42   |
| Future Volume (vph)               | 64   | 373   | 43   | 17    | 332   | 113   | 54                   | 92    | 15   | 57   | 56   | 42   |
| Peak Hour Factor                  | 0.91 | 0.91  | 0.91 | 0.91  | 0.91  | 0.91  | 0.91                 | 0.91  | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph)            | 70   | 410   | 47   | 19    | 365   | 124   | 59                   | 101   | 16   | 63   | 62   | 46   |
| Direction, Lane #                 | EB 1 | EB 2  | WB 1 | WB 2  | NB 1  | NB 2  | SB 1                 | SB 2  |      |      |      |      |
| Volume Total (vph)                | 70   | 457   | 19   | 489   | 59    | 117   | 63                   | 108   |      |      |      |      |
| Volume Left (vph)                 | 70   | 0     | 19   | 0     | 59    | 0     | 63                   | 0     |      |      |      |      |
| Volume Right (vph)                | 0    | 47    | 0    | 124   | 0     | 16    | 0                    | 46    |      |      |      |      |
| Hadj (s)                          | 0.50 | -0.03 | 0.50 | -0.14 | 0.50  | -0.10 | 0.53                 | -0.30 |      |      |      |      |
| Departure Headway (s)             | 7.0  | 6.5   | 7.0  | 6.4   | 8.2   | 7.6   | 8.2                  | 7.4   |      |      |      |      |
| Degree Utilization, x             | 0.14 | 0.82  | 0.04 | 0.87  | 0.13  | 0.25  | 0.14                 | 0.22  |      |      |      |      |
| Capacity (veh/h)                  | 493  | 545   | 493  | 554   | 401   | 429   | 404                  | 448   |      |      |      |      |
| Control Delay (s)                 | 9.9  | 31.2  | 9.1  | 36.4  | 11.2  | 11.8  | 11.4                 | 11.3  |      |      |      |      |
| Approach Delay (s)                | 28.4 |       | 35.4 |       | 11.6  |       | 11.3                 |       |      |      |      |      |
| Approach LOS                      | D    |       | E    |       | B     |       | B                    |       |      |      |      |      |
| Intersection Summary              |      |       |      |       |       |       |                      |       |      |      |      |      |
| Delay                             |      |       |      |       |       |       |                      |       |      |      |      |      |
| Level of Service                  |      |       |      |       |       |       |                      |       |      |      |      |      |
| Intersection Capacity Utilization |      |       |      |       | 48.1% |       | ICU Level of Service |       |      |      |      |      |
| Analysis Period (min)             |      |       |      |       |       |       |                      |       | A    |      |      |      |
|                                   |      |       |      |       |       |       |                      |       |      |      |      |      |

## Timings

5: Fifth Line &amp; Sheridan Park Dr

01/12/2018



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   |
| Traffic Volume (vph) | 64    | 373   | 17    | 332   | 54    | 92    | 57    | 56    |
| Future Volume (vph)  | 64    | 373   | 17    | 332   | 54    | 92    | 57    | 56    |
| Turn Type            | Perm  | NA    | Perm  | NA    | Perm  | NA    | Perm  | NA    |
| Protected Phases     |       |       | 4     |       | 8     |       | 2     |       |
| Permitted Phases     | 4     |       |       | 8     |       | 2     |       | 6     |
| Detector Phase       | 4     | 4     | 8     | 8     | 2     | 2     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  |
| Total Split (s)      | 67.0  | 67.0  | 67.0  | 67.0  | 33.0  | 33.0  | 33.0  | 33.0  |
| Total Split (%)      | 67.0% | 67.0% | 67.0% | 67.0% | 33.0% | 33.0% | 33.0% | 33.0% |
| Yellow Time (s)      | 3.5   | 3.5   | 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   | 1.0   | 1.0   |
| 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   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   |
| Lead/Lag             |       |       |       |       |       |       |       |       |
| Lead-Lag Optimize?   |       |       |       |       |       |       |       |       |
| Recall Mode          | None  | None  | None  | None  | Min   | Min   | Min   | Min   |
| Act Effect Green (s) | 14.0  | 14.0  | 14.0  | 14.0  | 7.6   | 7.6   | 7.6   | 7.6   |
| Actuated g/C Ratio   | 0.45  | 0.45  | 0.45  | 0.45  | 0.25  | 0.25  | 0.25  | 0.25  |
| v/c Ratio            | 0.19  | 0.55  | 0.05  | 0.59  | 0.18  | 0.25  | 0.20  | 0.23  |
| Control Delay        | 6.5   | 8.8   | 5.0   | 9.1   | 12.3  | 11.7  | 12.5  | 9.3   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 6.5   | 8.8   | 5.0   | 9.1   | 12.3  | 11.7  | 12.5  | 9.3   |
| LOS                  | A     | A     | A     | A     | B     | B     | B     | A     |
| Approach Delay       |       | 8.4   |       |       | 8.9   |       | 11.9  | 10.5  |
| Approach LOS         |       | A     |       |       | A     |       | B     | B     |

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 30.9

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 9.3

Intersection LOS: A

Intersection Capacity Utilization 50.1%

ICU Level of Service A

Analysis Period (min) 15

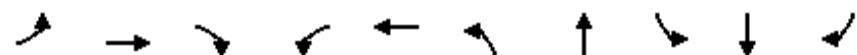
Splits and Phases: 5: Fifth Line &amp; Sheridan Park Dr



## Timings

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

01/18/2018



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑↑↑   | ↑     | ↑↑↑   | ↑     |
| Traffic Volume (vph) | 191   | 101   | 123   | 71    | 84    | 234   | 2365  | 95    | 1527  | 145   |
| Future Volume (vph)  | 191   | 101   | 123   | 71    | 84    | 234   | 2365  | 95    | 1527  | 145   |
| Turn Type            | pm+pt | NA    | Perm  | Perm  | NA    | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     | 7     | 4     |       |       | 8     | 5     | 2     | 1     | 6     |       |
| Permitted Phases     | 4     |       | 4     | 8     |       | 2     |       | 6     |       | 6     |
| Detector Phase       | 7     | 4     | 4     | 8     | 8     | 5     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 9.5   | 38.0  | 38.0  | 38.0  | 38.0  | 9.5   | 38.0  | 9.5   | 38.0  | 38.0  |
| Total Split (s)      | 14.0  | 52.0  | 52.0  | 38.0  | 38.0  | 24.2  | 78.0  | 10.0  | 63.8  | 63.8  |
| Total Split (%)      | 10.0% | 37.1% | 37.1% | 27.1% | 27.1% | 17.3% | 55.7% | 7.1%  | 45.6% | 45.6% |
| Yellow Time (s)      | 3.5   | 4.0   | 4.0   | 4.0   | 4.0   | 3.5   | 5.0   | 3.0   | 5.0   | 5.0   |
| All-Red Time (s)     | 1.0   | 3.0   | 3.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 4.5   | 7.0   | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 3.0   | 7.0   | 7.0   |
| Lead/Lag             | Lead  |       |       | Lag   | Lag   | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   | Yes   |       |       | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 36.5  | 34.0  | 34.0  | 20.0  | 20.0  | 94.5  | 79.7  | 82.1  | 68.9  | 68.9  |
| Actuated g/C Ratio   | 0.26  | 0.24  | 0.24  | 0.14  | 0.14  | 0.68  | 0.57  | 0.59  | 0.49  | 0.49  |
| v/c Ratio            | 0.93  | 0.23  | 0.28  | 0.41  | 0.79  | 0.77  | 0.90  | 0.61  | 0.64  | 0.18  |
| Control Delay        | 91.6  | 42.2  | 7.4   | 59.4  | 62.8  | 44.1  | 32.9  | 43.0  | 29.6  | 6.8   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 91.6  | 42.2  | 7.4   | 59.4  | 62.8  | 44.1  | 32.9  | 43.0  | 29.6  | 6.8   |
| LOS                  | F     | D     | A     | E     | E     | D     | C     | D     | C     | A     |
| Approach Delay       |       | 54.7  |       |       | 61.9  |       | 33.9  |       | 28.4  |       |
| Approach LOS         |       | D     |       |       | E     |       | C     |       | C     |       |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 35.2

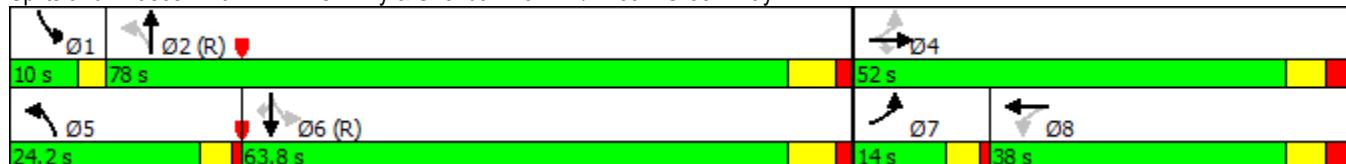
Intersection LOS: D

Intersection Capacity Utilization 96.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way



# HCM Unsignalized Intersection Capacity Analysis

7: Speakman Dr & Hadwen Dr

12/19/2017



| Movement                          | EBL  | EBT   | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |      |       |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |      | Stop  |       |       |      | Stop                 |      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 36   | 36    | 8     | 62    | 26   | 60                   | 2    | 170  | 91   | 40   | 90   | 23   |
| Future Volume (vph)               | 36   | 36    | 8     | 62    | 26   | 60                   | 2    | 170  | 91   | 40   | 90   | 23   |
| Peak Hour Factor                  | 0.81 | 0.81  | 0.81  | 0.81  | 0.81 | 0.81                 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Hourly flow rate (vph)            | 44   | 44    | 10    | 77    | 32   | 74                   | 2    | 210  | 112  | 49   | 111  | 28   |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 98   | 183   | 324   | 188   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 44   | 77    | 2     | 49    |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 10   | 74    | 112   | 28    |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | 0.05 | -0.15 | -0.21 | -0.04 |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 5.5  | 5.2   | 4.7   | 5.1   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.15 | 0.26  | 0.43  | 0.27  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 577  | 628   | 723   | 657   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 9.5  | 10.1  | 11.2  | 9.9   |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 9.5  | 10.1  | 11.2  | 9.9   |      |                      |      |      |      |      |      |      |
| Approach LOS                      | A    | B     | B     | A     |      |                      |      |      |      |      |      |      |
| <b>Intersection Summary</b>       |      |       |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |      |       |       |       | 10.4 |                      |      |      |      |      |      |      |
| Level of Service                  |      |       |       |       | B    |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |       |       | 43.9% |      | ICU Level of Service |      |      |      |      | A    |      |
| Analysis Period (min)             |      |       |       | 15    |      |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

8: Flavelle Blvd West & Speakman Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      |       |      |                      |      |      |
| Traffic Volume (veh/h)            | 214  | 171   | 46   | 109                  | 0    | 0    |
| Future Volume (Veh/h)             | 214  | 171   | 46   | 109                  | 0    | 0    |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.75 | 0.75  | 0.75 | 0.75                 | 0.75 | 0.75 |
| Hourly flow rate (vph)            | 285  | 228   | 61   | 145                  | 0    | 0    |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 513   |      | 666                  | 399  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 513   |      | 666                  | 399  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 94    |      | 100                  | 100  |      |
| cM capacity (veh/h)               |      | 1052  |      | 403                  | 655  |      |
| Direction, Lane #                 | EB 1 | WB 1  |      |                      |      |      |
| Volume Total                      | 513  | 206   |      |                      |      |      |
| Volume Left                       | 0    | 61    |      |                      |      |      |
| Volume Right                      | 228  | 0     |      |                      |      |      |
| cSH                               | 1700 | 1052  |      |                      |      |      |
| Volume to Capacity                | 0.30 | 0.06  |      |                      |      |      |
| Queue Length 95th (m)             | 0.0  | 1.4   |      |                      |      |      |
| Control Delay (s)                 | 0.0  | 2.9   |      |                      |      |      |
| Lane LOS                          |      | A     |      |                      |      |      |
| Approach Delay (s)                | 0.0  | 2.9   |      |                      |      |      |
| Approach LOS                      |      |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 0.8   |      |                      |      |      |
| Intersection Capacity Utilization |      | 36.7% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

9: Flavelle Blvd East & Speakman Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    |       |      | ↑                    | ↖    | ↖    |
| Traffic Volume (veh/h)            | 212  | 0     | 0    | 142                  | 15   | 33   |
| Future Volume (Veh/h)             | 212  | 0     | 0    | 142                  | 15   | 33   |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.80 | 0.80  | 0.80 | 0.80                 | 0.80 | 0.80 |
| Hourly flow rate (vph)            | 265  | 0     | 0    | 178                  | 19   | 41   |
| Pedestrians                       |      |       |      |                      | 1    |      |
| Lane Width (m)                    |      |       |      | 3.7                  |      |      |
| Walking Speed (m/s)               |      |       |      | 1.1                  |      |      |
| Percent Blockage                  |      |       |      | 0                    |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 266   |      | 444                  | 266  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 266   |      | 444                  | 266  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 100   |      | 97                   | 95   |      |
| cM capacity (veh/h)               |      | 1308  |      | 575                  | 777  |      |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2                 |      |      |
| Volume Total                      | 265  | 178   | 19   | 41                   |      |      |
| Volume Left                       | 0    | 0     | 19   | 0                    |      |      |
| Volume Right                      | 0    | 0     | 0    | 41                   |      |      |
| cSH                               | 1700 | 1700  | 575  | 777                  |      |      |
| Volume to Capacity                | 0.16 | 0.10  | 0.03 | 0.05                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 0.8  | 1.3                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 11.5 | 9.9                  |      |      |
| Lane LOS                          |      |       | B    | A                    |      |      |
| Approach Delay (s)                | 0.0  | 0.0   | 10.4 |                      |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 1.2   |      |                      |      |      |
| Intersection Capacity Utilization |      | 21.2% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

10: Speakman Dr & Sheridan Park Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    | ↗     | ↖    | ↙                    | ↖    | ↗    |
| Traffic Volume (veh/h)            | 40   | 102   | 10   | 170                  | 518  | 10   |
| Future Volume (Veh/h)             | 40   | 102   | 10   | 170                  | 518  | 10   |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.92 | 0.92  | 0.92 | 0.92                 | 0.92 | 0.92 |
| Hourly flow rate (vph)            | 43   | 111   | 11   | 185                  | 563  | 11   |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       | None |                      |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               | 148  |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 154   |      | 250                  | 43   |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 154   |      | 250                  | 43   |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 99    |      | 23                   | 99   |      |
| cM capacity (veh/h)               |      | 1426  |      | 733                  | 1027 |      |
| Direction, Lane #                 | EB 1 | EB 2  | WB 1 | NB 1                 |      |      |
| Volume Total                      | 43   | 111   | 196  | 574                  |      |      |
| Volume Left                       | 0    | 0     | 11   | 563                  |      |      |
| Volume Right                      | 0    | 111   | 0    | 11                   |      |      |
| cSH                               | 1700 | 1700  | 1426 | 737                  |      |      |
| Volume to Capacity                | 0.03 | 0.07  | 0.01 | 0.78                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 0.2  | 58.4                 |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 0.5  | 24.9                 |      |      |
| Lane LOS                          |      |       | A    | C                    |      |      |
| Approach Delay (s)                | 0.0  |       | 0.5  | 24.9                 |      |      |
| Approach LOS                      |      |       |      | C                    |      |      |
| <b>Intersection Summary</b>       |      |       |      |                      |      |      |
| Average Delay                     |      | 15.5  |      |                      |      |      |
| Intersection Capacity Utilization |      | 52.1% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

| Junctions 9   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ARCADY 9 - Roundabout Module  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Version: 9.0.0.4211   © Copyright TRL Limited, 2018   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| For sales and distribution information, program advice and maintenance, contact TRL:<br>Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Filename: 039474\_Roundabout\_Analysis 85 With Ext.j9  
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady  
Report generation date: 1/9/2018 11:52:11 AM

## Summary of intersection performance

|   | AM          |                 |           |           |     |   |                  | PM                        |             |                 |           |           |      |                        |                                      |                           |
|---|-------------|-----------------|-----------|-----------|-----|---|------------------|---------------------------|-------------|-----------------|-----------|-----------|------|------------------------|--------------------------------------|---------------------------|
|   | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s)                    | Intersection LOS | Network Residual Capacity | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS  | Intersection Delay (s) | Intersection LOS                     | Network Residual Capacity |
| <b>Single Lane Roundabout - 2021 With Extension</b> |             |                 |           |           |     |   |                  |                           |             |                 |           |           |      |                        |                                      |                           |
| <b>1 - East End - 1 - Homelands Dr - N</b>          | 1.2         | 3.1             | 10.26     | 0.54      | B   | 9.05                                      | A                | 23 %                      | 0.4         | 1.2             | 5.42      | 0.27      | A    | 7.54                   | A                                    | 35 %                      |
| <b>1 - East End - 2 - Sheridan Park Dr - E</b>      | 1.6         | 2.0             | 9.33      | 0.61      | A   |   |                  |                           | 0.8         | 2.8             | 7.11      | 0.44      | A    |                        |                                      |                           |
| <b>1 - East End - 3 - Speakman Dr - S</b>           | 0.5         | 1.9             | 6.81      | 0.31      | A   | [2 - West End - 4 - Sheridan Park Dr - W] | A                | 1.1                       | 3.3         | 10.04           | 0.52      | B         | 6.13 | A                      | [1 - East End - 3 - Speakman Dr - S] |                           |
| <b>1 - East End - 4 - Sheridan Park Dr - W</b>      | 0.1         | 0.5             | 6.45      | 0.09      | A   |   |                  |                           | 0.1         | 0.5             | 4.47      | 0.11      | A    |                        |                                      |                           |
| <b>2 - West End - 2 - Sheridan Park Dr - E</b>      | 0.2         | 0.7             | 4.43      | 0.19      | A   |   |                  |                           | 0.3         | 1.4             | 6.18      | 0.24      | A    |                        |                                      |                           |
| <b>2 - West End - 3 - Speakman Dr - S</b>           | 0.2         | 0.5             | 4.01      | 0.15      | A   |   |                  |                           | 1.2         | 1.6             | 7.30      | 0.53      | A    |                        |                                      |                           |
| <b>2 - West End - 4 - Sheridan Park Dr - W</b>      | 1.7         | 1.9             | 6.83      | 0.63      | A   |   |                  |                           | 0.1         | 0.5             | 1.83      | 0.07      | A    |                        |                                      |                           |

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

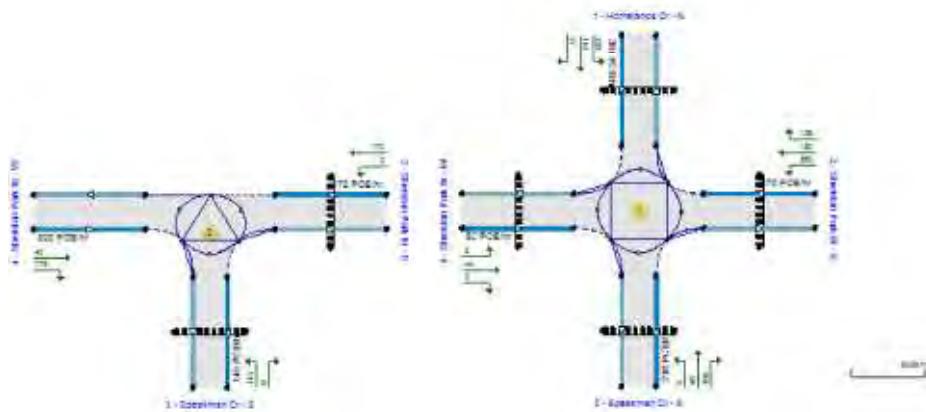
## File summary

### File Description

|             |  |
|-------------|--|
| Title       | Sheridan Park Drive With Extension 85 percent Capacity |
| Location    | Mississauga  |
| Site number |  |
| Date        | 7/25/2017  |
| Version     |  |
| Status      | (new file)   |
| Identifier  |  |
| Client      |  |
| Jobnumber   |  |
| Analyst     | RJBURNSIDE"jester                                      |
| Description |  |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|----------------|-------------|---------------------|-----------------------|------------|---------------------|-------------------|---------------------|
| m              | kph         | PCE                 | PCE                   | perHour    | s                   | -Min              | perMin              |



Showing original traffic demand (PCEhr).

The intersection diagram reflects the last run of Intersections.

### Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles         | Calculate detailed queueing delay | Calculate residual capacity         | Residual capacity criteria type | V/C Ratio Threshold | Average Delay threshold (s) | Queue threshold (PCE) |
|--------------------|-------------------------------------|-----------------------------------|-------------------------------------|---------------------------------|---------------------|-----------------------------|-----------------------|
| 5.75               | <input checked="" type="checkbox"/> |                                   | <input checked="" type="checkbox"/> | Delay                           | 0.85                | 36.00                       | 20.00                 |

### Demand Set Summary

| Scenario name       | Time Period name | Traffic profile type | Model start time (HH:mm) | Model finish time (HH:mm) | Time segment length (min) | Run automatically                   |
|---------------------|------------------|----------------------|--------------------------|---------------------------|---------------------------|-------------------------------------|
| 2021 With Extension | AM               | ONE HOUR             | 08:00                    | 09:30                     | 15                        | <input checked="" type="checkbox"/> |
| 2021 With Extension | PM               | ONE HOUR             | 16:00                    | 17:30                     | 15                        | <input checked="" type="checkbox"/> |

## Single Lane Roundabout - 2021 With Extension, AM

### Data Errors and Warnings

| Severity | Area             | Item  | Description   |
|----------|------------------|---|---|
| Last Run | Last Run         | 2 - West End - 3 - Speakman Dr - S - Capacity | Pedestrian Crossing causes blocking on previous leg due to traffic queuing to leave the intersection in 6 timesegment(s). |
| Warning  | Queue variations | Analysis Options                              | Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.                       |

## Results

### Results Summary for whole modelled period

| Intersection | Leg                      | Max V/C Ratio | Max delay (s) | Max Queue (PCE) | Max 95th percentile Queue (PCE) | Max LOS | Average Demand (PCE/hr) | Total Intersection Arrivals (PCE) |
|--------------|--------------------------|---------------|---------------|-----------------|---------------------------------|---------|-------------------------|-----------------------------------|
| 1 - East End | 1 - Homelands Dr - N     | 0.54          | 10.26         | 1.2             | 3.1                             | B       | 349.61                  | 524.42                            |
|              | 2 - Sheridan Park Dr - E | 0.61          | 9.33          | 1.6             | 2.0                             | A       | 523.04                  | 784.56                            |
|              | 3 - Speakman Dr - S      | 0.31          | 6.81          | 0.5             | 1.9                             | A       | 200.04                  | 300.06                            |
|              | 4 - Sheridan Park Dr - W | 0.09          | 6.45          | 0.1             | 0.5                             | A       | 47.72                   | 71.57                             |
| 2 - West End | 2 - Sheridan Park Dr - E | 0.19          | 4.43          | 0.2             | 0.7                             | A       | 157.83                  | 236.75                            |
|              | 3 - Speakman Dr - S      | 0.15          | 4.01          | 0.2             | 0.5                             | A       | 133.05                  | 199.58                            |
|              | 4 - Sheridan Park Dr - W | 0.63          | 6.83          | 1.7             | 1.9                             | A       | 752.45                  | 1128.67                           |

## Single Lane Roundabout - 2021 With Extension, PM

### Data Errors and Warnings

| Severity | Area             | Item   | Description   |
|----------|------------------|--|---|
| Last Run | Last Run         | 1 - East End - 2 - Sheridan Park Dr - E - Capacity | Pedestrian Crossing causes blocking on previous leg due to traffic queuing to leave the intersection in 6 timesegment(s). |
| Warning  | Queue variations | Analysis Options                                   | Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.                       |

## Results

### Results Summary for whole modelled period

| Intersection | Leg                      | Max V/C Ratio | Max delay (s) | Max Queue (PCE) | Max 95th percentile Queue (PCE) | Max LOS | Average Demand (PCE/hr) | Total Intersection Arrivals (PCE) |
|--------------|--------------------------|---------------|---------------|-----------------|---------------------------------|---------|-------------------------|-----------------------------------|
| 1 - East End | 1 - Homelands Dr - N     | 0.27          | 5.42          | 0.4             | 1.2                             | A       | 205.55                  | 308.32                            |
|              | 2 - Sheridan Park Dr - E | 0.44          | 7.11          | 0.8             | 2.8                             | A       | 337.68                  | 506.52                            |
|              | 3 - Speakman Dr - S      | 0.52          | 10.04         | 1.1             | 3.3                             | B       | 333.10                  | 499.64                            |
|              | 4 - Sheridan Park Dr - W | 0.11          | 4.47          | 0.1             | 0.5                             | A       | 83.50                   | 125.25                            |
| 2 - West End | 2 - Sheridan Park Dr - E | 0.24          | 6.18          | 0.3             | 1.4                             | A       | 157.83                  | 236.75                            |
|              | 3 - Speakman Dr - S      | 0.53          | 7.30          | 1.2             | 1.6                             | A       | 477.16                  | 715.74                            |
|              | 4 - Sheridan Park Dr - W | 0.07          | 1.83          | 0.1             | 0.5                             | A       | 132.14                  | 198.21                            |



---

## Appendix G

### 2021 95<sup>th</sup> Percentile Queues

## Queues

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group             | EBL  | EBT  | WBL  | WBT    | NBL    | NBT   | SBL  | SBT   | SBR  |
|------------------------|------|------|------|--------|--------|-------|------|-------|------|
| Lane Group Flow (vph)  | 40   | 147  | 123  | 182    | 260    | 1280  | 54   | 1513  | 134  |
| v/c Ratio              | 0.35 | 0.52 | 0.83 | 0.69   | 0.72   | 0.49  | 0.24 | 0.72  | 0.14 |
| Control Delay          | 59.9 | 37.8 | 96.6 | 63.5   | 48.1   | 6.7   | 16.5 | 22.2  | 5.9  |
| Queue Delay            | 0.0  | 0.0  | 0.0  | 0.0    | 0.0    | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 59.9 | 37.8 | 96.6 | 63.5   | 48.1   | 6.7   | 16.5 | 22.2  | 5.9  |
| Queue Length 50th (m)  | 10.1 | 22.4 | 33.6 | 43.8   | 52.8   | 38.4  | 6.7  | 147.8 | 6.5  |
| Queue Length 95th (m)  | 20.8 | 41.3 | 53.1 | 64.7   | m#83.4 | 66.9  | 15.2 | 173.6 | 15.4 |
| Internal Link Dist (m) |      | 99.2 |      | 1187.3 |        | 464.2 |      | 152.1 |      |
| Turn Bay Length (m)    |      |      | 15.0 |        | 126.0  |       | 75.0 |       | 45.0 |
| Base Capacity (vph)    | 177  | 409  | 231  | 402    | 361    | 2622  | 226  | 2106  | 946  |
| Starvation Cap Reductn | 0    | 0    | 0    | 0      | 0      | 0     | 0    | 0     | 0    |
| Spillback Cap Reductn  | 0    | 0    | 0    | 0      | 0      | 0     | 0    | 0     | 0    |
| Storage Cap Reductn    | 0    | 0    | 0    | 0      | 0      | 0     | 0    | 0     | 0    |
| Reduced v/c Ratio      | 0.23 | 0.36 | 0.53 | 0.45   | 0.72   | 0.49  | 0.24 | 0.72  | 0.14 |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

## Queues

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group             | EBL  | EBT   | EBC  | WBL  | WBT   | WBR  | NBL    | NBT   | SBL    | SBT   | SBR   |
|------------------------|------|-------|------|------|-------|------|--------|-------|--------|-------|-------|
| Lane Group Flow (vph)  | 20   | 268   | 138  | 28   | 74    | 48   | 208    | 1610  | 285    | 1291  | 121   |
| v/c Ratio              | 0.09 | 0.78  | 0.41 | 0.31 | 0.21  | 0.15 | 0.95   | 0.82  | 0.89   | 0.50  | 0.10  |
| Control Delay          | 45.5 | 70.0  | 24.2 | 56.5 | 48.4  | 12.2 | 78.6   | 28.9  | 68.7   | 7.8   | 1.4   |
| Queue Delay            | 0.0  | 0.0   | 0.0  | 0.0  | 0.0   | 0.0  | 0.0    | 0.0   | 0.0    | 0.0   | 0.0   |
| Total Delay            | 45.5 | 70.0  | 24.2 | 56.5 | 48.4  | 12.2 | 78.6   | 28.9  | 68.7   | 7.8   | 1.4   |
| Queue Length 50th (m)  | 4.7  | 71.8  | 13.6 | 6.8  | 17.7  | 0.0  | 51.6   | 181.2 | 68.7   | 52.8  | 0.0   |
| Queue Length 95th (m)  | 11.3 | 96.1  | 31.2 | 15.9 | 29.9  | 10.3 | #106.1 | 214.0 | #140.9 | 78.7  | m4.1  |
| Internal Link Dist (m) |      | 197.7 |      |      | 123.8 |      |        | 371.2 |        | 464.2 |       |
| Turn Bay Length (m)    | 32.0 |       | 30.0 | 30.0 |       |      | 170.0  |       | 78.0   |       | 130.0 |
| Base Capacity (vph)    | 313  | 461   | 426  | 123  | 466   | 418  | 220    | 1956  | 321    | 2600  | 1187  |
| Starvation Cap Reductn | 0    | 0     | 0    | 0    | 0     | 0    | 0      | 0     | 0      | 0     | 0     |
| Spillback Cap Reductn  | 0    | 0     | 0    | 0    | 0     | 0    | 0      | 0     | 0      | 0     | 0     |
| Storage Cap Reductn    | 0    | 0     | 0    | 0    | 0     | 0    | 0      | 0     | 0      | 0     | 0     |
| Reduced v/c Ratio      | 0.06 | 0.58  | 0.32 | 0.23 | 0.16  | 0.11 | 0.95   | 0.82  | 0.89   | 0.50  | 0.10  |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

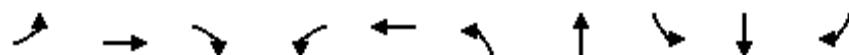
Queue shown is maximum after two cycles.

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

## Queues

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



| Lane Group             | EBL  | EBT   | EBR  | WBL  | WBT   | NBL   | NBT   | SBL   | SBT   | SBR  |
|------------------------|------|-------|------|------|-------|-------|-------|-------|-------|------|
| Lane Group Flow (vph)  | 167  | 120   | 168  | 155  | 128   | 85    | 2199  | 162   | 1606  | 211  |
| v/c Ratio              | 0.81 | 0.37  | 0.54 | 0.74 | 0.42  | 0.54  | 0.72  | 0.77  | 0.45  | 0.18 |
| Control Delay          | 81.8 | 52.2  | 40.0 | 74.3 | 40.6  | 37.2  | 22.6  | 56.0  | 9.1   | 1.7  |
| Queue Delay            | 0.0  | 0.0   | 0.0  | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0  |
| Total Delay            | 81.8 | 52.2  | 40.0 | 74.3 | 40.6  | 37.2  | 22.6  | 56.0  | 9.1   | 1.7  |
| Queue Length 50th (m)  | 45.1 | 29.7  | 28.7 | 41.3 | 23.8  | 12.9  | 145.8 | 28.0  | 59.4  | 1.1  |
| Queue Length 95th (m)  | 65.7 | 44.3  | 47.6 | 60.6 | 39.8  | #47.3 | 215.8 | 53.0  | 89.5  | 10.0 |
| Internal Link Dist (m) |      | 167.9 |      |      | 140.2 |       | 718.6 |       | 284.6 |      |
| Turn Bay Length (m)    | 31.0 |       | 35.0 | 45.0 |       | 120.0 |       | 112.0 |       | 50.0 |
| Base Capacity (vph)    | 302  | 474   | 426  | 306  | 426   | 156   | 3056  | 265   | 3581  | 1197 |
| 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      | 0.55 | 0.25  | 0.39 | 0.51 | 0.30  | 0.54  | 0.72  | 0.61  | 0.45  | 0.18 |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

## Queues

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group             | EBL   | EBT    | WBL   | WBT    | NBL   | NBT   | SBL  | SBT   | SBR  |
|------------------------|-------|--------|-------|--------|-------|-------|------|-------|------|
| Lane Group Flow (vph)  | 167   | 341    | 60    | 176    | 206   | 1627  | 98   | 957   | 69   |
| v/c Ratio              | 0.81  | 0.89   | 0.83  | 0.46   | 0.51  | 0.75  | 0.49 | 0.44  | 0.07 |
| Control Delay          | 80.8  | 71.9   | 120.4 | 47.7   | 8.9   | 10.7  | 16.6 | 15.0  | 3.5  |
| Queue Delay            | 0.0   | 0.0    | 0.0   | 0.0    | 0.0   | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 80.8  | 71.9   | 120.4 | 47.7   | 8.9   | 10.7  | 16.6 | 15.0  | 3.5  |
| Queue Length 50th (m)  | 43.3  | 80.5   | 15.7  | 38.3   | 8.3   | 41.6  | 7.8  | 73.1  | 0.9  |
| Queue Length 95th (m)  | #76.3 | #125.3 | #41.8 | 60.7   | m19.2 | 66.6  | 17.3 | 88.3  | 6.9  |
| Internal Link Dist (m) |       | 99.2   |       | 1187.3 |       | 464.2 |      | 152.1 |      |
| Turn Bay Length (m)    |       |        | 15.0  |        | 126.0 |       | 75.0 |       | 45.0 |
| Base Capacity (vph)    | 230   | 424    | 80    | 428    | 403   | 2159  | 244  | 2182  | 976  |
| Starvation Cap Reductn | 0     | 0      | 0     | 0      | 0     | 0     | 0    | 0     | 0    |
| Spillback Cap Reductn  | 0     | 0      | 0     | 0      | 0     | 0     | 0    | 0     | 0    |
| Storage Cap Reductn    | 0     | 0      | 0     | 0      | 0     | 0     | 0    | 0     | 0    |
| Reduced v/c Ratio      | 0.73  | 0.80   | 0.75  | 0.41   | 0.51  | 0.75  | 0.40 | 0.44  | 0.07 |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

## Queues

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group             | EBL  | EBT   | EBR  | WBL  | WBT   | WBR  | NBL   | NBT   | SBL   | SBT   | SBR   |
|------------------------|------|-------|------|------|-------|------|-------|-------|-------|-------|-------|
| Lane Group Flow (vph)  | 77   | 53    | 390  | 147  | 228   | 165  | 213   | 1671  | 27    | 1207  | 39    |
| v/c Ratio              | 0.43 | 0.18  | 0.88 | 0.48 | 0.53  | 0.37 | 0.66  | 0.72  | 0.16  | 0.68  | 0.04  |
| Control Delay          | 57.8 | 48.7  | 43.7 | 47.6 | 50.6  | 17.6 | 21.3  | 21.9  | 9.6   | 19.7  | 0.1   |
| Queue Delay            | 0.0  | 0.0   | 0.0  | 0.0  | 0.0   | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay            | 57.8 | 48.7  | 43.7 | 47.6 | 50.6  | 17.6 | 21.3  | 21.9  | 9.6   | 19.7  | 0.1   |
| Queue Length 50th (m)  | 19.5 | 12.8  | 45.2 | 33.5 | 55.6  | 12.9 | 19.3  | 166.8 | 1.6   | 88.3  | 0.0   |
| Queue Length 95th (m)  | 32.2 | 23.0  | 78.2 | 47.1 | 72.8  | 29.5 | 45.5  | 243.6 | m4.3  | 101.1 | m0.0  |
| Internal Link Dist (m) |      | 197.7 |      |      | 123.8 |      |       |       | 371.2 |       | 464.2 |
| Turn Bay Length (m)    | 32.0 |       | 30.0 | 30.0 |       |      | 170.0 |       | 78.0  |       | 130.0 |
| Base Capacity (vph)    | 281  | 466   | 559  | 304  | 600   | 571  | 359   | 2314  | 178   | 1785  | 930   |
| Starvation Cap Reductn | 0    | 0     | 0    | 0    | 0     | 0    | 0     | 0     | 0     | 0     | 0     |
| Spillback Cap Reductn  | 0    | 0     | 0    | 0    | 0     | 0    | 0     | 0     | 0     | 0     | 0     |
| Storage Cap Reductn    | 0    | 0     | 0    | 0    | 0     | 0    | 0     | 0     | 0     | 0     | 0     |
| Reduced v/c Ratio      | 0.27 | 0.11  | 0.70 | 0.48 | 0.38  | 0.29 | 0.59  | 0.72  | 0.15  | 0.68  | 0.04  |

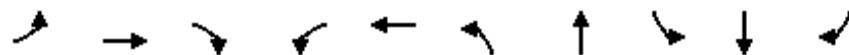
## Intersection Summary

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

## Queues

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



| Lane Group             | EBL   | EBT   | EBR  | WBL  | WBT   | NBL   | NBT    | SBL   | SBT   | SBR  |
|------------------------|-------|-------|------|------|-------|-------|--------|-------|-------|------|
| Lane Group Flow (vph)  | 184   | 104   | 115  | 75   | 214   | 167   | 2593   | 100   | 1607  | 83   |
| v/c Ratio              | 0.95  | 0.25  | 0.27 | 0.26 | 0.51  | 0.66  | 0.86   | 0.62  | 0.55  | 0.09 |
| Control Delay          | 104.5 | 44.3  | 8.0  | 45.0 | 36.5  | 25.8  | 29.3   | 41.4  | 21.4  | 7.7  |
| Queue Delay            | 0.0   | 0.0   | 0.0  | 0.0  | 0.0   | 0.0   | 0.0    | 0.0   | 0.0   | 0.0  |
| Total Delay            | 104.5 | 44.3  | 8.0  | 45.0 | 36.5  | 25.8  | 29.3   | 41.4  | 21.4  | 7.7  |
| Queue Length 50th (m)  | 50.4  | 23.9  | 0.0  | 17.3 | 36.9  | 14.3  | 211.3  | 11.6  | 99.3  | 3.3  |
| Queue Length 95th (m)  | #78.9 | 36.7  | 14.2 | 28.9 | 56.6  | 39.5  | #305.7 | 32.5  | 137.8 | 13.2 |
| Internal Link Dist (m) |       | 167.9 |      |      | 140.2 |       | 718.6  |       | 284.6 |      |
| Turn Bay Length (m)    | 31.0  |       | 35.0 | 45.0 |       | 120.0 |        | 112.0 |       | 50.0 |
| Base Capacity (vph)    | 259   | 551   | 523  | 378  | 534   | 288   | 2998   | 196   | 2904  | 918  |
| 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      | 0.71  | 0.19  | 0.22 | 0.20 | 0.40  | 0.58  | 0.86   | 0.51  | 0.55  | 0.09 |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

## Queues

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group             | EBL  | EBT  | WBL  | WBT    | NBL    | NBT   | SBL  | SBT   | SBR  |
|------------------------|------|------|------|--------|--------|-------|------|-------|------|
| Lane Group Flow (vph)  | 40   | 150  | 123  | 162    | 260    | 1349  | 46   | 1533  | 134  |
| v/c Ratio              | 0.31 | 0.52 | 0.84 | 0.61   | 0.73   | 0.51  | 0.22 | 0.73  | 0.14 |
| Control Delay          | 56.8 | 37.5 | 97.4 | 56.8   | 48.5   | 6.0   | 16.2 | 22.5  | 6.0  |
| Queue Delay            | 0.0  | 0.0  | 0.0  | 0.0    | 0.0    | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 56.8 | 37.5 | 97.4 | 56.8   | 48.5   | 6.0   | 16.2 | 22.5  | 6.0  |
| Queue Length 50th (m)  | 10.0 | 22.7 | 33.6 | 36.8   | 53.0   | 39.8  | 5.6  | 151.3 | 6.6  |
| Queue Length 95th (m)  | 20.5 | 41.8 | 53.1 | 56.1   | m#63.2 | m51.5 | 13.4 | 177.8 | 15.5 |
| Internal Link Dist (m) |      | 99.2 |      | 1187.3 |        | 464.2 |      | 152.1 |      |
| Turn Bay Length (m)    |      |      | 15.0 |        | 126.0  |       | 75.0 |       | 45.0 |
| Base Capacity (vph)    | 202  | 410  | 228  | 400    | 354    | 2627  | 211  | 2106  | 946  |
| Starvation Cap Reductn | 0    | 0    | 0    | 0      | 0      | 0     | 0    | 0     | 0    |
| Spillback Cap Reductn  | 0    | 0    | 0    | 0      | 0      | 0     | 0    | 0     | 0    |
| Storage Cap Reductn    | 0    | 0    | 0    | 0      | 0      | 0     | 0    | 0     | 0    |
| Reduced v/c Ratio      | 0.20 | 0.37 | 0.54 | 0.41   | 0.73   | 0.51  | 0.22 | 0.73  | 0.14 |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

## Queues

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group             | EBL  | EBT   | EBC  | WBL  | WBT   | WBR  | NBL   | NBT    | SBL    | SBT   | SBR   |
|------------------------|------|-------|------|------|-------|------|-------|--------|--------|-------|-------|
| Lane Group Flow (vph)  | 20   | 273   | 138  | 109  | 91    | 129  | 208   | 1627   | 306    | 1291  | 121   |
| v/c Ratio              | 0.09 | 0.78  | 0.39 | 0.67 | 0.19  | 0.26 | 0.72  | 0.98   | 0.93   | 0.70  | 0.14  |
| Control Delay          | 45.2 | 69.9  | 20.0 | 60.8 | 40.3  | 7.0  | 33.1  | 52.1   | 74.8   | 25.0  | 5.7   |
| Queue Delay            | 0.0  | 0.0   | 0.0  | 0.0  | 0.0   | 0.0  | 0.0   | 0.0    | 0.0    | 0.0   | 0.0   |
| Total Delay            | 45.2 | 69.9  | 20.0 | 60.8 | 40.3  | 7.0  | 33.1  | 52.1   | 74.8   | 25.0  | 5.7   |
| Queue Length 50th (m)  | 4.7  | 73.1  | 10.4 | 23.7 | 19.9  | 0.0  | 21.6  | 225.0  | 78.0   | 90.3  | 0.3   |
| Queue Length 95th (m)  | 11.3 | 97.3  | 27.7 | 36.5 | 32.0  | 14.6 | #64.8 | #280.5 | #157.3 | 118.2 | m8.7  |
| Internal Link Dist (m) |      | 197.7 |      |      | 124.6 |      |       | 371.2  |        | 464.2 |       |
| Turn Bay Length (m)    | 32.0 |       | 30.0 | 50.0 |       | 60.0 | 170.0 |        | 78.0   |       | 130.0 |
| Base Capacity (vph)    | 308  | 461   | 436  | 162  | 600   | 581  | 287   | 1668   | 330    | 1855  | 882   |
| Starvation Cap Reductn | 0    | 0     | 0    | 0    | 0     | 0    | 0     | 0      | 0      | 0     | 0     |
| Spillback Cap Reductn  | 0    | 0     | 0    | 0    | 0     | 0    | 0     | 0      | 0      | 0     | 0     |
| Storage Cap Reductn    | 0    | 0     | 0    | 0    | 0     | 0    | 0     | 0      | 0      | 0     | 0     |
| Reduced v/c Ratio      | 0.06 | 0.59  | 0.32 | 0.67 | 0.15  | 0.22 | 0.72  | 0.98   | 0.93   | 0.70  | 0.14  |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

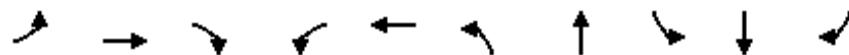
Queue shown is maximum after two cycles.

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

## Queues

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



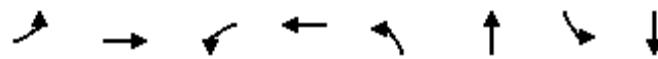
| Lane Group             | EBL  | EBT  | EBR   | WBL  | WBT  | NBL   | NBT   | SBL   | SBT   | SBR   |
|------------------------|------|------|-------|------|------|-------|-------|-------|-------|-------|
| Lane Group Flow (vph)  | 184  | 122  | 183   | 155  | 137  | 159   | 2199  | 162   | 1606  | 282   |
| v/c Ratio              | 0.86 | 0.35 | 0.43  | 0.70 | 0.43 | 0.63  | 0.74  | 0.74  | 0.54  | 0.27  |
| Control Delay          | 87.5 | 50.8 | 9.0   | 68.6 | 42.9 | 22.7  | 23.9  | 52.8  | 18.9  | 6.1   |
| Queue Delay            | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay            | 87.5 | 50.8 | 9.0   | 68.6 | 42.9 | 22.7  | 23.9  | 52.8  | 18.9  | 6.1   |
| Queue Length 50th (m)  | 49.2 | 29.4 | 0.0   | 40.0 | 26.7 | 12.3  | 158.9 | 27.4  | 93.2  | 10.4  |
| Queue Length 95th (m)  | 74.3 | 45.9 | 18.7  | 61.8 | 45.2 | 32.4  | 205.7 | 52.8  | 130.7 | 29.7  |
| Internal Link Dist (m) |      |      | 167.9 |      |      | 140.2 |       | 718.6 |       | 284.6 |
| Turn Bay Length (m)    | 31.0 |      | 35.0  | 45.0 |      | 120.0 |       | 112.0 |       | 50.0  |
| Base Capacity (vph)    | 270  | 435  | 493   | 280  | 390  | 320   | 2980  | 264   | 2964  | 1034  |
| 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      | 0.68 | 0.28 | 0.37  | 0.55 | 0.35 | 0.50  | 0.74  | 0.61  | 0.54  | 0.27  |

Intersection Summary

## Queues

5: Fifth Line &amp; Sheridan Park Dr

01/18/2018



| Lane Group             | EBL   | EBT  | WBL   | WBT  | NBL   | NBT  | SBL   | SBT  |
|------------------------|-------|------|-------|------|-------|------|-------|------|
| Lane Group Flow (vph)  | 36    | 473  | 9     | 598  | 56    | 106  | 138   | 220  |
| v/c Ratio              | 0.12  | 0.53 | 0.03  | 0.68 | 0.20  | 0.22 | 0.40  | 0.44 |
| Control Delay          | 6.8   | 9.3  | 5.9   | 12.1 | 15.8  | 12.4 | 18.2  | 12.4 |
| Queue Delay            | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 6.8   | 9.3  | 5.9   | 12.1 | 15.8  | 12.4 | 18.2  | 12.4 |
| Queue Length 50th (m)  | 1.0   | 16.6 | 0.3   | 23.3 | 2.7   | 3.9  | 6.9   | 6.8  |
| Queue Length 95th (m)  | 4.9   | 42.5 | 1.9   | 59.0 | 11.5  | 15.6 | 23.6  | 25.2 |
| Internal Link Dist (m) | 552.8 |      | 167.9 |      | 418.3 |      | 255.1 |      |
| Turn Bay Length (m)    | 30.0  | 30.0 |       | 43.0 |       | 27.0 |       |      |
| Base Capacity (vph)    | 588   | 1716 | 607   | 1698 | 703   | 1190 | 874   | 1146 |
| 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      | 0.06  | 0.28 | 0.01  | 0.35 | 0.08  | 0.09 | 0.16  | 0.19 |

Intersection Summary

## Queues

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group             | EBL  | EBT    | WBL   | WBT    | NBL   | NBT   | SBL  | SBT   | SBR  |
|------------------------|------|--------|-------|--------|-------|-------|------|-------|------|
| Lane Group Flow (vph)  | 167  | 343    | 60    | 156    | 206   | 1682  | 82   | 977   | 69   |
| v/c Ratio              | 0.74 | 0.89   | 0.85  | 0.40   | 0.52  | 0.78  | 0.44 | 0.45  | 0.07 |
| Control Delay          | 71.9 | 72.1   | 122.8 | 44.8   | 9.5   | 11.0  | 15.3 | 15.2  | 3.6  |
| Queue Delay            | 0.0  | 0.0    | 0.0   | 0.0    | 0.0   | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 71.9 | 72.1   | 122.8 | 44.8   | 9.5   | 11.0  | 15.3 | 15.2  | 3.6  |
| Queue Length 50th (m)  | 42.5 | 81.0   | 15.7  | 32.3   | 9.8   | 50.9  | 6.5  | 75.1  | 1.0  |
| Queue Length 95th (m)  | 69.1 | #125.9 | #42.2 | 53.2   | m16.7 | 75.1  | 14.3 | 90.7  | 7.1  |
| Internal Link Dist (m) |      | 99.2   |       | 1187.3 |       | 464.2 |      | 152.1 |      |
| Turn Bay Length (m)    |      |        | 15.0  |        | 126.0 |       | 75.0 |       | 45.0 |
| Base Capacity (vph)    | 249  | 424    | 79    | 427    | 394   | 2170  | 234  | 2180  | 975  |
| Starvation Cap Reductn | 0    | 0      | 0     | 0      | 0     | 0     | 0    | 0     | 0    |
| Spillback Cap Reductn  | 0    | 0      | 0     | 0      | 0     | 0     | 0    | 0     | 0    |
| Storage Cap Reductn    | 0    | 0      | 0     | 0      | 0     | 0     | 0    | 0     | 0    |
| Reduced v/c Ratio      | 0.67 | 0.81   | 0.76  | 0.37   | 0.52  | 0.78  | 0.35 | 0.45  | 0.07 |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

## Queues

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

01/18/2018



| Lane Group             | EBL  | EBT   | EBR  | WBL  | WBT   | WBR  | NBL   | NBT    | SBL   | SBT    | SBR   |
|------------------------|------|-------|------|------|-------|------|-------|--------|-------|--------|-------|
| Lane Group Flow (vph)  | 77   | 57    | 390  | 227  | 245   | 245  | 213   | 1688   | 48    | 1207   | 39    |
| v/c Ratio              | 0.49 | 0.21  | 0.87 | 0.54 | 0.45  | 0.46 | 0.71  | 0.83   | 0.33  | 0.79   | 0.05  |
| Control Delay          | 63.0 | 51.5  | 37.6 | 42.1 | 42.0  | 21.9 | 33.3  | 31.8   | 26.3  | 28.8   | 0.1   |
| Queue Delay            | 0.0  | 0.0   | 0.0  | 0.0  | 0.0   | 0.0  | 0.0   | 0.0    | 0.0   | 0.0    | 0.0   |
| Total Delay            | 63.0 | 51.5  | 37.6 | 42.1 | 42.0  | 21.9 | 33.3  | 31.8   | 26.3  | 28.8   | 0.1   |
| Queue Length 50th (m)  | 20.1 | 14.3  | 35.5 | 50.1 | 55.7  | 28.5 | 26.2  | 200.6  | 3.8   | 101.2  | 0.0   |
| Queue Length 95th (m)  | 32.6 | 24.4  | 68.1 | 62.9 | 69.2  | 45.7 | #64.7 | #312.4 | m14.1 | #222.8 | m0.3  |
| Internal Link Dist (m) |      | 197.7 |      |      | 123.8 |      |       |        | 371.2 |        | 464.2 |
| Turn Bay Length (m)    | 32.0 |       | 30.0 | 60.0 |       | 60.0 | 170.0 |        | 78.0  |        | 130.0 |
| Base Capacity (vph)    | 281  | 473   | 589  | 422  | 761   | 701  | 320   | 2031   | 147   | 1534   | 817   |
| Starvation Cap Reductn | 0    | 0     | 0    | 0    | 0     | 0    | 0     | 0      | 0     | 0      | 0     |
| Spillback Cap Reductn  | 0    | 0     | 0    | 0    | 0     | 0    | 0     | 0      | 0     | 0      | 0     |
| Storage Cap Reductn    | 0    | 0     | 0    | 0    | 0     | 0    | 0     | 0      | 0     | 0      | 0     |
| Reduced v/c Ratio      | 0.27 | 0.12  | 0.66 | 0.54 | 0.32  | 0.35 | 0.67  | 0.83   | 0.33  | 0.79   | 0.05  |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

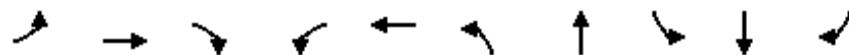
Queue shown is maximum after two cycles.

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

## Queues

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

01/18/2018



| Lane Group             | EBL   | EBT   | EBR  | WBL  | WBT   | NBL   | NBT    | SBL   | SBT   | SBR  |
|------------------------|-------|-------|------|------|-------|-------|--------|-------|-------|------|
| Lane Group Flow (vph)  | 201   | 106   | 129  | 75   | 223   | 246   | 2593   | 100   | 1607  | 153  |
| v/c Ratio              | 0.93  | 0.23  | 0.28 | 0.41 | 0.79  | 0.77  | 0.90   | 0.61  | 0.64  | 0.18 |
| Control Delay          | 91.6  | 42.2  | 7.4  | 59.4 | 62.8  | 44.1  | 32.9   | 43.0  | 29.6  | 6.8  |
| Queue Delay            | 0.0   | 0.0   | 0.0  | 0.0  | 0.0   | 0.0   | 0.0    | 0.0   | 0.0   | 0.0  |
| Total Delay            | 91.6  | 42.2  | 7.4  | 59.4 | 62.8  | 44.1  | 32.9   | 43.0  | 29.6  | 6.8  |
| Queue Length 50th (m)  | 46.5  | 23.7  | 0.0  | 19.1 | 47.0  | 40.9  | 225.2  | 11.1  | 120.5 | 4.0  |
| Queue Length 95th (m)  | #78.7 | 36.9  | 14.9 | 32.9 | 71.1  | 73.0  | #301.8 | #35.3 | 158.7 | 18.3 |
| Internal Link Dist (m) |       | 167.9 |      |      | 140.2 |       | 718.6  |       | 284.6 |      |
| Turn Bay Length (m)    | 31.0  |       | 35.0 | 45.0 |       | 120.0 |        | 112.0 |       | 50.0 |
| Base Capacity (vph)    | 215   | 605   | 572  | 285  | 412   | 349   | 2879   | 163   | 2505  | 847  |
| 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      | 0.93  | 0.18  | 0.23 | 0.26 | 0.54  | 0.70  | 0.90   | 0.61  | 0.64  | 0.18 |

## Intersection Summary

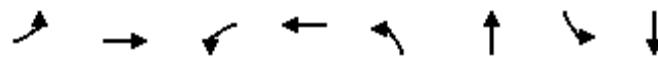
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

## Queues

5: Fifth Line &amp; Sheridan Park Dr

01/12/2018



| Lane Group             | EBL   | EBT  | WBL   | WBT  | NBL   | NBT  | SBL   | SBT  |
|------------------------|-------|------|-------|------|-------|------|-------|------|
| Lane Group Flow (vph)  | 70    | 457  | 19    | 489  | 59    | 117  | 63    | 108  |
| v/c Ratio              | 0.19  | 0.55 | 0.05  | 0.59 | 0.18  | 0.25 | 0.20  | 0.23 |
| Control Delay          | 6.5   | 8.8  | 5.0   | 9.1  | 12.3  | 11.7 | 12.5  | 9.3  |
| Queue Delay            | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 6.5   | 8.8  | 5.0   | 9.1  | 12.3  | 11.7 | 12.5  | 9.3  |
| Queue Length 50th (m)  | 1.7   | 13.0 | 0.4   | 13.4 | 2.2   | 4.1  | 2.4   | 2.7  |
| Queue Length 95th (m)  | 6.4   | 31.4 | 2.4   | 33.2 | 9.4   | 14.7 | 9.9   | 11.9 |
| Internal Link Dist (m) | 552.8 |      | 167.9 |      | 418.3 |      | 255.1 |      |
| Turn Bay Length (m)    |       |      |       |      | 43.0  | 27.0 |       |      |
| Base Capacity (vph)    | 816   | 1841 | 873   | 1808 | 1181  | 1687 | 1153  | 1609 |
| 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  | 0.25 | 0.02  | 0.27 | 0.05  | 0.07 | 0.05  | 0.07 |

Intersection Summary

| Junctions 9   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ARCADY 9 - Roundabout Module  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Version: 9.0.0.4211  <br>© Copyright TRL Limited, 2017  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| For sales and distribution information, program advice and maintenance, contact TRL:<br>Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution</b>     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Filename: 039474\_Roundabout\_Analysis 85 BG.j9  
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady  
Report generation date: 7/25/2017 8:50:49 AM

## Summary of intersection performance

|   | AM          |                 |           |           |     |                        |                  |                                      | PM          |                 |           |           |     |                        |                  |                                     |
|---|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|--------------------------------------|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|-------------------------------------|
|   | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity            | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity           |
| <b>Single Lane Roundabout - 2021 Background</b> |             |                 |           |           |     |                        |                  |                                      |             |                 |           |           |     |                        |                  |                                     |
| <b>1 - Homelands Dr - N</b>                     | 0.9         | 2.7             | 7.44      | 0.46      | A   | 7.01                   | A                | 65 %<br>[1 -<br>Homelands<br>Dr - N] | 0.3         | 1.3             | 4.42      | 0.22      | A   | 6.88                   | A                | 40 %<br>[3 -<br>Speakman<br>Dr - S] |
| <b>2 - Sheridan Park Dr - E</b>                 | 0.9         | 2.3             | 7.01      | 0.48      | A   |                        |                  |                                      | 0.4         | 1.8             | 5.92      | 0.30      | A   |                        |                  |                                     |
| <b>3 - Speakman Dr - S</b>                      | 0.4         | 1.6             | 6.29      | 0.29      | A   |                        |                  |                                      | 1.1         | 3.0             | 9.31      | 0.51      | A   |                        |                  |                                     |
| <b>4 - Sheridan Park Dr - W</b>                 | 0.0         | 0.5             | 6.14      | 0.02      | A   |                        |                  |                                      | 0.1         | 0.5             | 4.27      | 0.06      | A   |                        |                  |                                     |

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

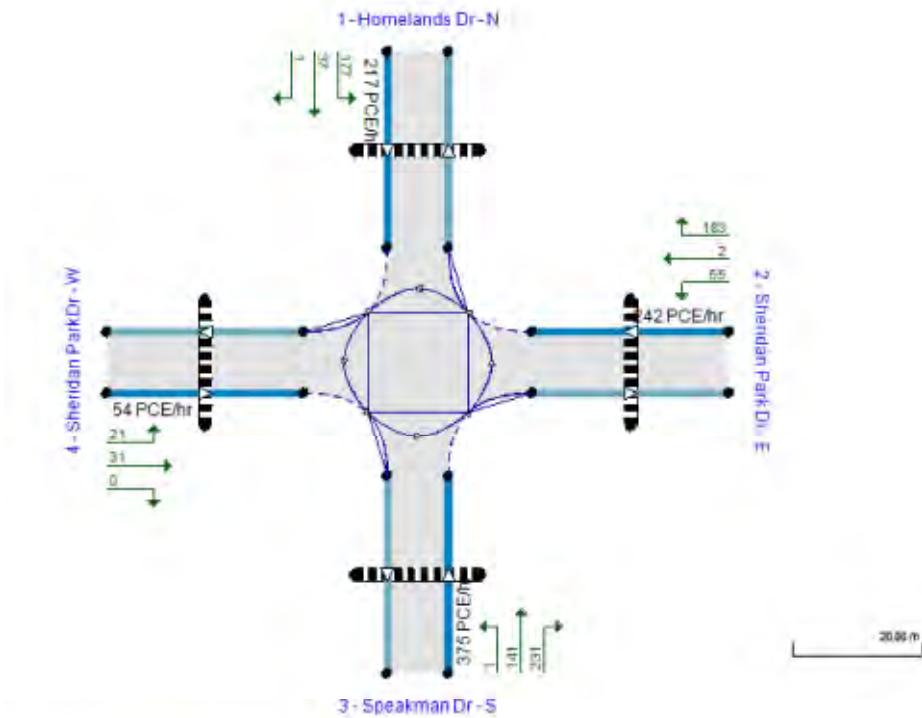
## File summary

### File Description

|             |   |
|-------------|---|
| Title       | Sheridan Park Drive 85 percent Capacity |
| Location    | Mississauga                             |
| Site number |   |
| Date        | 7/25/2017                               |
| Version     |   |
| Status      | (new file)                              |
| Identifier  |   |
| Client      |   |
| Jobnumber   |   |
| Analyst     | RJBURNSIDE"jester                       |
| Description |   |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|----------------|-------------|---------------------|-----------------------|------------|---------------------|-------------------|---------------------|
| m              | kph         | PCE                 | PCE                   | perHour    | s                   | -Min              | perMin              |



Showing original traffic demand (PCE/hr)

The intersection diagram reflects the last run of Intersections.

### Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | Residual capacity criteria type | V/C Ratio Threshold | Average Delay threshold (s) | Queue threshold (PCE) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------|---------------------|-----------------------------|-----------------------|
| 5.75               | ✓                           |                                   | ✓                           | Delay                           | 0.85                | 36.00                       | 20.00                 |

### Demand Set Summary

| Scenario name   | Time Period name | Traffic profile type | Model start time (HH:mm) | Model finish time (HH:mm) | Time segment length (min) | Run automatically |
|-----------------|------------------|----------------------|--------------------------|---------------------------|---------------------------|-------------------|
| 2021 Background | AM               | ONE HOUR             | 08:00                    | 09:30                     | 15                        | ✓                 |
| 2021 Background | PM               | ONE HOUR             | 16:00                    | 17:30                     | 15                        | ✓                 |

| Junctions 9   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ARCADY 9 - Roundabout Module  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Version: 9.0.0.4211   © Copyright TRL Limited, 2018   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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Filename: 039474\_Roundabout\_Analysis 85 With Ext.j9  
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady  
Report generation date: 1/9/2018 11:52:11 AM

## Summary of intersection performance

|   | AM          |                 |           |           |     |   |                  | PM                        |             |                 |           |           |      |                        |                                      |                           |
|---|-------------|-----------------|-----------|-----------|-----|---|------------------|---------------------------|-------------|-----------------|-----------|-----------|------|------------------------|--------------------------------------|---------------------------|
|   | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s)                    | Intersection LOS | Network Residual Capacity | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS  | Intersection Delay (s) | Intersection LOS                     | Network Residual Capacity |
| <b>Single Lane Roundabout - 2021 With Extension</b> |             |                 |           |           |     |   |                  |                           |             |                 |           |           |      |                        |                                      |                           |
| <b>1 - East End - 1 - Homelands Dr - N</b>          | 1.2         | 3.1             | 10.26     | 0.54      | B   | 9.05                                      | A                | 23 %                      | 0.4         | 1.2             | 5.42      | 0.27      | A    | 7.54                   | A                                    | 35 %                      |
| <b>1 - East End - 2 - Sheridan Park Dr - E</b>      | 1.6         | 2.0             | 9.33      | 0.61      | A   |   |                  |                           | 0.8         | 2.8             | 7.11      | 0.44      | A    |                        |                                      |                           |
| <b>1 - East End - 3 - Speakman Dr - S</b>           | 0.5         | 1.9             | 6.81      | 0.31      | A   | [2 - West End - 4 - Sheridan Park Dr - W] | A                | 1.1                       | 3.3         | 10.04           | 0.52      | B         | 6.13 | A                      | [1 - East End - 3 - Speakman Dr - S] |                           |
| <b>1 - East End - 4 - Sheridan Park Dr - W</b>      | 0.1         | 0.5             | 6.45      | 0.09      | A   |   |                  |                           | 0.1         | 0.5             | 4.47      | 0.11      | A    |                        |                                      |                           |
| <b>2 - West End - 2 - Sheridan Park Dr - E</b>      | 0.2         | 0.7             | 4.43      | 0.19      | A   |   |                  |                           | 0.3         | 1.4             | 6.18      | 0.24      | A    |                        |                                      |                           |
| <b>2 - West End - 3 - Speakman Dr - S</b>           | 0.2         | 0.5             | 4.01      | 0.15      | A   |   |                  |                           | 1.2         | 1.6             | 7.30      | 0.53      | A    |                        |                                      |                           |
| <b>2 - West End - 4 - Sheridan Park Dr - W</b>      | 1.7         | 1.9             | 6.83      | 0.63      | A   |   |                  |                           | 0.1         | 0.5             | 1.83      | 0.07      | A    |                        |                                      |                           |

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

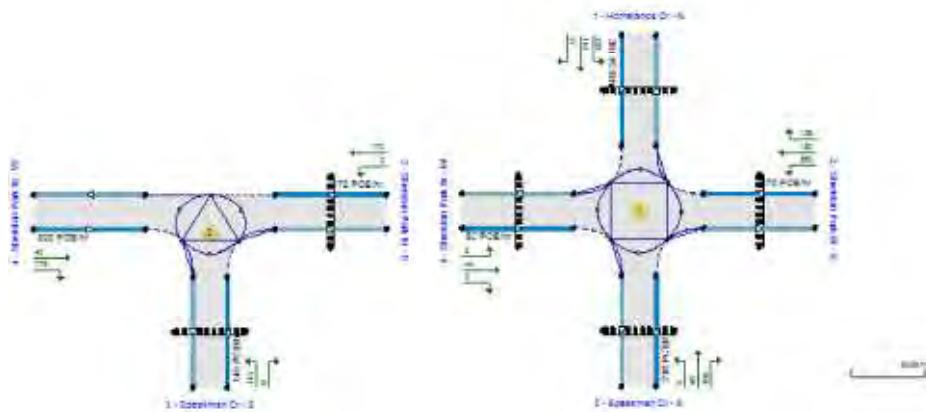
## File summary

### File Description

|             |  |
|-------------|--|
| Title       | Sheridan Park Drive With Extension 85 percent Capacity |
| Location    | Mississauga  |
| Site number |  |
| Date        | 7/25/2017  |
| Version     |  |
| Status      | (new file)   |
| Identifier  |  |
| Client      |  |
| Jobnumber   |  |
| Analyst     | RJBURNSIDE"jester                                      |
| Description |  |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|----------------|-------------|---------------------|-----------------------|------------|---------------------|-------------------|---------------------|
| m              | kph         | PCE                 | PCE                   | perHour    | s                   | -Min              | perMin              |



Showing original traffic demand (PCEhr).

The intersection diagram reflects the last run of Intersections.

### Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles         | Calculate detailed queueing delay | Calculate residual capacity         | Residual capacity criteria type | V/C Ratio Threshold | Average Delay threshold (s) | Queue threshold (PCE) |
|--------------------|-------------------------------------|-----------------------------------|-------------------------------------|---------------------------------|---------------------|-----------------------------|-----------------------|
| 5.75               | <input checked="" type="checkbox"/> |                                   | <input checked="" type="checkbox"/> | Delay                           | 0.85                | 36.00                       | 20.00                 |

### Demand Set Summary

| Scenario name       | Time Period name | Traffic profile type | Model start time (HH:mm) | Model finish time (HH:mm) | Time segment length (min) | Run automatically                   |
|---------------------|------------------|----------------------|--------------------------|---------------------------|---------------------------|-------------------------------------|
| 2021 With Extension | AM               | ONE HOUR             | 08:00                    | 09:30                     | 15                        | <input checked="" type="checkbox"/> |
| 2021 With Extension | PM               | ONE HOUR             | 16:00                    | 17:30                     | 15                        | <input checked="" type="checkbox"/> |



---

## Appendix H

### 2031 Traffic Operations Without Sheridan Park Drive Extension

## Timings

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/19/2017



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↑↑ ↗  | ↑ ↗   | ↑↑ ↗  | ↑ ↗   |
| Traffic Volume (vph) | 44    | 48    | 135   | 120   | 234   | 1293  | 56    | 1660  | 121   |
| Future Volume (vph)  | 44    | 48    | 135   | 120   | 234   | 1293  | 56    | 1660  | 121   |
| Turn Type            | Perm  | NA    | Perm  | NA    | pm+pt | NA    | Perm  | NA    | Perm  |
| Protected Phases     |       |       |       | 4     | 8     | 5     | 2     | 6     |       |
| Permitted Phases     |       |       |       | 4     | 8     | 2     | 6     | 6     |       |
| Detector Phase       |       |       |       | 4     | 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   | 5.0   |
| Minimum Split (s)    | 35.0  | 35.0  | 35.0  | 35.0  | 9.5   | 25.0  | 25.0  | 25.0  | 25.0  |
| Total Split (s)      | 35.0  | 35.0  | 35.0  | 35.0  | 21.0  | 105.0 | 84.0  | 84.0  | 84.0  |
| Total Split (%)      | 25.0% | 25.0% | 25.0% | 25.0% | 15.0% | 75.0% | 60.0% | 60.0% | 60.0% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 4.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 6.0   | 6.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       | Lead  |       | Lag   | Lag   | Lag   |
| Lead-Lag Optimize?   |       |       |       |       | Yes   |       | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | C-Max | C-Max | C-Max |
| Act Effect Green (s) | 24.3  | 24.3  | 24.3  | 24.3  | 105.7 | 102.7 | 83.0  | 83.0  | 83.0  |
| Actuated g/C Ratio   | 0.17  | 0.17  | 0.17  | 0.17  | 0.76  | 0.73  | 0.59  | 0.59  | 0.59  |
| v/c Ratio            | 0.40  | 0.51  | 0.90  | 0.69  | 0.86  | 0.43  | 0.39  | 0.62  | 0.14  |
| Control Delay        | 59.7  | 35.0  | 104.1 | 60.6  | 72.5  | 5.4   | 26.8  | 20.3  | 6.6   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 59.7  | 35.0  | 104.1 | 60.6  | 72.5  | 5.4   | 26.8  | 20.3  | 6.6   |
| LOS                  | E     | D     | F     | E     | E     | A     | C     | C     | A     |
| Approach Delay       |       | 40.6  |       |       | 78.6  |       | 15.0  |       | 19.6  |
| Approach LOS         |       | D     |       |       | E     |       | B     |       | B     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 23.6

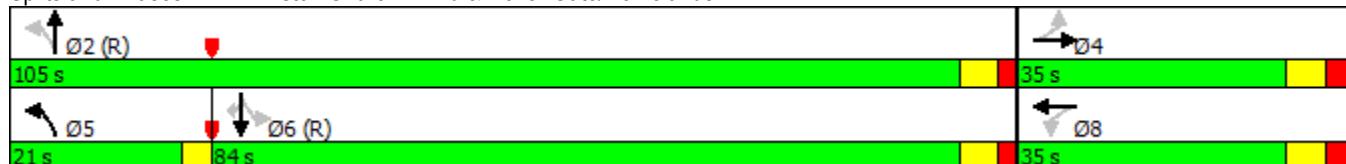
Intersection LOS: C

Intersection Capacity Utilization 84.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr



# HCM Unsignalized Intersection Capacity Analysis

2: Homelands Dr & Thorn Lodge Dr

12/19/2017



| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      |       |      |                      |      |      |
| Sign Control                      | Stop | Stop  |      | Stop                 |      |      |
| Traffic Volume (vph)              | 221  | 57    | 128  | 108                  | 77   | 186  |
| Future Volume (vph)               | 221  | 57    | 128  | 108                  | 77   | 186  |
| Peak Hour Factor                  | 0.78 | 0.78  | 0.78 | 0.78                 | 0.78 | 0.78 |
| Hourly flow rate (vph)            | 283  | 73    | 164  | 138                  | 99   | 238  |
| Direction, Lane #                 | WB 1 | NB 1  | SB 1 |                      |      |      |
| Volume Total (vph)                | 356  | 302   | 337  |                      |      |      |
| Volume Left (vph)                 | 283  | 0     | 99   |                      |      |      |
| Volume Right (vph)                | 73   | 138   | 0    |                      |      |      |
| Hadj (s)                          | 0.09 | -0.11 | 0.18 |                      |      |      |
| Departure Headway (s)             | 5.7  | 5.5   | 5.7  |                      |      |      |
| Degree Utilization, x             | 0.57 | 0.46  | 0.53 |                      |      |      |
| Capacity (veh/h)                  | 595  | 616   | 604  |                      |      |      |
| Control Delay (s)                 | 15.9 | 13.0  | 14.9 |                      |      |      |
| Approach Delay (s)                | 15.9 | 13.0  | 14.9 |                      |      |      |
| Approach LOS                      | C    | B     | B    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Delay                             |      |       | 14.7 |                      |      |      |
| Level of Service                  |      |       | B    |                      |      |      |
| Intersection Capacity Utilization |      | 53.6% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |       | 15   |                      |      |      |

## Timings

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/19/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑↑↑   | ↑ ↗   | ↑↑↑   | ↑ ↗   |
| Traffic Volume (vph) | 24    | 289   | 160   | 33    | 79    | 56    | 225   | 1558  | 307   | 1495  | 131   |
| Future Volume (vph)  | 24    | 289   | 160   | 33    | 79    | 56    | 225   | 1558  | 307   | 1495  | 131   |
| Turn Type            | Perm  | NA    | Perm  | Perm  | NA    | Perm  | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       |       | 8     |       | 5     | 2     | 1     | 6     |
| Permitted Phases     | 4     |       |       | 4     | 8     |       | 8     | 2     |       | 6     | 6     |
| Detector Phase       | 4     | 4     | 4     | 8     | 8     | 8     | 5     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 9.5   | 36.0  | 9.5   | 36.0  |
| Total Split (s)      | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 31.0  | 68.0  | 31.0  | 68.0  |
| Total Split (%)      | 29.3% | 29.3% | 29.3% | 29.3% | 29.3% | 29.3% | 29.3% | 22.1% | 48.6% | 22.1% | 48.6% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 3.5   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 4.5   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       |       |       |       | Lead  | Lag   | Lead  | Lag   |
| Lead-Lag Optimize?   |       |       |       |       |       |       |       | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 27.5  | 27.5  | 27.5  | 27.5  | 27.5  | 27.5  | 92.3  | 71.8  | 101.9 | 76.0  | 76.0  |
| Actuated g/C Ratio   | 0.20  | 0.20  | 0.20  | 0.20  | 0.20  | 0.20  | 0.66  | 0.51  | 0.73  | 0.54  | 0.54  |
| v/c Ratio            | 0.10  | 0.81  | 0.45  | 0.42  | 0.22  | 0.17  | 0.70  | 0.76  | 0.87  | 0.56  | 0.15  |
| Control Delay        | 44.3  | 70.6  | 25.0  | 62.7  | 46.9  | 10.9  | 33.8  | 30.7  | 64.0  | 21.1  | 5.1   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 44.3  | 70.6  | 25.0  | 62.7  | 46.9  | 10.9  | 33.8  | 30.7  | 64.0  | 21.1  | 5.1   |
| LOS                  | D     | E     | C     | E     | D     | B     | C     | C     | E     | C     | A     |
| Approach Delay       |       | 53.9  |       |       |       | 38.1  |       |       | 31.0  |       | 26.8  |
| Approach LOS         |       | D     |       |       |       | D     |       |       | C     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 31.8

Intersection LOS: C

Intersection Capacity Utilization 95.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr



# HCM Unsignalized Intersection Capacity Analysis

5: Fifth Line & Sheridan Park Dr

12/19/2017

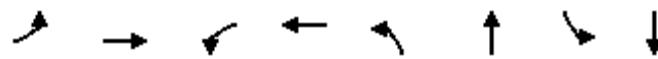


| Movement                          | EBL   | EBT  | EBR  | WBL   | WBT                  | WBR   | NBL  | NBT   | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|------|------|-------|----------------------|-------|------|-------|------|------|------|------|
| Lane Configurations               | ↑ ↗   | ↑ ↘  |      | ↑ ↗   | ↑ ↘                  |       | ↑ ↗  | ↑ ↘   |      | ↑ ↗  | ↑ ↘  |      |
| Sign Control                      | Stop  |      |      |       | Stop                 |       |      |       | Stop |      |      |      |
| Traffic Volume (vph)              | 29    | 374  | 43   | 8     | 344                  | 68    | 51   | 66    | 29   | 135  | 83   | 108  |
| Future Volume (vph)               | 29    | 374  | 43   | 8     | 344                  | 68    | 51   | 66    | 29   | 135  | 83   | 108  |
| Peak Hour Factor                  | 0.86  | 0.86 | 0.86 | 0.86  | 0.86                 | 0.86  | 0.86 | 0.86  | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph)            | 34    | 435  | 50   | 9     | 400                  | 79    | 59   | 77    | 34   | 157  | 97   | 126  |
| Direction, Lane #                 | EB 1  | EB 2 | WB 1 | WB 2  | NB 1                 | NB 2  | SB 1 | SB 2  |      |      |      |      |
| Volume Total (vph)                | 34    | 485  | 9    | 479   | 59                   | 111   | 157  | 223   |      |      |      |      |
| Volume Left (vph)                 | 34    | 0    | 9    | 0     | 59                   | 0     | 157  | 0     |      |      |      |      |
| Volume Right (vph)                | 0     | 50   | 0    | 79    | 0                    | 34    | 0    | 126   |      |      |      |      |
| Hadj (s)                          | 0.50  | 0.01 | 0.99 | -0.02 | 0.70                 | -0.16 | 0.52 | -0.34 |      |      |      |      |
| Departure Headway (s)             | 7.9   | 7.4  | 8.4  | 7.4   | 9.3                  | 8.5   | 8.6  | 7.7   |      |      |      |      |
| Degree Utilization, x             | 0.07  | 1.00 | 0.02 | 0.99  | 0.15                 | 0.26  | 0.38 | 0.48  |      |      |      |      |
| Capacity (veh/h)                  | 444   | 485  | 418  | 479   | 374                  | 410   | 406  | 452   |      |      |      |      |
| Control Delay (s)                 | 10.3  | 66.5 | 10.4 | 63.8  | 12.8                 | 13.2  | 15.5 | 16.5  |      |      |      |      |
| Approach Delay (s)                | 62.8  |      | 62.8 |       | 13.1                 |       | 16.1 |       |      |      |      |      |
| Approach LOS                      | F     |      | F    |       | B                    |       | C    |       |      |      |      |      |
| Intersection Summary              |       |      |      |       |                      |       |      |       |      |      |      |      |
| Delay                             | 46.0  |      |      |       |                      |       |      |       |      |      |      |      |
| Level of Service                  | E     |      |      |       |                      |       |      |       |      |      |      |      |
| Intersection Capacity Utilization | 49.4% |      |      |       | ICU Level of Service |       |      |       | A    |      |      |      |
| Analysis Period (min)             | 15    |      |      |       |                      |       |      |       |      |      |      |      |

## Timings

5: Fifth Line &amp; Sheridan Park Dr

01/12/2018



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   |
| Traffic Volume (vph) | 29    | 374   | 8     | 344   | 51    | 66    | 135   | 83    |
| Future Volume (vph)  | 29    | 374   | 8     | 344   | 51    | 66    | 135   | 83    |
| Turn Type            | Perm  | NA    | Perm  | NA    | Perm  | NA    | Perm  | NA    |
| Protected Phases     |       |       |       | 4     |       | 8     |       | 2     |
| Permitted Phases     |       |       |       |       | 2     |       | 6     |       |
| Detector Phase       | 4     | 4     | 8     | 8     | 2     | 2     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  |
| Total Split (s)      | 61.0  | 61.0  | 61.0  | 61.0  | 39.0  | 39.0  | 39.0  | 39.0  |
| Total Split (%)      | 61.0% | 61.0% | 61.0% | 61.0% | 39.0% | 39.0% | 39.0% | 39.0% |
| Yellow Time (s)      | 3.5   | 3.5   | 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   | 1.0   | 1.0   |
| 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   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   |
| Lead/Lag             |       |       |       |       |       |       |       |       |
| Lead-Lag Optimize?   |       |       |       |       |       |       |       |       |
| Recall Mode          | None  | None  | None  | None  | Min   | Min   | Min   | Min   |
| Act Effect Green (s) | 16.4  | 16.4  | 16.4  | 16.4  | 10.8  | 10.8  | 10.8  | 10.8  |
| Actuated g/C Ratio   | 0.45  | 0.45  | 0.45  | 0.45  | 0.29  | 0.29  | 0.29  | 0.29  |
| v/c Ratio            | 0.10  | 0.60  | 0.03  | 0.60  | 0.19  | 0.21  | 0.41  | 0.41  |
| Control Delay        | 7.1   | 11.4  | 6.6   | 11.4  | 13.1  | 10.4  | 15.7  | 10.9  |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 7.1   | 11.4  | 6.6   | 11.4  | 13.1  | 10.4  | 15.7  | 10.9  |
| LOS                  | A     | B     | A     | B     | B     | B     | B     | B     |
| Approach Delay       |       | 11.1  |       | 11.3  |       | 11.3  |       | 12.9  |
| Approach LOS         |       | B     |       | B     |       | B     |       | B     |

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 36.8

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 11.6

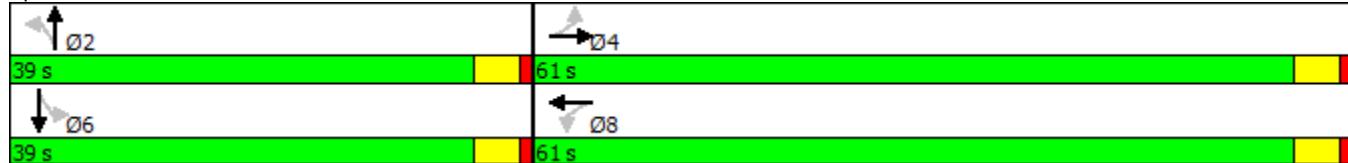
Intersection LOS: B

Intersection Capacity Utilization 51.9%

ICU Level of Service A

Analysis Period (min) 15

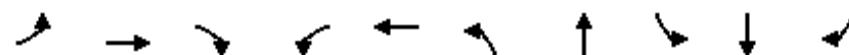
Splits and Phases: 5: Fifth Line &amp; Sheridan Park Dr



## Timings

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/19/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↗ ↙   | ↖ ↗   | ↖ ↙   | ↖ ↗   | ↑ ↑ ↗ | ↖ ↙   | ↑ ↑ ↗ | ↖ ↙   |
| Traffic Volume (vph) | 162   | 118   | 163   | 150   | 76    | 96    | 2042  | 159   | 1558  | 240   |
| Future Volume (vph)  | 162   | 118   | 163   | 150   | 76    | 96    | 2042  | 159   | 1558  | 240   |
| Turn Type            | Perm  | NA    | Perm  | Perm  | NA    | Perm  | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 8     |       | 2     | 1     | 6     |       |
| Permitted Phases     | 4     |       |       | 4     | 8     |       | 2     |       | 6     |       |
| Detector Phase       | 4     | 4     | 4     | 8     | 8     | 2     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 9.5   | 38.0  | 38.0  |
| Total Split (s)      | 43.0  | 43.0  | 43.0  | 43.0  | 43.0  | 77.0  | 77.0  | 20.0  | 97.0  | 97.0  |
| Total Split (%)      | 30.7% | 30.7% | 30.7% | 30.7% | 30.7% | 55.0% | 55.0% | 14.3% | 69.3% | 69.3% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 5.0   | 5.0   | 3.0   | 5.0   | 5.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 2.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 7.0   | 7.0   |
| Lead/Lag             |       |       |       |       |       | Lag   | Lag   | Lead  |       |       |
| Lead-Lag Optimize?   |       |       |       |       |       | Yes   | Yes   | Yes   |       |       |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 25.0  | 25.0  | 25.0  | 25.0  | 25.0  | 85.5  | 85.5  | 105.0 | 101.0 | 101.0 |
| Actuated g/C Ratio   | 0.18  | 0.18  | 0.18  | 0.18  | 0.18  | 0.61  | 0.61  | 0.75  | 0.72  | 0.72  |
| v/c Ratio            | 0.82  | 0.36  | 0.53  | 0.72  | 0.46  | 0.62  | 0.71  | 0.78  | 0.45  | 0.20  |
| Control Delay        | 84.4  | 51.7  | 39.1  | 71.7  | 44.4  | 42.4  | 22.5  | 57.0  | 9.2   | 1.7   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 84.4  | 51.7  | 39.1  | 71.7  | 44.4  | 42.4  | 22.5  | 57.0  | 9.2   | 1.7   |
| LOS                  | F     | D     | D     | E     | D     | D     | C     | E     | A     | A     |
| Approach Delay       |       | 59.0  |       |       |       | 58.7  |       | 23.4  |       | 12.2  |
| Approach LOS         |       | E     |       |       |       | E     |       | C     |       | B     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 24.2

Intersection LOS: C

Intersection Capacity Utilization 91.7%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way



# HCM Unsignalized Intersection Capacity Analysis

7: Speakman Dr & Hadwen Dr

12/19/2017

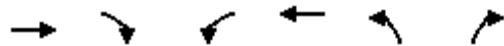


| Movement                          | EBL  | EBT  | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |      |      |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |      | Stop |       |       | Stop |                      |      | Stop |      |      | Stop |      |
| Traffic Volume (vph)              | 34   | 12   | 8     | 82    | 74   | 23                   | 10   | 187  | 106  | 52   | 316  | 74   |
| Future Volume (vph)               | 34   | 12   | 8     | 82    | 74   | 23                   | 10   | 187  | 106  | 52   | 316  | 74   |
| Peak Hour Factor                  | 0.77 | 0.77 | 0.77  | 0.77  | 0.77 | 0.77                 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 |
| Hourly flow rate (vph)            | 44   | 16   | 10    | 106   | 96   | 30                   | 13   | 243  | 138  | 68   | 410  | 96   |
| Direction, Lane #                 | EB 1 | WB 1 | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 70   | 232  | 394   | 574   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 44   | 106  | 13    | 68    |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 10   | 30   | 138   | 96    |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | 0.04 | 0.01 | -0.20 | -0.08 |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 7.4  | 6.8  | 5.8   | 5.6   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.14 | 0.44 | 0.63  | 0.90  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 417  | 498  | 589   | 574   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 11.7 | 14.9 | 18.3  | 38.3  |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 11.7 | 14.9 | 18.3  | 38.3  |      |                      |      |      |      |      |      |      |
| Approach LOS                      | B    | B    | C     | E     |      |                      |      |      |      |      |      |      |
| <b>Intersection Summary</b>       |      |      |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |      |      |       |       | 26.3 |                      |      |      |      |      |      |      |
| Level of Service                  |      |      |       |       | D    |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |      |       | 61.7% |      | ICU Level of Service |      |      |      | B    |      |      |
| Analysis Period (min)             |      |      |       | 15    |      |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

8: Flavelle Blvd West & Speakman Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      |       |      |                      |      |      |
| Traffic Volume (veh/h)            | 205  | 19    | 35   | 388                  | 0    | 0    |
| Future Volume (Veh/h)             | 205  | 19    | 35   | 388                  | 0    | 0    |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.80 | 0.80  | 0.80 | 0.80                 | 0.80 | 0.80 |
| Hourly flow rate (vph)            | 256  | 24    | 44   | 485                  | 0    | 0    |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 280   |      | 841                  | 268  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 280   |      | 841                  | 268  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 97    |      | 100                  | 100  |      |
| cM capacity (veh/h)               |      | 1277  |      | 326                  | 776  |      |
| Direction, Lane #                 | EB 1 | WB 1  |      |                      |      |      |
| Volume Total                      | 280  | 529   |      |                      |      |      |
| Volume Left                       | 0    | 44    |      |                      |      |      |
| Volume Right                      | 24   | 0     |      |                      |      |      |
| cSH                               | 1700 | 1277  |      |                      |      |      |
| Volume to Capacity                | 0.16 | 0.03  |      |                      |      |      |
| Queue Length 95th (m)             | 0.0  | 0.8   |      |                      |      |      |
| Control Delay (s)                 | 0.0  | 1.0   |      |                      |      |      |
| Lane LOS                          |      | A     |      |                      |      |      |
| Approach Delay (s)                | 0.0  | 1.0   |      |                      |      |      |
| Approach LOS                      |      |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 0.7   |      |                      |      |      |
| Intersection Capacity Utilization |      | 41.0% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

9: Flavelle Blvd East & Speakman Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    |       |      | ↑                    | ↖    | ↖    |
| Traffic Volume (veh/h)            | 203  | 0     | 0    | 283                  | 137  | 167  |
| Future Volume (Veh/h)             | 203  | 0     | 0    | 283                  | 137  | 167  |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.75 | 0.75  | 0.75 | 0.75                 | 0.75 | 0.75 |
| Hourly flow rate (vph)            | 271  | 0     | 0    | 377                  | 183  | 223  |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 271   |      | 648                  | 271  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 271   |      | 648                  | 271  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 100   |      | 58                   | 71   |      |
| cM capacity (veh/h)               |      | 1304  |      | 437                  | 770  |      |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2                 |      |      |
| Volume Total                      | 271  | 377   | 183  | 223                  |      |      |
| Volume Left                       | 0    | 0     | 183  | 0                    |      |      |
| Volume Right                      | 0    | 0     | 0    | 223                  |      |      |
| cSH                               | 1700 | 1700  | 437  | 770                  |      |      |
| Volume to Capacity                | 0.16 | 0.22  | 0.42 | 0.29                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 15.5 | 9.1                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 19.1 | 11.6                 |      |      |
| Lane LOS                          |      |       | C    | B                    |      |      |
| Approach Delay (s)                | 0.0  | 0.0   | 15.0 |                      |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| <b>Intersection Summary</b>       |      |       |      |                      |      |      |
| Average Delay                     |      | 5.8   |      |                      |      |      |
| Intersection Capacity Utilization |      | 29.2% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

## Timings

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/19/2017



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑↑↑   | ↑     | ↑↑↑   | ↑     |
| Traffic Volume (vph) | 191   | 146   | 69    | 130   | 194   | 1674  | 104   | 1098  | 65    |
| Future Volume (vph)  | 191   | 146   | 69    | 130   | 194   | 1674  | 104   | 1098  | 65    |
| Turn Type            | Perm  | NA    | Perm  | NA    | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       | 4     |       | 8     | 5     | 2     | 1     |
| Permitted Phases     |       |       |       |       |       | 2     |       | 6     |       |
| Detector Phase       |       |       |       | 4     | 4     | 8     | 8     | 5     | 2     |
| Switch Phase         |       |       |       |       |       |       | 1     | 6     | 6     |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 35.0  | 35.0  | 35.0  | 35.0  | 9.5   | 25.0  | 9.5   | 25.0  | 25.0  |
| Total Split (s)      | 50.0  | 50.0  | 50.0  | 50.0  | 22.0  | 73.8  | 16.2  | 68.0  | 68.0  |
| Total Split (%)      | 35.7% | 35.7% | 35.7% | 35.7% | 15.7% | 52.7% | 11.6% | 48.6% | 48.6% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       |       | Lead  | Lag   | Lead  | Lag   |
| Lead-Lag Optimize?   |       |       |       |       |       | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 33.7  | 33.7  | 33.7  | 33.7  | 95.3  | 80.6  | 91.2  | 78.5  | 78.5  |
| Actuated g/C Ratio   | 0.24  | 0.24  | 0.24  | 0.24  | 0.68  | 0.58  | 0.65  | 0.56  | 0.56  |
| v/c Ratio            | 0.88  | 0.85  | 0.86  | 0.46  | 0.58  | 0.68  | 0.60  | 0.41  | 0.08  |
| Control Delay        | 85.8  | 60.0  | 113.9 | 43.1  | 25.0  | 12.2  | 34.4  | 19.6  | 3.6   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 85.8  | 60.0  | 113.9 | 43.1  | 25.0  | 12.2  | 34.4  | 19.6  | 3.6   |
| LOS                  | F     | E     | F     | D     | C     | B     | C     | B     | A     |
| Approach Delay       |       |       | 69.0  |       | 61.7  |       | 13.4  |       | 20.0  |
| Approach LOS         |       |       | E     |       | E     |       | B     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 25.9

Intersection LOS: C

Intersection Capacity Utilization 88.0%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr



# HCM Unsignalized Intersection Capacity Analysis

2: Homelands Dr & Thorn Lodge Dr

12/19/2017



| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
| Sign Control                      | Stop |       | Stop |                      |      | Stop |
| Traffic Volume (vph)              | 127  | 30    | 165  | 188                  | 19   | 125  |
| Future Volume (vph)               | 127  | 30    | 165  | 188                  | 19   | 125  |
| Peak Hour Factor                  | 0.87 | 0.87  | 0.87 | 0.87                 | 0.87 | 0.87 |
| Hourly flow rate (vph)            | 146  | 34    | 190  | 216                  | 22   | 144  |
| Direction, Lane #                 | WB 1 | NB 1  | SB 1 |                      |      |      |
| Volume Total (vph)                | 180  | 406   | 166  |                      |      |      |
| Volume Left (vph)                 | 146  | 0     | 22   |                      |      |      |
| Volume Right (vph)                | 34   | 216   | 0    |                      |      |      |
| Hadj (s)                          | 0.05 | -0.29 | 0.11 |                      |      |      |
| Departure Headway (s)             | 5.2  | 4.3   | 5.0  |                      |      |      |
| Degree Utilization, x             | 0.26 | 0.49  | 0.23 |                      |      |      |
| Capacity (veh/h)                  | 627  | 803   | 682  |                      |      |      |
| Control Delay (s)                 | 10.1 | 11.4  | 9.5  |                      |      |      |
| Approach Delay (s)                | 10.1 | 11.4  | 9.5  |                      |      |      |
| Approach LOS                      | B    | B     | A    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Delay                             |      |       | 10.7 |                      |      |      |
| Level of Service                  |      |       | B    |                      |      |      |
| Intersection Capacity Utilization |      | 38.2% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |       | 15   |                      |      |      |

## Timings

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/19/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑↑↑   | ↑     | ↑↑↑   | ↑     |
| Traffic Volume (vph) | 90    | 58    | 456   | 173   | 248   | 193   | 231   | 1925  | 30    | 1413  | 42    |
| Future Volume (vph)  | 90    | 58    | 456   | 173   | 248   | 193   | 231   | 1925  | 30    | 1413  | 42    |
| Turn Type            | Perm  | NA    | Perm  | pm+pt | NA    | Perm  | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 4     | 3     | 8     | 5     | 2     | 1     | 6     |
| Permitted Phases     |       |       |       |       | 4     | 4     | 8     | 2     |       | 6     | 6     |
| Detector Phase       |       |       |       |       | 4     | 4     | 3     | 8     | 5     | 2     | 1     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 41.0  | 41.0  | 41.0  | 9.5   | 41.0  | 41.0  | 9.5   | 36.0  | 9.5   | 36.0  | 36.0  |
| Total Split (s)      | 42.0  | 42.0  | 42.0  | 11.0  | 53.0  | 53.0  | 27.0  | 77.5  | 9.5   | 60.0  | 60.0  |
| Total Split (%)      | 30.0% | 30.0% | 30.0% | 7.9%  | 37.9% | 37.9% | 19.3% | 55.4% | 6.8%  | 42.9% | 42.9% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 3.5   | 4.0   | 4.0   | 3.5   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 1.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 7.0   | 4.5   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             | Lag   | Lag   | Lag   | Lead  |       |       | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   | Yes   | Yes   | Yes   | Yes   |       |       | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 24.0  | 24.0  | 24.0  | 37.5  | 35.0  | 35.0  | 93.5  | 86.3  | 79.0  | 69.8  | 69.8  |
| Actuated g/C Ratio   | 0.17  | 0.17  | 0.17  | 0.27  | 0.25  | 0.25  | 0.67  | 0.62  | 0.56  | 0.50  | 0.50  |
| v/c Ratio            | 0.49  | 0.18  | 0.91  | 0.53  | 0.54  | 0.42  | 0.74  | 0.64  | 0.21  | 0.64  | 0.05  |
| Control Delay        | 58.3  | 47.1  | 42.2  | 46.3  | 48.2  | 22.1  | 36.3  | 20.5  | 17.6  | 21.3  | 0.1   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 58.3  | 47.1  | 42.2  | 46.3  | 48.2  | 22.1  | 36.3  | 20.5  | 17.6  | 21.3  | 0.1   |
| LOS                  | E     | D     | D     | D     | D     | C     | D     | C     | B     | C     | A     |
| Approach Delay       |       | 45.0  |       |       |       | 39.5  |       |       | 22.1  |       | 20.6  |
| Approach LOS         |       | D     |       |       |       | D     |       |       | C     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 26.7

Intersection LOS: C

Intersection Capacity Utilization 84.7%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr



# HCM Unsignalized Intersection Capacity Analysis

5: Fifth Line & Sheridan Park Dr

12/19/2017

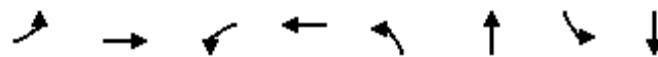


| Movement                          | EBL  | EBT   | EBR  | WBL   | WBT  | WBR   | NBL                  | NBT   | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|------|-------|------|-------|----------------------|-------|------|------|------|------|
| Lane Configurations               | ↑    | ↑     |      | ↑     | ↑    |       | ↑                    | ↑     |      | ↑    | ↑    |      |
| Sign Control                      |      | Stop  |      |       | Stop |       |                      | Stop  |      |      | Stop |      |
| Traffic Volume (vph)              | 63   | 386   | 41   | 17    | 215  | 113   | 58                   | 92    | 18   | 65   | 56   | 35   |
| Future Volume (vph)               | 63   | 386   | 41   | 17    | 215  | 113   | 58                   | 92    | 18   | 65   | 56   | 35   |
| Peak Hour Factor                  | 0.91 | 0.91  | 0.91 | 0.91  | 0.91 | 0.91  | 0.91                 | 0.91  | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph)            | 69   | 424   | 45   | 19    | 236  | 124   | 64                   | 101   | 20   | 71   | 62   | 38   |
| Direction, Lane #                 | EB 1 | EB 2  | WB 1 | WB 2  | NB 1 | NB 2  | SB 1                 | SB 2  |      |      |      |      |
| Volume Total (vph)                | 69   | 469   | 19   | 360   | 64   | 121   | 71                   | 100   |      |      |      |      |
| Volume Left (vph)                 | 69   | 0     | 19   | 0     | 64   | 0     | 71                   | 0     |      |      |      |      |
| Volume Right (vph)                | 0    | 45    | 0    | 124   | 0    | 20    | 0                    | 38    |      |      |      |      |
| Hadj (s)                          | 0.50 | -0.03 | 0.50 | -0.21 | 0.50 | -0.12 | 0.53                 | -0.27 |      |      |      |      |
| Departure Headway (s)             | 6.7  | 6.2   | 7.0  | 6.3   | 7.8  | 7.2   | 7.9                  | 7.1   |      |      |      |      |
| Degree Utilization, x             | 0.13 | 0.81  | 0.04 | 0.63  | 0.14 | 0.24  | 0.16                 | 0.20  |      |      |      |      |
| Capacity (veh/h)                  | 511  | 565   | 491  | 548   | 428  | 462   | 422                  | 467   |      |      |      |      |
| Control Delay (s)                 | 9.5  | 29.2  | 9.0  | 17.9  | 10.9 | 11.3  | 11.1                 | 10.6  |      |      |      |      |
| Approach Delay (s)                | 26.7 |       | 17.5 |       | 11.1 |       | 10.8                 |       |      |      |      |      |
| Approach LOS                      | D    |       | C    |       | B    |       | B                    |       |      |      |      |      |
| Intersection Summary              |      |       |      |       |      |       |                      |       |      |      |      |      |
| Delay                             |      |       |      |       |      |       |                      |       |      |      |      | 19.5 |
| Level of Service                  |      |       |      |       |      |       |                      |       |      |      |      | C    |
| Intersection Capacity Utilization |      |       |      | 46.8% |      |       | ICU Level of Service |       |      |      |      | A    |
| Analysis Period (min)             |      |       |      |       |      |       |                      |       |      |      |      | 15   |

## Timings

5: Fifth Line &amp; Sheridan Park Dr

01/12/2018



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | →     | ↑     | →     | ↑     | →     | ↑     | ↓     |
| Traffic Volume (vph) | 63    | 386   | 17    | 215   | 58    | 92    | 65    | 56    |
| Future Volume (vph)  | 63    | 386   | 17    | 215   | 58    | 92    | 65    | 56    |
| Turn Type            | Perm  | NA    | Perm  | NA    | Perm  | NA    | Perm  | NA    |
| Protected Phases     |       |       |       | 4     |       | 8     |       | 2     |
| Permitted Phases     |       |       |       |       |       | 2     |       | 6     |
| Detector Phase       | 4     | 4     | 8     | 8     | 2     | 2     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  |
| Total Split (s)      | 66.0  | 66.0  | 66.0  | 66.0  | 34.0  | 34.0  | 34.0  | 34.0  |
| Total Split (%)      | 66.0% | 66.0% | 66.0% | 66.0% | 34.0% | 34.0% | 34.0% | 34.0% |
| Yellow Time (s)      | 3.5   | 3.5   | 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   | 1.0   | 1.0   |
| 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   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   |
| Lead/Lag             |       |       |       |       |       |       |       |       |
| Lead-Lag Optimize?   |       |       |       |       |       |       |       |       |
| Recall Mode          | None  | None  | None  | None  | Min   | Min   | Min   | Min   |
| Act Effect Green (s) | 13.8  | 13.8  | 13.8  | 13.8  | 7.7   | 7.7   | 7.7   | 7.7   |
| Actuated g/C Ratio   | 0.45  | 0.45  | 0.45  | 0.45  | 0.25  | 0.25  | 0.25  | 0.25  |
| v/c Ratio            | 0.15  | 0.57  | 0.05  | 0.44  | 0.19  | 0.25  | 0.22  | 0.21  |
| Control Delay        | 5.9   | 9.2   | 5.2   | 6.8   | 12.2  | 11.4  | 12.6  | 9.3   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 5.9   | 9.2   | 5.2   | 6.8   | 12.2  | 11.4  | 12.6  | 9.3   |
| LOS                  | A     | A     | A     | A     | B     | B     | B     | A     |
| Approach Delay       |       | 8.8   |       |       | 6.8   |       | 11.7  |       |
| Approach LOS         |       | A     |       |       | A     |       | B     |       |

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 30.8

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 8.8

Intersection LOS: A

Intersection Capacity Utilization 49.0%

ICU Level of Service A

Analysis Period (min) 15

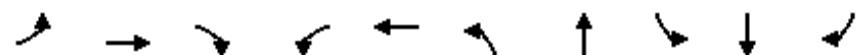
Splits and Phases: 5: Fifth Line &amp; Sheridan Park Dr



## Timings

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/19/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑↑↑↗  | ↑ ↗   | ↑↑↑↗  | ↑ ↗   |
| Traffic Volume (vph) | 174   | 99    | 108   | 70    | 88    | 185   | 2342  | 95    | 1511  | 91    |
| Future Volume (vph)  | 174   | 99    | 108   | 70    | 88    | 185   | 2342  | 95    | 1511  | 91    |
| Turn Type            | Perm  | NA    | Perm  | Perm  | NA    | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 8     | 5     | 2     | 1     | 6     |       |
| Permitted Phases     | 4     |       |       | 4     | 8     |       | 2     |       | 6     |       |
| Detector Phase       | 4     | 4     | 4     | 8     | 8     | 5     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 38.0  | 38.0  | 38.0  | 38.0  | 38.0  | 9.5   | 38.0  | 9.5   | 38.0  | 38.0  |
| Total Split (s)      | 48.0  | 48.0  | 48.0  | 48.0  | 48.0  | 18.0  | 77.0  | 15.0  | 74.0  | 74.0  |
| Total Split (%)      | 34.3% | 34.3% | 34.3% | 34.3% | 34.3% | 12.9% | 55.0% | 10.7% | 52.9% | 52.9% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 3.5   | 5.0   | 3.0   | 5.0   | 5.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 3.0   | 7.0   | 7.0   |
| Lead/Lag             |       |       |       |       |       | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   |       |       |       |       |       | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 31.4  | 31.4  | 31.4  | 31.4  | 31.4  | 96.6  | 82.5  | 90.8  | 77.7  | 77.7  |
| Actuated g/C Ratio   | 0.22  | 0.22  | 0.22  | 0.22  | 0.22  | 0.69  | 0.59  | 0.65  | 0.56  | 0.56  |
| v/c Ratio            | 0.97  | 0.25  | 0.27  | 0.26  | 0.54  | 0.72  | 0.86  | 0.61  | 0.56  | 0.11  |
| Control Delay        | 110.3 | 43.8  | 7.9   | 44.3  | 40.1  | 33.0  | 29.5  | 41.0  | 22.7  | 8.1   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 110.3 | 43.8  | 7.9   | 44.3  | 40.1  | 33.0  | 29.5  | 41.0  | 22.7  | 8.1   |
| LOS                  | F     | D     | A     | D     | D     | C     | C     | D     | C     | A     |
| Approach Delay       |       | 63.9  |       |       |       | 41.1  |       | 29.7  |       | 23.0  |
| Approach LOS         |       | E     |       |       |       | D     |       | C     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 30.7

Intersection LOS: C

Intersection Capacity Utilization 97.1%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way



# HCM Unsignalized Intersection Capacity Analysis

7: Speakman Dr & Hadwen Dr

12/19/2017

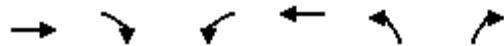


| Movement                          | EBL  | EBT   | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |      |       |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |      | Stop  |       |       |      | Stop                 |      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 39   | 41    | 9     | 68    | 29   | 60                   | 2    | 188  | 103  | 43   | 100  | 26   |
| Future Volume (vph)               | 39   | 41    | 9     | 68    | 29   | 60                   | 2    | 188  | 103  | 43   | 100  | 26   |
| Peak Hour Factor                  | 0.81 | 0.81  | 0.81  | 0.81  | 0.81 | 0.81                 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Hourly flow rate (vph)            | 48   | 51    | 11    | 84    | 36   | 74                   | 2    | 232  | 127  | 53   | 123  | 32   |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 110  | 194   | 361   | 208   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 48   | 84    | 2     | 53    |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 11   | 74    | 127   | 32    |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | 0.05 | -0.13 | -0.21 | -0.04 |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 5.8  | 5.4   | 4.9   | 5.3   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.18 | 0.29  | 0.49  | 0.30  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 547  | 599   | 692   | 634   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 10.0 | 10.7  | 12.5  | 10.5  |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 10.0 | 10.7  | 12.5  | 10.5  |      |                      |      |      |      |      |      |      |
| Approach LOS                      | A    | B     | B     | B     |      |                      |      |      |      |      |      |      |
| <b>Intersection Summary</b>       |      |       |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |      |       |       |       | 11.3 |                      |      |      |      |      |      |      |
| Level of Service                  |      |       |       |       | B    |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |       |       | 47.3% |      | ICU Level of Service |      |      |      | A    |      |      |
| Analysis Period (min)             |      |       |       | 15    |      |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

8: Flavelle Blvd West & Speakman Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      |       |      |                      |      |      |
| Traffic Volume (veh/h)            | 237  | 189   | 51   | 121                  | 0    | 0    |
| Future Volume (Veh/h)             | 237  | 189   | 51   | 121                  | 0    | 0    |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.75 | 0.75  | 0.75 | 0.75                 | 0.75 | 0.75 |
| Hourly flow rate (vph)            | 316  | 252   | 68   | 161                  | 0    | 0    |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 568   |      | 739                  | 442  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 568   |      | 739                  | 442  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 93    |      | 100                  | 100  |      |
| cM capacity (veh/h)               |      | 1004  |      | 361                  | 620  |      |
| Direction, Lane #                 | EB 1 | WB 1  |      |                      |      |      |
| Volume Total                      | 568  | 229   |      |                      |      |      |
| Volume Left                       | 0    | 68    |      |                      |      |      |
| Volume Right                      | 252  | 0     |      |                      |      |      |
| cSH                               | 1700 | 1004  |      |                      |      |      |
| Volume to Capacity                | 0.33 | 0.07  |      |                      |      |      |
| Queue Length 95th (m)             | 0.0  | 1.7   |      |                      |      |      |
| Control Delay (s)                 | 0.0  | 3.1   |      |                      |      |      |
| Lane LOS                          |      | A     |      |                      |      |      |
| Approach Delay (s)                | 0.0  | 3.1   |      |                      |      |      |
| Approach LOS                      |      |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 0.9   |      |                      |      |      |
| Intersection Capacity Utilization |      | 39.9% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

9: Flavelle Blvd East & Speakman Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    |       |      | ↑                    | ↖    | ↖    |
| Traffic Volume (veh/h)            | 235  | 0     | 0    | 157                  | 16   | 36   |
| Future Volume (Veh/h)             | 235  | 0     | 0    | 157                  | 16   | 36   |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.80 | 0.80  | 0.80 | 0.80                 | 0.80 | 0.80 |
| Hourly flow rate (vph)            | 294  | 0     | 0    | 196                  | 20   | 45   |
| Pedestrians                       |      |       |      |                      | 1    |      |
| Lane Width (m)                    |      |       |      |                      | 3.7  |      |
| Walking Speed (m/s)               |      |       |      |                      | 1.1  |      |
| Percent Blockage                  |      |       |      |                      | 0    |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 295   |      | 491                  | 295  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 295   |      | 491                  | 295  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 100   |      | 96                   | 94   |      |
| cM capacity (veh/h)               |      | 1277  |      | 540                  | 748  |      |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2                 |      |      |
| Volume Total                      | 294  | 196   | 20   | 45                   |      |      |
| Volume Left                       | 0    | 0     | 20   | 0                    |      |      |
| Volume Right                      | 0    | 0     | 0    | 45                   |      |      |
| cSH                               | 1700 | 1700  | 540  | 748                  |      |      |
| Volume to Capacity                | 0.17 | 0.12  | 0.04 | 0.06                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 0.9  | 1.5                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 11.9 | 10.1                 |      |      |
| Lane LOS                          |      |       | B    | B                    |      |      |
| Approach Delay (s)                | 0.0  | 0.0   | 10.7 |                      |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 1.3   |      |                      |      |      |
| Intersection Capacity Utilization |      | 22.4% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

| <b>Junctions 9</b>  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <b>ARCADY 9 - Roundabout Module</b>   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Version: 9.0.0.4211  <br>© Copyright TRL Limited, 2017  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| For sales and distribution information, program advice and maintenance, contact TRL:<br>Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Filename: 039474\_Roundabout\_Analysis 90 BG.j9  
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady  
Report generation date: 7/25/2017 9:10:16 AM

## Summary of intersection performance

|   | AM          |                 |           |           |     |                        |                  |                                | PM          |                 |           |           |     |                        |                  |                               |
|---|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|--------------------------------|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|-------------------------------|
|   | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity      | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity     |
| <b>Single Lane Roundabout - 2031 Background</b> |             |                 |           |           |     |                        |                  |                                |             |                 |           |           |     |                        |                  |                               |
| <b>1 - Homelands Dr - N</b>                     | 1.0         | 2.3             | 7.75      | 0.51      | A   | 7.27                   | A                | 54 %<br>[1 - Homelands Dr - N] | 0.3         | 1.4             | 4.29      | 0.24      | A   | 7.59                   | A                | 27 %<br>[3 - Speakman Dr - S] |
| <b>2 - Sheridan Park Dr - E</b>                 | 1.1         | 1.9             | 7.17      | 0.51      | A   |                        |                  |                                | 0.5         | 2.2             | 6.01      | 0.33      | A   |                        |                  |                               |
| <b>3 - Speakman Dr - S</b>                      | 0.5         | 2.3             | 6.65      | 0.33      | A   |                        |                  |                                | 1.4         | 3.4             | 11.00     | 0.59      | B   |                        |                  |                               |
| <b>4 - Sheridan Park Dr - W</b>                 | 0.0         | 0.5             | 6.20      | 0.02      | A   |                        |                  |                                | 0.1         | 0.5             | 4.12      | 0.07      | A   |                        |                  |                               |

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

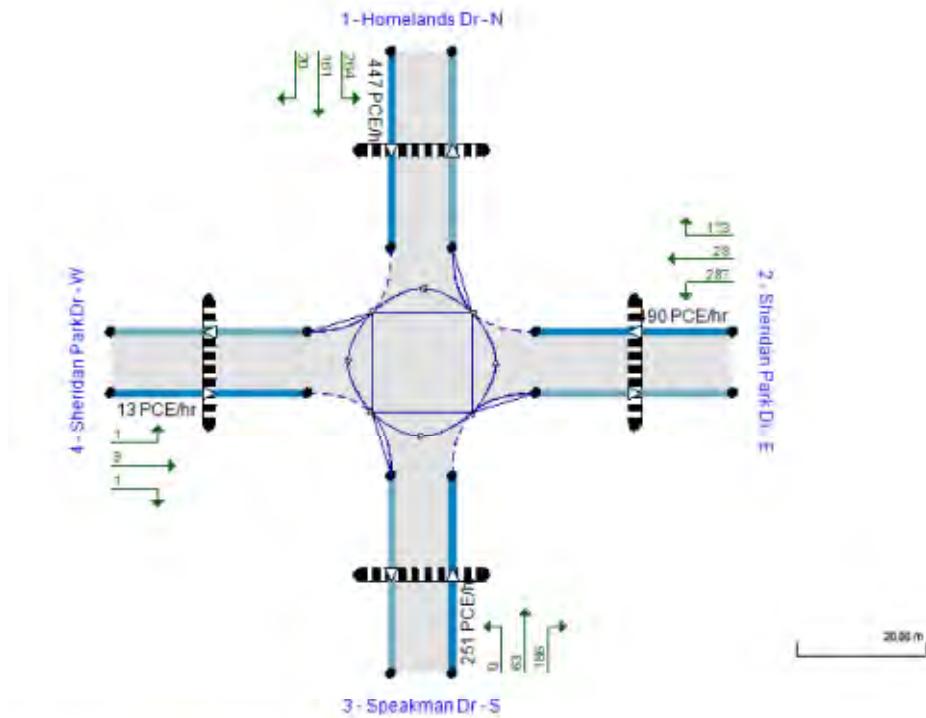
## File summary

### File Description

|             |   |
|-------------|---|
| Title       | Sheridan Park Drive 90 percent Capacity |
| Location    | Mississauga                             |
| Site number |   |
| Date        | 7/25/2017                               |
| Version     |   |
| Status      | (new file)                              |
| Identifier  |   |
| Client      |   |
| Jobnumber   |   |
| Analyst     | RJBURNSIDE"jester                       |
| Description |   |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|----------------|-------------|---------------------|-----------------------|------------|---------------------|-------------------|---------------------|
| m              | kph         | PCE                 | PCE                   | perHour    | s                   | -Min              | perMin              |



Showing original traffic demand (PCE/hr).

The intersection diagram reflects the last run of Intersections.

### Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | Residual capacity criteria type | V/C Ratio Threshold | Average Delay threshold (s) | Queue threshold (PCE) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------|---------------------|-----------------------------|-----------------------|
| 5.75               | ✓                           |                                   | ✓                           | Delay                           | 0.85                | 36.00                       | 20.00                 |

### Demand Set Summary

| Scenario name   | Time Period name | Traffic profile type | Model start time (HH:mm) | Model finish time (HH:mm) | Time segment length (min) | Run automatically |
|-----------------|------------------|----------------------|--------------------------|---------------------------|---------------------------|-------------------|
| 2031 Background | AM               | ONE HOUR             | 08:00                    | 09:30                     | 15                        | ✓                 |
| 2031 Background | PM               | ONE HOUR             | 16:00                    | 17:30                     | 15                        | ✓                 |

## Single Lane Roundabout - 2031 Background, AM

### Data Errors and Warnings

| Severity | Area             | Item                                | Description   |
|----------|------------------|-------------------------------------|---|
| Last Run | Last Run         | 2 - Sheridan Park Dr - E - Capacity | Pedestrian Crossing causes blocking on previous leg due to traffic queuing to leave the intersection in 6 timesegment(s). |
| Warning  | Queue variations | Analysis Options                    | Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.                       |

## Results

### Results Summary for whole modelled period

| Leg                      | Max V/C Ratio | Max delay (s) | Max Queue (PCE) | Max 95th percentile Queue (PCE) | Max LOS | Average Demand (PCE/hr) | Total Intersection Arrivals (PCE) |
|--------------------------|---------------|---------------|-----------------|---------------------------------|---------|-------------------------|-----------------------------------|
| 1 - Homelands Dr - N     | 0.51          | 7.75          | 1.0             | 2.3                             | A       | 410.18                  | 615.26                            |
| 2 - Sheridan Park Dr - E | 0.51          | 7.17          | 1.1             | 1.9                             | A       | 449.63                  | 674.45                            |
| 3 - Speakman Dr - S      | 0.33          | 6.65          | 0.5             | 2.3                             | A       | 230.32                  | 345.48                            |
| 4 - Sheridan Park Dr - W | 0.02          | 6.20          | 0.0             | 0.5                             | A       | 11.93                   | 17.89                             |

# Single Lane Roundabout - 2031 Background, PM

## Data Errors and Warnings

| Severity | Area             | Item                                | Description   |
|----------|------------------|-------------------------------------|---|
| Last Run | Last Run         | 2 - Sheridan Park Dr - E - Capacity | Pedestrian Crossing causes blocking on previous leg due to traffic queuing to leave the intersection in 6 timesegment(s). |
| Warning  | Queue variations | Analysis Options                    | Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.                       |

# Results

## Results Summary for whole modelled period

| Leg                      | Max V/C Ratio | Max delay (s) | Max Queue (PCE) | Max 95th percentile Queue (PCE) | Max LOS | Average Demand (PCE/hr) | Total Intersection Arrivals (PCE) |
|--------------------------|---------------|---------------|-----------------|---------------------------------|---------|-------------------------|-----------------------------------|
| 1 - Homelands Dr - N     | 0.24          | 4.29          | 0.3             | 1.4                             | A       | 229.40                  | 344.11                            |
| 2 - Sheridan Park Dr - E | 0.33          | 6.01          | 0.5             | 2.2                             | A       | 249.59                  | 374.39                            |
| 3 - Speakman Dr - S      | 0.59          | 11.00         | 1.4             | 3.4                             | B       | 395.49                  | 593.24                            |
| 4 - Sheridan Park Dr - W | 0.07          | 4.12          | 0.1             | 0.5                             | A       | 55.97                   | 83.96                             |



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## Appendix I

### 2031 Intersection Operations With Sheridan Park Drive Extension

## Timings

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/19/2017



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |      |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| Lane Configurations  | ↑ ↗   | ↗ ↘   | ↖ ↗   | ↖ ↘   | ↖ ↗   | ↑↑ ↗  | ↖ ↗   | ↑↑ ↗  | ↖ ↗   |      |
| Traffic Volume (vph) | 44    | 48    | 135   | 89    | 234   | 1347  | 41    | 1673  | 121   |      |
| Future Volume (vph)  | 44    | 48    | 135   | 89    | 234   | 1347  | 41    | 1673  | 121   |      |
| Turn Type            | Perm  | NA    | Perm  | NA    | pm+pt | NA    | Perm  | NA    | Perm  |      |
| Protected Phases     |       |       |       | 4     | 8     | 5     | 2     | 6     |       |      |
| Permitted Phases     |       |       |       | 4     | 8     | 2     | 6     | 6     |       |      |
| Detector Phase       |       |       |       | 4     | 4     | 8     | 5     | 2     | 6     |      |
| Switch Phase         |       |       |       |       |       |       |       |       |       |      |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |      |
| Minimum Split (s)    | 35.0  | 35.0  | 35.0  | 35.0  | 9.5   | 25.0  | 25.0  | 25.0  | 25.0  |      |
| Total Split (s)      | 39.0  | 39.0  | 39.0  | 39.0  | 15.0  | 101.0 | 86.0  | 86.0  | 86.0  |      |
| Total Split (%)      | 27.9% | 27.9% | 27.9% | 27.9% | 10.7% | 72.1% | 61.4% | 61.4% | 61.4% |      |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0   | 4.0   | 4.0   | 4.0   |      |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 2.0   | 2.0   | 2.0   | 2.0   |      |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |      |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 6.0   | 6.0   | 6.0   | 6.0   |      |
| Lead/Lag             |       |       |       |       | Lead  |       | Lag   | Lag   | Lag   |      |
| Lead-Lag Optimize?   |       |       |       |       | Yes   |       | Yes   | Yes   | Yes   |      |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max | C-Max | C-Max | C-Max |      |
| Act Effect Green (s) | 24.6  | 24.6  | 24.6  | 24.6  | 105.4 | 102.4 | 80.3  | 80.3  | 80.3  |      |
| Actuated g/C Ratio   | 0.18  | 0.18  | 0.18  | 0.18  | 0.75  | 0.73  | 0.57  | 0.57  | 0.57  |      |
| v/c Ratio            | 0.32  | 0.51  | 0.90  | 0.57  | 0.80  | 0.43  | 0.31  | 0.64  | 0.15  |      |
| Control Delay        | 53.7  | 33.2  | 103.0 | 50.8  | 67.6  | 3.4   | 22.9  | 21.5  | 6.1   |      |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |      |
| Total Delay          | 53.7  | 33.2  | 103.0 | 50.8  | 67.6  | 3.4   | 22.9  | 21.5  | 6.1   |      |
| LOS                  | D     | C     | F     | D     | E     | A     | C     | C     | A     |      |
| Approach Delay       |       |       |       | 37.7  |       | 74.7  |       | 12.5  |       | 20.5 |
| Approach LOS         |       |       |       | D     |       | E     |       | B     |       | C    |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 22.0

Intersection LOS: C

Intersection Capacity Utilization 84.3%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr



# HCM Unsignalized Intersection Capacity Analysis

2: Homelands Dr & Thorn Lodge Dr

12/19/2017



| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | Y    |       | Y    |                      | Y    |      |
| Sign Control                      | Stop |       | Stop |                      |      | Stop |
| Traffic Volume (vph)              | 169  | 42    | 95   | 110                  | 77   | 138  |
| Future Volume (vph)               | 169  | 42    | 95   | 110                  | 77   | 138  |
| Peak Hour Factor                  | 0.78 | 0.78  | 0.78 | 0.78                 | 0.78 | 0.78 |
| Hourly flow rate (vph)            | 217  | 54    | 122  | 141                  | 99   | 177  |
| Direction, Lane #                 | WB 1 | NB 1  | SB 1 |                      |      |      |
| Volume Total (vph)                | 271  | 263   | 276  |                      |      |      |
| Volume Left (vph)                 | 217  | 0     | 99   |                      |      |      |
| Volume Right (vph)                | 54   | 141   | 0    |                      |      |      |
| Hadj (s)                          | 0.09 | -0.18 | 0.19 |                      |      |      |
| Departure Headway (s)             | 5.3  | 4.9   | 5.2  |                      |      |      |
| Degree Utilization, x             | 0.40 | 0.36  | 0.40 |                      |      |      |
| Capacity (veh/h)                  | 629  | 696   | 653  |                      |      |      |
| Control Delay (s)                 | 11.9 | 10.6  | 11.7 |                      |      |      |
| Approach Delay (s)                | 11.9 | 10.6  | 11.7 |                      |      |      |
| Approach LOS                      | B    | B     | B    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Delay                             |      |       | 11.4 |                      |      |      |
| Level of Service                  |      |       | B    |                      |      |      |
| Intersection Capacity Utilization |      | 46.2% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |       | 15   |                      |      |      |

## Timings

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/19/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑↑↑   | ↑     | ↑↑↑   | ↑     |
| Traffic Volume (vph) | 24    | 292   | 160   | 87    | 91    | 110   | 225   | 1558  | 322   | 1495  | 131   |
| Future Volume (vph)  | 24    | 292   | 160   | 87    | 91    | 110   | 225   | 1558  | 322   | 1495  | 131   |
| Turn Type            | pm+pt | NA    | Perm  | Perm  | NA    | Perm  | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     | 7     | 4     |       |       | 8     |       | 5     | 2     | 1     | 6     |       |
| Permitted Phases     | 4     |       | 4     | 8     |       | 8     | 2     |       | 6     |       | 6     |
| Detector Phase       | 7     | 4     | 4     | 8     | 8     | 8     | 5     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 9.5   | 41.0  | 41.0  | 41.0  | 41.0  | 41.0  | 9.5   | 36.0  | 9.5   | 36.0  | 36.0  |
| Total Split (s)      | 9.6   | 50.6  | 50.6  | 41.0  | 41.0  | 41.0  | 24.9  | 62.3  | 27.1  | 64.5  | 64.5  |
| Total Split (%)      | 6.9%  | 36.1% | 36.1% | 29.3% | 29.3% | 29.3% | 17.8% | 44.5% | 19.4% | 46.1% | 46.1% |
| Yellow Time (s)      | 3.5   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 3.5   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 1.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 4.5   | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 4.5   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             | Lead  |       |       | Lag   | Lag   | Lag   | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   | Yes   |       |       | Yes   |
| Recall Mode          | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 31.6  | 29.1  | 29.1  | 23.3  | 23.3  | 23.3  | 87.8  | 67.5  | 100.8 | 74.6  | 74.6  |
| Actuated g/C Ratio   | 0.23  | 0.21  | 0.21  | 0.17  | 0.17  | 0.17  | 0.63  | 0.48  | 0.72  | 0.53  | 0.53  |
| v/c Ratio            | 0.10  | 0.78  | 0.43  | 0.82  | 0.30  | 0.32  | 0.72  | 0.81  | 0.82  | 0.57  | 0.15  |
| Control Delay        | 39.9  | 65.5  | 21.6  | 104.0 | 53.1  | 10.4  | 37.7  | 35.1  | 55.3  | 26.3  | 7.8   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 39.9  | 65.5  | 21.6  | 104.0 | 53.1  | 10.4  | 37.7  | 35.1  | 55.3  | 26.3  | 7.8   |
| LOS                  | D     | E     | C     | F     | D     | B     | D     | D     | E     | C     | A     |
| Approach Delay       |       | 49.5  |       |       |       | 52.2  |       |       | 35.3  |       | 29.9  |
| Approach LOS         |       | D     |       |       |       | D     |       |       | D     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 35.5

Intersection LOS: D

Intersection Capacity Utilization 98.2%

ICU Level of Service F

Analysis Period (min) 15

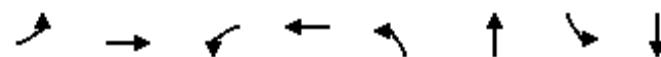
Splits and Phases: 3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr



## Timings

5: Fifth Line &amp; Sheridan Park Dr

01/18/2018



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   |
| Traffic Volume (vph) | 30    | 398   | 8     | 444   | 53    | 66    | 135   | 83    |
| Future Volume (vph)  | 30    | 398   | 8     | 444   | 53    | 66    | 135   | 83    |
| Turn Type            | Perm  | NA    | Perm  | NA    | Perm  | NA    | Perm  | NA    |
| Protected Phases     |       |       |       | 4     |       | 8     |       | 2     |
| Permitted Phases     |       |       |       |       | 2     |       | 6     |       |
| Detector Phase       | 4     | 4     | 8     | 8     | 2     | 2     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  | 22.5  |
| Total Split (s)      | 65.0  | 65.0  | 65.0  | 65.0  | 35.0  | 35.0  | 35.0  | 35.0  |
| Total Split (%)      | 65.0% | 65.0% | 65.0% | 65.0% | 35.0% | 35.0% | 35.0% | 35.0% |
| Yellow Time (s)      | 3.5   | 3.5   | 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   | 1.0   | 1.0   |
| 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   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   |
| Lead/Lag             |       |       |       |       |       |       |       |       |
| Lead-Lag Optimize?   |       |       |       |       |       |       |       |       |
| Recall Mode          | None  | None  | None  | None  | Min   | Min   | Min   | Min   |
| Act Effect Green (s) | 21.0  | 21.0  | 21.0  | 21.0  | 11.6  | 11.6  | 11.6  | 11.6  |
| Actuated g/C Ratio   | 0.50  | 0.50  | 0.50  | 0.50  | 0.27  | 0.27  | 0.27  | 0.27  |
| v/c Ratio            | 0.12  | 0.57  | 0.03  | 0.67  | 0.22  | 0.22  | 0.44  | 0.46  |
| Control Delay        | 7.1   | 10.4  | 6.2   | 12.3  | 16.5  | 12.9  | 19.4  | 13.7  |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.1   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 7.1   | 10.4  | 6.2   | 12.4  | 16.5  | 12.9  | 19.4  | 13.7  |
| LOS                  | A     | B     | A     | B     | B     | B     | B     | B     |
| Approach Delay       |       | 10.2  |       | 12.3  |       | 14.2  |       | 16.0  |
| Approach LOS         |       | B     |       | B     |       | B     |       | B     |

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 42.4

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 12.7

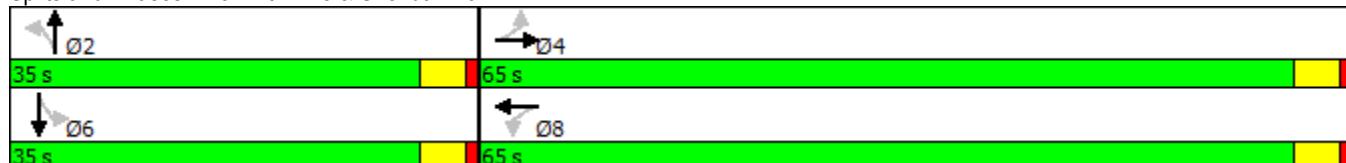
Intersection LOS: B

Intersection Capacity Utilization 55.8%

ICU Level of Service B

Analysis Period (min) 15

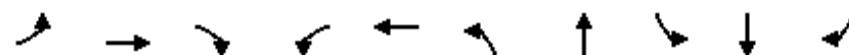
Splits and Phases: 5: Fifth Line &amp; Sheridan Park Dr



## Timings

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/19/2017



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑ ↗   | ↑↑↑↗  | ↑ ↗   | ↑↑↑↗  | ↑ ↗   |
| Traffic Volume (vph) | 174   | 119   | 174   | 150   | 81    | 146   | 2042  | 159   | 1558  | 285   |
| Future Volume (vph)  | 174   | 119   | 174   | 150   | 81    | 146   | 2042  | 159   | 1558  | 285   |
| Turn Type            | pm+pt | NA    | Perm  | pm+pt | NA    | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     | 7     | 4     |       | 3     | 8     | 5     | 2     | 1     | 6     |       |
| Permitted Phases     |       |       | 4     |       | 8     |       | 2     |       | 6     |       |
| Detector Phase       | 7     | 4     | 4     | 3     | 8     | 5     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 9.5   | 38.0  | 38.0  | 9.5   | 38.0  | 9.5   | 38.0  | 9.5   | 38.0  | 38.0  |
| Total Split (s)      | 11.6  | 38.8  | 38.8  | 10.8  | 38.0  | 21.7  | 74.0  | 16.4  | 68.7  | 68.7  |
| Total Split (%)      | 8.3%  | 27.7% | 27.7% | 7.7%  | 27.1% | 15.5% | 52.9% | 11.7% | 49.1% | 49.1% |
| Yellow Time (s)      | 3.5   | 4.0   | 4.0   | 3.5   | 4.0   | 3.5   | 5.0   | 3.0   | 5.0   | 5.0   |
| All-Red Time (s)     | 1.0   | 3.0   | 3.0   | 1.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 4.5   | 7.0   | 7.0   | 4.5   | 7.0   | 4.5   | 7.0   | 3.0   | 7.0   | 7.0   |
| Lead/Lag             | Lead  | Lag   | Lag   | Lead  | Lag   | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 26.6  | 17.0  | 17.0  | 25.0  | 16.2  | 95.7  | 81.2  | 99.7  | 81.7  | 81.7  |
| Actuated g/C Ratio   | 0.19  | 0.12  | 0.12  | 0.18  | 0.12  | 0.68  | 0.58  | 0.71  | 0.58  | 0.58  |
| v/c Ratio            | 0.82  | 0.54  | 0.53  | 0.65  | 0.71  | 0.58  | 0.75  | 0.71  | 0.55  | 0.29  |
| Control Delay        | 77.9  | 65.8  | 12.9  | 62.1  | 67.6  | 19.5  | 25.6  | 48.2  | 20.2  | 7.6   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 77.9  | 65.8  | 12.9  | 62.1  | 67.6  | 19.5  | 25.6  | 48.2  | 20.2  | 7.6   |
| LOS                  | E     | E     | B     | E     | E     | B     | C     | D     | C     | A     |
| Approach Delay       |       | 50.6  |       |       | 64.8  |       | 25.2  |       | 20.6  |       |
| Approach LOS         |       | D     |       |       | E     |       | C     |       | C     |       |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 28.0

Intersection LOS: C

Intersection Capacity Utilization 89.7%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way



# HCM Unsignalized Intersection Capacity Analysis

7: Speakman Dr & Hadwen Dr

12/19/2017

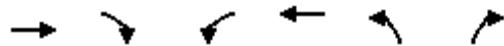


| Movement                          | EBL  | EBT  | EBR   | WBL   | WBT   | WBR  | NBL                  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|------|-------|-------|-------|------|----------------------|------|------|------|------|------|
| Lane Configurations               |      |      |       |       |       |      |                      |      |      |      |      |      |
| Sign Control                      |      | Stop |       |       |       | Stop |                      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 34   | 12   | 8     | 82    | 74    | 27   | 10                   | 187  | 106  | 54   | 316  | 74   |
| Future Volume (vph)               | 34   | 12   | 8     | 82    | 74    | 27   | 10                   | 187  | 106  | 54   | 316  | 74   |
| Peak Hour Factor                  | 0.77 | 0.77 | 0.77  | 0.77  | 0.77  | 0.77 | 0.77                 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 |
| Hourly flow rate (vph)            | 44   | 16   | 10    | 106   | 96    | 35   | 13                   | 243  | 138  | 70   | 410  | 96   |
| Direction, Lane #                 | EB 1 | WB 1 | NB 1  | SB 1  |       |      |                      |      |      |      |      |      |
| Volume Total (vph)                | 70   | 237  | 394   | 576   |       |      |                      |      |      |      |      |      |
| Volume Left (vph)                 | 44   | 106  | 13    | 70    |       |      |                      |      |      |      |      |      |
| Volume Right (vph)                | 10   | 35   | 138   | 96    |       |      |                      |      |      |      |      |      |
| Hadj (s)                          | 0.04 | 0.00 | -0.20 | -0.08 |       |      |                      |      |      |      |      |      |
| Departure Headway (s)             | 7.5  | 6.8  | 5.8   | 5.6   |       |      |                      |      |      |      |      |      |
| Degree Utilization, x             | 0.14 | 0.45 | 0.64  | 0.90  |       |      |                      |      |      |      |      |      |
| Capacity (veh/h)                  | 415  | 499  | 586   | 576   |       |      |                      |      |      |      |      |      |
| Control Delay (s)                 | 11.7 | 15.2 | 18.5  | 39.6  |       |      |                      |      |      |      |      |      |
| Approach Delay (s)                | 11.7 | 15.2 | 18.5  | 39.6  |       |      |                      |      |      |      |      |      |
| Approach LOS                      | B    | C    | C     | E     |       |      |                      |      |      |      |      |      |
| <b>Intersection Summary</b>       |      |      |       |       |       |      |                      |      |      |      |      |      |
| Delay                             |      |      |       |       | 27.0  |      |                      |      |      |      |      |      |
| Level of Service                  |      |      |       |       |       | D    |                      |      |      |      |      |      |
| Intersection Capacity Utilization |      |      |       |       | 62.1% |      | ICU Level of Service |      |      |      | B    |      |
| Analysis Period (min)             |      |      |       |       |       | 15   |                      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

8: Flavelle Blvd West & Speakman Dr

12/19/2017

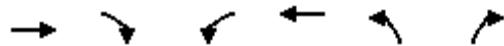


| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      |       |      |                      |      |      |
| Traffic Volume (veh/h)            | 205  | 19    | 35   | 388                  | 0    | 0    |
| Future Volume (Veh/h)             | 205  | 19    | 35   | 388                  | 0    | 0    |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.80 | 0.80  | 0.80 | 0.80                 | 0.80 | 0.80 |
| Hourly flow rate (vph)            | 256  | 24    | 44   | 485                  | 0    | 0    |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 280   |      | 841                  | 268  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 280   |      | 841                  | 268  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 97    |      | 100                  | 100  |      |
| cM capacity (veh/h)               |      | 1277  |      | 326                  | 776  |      |
| Direction, Lane #                 | EB 1 | WB 1  |      |                      |      |      |
| Volume Total                      | 280  | 529   |      |                      |      |      |
| Volume Left                       | 0    | 44    |      |                      |      |      |
| Volume Right                      | 24   | 0     |      |                      |      |      |
| cSH                               | 1700 | 1277  |      |                      |      |      |
| Volume to Capacity                | 0.16 | 0.03  |      |                      |      |      |
| Queue Length 95th (m)             | 0.0  | 0.8   |      |                      |      |      |
| Control Delay (s)                 | 0.0  | 1.0   |      |                      |      |      |
| Lane LOS                          |      | A     |      |                      |      |      |
| Approach Delay (s)                | 0.0  | 1.0   |      |                      |      |      |
| Approach LOS                      |      |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 0.7   |      |                      |      |      |
| Intersection Capacity Utilization |      | 41.0% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

9: Flavelle Blvd East & Speakman Dr

12/19/2017

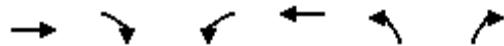


| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    |       |      | ↑                    | ↖    | ↖    |
| Traffic Volume (veh/h)            | 203  | 0     | 0    | 283                  | 137  | 167  |
| Future Volume (Veh/h)             | 203  | 0     | 0    | 283                  | 137  | 167  |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.75 | 0.75  | 0.75 | 0.75                 | 0.75 | 0.75 |
| Hourly flow rate (vph)            | 271  | 0     | 0    | 377                  | 183  | 223  |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 271   |      | 648                  | 271  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 271   |      | 648                  | 271  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 100   |      | 58                   | 71   |      |
| cM capacity (veh/h)               |      | 1304  |      | 437                  | 770  |      |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2                 |      |      |
| Volume Total                      | 271  | 377   | 183  | 223                  |      |      |
| Volume Left                       | 0    | 0     | 183  | 0                    |      |      |
| Volume Right                      | 0    | 0     | 0    | 223                  |      |      |
| cSH                               | 1700 | 1700  | 437  | 770                  |      |      |
| Volume to Capacity                | 0.16 | 0.22  | 0.42 | 0.29                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 15.5 | 9.1                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 19.1 | 11.6                 |      |      |
| Lane LOS                          |      |       | C    | B                    |      |      |
| Approach Delay (s)                | 0.0  | 0.0   | 15.0 |                      |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| <b>Intersection Summary</b>       |      |       |      |                      |      |      |
| Average Delay                     |      | 5.8   |      |                      |      |      |
| Intersection Capacity Utilization |      | 29.2% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

10: Speakman Dr & Sheridan Park Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    | ↗     | ↖    | ↙                    | ↘    |      |
| Traffic Volume (veh/h)            | 30   | 881   | 10   | 120                  | 168  | 10   |
| Future Volume (Veh/h)             | 30   | 881   | 10   | 120                  | 168  | 10   |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.92 | 0.92  | 0.92 | 0.92                 | 0.92 | 0.92 |
| Hourly flow rate (vph)            | 33   | 958   | 11   | 130                  | 183  | 11   |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       | None |                      |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               | 149  |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 991   |      | 185                  | 33   |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 991   |      | 185                  | 33   |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 98    |      | 77                   | 99   |      |
| cM capacity (veh/h)               |      | 698   |      | 792                  | 1041 |      |
| Direction, Lane #                 | EB 1 | EB 2  | WB 1 | NB 1                 |      |      |
| Volume Total                      | 33   | 958   | 141  | 194                  |      |      |
| Volume Left                       | 0    | 0     | 11   | 183                  |      |      |
| Volume Right                      | 0    | 958   | 0    | 11                   |      |      |
| cSH                               | 1700 | 1700  | 698  | 802                  |      |      |
| Volume to Capacity                | 0.02 | 0.56  | 0.02 | 0.24                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 0.4  | 7.2                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 1.0  | 10.9                 |      |      |
| Lane LOS                          |      |       | A    | B                    |      |      |
| Approach Delay (s)                | 0.0  |       | 1.0  | 10.9                 |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| <b>Intersection Summary</b>       |      |       |      |                      |      |      |
| Average Delay                     |      | 1.7   |      |                      |      |      |
| Intersection Capacity Utilization |      | 68.1% |      | ICU Level of Service |      | C    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

## Timings

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/19/2017



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT    | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| Lane Configurations  | ↑ ↗   | ↑ ↘   | ↑ ↗   | ↑ ↘   | ↑ ↗   | ↑↑ ↗ ↘ | ↑ ↗   | ↑↑ ↗  | ↑     |
| Traffic Volume (vph) | 191   | 146   | 69    | 96    | 194   | 1728   | 77    | 1111  | 65    |
| Future Volume (vph)  | 191   | 146   | 69    | 96    | 194   | 1728   | 77    | 1111  | 65    |
| Turn Type            | Perm  | NA    | Perm  | NA    | pm+pt | NA     | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       | 4     |       | 8      | 5     | 2     | 1     |
| Permitted Phases     |       |       |       |       |       | 2      |       | 6     |       |
| Detector Phase       |       |       |       | 4     |       | 8      | 5     | 2     | 1     |
| Switch Phase         |       |       |       |       |       |        |       | 6     | 6     |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0    | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 35.0  | 35.0  | 35.0  | 35.0  | 9.5   | 25.0   | 9.5   | 25.0  | 25.0  |
| Total Split (s)      | 50.0  | 50.0  | 50.0  | 50.0  | 22.0  | 74.0   | 16.0  | 68.0  | 68.0  |
| Total Split (%)      | 35.7% | 35.7% | 35.7% | 35.7% | 15.7% | 52.9%  | 11.4% | 48.6% | 48.6% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 4.0   | 3.0   | 4.0    | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 3.0   | 0.0   | 2.0    | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0    | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 7.0   | 3.0   | 6.0    | 3.0   | 6.0   | 6.0   |
| Lead/Lag             |       |       |       |       |       | Lead   | Lag   | Lead  | Lag   |
| Lead-Lag Optimize?   |       |       |       |       |       | Yes    | Yes   | Yes   | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | C-Max  | None  | C-Max | C-Max |
| Act Effect Green (s) | 33.8  | 33.8  | 33.8  | 33.8  | 95.9  | 81.9   | 89.7  | 78.4  | 78.4  |
| Actuated g/C Ratio   | 0.24  | 0.24  | 0.24  | 0.24  | 0.68  | 0.58   | 0.64  | 0.56  | 0.56  |
| v/c Ratio            | 0.77  | 0.85  | 0.86  | 0.37  | 0.59  | 0.67   | 0.49  | 0.42  | 0.08  |
| Control Delay        | 68.5  | 60.2  | 114.9 | 38.6  | 25.5  | 12.4   | 25.1  | 19.8  | 3.6   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0    | 0.0   | 0.0   | 0.0   |
| Total Delay          | 68.5  | 60.2  | 114.9 | 38.6  | 25.5  | 12.4   | 25.1  | 19.8  | 3.6   |
| LOS                  | E     | E     | F     | D     | C     | B      | C     | B     | A     |
| Approach Delay       |       |       | 63.1  |       | 61.6  |        | 13.7  |       | 19.3  |
| Approach LOS         |       |       | E     |       | E     |        | B     |       | B     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 24.7

Intersection LOS: C

Intersection Capacity Utilization 86.7%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr



# HCM Unsignalized Intersection Capacity Analysis

2: Homelands Dr & Thorn Lodge Dr

12/19/2017



| Movement                          | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | WBL  | WBR   | NBT  | NBR                  | SBL  | SBT  |
| Sign Control                      | Stop |       | Stop |                      |      | Stop |
| Traffic Volume (vph)              | 100  | 22    | 122  | 190                  | 19   | 93   |
| Future Volume (vph)               | 100  | 22    | 122  | 190                  | 19   | 93   |
| Peak Hour Factor                  | 0.87 | 0.87  | 0.87 | 0.87                 | 0.87 | 0.87 |
| Hourly flow rate (vph)            | 115  | 25    | 140  | 218                  | 22   | 107  |
| Direction, Lane #                 | WB 1 | NB 1  | SB 1 |                      |      |      |
| Volume Total (vph)                | 140  | 358   | 129  |                      |      |      |
| Volume Left (vph)                 | 115  | 0     | 22   |                      |      |      |
| Volume Right (vph)                | 25   | 218   | 0    |                      |      |      |
| Hadj (s)                          | 0.06 | -0.34 | 0.12 |                      |      |      |
| Departure Headway (s)             | 5.0  | 4.1   | 4.8  |                      |      |      |
| Degree Utilization, x             | 0.20 | 0.41  | 0.17 |                      |      |      |
| Capacity (veh/h)                  | 657  | 850   | 715  |                      |      |      |
| Control Delay (s)                 | 9.2  | 9.9   | 8.7  |                      |      |      |
| Approach Delay (s)                | 9.2  | 9.9   | 8.7  |                      |      |      |
| Approach LOS                      | A    | A     | A    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Delay                             |      |       | 9.5  |                      |      |      |
| Level of Service                  |      |       | A    |                      |      |      |
| Intersection Capacity Utilization |      | 34.7% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      |       | 15   |                      |      |      |

## Timings

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

01/18/2018



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑↑↑   | ↑     | ↑↑↑   | ↑     |
| Traffic Volume (vph) | 90    | 61    | 456   | 227   | 260   | 247   | 231   | 1925  | 45    | 1413  | 42    |
| Future Volume (vph)  | 90    | 61    | 456   | 227   | 260   | 247   | 231   | 1925  | 45    | 1413  | 42    |
| Turn Type            | Perm  | NA    | Perm  | pm+pt | NA    | Perm  | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     |       |       |       |       | 4     | 3     | 8     | 5     | 2     | 1     | 6     |
| Permitted Phases     |       |       |       |       | 4     | 4     | 8     | 2     | 6     | 6     | 6     |
| Detector Phase       |       |       |       |       | 4     | 4     | 3     | 8     | 5     | 2     | 1     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 41.0  | 41.0  | 41.0  | 9.5   | 41.0  | 41.0  | 9.5   | 36.0  | 9.5   | 36.0  | 36.0  |
| Total Split (s)      | 41.5  | 41.5  | 41.5  | 21.0  | 62.5  | 62.5  | 20.0  | 68.0  | 9.5   | 57.5  | 57.5  |
| Total Split (%)      | 29.6% | 29.6% | 29.6% | 15.0% | 44.6% | 44.6% | 14.3% | 48.6% | 6.8%  | 41.1% | 41.1% |
| Yellow Time (s)      | 4.0   | 4.0   | 4.0   | 3.5   | 4.0   | 4.0   | 3.5   | 4.0   | 3.0   | 4.0   | 4.0   |
| All-Red Time (s)     | 3.0   | 3.0   | 3.0   | 1.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 7.0   | 4.5   | 6.0   | 3.0   | 6.0   | 6.0   |
| Lead/Lag             | Lag   | Lag   | Lag   | Lead  |       |       | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   | Yes   | Yes   | Yes   | Yes   |       |       | Yes   | Yes   | Yes   | Yes   | Yes   |
| Recall Mode          | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 27.5  | 27.5  | 27.5  | 50.5  | 48.0  | 48.0  | 80.5  | 71.3  | 66.3  | 56.9  | 56.9  |
| Actuated g/C Ratio   | 0.20  | 0.20  | 0.20  | 0.36  | 0.34  | 0.34  | 0.58  | 0.51  | 0.47  | 0.41  | 0.41  |
| v/c Ratio            | 0.43  | 0.17  | 0.92  | 0.47  | 0.41  | 0.42  | 0.85  | 0.78  | 0.34  | 0.78  | 0.06  |
| Control Delay        | 53.5  | 45.0  | 49.1  | 34.9  | 36.0  | 19.9  | 61.4  | 32.5  | 29.4  | 30.6  | 0.3   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 53.5  | 45.0  | 49.1  | 34.9  | 36.0  | 19.9  | 61.4  | 32.5  | 29.4  | 30.6  | 0.3   |
| LOS                  | D     | D     | D     | C     | D     | B     | E     | C     | C     | C     | A     |
| Approach Delay       |       | 49.4  |       |       |       | 30.2  |       |       | 35.5  |       | 29.7  |
| Approach LOS         |       | D     |       |       |       | C     |       |       | D     |       | C     |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 34.7

Intersection LOS: C

Intersection Capacity Utilization 85.4%

ICU Level of Service E

Analysis Period (min) 15

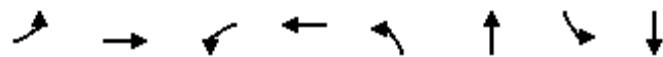
Splits and Phases: 3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr



## Timings

5: Fifth Line &amp; Sheridan Park Dr

01/18/2018



| Lane Group           | EBL   | EBT   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   |   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|---|
| Lane Configurations  | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   | ↑ ↗   | ↗ ↘   |   |
| Traffic Volume (vph) | 64    | 410   | 17    | 315   | 60    | 92    | 65    | 56    |   |
| Future Volume (vph)  | 64    | 410   | 17    | 315   | 60    | 92    | 65    | 56    |   |
| Turn Type            | Perm  | NA    | Perm  | NA    | Perm  | NA    | Perm  | NA    |   |
| Protected Phases     |       |       | 4     |       | 8     |       | 2     |       | 6 |
| Permitted Phases     | 4     |       |       | 8     |       | 2     |       | 6     |   |
| Detector Phase       | 4     | 4     | 8     | 8     | 2     | 2     | 6     | 6     |   |
| Switch Phase         |       |       |       |       |       |       |       |       |   |
| Minimum Initial (s)  | 5.0   | 5.0   | 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  | 22.5  | 22.5  |   |
| Total Split (s)      | 67.0  | 67.0  | 67.0  | 67.0  | 33.0  | 33.0  | 33.0  | 33.0  |   |
| Total Split (%)      | 67.0% | 67.0% | 67.0% | 67.0% | 33.0% | 33.0% | 33.0% | 33.0% |   |
| Yellow Time (s)      | 3.5   | 3.5   | 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   | 1.0   | 1.0   |   |
| 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   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   | 4.5   |   |
| Lead/Lag             |       |       |       |       |       |       |       |       |   |
| Lead-Lag Optimize?   |       |       |       |       |       |       |       |       |   |
| Recall Mode          | None  | None  | None  | None  | Min   | Min   | Min   | Min   |   |
| Act Effect Green (s) | 14.7  | 14.7  | 14.7  | 14.7  | 7.8   | 7.8   | 7.8   | 7.8   |   |
| Actuated g/C Ratio   | 0.46  | 0.46  | 0.46  | 0.46  | 0.24  | 0.24  | 0.24  | 0.24  |   |
| v/c Ratio            | 0.18  | 0.58  | 0.05  | 0.55  | 0.21  | 0.26  | 0.23  | 0.24  |   |
| Control Delay        | 6.2   | 9.2   | 5.1   | 8.5   | 13.1  | 12.2  | 13.4  | 9.7   |   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |   |
| Total Delay          | 6.2   | 9.2   | 5.1   | 8.5   | 13.1  | 12.2  | 13.4  | 9.7   |   |
| LOS                  | A     | A     | A     | A     | B     | B     | B     | A     |   |
| Approach Delay       |       | 8.9   |       | 8.3   |       | 12.5  |       | 11.2  |   |
| Approach LOS         |       | A     |       | A     |       | B     |       | B     |   |

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 31.9

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 9.5

Intersection LOS: A

Intersection Capacity Utilization 50.3%

ICU Level of Service A

Analysis Period (min) 15

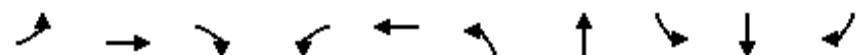
Splits and Phases: 5: Fifth Line &amp; Sheridan Park Dr



## Timings

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

01/18/2018



| Lane Group           | EBL   | EBT   | EBR   | WBL   | WBT   | NBL   | NBT   | SBL   | SBT   | SBR   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations  | ↑     | ↑     | ↑     | ↑     | ↑     | ↑     | ↑↑↑   | ↑     | ↑↑↑   | ↑     |
| Traffic Volume (vph) | 186   | 100   | 119   | 70    | 93    | 235   | 2342  | 95    | 1511  | 136   |
| Future Volume (vph)  | 186   | 100   | 119   | 70    | 93    | 235   | 2342  | 95    | 1511  | 136   |
| Turn Type            | pm+pt | NA    | Perm  | Perm  | NA    | pm+pt | NA    | pm+pt | NA    | Perm  |
| Protected Phases     | 7     | 4     |       |       | 8     | 5     | 2     | 1     | 6     |       |
| Permitted Phases     | 4     |       | 4     | 8     |       | 2     |       | 6     |       | 6     |
| Detector Phase       | 7     | 4     | 4     | 8     | 8     | 5     | 2     | 1     | 6     | 6     |
| Switch Phase         |       |       |       |       |       |       |       |       |       |       |
| Minimum Initial (s)  | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   | 5.0   |
| Minimum Split (s)    | 9.5   | 38.0  | 38.0  | 38.0  | 38.0  | 9.5   | 38.0  | 9.5   | 38.0  | 38.0  |
| Total Split (s)      | 14.0  | 52.0  | 52.0  | 38.0  | 38.0  | 24.4  | 78.0  | 10.0  | 63.6  | 63.6  |
| Total Split (%)      | 10.0% | 37.1% | 37.1% | 27.1% | 27.1% | 17.4% | 55.7% | 7.1%  | 45.4% | 45.4% |
| Yellow Time (s)      | 3.5   | 4.0   | 4.0   | 4.0   | 4.0   | 3.5   | 5.0   | 3.0   | 5.0   | 5.0   |
| All-Red Time (s)     | 1.0   | 3.0   | 3.0   | 3.0   | 3.0   | 1.0   | 2.0   | 0.0   | 2.0   | 2.0   |
| Lost Time Adjust (s) | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Lost Time (s)  | 4.5   | 7.0   | 7.0   | 7.0   | 7.0   | 4.5   | 7.0   | 3.0   | 7.0   | 7.0   |
| Lead/Lag             | Lead  |       |       | Lag   | Lag   | Lead  | Lag   | Lead  | Lag   | Lag   |
| Lead-Lag Optimize?   | Yes   |       |       | Yes   |
| Recall Mode          | None  | None  | None  | None  | None  | None  | C-Max | None  | C-Max | C-Max |
| Act Effect Green (s) | 37.6  | 35.1  | 35.1  | 21.1  | 21.1  | 93.4  | 78.9  | 80.9  | 67.9  | 67.9  |
| Actuated g/C Ratio   | 0.27  | 0.25  | 0.25  | 0.15  | 0.15  | 0.67  | 0.56  | 0.58  | 0.48  | 0.48  |
| v/c Ratio            | 0.90  | 0.22  | 0.26  | 0.38  | 0.79  | 0.78  | 0.90  | 0.62  | 0.64  | 0.17  |
| Control Delay        | 83.1  | 41.2  | 7.3   | 57.3  | 64.4  | 45.0  | 33.5  | 43.6  | 30.2  | 6.2   |
| Queue Delay          | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay          | 83.1  | 41.2  | 7.3   | 57.3  | 64.4  | 45.0  | 33.5  | 43.6  | 30.2  | 6.2   |
| LOS                  | F     | D     | A     | E     | E     | D     | C     | D     | C     | A     |
| Approach Delay       |       | 50.5  |       |       | 62.7  |       | 34.5  |       | 29.1  |       |
| Approach LOS         |       | D     |       |       | E     |       | C     |       | C     |       |

## Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 35.5

Intersection LOS: D

Intersection Capacity Utilization 95.9%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way



# HCM Unsignalized Intersection Capacity Analysis

7: Speakman Dr & Hadwen Dr

12/19/2017

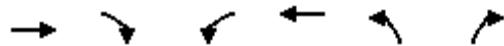


| Movement                          | EBL  | EBT   | EBR   | WBL   | WBT  | WBR                  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|-------|-------|------|----------------------|------|------|------|------|------|------|
| Lane Configurations               |      |       |       |       |      |                      |      |      |      |      |      |      |
| Sign Control                      |      | Stop  |       |       |      | Stop                 |      |      | Stop |      |      | Stop |
| Traffic Volume (vph)              | 39   | 41    | 9     | 68    | 29   | 64                   | 2    | 188  | 103  | 45   | 100  | 26   |
| Future Volume (vph)               | 39   | 41    | 9     | 68    | 29   | 64                   | 2    | 188  | 103  | 45   | 100  | 26   |
| Peak Hour Factor                  | 0.81 | 0.81  | 0.81  | 0.81  | 0.81 | 0.81                 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Hourly flow rate (vph)            | 48   | 51    | 11    | 84    | 36   | 79                   | 2    | 232  | 127  | 56   | 123  | 32   |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1  | SB 1  |      |                      |      |      |      |      |      |      |
| Volume Total (vph)                | 110  | 199   | 361   | 211   |      |                      |      |      |      |      |      |      |
| Volume Left (vph)                 | 48   | 84    | 2     | 56    |      |                      |      |      |      |      |      |      |
| Volume Right (vph)                | 11   | 79    | 127   | 32    |      |                      |      |      |      |      |      |      |
| Hadj (s)                          | 0.05 | -0.14 | -0.21 | -0.04 |      |                      |      |      |      |      |      |      |
| Departure Headway (s)             | 5.8  | 5.4   | 4.9   | 5.3   |      |                      |      |      |      |      |      |      |
| Degree Utilization, x             | 0.18 | 0.30  | 0.49  | 0.31  |      |                      |      |      |      |      |      |      |
| Capacity (veh/h)                  | 544  | 599   | 689   | 631   |      |                      |      |      |      |      |      |      |
| Control Delay (s)                 | 10.0 | 10.7  | 12.6  | 10.6  |      |                      |      |      |      |      |      |      |
| Approach Delay (s)                | 10.0 | 10.7  | 12.6  | 10.6  |      |                      |      |      |      |      |      |      |
| Approach LOS                      | B    | B     | B     | B     |      |                      |      |      |      |      |      |      |
| <b>Intersection Summary</b>       |      |       |       |       |      |                      |      |      |      |      |      |      |
| Delay                             |      |       |       |       | 11.4 |                      |      |      |      |      |      |      |
| Level of Service                  |      |       |       |       | B    |                      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |       |       | 47.6% |      | ICU Level of Service |      |      |      | A    |      |      |
| Analysis Period (min)             |      |       |       | 15    |      |                      |      |      |      |      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

8: Flavelle Blvd West & Speakman Dr

12/19/2017

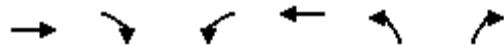


| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               |      |       |      |                      |      |      |
| Traffic Volume (veh/h)            | 237  | 189   | 51   | 121                  | 0    | 0    |
| Future Volume (Veh/h)             | 237  | 189   | 51   | 121                  | 0    | 0    |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.75 | 0.75  | 0.75 | 0.75                 | 0.75 | 0.75 |
| Hourly flow rate (vph)            | 316  | 252   | 68   | 161                  | 0    | 0    |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 568   |      | 739                  | 442  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 568   |      | 739                  | 442  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 93    |      | 100                  | 100  |      |
| cM capacity (veh/h)               |      | 1004  |      | 361                  | 620  |      |
| Direction, Lane #                 | EB 1 | WB 1  |      |                      |      |      |
| Volume Total                      | 568  | 229   |      |                      |      |      |
| Volume Left                       | 0    | 68    |      |                      |      |      |
| Volume Right                      | 252  | 0     |      |                      |      |      |
| cSH                               | 1700 | 1004  |      |                      |      |      |
| Volume to Capacity                | 0.33 | 0.07  |      |                      |      |      |
| Queue Length 95th (m)             | 0.0  | 1.7   |      |                      |      |      |
| Control Delay (s)                 | 0.0  | 3.1   |      |                      |      |      |
| Lane LOS                          |      | A     |      |                      |      |      |
| Approach Delay (s)                | 0.0  | 3.1   |      |                      |      |      |
| Approach LOS                      |      |       |      |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 0.9   |      |                      |      |      |
| Intersection Capacity Utilization |      | 39.9% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

9: Flavelle Blvd East & Speakman Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    |       |      | ↑                    | ↖    | ↖    |
| Traffic Volume (veh/h)            | 235  | 0     | 0    | 157                  | 16   | 36   |
| Future Volume (Veh/h)             | 235  | 0     | 0    | 157                  | 16   | 36   |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.80 | 0.80  | 0.80 | 0.80                 | 0.80 | 0.80 |
| Hourly flow rate (vph)            | 294  | 0     | 0    | 196                  | 20   | 45   |
| Pedestrians                       |      |       |      |                      | 1    |      |
| Lane Width (m)                    |      |       |      |                      | 3.7  |      |
| Walking Speed (m/s)               |      |       |      |                      | 1.1  |      |
| Percent Blockage                  |      |       |      |                      | 0    |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       |      | None                 |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               |      |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 295   |      | 491                  | 295  |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 295   |      | 491                  | 295  |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 100   |      | 96                   | 94   |      |
| cM capacity (veh/h)               |      | 1277  |      | 540                  | 748  |      |
| Direction, Lane #                 | EB 1 | WB 1  | NB 1 | NB 2                 |      |      |
| Volume Total                      | 294  | 196   | 20   | 45                   |      |      |
| Volume Left                       | 0    | 0     | 20   | 0                    |      |      |
| Volume Right                      | 0    | 0     | 0    | 45                   |      |      |
| cSH                               | 1700 | 1700  | 540  | 748                  |      |      |
| Volume to Capacity                | 0.17 | 0.12  | 0.04 | 0.06                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 0.9  | 1.5                  |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 11.9 | 10.1                 |      |      |
| Lane LOS                          |      |       | B    | B                    |      |      |
| Approach Delay (s)                | 0.0  | 0.0   | 10.7 |                      |      |      |
| Approach LOS                      |      |       | B    |                      |      |      |
| Intersection Summary              |      |       |      |                      |      |      |
| Average Delay                     |      | 1.3   |      |                      |      |      |
| Intersection Capacity Utilization |      | 22.4% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

# HCM Unsignalized Intersection Capacity Analysis

10: Speakman Dr & Sheridan Park Dr

12/19/2017



| Movement                          | EBT  | EBR   | WBL  | WBT                  | NBL  | NBR  |
|-----------------------------------|------|-------|------|----------------------|------|------|
| Lane Configurations               | ↑    | ↗     | ↖    | ↙                    | ↖    | ↗    |
| Traffic Volume (veh/h)            | 30   | 116   | 0    | 120                  | 614  | 0    |
| Future Volume (Veh/h)             | 30   | 116   | 0    | 120                  | 614  | 0    |
| Sign Control                      | Free |       |      | Free                 | Stop |      |
| Grade                             | 0%   |       |      | 0%                   | 0%   |      |
| Peak Hour Factor                  | 0.92 | 0.92  | 0.92 | 0.92                 | 0.92 | 0.92 |
| Hourly flow rate (vph)            | 33   | 126   | 0    | 130                  | 667  | 0    |
| Pedestrians                       |      |       |      |                      |      |      |
| Lane Width (m)                    |      |       |      |                      |      |      |
| Walking Speed (m/s)               |      |       |      |                      |      |      |
| Percent Blockage                  |      |       |      |                      |      |      |
| Right turn flare (veh)            |      |       |      |                      |      |      |
| Median type                       | None |       | None |                      |      |      |
| Median storage veh)               |      |       |      |                      |      |      |
| Upstream signal (m)               | 148  |       |      |                      |      |      |
| pX, platoon unblocked             |      |       |      |                      |      |      |
| vC, conflicting volume            |      | 159   |      | 163                  | 33   |      |
| vC1, stage 1 conf vol             |      |       |      |                      |      |      |
| vC2, stage 2 conf vol             |      |       |      |                      |      |      |
| vCu, unblocked vol                |      | 159   |      | 163                  | 33   |      |
| tC, single (s)                    |      | 4.1   |      | 6.4                  | 6.2  |      |
| tC, 2 stage (s)                   |      |       |      |                      |      |      |
| tF (s)                            |      | 2.2   |      | 3.5                  | 3.3  |      |
| p0 queue free %                   |      | 100   |      | 19                   | 100  |      |
| cM capacity (veh/h)               |      | 1420  |      | 828                  | 1041 |      |
| Direction, Lane #                 | EB 1 | EB 2  | WB 1 | NB 1                 |      |      |
| Volume Total                      | 33   | 126   | 130  | 667                  |      |      |
| Volume Left                       | 0    | 0     | 0    | 667                  |      |      |
| Volume Right                      | 0    | 126   | 0    | 0                    |      |      |
| cSH                               | 1700 | 1700  | 1420 | 828                  |      |      |
| Volume to Capacity                | 0.02 | 0.07  | 0.00 | 0.81                 |      |      |
| Queue Length 95th (m)             | 0.0  | 0.0   | 0.0  | 66.0                 |      |      |
| Control Delay (s)                 | 0.0  | 0.0   | 0.0  | 24.7                 |      |      |
| Lane LOS                          |      |       | C    |                      |      |      |
| Approach Delay (s)                | 0.0  |       | 0.0  | 24.7                 |      |      |
| Approach LOS                      |      |       | C    |                      |      |      |
| <b>Intersection Summary</b>       |      |       |      |                      |      |      |
| Average Delay                     |      | 17.2  |      |                      |      |      |
| Intersection Capacity Utilization |      | 47.0% |      | ICU Level of Service |      | A    |
| Analysis Period (min)             |      | 15    |      |                      |      |      |

| Junctions 9   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ARCADY 9 - Roundabout Module  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Version: 9.0.0.4211   © Copyright TRL Limited, 2018   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| For sales and distribution information, program advice and maintenance, contact TRL:<br>Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution</b>     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Filename: 039474\_Roundabout\_Analysis 90 With Ext.j9  
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady  
Report generation date: 1/9/2018 11:50:17 AM

## Summary of intersection performance

|   | AM          |                 |           |           |     |                        |                  | PM  |             |                 |           |           |     |                        |                  |                                      |
|---|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|---|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|--------------------------------------|
|   | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity                 | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity            |
| <b>Single Lane Roundabout - 2031 With Extension</b> |             |                 |           |           |     |                        |                  |   |             |                 |           |           |     |                        |                  |                                      |
| 1 - East End - 1 - Homelands Dr - N                 | 1.1         | 2.8             | 8.98      | 0.53      | A   | 7.93                   | A                | 13 %                                      | 0.4         | 1.0             | 4.84      | 0.26      | A   | 7.25                   | A                | 29 %                                 |
| 1 - East End - 2 - Sheridan Park Dr - E             | 1.3         | 1.5             | 7.77      | 0.56      | A   |                        |                  |   | 0.6         | 2.7             | 5.92      | 0.37      | A   |                        |                  |                                      |
| 1 - East End - 3 - Speakman Dr - S                  | 0.5         | 2.1             | 6.81      | 0.33      | A   | 8.40                   | A                | [2 - West End - 4 - Sheridan Park Dr - W] | 1.2         | 3.4             | 10.50     | 0.55      | B   | 6.49                   | A                | [1 - East End - 3 - Speakman Dr - S] |
| 1 - East End - 4 - Sheridan Park Dr - W             | 0.1         | 0.5             | 6.18      | 0.07      | A   |                        |                  |   | 0.1         | 0.5             | 4.21      | 0.10      | A   |                        |                  |                                      |
| 2 - West End - 2 - Sheridan Park Dr - E             | 0.1         | 0.5             | 3.93      | 0.13      | A   |                        |                  |   | 0.2         | 0.5             | 5.61      | 0.17      | A   |                        |                  |                                      |
| 2 - West End - 3 - Speakman Dr - S                  | 0.2         | 0.5             | 3.82      | 0.16      | A   |                        |                  |   | 1.5         | 1.8             | 7.80      | 0.59      | A   |                        |                  |                                      |
| 2 - West End - 4 - Sheridan Park Dr - W             | 2.7         | 7.8             | 9.86      | 0.73      | A   |                        |                  |   | 0.1         | 0.5             | 1.74      | 0.07      | A   |                        |                  |                                      |

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

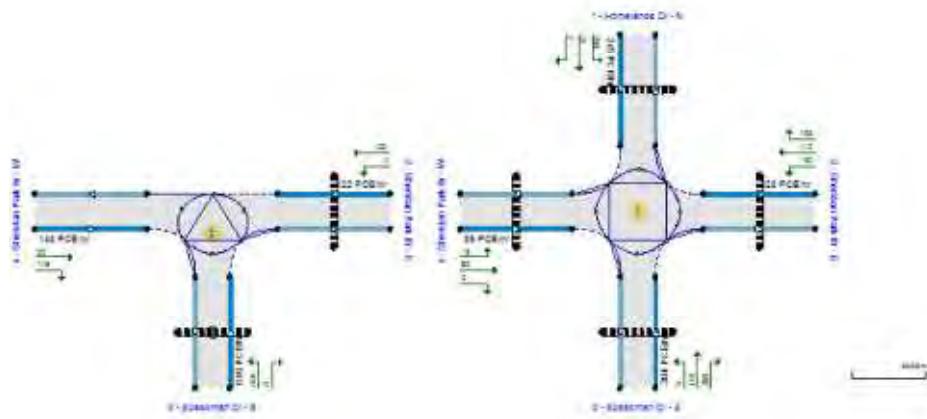
## File summary

### File Description

|             |  |
|-------------|--|
| Title       | Sheridan Park Drive With Extension 90 percent Capacity |
| Location    | Mississauga  |
| Site number |  |
| Date        | 7/25/2017  |
| Version     |  |
| Status      | (new file)   |
| Identifier  |  |
| Client      |  |
| Jobnumber   |  |
| Analyst     | RJBURNSIDE"jester                                      |
| Description |  |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|----------------|-------------|---------------------|-----------------------|------------|---------------------|-------------------|---------------------|
| m              | kph         | PCE                 | PCE                   | perHour    | s                   | -Min              | perMin              |



Showing original traffic demand (PCEh).

The intersection diagram reflects the last run of Intersections.

### Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | Residual capacity criteria type | V/C Ratio Threshold | Average Delay threshold (s) | Queue threshold (PCE) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------|---------------------|-----------------------------|-----------------------|
| 5.75               | ✓                           |                                   | ✓                           | Delay                           | 0.85                | 36.00                       | 20.00                 |

### Demand Set Summary

| Scenario name       | Time Period name | Traffic profile type | Model start time (HH:mm) | Model finish time (HH:mm) | Time segment length (min) | Run automatically |
|---------------------|------------------|----------------------|--------------------------|---------------------------|---------------------------|-------------------|
| 2031 With Extension | AM               | ONE HOUR             | 08:00                    | 09:30                     | 15                        | ✓                 |
| 2031 With Extension | PM               | ONE HOUR             | 16:00                    | 17:30                     | 15                        | ✓                 |

## Single Lane Roundabout - 2031 With Extension, AM

### Data Errors and Warnings

| Severity | Area             | Item   | Description   |
|----------|------------------|--|---|
| Last Run | Last Run         | 1 - East End - 2 - Sheridan Park Dr - E - Capacity | Pedestrian Crossing causes blocking on previous leg due to traffic queuing to leave the intersection in 6 timesegment(s). |
| Last Run | Last Run         | 2 - West End - 3 - Speakman Dr - S - Capacity      | Pedestrian Crossing causes blocking on previous leg due to traffic queuing to leave the intersection in 6 timesegment(s). |
| Warning  | Queue variations | Analysis Options                                   | Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.                       |

## Results

### Results Summary for whole modelled period

| Intersection | Leg                      | Max V/C Ratio | Max delay (s) | Max Queue (PCE) | Max 95th percentile Queue (PCE) | Max LOS | Average Demand (PCE/hr) | Total Intersection Arrivals (PCE) |
|--------------|--------------------------|---------------|---------------|-----------------|---------------------------------|---------|-------------------------|-----------------------------------|
| 1 - East End | 1 - Homelands Dr - N     | 0.53          | 8.98          | 1.1             | 2.8                             | A       | 378.06                  | 567.09                            |
|              | 2 - Sheridan Park Dr - E | 0.56          | 7.77          | 1.3             | 1.5                             | A       | 509.28                  | 763.92                            |
|              | 3 - Speakman Dr - S      | 0.33          | 6.81          | 0.5             | 2.1                             | A       | 218.39                  | 327.59                            |
|              | 4 - Sheridan Park Dr - W | 0.07          | 6.18          | 0.1             | 0.5                             | A       | 39.46                   | 59.19                             |
| 2 - West End | 2 - Sheridan Park Dr - E | 0.13          | 3.93          | 0.1             | 0.5                             | A       | 111.95                  | 167.92                            |
|              | 3 - Speakman Dr - S      | 0.16          | 3.82          | 0.2             | 0.5                             | A       | 155.99                  | 233.99                            |
|              | 4 - Sheridan Park Dr - W | 0.73          | 9.86          | 2.7             | 7.8                             | A       | 837.78                  | 1256.68                           |

## Single Lane Roundabout - 2031 With Extension, PM

### Data Errors and Warnings

| Severity | Area             | Item   | Description   |
|----------|------------------|--|---|
| Last Run | Last Run         | 1 - East End - 2 - Sheridan Park Dr - E - Capacity | Pedestrian Crossing causes blocking on previous leg due to traffic queuing to leave the intersection in 6 timesegment(s). |
| Warning  | Queue variations | Analysis Options                                   | Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.                       |

## Results

### Results Summary for whole modelled period

| Intersection | Leg                      | Max V/C Ratio | Max delay (s) | Max Queue (PCE) | Max 95th percentile Queue (PCE) | Max LOS | Average Demand (PCE/hr) | Total Intersection Arrivals (PCE) |
|--------------|--------------------------|---------------|---------------|-----------------|---------------------------------|---------|-------------------------|-----------------------------------|
| 1 - East End | 1 - Homelands Dr - N     | 0.26          | 4.84          | 0.4             | 1.0                             | A       | 224.82                  | 337.22                            |
|              | 2 - Sheridan Park Dr - E | 0.37          | 5.92          | 0.6             | 2.7                             | A       | 300.98                  | 451.47                            |
|              | 3 - Speakman Dr - S      | 0.55          | 10.50         | 1.2             | 3.4                             | B       | 361.54                  | 542.31                            |
|              | 4 - Sheridan Park Dr - W | 0.10          | 4.21          | 0.1             | 0.5                             | A       | 78.00                   | 117.00                            |
| 2 - West End | 2 - Sheridan Park Dr - E | 0.17          | 5.61          | 0.2             | 0.5                             | A       | 111.95                  | 167.92                            |
|              | 3 - Speakman Dr - S      | 0.59          | 7.80          | 1.5             | 1.8                             | A       | 565.25                  | 847.88                            |
|              | 4 - Sheridan Park Dr - W | 0.07          | 1.74          | 0.1             | 0.5                             | A       | 135.81                  | 203.71                            |



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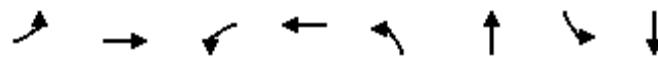
## Appendix J

### 2031 95<sup>th</sup> Percentile Queues

## Queues

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group             | EBL  | EBT  | WBL   | WBT    | NBL    | NBT   | SBL  | SBT   |
|------------------------|------|------|-------|--------|--------|-------|------|-------|
| Lane Group Flow (vph)  | 49   | 169  | 150   | 212    | 260    | 1553  | 62   | 1978  |
| v/c Ratio              | 0.40 | 0.51 | 0.90  | 0.69   | 0.88   | 0.43  | 0.40 | 0.68  |
| Control Delay          | 59.7 | 35.0 | 104.1 | 60.6   | 78.4   | 5.4   | 27.1 | 22.0  |
| Queue Delay            | 0.0  | 0.0  | 0.0   | 0.0    | 0.0    | 0.0   | 0.0  | 0.0   |
| Total Delay            | 59.7 | 35.0 | 104.1 | 60.6   | 78.4   | 5.4   | 27.1 | 22.0  |
| Queue Length 50th (m)  | 11.9 | 24.1 | 40.2  | 49.6   | 61.7   | 20.3  | 9.5  | 141.0 |
| Queue Length 95th (m)  | 24.8 | 46.6 | #75.3 | 76.2   | m#97.1 | 44.2  | 23.9 | 157.8 |
| Internal Link Dist (m) |      | 99.2 |       | 1187.3 |        | 464.2 |      | 152.1 |
| Turn Bay Length (m)    |      |      | 15.0  |        | 126.0  |       | 75.0 |       |
| Base Capacity (vph)    | 143  | 370  | 191   | 353    | 305    | 3640  | 156  | 2925  |
| 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      | 0.34 | 0.46 | 0.79  | 0.60   | 0.85   | 0.43  | 0.40 | 0.68  |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

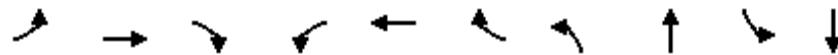
Queue shown is maximum after two cycles.

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

## Queues

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group             | EBL  | EBT   | EBR  | WBL  | WBT   | WBR  | NBL   | NBT           | SBL   | SBT   |
|------------------------|------|-------|------|------|-------|------|-------|---------------|-------|-------|
| Lane Group Flow (vph)  | 25   | 304   | 168  | 35   | 83    | 59   | 237   | 1940          | 323   | 1712  |
| v/c Ratio              | 0.10 | 0.81  | 0.45 | 0.42 | 0.22  | 0.17 | 0.75  | 0.76          | 0.87  | 0.62  |
| Control Delay          | 44.3 | 70.6  | 25.0 | 62.7 | 46.9  | 10.9 | 43.5  | 30.7          | 61.7  | 23.5  |
| Queue Delay            | 0.0  | 0.0   | 0.0  | 0.0  | 0.0   | 0.0  | 0.0   | 0.0           | 0.0   | 0.0   |
| Total Delay            | 44.3 | 70.6  | 25.0 | 62.7 | 46.9  | 10.9 | 43.5  | 30.7          | 61.7  | 23.5  |
| Queue Length 50th (m)  | 5.7  | 80.7  | 17.6 | 8.5  | 19.4  | 0.0  | 39.2  | 155.7         | 80.3  | 87.4  |
| Queue Length 95th (m)  | 13.3 | 108.3 | 37.8 | 19.5 | 32.6  | 11.4 | 66.2  | 195.1 m#114.5 | 108.8 |       |
| Internal Link Dist (m) |      | 197.7 |      |      | 123.8 |      |       | 371.2         |       | 464.2 |
| Turn Bay Length (m)    | 32.0 |       | 30.0 | 50.0 |       | 60.0 | 170.0 |               | 78.0  |       |
| Base Capacity (vph)    | 311  | 461   | 435  | 104  | 466   | 426  | 409   | 2562          | 418   | 2763  |
| 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      | 0.08 | 0.66  | 0.39 | 0.34 | 0.18  | 0.14 | 0.58  | 0.76          | 0.77  | 0.62  |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

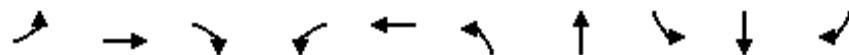
Queue shown is maximum after two cycles.

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

## Queues

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



| Lane Group             | EBL  | EBT  | EBR   | WBL  | WBT  | NBL   | NBT   | SBL   | SBT  | SBR   |
|------------------------|------|------|-------|------|------|-------|-------|-------|------|-------|
| Lane Group Flow (vph)  | 165  | 120  | 166   | 153  | 139  | 98    | 2178  | 162   | 1590 | 245   |
| v/c Ratio              | 0.82 | 0.36 | 0.53  | 0.72 | 0.46 | 0.62  | 0.71  | 0.78  | 0.45 | 0.20  |
| Control Delay          | 84.4 | 51.7 | 39.1  | 71.7 | 44.4 | 42.4  | 22.5  | 57.0  | 9.2  | 1.7   |
| Queue Delay            | 0.0  | 0.0  | 0.0   | 0.0  | 0.0  | 0.0   | 0.0   | 0.0   | 0.0  | 0.0   |
| Total Delay            | 84.4 | 51.7 | 39.1  | 71.7 | 44.4 | 42.4  | 22.5  | 57.0  | 9.2  | 1.7   |
| Queue Length 50th (m)  | 44.7 | 29.7 | 28.1  | 40.5 | 28.0 | 16.1  | 144.1 | 28.0  | 59.0 | 1.0   |
| Queue Length 95th (m)  | 65.1 | 44.0 | 46.7  | 59.2 | 44.4 | #56.5 | 212.2 | 53.4  | 89.7 | 10.7  |
| Internal Link Dist (m) |      |      | 167.9 |      |      | 140.2 |       | 718.6 |      | 284.6 |
| Turn Bay Length (m)    | 31.0 |      | 35.0  | 45.0 |      | 120.0 |       | 112.0 |      | 50.0  |
| Base Capacity (vph)    | 289  | 474  | 426   | 306  | 423  | 158   | 3049  | 263   | 3569 | 1203  |
| 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      | 0.57 | 0.25 | 0.39  | 0.50 | 0.33 | 0.62  | 0.71  | 0.62  | 0.45 | 0.20  |

## Intersection Summary

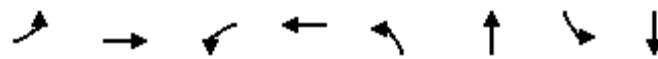
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

## Queues

5: Fifth Line &amp; Sheridan Park Dr

01/12/2018



| Lane Group             | EBL   | EBT  | WBL   | WBT  | NBL   | NBT  | SBL   | SBT  |
|------------------------|-------|------|-------|------|-------|------|-------|------|
| Lane Group Flow (vph)  | 34    | 485  | 9     | 479  | 59    | 111  | 157   | 223  |
| v/c Ratio              | 0.10  | 0.60 | 0.03  | 0.60 | 0.19  | 0.21 | 0.41  | 0.41 |
| Control Delay          | 7.1   | 11.4 | 6.6   | 11.4 | 13.1  | 10.4 | 15.7  | 10.9 |
| Queue Delay            | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 7.1   | 11.4 | 6.6   | 11.4 | 13.1  | 10.4 | 15.7  | 10.9 |
| Queue Length 50th (m)  | 1.0   | 18.0 | 0.3   | 17.6 | 2.5   | 3.7  | 7.2   | 6.7  |
| Queue Length 95th (m)  | 4.8   | 45.3 | 2.0   | 44.5 | 10.2  | 13.8 | 22.7  | 22.7 |
| Internal Link Dist (m) | 552.8 |      | 167.9 |      | 418.3 |      | 255.1 |      |
| Turn Bay Length (m)    | 30.0  | 30.0 |       | 43.0 |       | 27.0 |       |      |
| Base Capacity (vph)    | 783   | 1798 | 597   | 1765 | 937   | 1577 | 1163  | 1499 |
| Starvation Cap Reductn | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    |
| Spillback Cap Reductn  | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    |
| Storage Cap Reductn    | 0     | 0    | 0     | 0    | 0     | 0    | 0     | 0    |
| Reduced v/c Ratio      | 0.04  | 0.27 | 0.02  | 0.27 | 0.06  | 0.07 | 0.13  | 0.15 |

Intersection Summary

## Queues

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group             | EBL    | EBT    | WBL    | WBT  | NBL   | NBT  | SBL   | SBT  | SBR  |
|------------------------|--------|--------|--------|------|-------|------|-------|------|------|
| Lane Group Flow (vph)  | 203    | 383    | 73     | 205  | 206   | 1968 | 111   | 1168 | 69   |
| v/c Ratio              | 0.95   | 0.90   | 1.04   | 0.48 | 0.62  | 0.66 | 0.60  | 0.39 | 0.07 |
| Control Delay          | 103.7  | 69.9   | 172.0  | 47.4 | 21.1  | 9.8  | 30.8  | 15.0 | 2.7  |
| Queue Delay            | 0.0    | 0.0    | 0.0    | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0  |
| Total Delay            | 103.7  | 69.9   | 172.0  | 47.4 | 21.1  | 9.8  | 30.8  | 15.0 | 2.7  |
| Queue Length 50th (m)  | 55.8   | 92.0   | ~21.7  | 45.6 | 11.3  | 49.1 | 9.7   | 58.7 | 0.0  |
| Queue Length 95th (m)  | #105.2 | #148.6 | #54.5  | 70.6 | m33.7 | 58.4 | 29.1  | 68.3 | 6.0  |
| Internal Link Dist (m) | 99.2   |        | 1187.3 |      | 464.2 |      | 152.1 |      |      |
| Turn Bay Length (m)    |        |        | 15.0   |      | 126.0 |      | 75.0  |      | 45.0 |
| Base Capacity (vph)    | 213    | 427    | 70     | 427  | 330   | 2964 | 219   | 3025 | 948  |
| Starvation Cap Reductn | 0      | 0      | 0      | 0    | 0     | 0    | 0     | 0    | 0    |
| Spillback Cap Reductn  | 0      | 0      | 0      | 0    | 0     | 0    | 0     | 0    | 0    |
| Storage Cap Reductn    | 0      | 0      | 0      | 0    | 0     | 0    | 0     | 0    | 0    |
| Reduced v/c Ratio      | 0.95   | 0.90   | 1.04   | 0.48 | 0.62  | 0.66 | 0.51  | 0.39 | 0.07 |

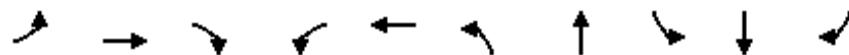
## Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

## Queues

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group             | EBL   | EBT   | EBC    | WBL  | WBT   | NBL    | NBT   | SBL  | SBT   | SBR   |
|------------------------|-------|-------|--------|------|-------|--------|-------|------|-------|-------|
| Lane Group Flow (vph)  | 94    | 60    | 475    | 180  | 459   | 241    | 2034  | 31   | 1472  | 44    |
| v/c Ratio              | 0.72  | 0.13  | 1.07   | 0.41 | 0.78  | 1.71   | 0.72  | 0.23 | 0.54  | 0.05  |
| Control Delay          | 78.9  | 42.4  | 103.0  | 37.7 | 50.5  | 374.9  | 26.6  | 17.6 | 13.7  | 0.2   |
| Queue Delay            | 0.0   | 0.0   | 0.0    | 0.0  | 0.0   | 0.0    | 0.0   | 0.0  | 0.0   | 0.0   |
| Total Delay            | 78.9  | 42.4  | 103.0  | 37.7 | 50.5  | 374.9  | 26.6  | 17.6 | 13.7  | 0.2   |
| Queue Length 50th (m)  | 24.0  | 13.1  | ~126.9 | 36.5 | 108.2 | ~99.7  | 158.8 | 2.5  | 62.5  | 0.0   |
| Queue Length 95th (m)  | #53.0 | 25.4  | #194.5 | 56.1 | 150.6 | #117.9 | 180.4 | m5.6 | m67.3 | m0.0  |
| Internal Link Dist (m) |       | 197.7 |        |      | 123.8 |        | 371.2 |      | 464.2 |       |
| Turn Bay Length (m)    | 32.0  |       | 30.0   | 30.0 |       | 170.0  |       | 78.0 |       | 130.0 |
| Base Capacity (vph)    | 131   | 466   | 445    | 440  | 590   | 141    | 2814  | 181  | 2718  | 953   |
| Starvation Cap Reductn | 0     | 0     | 0      | 0    | 0     | 0      | 0     | 0    | 0     | 0     |
| Spillback Cap Reductn  | 0     | 0     | 0      | 0    | 0     | 0      | 0     | 0    | 0     | 0     |
| Storage Cap Reductn    | 0     | 0     | 0      | 0    | 0     | 0      | 0     | 0    | 0     | 0     |
| Reduced v/c Ratio      | 0.72  | 0.13  | 1.07   | 0.41 | 0.78  | 1.71   | 0.72  | 0.17 | 0.54  | 0.05  |

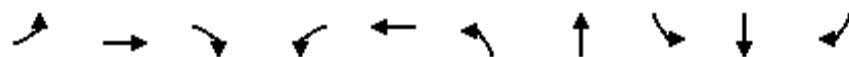
## Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

## Queues

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



| Lane Group             | EBL   | EBT   | EBR  | WBL  | WBT   | NBL   | NBT    | SBL   | SBT   | SBR  |
|------------------------|-------|-------|------|------|-------|-------|--------|-------|-------|------|
| Lane Group Flow (vph)  | 183   | 104   | 114  | 74   | 227   | 195   | 2569   | 100   | 1591  | 96   |
| v/c Ratio              | 0.97  | 0.25  | 0.27 | 0.26 | 0.54  | 0.72  | 0.86   | 0.61  | 0.56  | 0.11 |
| Control Delay          | 110.3 | 43.8  | 7.9  | 44.3 | 40.1  | 33.0  | 29.5   | 41.0  | 22.7  | 8.1  |
| Queue Delay            | 0.0   | 0.0   | 0.0  | 0.0  | 0.0   | 0.0   | 0.0    | 0.0   | 0.0   | 0.0  |
| Total Delay            | 110.3 | 43.8  | 7.9  | 44.3 | 40.1  | 33.0  | 29.5   | 41.0  | 22.7  | 8.1  |
| Queue Length 50th (m)  | 50.3  | 23.7  | 0.0  | 16.9 | 42.8  | 19.5  | 210.6  | 11.5  | 104.1 | 4.3  |
| Queue Length 95th (m)  | #81.6 | 36.7  | 14.2 | 28.6 | 63.6  | #55.9 | #300.8 | 31.9  | 136.0 | 14.8 |
| Internal Link Dist (m) |       | 167.9 |      |      | 140.2 |       | 718.6  |       | 284.6 |      |
| Turn Bay Length (m)    | 31.0  |       | 35.0 | 45.0 |       | 120.0 |        | 112.0 |       | 50.0 |
| Base Capacity (vph)    | 247   | 551   | 522  | 378  | 530   | 289   | 2978   | 197   | 2825  | 897  |
| 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      | 0.74  | 0.19  | 0.22 | 0.20 | 0.43  | 0.67  | 0.86   | 0.51  | 0.56  | 0.11 |

## Intersection Summary

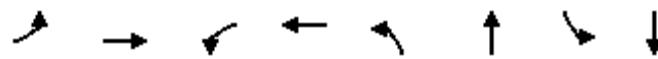
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

## Queues

5: Fifth Line &amp; Sheridan Park Dr

01/12/2018



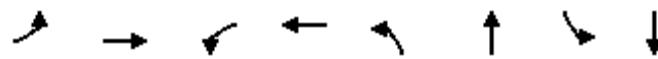
| Lane Group             | EBL   | EBT  | WBL   | WBT  | NBL   | NBT  | SBL   | SBT  |
|------------------------|-------|------|-------|------|-------|------|-------|------|
| Lane Group Flow (vph)  | 69    | 469  | 19    | 360  | 64    | 121  | 71    | 100  |
| v/c Ratio              | 0.15  | 0.57 | 0.05  | 0.44 | 0.19  | 0.25 | 0.22  | 0.21 |
| Control Delay          | 5.9   | 9.2  | 5.2   | 6.8  | 12.2  | 11.4 | 12.6  | 9.3  |
| Queue Delay            | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 5.9   | 9.2  | 5.2   | 6.8  | 12.2  | 11.4 | 12.6  | 9.3  |
| Queue Length 50th (m)  | 1.7   | 13.6 | 0.4   | 8.4  | 2.4   | 4.2  | 2.7   | 2.5  |
| Queue Length 95th (m)  | 6.1   | 33.2 | 2.4   | 22.0 | 9.8   | 14.8 | 10.7  | 11.3 |
| Internal Link Dist (m) | 552.8 |      | 167.9 |      | 418.3 |      | 255.1 |      |
| Turn Bay Length (m)    | 30.0  | 30.0 |       | 43.0 |       | 27.0 |       |      |
| Base Capacity (vph)    | 1044  | 1844 | 847   | 1786 | 1213  | 1716 | 1173  | 1650 |
| 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      | 0.07  | 0.25 | 0.02  | 0.20 | 0.05  | 0.07 | 0.06  | 0.06 |

Intersection Summary

## Queues

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group             | EBL  | EBT  | WBL   | WBT          | NBL   | NBT   | SBL   | SBT   |
|------------------------|------|------|-------|--------------|-------|-------|-------|-------|
| Lane Group Flow (vph)  | 49   | 171  | 150   | 178          | 260   | 1583  | 46    | 1993  |
| v/c Ratio              | 0.32 | 0.51 | 0.90  | 0.57         | 0.84  | 0.43  | 0.31  | 0.70  |
| Control Delay          | 53.7 | 33.2 | 103.0 | 50.8         | 73.9  | 3.4   | 23.0  | 22.9  |
| Queue Delay            | 0.0  | 0.0  | 0.0   | 0.0          | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay            | 53.7 | 33.2 | 103.0 | 50.8         | 73.9  | 3.4   | 23.0  | 22.9  |
| Queue Length 50th (m)  | 11.9 | 23.9 | 40.8  | 38.4         | 61.8  | 12.7  | 6.4   | 137.7 |
| Queue Length 95th (m)  | 23.3 | 44.6 | #67.8 | 59.2 m#110.5 | 27.8  | 16.6  | 154.0 |       |
| Internal Link Dist (m) |      | 99.2 |       | 1187.3       |       | 464.2 |       | 152.1 |
| Turn Bay Length (m)    |      |      | 15.0  |              | 126.0 |       | 75.0  |       |
| Base Capacity (vph)    | 199  | 415  | 217   | 397          | 311   | 3646  | 147   | 2853  |
| Starvation Cap Reductn | 0    | 0    | 0     | 0            | 0     | 0     | 0     | 0     |
| Spillback Cap Reductn  | 0    | 0    | 0     | 0            | 0     | 0     | 0     | 0     |
| Storage Cap Reductn    | 0    | 0    | 0     | 0            | 0     | 0     | 0     | 0     |
| Reduced v/c Ratio      | 0.25 | 0.41 | 0.69  | 0.45         | 0.84  | 0.43  | 0.31  | 0.70  |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

## Queues

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

12/04/2017



| Lane Group             | EBL  | EBT   | EBR  | WBL   | WBT   | WBR  | NBL   | NBT    | SBL    | SBT   |
|------------------------|------|-------|------|-------|-------|------|-------|--------|--------|-------|
| Lane Group Flow (vph)  | 25   | 307   | 168  | 92    | 96    | 116  | 237   | 1953   | 339    | 1712  |
| v/c Ratio              | 0.10 | 0.78  | 0.43 | 0.82  | 0.30  | 0.32 | 0.77  | 0.81   | 0.82   | 0.63  |
| Control Delay          | 39.9 | 65.5  | 21.6 | 104.0 | 53.1  | 10.4 | 47.8  | 35.1   | 53.3   | 29.5  |
| Queue Delay            | 0.0  | 0.0   | 0.0  | 0.0   | 0.0   | 0.0  | 0.0   | 0.0    | 0.0    | 0.0   |
| Total Delay            | 39.9 | 65.5  | 21.6 | 104.0 | 53.1  | 10.4 | 47.8  | 35.1   | 53.3   | 29.5  |
| Queue Length 50th (m)  | 5.5  | 81.2  | 15.5 | 25.8  | 24.5  | 0.0  | 41.1  | 167.0  | 81.8   | 104.8 |
| Queue Length 95th (m)  | 12.1 | 104.1 | 33.7 | #48.3 | 38.5  | 15.9 | 70.3  | #225.6 | #123.5 | 125.1 |
| Internal Link Dist (m) |      | 197.7 |      |       | 124.6 |      |       | 371.2  |        | 464.2 |
| Turn Bay Length (m)    | 32.0 |       | 30.0 | 50.0  |       | 60.0 | 170.0 |        |        | 78.0  |
| Base Capacity (vph)    | 263  | 592   | 538  | 163   | 466   | 470  | 347   | 2413   | 418    | 2710  |
| Starvation Cap Reductn | 0    | 0     | 0    | 0     | 0     | 0    | 0     | 0      | 0      | 0     |
| Spillback Cap Reductn  | 0    | 0     | 0    | 0     | 0     | 0    | 0     | 0      | 0      | 0     |
| Storage Cap Reductn    | 0    | 0     | 0    | 0     | 0     | 0    | 0     | 0      | 0      | 0     |
| Reduced v/c Ratio      | 0.10 | 0.52  | 0.31 | 0.56  | 0.21  | 0.25 | 0.68  | 0.81   | 0.81   | 0.63  |

## Intersection Summary

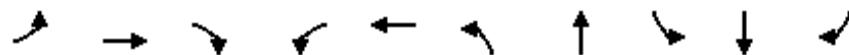
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

## Queues

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

12/04/2017



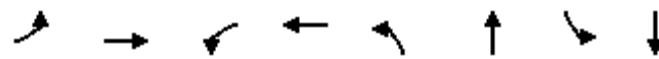
| Lane Group             | EBL  | EBT  | EBR   | WBL  | WBT   | NBL   | NBT   | SBL   | SBT   | SBR  |
|------------------------|------|------|-------|------|-------|-------|-------|-------|-------|------|
| Lane Group Flow (vph)  | 178  | 121  | 178   | 153  | 144   | 149   | 2178  | 162   | 1590  | 291  |
| v/c Ratio              | 0.82 | 0.54 | 0.53  | 0.65 | 0.71  | 0.58  | 0.75  | 0.71  | 0.55  | 0.29 |
| Control Delay          | 77.9 | 65.8 | 12.9  | 62.1 | 67.6  | 19.5  | 25.6  | 48.2  | 20.2  | 7.6  |
| Queue Delay            | 0.0  | 0.0  | 0.0   | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0  |
| Total Delay            | 77.9 | 65.8 | 12.9  | 62.1 | 67.6  | 19.5  | 25.6  | 48.2  | 20.2  | 7.6  |
| Queue Length 50th (m)  | 43.3 | 32.0 | 0.0   | 36.6 | 32.5  | 11.5  | 157.9 | 27.1  | 93.8  | 13.8 |
| Queue Length 95th (m)  | 62.1 | 49.8 | 20.3  | 54.0 | 53.0  | 30.1  | 218.5 | 51.4  | 136.3 | 37.2 |
| Internal Link Dist (m) |      |      | 167.9 |      | 140.2 |       | 718.6 |       | 284.6 |      |
| Turn Bay Length (m)    | 31.0 |      | 35.0  | 45.0 |       | 120.0 |       | 112.0 |       | 50.0 |
| Base Capacity (vph)    | 218  | 419  | 478   | 235  | 366   | 323   | 2896  | 248   | 2887  | 993  |
| 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      | 0.82 | 0.29 | 0.37  | 0.65 | 0.39  | 0.46  | 0.75  | 0.65  | 0.55  | 0.29 |

Intersection Summary

## Queues

5: Fifth Line &amp; Sheridan Park Dr

01/18/2018



| Lane Group             | EBL   | EBT  | WBL   | WBT  | NBL   | NBT  | SBL   | SBT  |
|------------------------|-------|------|-------|------|-------|------|-------|------|
| Lane Group Flow (vph)  | 35    | 514  | 9     | 595  | 62    | 111  | 157   | 232  |
| v/c Ratio              | 0.12  | 0.57 | 0.03  | 0.67 | 0.22  | 0.22 | 0.44  | 0.46 |
| Control Delay          | 7.1   | 10.4 | 6.2   | 12.3 | 16.5  | 12.9 | 19.4  | 13.7 |
| Queue Delay            | 0.0   | 0.0  | 0.0   | 0.1  | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 7.1   | 10.4 | 6.2   | 12.4 | 16.5  | 12.9 | 19.4  | 13.7 |
| Queue Length 50th (m)  | 1.1   | 20.5 | 0.3   | 25.2 | 3.2   | 4.5  | 8.6   | 8.5  |
| Queue Length 95th (m)  | 5.1   | 50.8 | 2.0   | 62.4 | 13.0  | 16.8 | 27.7  | 29.1 |
| Internal Link Dist (m) | 552.8 |      | 167.9 |      | 418.3 |      | 255.1 |      |
| Turn Bay Length (m)    | 30.0  | 30.0 |       | 43.0 |       | 27.0 |       |      |
| Base Capacity (vph)    | 607   | 1778 | 570   | 1759 | 785   | 1336 | 982   | 1274 |
| Starvation Cap Reductn | 0     | 0    | 0     | 293  | 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      | 0.06  | 0.29 | 0.02  | 0.41 | 0.08  | 0.08 | 0.16  | 0.18 |

Intersection Summary

## Queues

1: Winston Churchill Blvd &amp; Dover Gate/Homelands Dr

12/04/2017



| Lane Group             | EBL   | EBT    | WBL   | WBT    | NBL   | NBT   | SBL  | SBT   | SBR  |
|------------------------|-------|--------|-------|--------|-------|-------|------|-------|------|
| Lane Group Flow (vph)  | 203   | 385    | 73    | 169    | 206   | 1977  | 82   | 1182  | 69   |
| v/c Ratio              | 0.83  | 0.90   | 1.07  | 0.40   | 0.63  | 0.66  | 0.48 | 0.39  | 0.07 |
| Control Delay          | 79.0  | 70.6   | 181.6 | 42.8   | 19.3  | 5.1   | 19.9 | 15.1  | 2.7  |
| Queue Delay            | 0.0   | 0.0    | 0.0   | 0.0    | 0.0   | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 79.0  | 70.6   | 181.6 | 42.8   | 19.3  | 5.1   | 19.9 | 15.1  | 2.7  |
| Queue Length 50th (m)  | 53.9  | 92.8   | ~22.3 | 34.7   | 7.9   | 31.5  | 6.5  | 59.7  | 0.0  |
| Queue Length 95th (m)  | #96.4 | #150.5 | #55.0 | 56.5   | m19.6 | 34.5  | 17.7 | 69.2  | 6.0  |
| Internal Link Dist (m) |       | 99.2   |       | 1187.3 |       | 464.2 |      | 152.1 |      |
| Turn Bay Length (m)    |       |        | 15.0  |        | 126.0 |       | 75.0 |       | 45.0 |
| Base Capacity (vph)    | 244   | 427    | 68    | 427    | 326   | 3013  | 220  | 3025  | 948  |
| Starvation Cap Reductn | 0     | 0      | 0     | 0      | 0     | 0     | 0    | 0     | 0    |
| Spillback Cap Reductn  | 0     | 0      | 0     | 0      | 0     | 0     | 0    | 0     | 0    |
| Storage Cap Reductn    | 0     | 0      | 0     | 0      | 0     | 0     | 0    | 0     | 0    |
| Reduced v/c Ratio      | 0.83  | 0.90   | 1.07  | 0.40   | 0.63  | 0.66  | 0.37 | 0.39  | 0.07 |

## Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

## Queues

3: Winston Churchill Blvd &amp; Plymouth Dr/Sheridan Park Dr

01/18/2018



| Lane Group             | EBL  | EBT   | EBC    | WBL  | WBT   | WBR  | NBL    | NBT   | SBL   | SBT   | SBR   |
|------------------------|------|-------|--------|------|-------|------|--------|-------|-------|-------|-------|
| Lane Group Flow (vph)  | 94   | 64    | 475    | 236  | 271   | 257  | 241    | 2047  | 47    | 1472  | 44    |
| v/c Ratio              | 0.43 | 0.17  | 0.92   | 0.47 | 0.41  | 0.42 | 0.85   | 0.78  | 0.34  | 0.78  | 0.06  |
| Control Delay          | 53.5 | 45.0  | 49.1   | 34.9 | 36.0  | 19.9 | 61.4   | 32.5  | 29.4  | 30.6  | 0.3   |
| Queue Delay            | 0.0  | 0.0   | 0.0    | 0.0  | 0.0   | 0.0  | 0.0    | 0.0   | 0.0   | 0.0   | 0.0   |
| Total Delay            | 53.5 | 45.0  | 49.1   | 34.9 | 36.0  | 19.9 | 61.4   | 32.5  | 29.4  | 30.6  | 0.3   |
| Queue Length 50th (m)  | 22.6 | 14.5  | 64.5   | 46.1 | 55.3  | 28.6 | 48.0   | 178.1 | 4.3   | 142.8 | 0.0   |
| Queue Length 95th (m)  | 38.7 | 26.4  | #115.9 | 64.2 | 75.2  | 49.2 | #103.4 | 209.8 | m15.8 | 90.4  | m0.0  |
| Internal Link Dist (m) |      | 197.7 |        |      | 123.8 |      |        | 371.2 |       | 464.2 |       |
| Turn Bay Length (m)    | 32.0 |       | 30.0   | 60.0 |       | 60.0 | 170.0  |       | 78.0  |       | 130.0 |
| Base Capacity (vph)    | 275  | 473   | 581    | 501  | 761   | 698  | 282    | 2638  | 142   | 1885  | 716   |
| Starvation Cap Reductn | 0    | 0     | 0      | 0    | 0     | 0    | 0      | 0     | 0     | 0     | 0     |
| Spillback Cap Reductn  | 0    | 0     | 0      | 0    | 0     | 0    | 0      | 0     | 0     | 0     | 0     |
| Storage Cap Reductn    | 0    | 0     | 0      | 0    | 0     | 0    | 0      | 0     | 0     | 0     | 0     |
| Reduced v/c Ratio      | 0.34 | 0.14  | 0.82   | 0.47 | 0.36  | 0.37 | 0.85   | 0.78  | 0.33  | 0.78  | 0.06  |

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

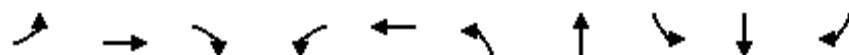
Queue shown is maximum after two cycles.

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

## Queues

6: Erin Mills Pkwy &amp; Sheridan Park Dr/Lincoln Green Way

01/18/2018



| Lane Group             | EBL   | EBT   | EBR  | WBL  | WBT   | NBL   | NBT    | SBL   | SBT   | SBR  |
|------------------------|-------|-------|------|------|-------|-------|--------|-------|-------|------|
| Lane Group Flow (vph)  | 196   | 105   | 125  | 74   | 232   | 247   | 2569   | 100   | 1591  | 143  |
| v/c Ratio              | 0.90  | 0.22  | 0.26 | 0.38 | 0.79  | 0.78  | 0.90   | 0.62  | 0.64  | 0.17 |
| Control Delay          | 83.1  | 41.2  | 7.3  | 57.3 | 64.4  | 45.0  | 33.5   | 43.6  | 30.2  | 6.2  |
| Queue Delay            | 0.0   | 0.0   | 0.0  | 0.0  | 0.0   | 0.0   | 0.0    | 0.0   | 0.0   | 0.0  |
| Total Delay            | 83.1  | 41.2  | 7.3  | 57.3 | 64.4  | 45.0  | 33.5   | 43.6  | 30.2  | 6.2  |
| Queue Length 50th (m)  | 44.7  | 23.2  | 0.0  | 18.7 | 51.0  | 41.3  | 225.6  | 11.1  | 121.1 | 2.6  |
| Queue Length 95th (m)  | #73.7 | 36.0  | 14.3 | 32.2 | 75.2  | 74.2  | #296.9 | #39.2 | 157.0 | 16.4 |
| Internal Link Dist (m) |       | 167.9 |      |      | 140.2 |       | 718.6  |       | 284.6 |      |
| Turn Bay Length (m)    | 31.0  |       | 35.0 | 45.0 |       | 120.0 |        | 112.0 |       | 50.0 |
| Base Capacity (vph)    | 218   | 605   | 570  | 285  | 409   | 347   | 2847   | 161   | 2468  | 824  |
| 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      | 0.90  | 0.17  | 0.22 | 0.26 | 0.57  | 0.71  | 0.90   | 0.62  | 0.64  | 0.17 |

## Intersection Summary

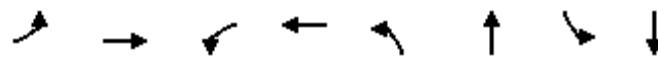
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

## Queues

5: Fifth Line &amp; Sheridan Park Dr

01/18/2018



| Lane Group             | EBL   | EBT  | WBL   | WBT  | NBL   | NBT  | SBL   | SBT  |
|------------------------|-------|------|-------|------|-------|------|-------|------|
| Lane Group Flow (vph)  | 70    | 497  | 19    | 470  | 66    | 121  | 71    | 109  |
| v/c Ratio              | 0.18  | 0.58 | 0.05  | 0.55 | 0.21  | 0.26 | 0.23  | 0.24 |
| Control Delay          | 6.2   | 9.2  | 5.1   | 8.5  | 13.1  | 12.2 | 13.4  | 9.7  |
| Queue Delay            | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  | 0.0   | 0.0  |
| Total Delay            | 6.2   | 9.2  | 5.1   | 8.5  | 13.1  | 12.2 | 13.4  | 9.7  |
| Queue Length 50th (m)  | 1.7   | 14.7 | 0.4   | 12.8 | 2.5   | 4.3  | 2.8   | 2.7  |
| Queue Length 95th (m)  | 6.5   | 35.7 | 2.5   | 32.0 | 10.7  | 15.7 | 11.4  | 12.5 |
| Internal Link Dist (m) | 552.8 |      | 167.9 |      | 418.3 |      | 255.1 |      |
| Turn Bay Length (m)    | 30.0  | 30.0 |       | 43.0 |       | 27.0 |       |      |
| Base Capacity (vph)    | 852   | 1844 | 798   | 1804 | 1154  | 1644 | 1124  | 1567 |
| 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      | 0.08  | 0.27 | 0.02  | 0.26 | 0.06  | 0.07 | 0.06  | 0.07 |

Intersection Summary

| Junctions 9   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ARCADY 9 - Roundabout Module  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Version: 9.0.0.4211  <br>© Copyright TRL Limited, 2017  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| <b>The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution</b>     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Filename: 039474\_Roundabout\_Analysis 90 BG.j9  
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady  
Report generation date: 7/25/2017 9:10:16 AM

## Summary of intersection performance

|   | AM          |                 |           |           |     |                        |                  |                                      | PM          |                 |           |           |     |                        |                  |                                     |
|---|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|--------------------------------------|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|-------------------------------------|
|   | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity            | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity           |
| <b>Single Lane Roundabout - 2031 Background</b> |             |                 |           |           |     |                        |                  |                                      |             |                 |           |           |     |                        |                  |                                     |
| <b>1 - Homelands Dr - N</b>                     | 1.0         | 2.3             | 7.75      | 0.51      | A   | 7.27                   | A                | 54 %<br>[1 -<br>Homelands<br>Dr - N] | 0.3         | 1.4             | 4.29      | 0.24      | A   | 7.59                   | A                | 27 %<br>[3 -<br>Speakman<br>Dr - S] |
| <b>2 - Sheridan Park Dr - E</b>                 | 1.1         | 1.9             | 7.17      | 0.51      | A   |                        |                  |                                      | 0.5         | 2.2             | 6.01      | 0.33      | A   |                        |                  |                                     |
| <b>3 - Speakman Dr - S</b>                      | 0.5         | 2.3             | 6.65      | 0.33      | A   |                        |                  |                                      | 1.4         | 3.4             | 11.00     | 0.59      | B   |                        |                  |                                     |
| <b>4 - Sheridan Park Dr - W</b>                 | 0.0         | 0.5             | 6.20      | 0.02      | A   |                        |                  |                                      | 0.1         | 0.5             | 4.12      | 0.07      | A   |                        |                  |                                     |

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

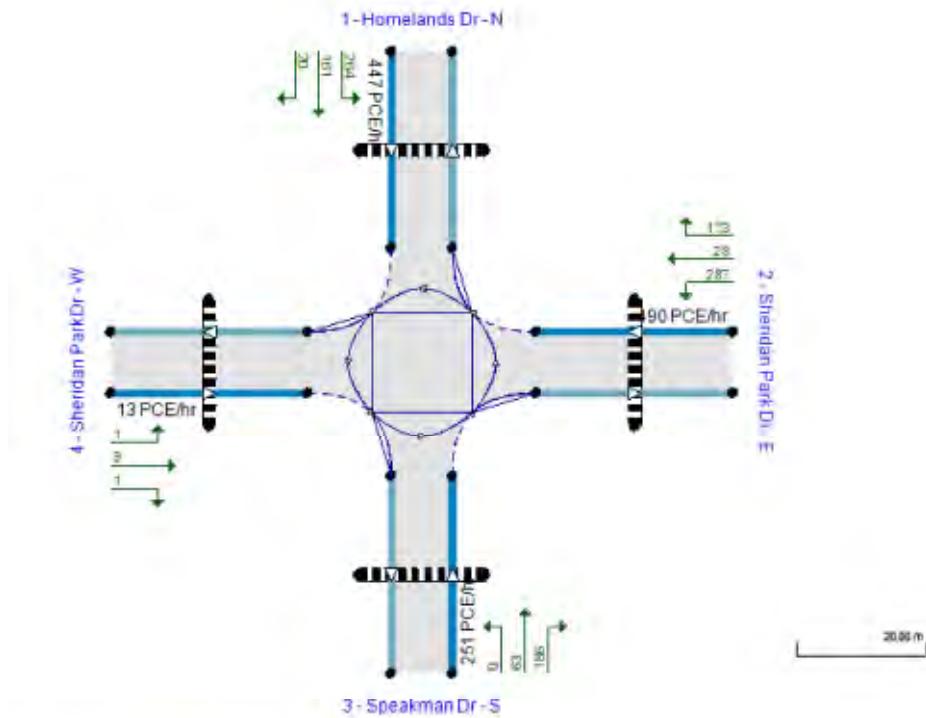
## File summary

### File Description

|             |   |
|-------------|---|
| Title       | Sheridan Park Drive 90 percent Capacity |
| Location    | Mississauga                             |
| Site number |   |
| Date        | 7/25/2017                               |
| Version     |   |
| Status      | (new file)                              |
| Identifier  |   |
| Client      |   |
| Jobnumber   |   |
| Analyst     | RJBURNSIDE"jester                       |
| Description |   |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|----------------|-------------|---------------------|-----------------------|------------|---------------------|-------------------|---------------------|
| m              | kph         | PCE                 | PCE                   | perHour    | s                   | -Min              | perMin              |



Showing original traffic demand (PCE/hr).

The intersection diagram reflects the last run of Intersections.

### Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | Residual capacity criteria type | V/C Ratio Threshold | Average Delay threshold (s) | Queue threshold (PCE) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------|---------------------|-----------------------------|-----------------------|
| 5.75               | ✓                           |                                   | ✓                           | Delay                           | 0.85                | 36.00                       | 20.00                 |

### Demand Set Summary

| Scenario name   | Time Period name | Traffic profile type | Model start time (HH:mm) | Model finish time (HH:mm) | Time segment length (min) | Run automatically |
|-----------------|------------------|----------------------|--------------------------|---------------------------|---------------------------|-------------------|
| 2031 Background | AM               | ONE HOUR             | 08:00                    | 09:30                     | 15                        | ✓                 |
| 2031 Background | PM               | ONE HOUR             | 16:00                    | 17:30                     | 15                        | ✓                 |

| Junctions 9   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ARCADY 9 - Roundabout Module  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Version: 9.0.0.4211   © Copyright TRL Limited, 2018   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Filename: 039474\_Roundabout\_Analysis 90 With Ext.j9  
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady  
Report generation date: 1/9/2018 11:50:17 AM

## Summary of intersection performance

|   | AM          |                 |           |           |     |                        |                  | PM  |             |                 |           |           |     |                        |                  |                                      |
|---|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|---|-------------|-----------------|-----------|-----------|-----|------------------------|------------------|--------------------------------------|
|   | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity                 | Queue (PCE) | 95% Queue (PCE) | Delay (s) | V/C Ratio | LOS | Intersection Delay (s) | Intersection LOS | Network Residual Capacity            |
| <b>Single Lane Roundabout - 2031 With Extension</b> |             |                 |           |           |     |                        |                  |   |             |                 |           |           |     |                        |                  |                                      |
| <b>1 - East End - 1 - Homelands Dr - N</b>          | 1.1         | 2.8             | 8.98      | 0.53      | A   | 7.93                   | A                | 13 %                                      | 0.4         | 1.0             | 4.84      | 0.26      | A   | 7.25                   | A                | 29 %                                 |
| <b>1 - East End - 2 - Sheridan Park Dr - E</b>      | 1.3         | 1.5             | 7.77      | 0.56      | A   |                        |                  |   | 0.6         | 2.7             | 5.92      | 0.37      | A   |                        |                  |                                      |
| <b>1 - East End - 3 - Speakman Dr - S</b>           | 0.5         | 2.1             | 6.81      | 0.33      | A   | 8.40                   | A                | [2 - West End - 4 - Sheridan Park Dr - W] | 1.2         | 3.4             | 10.50     | 0.55      | B   | 6.49                   | A                | [1 - East End - 3 - Speakman Dr - S] |
| <b>1 - East End - 4 - Sheridan Park Dr - W</b>      | 0.1         | 0.5             | 6.18      | 0.07      | A   |                        |                  |   | 0.1         | 0.5             | 4.21      | 0.10      | A   |                        |                  |                                      |
| <b>2 - West End - 2 - Sheridan Park Dr - E</b>      | 0.1         | 0.5             | 3.93      | 0.13      | A   |                        |                  |   | 0.2         | 0.5             | 5.61      | 0.17      | A   |                        |                  |                                      |
| <b>2 - West End - 3 - Speakman Dr - S</b>           | 0.2         | 0.5             | 3.82      | 0.16      | A   |                        |                  |   | 1.5         | 1.8             | 7.80      | 0.59      | A   |                        |                  |                                      |
| <b>2 - West End - 4 - Sheridan Park Dr - W</b>      | 2.7         | 7.8             | 9.86      | 0.73      | A   |                        |                  |   | 0.1         | 0.5             | 1.74      | 0.07      | A   |                        |                  |                                      |

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

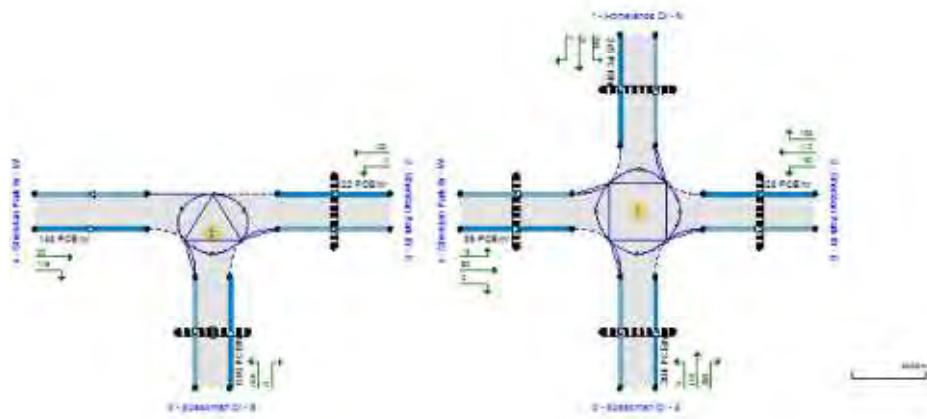
## File summary

### File Description

|             |  |
|-------------|--|
| Title       | Sheridan Park Drive With Extension 90 percent Capacity |
| Location    | Mississauga  |
| Site number |  |
| Date        | 7/25/2017  |
| Version     |  |
| Status      | (new file)   |
| Identifier  |  |
| Client      |  |
| Jobnumber   |  |
| Analyst     | RJBURNSIDE"jester                                      |
| Description |  |

## Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|----------------|-------------|---------------------|-----------------------|------------|---------------------|-------------------|---------------------|
| m              | kph         | PCE                 | PCE                   | perHour    | s                   | -Min              | perMin              |



Showing original traffic demand (PCEh).

The intersection diagram reflects the last run of Intersections.

### Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | Residual capacity criteria type | V/C Ratio Threshold | Average Delay threshold (s) | Queue threshold (PCE) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------------------------|---------------------|-----------------------------|-----------------------|
| 5.75               | ✓                           |                                   | ✓                           | Delay                           | 0.85                | 36.00                       | 20.00                 |

### Demand Set Summary

| Scenario name       | Time Period name | Traffic profile type | Model start time (HH:mm) | Model finish time (HH:mm) | Time segment length (min) | Run automatically |
|---------------------|------------------|----------------------|--------------------------|---------------------------|---------------------------|-------------------|
| 2031 With Extension | AM               | ONE HOUR             | 08:00                    | 09:30                     | 15                        | ✓                 |
| 2031 With Extension | PM               | ONE HOUR             | 16:00                    | 17:30                     | 15                        | ✓                 |