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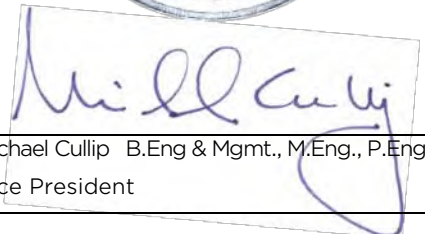
South Fergus MESP & Secondary Plan

TRANSPORTATION PLAN

South Fergus Landowners Group

Document Control

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| Issue | Date | Description |
|-------|------------------|-----------------------------|
| 1 | March 10, 2023 | Issued for TAC Submission |
| 2 | January 19, 2024 | Revised per Review Comments |
| 3 | March 8, 2024 | Revised per Review Comments |

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1 Introduction

Tatham Engineering Limited has been retained by the South Fergus Landowners Group to provide engineering support in the development of a Master Environmental Servicing Study (MESP) and Secondary Plan outlining the objectives, constraints, design criteria, development concept and implementation plan for a proposed mixed-use development in the South Fergus Secondary Plan area within the Township of Centre Wellington.

1.1 SECONDARY PLAN AREA

The South Fergus Secondary Plan Area (Study Area) consists of approximately 147.5 ha of undeveloped land in the south end of Fergus, Township of Centre Wellington, County of Wellington. It is generally bound by Second Line to the south, Guelph Street to the west, McQueen Boulevard to the north and Scotland Street to the east, as evident in Figure 1 and illustrated on the Preferred Land Use Plan in Appendix A.

The Study Area consists of properties both east and west of Tower Street South (Highway 6) as follows:

- 925 and 935 Scotland Street;
- 200 McQueen Boulevard;
- 7856 and 7872 2nd Line;
- 963 and 1000 Tower Street South; and
- 936 Guelph Street.

1.2 STUDY PURPOSE

The purpose of the Transportation Plan is to assess the existing road network, the traffic volumes to result from the Secondary Plan development and the impacts of such on the future road network. Key elements of the Transportation Plan are as follows:

1. Identify and inventory the surrounding external road system and their respective intersections. The inventory addresses jurisdiction, number of lanes, cross-sections, speed limits, intersection configurations, etc.
2. Compile traffic data from the appropriate road jurisdictions for the subject road sections and intersections.
3. Conduct additional traffic counts to address data gaps and ensure traffic data represents current conditions.

4. Complete an assessment of the existing road system traffic operations and establish any system needs based on existing conditions.
5. Establish traffic projections for the future horizon years (to correspond to full build-out and 10 years beyond build-out). In addition to historic growth, consideration has been given to other development in the immediate and surrounding areas that could have a bearing on future traffic volumes.
6. Identify the future road system, considering any planned road improvements or developments that would otherwise occur independent of the Secondary Plan.
7. Complete an assessment of the future road system traffic operations (prior to consideration for the Secondary Plan development) and establish any system needs based on future background conditions. This includes road widenings, provision of turn lanes, traffic signals and/or roundabout control, etc.
8. Establish and review potential road system connection points to the existing system and related receiving system capacities, including consideration for any growth-related upgrades planned or underway.

This report builds on the *South Fergus MESP & Secondary Plan: Transportation Plan – Existing Conditions* report¹, addressing the needs of the road network to accommodate the future conditions associated with the development of the Secondary Plan area.

¹ *South Fergus MESP & Secondary Plan: Transportation Plan – Existing Conditions*. Tatham Engineering. July 26, 2021.

2 Existing Conditions

This chapter will discuss the existing conditions within the project area, namely the current road network, transit services, traffic volumes, and traffic operations.

2.1 ROAD NETWORK

The existing road network to be addressed by this study consists of the following:

- Tower Street South (Highway 6);
- McQueen Boulevard;
- Guelph Street;
- Scotland Street;
- 2nd Line; and
- respective intersections of the above.

Mapping and photographs of the road network are provided in Figure 2 through Figure 4, with further details provided below.

2.1.1 Key Road Sections

Tower Street South (Highway 6)

Key elements/characteristics of Tower Street South (Highway 6), which bisects the Secondary Plan area, are as follows:

- Class 2B Arterial under the jurisdiction of MTO (MTO jurisdiction extends to approximately 120 metres south of McQueen Boulevard, beyond which the road reverts to the Township through the built area of Fergus and is designated as a connecting link to Sideroad 19);
- classified as an arterial road under the *Township of Centre Wellington Transportation Master Plan*²;
- oriented north-south through the project area;
- from 2nd Line to the south limits of the Skyline Retail Plaza (approximately 400 metres south of McQueen Boulevard), it has 1 travel lane per direction within a rural cross-section;

² *Township of Centre Wellington Transportation Master Plan*. WSP. January 2019.

- from the south limits of the Skyline Retail Plaza to McQueen Boulevard, it has 2 northbound lanes, 1 southbound lane and select left turn lanes with an urban cross-section along the east side and rural cross-section on the west side;
- sidewalk on the east side of the road through the urban area (i.e. from the south limits of the Skyline Retail Plaza to McQueen Boulevard);
- posted speed limit of 80 km/h, decreasing to 60 km/h approximately 710 metres south of McQueen Boulevard upon entry into the built area with a further reduction to 50 km/h approximately 210 metres south of McQueen Boulevard;
- relatively straight and flat alignment albeit there is a slight horizontal curve in the area of the signalized commercial access to the Skyline Retail Plaza; and
- planning capacity of 1000 vehicles per hour per lane (vphpl) as per the *Transportation Master Plan* reflective of its highway designation.

McQueen Boulevard

McQueen Boulevard is detailed as follows:

- under the jurisdiction of the Township of Centre Wellington;
- designated a collector road under the *Transportation Master Plan*;
- oriented east-west through the project area;
- urban cross-section;
- from Tower Street South (Highway 6) to its westerly terminus (cul-de-sac approximately 275 metres to the west), it has a 14 metre paved road width which accommodates 2 lanes of travel per direction, albeit the road is currently configured (via pavement markings) to provide only 1 lane of travel per direction;
- from Tower Street South (Highway 6) to Millburn Boulevard (230 metres), it has a similar 14 metre width configured to provide 1 travel lane per direction;
- from McTavish Street to Scotland Street (320 metres), it has a 10.5 metre paved surface providing 1 lane of travel per direction;
- sidewalks are provided on both sides of the road through all of the noted sections;
- a westerly extension to Guelph Street and an extension from Millburn Boulevard to McTavish Street are planned in conjunction with the development of the South Fergus Secondary Plan area,

- unposted speed limit of 50 km/h, reflective of the urban area (i.e. 50 km/h unless otherwise posted);
- relatively flat alignment albeit there are horizontal curves both west and east of Tower Street South; and
- assumed planning capacity of 700 vehicles per hour per lane (vphpl) reflective of its urban collector road designation, as per the *Transportation Master Plan*.

Guelph Street

Guelph Street, which serves as the west development boundary, is characterized as follows:

- local road under the jurisdiction of the Township of Centre Wellington;
- oriented north-south through the project area;
- rural cross-section with a 6.0 to 7.0 metre paved surface and minimal gravel shoulders, providing 1 travel lane per direction;
- paved surface is in relatively poor condition with significant alligator and longitudinal cracking throughout;
- posted speed limit of 50 km/h;
- relatively straight horizontal alignment with a number of relatively minor vertical curves; and
- planning capacity of 500 vehicles per hour per lane (vphpl) as per the *Transportation Master Plan* reflective of its rural local road designation.

Scotland Street

Scotland Street, which serves as the east development boundary, is characterized as follows:

- local road under the jurisdiction of the Township of Centre Wellington;
- oriented north-south through the project area;
- from 2nd Line to the south limit of the Centre Wellington District High School, the road has a rural cross-section with an 8.5 to 9.0 metre paved surface and minimal gravel shoulders, providing 1 travel lane per direction;
- from the high school to the north, the road has an urban cross-section with a 10.25 metre paved surface providing 1 lane per direction and a sidewalk on the west side;
- the paved surface through the rural section is in relatively poor condition with alligator and longitudinal cracking, and rutting throughout;

- posted speed limit of 80 km/h which transitions to 50 km/h just south of the Centre Wellington District High School reflective of the residential nature of the surroundings;
- relatively straight horizontal alignment and consistent vertical alignment; and
- planning capacity of 500 vehicles per hour per lane (vphpl) as per the *Transportation Master Plan* reflective of its rural/urban local road designation.

2nd Line

2nd Line is the south boundary of the Secondary Plan area, details of which are as follows:

- local road under the jurisdiction of the Township of Centre Wellington;
- oriented east-west through the project area;
- to the west of Tower Street South (Highway 6), the road has a rural cross-section with a 9.0 metre platform which accommodates a 7.0 metre paved surface (1 lane per direction) with gravel shoulders;
- to the east of Tower Street South (Highway 6), the road has a rural cross-section with an approximate 10 metre platform width accommodating an 8 metre surface treated road (1 lane per direction) with gravel shoulders;
- there is a 5 tonne per axle posted load limit in effect from March 1 to April 30;
- posted speed limit of 80 km/h;
- relatively straight horizontal alignment and with some minor vertical curves; and
- planning capacity of 500 vehicles per hour per lane (vphpl) as per the *Transportation Master Plan* reflective of its rural local road designation.

2.1.2 Key Intersections

The following key intersections will be considered in the transportation study:

- Tower Street South (Highway 6) with McQueen Boulevard – signalized;
- Tower Street South (Highway 6) with Skyline Retail Plaza access - signalized;
- Tower Street South (Highway 6) with 2nd Line - stop controlled on 2nd Line;
- Guelph Street with 2nd Line – stop controlled on Guelph Street;
- Scotland Street with McQueen Boulevard - stop controlled on McQueen Boulevard; and
- Scotland Street with 2nd Line – stop controlled on 2nd Line.

The configurations of the above noted intersections are illustrated in Figure 5. As evident, all of the intersections have single lane, shared approaches except the Tower Street South intersections which are summarized below.

Tower Street South (Highway 6) with McQueen Boulevard

- NB: left turn lane + through lane + through-right lane
- SB: left turn lane + through lane + through-right lane
- WB: left turn lane + through lane + right turn lane
- EB: left turn lane + through-right lane

Tower Street South (Highway 6) with Skyline Access

- NB: through lane + through-right lane
- SB: left turn lane + through lane
- WB: left turn lane + right turn lane

Tower Street South (Highway 6) with 2nd Line

- NB: left turn lane + through-right lane
- SB: left turn lane + through-right lane
- WB: left-through-right lane
- EB: left-through-right lane

2.2 ACTIVE TRANSPORTATION NETWORK

As noted in the previous section, the following sidewalks are currently provided:

- east side of Tower Street South (Highway 6) from the south limit of the Skyline Retail Plaza to McQueen Street (and extending further north beyond the project area);
- both sides of all sections of McQueen Boulevard; and
- west side of Scotland Street across the frontage of the Centre Wellington District High School (and extending further north beyond McQueen Boulevard).

An inventory of existing trails within the project area and immediate surroundings is provided in Figure 6.

2.3 TRANSIT NETWORK

The Township of Centre Wellington does not currently provide a public transit service, however, the *Transportation Master Plan* states that the Township intends to explore public transportation options for implementation in the future. These options include:

- subsidized rideshare/taxi programs;
- fixed/flexible bus routes operated by the Township; and
- service expansions from existing local/regional transit services:
 - Grand River Transit (operating in Kitchener and Waterloo);
 - Guelph Transit (operating in Guelph); and
 - GO Transit (operating in the Greater Golden Horseshoe).

While the Township has indicated its intention to explore public transportation options, the implementation of service is not anticipated for the foreseeable future. As such, the assessment contained herein has not given consideration to the provision of public transit within the Fergus area. This is not to preclude the implementation of public transit within the Secondary Plan Area, only to note that reductions associated with public transit service have not been applied to future traffic projections for the purpose of this study.

To facilitate the development of future public transit within the Secondary Plan Area, emphasis should be placed on creating a pattern of development and an interconnected internal road network that is capable of accommodating diverse transportation modes including walking, cycling, transit and the automobile. Travel distances to surrounding streets, uses and open spaces should be minimized recognizing that transit users are sensitive to the distance they must walk or cycle to a transit stop (long, circuitous routes will discourage travel to and from transit services even if the quality and frequency of transit service is good).

2.4 TRAFFIC VOLUMES

2.4.1 Traffic Counts

To establish existing conditions on the road network, traffic counts were conducted on October 28, 2021, from 7:00 to 9:00 and 16:00 to 18:00 at the following project area intersections:

- Tower Street South (Highway 6) with McQueen Boulevard;
- Tower Street South (Highway 6) with Skyline Retail Plaza access;
- Tower Street South (Highway 6) with 2nd Line;
- Guelph Street with 2nd Line;

- Scotland Street/Jones Baseline with 2nd Line; and
- Scotland Street with McQueen Boulevard.

Detailed traffic count sheets are provided in Appendix B.

2.4.2 Factors & Adjustments

It is recognized that the traffic counts were conducted during the COVID-19 pandemic; however, public health and travel restrictions were greatly reduced at the time as compared to the start of the pandemic (i.e. capacity limits on restaurants and commercial/retail establishments had been lifted). As such, it has been assumed that the counts reflect typical peak conditions.

2.4.3 Adjusted Traffic Volumes

The 2021 volumes were increased by a background growth rate of 1% to reflect 2022 volumes (see Section 3.2.1 for discussion on background growth) and are illustrated in Figure 7.

2.5 TRAFFIC OPERATIONS

The assessment of existing conditions provides the baseline from which the future traffic volumes and operations can be assessed. The operational assessment of existing conditions has considered the following:

- operations at the key intersections;
- vehicle queue operations; and
- midblock capacity.

2.5.1 Intersection Operations

The capacity, and hence operations, of a road system is effectively dictated by its intersections, recognizing that intersections reflect pinch points in the road network. The analysis is based on the 2022 traffic volumes, the existing intersection configuration and control, and procedures outlined in the *2000 Highway Capacity Manual*³ (using Synchro v.11 software). For signalized intersections, the analysis considers the following for each signalized movement:

- average delay (in seconds);
- level of service (LOS); and
- and volume to capacity (v/c).

³ *Highway Capacity Manual*. Transportation Research Board. Washington DC, 2000.

For unsignalized intersections, the analysis considers the same metrics but focuses on critical movements only, namely stop controlled movements on the minor road and the left turn movements from the major road to the minor road.

With respect to the noted metrics:

- level of service 'A' corresponds to the best operating condition with minimal delays whereas level of service 'F' corresponds to poor operations resulting from high intersection delays (additional details regarding Level of Service definitions are provided in Appendix C); and
- a v/c ratio of less than 1.0 indicates the intersection movement/approach is operating at less than capacity while v/c of 1.0 indicates capacity has been reached.

A summary of operations for the intersections is provided in

Table 1 whereas detailed worksheets are provided in Appendix D.

As indicated, the project area intersections are currently providing good overall operations (LOS C or better) with average delays. The exception being the intersection of Tower Street South with 2nd Line, which is experiencing poor operations (LOS F on the eastbound approach) during the PM peak hour. The poor operating conditions are a result of the significant volumes on Tower Street South. Despite the poor operating conditions, the volumes do not warrant the implementation of traffic signals recognizing that the volumes on 2nd Line are relatively low (in the order of 70 vehicles or less on eastbound approach and 40 vehicles on the westbound approach).

2.5.2 Queue Operations

The presence of traffic queues at the subject intersections was considered where exclusive turn lanes exist to ensure they are appropriately sized. The queueing analysis was conducted using *SimTraffic*, the traffic simulation module that accompanies the Synchro traffic modelling software. As per industry guidelines, the queueing assessment considers the average results of 5 simulation runs, with each simulation consisting of a 15-minute seed time and 60-minute run time. The resulting 50th and 95th percentile queues and the existing storage lengths are summarized in Table 2, with detailed worksheets provided in Appendix D. The 50th percentile queues reflect the average queue lengths and thus will be exceeded 50% of the time, whereas the 95th percentile queues will only be exceeded 5% of the time. The existing storage lengths have been determined from the existing lane configurations and measurements (which reflect the storage + parallel lane lengths), with consideration for applicable standards with respect to parallel lane lengths. Queues which exceed the available storage are bolded in the summary table.

As noted, all of the existing dedicated turn lanes are of sufficient length to accommodate the 50th and 95th percentile queues under the existing conditions.

Table 1: Intersection Operations – 2022 Conditions

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--|---------|--------|----------------------|-----|------|----------------------|----------|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Scotland Street & McQueen Boulevard | EB LR | stop | 12s | B | 0.03 | 0s | A | 0.00 |
| | NB L | free | 0 | A | 0.00 | 0 | A | 0.00 |
| Tower Street & McQueen Boulevard | EB L | signal | 19 | B | 0.06 | 21 | C | 0.19 |
| | EB T | signal | 19 | B | 0.05 | 19 | B | 0.15 |
| | EB R | signal | 19 | B | 0.04 | 19 | B | 0.01 |
| | WB L | signal | 22 | B | 0.42 | 22 | C | 0.42 |
| | WB TR | signal | 19 | B | 0.08 | 19 | B | 0.08 |
| | NB L | signal | 7 | B | 0.02 | 8 | A | 0.12 |
| | NB TR | signal | 8 | B | 0.26 | 9 | A | 0.51 |
| | SB L | signal | 3 | A | 0.07 | 6 | A | 0.32 |
| | SB TR | signal | 3 | A | 0.25 | 3 | A | 0.23 |
| | overall | signal | 8 | A | 0.30 | 9 | A | 0.47 |
| Scotland Street/ Jones Baseline & 2 nd Line | EB LR | stop | 9 | A | 0.06 | 9 | A | 0.04 |
| | NB L | free | 2 | A | 0.01 | 2 | A | 0.02 |
| Tower Street S & Skyline Plaza Access | WB LR | signal | 24 | C | 0.33 | 19 | B | 0.33 |
| | NB TR | signal | 5 | A | 0.21 | 9 | A | 0.50 |
| | SB L | signal | 2 | A | 0.11 | 4 | A | 0.27 |
| | SB T | signal | 4 | A | 0.45 | 5 | A | 0.41 |
| | overall | signal | 5 | A | 0.48 | 9 | A | 0.47 |
| Tower Street S/Highway 6 & 2 nd Line | EB LTR | stop | 28 | D | 0.29 | 83 | F | 0.62 |
| | WB LTR | stop | 22 | C | 0.09 | 38 | E | 0.27 |
| | NB L | free | 9 | A | 0.02 | 9 | A | 0.02 |
| | SB L | free | 9 | A | 0.00 | 9 | A | 0.00 |
| Guelph Street & 2 nd Line | EB L | free | 2 | A | 0.01 | 4 | A | 0.04 |
| | WB L | free | 1 | A | 0.00 | 0 | A | 0.00 |
| | NB LTR | stop | 9 | A | 0.01 | 11 | B | 0.01 |
| | SB LTR | stop | 9 | A | 0.03 | 9 | A | 0.04 |

Table 2: Queue Operations – 2022 Conditions

| INTERSECTION & MOVEMENTS | | STORAGE LENGTH (M) | WEEKDAY AM PEAK HOUR | | WEEKDAY PM PEAK HOUR | |
|---|------|--------------------|----------------------|------------------|----------------------|------------------|
| | | | 50 th | 95 th | 50 th | 95 th |
| Tower Street & McQueen Boulevard | EB L | 75m | 3m | 9m | 7m | 15m |
| | EB R | 75 | 9 | 15 | 5 | 12 |
| | WB L | 30 | 12 | 20 | 12 | 21 |
| | NB L | 30 | 2 | 7 | 8 | 17 |
| | SB L | 50 | 6 | 14 | 14 | 24 |
| Tower Street S & Skyline Plaza Access | WB L | 30 | 16 | 28 | 11 | 21 |
| | WB R | 30 | 5 | 11 | 8 | 16 |
| | SB L | 130 | 8 | 16 | 12 | 21 |
| Tower Street S/Highway 6 & 2 nd Line | NB L | 100 | 3 | 8 | 1 | 2 |
| | SB L | 100 | 1 | 4 | 1 | 2 |

2.5.3 Mid-Block Operations

Mid-block operations assess the peak hour directional volumes on the subject road sections in consideration of the assumed lane capacity of the road. The capacity thresholds contained herein reflect those provided in the Township's *TMP*. A summary of the volume to capacity ratios (i.e. the degree to which the available capacity is utilized) is provided in Table 3 for the existing conditions. A volume-to-capacity (v/c) ratio below 1.0 indicates there is available capacity on the road network, whereas a v/c ratio at or above 1.0 indicates that road capacity has been reached or surpassed. As the v/c approaches 1.0, congestion is more likely to occur. Any road segments operating near or over capacity ($v/c \geq 0.95$) have been bolded in the summary tables.

As indicated, the project area road network is operating at 88% capacity or less ($v/c \leq 0.88$). It is noted that the greatest v/c is experienced on Tower Street South, south of the Skyline Retail Plaza access where the road reduces to a two-lane cross-section (1 travel lane per direction). The remaining roads are operating at 62% of capacity or less ($v/c \leq 0.62$).

Table 3: Mid-Block Operations – 2022 Conditions

| ROAD SECTION & LOCATION | | CAPACITY (VPHPL) ¹ | AM PEAK HOUR V/C RATIO | | PM PEAK HOUR V/C RATIO | |
|-------------------------|---------------------------|-------------------------------|------------------------|-------|------------------------|-------|
| | | | NB/EB | SB/WB | NB/EB | SB/WB |
| Guelph St | N of McQueen Blvd | 500 | 0.00 | 0.05 | 0.00 | 0.06 |
| | N of 2 nd Line | 500 | 0.04 | 0.06 | 0.16 | 0.06 |
| | S of 2 nd Line | 500 | 0.01 | 0.02 | 0.01 | 0.02 |
| Tower St S/Hwy 6 | N of McQueen Blvd | 1000 | 0.22 | 0.33 | 0.43 | 0.36 |
| | S of McQueen Blvd | 1000 | 0.22 | 0.73 | 0.45 | 0.63 |
| | S of Skyline Retail | 1000 | 0.46 | 0.68 | 0.88 | 0.59 |
| | S of 2 nd Line | 1000 | 0.45 | 0.66 | 0.86 | 0.56 |
| McQueen Blvd | W of Guelph St | 700 | 0.00 | 0.00 | 0.00 | 0.00 |
| | W of Tower St S | 700 | 0.12 | 0.03 | 0.12 | 0.10 |
| | E of Tower St S | 700 | 0.13 | 0.15 | 0.42 | 0.24 |
| Scotland St | N of McQueen Blvd | 500 | 0.39 | 0.62 | 0.37 | 0.17 |
| | S of McQueen Blvd | 500 | 0.36 | 0.62 | 0.37 | 0.17 |
| | S of 2 nd Line | 500 | 0.16 | 0.14 | 0.31 | 0.13 |
| 2 nd Line | W of Guelph St | 500 | 0.15 | 0.19 | 0.25 | 0.18 |
| | W of Highway 6 | 500 | 0.14 | 0.15 | 0.14 | 0.18 |
| | E of Highway 6 | 500 | 0.06 | 0.04 | 0.06 | 0.08 |

¹ Capacity is denoted as vehicles per hour per lane

2.5.4 Operational Summary

Based on the results of the above analyses, the existing weekday AM and PM peak hour volumes are readily accommodated by the current configuration of the project area road network. Therefore, no improvements to the network are required to accommodate the existing conditions.

3 Future Background Conditions

This chapter will describe the road network and background traffic volumes expected for the years 2025, 2031, 2039, and 2049. The 2025 and 2031 horizons have been adopted to reflect the proposed phasing of developments within the project areas (as detailed in Section 4.3). The 2039 horizon has been adopted to reflect a full build-out of the subject lands, while the 2049 horizon will address longer-term impacts of the development (10 years beyond build-out).

3.1 ROAD NETWORK

The Township's *Development Charges Background Study*⁴ comprehensively lists all planned road/intersection works within the Township and assigns each a completion timeline. The upgrades are based on those identified in the Township TMP's preferred road network alternative (Alternative 3, see Figure 8). The planned upgrades which will affect the project area road network are detailed below. With exception of the upgrades planned for the intersection of Highway 6 and 2nd Line (which are planned for completion between 2032 and 2041), all noted road/intersection works are planned for completion between 2024 and 2031. For the purpose of this report, all upgrades are assumed will be in place by the 2031 horizon, with exception of the following two upgrades:

- eastern extension of McQueen Boulevard, assumed complete by the 2025 horizon to serve Study Area Phase 1 development; and
- signalization of the intersection of 2nd Line with Tower Street South/Highway 6, assumed complete by the 2025 horizon to address poor operations experienced under 2022 conditions.

3.1.1 Road Improvements

Guelph Street

Guelph Street is currently a local road with an unbuilt road allowance between Union Street West and Elora Street, thus it cannot be used as a through road between 2nd Line and Union Street West. The TMP states an intention to extend Guelph Street through this road allowance and upgrade it to a collector road between Union Street West and 2nd Line. The road will maintain a 2-lane cross-section after the upgrade.

⁴ *Township of Centre Wellington Development Charges Background Study*. Watson & Associates Economists Ltd. December 23, 2020.

Highway 6

The section of Highway 6 between the existing Fergus south limits and 2nd Line is to be adopted as a connecting link, with MTO transferring planning, maintenance and operations responsibilities to the Township.

Furthermore, as per Report to Council IS2023-34⁵:

The Township's vision for Highway 6 through the Fergus urban area is a multi-modal transportation corridor that includes vehicles, pedestrians, cyclists, and transit to create Complete Streets designed to safety and efficiently move local and regional traffic. The Highway 6 corridor will have new intersections, road widenings, and underground utilities including watermain, storm and sanitary sewers, electrical, and telecommunications infrastructure as part of development in the area. With a common vision for Highway 6 including Highway Access Management Plans through future development lands, implementation and phasing plans, and financial plans, the significant growth poised for Fergus can proceed in a coordinated and efficient manner.

Scotland Street

Scotland Street will be upgraded to a collector road through the project area. It will maintain a 2-lane cross-section.

McQueen Boulevard

McQueen Boulevard currently exists in two segments stretching from Aberdeen Street to Milburn Boulevard in the west and from McTavish Street to Scotland Street in the east. The Township plans to extend McQueen Boulevard both eastward and westward to provide a continuous collector road between Guelph Street and Scotland Street. Additionally, McQueen Boulevard will be extended approximately 200 metres further west beyond Guelph Street to connect to the planned southward extension of Beatty Line North.

2nd Line

2nd Line is planned to be upgraded to an arterial road between Guelph Street and Scotland Street. The road will maintain a 2-lane cross-section.

⁵ Report to Council IS2023-34 re: Improvements to Highway 6 Related to Future Development Plans, December 18, 2023.

Beatty Line North

The most significant upgrade to the area road network is the planned southward extension of Beatty Line North to intersect with the McQueen Boulevard western extension, which will entail the construction of a new bridge across the Grand River, providing a new north-south connection in western Fergus – no connection across the Grand River currently exists in western Fergus. This new link is expected to draw a significant amount of traffic and will provide a much faster and more direct travel route between Highway 6 and the neighbouring communities of Elora and Salem. Traffic bound between the Study Area and Elora/Salem has been assumed to use this link exclusively.

EMME modelling within the TMP shows the new Beatty Line extension significantly reducing traffic through downtown Fergus, but only moderately affecting trips along Highway 6 through the project area. From the modelling data, it is estimated that the new extension will divert approximately 20% of southbound weekday AM peak trips from Highway 6 between McQueen Boulevard and 2nd Line. Similarly, approximately 20% of northbound weekday PM peak trips will be diverted from the same stretch of Highway 6. These trips have been distributed evenly between 2nd Line and McQueen Boulevard.

At the time of future Planning Act applications, consultation with the Township will be required to confirm the status of the Beatty Line North extension and the new bridge over the Grand River, for consideration in traffic impact studies for each subsequent application submission (recognizing the implications of the road extension and bridge on area travel patterns and traffic assignment through the study area).

3.1.2 Intersection Improvements

Tower Street South/Highway 6 & 2nd Line

The intersection of Tower Street South/Highway 6 and 2nd Line is planned to be reconstructed. This may include additional dedicated turning lanes and/or installation of traffic signals, or conversion to a roundabout configuration.

Further to the above Township consideration, the MTO is currently undertaking the Preliminary Design and Class Environmental Assessment (Class EA) for the intersection of Highway 6 and 2nd Line (recognizing that Highway 6 is under MTO jurisdiction). As per the Notice of Study Commencement, the project is being undertaken primarily to address safety concerns at the intersection and will include new traffic signals, provision of turning lanes and pavement resurfacing. Timing of construction is subject to funding and approvals and thus has yet to be confirmed.

For the purposes of this study, a signalized intersection configuration was assumed for the future background conditions, with consideration for roundabout control under the future total conditions given the opportunity for the roundabout to serve as a gateway feature to the project area (additional details regarding roundabout operations are provided in Section 0).

Guelph Street & McQueen Boulevard

In conjunction with the planned extensions of McQueen Boulevard, a new intersection will be constructed at Guelph Street. The Township's TMP does not state what the planned configuration of the intersection is (i.e. stop-controlled, signalized, etc.). Given the modest volumes forecast by the EMME macro modelling conducted within the TMP, the intersection has been assumed to operate as a two-way stop-controlled intersection, with McQueen Boulevard serving as the through road and Guelph Street operating under stop control. Should future traffic operations dictate, the provision of all-way stop and/or traffic signals can also be considered.

3.2 TRAFFIC VOLUMES

Background traffic volumes for the 2025, 2031, 2039 and 2049 horizons have been determined based on the existing traffic volumes, projected growth, and growth from additional developments (other than the subject development).

3.2.1 Background Growth

According to census data, the population of Fergus increased from 20,928 persons in 2016 to 23,209 persons in 2021, translating to an annual growth rate of approximately 2% per annum. This is somewhat lower than the projected growth rate of approximately 3.3% per annum forecast between 2016 and 2036 in the *County of Wellington Official Plan*⁶. Given that the projections provided in the County's Official Plan were established approximately 25 years ago, the growth rate reflected in the census data (ie. 2%) is considered reflective of current growth patterns.

It is noted that major developments within Fergus are being considered independently of the general background growth (see Section 3.2.2) in addition to the subject development (see Section 4.5.1), which in turn will inherently contribute to future growth. In this regard, a reduced background growth rate of 1% has been applied to the existing volumes within the project area to consider general background growth, with additional development specific growth considered further. This approach is also consistent with the methodology employed in the traffic study for the Northwest Fergus Secondary Plan Area as referenced in the following section.

⁶ *County of Wellington Official Plan*. County of Wellington. September 24, 1998.

3.2.2 Background Development

Northwest Fergus Secondary Plan Area

The Northwest Fergus Secondary Plan Area (NWFSPA) is a 3-phase mixed-use development currently under construction. It consists of approximately 1,300 residential units constructed in varying densities (predominantly low and medium density), a 400-student elementary school, and 3,000 m² (32,300 ft²) of commercial space. The *Northwest Fergus Secondary Plan Traffic Impact Study (Phases 2 & 3)*⁷ is a comprehensive study that considered the traffic impacts associated with the development of the NWFSPA along with several other developments surrounding the secondary plan area. Based on the trip generation estimates provided in the *Northwest Fergus Secondary Plan Traffic Impact Study*, the NWFSPA and developments within the surrounding area are expected to generate approximately 2,050 trips during the weekday AM peak hour, and 2,500 trips during the weekday PM peak hour. The phasing assumed for the NWFSPA and surrounding developments, as assumed in the *Northwest Fergus Secondary Plan Traffic Impact Study*, is summarized in Table 4.

In reviewing existing development levels, all those developments considered as built-out by the 2018 horizon, including Phase 1 of the NWFSPA, are considered to be built-out. The exception being the Keating Subdivision which is partially built-out. For the purpose of this study, the remaining developments identified for build-out by 2023 and 2028 have been considered as completed by the 2025 and 2031 horizons, respectively.

Based on the trip generation provided in the *Northwest Fergus Secondary Plan Traffic Impact Study* and the distribution assumptions, the remaining lands identified for development are expected to contribute approximately 300 AM trips and 380 PM trips through the project area during the weekday.

Other Developments

Upon review of the County's active development map, there are no other developments within the surrounding areas that would contribute any meaningful volumes to the road network.

⁷ *Northwest Fergus Secondary Plan Traffic Impact Study (Phase 2 & 3)*. R.J. Burnside & Associates Ltd. 2018.

Table 4: Northwest Fergus Secondary Plan - Phasing

| DEVELOPMENT | DESCRIPTION | BUILD-OUT | | |
|---|--|-----------|------|------|
| | | 2018 | 2023 | 2028 |
| Northwest Fergus Secondary Plan Area | | | | |
| Phase 1 | 218 residential units 400 student elementary school | 100% | 100% | 100% |
| Phase 2 | 535 residential units | 0% | 100% | 100% |
| Phase 3 | 552 residential units 3,000 m ² of commercial space | 0% | 0% | 100% |
| Other Development Lands | | | | |
| Groves Hospital | new hospital | 100% | 100% | 100% |
| Medical Arts Offices | 7,432 ft ² medical office space | 100% | 100% | 100% |
| Keating S/D | 143 unit residential subdivision | 100% | 100% | 100% |
| Bonaire S/D | 223 unit residential subdivision | 100% | 100% | 100% |
| Mod-Aire/Orsite S/D | 15 unit residential infill | 100% | 100% | 100% |
| Keating (Millage Lane) | 6 unit residential infill | 100% | 100% | 100% |
| Keating (Beatty Line) | 12 unit residential infill | 100% | 100% | 100% |
| County Institutional Campus | 176 units of supportive housing, gov't offices and community college | 0% | 50% | 100% |
| Richardson Farm | 144 unit residential subdivision | 0% | 0% | 100% |

3.2.3 Background Traffic Volumes

The resulting 2025, 2031, 2039, and 2049 background traffic volumes are illustrated in Figure 9 through Figure 12. The background volumes reflect the 2022 volumes, the noted background growth rate, and additional volume generated by the Northwest Fergus Secondary Plan Area and the surrounding developments identified in the *Northwest Fergus Secondary Plan Traffic Impact Study*. To reflect the completion of the eastern extension of McQueen Boulevard (and subsequent use as an east-west link between Tower Street and Scotland Street), a small amount of traffic has been assigned to each movement at the intersection with Scotland Street.

3.3 TRAFFIC OPERATIONS

Analysis of the operations of the key intersections and assessment of mid-block capacity was reviewed at each horizon year. Vehicle queueing at key intersections was reviewed again under the 2039 and 2049 background conditions, as these are the most critical horizons.

3.3.1 Intersection Operations

Analysis of the operations of the key intersections present under 2025, 2031, 2039 and 2049 background conditions was conducted. Results of the analysis are summarized in Table 5 through Table 8 with detailed worksheets provided in Appendix E.

Signal phasing at each signalized intersection was optimized at each horizon as necessary to ensure optimal performance of each intersection. A protected left movement for northbound traffic at the intersection of Tower Street South and McQueen Boulevard was added at the 2049 horizon.

As indicated, all intersections operate well (LOS C or better) under future background conditions. The addition of traffic signals at the intersection of Tower Street South and 2nd Line has seen delays on 2nd Line decrease significantly (as much as 55 seconds) despite the increased traffic on both roads. It is recognized that some intersections along McQueen Boulevard (namely at Guelph Street and Scotland Street) will likely be much busier than the background analysis suggests due to the redistribution of traffic through the network following completion of the Beatty Line North and McQueen Boulevard extensions. Monitoring of these intersection may be necessary to ensure that adequate operations are maintained.

3.3.2 Queue Operations

Once again, a queueing analysis was conducted using the average of five, 60-minute SimTraffic simulations for each peak hour. Results of the queueing analyses for the horizon years under future background conditions are provided in Table 9 and Table 10 with detailed worksheets provided in Appendix E. As indicated, the length of storage lanes within the network remains satisfactory, with nearly all queue lengths shorter than the provided storage length. Movements with queues exceeding storage lengths are not expected to cause serious delays, as the 95th percentile lengths exceed available storage lengths by less than 10 metres.

Table 5: Intersection Operations – 2025 Background Conditions

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--|---------|--------|----------------------|-----|------|----------------------|-----|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Scotland Street & McQueen Boulevard | EB LR | stop | 12s | B | 0.05 | 9s | A | 0.02 |
| | NB L | free | 1 | A | 0.01 | 1 | A | 0.01 |
| Tower Street & McQueen Boulevard | EB L | signal | 19 | B | 0.06 | 21 | C | 0.20 |
| | EB T | signal | 19 | B | 0.05 | 19 | B | 0.15 |
| | EB R | signal | 19 | B | 0.04 | 19 | B | 0.02 |
| | WB L | signal | 23 | C | 0.44 | 23 | C | 0.44 |
| | WB TR | signal | 19 | B | 0.08 | 19 | B | 0.08 |
| | NB L | signal | 7 | B | 0.03 | 8 | A | 0.14 |
| | NB TR | signal | 9 | B | 0.30 | 11 | B | 0.60 |
| | SB L | signal | 3 | A | 0.08 | 7 | A | 0.37 |
| | SB TR | signal | 4 | A | 0.30 | 4 | A | 0.27 |
| | overall | signal | 8 | A | 0.35 | 9 | A | 0.53 |
| Scotland Street/ Jones Baseline & 2 nd Line | EB LR | stop | 9 | A | 0.06 | 9 | A | 0.04 |
| | NB L | free | 2 | A | 0.01 | 2 | A | 0.02 |
| Tower Street S & Skyline Plaza Access | WB LR | signal | 24 | C | 0.33 | 19 | B | 0.33 |
| | NB TR | signal | 5 | A | 0.24 | 11 | B | 0.58 |
| | SB L | signal | 2 | A | 0.11 | 5 | A | 0.30 |
| | SB T | signal | 5 | A | 0.53 | 6 | A | 0.48 |
| | overall | signal | 5 | A | 0.56 | 9 | A | 0.53 |
| Tower Street S/Highway 6 & 2 nd Line | EB LTR | signal | 28 | C | 0.33 | 28 | C | 0.45 |
| | WB LTR | signal | 26 | C | 0.10 | 26 | C | 0.19 |
| | NB L | signal | 3 | A | 0.04 | 3 | A | 0.05 |
| | NB TR | signal | 5 | A | 0.38 | 9 | A | 0.75 |
| | SB L | signal | 3 | A | 0.01 | 3 | A | 0.00 |
| | SB TR | signal | 7 | A | 0.61 | 6 | A | 0.53 |
| | overall | signal | 8 | A | 0.57 | 9 | A | 0.71 |
| Guelph Street & 2 nd Line | EB L | free | 2 | A | 0.01 | 4 | A | 0.04 |
| | WB L | free | 1 | A | 0.00 | 0 | A | 0.00 |
| | NB LTR | stop | 10 | A | 0.01 | 11 | B | 0.01 |
| | SB LTR | stop | 9 | A | 0.03 | 9 | A | 0.04 |

Table 6: Intersection Operations – 2031 Background Conditions

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--|---------|--------|----------------------|-----|------|----------------------|-----|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Scotland Street & McQueen Boulevard | EB LR | stop | 12s | B | 0.05 | 9s | A | 0.03 |
| | NB L | stop | 1 | A | 0.01 | 1 | A | 0.01 |
| Tower Street S & McQueen Boulevard | EB L | signal | 18 | B | 0.05 | 21 | B | 0.21 |
| | EB T | signal | 18 | B | 0.04 | 19 | B | 0.16 |
| | EB R | signal | 19 | B | 0.17 | 19 | B | 0.02 |
| | WB L | signal | 19 | B | 0.32 | 23 | C | 0.46 |
| | WB TR | signal | 18 | B | 0.07 | 19 | B | 0.09 |
| | NB L | signal | 9 | A | 0.03 | 9 | B | 0.16 |
| | NB TR | signal | 11 | B | 0.39 | 11 | B | 0.60 |
| | SB L | signal | 4 | A | 0.09 | 7 | A | 0.40 |
| | SB TR | signal | 5 | A | 0.32 | 4 | A | 0.31 |
| | overall | signal | 9 | A | 0.37 | 9 | A | 0.55 |
| Scotland Street/ Jones Baseline & 2 nd Line | EB LR | stop | 9 | A | 0.07 | 10 | A | 0.04 |
| | NB L | stop | 2 | A | 0.01 | 2 | A | 0.02 |
| Tower Street S & Skyline Plaza Access | WB LR | signal | 25 | C | 0.34 | 22 | C | 0.34 |
| | NB TR | signal | 6 | A | 0.29 | 12 | B | 0.58 |
| | SB L | signal | 3 | A | 0.12 | 6 | A | 0.32 |
| | SB T | signal | 5 | A | 0.55 | 8 | A | 0.59 |
| | overall | signal | 7 | A | 0.58 | 11 | B | 0.60 |
| Guelph Street & McQueen Boulevard | NB LTR | stop | 9 | A | 0.02 | 9 | A | 0.09 |
| | SB LTR | stop | 9 | A | 0.03 | 9 | A | 0.04 |
| Tower Street S/Highway 6 & 2 nd Line | EB LTR | signal | 22 | B | 0.42 | 23 | C | 0.49 |
| | WB LTR | signal | 19 | B | 0.14 | 21 | C | 0.26 |
| | NB L | signal | 3 | A | 0.04 | 3 | A | 0.07 |
| | NB TR | signal | 4 | A | 0.45 | 9 | A | 0.74 |
| | SB L | signal | 2 | A | 0.01 | 2 | A | 0.00 |
| | SB TR | signal | 6 | A | 0.62 | 6 | A | 0.62 |
| | overall | signal | 6 | A | 0.60 | 8 | A | 0.72 |
| Guelph Street & 2 nd Line | EB L | stop | 2 | A | 0.01 | 4 | A | 0.04 |
| | WB L | stop | 1 | A | 0.00 | 0 | A | 0.00 |
| | NB LTR | stop | 11 | B | 0.01 | 12 | B | 0.01 |
| | SB LTR | stop | 9 | A | 0.03 | 9 | A | 0.04 |

Table 7: Intersection Operations – 2039 Background Conditions

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--|---------|--------|----------------------|-----|------|----------------------|-----|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Scotland Street & McQueen Boulevard | EB LR | stop | 13s | B | 0.06 | 9s | A | 0.03 |
| | NB L | stop | 1 | A | 0.01 | 1 | A | 0.01 |
| Tower Street S & McQueen Boulevard | EB L | signal | 18 | B | 0.05 | 19 | B | 0.19 |
| | EB T | signal | 18 | B | 0.04 | 19 | B | 0.13 |
| | EB R | signal | 19 | B | 0.33 | 19 | B | 0.02 |
| | WB L | signal | 19 | B | 0.33 | 21 | C | 0.41 |
| | WB TR | signal | 18 | B | 0.07 | 19 | B | 0.08 |
| | NB L | signal | 9 | A | 0.04 | 14 | B | 0.43 |
| | NB TR | signal | 12 | B | 0.42 | 12 | B | 0.57 |
| | SB L | signal | 5 | A | 0.11 | 8 | A | 0.43 |
| | SB TR | signal | 5 | A | 0.29 | 5 | A | 0.35 |
| | overall | signal | 11 | B | 0.39 | 9 | A | 0.52 |
| Scotland Street/ Jones Baseline & 2 nd Line | EB LR | stop | 9 | A | 0.07 | 11 | B | 0.05 |
| | NB L | stop | 2 | A | 0.01 | 2 | A | 0.02 |
| Tower Street S & Skyline Plaza Access | WB LR | signal | 25 | C | 0.34 | 22 | C | 0.34 |
| | NB TR | signal | 7 | A | 0.31 | 11 | B | 0.57 |
| | SB L | signal | 3 | A | 0.13 | 5 | A | 0.32 |
| | SB T | signal | 5 | A | 0.54 | 8 | A | 0.63 |
| | overall | signal | 7 | A | 0.57 | 11 | B | 0.63 |
| Guelph Street & McQueen Boulevard | NB LTR | stop | 9 | A | 0.02 | 11 | B | 0.19 |
| | SB LTR | stop | 9 | A | 0.04 | 9 | A | 0.04 |
| Tower Street S/Highway 6 & 2 nd Line | EB LTR | signal | 19 | B | 0.40 | 24 | C | 0.53 |
| | WB LTR | signal | 18 | B | 0.11 | 21 | C | 0.28 |
| | NB L | signal | 3 | A | 0.05 | 5 | A | 0.28 |
| | NB TR | signal | 5 | A | 0.51 | 8 | A | 0.73 |
| | SB L | signal | 3 | A | 0.01 | 2 | A | 0.00 |
| | SB TR | signal | 7 | A | 0.64 | 7 | A | 0.66 |
| | overall | signal | 8 | A | 0.61 | 8 | A | 0.71 |
| Guelph Street & 2 nd Line | EB L | stop | 2 | A | 0.01 | 4 | A | 0.05 |
| | WB L | stop | 1 | A | 0.00 | 0 | A | 0.00 |
| | NB LTR | stop | 11 | B | 0.01 | 13 | B | 0.01 |
| | SB LTR | stop | 11 | B | 0.11 | 11 | B | 0.05 |

Table 8: Intersection Operations – 2049 Background Conditions

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--|---------|--------|----------------------|-----|------|----------------------|-----|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Scotland Street & McQueen Boulevard | EB LR | stop | 13s | B | 0.07 | 10s | B | 0.04 |
| | NB L | stop | 1 | A | 0.01 | 1 | A | 0.01 |
| Tower Street S & McQueen Boulevard | EB L | signal | 19 | B | 0.06 | 19 | B | 0.22 |
| | EB T | signal | 19 | B | 0.04 | 19 | B | 0.14 |
| | EB R | signal | 19 | B | 0.20 | 19 | B | 0.02 |
| | WB L | signal | 21 | C | 0.38 | 22 | C | 0.46 |
| | WB TR | signal | 19 | B | 0.08 | 19 | B | 0.09 |
| | NB L | signal | 8 | A | 0.03 | 7 | B | 0.34 |
| | NB TR | signal | 11 | B | 0.41 | 13 | B | 0.64 |
| | SB L | signal | 5 | A | 0.12 | 9 | A | 0.48 |
| | SB TR | signal | 8 | A | 0.36 | 9 | A | 0.50 |
| | overall | signal | 12 | B | 0.37 | 12 | B | 0.57 |
| Scotland Street/ Jones Baseline & 2 nd Line | EB LR | stop | 10 | A | 0.08 | 11 | B | 0.05 |
| | NB L | stop | 2 | A | 0.02 | 2 | A | 0.02 |
| Tower Street S & Skyline Plaza Access | WB LR | signal | 25 | C | 0.36 | 22 | C | 0.37 |
| | NB TR | signal | 7 | A | 0.34 | 12 | B | 0.62 |
| | SB L | signal | 3 | A | 0.15 | 6 | A | 0.38 |
| | SB T | signal | 6 | A | 0.58 | 9 | A | 0.68 |
| | overall | signal | 7 | A | 0.61 | 12 | B | 0.69 |
| Guelph Street & McQueen Boulevard | NB LTR | stop | 9 | A | 0.03 | 11 | B | 0.21 |
| | SB LTR | stop | 9 | A | 0.04 | 9 | A | 0.05 |
| Tower Street S/Highway 6 & 2 nd Line | EB LTR | signal | 19 | B | 0.44 | 28 | C | 0.60 |
| | WB LTR | signal | 18 | B | 0.12 | 21 | C | 0.31 |
| | NB L | signal | 3 | A | 0.06 | 6 | A | 0.37 |
| | NB TR | signal | 6 | A | 0.55 | 9 | A | 0.79 |
| | SB L | signal | 3 | A | 0.02 | 2 | A | 0.00 |
| | SB TR | signal | 8 | A | 0.69 | 8 | A | 0.72 |
| | overall | signal | 8 | A | 0.66 | 9 | A | 0.77 |
| Guelph Street & 2 nd Line | EB L | stop | 2 | A | 0.01 | 4 | A | 0.06 |
| | WB L | stop | 1 | A | 0.00 | 0 | A | 0.00 |
| | NB LTR | stop | 11 | B | 0.01 | 13 | B | 0.01 |
| | SB LTR | stop | 11 | B | 0.13 | 11 | B | 0.06 |

Table 9: Queue Operations – 2039 Background Conditions

| INTERSECTION & MOVEMENTS | STORAGE LENGTH | WEEKDAY AM PEAK HOUR | | WEEKDAY PM PEAK HOUR | | |
|---|----------------|----------------------|------------------|----------------------|------------------|-----------|
| | | 50 th | 95 th | 50 th | 95 th | |
| Tower Street & McQueen Boulevard | EB L | 50m | 2m | 8m | 6m | 15m |
| | EB R | 50 | 21 | 35 | 6 | 14 |
| | WB L | 30 | 13 | 25 | 13 | 24 |
| | NB L | 30 | 3 | 9 | 21 | 40 |
| | SB L | 30 | 7 | 16 | 16 | 27 |
| Tower Street S & Skyline Plaza Access | WB LR | N/A | 12 | 21 | 17 | 23 |
| | SB L | N/A | 8 | 17 | 14 | 26 |
| Tower Street S/Highway 6 & 2 nd Line | EB LTR | N/A | 17 | 28 | 12 | 22 |
| | WB LTR | N/A | 5 | 12 | 8 | 16 |
| | NB L | 100 | 4 | 10 | 18 | 42 |
| | SB L | 100 | 2 | 6 | 1 | 2 |

Table 10: Queue Operations – 2049 Background Conditions

| INTERSECTION & MOVEMENTS | STORAGE LENGTH | WEEKDAY AM PEAK HOUR | | WEEKDAY PM PEAK HOUR | | |
|---|----------------|----------------------|------------------|----------------------|------------------|-----------|
| | | 50 th | 95 th | 50 th | 95 th | |
| Tower Street & McQueen Boulevard | EB L | 50m | 3m | 9m | 7m | 18m |
| | EB R | 50 | 26 | 46 | 6 | 14 |
| | WB L | 30 | 14 | 26 | 14 | 24 |
| | NB L | 30 | 3 | 8 | 19 | 36 |
| | SB L | 30 | 8 | 17 | 20 | 34 |
| Tower Street S & Skyline Plaza Access | WB LR | N/A | 12 | 21 | 17 | 22 |
| | SB L | N/A | 8 | 18 | 17 | 30 |
| Tower Street S/Highway 6 & 2 nd Line | EB LTR | N/A | 18 | 33 | 13 | 24 |
| | WB LTR | N/A | 5 | 12 | 7 | 15 |
| | NB L | 100 | 5 | 12 | 24 | 62 |
| | SB L | 100 | 2 | 7 | 1 | 2 |

3.3.3 Mid-Block Operations

Mid-block operations were assessed under the future background conditions and are summarized in Table 11 through Table 14. As indicated, most roads (excluding Tower Street South) experienced minimal changes in the resulting volume to capacity ratios through to the 2049 horizon despite increased volumes. This is largely due to the upgrading of local roads to collector roads and the corresponding increases to the road capacities (capacity increases from 500 vphpl to 700 vphpl) thus accommodating increased volumes on each road.

Table 11: Mid-Block Operations – 2025 Background Conditions

| ROAD SECTION & LOCATION | | CAPACITY (VPHPL) | AM PEAK HOUR V/C RATIO | | PM PEAK HOUR V/C RATIO | |
|-------------------------|---------------------------|------------------|------------------------|-------|------------------------|-------|
| | | | NB/EB | SB/WB | NB/EB | SB/WB |
| Guelph St | N of McQueen Blvd | 500 | 0.00 | 0.05 | 0.00 | 0.06 |
| | N of 2 nd Line | 500 | 0.04 | 0.06 | 0.17 | 0.07 |
| | S of 2 nd Line | 500 | 0.01 | 0.02 | 0.01 | 0.02 |
| Tower St S/Hwy 6 | N of McQueen Blvd | 1000 | 0.26 | 0.38 | 0.50 | 0.40 |
| | S of McQueen Blvd | 1000 | 0.26 | 0.42 | 0.52 | 0.36 |
| | S of Skyline Retail | 1000 | 0.53 | 0.80 | 1.02 | 0.68 |
| | S of 2 nd Line | 1000 | 0.52 | 0.78 | 1.00 | 0.66 |
| McQueen Blvd | W of Guelph St | 700 | 0.00 | 0.00 | 0.00 | 0.00 |
| | W of Tower St S | 700 | 0.12 | 0.03 | 0.12 | 0.10 |
| | E of Tower St S | 700 | 0.13 | 0.16 | 0.44 | 0.25 |
| Scotland St | N of McQueen Blvd | 500 | 0.40 | 0.66 | 0.40 | 0.20 |
| | S of McQueen Blvd | 500 | 0.39 | 0.66 | 0.40 | 0.20 |
| | S of 2 nd Line | 500 | 0.16 | 0.14 | 0.32 | 0.13 |
| 2 nd Line | W of Guelph St | 500 | 0.16 | 0.19 | 0.26 | 0.18 |
| | W of Highway 6 | 500 | 0.14 | 0.16 | 0.14 | 0.18 |
| | E of Highway 6 | 500 | 0.06 | 0.05 | 0.06 | 0.09 |

Table 12: Mid-Block Operations – 2031 Background Conditions

| ROAD SECTION & LOCATION | | CAPACITY (VPHPL) | AM PEAK HOUR V/C RATIO | | PM PEAK HOUR V/C RATIO | |
|-------------------------|---------------------------|------------------|------------------------|-------|------------------------|-------|
| | | | NB/EB | SB/WB | NB/EB | SB/WB |
| Guelph St | N of McQueen Blvd | 700 | 0.00 | 0.04 | 0.00 | 0.05 |
| | N of 2 nd Line | 700 | 0.03 | 0.04 | 0.13 | 0.05 |
| | S of 2 nd Line | 700 | 0.01 | 0.01 | 0.01 | 0.01 |
| Tower St S/Hwy 6 | N of McQueen Blvd | 1000 | 0.30 | 0.39 | 0.51 | 0.47 |
| | S of McQueen Blvd | 1000 | 0.30 | 0.49 | 0.53 | 0.42 |
| | S of Skyline Retail | 1000 | 0.61 | 0.79 | 1.01 | 0.79 |
| | S of 2 nd Line | 1000 | 0.60 | 0.77 | 0.99 | 0.77 |
| McQueen Blvd | W of Guelph St | 700 | 0.00 | 0.00 | 0.00 | 0.00 |
| | W of Tower St S | 700 | 0.32 | 0.03 | 0.13 | 0.11 |
| | E of Tower St S | 700 | 0.14 | 0.17 | 0.46 | 0.26 |
| Scotland St | N of McQueen Blvd | 700 | 0.30 | 0.50 | 0.30 | 0.15 |
| | S of McQueen Blvd | 700 | 0.29 | 0.50 | 0.30 | 0.15 |
| | S of 2 nd Line | 500 | 0.17 | 0.15 | 0.34 | 0.14 |
| 2 nd Line | W of Guelph St | 500 | 0.17 | 0.20 | 0.27 | 0.19 |
| | W of Highway 6 | 700 | 0.11 | 0.12 | 0.11 | 0.14 |
| | E of Highway 6 | 700 | 0.05 | 0.03 | 0.04 | 0.07 |

The sections of Tower Street South south of the Skyline Retail Plaza access operate at/over capacity (v/c of 0.99 to 1.02) in the northbound direction during the weekday PM peak hour by the 2025 and 2031 horizons. The southbound direction (over the same road segments) operates with significant capacity remaining at the 2031 horizon (v/c or 0.77 to 0.79) and begins to operate close to capacity (v/c of 0.90 to 0.91) by the 2049 horizon.

Table 13: Mid-Block Operations – 2039 Background Conditions

| ROAD SECTION & LOCATION | | CAPACITY (VPHPL) | AM PEAK HOUR V/C RATIO | | PM PEAK HOUR V/C RATIO | |
|-------------------------|---------------------------|---------------------|---------------------------|-------|---------------------------|-------|
| | | | NB/EB | SB/WB | NB/EB | SB/WB |
| Guelph St | N of McQueen Blvd | 700 | 0.00 | 0.04 | 0.20 | 0.05 |
| | N of 2 nd Line | 700 | 0.03 | 0.13 | 0.24 | 0.05 |
| | S of 2 nd Line | 700 | 0.01 | 0.01 | 0.01 | 0.02 |
| Tower St S/Hwy 6 | N of McQueen Blvd | 1000 | 0.32 | 0.35 | 0.47 | 0.50 |
| | S of McQueen Blvd | 1000 | 0.32 | 0.50 | 0.53 | 0.45 |
| | S of Skyline Retail | 1000 | 0.65 | 0.78 | 0.99 | 0.84 |
| | S of 2 nd Line | 1000 | 0.64 | 0.82 | 1.05 | 0.82 |
| McQueen Blvd | W of Guelph St | 700 | 0.16 | 0.00 | 0.00 | 0.20 |
| | W of Tower St S | 700 | 0.43 | 0.04 | 0.14 | 0.22 |
| | E of Tower St S | 700 | 0.15 | 0.18 | 0.50 | 0.28 |
| Scotland St | N of McQueen Blvd | 700 | 0.33 | 0.54 | 0.33 | 0.16 |
| | S of McQueen Blvd | 700 | 0.32 | 0.54 | 0.33 | 0.16 |
| | S of 2 nd Line | 500 | 0.19 | 0.17 | 0.37 | 0.15 |
| 2 nd Line | W of Guelph St | 500 | 0.18 | 0.22 | 0.29 | 0.21 |
| | W of Highway 6 | 700 | 0.20 | 0.13 | 0.12 | 0.25 |
| | E of Highway 6 | 700 | 0.05 | 0.04 | 0.05 | 0.07 |

Results of the analyses of intersection operations, queueing operations, and SimTraffic simulations demonstrate that the operations of the network remain satisfactory on Tower Street South/Highway 6 despite the volume exceeding road capacity. However, upgrading Tower Street South to a 4-lane configuration (i.e. 2 through lanes per direction) between the Skyline Retail Plaza access and 2nd Line is still warranted to increase road capacity by the 2031 horizon.

Table 14: Mid-Block Operations – 2049 Background Conditions

| ROAD SECTION & LOCATION | | CAPACITY (VPHPL) | AM PEAK HOUR V/C RATIO | | PM PEAK HOUR V/C RATIO | |
|-------------------------|---------------------------|---------------------|---------------------------|-------|---------------------------|-------|
| | | | NB/EB | SB/WB | NB/EB | SB/WB |
| Guelph St | N of McQueen Blvd | 700 | 0.00 | 0.05 | 0.22 | 0.05 |
| | N of 2 nd Line | 700 | 0.04 | 0.14 | 0.26 | 0.06 |
| | S of 2 nd Line | 700 | 0.01 | 0.02 | 0.01 | 0.02 |
| Tower St S/Hwy 6 | N of McQueen Blvd | 1000 | 0.34 | 0.38 | 0.51 | 0.54 |
| | S of McQueen Blvd | 1000 | 0.34 | 0.54 | 0.57 | 0.49 |
| | S of Skyline Retail | 1000 | 0.70 | 0.84 | 1.07 | 0.91 |
| | S of 2 nd Line | 1000 | 0.70 | 0.88 | 1.13 | 0.89 |
| McQueen Blvd | W of Guelph St | 700 | 0.18 | 0.00 | 0.00 | 0.22 |
| | W of Tower St S | 700 | 0.47 | 0.04 | 0.15 | 0.24 |
| | E of Tower St S | 700 | 0.16 | 0.20 | 0.56 | 0.31 |
| Scotland St | N of McQueen Blvd | 700 | 0.36 | 0.60 | 0.36 | 0.18 |
| | S of McQueen Blvd | 700 | 0.35 | 0.60 | 0.36 | 0.18 |
| | S of 2 nd Line | 500 | 0.21 | 0.18 | 0.41 | 0.17 |
| 2 nd Line | W of Guelph St | 500 | 0.20 | 0.24 | 0.33 | 0.23 |
| | W of Highway 6 | 700 | 0.22 | 0.14 | 0.13 | 0.28 |
| | E of Highway 6 | 700 | 0.06 | 0.04 | 0.05 | 0.08 |

3.3.4 Operational Summary

Based on the results of the analyses of intersection, queueing, and mid-block operations, and applying the network upgrades proposed in the Township TMP, the network will provide adequate operations through the 2049 horizon under future background conditions. Minor changes were required to the timing plan at the intersection of Tower Street South and McQueen Boulevard to accommodate increased northbound left turn volumes.

Consideration should be given to increasing the capacity of Tower Street South between the Skyline Retail Plaza access and 2nd Line by adding an additional through lane in each direction by the 2031 horizon. No additional changes are required to accommodate the future background conditions.

4 Proposed Development

This chapter will cover the location, proposed land-use, access, and traffic generated by the South Fergus Secondary Plan development.

4.1 SITE LOCATION

As previously indicated and illustrated in Figure 1, the South Fergus Secondary Plan Area (Study Area) is generally bound by McQueen Boulevard to the north, 2nd Line to the south, Scotland Street to the east and Guelph Street to the west. It is bisected into an eastern portion and western portion by Tower Street South/Highway 6.

4.2 LAND-USE

The Study Area is predominantly a residential development, with provisions to include commercial areas within the development as mixed-use with residential units. As illustrated in Figure 13, the development has been divided into 16 development zones (Zones A through P). The corresponding land areas, unit counts and commercial floor areas are summarized in Table 15; the adjusted areas represent 78% of the gross area, allowing for internal roads, stormwater management ponds, etc.

As shown, the total development size is nearly 113 ha, leaving approximately 35 ha unclaimed. This unclaimed land represents approximately 32 ha of natural heritage features (areas to be left undeveloped due to historical/environmental significance) and 3.1 ha which will be allocated to parkland (the precise amount to be determined in future Plan of Subdivision applications).

With respect to development levels, the development will include:

- 953 low density residential units;
- 871 medium density residential units;
- 1106 mixed use commercial/corridor residential units;
- 158 gateway commercial residential units; and
- 3088 total residential units.

In addition, the following will also be provided:

- approximately 35,800 m² (385,000 ft²) of commercial gross floor area within the gateway commercial and mixed-use corridor zones; and
- an elementary school with an assumed 400 student enrolment.

Table 15: Study Area Land-Uses by Development Zone

| ZONE & LAND USE | | LAND AREA | | DEVELOPMENT SIZE | |
|-----------------|----------------------------|---------------|---------------|------------------|-----------------------|
| | | Gross (ha) | Adjusted (ha) | Units | GFA (m ²) |
| A | medium-density residential | 2.79 | 2.18 | 95 | - |
| B | low-density residential | 17.20 | 13.42 | 267 | - |
| C | mixed-use corridor | 12.32 | 9.61 | 721 | 19,220 |
| D | low-density residential | 8.23 | 6.42 | 128 | - |
| E | medium-density residential | 3.52 | 2.75 | 119 | - |
| F | gateway commercial | 1.71 | 1.33 | - | 3335 |
| G | mixed-use corridor | 2.33 | 1.82 | 136 | 3635 |
| H | mixed-use corridor | 4.25 | 3.32 | 249 | 6630 |
| I | gateway commercial | 1.89 | 1.47 | 83 | 2950 |
| J | medium-density residential | 2.03 | 1.58 | 69 | - |
| K | low-density residential | 14.90 | 11.62 | 232 | - |
| L | medium-density residential | 5.99 | 4.67 | 203 | - |
| M | low-density residential | 9.75 | 7.61 | 152 | - |
| N | low-density residential | 11.08 | 8.64 | 173 | - |
| O | institutional (school) | 3.36 | 2.62 | | - |
| P | medium-density residential | 11.34 | 8.85 | 385 | - |
| Total | | 112.69 | 87.90 | 3088 | 35,770 |

4.3 PHASING

The build-out date of the site was determined based on the number of residential units present within the development and rate of construction. Assuming a unit uptake rate in the order of 180 units per year (approximate historical uptake rate in the Elora/Fergus area), the nearly 3,100 residential units proposed for the Study Area will be fully built-out in approximately 17 years (2039 completion). Other construction (such as standalone commercial buildings, the new school, etc.) are assumed to be built in parallel with the residential development thus do not affect the build-out year.

Based on communications with the developers, the following development phasing has been established (as illustrated in Figure 14):

| | | | |
|---------|----------------|--------------|---------|
| Phase 1 | Phase 2 | Phase 3 | Phase 4 |
| Zone P | Zones A, B & C | Zones E to O | Zone D |

In consideration of the assumed uptake rate of 180 residential units per year, the following horizon years have been considered:

| | | | |
|---------|---------|---------|---------|
| Phase 1 | Phase 2 | Phase 3 | Phase 4 |
| 2025 | 2031 | 2039 | 2039 |

4.4 SITE ACCESS

4.4.1 Access Arrangement

Collector Road Access

Access to the Study Area will be provided by the existing road network and by two new collector roads built within the eastern portion of the Study Area as illustrated in Figure 13.

- The first collector will be built in an east-west alignment between Tower Street South and Scotland Street (new 3-leg intersections will be constructed at both limits), approximately 350 metres north of 2nd Line. This location has been established in consideration of the natural heritage corridor which bisects the SFSPA and the desire to provide an appropriate frontage from it (as evident in Figure 13). As previously noted, it is expected that the existing Highway 6 connecting link south limit will be extended to 2nd Line, thereby encompassing the proposed intersection and placing the jurisdiction of such with the Township. Should the connecting link not be extended, approvals will be required from the MTO.
- The second collector will be built in a north-south alignment between McQueen Boulevard and 2nd Line, aligning with McTavish Street to the north.

It has been assumed these roads will be built to the appropriate municipal standards with 2-lane cross-sections. Construction of these roads is assumed to coincide with the start of Phase 3 developments (i.e. 2031 or later), as they will be required to provide access to said developments.

Highway 6 Commercial Access

Access to Highway 6 for mixed-use and/or highway commercial blocks will be considered as part of future development plans in conjunction with the development of the local road systems. It is assumed that access will be reflective of that which is currently on the east side of Highway 6, including a new access opposite the Skyline Retail Plaza access (thus creating a 4th leg at this

signalized intersection). Direct commercial driveway access to Highway 6 should be discouraged (and likely not permitted by MTO) in favour of access via the local roads.

Local Road Access

Access to the remaining zones has been assumed to be provided by new local roads/public accesses built off the collector network. These access points are assumed will also be built to the appropriate municipal standards.

4.4.2 Access Spacing

To ensure that interruptions to through traffic are minimized, both MTO and Transportation Association of Canada (TAC) recommend minimum separation distances between intersections along a road. The relevant intersection spacing standards are as follows:

- MTO
 - Class 2B Arterial (i.e. Highway 6) - 1600 metres desired, 800 metres minimum
 - Class 3 Collector - 800 metres desired, 400 metres minimum
 - Class 4 Local - 400 metres minimum
- TAC
 - arterials (i.e. Tower Street) - 400 metres desired between signalized intersections; 200 metres minimum
 - collectors and local roads at 4-legged intersections - 60 metres minimum
 - local roads at 3-legged intersections - 40 metres minimum

Recognizing that management of Highway 6 within the project area will transfer to the Township (as detailed in Section 3.1.1) and all other roads within the project area are/will be under jurisdiction of the Township, intersection spacing standards as defined by TAC are considered appropriate to apply.

With regard to the east-west collector, it will be located between two signalized intersections along Highway 6 - approximately 350 metres north of 2nd Line intersection and 520 metres south of the Skyline Retail intersection. While the 350 metre spacing from 2nd Line is somewhat less than the recommended 400 metre spacing, such is not considered problematic given that the new access intersection with Tower Street will be a T intersection with no west leg and hence no northbound left turn lane. The 400 metre spacing is typically desired to ensure that there is no overlap between back-to-back left lanes (which in this case would be between the southbound left turn at 2nd Line and the northbound left turn at the new access intersection). It is noted that

the location of the east-west collector respects the existing watercourse, natural heritage corridor and required buffers.

With regard to the new north-south collector, the southern terminus on 2nd Line will be located more than 200 metres away from the intersections at Scotland Street and Highway 6, thus the spacing between intersections is considered appropriate.

Local roads/private accesses connecting individual zones to the arterial/collector network will adhere to the minimum spacing requirements set forth by TAC (noted above) - 200 metres between intersections on an arterial road (i.e. connecting to Tower Street/Highway 6 or 2nd Line) and 60 metres between intersections on a collector road (Guelph Street, McQueen Boulevard, Scotland Street, or the new north/south or east/west collectors).

4.5 SITE TRAFFIC

4.5.1 Trip Generation

The number of vehicle trips expected to be generated by the SFSPA during the weekday AM and PM peak hours has been developed based on the type of use, the size of each internal zone and associated trip generation rates per the ITE *Trip Generation Manual*⁸. The trip rates for each identified land-use are summarized in Table 16, with the associated trip estimates for each zone summarized in Table 17.

Table 16: Study Area Trip Rates

| ITE LAND USE | SFSPA LAND USE | ITE CODE | VARIABLE | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--------------------------------|--------------------------|----------|--------------------------|----------------------|------|-------|----------------------|------|-------|
| | | | | In | Out | Total | In | Out | Total |
| single family detached | low-density residential | 210 | units | 0.19 | 0.56 | 0.74 | 0.62 | 0.37 | 0.99 |
| multifamily housing (low-rise) | med-density residential | 220 | units | 0.11 | 0.35 | 0.46 | 0.35 | 0.21 | 0.56 |
| multifamily housing (mid-rise) | high-density residential | 221 | units | 0.09 | 0.27 | 0.36 | 0.27 | 0.17 | 0.44 |
| elementary school (KG-6) | institutional - school | 520 | students | 0.36 | 0.31 | 0.67 | 0.08 | 0.09 | 0.17 |
| shopping centre | commercial | 820 | 1000 ft ² GLA | 0.58 | 0.36 | 0.94 | 1.83 | 1.98 | 3.81 |

⁸ *Trip Generation Manual, 10th Edition*. Institute of Transportation Engineers. September 2017.

Table 17: Study Area Trip Generation

| ZONE | LAND USE | ITE CODE | SIZE | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--------------|-------------------------|----------|-------------------------|----------------------|--------------|--------------|----------------------|--------------|--------------|
| | | | | In | Out | Total | In | Out | Total |
| A | med-density residential | 220 | 95 units | 10 | 34 | 44 | 33 | 20 | 53 |
| B | low-density residential | 210 | 267 units | 49 | 148 | 198 | 167 | 98 | 265 |
| C | mixed-use corridor | 221 | 721 units | 67 | 192 | 260 | 194 | 124 | 317 |
| | | 820 | 206,874 ft ² | 121 | 74 | 194 | 378 | 410 | 788 |
| D | low-density residential | 210 | 128 units | 24 | 71 | 95 | 80 | 47 | 127 |
| E | med-density residential | 220 | 119 units | 13 | 42 | 55 | 42 | 25 | 67 |
| F | gateway commercial | 221 | 75 units | 7 | 20 | 27 | 20 | 13 | 33 |
| | | 820 | 35,892 ft ² | 21 | 13 | 34 | 66 | 71 | 137 |
| G | mixed-use corridor | 221 | 136 units | 13 | 36 | 49 | 37 | 23 | 60 |
| | | 820 | 39,125 ft ² | 23 | 14 | 37 | 72 | 78 | 149 |
| H | mixed-use corridor | 221 | 249 units | 23 | 66 | 90 | 67 | 43 | 109 |
| | | 820 | 71,365 ft ² | 42 | 25 | 67 | 131 | 141 | 272 |
| I | gateway commercial | 221 | 83 units | 8 | 22 | 30 | 22 | 14 | 36 |
| | | 820 | 31,736 ft ² | 18 | 11 | 30 | 58 | 63 | 121 |
| J | med-density residential | 220 | 69 units | 7 | 24 | 32 | 24 | 14 | 39 |
| K | low-density residential | 210 | 232 units | 43 | 129 | 172 | 145 | 85 | 230 |
| L | med-density residential | 220 | 203 units | 22 | 72 | 93 | 72 | 42 | 114 |
| M | low-density residential | 210 | 152 units | 28 | 84 | 113 | 95 | 56 | 151 |
| N | low-density residential | 210 | 173 units | 32 | 96 | 128 | 108 | 63 | 171 |
| O | institutional (school) | 520 | 400 students | 145 | 123 | 268 | 33 | 35 | 68 |
| P | med-density residential | 220 | 385 units | 41 | 136 | 177 | 136 | 80 | 215 |
| Total | | | | 756 | 1,435 | 2,191 | 1,978 | 1,545 | 3,522 |

When fully built out, the Study Area is expected to generate in the order of 2,190 trips during the weekday AM peak hour and 3,520 trips during the weekday PM peak hour. These trips are the combined total of inbound and outbound trips.

It is recognized that a portion of these trips will not be new trips, but rather consist of both internal trips and pass-by trips.

- Internal trips occur when both the origin and destination of the trip are either within the same zone or same area within the development. The trip can be completed without ever entering the external road network (i.e. without travelling along or crossing any of the roads outlined in Section 2.1 and 3.1). For example, a motorist may live in Zone C and travel to a shop within Zone C via internal roads, never needing to travel along Tower Street South thus generating an internal trip.
- Pass-by trips occur when the origin and destination of the trip are outside of an intermediate location, but the trip will stop at the intermediate location while travelling. For example, a motorist may live in northern Fergus and, while travelling to their place of work in Guelph, will stop at a coffee shop in Zone C thus generating a pass-by trip in Zone C.

While it is certain that applying internal and pass-by reductions would reduce the total number of new trips generated, not applying these reductions offers a worst-case scenario for the adjacent road network. It is also noted that these reductions only typically affect commercial land-uses – residential land-uses are not expected to generate significant internal or pass-by trips. Therefore, internal and pass-by trips are largely only applicable to the mixed-use developments along Tower Street South. It is possible that zones adjacent to the mixed-use zones may generate internal trips if internal connections are available. The internal interconnectivity of adjacent zones is not yet final, affecting the number of internal trips possible. Therefore, no reductions have been applied for internal and pass-by trips within the network.

4.5.2 Trip Distribution & Assignment

Distribution of new trips to the network is based on observed travel patterns through the project area road network evident in the 2021 counts, proximity to nearby build-up areas, and travel patterns observed by the *2016 Transportation Tomorrow Survey* (TTS). The TTS is a comprehensive survey of travel patterns in the Greater Golden Horseshoe conducted every 5 years, with the most recent data available being from the 2016 survey. The TTS allows for the trips of a numbered traffic zone (or group of traffic zones) to be traced from trip origin to trip destination, both inbound and outbound from the zone(s) of interest. Based on these observations, the following distribution has been applied, with the intended trip origin/destination provided in parentheses:

- to/from the north (Fergus): 40%
- to/from the south (Guelph): 40%
- to/from the west (Elora/Salem): 20%

Trips from each development zone were distributed to the nearest adjacent road(s) within the road network, then moved through the remaining network based on their assigned travel direction and expected travel route. The resulting site-generated traffic volumes at each horizon and their distribution to the network are illustrated in Figure 15 through Figure 18 for Phases 1 through 4 respectively.

4.6 ACTIVE TRANSPORTATION

In conjunction with the development of the internal road system, the following active transportation facilities will be provided:

- sidewalks on one side of local roads;
- sidewalks on both sides of collector roads; and
- dedicated cycling facilities on collector roads.

In addition, as evident in the land use plan of Figure 13, a number of trail corridors will be provided throughout the development lands (on both sides of Tower Street South) utilizing natural corridors where appropriate. It is expected that connections will be provided between the trail systems and the sidewalk systems to increase connectivity and permeability throughout the development.

Similarly, it is expected that enhanced pedestrian crossings will be provided at the site access intersections with Tower Street South (in conjunction with traffic signals) to ensure appropriate crossing opportunities are afforded.

5 Future Total Conditions

This chapter will address the resulting impacts of the South Fergus Secondary Plan Area on the adjacent road system at each identified horizon year. The following areas will be addressed:

- operations of the road network including;
 - operations of the key intersections;
 - vehicle queueing at each key intersection;
 - mid-block capacity assessment;
 - roundabout feasibility; and
- potential improvements to the project area road network, if necessary.

5.1 TRAFFIC VOLUMES

To assess the impacts of the Study Area on the local road network, the site-generated volumes have been added to the future background volumes for each horizon year (2025, 2031, 2039 and 2049). Additionally, a minimum volume of 10 vehicles was applied to each movement within the network. This ensures a conservative assessment at each intersection. The resulting future total volumes are illustrated in Figure 19 through Figure 22.

5.2 TRAFFIC OPERATIONS

Analysis of the operations of the key intersections and midblock capacity was assessed again at each future horizon to assess the impact of the Study Area. Vehicle queueing at key was reviewed under the 2039 and 2049 total conditions, as these represent the ultimate traffic conditions and thus worst-case scenario on the road network.

5.2.1 Intersection Operations

The operations of the key intersections were analyzed a final time at each horizon under future total conditions. Results of the analyses are summarized in Table 20 and Table 21 with detailed worksheets provided in Appendix F.

It is noted that improvements are required at several intersections within the Tower Street South corridor to ensure acceptable intersection operations due to significant increases in traffic volume (which have been considered in the intersection operating conditions noted). These improvements include the addition of exclusive left and/or right turn lanes, the addition of another through lane and/or adjustment to timing plans (more detail is provided in Section 5.3 as to the specific improvements). Outside of the Tower Street South corridor, the remaining

intersections performed well in their background condition configuration and thus no further improvements are required to accommodate future total conditions.

Table 18: Intersection Operations – 2025 Total Conditions

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--|--------|--------|----------------------|------|------|----------------------|------|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Scotland Street & McQueen Boulevard | EB LR | stop | 13s | B | 0.11 | 11s | B | 0.05 |
| | NB L | free | 1 | A | 0.01 | 1 | A | 0.01 |
| Tower Street S & McQueen Boulevard | EB L | signal | 25 | C | 0.04 | 27 | C | 0.15 |
| | EB T | signal | 25 | C | 0.06 | 28 | C | 0.19 |
| | EB R | signal | 25 | C | 0.04 | 27 | C | 0.02 |
| | WB L | signal | 31 | C | 0.56 | 33 | C | 0.58 |
| | WB TR | signal | 26 | C | 0.18 | 28 | C | 0.18 |
| | NB L | signal | 7 | A | 0.02 | 9 | A | 0.12 |
| | NB TR | signal | 8 | A | 0.26 | 13 | B | 0.56 |
| | SB L | signal | 4 | A | 0.10 | 7 | A | 0.47 |
| | SB TR | signal | 5 | A | 0.29 | 5 | A | 0.26 |
| overall | signal | 10 | A | 0.37 | 13 | B | 0.56 | |
| Scotland Street/ Jones Baseline & 2 nd Line | EB LR | stop | 9 | A | 0.06 | 9 | A | 0.04 |
| | NB L | stop | 2 | A | 0.01 | 2 | A | 0.02 |
| Tower Street S & Skyline Plaza Access | WB L | signal | 38 | D | 0.36 | 33 | C | 0.36 |
| | WB R | signal | 34 | C | 0.02 | 31 | C | 0.08 |
| | NB TR | signal | 6 | A | 0.24 | 9 | A | 0.51 |
| | SB L | signal | 3 | A | 0.11 | 5 | A | 0.31 |
| | SB T | signal | 6 | A | 0.56 | 6 | A | 0.47 |
| overall | signal | 7 | A | 0.57 | 9 | A | 0.50 | |
| Tower Street S/Highway 6 & 2 nd Line | EB LTR | signal | 36 | D | 0.36 | 36 | D | 0.45 |
| | WB LTR | signal | 34 | C | 0.12 | 33 | C | 0.18 |
| | NB L | signal | 2 | A | 0.04 | 3 | A | 0.05 |
| | NB TR | signal | 4 | A | 0.36 | 8 | A | 0.72 |
| | SB L | signal | 2 | A | 0.01 | 3 | A | 0.02 |
| | SB TR | signal | 6 | A | 0.59 | 5 | A | 0.51 |
| overall | signal | 7 | A | 0.57 | 9 | A | 0.69 | |
| Guelph Street & 2 nd Line | EB L | free | 2 | A | 0.01 | 4 | A | 0.04 |
| | WB L | free | 1 | A | 0.00 | 1 | A | 0.00 |
| | NB LTR | stop | 9 | A | 0.02 | 9 | A | 0.02 |
| | SB LTR | stop | 9 | A | 0.04 | 9 | A | 0.04 |

Table 19: Intersection Operations – 2031 Total Conditions

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--|---------|--------|----------------------|------|------|----------------------|------|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Scotland Street & McQueen Boulevard | EB LR | stop | 13s | B | 0.12 | 11s | B | 0.06 |
| | NB L | free | 1 | A | 0.01 | 1 | A | 0.01 |
| Tower Street S & McQueen Boulevard | EB L | signal | 27 | C | 0.40 | 39 | D | 0.56 |
| | EB T | signal | 24 | C | 0.06 | 34 | C | 0.24 |
| | EB R | signal | 26 | C | 0.26 | 33 | C | 0.09 |
| | WB L | signal | 30 | C | 0.56 | 37 | D | 0.53 |
| | WB TR | signal | 25 | C | 0.18 | 34 | C | 0.23 |
| | NB L | signal | 9 | A | 0.18 | 19 | B | 0.55 |
| | NB TR | signal | 9 | A | 0.35 | 14 | B | 0.63 |
| | SB L | signal | 4 | A | 0.13 | 12 | B | 0.61 |
| | SB T | signal | 5 | A | 0.34 | 6 | A | 0.43 |
| | overall | signal | 12 | B | 0.41 | 15 | B | 0.62 |
| Scotland Street/ Jones Baseline & 2 nd Line | EB LR | stop | 9 | A | 0.07 | 9 | A | 0.05 |
| | NB L | free | 2 | A | 0.01 | 2 | A | 0.02 |
| Tower Street S & Skyline Plaza Access/Zone C Access | EB L | signal | 39 | D | 0.66 | 58 | E | 0.90 |
| | EB TR | signal | 29 | B | 0.10 | 24 | C | 0.16 |
| | WB L | signal | 30 | B | 0.22 | 25 | C | 0.23 |
| | WB TR | signal | 28 | B | 0.05 | 23 | C | 0.10 |
| | NB L | signal | 7 | A | 0.19 | 27 | C | 0.74 |
| | NB TR | signal | 11 | B | 0.32 | 19 | C | 0.65 |
| | SB L | signal | 7 | A | 0.14 | 16 | B | 0.46 |
| | SB TR | signal | 12 | B | 0.47 | 27 | C | 0.77 |
| overall | signal | 15 | B | 0.49 | 27 | C | 0.82 | |
| Guelph Street & McQueen Boulevard | EB L | free | 8 | A | 0.01 | 8 | A | 0.01 |
| | WB L | free | 8 | A | 0.02 | 8 | A | 0.06 |
| | NB LTR | stop | 9 | A | 0.14 | 13 | B | 0.24 |
| | SB LTR | stop | 11 | B | 0.07 | 12 | B | 0.09 |
| Tower Street S/Highway 6 & 2 nd Line | EB LTR | signal | 34 | C | 0.34 | 38 | D | 0.46 |
| | WB LTR | signal | 32 | C | 0.14 | 34 | C | 0.16 |
| | NB L | signal | 3 | A | 0.10 | 7 | A | 0.32 |
| | NB TR | signal | 3 | A | 0.25 | 6 | A | 0.48 |
| | SB L | signal | 3 | A | 0.02 | 4 | A | 0.04 |
| | SB TR | signal | 4 | A | 0.36 | 5 | A | 0.41 |
| overall | signal | 7 | A | 0.36 | 8 | A | 0.48 | |

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--------------------------------------|--------|------|----------------------|-----|------|----------------------|-----|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Guelph Street & 2 nd Line | EB L | free | 2 | A | 0.01 | 4 | A | 0.05 |
| | WB L | free | 1 | A | 0.01 | 1 | A | 0.01 |
| | NB LTR | stop | 9 | A | 0.04 | 11 | B | 0.04 |
| | SB LTR | stop | 11 | B | 0.14 | 11 | B | 0.12 |

Table 20: Intersection Operations - 2039 Total Conditions

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--|---------|--------|----------------------|-----|------|----------------------|-----|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Scotland Street & McQueen Boulevard | EB LR | stop | 15s | B | 0.17 | 12s | B | 0.07 |
| | NB L | free | 1 | A | 0.01 | 1 | A | 0.01 |
| Tower Street S & McQueen Boulevard | EB L | signal | 19 | B | 0.26 | 43 | D | 0.40 |
| | EB T | signal | 23 | C | 0.09 | 47 | D | 0.34 |
| | EB R | signal | 24 | C | 0.23 | 46 | D | 0.19 |
| | WB L | signal | 21 | C | 0.39 | 41 | D | 0.51 |
| | WB TR | signal | 24 | C | 0.27 | 47 | D | 0.43 |
| | NB L | signal | 11 | B | 0.54 | 54 | D | 0.87 |
| | NB T | signal | 17 | B | 0.63 | 19 | B | 0.65 |
| | NB R | signal | 11 | B | 0.03 | 13 | B | 0.18 |
| | SB L | signal | 12 | B | 0.25 | 17 | B | 0.64 |
| | SB T | signal | 19 | B | 0.69 | 29 | C | 0.82 |
| | SB R | signal | 13 | B | 0.02 | 16 | B | 0.06 |
| | overall | signal | 19 | B | 0.57 | 29 | C | 0.83 |
| Scotland Street/ Jones Baseline & 2 nd Line | EB LR | stop | 9 | A | 0.07 | 11 | B | 0.05 |
| | NB L | free | 2 | A | 0.01 | 2 | A | 0.02 |
| Future N/S Collector & Future E/W Collector | EB LTR | stop | 8 | A | 0.03 | 8 | A | 0.05 |
| | WB LTR | stop | 8 | A | 0.05 | 8 | A | 0.05 |
| | NB LTR | stop | 8 | A | 0.07 | 8 | A | 0.05 |
| | SB LTR | stop | 8 | A | 0.05 | 8 | A | 0.03 |
| Tower Street S & Skyline Plaza Access/Zone C Access | EB L | signal | 26 | C | 0.65 | 74 | E | 0.93 |
| | EB TR | signal | 18 | B | 0.10 | 29 | C | 0.16 |
| | WB L | signal | 19 | B | 0.21 | 30 | C | 0.25 |
| | WB TR | signal | 18 | B | 0.05 | 28 | C | 0.10 |

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|---|---------|--------|----------------------|------|------|----------------------|------|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Tower Street S & Skyline Plaza Access/Zone C Access | NB L | signal | 7 | A | 0.23 | 49 | D | 0.83 |
| | NB TR | signal | 12 | B | 0.59 | 26 | C | 0.81 |
| | SB L | signal | 7 | A | 0.23 | 23 | C | 0.60 |
| | SB T | signal | 12 | B | 0.58 | 28 | C | 0.78 |
| | SB R | signal | 8 | A | 0.07 | 19 | B | 0.30 |
| | overall | signal | 13 | B | 0.57 | 31 | C | 0.88 |
| Tower Street S & Future E/W Collector | WB L | signal | 21 | C | 0.46 | 63 | E | 0.76 |
| | WB R | signal | 19 | B | 0.18 | 46 | D | 0.19 |
| | NB T | signal | 13 | B | 0.53 | 25 | C | 0.76 |
| | NB R | signal | 9 | A | 0.06 | 15 | B | 0.20 |
| | SB L | signal | 6 | A | 0.31 | 51 | D | 0.86 |
| | SB T | signal | 6 | A | 0.45 | 5 | A | 0.43 |
| overall | signal | 11 | B | 0.52 | 24 | C | 0.86 | |
| Guelph Street & McQueen Boulevard | EB L | free | 8 | A | 0.01 | 8 | A | 0.01 |
| | WB L | free | 8 | A | 0.03 | 9 | A | 0.07 |
| | NB LTR | stop | 12 | B | 0.22 | 26 | D | 0.63 |
| | SB LTR | stop | 12 | B | 0.08 | 15 | C | 0.13 |
| Tower Street S/Highway 6 & 2 nd Line | EB L | signal | 26 | C | 0.27 | 30 | C | 0.44 |
| | EB TR | signal | 29 | C | 0.21 | 34 | C | 0.16 |
| | WB L | signal | 26 | C | 0.52 | 30 | C | 0.38 |
| | WB TR | signal | 27 | C | 0.10 | 34 | C | 0.23 |
| | NB L | signal | 9 | A | 0.37 | 34 | C | 0.80 |
| | NB TR | signal | 12 | B | 0.45 | 17 | B | 0.78 |
| | SB L | signal | 9 | A | 0.05 | 13 | B | 0.22 |
| | SB TR | signal | 18 | B | 0.70 | 21 | C | 0.79 |
| overall | signal | 17 | B | 0.63 | 21 | C | 0.75 | |
| Guelph Street & 2 nd Line | EB L | free | 2 | A | 0.01 | 4 | A | 0.06 |
| | WB L | free | 1 | A | 0.01 | 1 | A | 0.01 |
| | NB LTR | stop | 9 | A | 0.04 | 11 | B | 0.05 |
| | SB LTR | stop | 12 | B | 0.30 | 13 | B | 0.28 |

Table 21: Intersection Operations – 2049 Total Conditions

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|--|---------|---------|----------------------|-----|------|----------------------|-----|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Scotland Street & McQueen Boulevard | EB LR | stop | 17s | C | 0.21 | 12s | B | 0.09 |
| | NB L | free | 1 | A | 0.02 | 1 | A | 0.01 |
| Tower Street S & McQueen Boulevard | EB L | signal | 19 | B | 0.26 | 43 | D | 0.42 |
| | EB T | signal | 23 | C | 0.09 | 48 | D | 0.35 |
| | EB R | signal | 25 | C | 0.37 | 47 | D | 0.19 |
| | WB L | signal | 21 | C | 0.39 | 42 | D | 0.54 |
| | WB TR | signal | 24 | C | 0.27 | 48 | D | 0.46 |
| | NB L | signal | 13 | B | 0.57 | 62 | E | 0.90 |
| | NB T | signal | 18 | B | 0.67 | 19 | B | 0.68 |
| | NB R | signal | 12 | B | 0.04 | 13 | B | 0.19 |
| | SB L | signal | 13 | B | 0.30 | 23 | C | 0.72 |
| | SB T | signal | 22 | C | 0.73 | 32 | C | 0.85 |
| | SB R | signal | 14 | B | 0.02 | 16 | B | 0.06 |
| | overall | signal | 19 | B | 0.60 | 31 | C | 0.86 |
| Scotland Street/ Jones Baseline & 2 nd Line | EB LR | stop | 9 | A | 0.09 | 11 | B | 0.07 |
| | NB L | free | 2 | A | 0.02 | 2 | A | 0.02 |
| Future N/S Collector & Future E/W Collector | EB LTR | stop | 8 | A | 0.07 | 8 | A | 0.07 |
| | WB LTR | stop | 8 | A | 0.07 | 8 | A | 0.07 |
| | NB LTR | stop | 8 | A | 0.09 | 8 | A | 0.07 |
| | SB LTR | stop | 8 | A | 0.07 | 8 | A | 0.07 |
| Tower Street S & Skyline Plaza Access/Zone C Access | EB L | signal | 26 | C | 0.65 | 76 | E | 0.93 |
| | EB TR | signal | 19 | B | 0.13 | 30 | C | 0.19 |
| | WB L | signal | 19 | B | 0.23 | 31 | C | 0.26 |
| | WB TR | signal | 18 | B | 0.08 | 29 | C | 0.13 |
| | NB L | signal | 7 | A | 0.25 | 62 | E | 0.87 |
| | NB TR | signal | 12 | B | 0.63 | 31 | C | 0.86 |
| | SB L | signal | 7 | A | 0.27 | 34 | C | 0.70 |
| | SB T | signal | 12 | B | 0.61 | 33 | C | 0.84 |
| | SB R | signal | 8 | A | 0.07 | 21 | C | 0.33 |
| | | overall | signal | 13 | B | 0.60 | 36 | D |

| INTERSECTION, MOVEMENTS & CONTROL | | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|---|---------|--------|----------------------|------|------|----------------------|------|------|
| | | | Delay | LOS | V/C | Delay | LOS | V/C |
| Tower Street S & Future E/W Collector | WB L | signal | 21 | C | 0.46 | 63 | E | 0.76 |
| | WB R | signal | 19 | B | 0.18 | 46 | D | 0.19 |
| | NB T | signal | 13 | B | 0.56 | 27 | C | 0.81 |
| | NB R | signal | 9 | A | 0.06 | 15 | B | 0.21 |
| | SB L | signal | 6 | A | 0.32 | 59 | E | 0.89 |
| | SB T | signal | 7 | A | 0.48 | 5 | A | 0.46 |
| | overall | signal | 11 | B | 0.54 | 26 | C | 0.89 |
| Guelph Street & McQueen Boulevard | EB L | free | 8 | A | 0.02 | 8 | A | 0.02 |
| | WB L | free | 8 | A | 0.03 | 9 | A | 0.07 |
| | NB LTR | stop | 13 | B | 0.23 | 32 | D | 0.70 |
| | SB LTR | stop | 12 | B | 0.12 | 16 | C | 0.19 |
| Tower Street S/Highway 6 & 2 nd Line | EB L | signal | 26 | C | 0.29 | 30 | C | 0.46 |
| | EB TR | signal | 29 | C | 0.23 | 34 | C | 0.20 |
| | WB L | signal | 26 | C | 0.51 | 30 | C | 0.40 |
| | WB TR | signal | 27 | C | 0.10 | 34 | C | 0.24 |
| | NB L | signal | 11 | B | 0.41 | 39 | D | 0.83 |
| | NB TR | signal | 12 | B | 0.48 | 18 | C | 0.82 |
| | SB L | signal | 9 | A | 0.07 | 13 | B | 0.23 |
| | SB TR | signal | 19 | B | 0.74 | 24 | C | 0.84 |
| overall | signal | 18 | B | 0.66 | 23 | C | 0.78 | |
| Guelph Street & 2 nd Line | EB L | free | 2 | A | 0.01 | 4 | A | 0.07 |
| | WB L | free | 1 | A | 0.01 | 1 | A | 0.01 |
| | NB LTR | stop | 11 | B | 0.08 | 12 | B | 0.10 |
| | SB LTR | stop | 13 | B | 0.35 | 14 | B | 0.33 |

5.2.2 Queue Operations

A final queueing analysis was conducted using the average of five 60-minute SimTraffic simulations for each peak hour. Results of the queueing analyses for the 2039 and 2049 horizon years under future total conditions are provided in Table 22 and Table 23, with detailed worksheets provided in Appendix F.

Table 22: Queue Operations – 2039 Total Conditions

| INTERSECTION & MOVEMENTS | | STORAGE LENGTH (METRES) | | WEEKDAY AM PEAK HOUR | | WEEKDAY PM PEAK HOUR | |
|--|--------|-------------------------|----------|----------------------|------------------|----------------------|------------------|
| | | EXISTING | REQUIRED | 50 th | 95 th | 50 th | 95 th |
| | | | | | | | |
| Scotland Street & McQueen Blvd | EB LR | N/A | N/A | 10m | 18m | 8m | 16m |
| Tower Street & McQueen Boulevard | EB L | 50 | 50 | 13 | 25 | 19 | 43 |
| | EB R | 50 | 50 | 31 | 51 | 45 | 75 |
| | WB L | 30 | 30 | 19 | 32 | 31 | 53 |
| | NB L | 50 | 50 | 25 | 44 | 66 | 89 |
| | NB R | N/A | 50 | 8 | 29 | 31 | 69 |
| | SB L | 50 | 75 | 11 | 20 | 62 | 120 |
| | SB R | N/A | 30 | 8 | 29 | 23 | 59 |
| Scotland Street & 2 nd Line | EB LR | N/A | N/A | 8 | 13 | 6 | 12 |
| Future N/S Collector & Future E/W Collector | EB LTR | N/A | N/A | 6 | 13 | 7 | 14 |
| | WB LTR | N/A | N/A | 7 | 14 | 8 | 14 |
| | NB LTR | N/A | N/A | 9 | 14 | 8 | 14 |
| | SB LTR | N/A | N/A | 8 | 15 | 6 | 14 |
| Tower Street S & Skyline Plaza Access/New Collector Road | EB L | N/A | 50 | 20 | 34 | 54 | 80 |
| | WB L | N/A | N/A | 9 | 18 | 11 | 22 |
| | NB L | N/A | 100 | 11 | 21 | 47 | 92 |
| | SB L | >100 | 75 | 10 | 18 | 30 | 73 |
| | SB R | N/A | 50 | 9 | 19 | 43 | 89 |
| Tower Street S & Future E/W Collector | WB L | N/A | 50 | 20 | 34 | 45 | 75 |
| | WB R | N/A | N/A | 21 | 37 | 51 | 91 |
| | NB R | N/A | 75 | 9 | 19 | 57 | 123 |
| | SB L | N/A | 100 | 17 | 29 | 71 | 118 |
| Tower Street S/Highway 6 & 2 nd Line | EB L | N/A | 50 | 13 | 25 | 21 | 38 |
| | WB L | N/A | 30 | 18 | 31 | 16 | 30 |
| | NB L | 100 | 100 | 15 | 25 | 40 | 72 |
| | SB L | 100 | 100 | 5 | 13 | 8 | 17 |
| Guelph Street & 2 nd Line | EB LTR | N/A | N/A | 1 | 5 | 6 | 16 |
| | WB LTR | N/A | N/A | 1 | 4 | 1 | 7 |
| | NB LTR | N/A | N/A | 3 | 9 | 6 | 14 |
| | SB LTR | N/A | N/A | 18 | 30 | 17 | 27 |

Table 23: Queue Operations – 2049 Total Conditions

| INTERSECTION & MOVEMENTS | | STORAGE LENGTH (METRES) | | WEEKDAY AM PEAK HOUR | | WEEKDAY PM PEAK HOUR | |
|--|--------|-------------------------|----------|----------------------|------------------|----------------------|------------------|
| | | EXISTING | REQUIRED | 50 th | 95 th | 50 th | 95 th |
| Scotland Street & McQueen Blvd | EB LR | N/A | N/A | 11m | 18m | 9m | 16m |
| Tower Street & McQueen Boulevard | EB L | 50 | 50 | 12 | 24 | 21 | 44 |
| | EB R | 50 | 50 | 34 | 55 | 49 | 76 |
| | WB L | 30 | 30 | 20 | 35 | 37 | 60 |
| | NB L | 50 | 50 | 28 | 54 | 72 | 86 |
| | NB R | N/A | 50 | 14 | 46 | 37 | 74 |
| | SB L | 50 | 75 | 14 | 35 | 78 | 126 |
| | SB R | N/A | 30 | 8 | 31 | 25 | 63 |
| Scotland Street & 2 nd Line | EB LR | N/A | N/A | 8 | 14 | 7 | 13 |
| Future N/S Collector & Future E/W Collector | EB LTR | N/A | N/A | 9 | 15 | 9 | 15 |
| | WB LTR | N/A | N/A | 9 | 14 | 9 | 15 |
| | NB LTR | N/A | N/A | 9 | 15 | 9 | 14 |
| | SB LTR | N/A | N/A | 9 | 15 | 8 | 14 |
| Tower Street S & Skyline Plaza Access/New Collector Road | EB L | N/A | 50 | 20 | 34 | 58 | 80 |
| | WB L | N/A | N/A | 10 | 19 | 12 | 23 |
| | NB L | N/A | 100 | 11 | 21 | 69 | 134 |
| | SB L | >100 | 75 | 11 | 22 | 44 | 101 |
| | SB R | N/A | 50 | 9 | 22 | 52 | 98 |
| Tower Street S & Future E/W Collector | WB L | N/A | 50 | 19 | 32 | 46 | 78 |
| | WB R | N/A | N/A | 21 | 38 | 57 | 116 |
| | NB R | N/A | 75 | 9 | 18 | 61 | 128 |
| | SB L | N/A | 100 | 16 | 26 | 82 | 125 |
| Tower Street S/Highway 6 & 2 nd Line | EB L | N/A | 50 | 13 | 28 | 23 | 41 |
| | WB L | N/A | 30 | 20 | 33 | 17 | 30 |
| | NB L | 100 | 100 | 14 | 25 | 43 | 75 |
| | SB L | 100 | 100 | 4 | 12 | 9 | 27 |
| Guelph Street & 2 nd Line | EB LTR | N/A | N/A | 1 | 6 | 8 | 19 |
| | WB LTR | N/A | N/A | 1 | 5 | 3 | 10 |
| | NB LTR | N/A | N/A | 8 | 15 | 9 | 16 |
| | SB LTR | N/A | N/A | 18 | 29 | 18 | 28 |

The sizing of storage lanes for exclusive turns within the network is generally sufficient to accommodate expected queues during the AM peak hour through the 2049 horizon. Due to the substantial increase in volumes along the Tower Street South/Highway 6 corridor, the size of storage lanes for the exclusive turn lanes along said corridor is nearly entirely insufficient during the PM peak hour through the 2049 horizon. This is the result of the combined effect of increased turning volumes (increasing the accumulation rate of vehicles) and increased cycle lengths at signalized intersections (necessitating more storage to hold vehicle queues between green signals).

This deficiency is only partially mitigated by lengthening existing storage lanes, as through traffic queues (particularly during the weekday PM peak hour) often block access to the storage lanes. Moreover, geometric constraints at some intersections prevent or limit lengthening of storage lanes as doing so would interfere with access to existing developments along Tower Street South. The recommended turn lane storage length (considering the noted practical and geometric constraints) at each approach has been provided in the summary tables above.

5.2.3 Mid-Block Operations

Mid-block operations were assessed under the future background conditions and are summarized in Table 24 through Table 27. As recommended under background conditions, the addition of a second through lane per direction along the southern sections of Tower Street South was required by the 2031 horizon to accommodate the additional volumes generated by the Study Area developments. It is noted that the new east/west collector road operates close to capacity (v/c of 0.97) during the PM peak hour in the eastbound direction immediately east of Tower Street South. This is due to the assumptions made regarding cross-section of the road (1 through lane per direction) and assignment of trips generated by the development. The remaining roads in the network are expected to operate under capacity through the 2049 horizon.

Table 24: Mid-Block Operations – 2025 Total Conditions

| ROAD SECTION & LOCATION | | CAPACITY (VPHPL) | AM PEAK HOUR V/C RATIO | | PM PEAK HOUR V/C RATIO | |
|-------------------------|---------------------------|------------------|------------------------|-------|------------------------|-------|
| | | | NB/EB | SB/WB | NB/EB | SB/WB |
| Guelph St | N of McQueen Blvd | 500 | 0.04 | 0.05 | 0.15 | 0.06 |
| | N of 2 nd Line | 500 | 0.04 | 0.06 | 0.17 | 0.07 |
| | S of 2 nd Line | 500 | 0.03 | 0.03 | 0.03 | 0.04 |
| Tower St S/Hwy 6 | N of McQueen Blvd | 1000 | 0.27 | 0.39 | 0.51 | 0.42 |
| | S of McQueen Blvd | 1000 | 0.27 | 0.45 | 0.55 | 0.38 |
| | S of Skyline Retail | 1000 | 0.55 | 0.86 | 1.08 | 0.72 |
| | S of 2 nd Line | 1000 | 0.54 | 0.84 | 1.06 | 0.69 |
| McQueen Blvd | W of Guelph St | 700 | 0.01 | 0.04 | 0.04 | 0.03 |
| | W of Tower St S | 700 | 0.14 | 0.08 | 0.16 | 0.13 |
| | E of Tower St S | 700 | 0.18 | 0.33 | 0.61 | 0.35 |
| Scotland St | N of McQueen Blvd | 500 | 0.46 | 0.68 | 0.43 | 0.26 |
| | S of McQueen Blvd | 500 | 0.39 | 0.66 | 0.40 | 0.20 |
| | S of 2 nd Line | 500 | 0.16 | 0.14 | 0.32 | 0.13 |
| 2 nd Line | W of Guelph St | 500 | 0.16 | 0.20 | 0.27 | 0.19 |
| | W of Highway 6 | 500 | 0.15 | 0.17 | 0.15 | 0.19 |
| | E of Highway 6 | 500 | 0.06 | 0.05 | 0.07 | 0.09 |

Table 25: Mid-Block Operations – 2031 Total Conditions

| ROAD SECTION & LOCATION | | CAPACITY (VPHPL) | AM PEAK HOUR V/C RATIO | | PM PEAK HOUR V/C RATIO | |
|-------------------------|---------------------------|------------------|------------------------|-------|------------------------|-------|
| | | | NB/EB | SB/WB | NB/EB | SB/WB |
| Guelph St | N of McQueen Blvd | 700 | 0.06 | 0.07 | 0.14 | 0.07 |
| | N of 2 nd Line | 700 | 0.07 | 0.17 | 0.26 | 0.12 |
| | S of 2 nd Line | 700 | 0.06 | 0.06 | 0.06 | 0.06 |
| Tower St S/Hwy 6 | N of McQueen Blvd | 1000 | 0.40 | 0.44 | 0.65 | 0.64 |
| | S of McQueen Blvd | 1000 | 0.39 | 0.58 | 0.72 | 0.61 |
| | S of Skyline Retail | 1000 | 0.35 | 0.48 | 0.65 | 0.52 |
| | S of 2 nd Line | 1000 | 0.36 | 0.51 | 0.68 | 0.54 |
| McQueen Blvd | W of Guelph St | 700 | 0.10 | 0.19 | 0.28 | 0.23 |
| | W of Tower St S | 700 | 0.50 | 0.19 | 0.41 | 0.41 |
| | E of Tower St S | 500 | 0.19 | 0.34 | 0.63 | 0.36 |
| Scotland St | N of McQueen Blvd | 700 | 0.35 | 0.51 | 0.33 | 0.19 |
| | S of McQueen Blvd | 700 | 0.29 | 0.50 | 0.30 | 0.15 |
| | S of 2 nd Line | 700 | 0.17 | 0.15 | 0.34 | 0.15 |
| 2 nd Line | W of Guelph St | 500 | 0.17 | 0.22 | 0.29 | 0.21 |
| | W of Highway 6 | 700 | 0.23 | 0.17 | 0.19 | 0.27 |
| | E of Highway 6 | 700 | 0.06 | 0.05 | 0.06 | 0.07 |

Table 26: Mid-Block Operations – 2039 Total Conditions

| ROAD SECTION & LOCATION | | CAPACITY (VPHPL) | AM PEAK HOUR V/C RATIO | | PM PEAK HOUR V/C RATIO | |
|-------------------------|---------------------------|------------------|------------------------|-------|------------------------|-------|
| | | | NB/EB | SB/WB | NB/EB | SB/WB |
| Guelph St | N of McQueen Blvd | 700 | 0.06 | 0.07 | 0.15 | 0.08 |
| | N of 2 nd Line | 700 | 0.18 | 0.33 | 0.49 | 0.26 |
| | S of 2 nd Line | 700 | 0.06 | 0.06 | 0.06 | 0.06 |
| Tower St S/Hwy 6 | N of McQueen Blvd | 1000 | 0.54 | 0.48 | 0.76 | 0.86 |
| | S of McQueen Blvd | 1000 | 0.58 | 0.68 | 0.92 | 0.90 |
| | S of Skyline Retail | 1000 | 0.54 | 0.57 | 0.84 | 0.80 |
| | S of 2 nd Line | 1000 | 0.46 | 0.69 | 0.92 | 0.73 |
| McQueen Blvd | W of Guelph St | 700 | 0.39 | 0.42 | 0.59 | 0.67 |
| | W of Tower St S | 700 | 0.68 | 0.38 | 0.65 | 0.69 |
| | E of Tower St S | 500 | 0.21 | 0.39 | 0.68 | 0.39 |
| Scotland St | N of McQueen Blvd | 700 | 0.47 | 0.59 | 0.41 | 0.30 |
| | S of McQueen Blvd | 700 | 0.40 | 0.57 | 0.38 | 0.26 |
| | S of 2 nd Line | 700 | 0.19 | 0.17 | 0.37 | 0.16 |
| 2 nd Line | W of Guelph St | 500 | 0.19 | 0.24 | 0.31 | 0.23 |
| | W of Highway 6 | 700 | 0.40 | 0.28 | 0.33 | 0.50 |
| | E of Highway 6 | 700 | 0.12 | 0.23 | 0.27 | 0.26 |
| Future E/W Collector | E of Tower St | 700 | 0.31 | 0.63 | 0.97 | 0.69 |

Table 27: Mid-Block Operations – 2049 Total Conditions

| ROAD SECTION & LOCATION | | CAPACITY (VPHPL) | AM PEAK HOUR V/C RATIO | | PM PEAK HOUR V/C RATIO | |
|-------------------------|---------------------------|---------------------|---------------------------|-------|---------------------------|-------|
| | | | NB/EB | SB/WB | NB/EB | SB/WB |
| Guelph St | N of McQueen Blvd | 700 | 0.09 | 0.10 | 0.19 | 0.11 |
| | N of 2 nd Line | 700 | 0.20 | 0.36 | 0.53 | 0.28 |
| | S of 2 nd Line | 700 | 0.12 | 0.12 | 0.12 | 0.12 |
| Tower St S/Hwy 6 | N of McQueen Blvd | 1000 | 0.57 | 0.51 | 0.79 | 0.90 |
| | S of McQueen Blvd | 1000 | 0.60 | 0.73 | 0.96 | 0.94 |
| | S of Skyline Retail | 1000 | 0.57 | 0.60 | 0.88 | 0.83 |
| | S of 2 nd Line | 1000 | 0.49 | 0.72 | 0.96 | 0.76 |
| McQueen Blvd | W of Guelph St | 700 | 0.42 | 0.43 | 0.60 | 0.71 |
| | W of Tower St S | 700 | 0.73 | 0.39 | 0.66 | 0.71 |
| | E of Tower St S | 500 | 0.22 | 0.41 | 0.74 | 0.42 |
| Scotland St | N of McQueen Blvd | 700 | 0.51 | 0.64 | 0.44 | 0.32 |
| | S of McQueen Blvd | 700 | 0.45 | 0.64 | 0.43 | 0.28 |
| | S of 2 nd Line | 700 | 0.21 | 0.20 | 0.41 | 0.19 |
| 2 nd Line | W of Guelph St | 500 | 0.24 | 0.28 | 0.37 | 0.27 |
| | W of Highway 6 | 700 | 0.43 | 0.31 | 0.36 | 0.55 |
| | E of Highway 6 | 700 | 0.13 | 0.24 | 0.28 | 0.27 |
| Future E/W Collector | E of Tower St | 700 | 0.31 | 0.63 | 0.97 | 0.69 |

5.2.4 Roundabout Operations

As noted in Section 3.1.2, the potential for a roundabout at the intersection of Highway 6 and 2nd Line was identified by the Township and thus has been considered further to the signalized configuration as otherwise assumed. While it is noted that the MTO Class EA study for this intersection is proceeding on the premise of signalization, roundabout control has nonetheless been considered for comparative purposes.

Advantages of Roundabout Control

While traffic signals are the traditional method of improving intersection performance, roundabouts offer a number of advantages over traffic signals including:

- increased safety and reduced incidence of severe accidents due to lower speeds and fewer conflict points;
- greater capacity than traffic signals or all-way stop control for the same level of service;
- environmental benefits due to reduced stop-and-go traffic, reducing emissions, fuel consumption, and noise;
- traffic calming effects;
- reduced travel delays; and
- not affected by power outages.

Disadvantages of Roundabout Control

Roundabouts have disadvantages compared to traffic signals, especially regarding the accessibility and safety of pedestrians, particularly visually impaired pedestrians, as they lack the auditory cues and protected pedestrian movements present at signalized intersections. Furthermore:

- multi-lane roundabouts can result in increased accident frequency (albeit non-injury types);
- they do not provide priority options for emergency vehicles; and
- excessive volume on one road/approach may restrict access from the intersecting road/approaches, potentially leading to higher delays than a signalized intersection.

Roundabout vs Signal Intersection Operations

To determine feasibility of a roundabout at this intersection, analyses was conducted using ARCADY roundabout software for the 2049 total conditions as this would impose the highest demand on it. Performance of the intersection in a 2-lane roundabout configuration (determined

to be the optimal configuration) was compared to performance of the intersection in the signalized configuration established in Section 5.3.2 (worksheets are provided in Appendix G).

Results of the intersection operations analysis are summarized in Table 28. Each approach of the roundabout does not have strictly defined vehicle movements like a signalized intersection (i.e. left, through, right), therefore the approach delays of the signalized intersection have been listed to provide a more even comparison with the roundabout.

Table 28: Highway 6 & 2nd Line Roundabout vs Traffic Signals – Intersection Operations

| INTERSECTION CONTROL & APPROACH | | WEEKDAY AM PEAK HOUR | | | WEEKDAY PM PEAK HOUR | | |
|------------------------------------|---------|-------------------------|-----|------|-------------------------|----------|-------------|
| | | DELAY | LOS | V/C | DELAY | LOS | V/C |
| Traffic Signal | EB | 28 | C | 0.29 | 32 | C | 0.46 |
| | WB | 26 | C | 0.51 | 32 | C | 0.40 |
| | NB | 12 | B | 0.48 | 21 | C | 0.83 |
| | SB | 19 | B | 0.74 | 23 | C | 0.84 |
| | overall | 18 | B | 0.66 | 23 | C | 0.78 |
| Roundabout | EB | 9 | A | 0.48 | 13 | B | 0.53 |
| | WB | 6 | A | 0.22 | 17 | C | 0.48 |
| | NB | 5 | A | 0.56 | 210 | F | 1.13 |
| | SB | 8 | A | 0.74 | 23 | C | 0.91 |
| | overall | 7 | A | 0.75 | 115 | F | 1.14 |

As shown, the roundabout configuration provides better performance during the weekday AM peak hour with consistently lower delays on all approaches than the signalized configuration. The overall delay at the roundabout is only 7 seconds during the AM peak hour compared to 18 seconds for the traffic signals. This situation is not maintained during the weekday PM peak hour however, as the increased volumes on all approaches (especially the south leg/northbound volume, which is nearly doubled) see delays on the northbound approach to the roundabout reach 210 seconds. This in turn sees the overall delay at the intersection increase from 7 seconds during the AM peak hour to 115 seconds during the PM peak hour. This is an unacceptably long delay – one not experienced by the signalized configuration which provides only slightly worse overall performance (overall delay increases by 5 seconds) during the PM peak hour compared to the AM peak hour.

Roundabout vs Signal Queue Operations

A one-to-one assessment of the queuing operations under each intersection configuration is not possible due to the physical differences in how each intersection operates:

- at a roundabout, movements do not separate until entering the roundabout - there exists only one single mixed queue at each approach; whereas
- at a signalized intersection, dedicated turn lanes and/or multiple through lanes allow for movement segregation and multiple simultaneous queues at each approach.

Nonetheless, queues have been listed for every available movement for each intersection configuration (based on the recommended configuration of the signalized intersection in Section 5.3.2). Results of the queueing analysis are summarized in Table 29. It is noted that the ARCADY queue output is in vehicles (not length), thus the output value has been multiplied by 5.75 metres (one passenger car equivalent length, an input parameter for the ARCADY analysis) to provide the queue length in metres.

Table 29: Highway 6 & 2nd Line Roundabout vs Traffic Signals - Queue Operations

| INTERSECTION CONTROL & APPROACH | | WEEKDAY AM PEAK HOUR | | WEEKDAY PM PEAK HOUR | |
|------------------------------------|-------|----------------------|------------------|----------------------|------------------|
| | | 50 th | 95 th | 50 th | 95 th |
| Traffic Signal | EB L | 13m | 28m | 23m | 41m |
| | EB TR | 27 | 49 | 22 | 37 |
| | WB L | 20 | 33 | 17 | 30 |
| | WB TR | 9 | 18 | 17 | 32 |
| | NB L | 14 | 25 | 43 | 75 |
| | NB T | 30 | 51 | 66 | 106 |
| | NB TR | 20 | 48 | 73 | 113 |
| | SB L | 4 | 12 | 9 | 27 |
| | SB T | 52 | 88 | 84 | 131 |
| | SB TR | 58 | 94 | 90 | 138 |
| Roundabout | EB | 6 | 22 | 7 | 28 |
| | WB | 2 | 7 | 6 | 25 |
| | NB | 8 | 10 | 746 | 1,150 |
| | SB | 17 | 37 | 54 | 291 |

As shown, queueing performance is better with shorter queues during the weekday AM peak hour under the roundabout configuration compared to the signalized configuration. This is not unexpected given the roundabout also provides superior intersection operations during the AM peak hour. Likewise, the roundabout configuration provides much worse queueing performance with longer queues (some in excess of 1 km long) compared to the signalized configuration during the weekday PM peak hour. This also aligns with the poorer intersection operations demonstrated by the roundabout during the PM peak hour.

5.2.5 Operational Summary

Based on the results of the operational analyses conducted under future total conditions, several road system improvements will be required within the Tower Street South/Highway 6 corridor to accommodate the developments associated with the Study Area by the 2039 horizon, details of which are provided in Section 5.3. For the remainder of the roads within the network, the upgrades outlined in the Township TMP and applied under background conditions remain sufficient under future total conditions through the 2049 horizon.

With regards to the feasibility of a roundabout at the intersection of Highway 6 and 2nd Line, the roundabout has been shown to provide superior operations during the weekday AM peak hour volumes expected under the 2049 total conditions when compared to the “baseline” signalized configuration. Under weekday PM peak hour volumes at the same horizon however, the roundabout performed significantly worse than the signalized configuration due to the increased northbound volumes expected during the peak hour.

While it is likely the roundabout would perform well under most conditions prior to full build-out of the Study Area, the lengthy delays and excessive queues which would form on Highway 6 during the weekday PM peak hour demonstrate that a conventional signalized intersection using the configuration recommended in Section 5.3.2 is the preferred alternative.

5.3 ROAD NETWORK

As noted in Section 5.2, upgrades are required along the Tower Street South corridor to accommodate the future total conditions. This section summarizes the changes made, and therefore recommended upgrades to the network to accommodate the future total conditions.

5.3.1 Road Improvements

Tower Street South

The section of Tower Street South between the Skyline Retail Plaza access and 2nd Line currently consists of a single through lane per direction. Under future background conditions, accounting for background growth and additional volumes generated by the NWFSPA developments, the

noted road section will operate near/over capacity during peak times. Under future total conditions, assuming a single through lane per direction is maintained, the traffic volumes will greatly exceed the road's directional capacity by 2031. In this regard, this portion of road will have to be upgraded to provide a minimum 4-lane (2 through lanes per direction) cross-section to serve the 2031 planning horizon.

If direct accesses to developments adjacent to Tower Street South are planned, (i.e. not requiring access by an internal road) it is advisable to consider inclusion of a continuous two-way left turn lane between McQueen Boulevard and 2nd Line. This will serve to boost effective capacity of the road by allowing left turns to exit the through traffic stream.

Highway 6

The section of Highway 6 south of 2nd Line is assumed to still be operated by the MTO through the 2049 horizon. Regardless, it has been assumed that the section of Highway 6 between 2nd Line and Wellington Road 7 will also be upgraded to a 4-lane cross-section by the 2031 horizon. This will provide sufficient through capacity to accommodate increased volumes travelling along this corridor due to the significant developments planned for the Fergus area.

5.3.2 Intersection Improvements

Listed below is each intersection which required improvements from its background condition configuration in order to provide acceptable operations through the 2049 horizon, and the horizon year at which each improvement must be in place to ensure adequate performance of the network is maintained. New intersection construction or addition of new intersection legs are recommended to be in place at the start of the development phase it will serve to ensure the benefits can be realized as the phase is completed and units occupied. General adjustments to signal timing plans were made at each intersection to improve performance (adjusting cycle lengths, phasing, etc.) with unique changes noted.

Tower Street South & McQueen Boulevard

- 2039 (required to serve the 2039 and 2049 horizons)
 - addition of a 50 metre exclusive right turn lane on the north leg
 - addition of a 30 metre exclusive right turn lane on the south leg
 - lengthening of the southbound left turn storage lane to 75 metres
 - addition of protected left turn phases (i.e. advance green) for all left turn movements

Tower Street South & Skyline Retail Plaza

- 2025 (required to serve Phase 2 development which will occur from 2025 to 2031)
 - addition of a west leg to serve the development, containing one shared through/right turn lane and one 50 metre exclusive left turn lane
 - addition of a 75 metre exclusive left turn lane on the north approach (the current left turn lane would be converted to a through lane)
 - addition of a 100 metre exclusive left turn lane on the south leg
 - addition of protected left movements to the signal phasing plan for the northbound and southbound left turn movements
- 2039 (required to serve the horizon 2039 to 2049)
 - addition of a 50 metre exclusive right turn lane on the north leg

Tower Street South & E/W Collector Road

- 2031 (required to serve Phase 3 development which will occur from 2031 to 2039)
 - construction of a new signalized T-intersection to serve Phase 3 development, connecting the proposed east/west collector road to Tower Street South with the following configuration:
 - North Leg: two through lanes and one 100 metre exclusive left turn lane with protected left movement in signal plan
 - South Leg: two through lanes and one 100 metre exclusive right turn lane
 - East Leg: one 50 metre exclusive left turn lane and one exclusive right turn lane

Tower Street South/Highway 6 & 2nd Line

- 2039 (required to serve the horizon 2039 to 2049)
 - addition of 30 metre exclusive left turn lane on east leg
 - addition of 50 metre exclusive left turn lane on west leg
 - addition of protected left movements to the signal phasing plans for all left turn movements

6 Summary

This Transportation Plan has addressed the transportation impacts associated with the proposed developments within the South Fergus Secondary Plan area (Study Area).

6.1 PROPOSED DEVELOPMENT

The Study Area consists of approximately 147 hectares of land in the south area of the community of Fergus, Township of Centre Wellington, County of Wellington. When fully built out, the Study Area will contain nearly 3,100 residential units of various types, commercial spaces, and a new elementary school. Upon completion, the developments within the Study Area are expected to generate approximately 2,190 trips during the weekday AM peak hour and 3,520 trips during the weekday PM peak hour.

6.2 TRAFFIC OPERATIONS

In addressing the traffic operations within the immediate area, the existing key intersections were assessed under existing (2022) and future (2025, 2031, 2039, and 2049) horizon periods. In addition, new intersections constructed as a result of network upgrades planned within the *Township of Centre Wellington Transportation Master Plan (TMP)*, *Township of Centre Wellington Development Charges Background Study*, and the Study Area were assessed under the future horizon periods.

6.2.1 Intersection Operations

Under the 2022 horizon, the existing key intersections provided acceptable performance in their current configuration. Under each future horizon, all key intersections performed well under background conditions based on the network upgrades planned within the Township TMP and *Development Charges Study*. Under the total conditions, the key intersections outside of the Tower Street South corridor performed well through the 2049 horizon, thus not requiring additional changes outside of those planned in the TMP.

Along Tower Street South under total conditions, the intersections performed acceptably up to the 2031 horizon and poorly under both the 2039 and 2049 horizons with only TMP-planned upgrades applied. As such, a number of improvements are required to ensure the LOS and delays are acceptable, namely addition/expansion of exclusive left and/or right turn lanes on most approaches, lengthening of signal cycles, provisions for protected left turning signal phases, and addition of a second through lane in both the north and south directions at intersections where such do not already exist.

6.2.2 Queue Operations

Queue operations at each key intersection were also reviewed to ensure that the turn lane configurations are sufficient to accommodate any resulting queues without interference with the through movements. Under the 2039 and 2049 background conditions, the existing turn lanes are sufficient for the expected volumes through the network. Under future total conditions however, the storage lanes were found to be insufficient (i.e. the queue lengths will exceed the available storage lengths) along Tower Street South. Recommended lengths of storage lanes were provided which would be more suitable for the expected storage requirements.

6.2.3 Mid-Block Operations

A review of the volume-to-capacity ratios of the project area roads between key intersections (i.e. the mid-block of the road sections) was conducted to ensure that the road network had sufficient capacity to accommodate existing and future volumes. The existing network was found to be sufficient for existing conditions. Similarly, the future network proposed in the Township TMP was found to be sufficient on all roads excluding Tower Street South through the 2049 horizon under total conditions.

Tower Street South operated close to or over-capacity under the background conditions between the Skyline Retail Plaza and 2nd Line intersections due to the 2-lane cross-section currently present, and the lack of upgrades for this segment of road put forth in the TMP. Under total conditions, the same road segment operated at or close to double its rated capacity. Based on these findings, it is recommended that the noted road segment be upgraded to a minimum 4-lane cross-section with 2 through lanes per direction by the 2031 horizon.

6.2.4 Highway 6 & 2nd Line Roundabout Feasibility

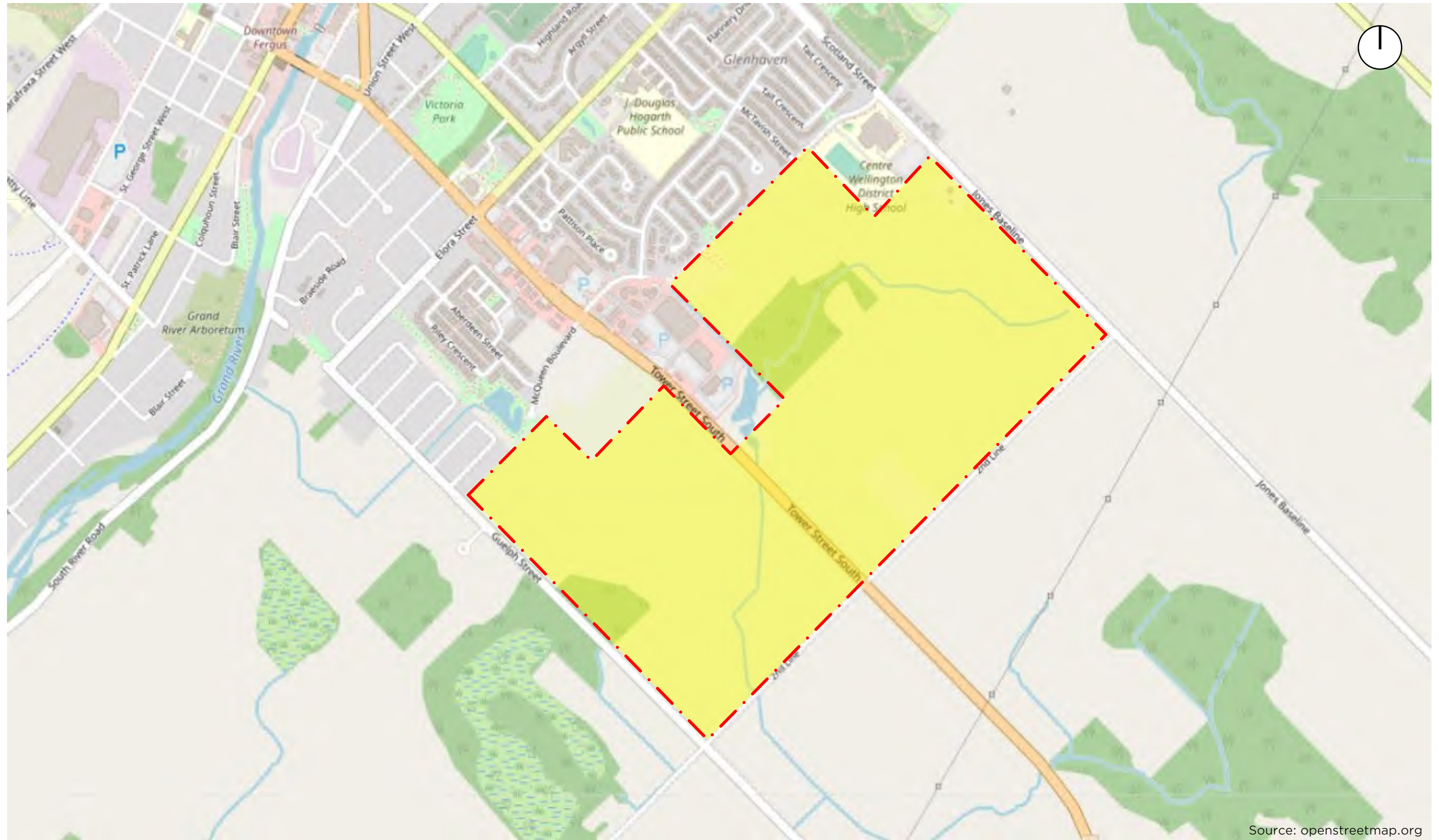
A review of intersection and queueing operations was conducted at the intersection of Highway 6 and 2nd Line under 2049 total conditions with the intersection configured as a 2-lane roundabout. Results of the analysis in this configuration were compared to the intersection and queueing operations of the intersection using the signalized configuration established in the initial future total analyses. The comparison demonstrated that the roundabout configuration was superior during the weekday AM peak hour, whereas the signalized configuration was superior during the weekday PM peak hour. Based on these results, the recommended configuration is a signalized intersection.

6.3 FUTURE STUDY

This study has been premised on the land use plan prepared in support of the South Fergus Secondary Plan Area and development levels established from overall areas and target densities, all of which are considered preliminary in nature at this stage of the development.

As the South Fergus Secondary Plan Area advances, and more detailed draft plans are prepared for individual developments and subdivisions, it is expected that development specific traffic impact studies will be required. In completing such, it is recommended that updated traffic counts be completed and that all assumptions employed in this study be reviewed and validated or revised as necessary, to ensure the accurate representation of both existing and future conditions. Such assumptions relate to background developments and growth levels, timing of external road improvements, provision of transit services within the area, jurisdiction of Highway 6 and the limits of the connecting link, intersection configurations and control, and development levels and phasing of the South Fergus Secondary Plan Area.

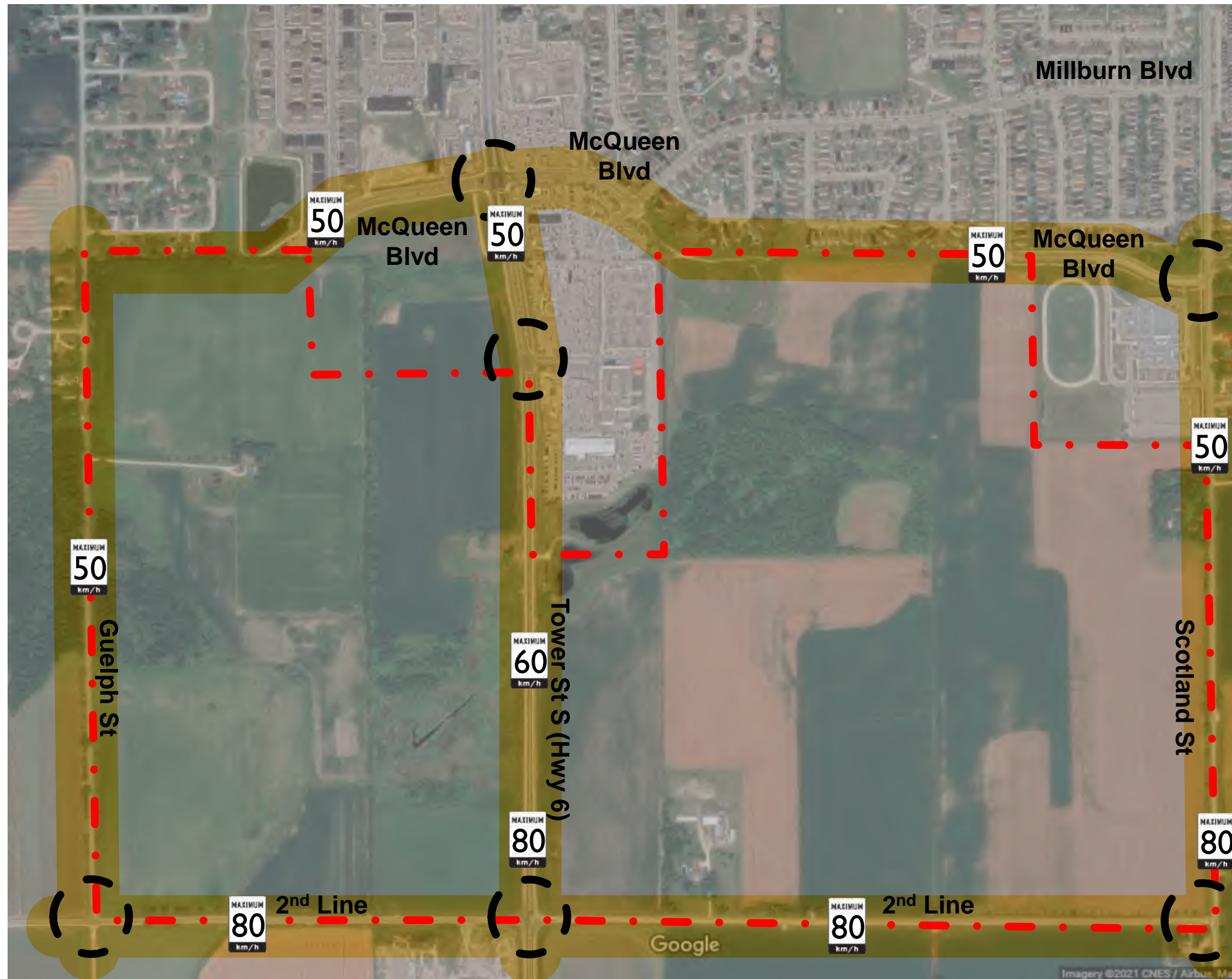
Prior to commencing each site specific traffic study, it is recommended a Terms of Reference be prepared and submitted to the Township for review and approval, including confirmation of the study area and road network to be investigated, and the status of future planned/proposed developments and road system improvements.






SOUTH FERGIS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 1: Site Location





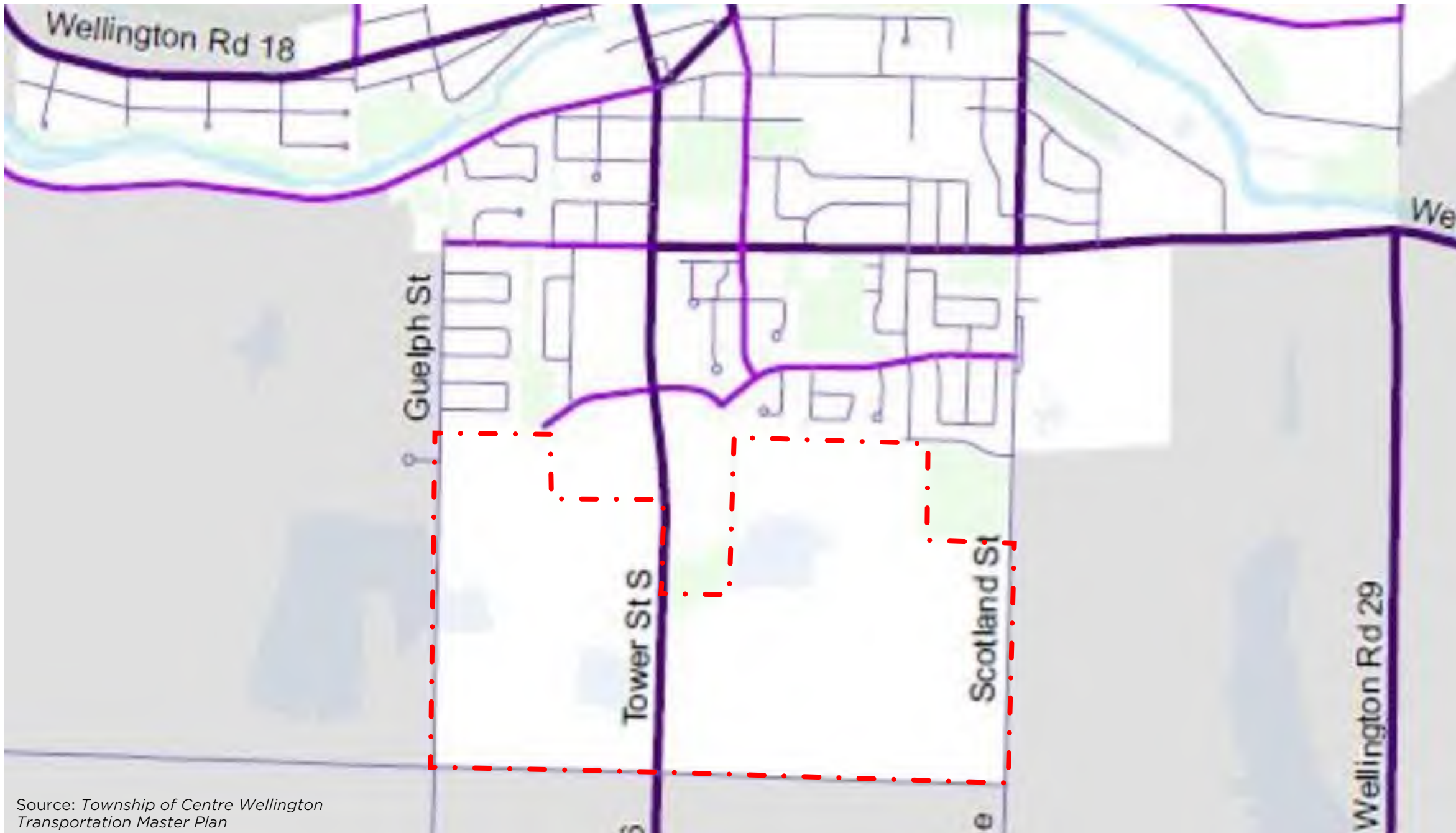
-  Key Road Section
-  Key Intersection
-  Speed Limit



Source: Google Earth

SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 2: Project Area Road Network





-  Project Area
-  Arterial
-  Collector
-  Local
-  Urban Area



► **Arterial Roadways:** Serve as the major connecting links for inter-urban traffic and generally consist of Provincial highways and County roads.



► **Collector Roadways:** Provide access between local and arterial roads and generally helps to circulate traffic within an individual neighbourhood.



► **Local Roadways:** Connect adjacent properties to collector roads. They are not intended to act as through routes or play a main connecting role in the traffic network.

SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

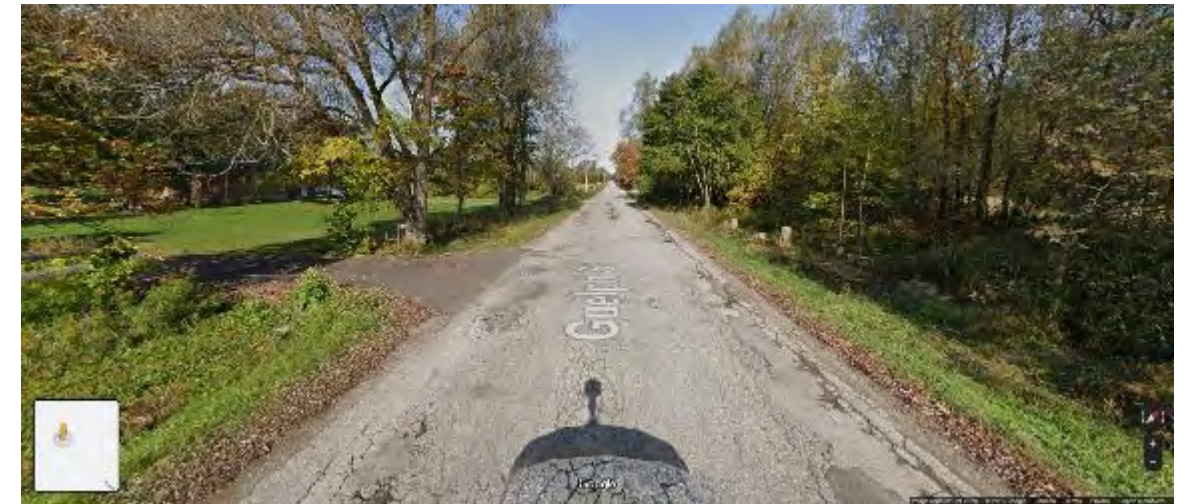
Figure 3: Project Area Road Classification & Hierarchy





◀ Tower Street South (Highway 6) looking north to McQueen Boulevard

Source: Google Streetview



▶ Guelph Street looking north at north limit of South Fergus Secondary Plan area

Source: Google Streetview



◀ Tower Street South (Highway 6) looking north to Gates of Fergus Access

Source: Google Streetview



▶ Guelph Street looking north at mid-point of South Fergus Secondary Plan area

Source: Google Streetview



◀ Tower Street South (Highway 6) looking north at 2nd Line

▶ Guelph Street looking north at 2nd Line



SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 4A: Project Area Road Sections





◀ Scotland Street looking north to McQueen Boulevard

Source: Google Streetview



▶ 2nd Line looking east to Scotland Street

Source: Google Streetview



◀ Scotland Street looking north to Centre Wellington District High School

Source: Google Streetview



▶ 2nd Line looking east from Tower Street South (Highway 6)

Source: Google Streetview



◀ Scotland Street looking north at 2nd Line

▶ 2nd Line looking west from Tower Street South (Highway 6)



SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 4B: Project Area Road Sections





Source: Google Streetview

◀ McQueen Boulevard looking west to West Limits



Source: Google Streetview

▶ McQueen Boulevard looking east to Millburn Boulevard



Source: Google Streetview

◀ McQueen Boulevard looking east to Tower Street South (Highway 6)

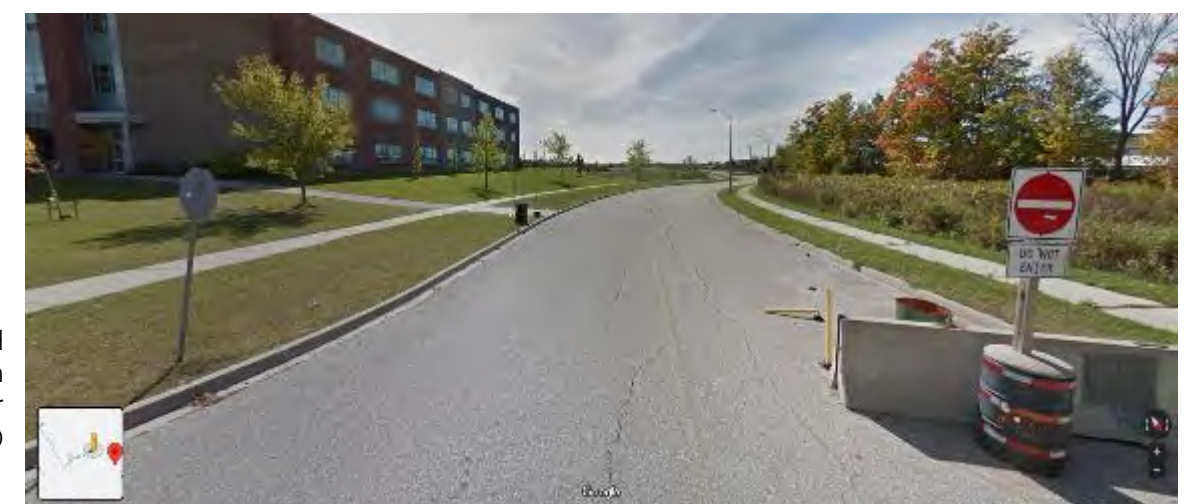


Source: Google Streetview

▶ McQueen Boulevard looking west at McTavish Street (prior to road opening)



◀ McQueen Boulevard looking west to Tower Street South (Highway 6)

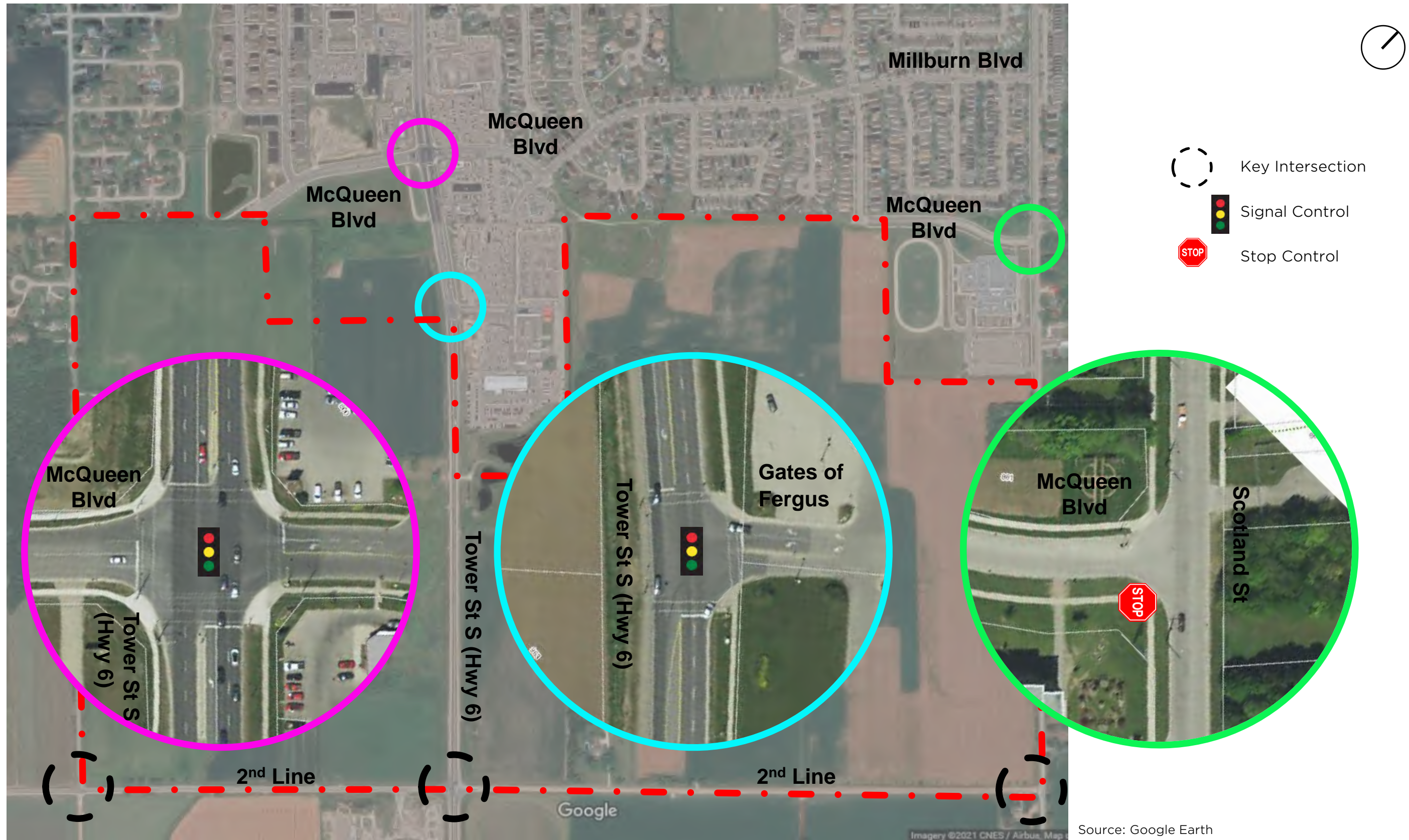


▶ McQueen Boulevard looking west from Scotland Street (prior to road opening)

SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 4C: Project Area Road Sections

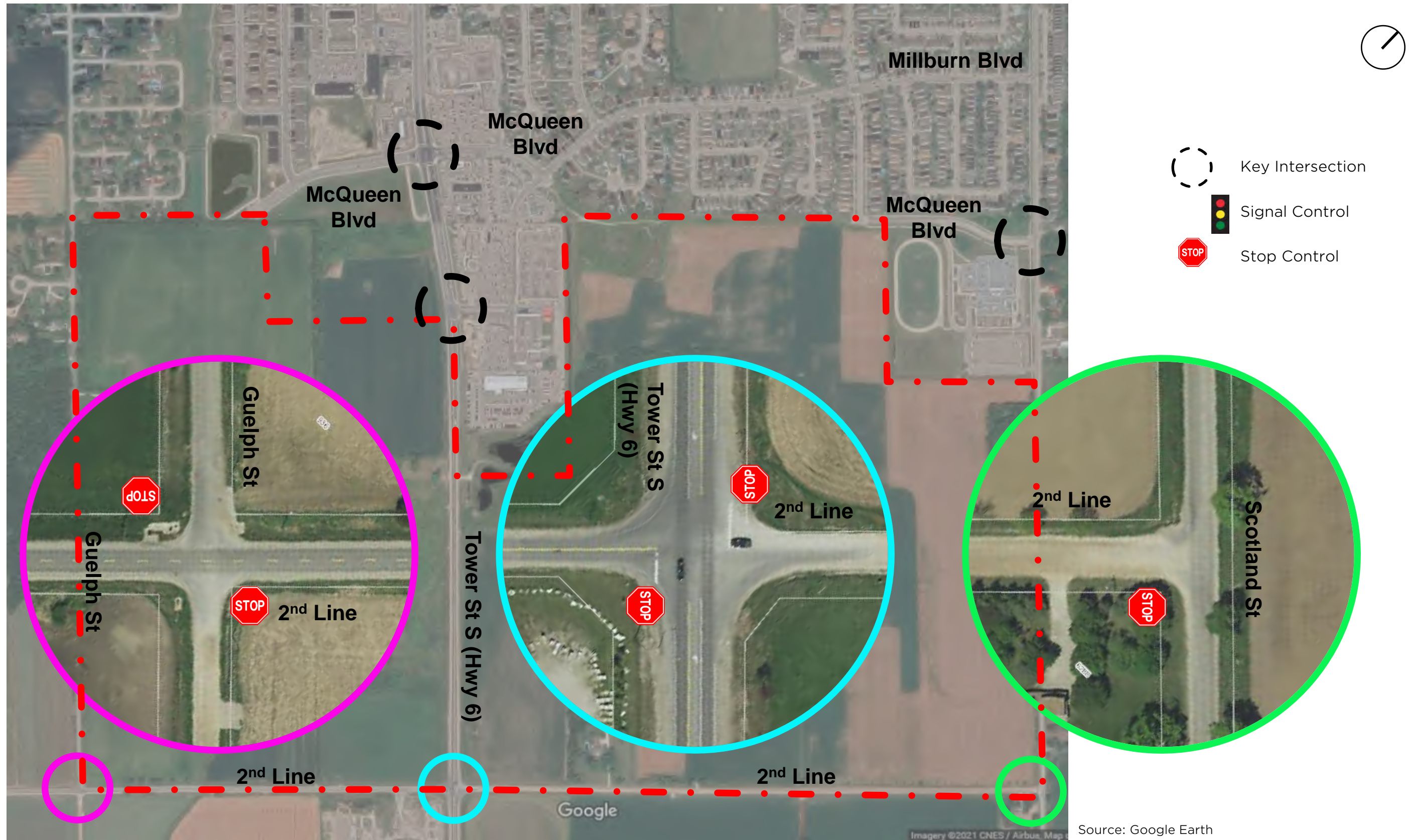




SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 5A: Project Area Intersections

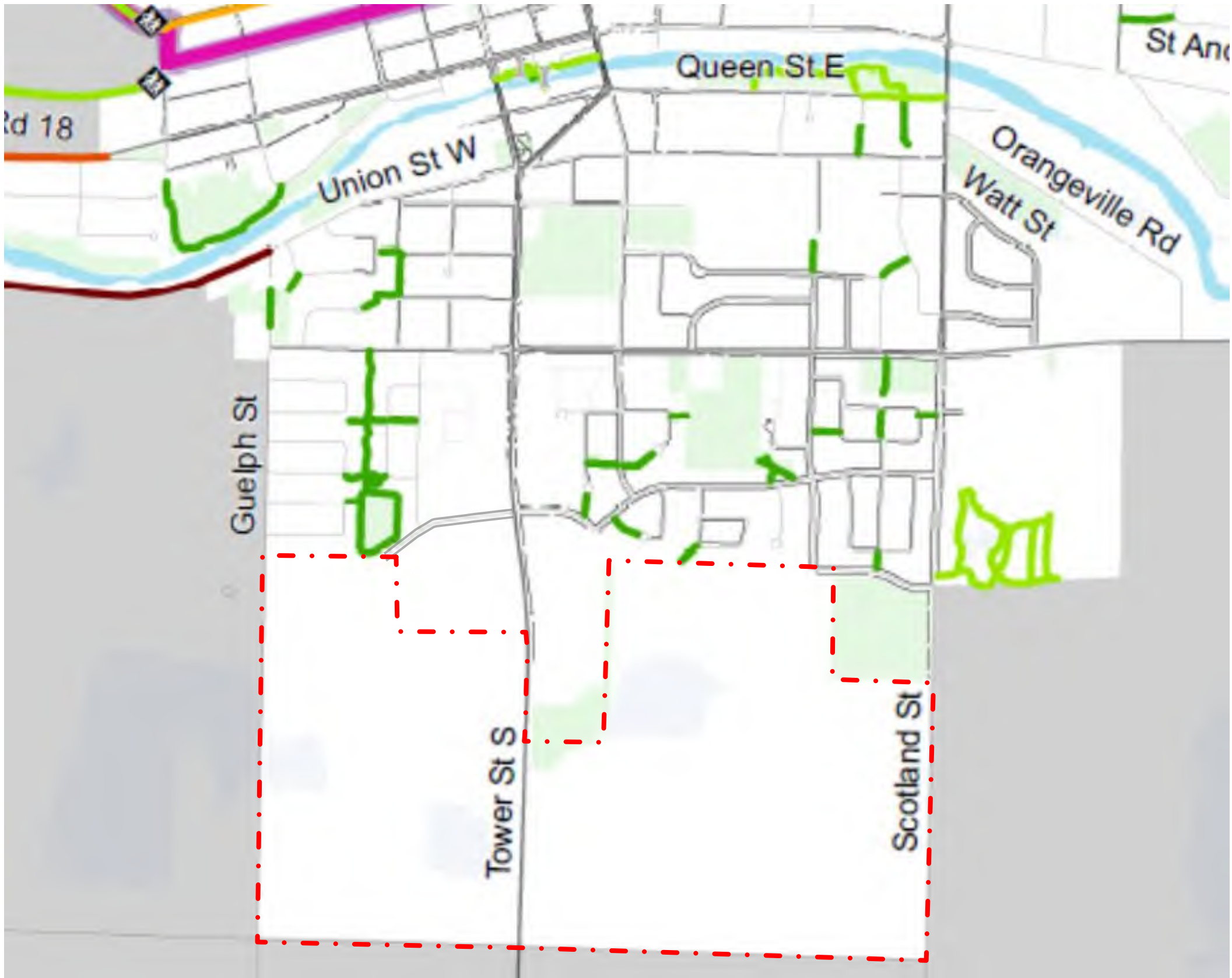




SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 5B: Project Area Intersections





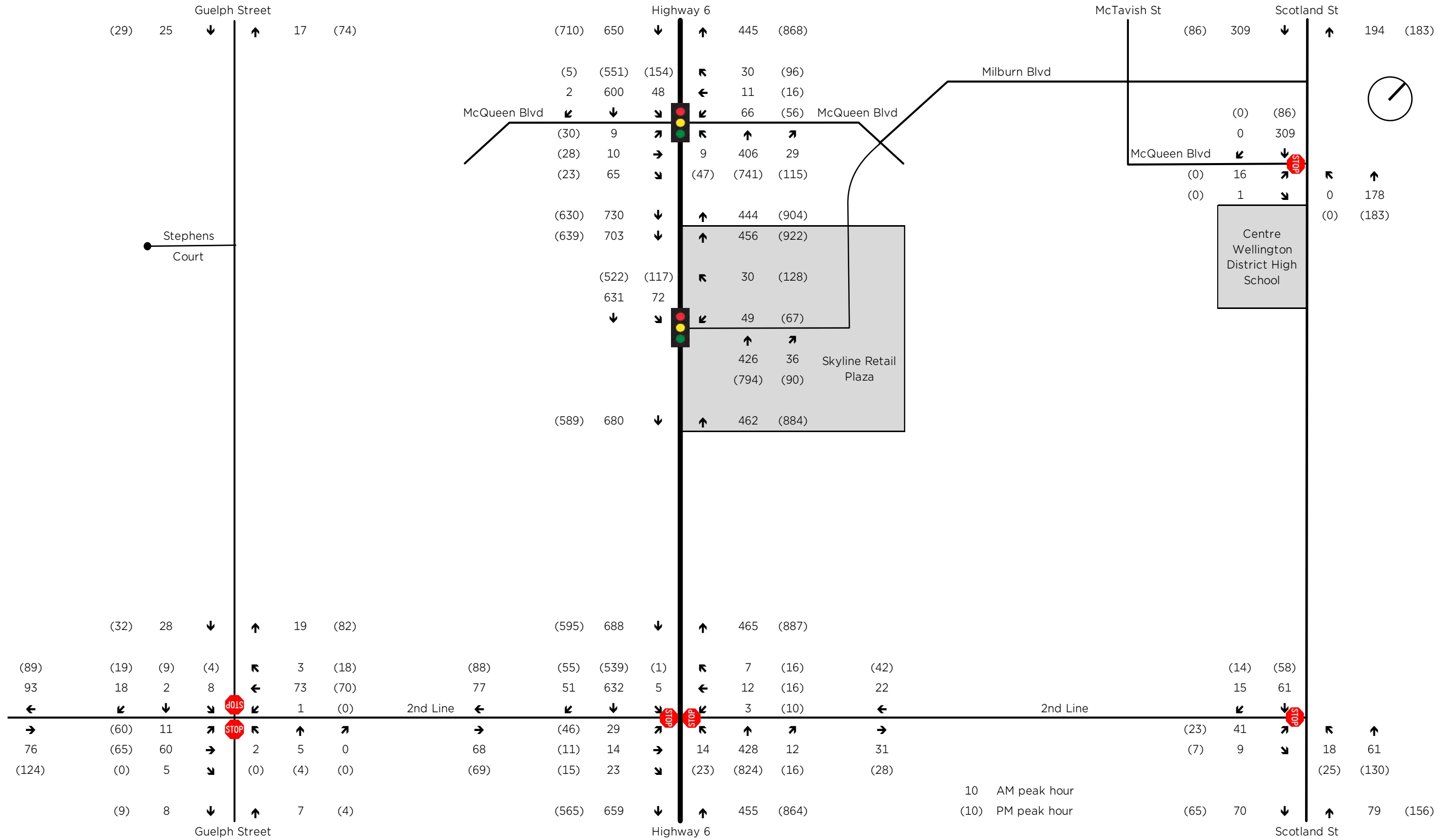
-  Project Area
-  Existing Off-Road Trail (County)
-  Existing Off-Road Trail (Township)
-  Existing Paved Shoulder (County)
-  Existing Paved Shoulder (Township)
-  Existing Signed Route (Township)
-  Sidewalks
-  Elora Cataract Trail
-  Trans Canada Trail
-  Trailhead

Source: Township of Centre Wellington
Transportation Master Plan

SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

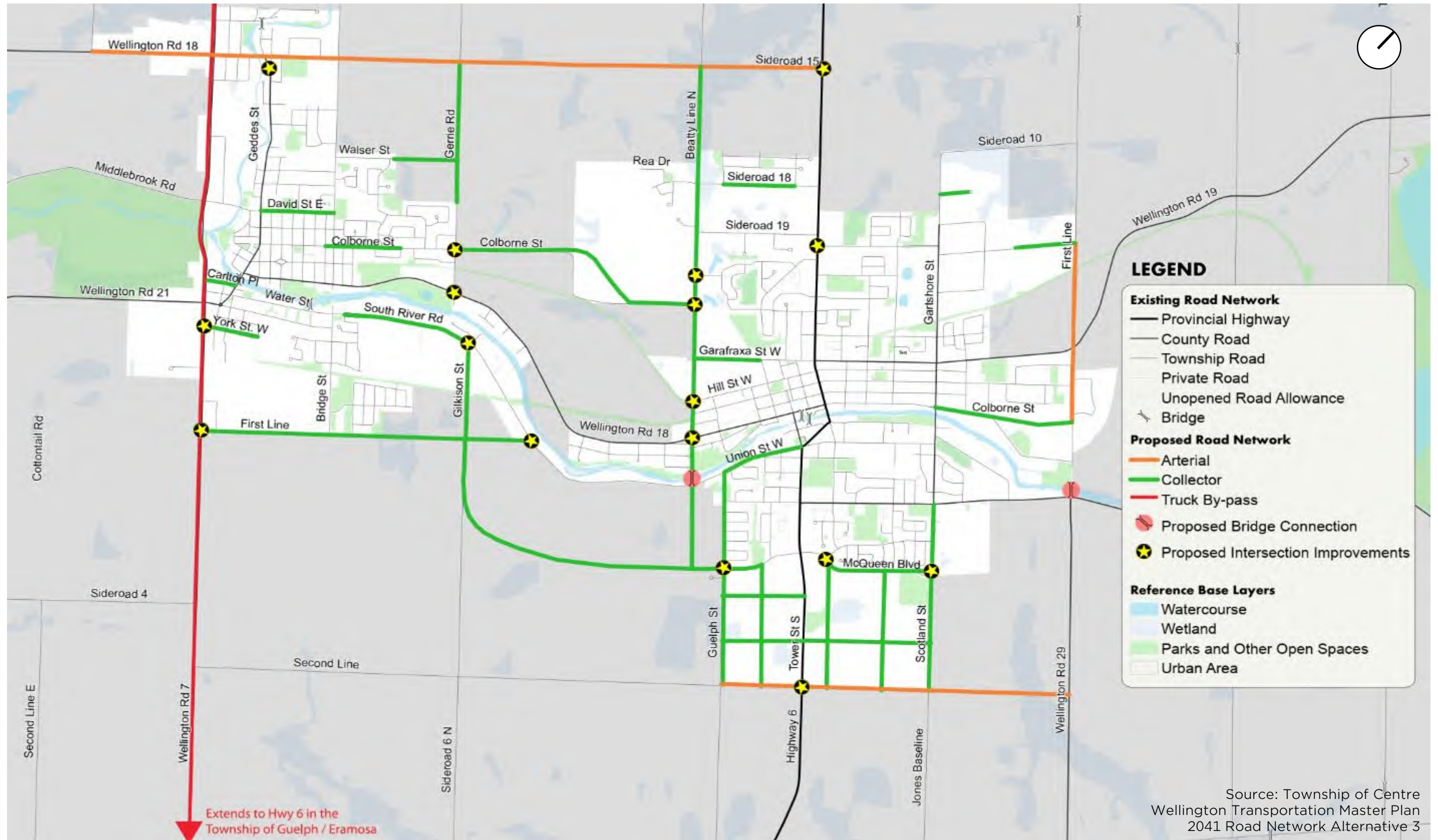
Figure 6: Project Area Trail System





SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN
 Figure 7: Traffic Volumes - 2022

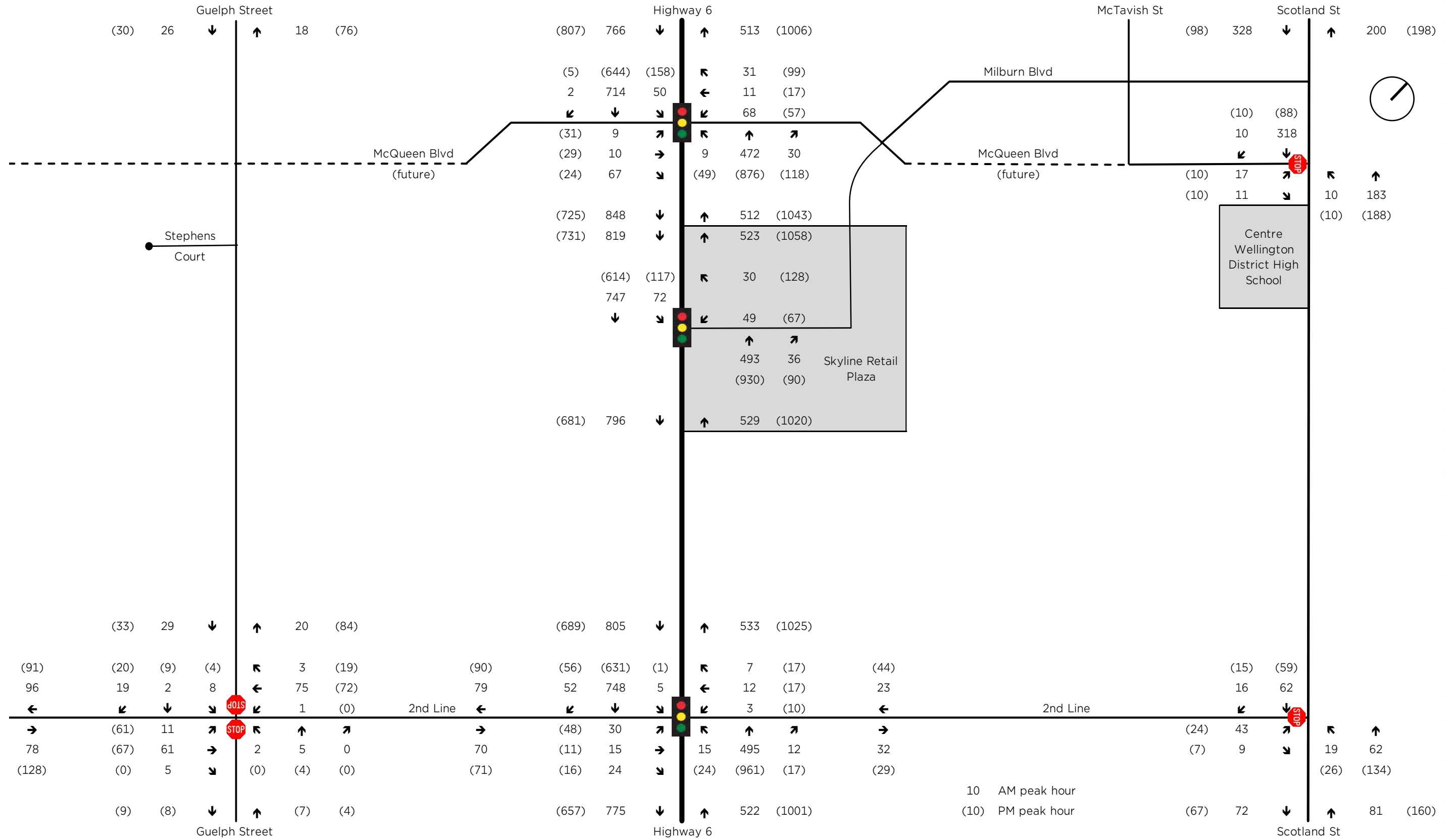




SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 8: 2041 Road Network

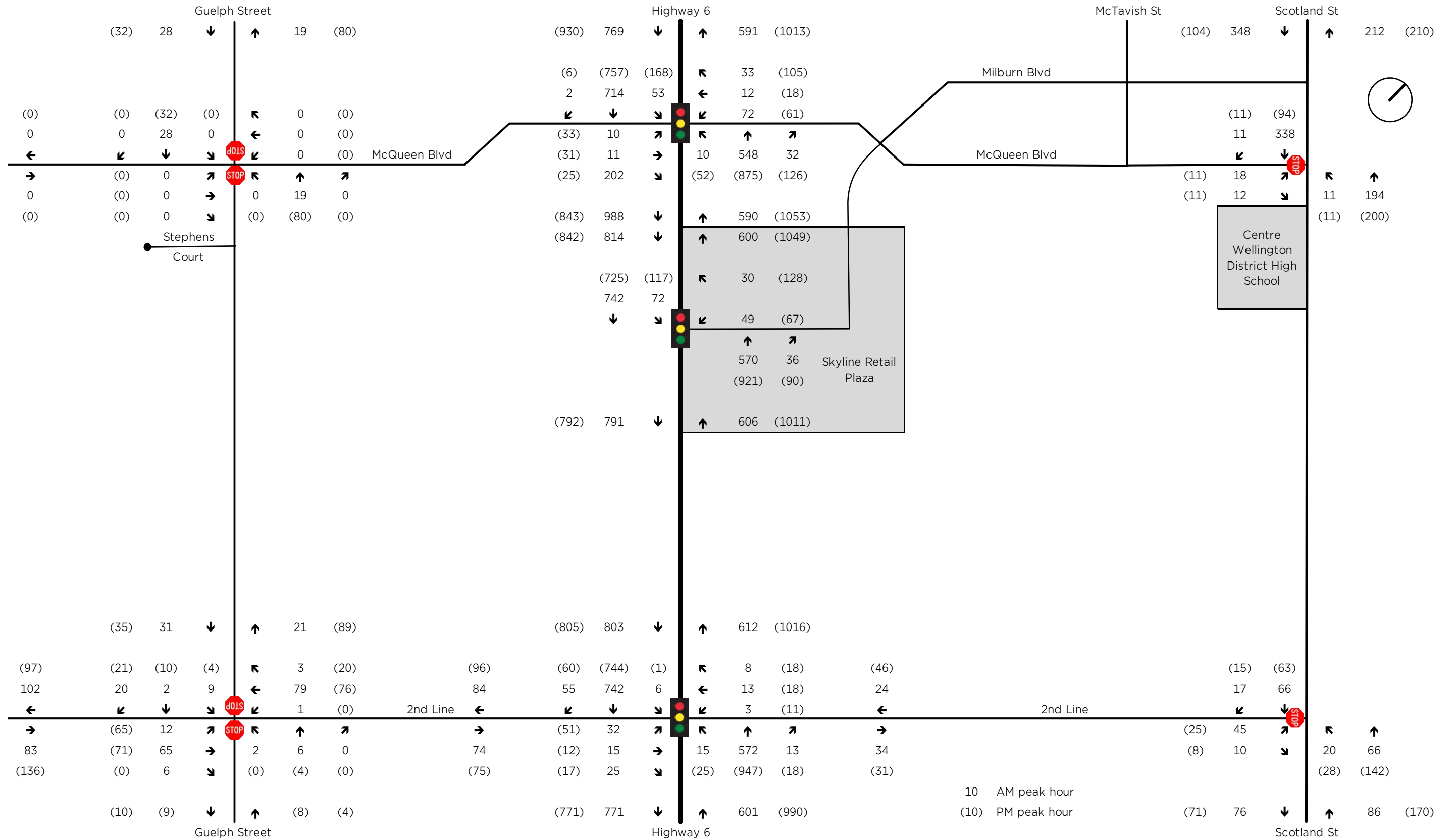




SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 9: Traffic Volumes - 2025 Background

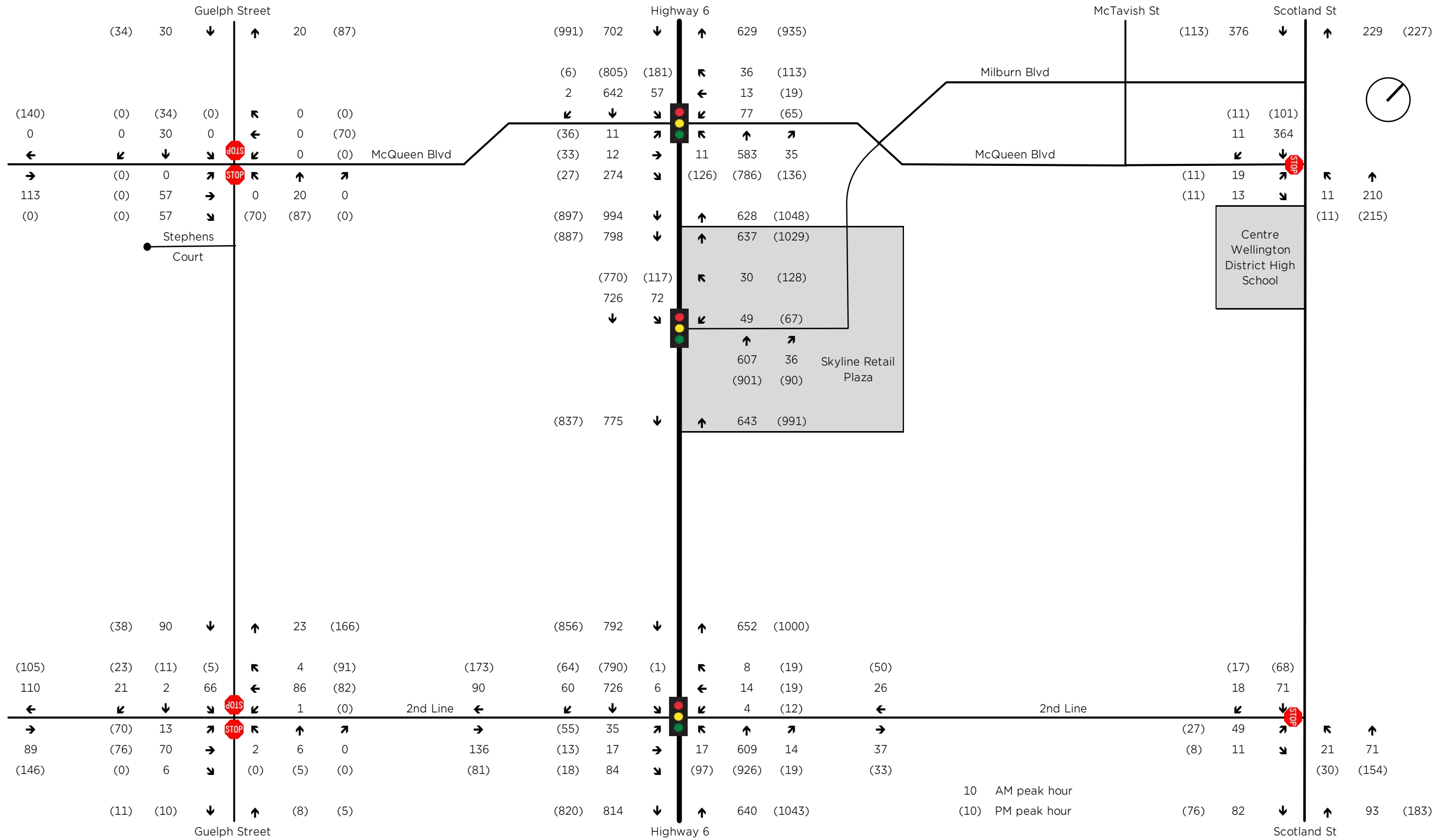




SOUTH FERGUSS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 10: Traffic Volumes - 2031 Background

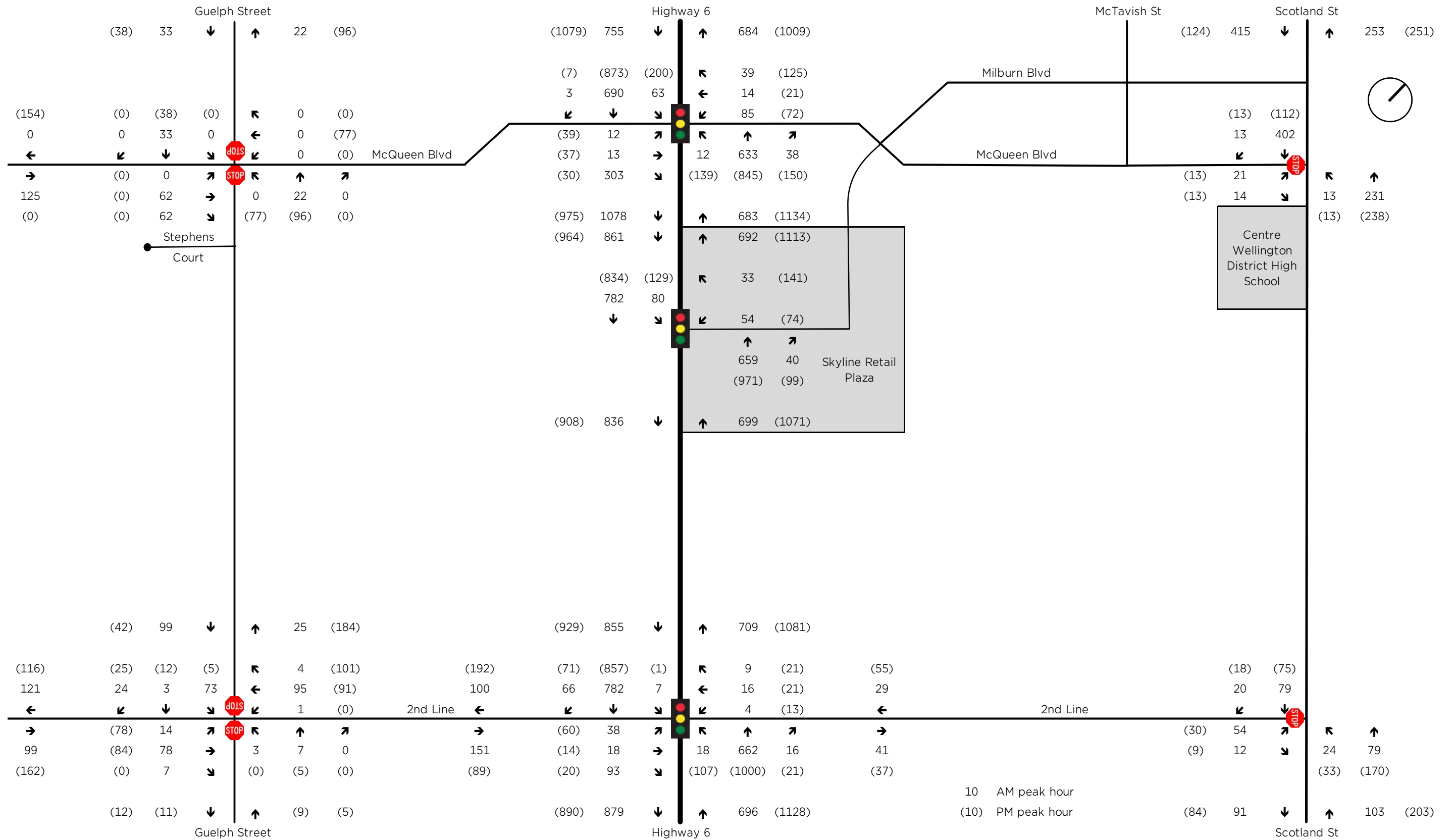




SOUTH FERGUSSON MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 11: Traffic Volumes - 2039 Background





SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 12: Traffic Volumes - 2049 Background

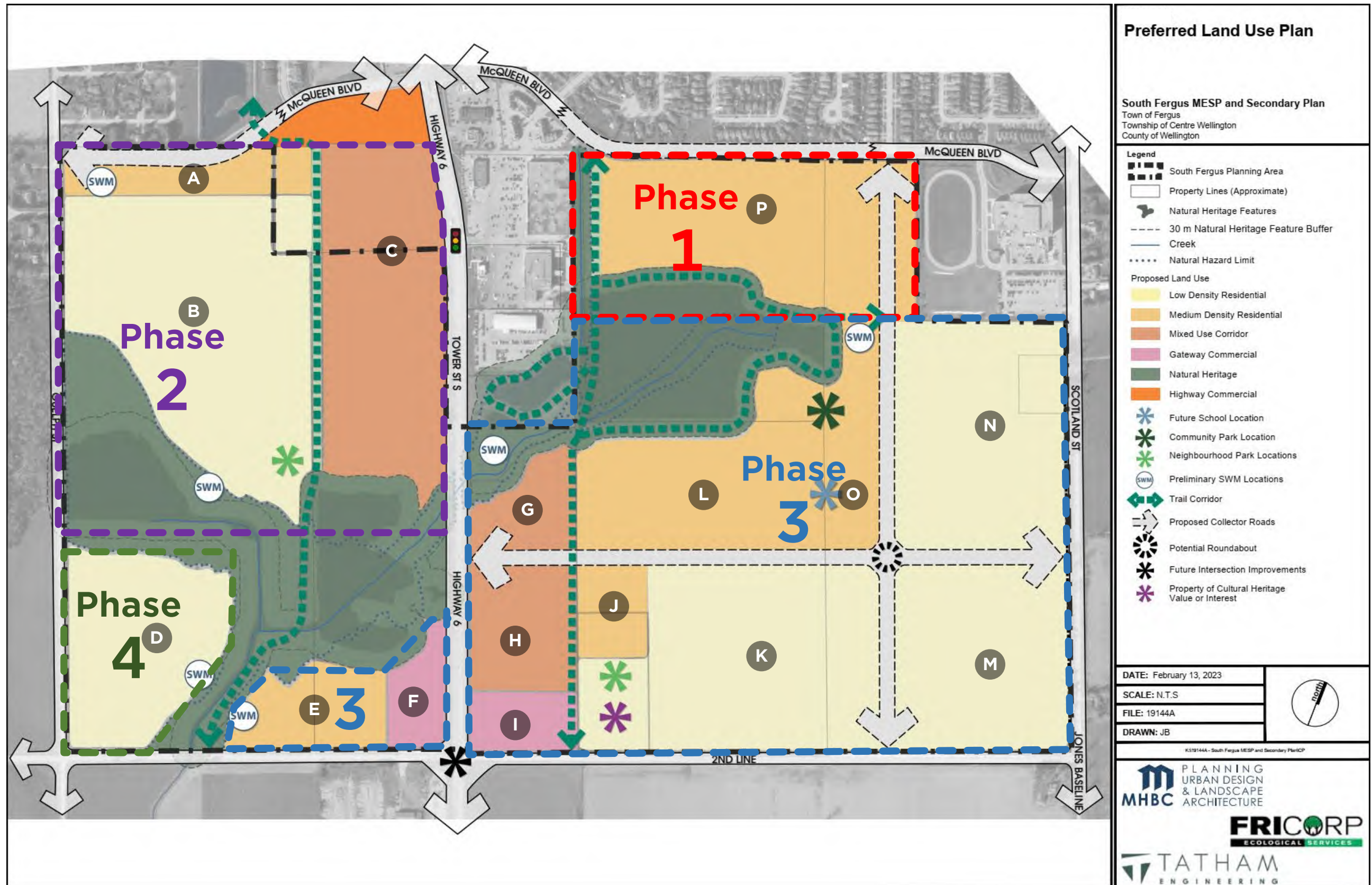




SOUTH FERUGS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 13: South Fergus Secondary Plan Area Land Use Plan

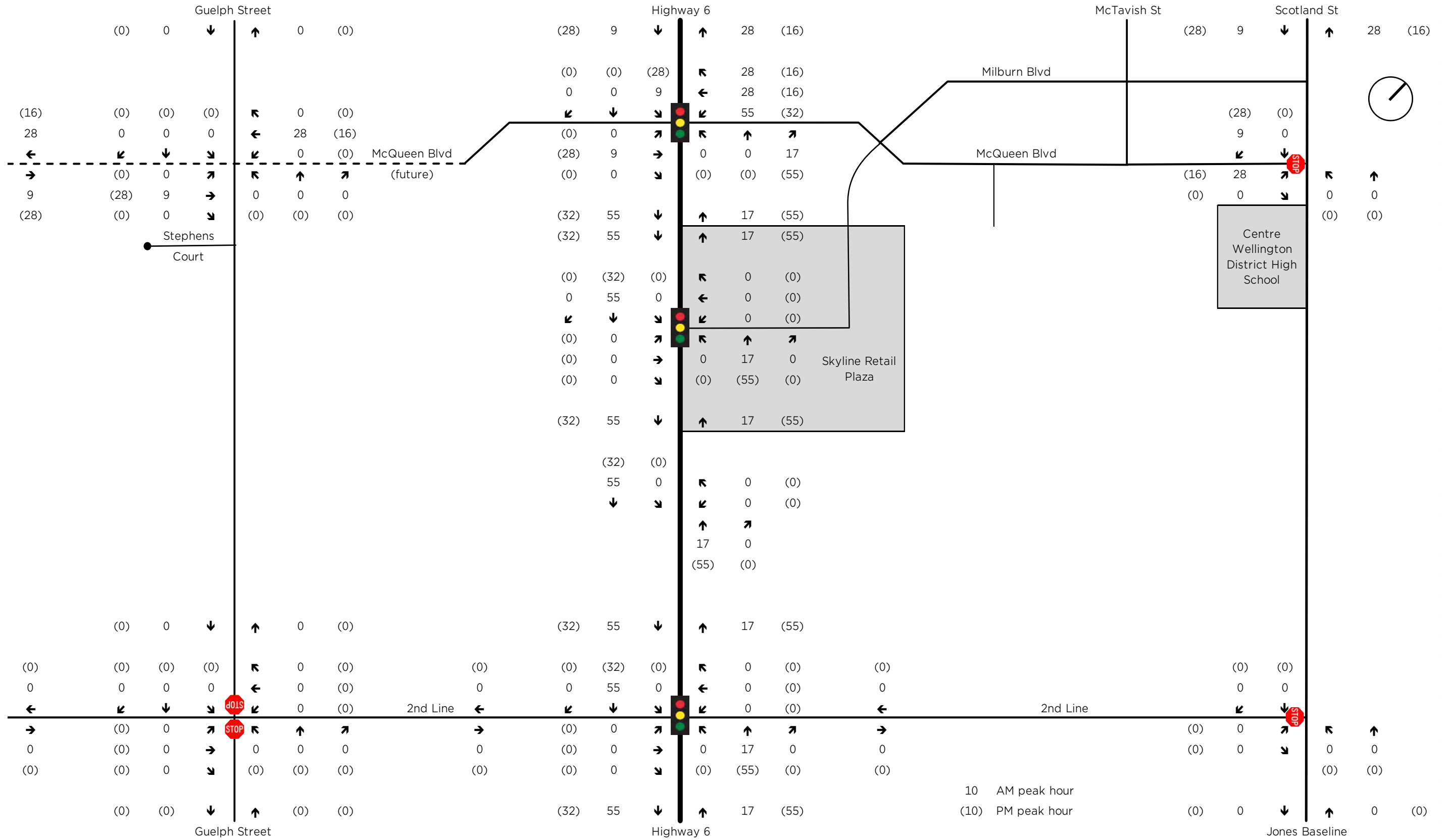




SOUTH FERUGS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 14: South Fergus Secondary Plan Area Phasing Plan

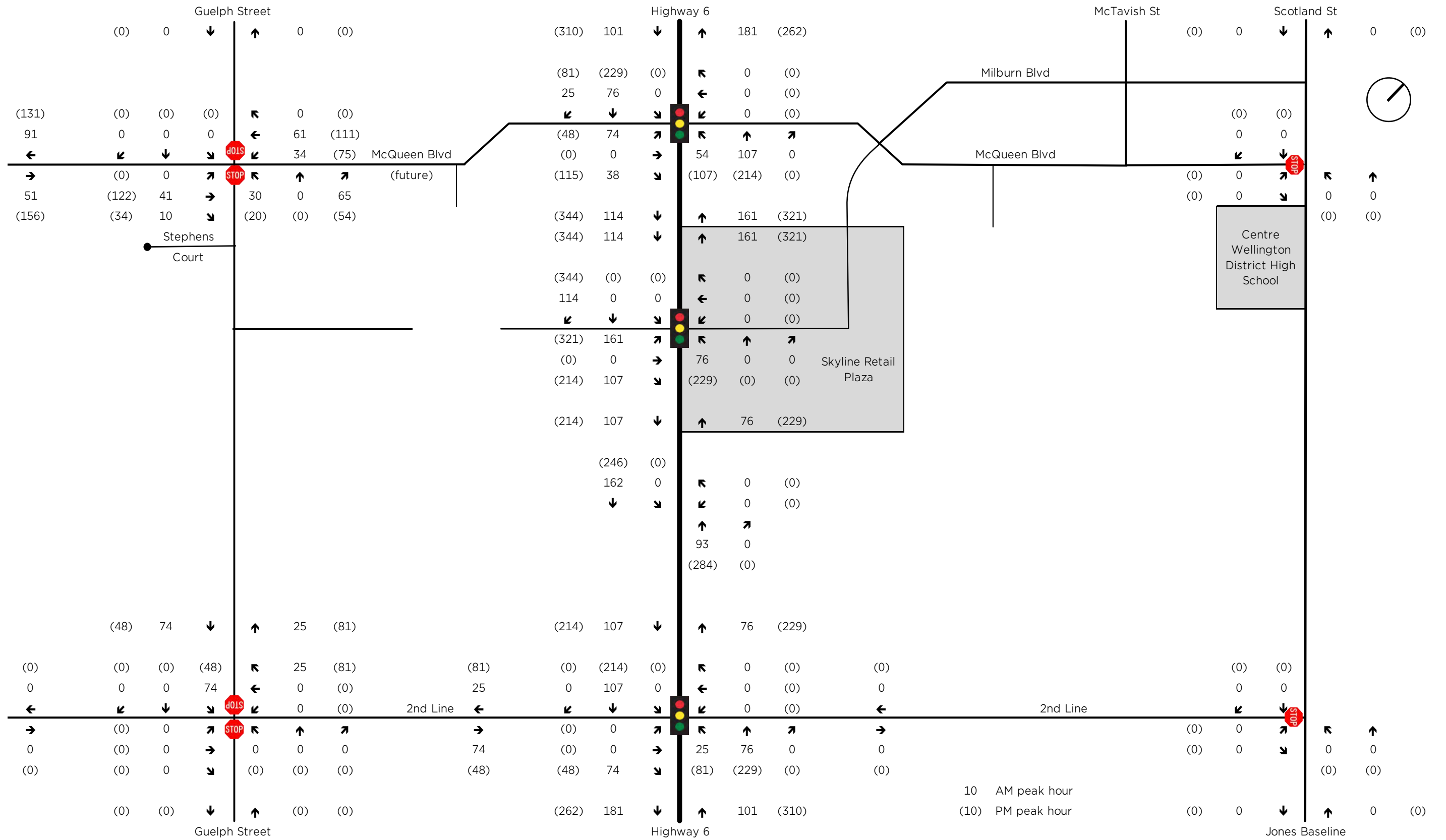




SOUTH FERGUSS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 15: Traffic Volumes - SFSPA Phase 1

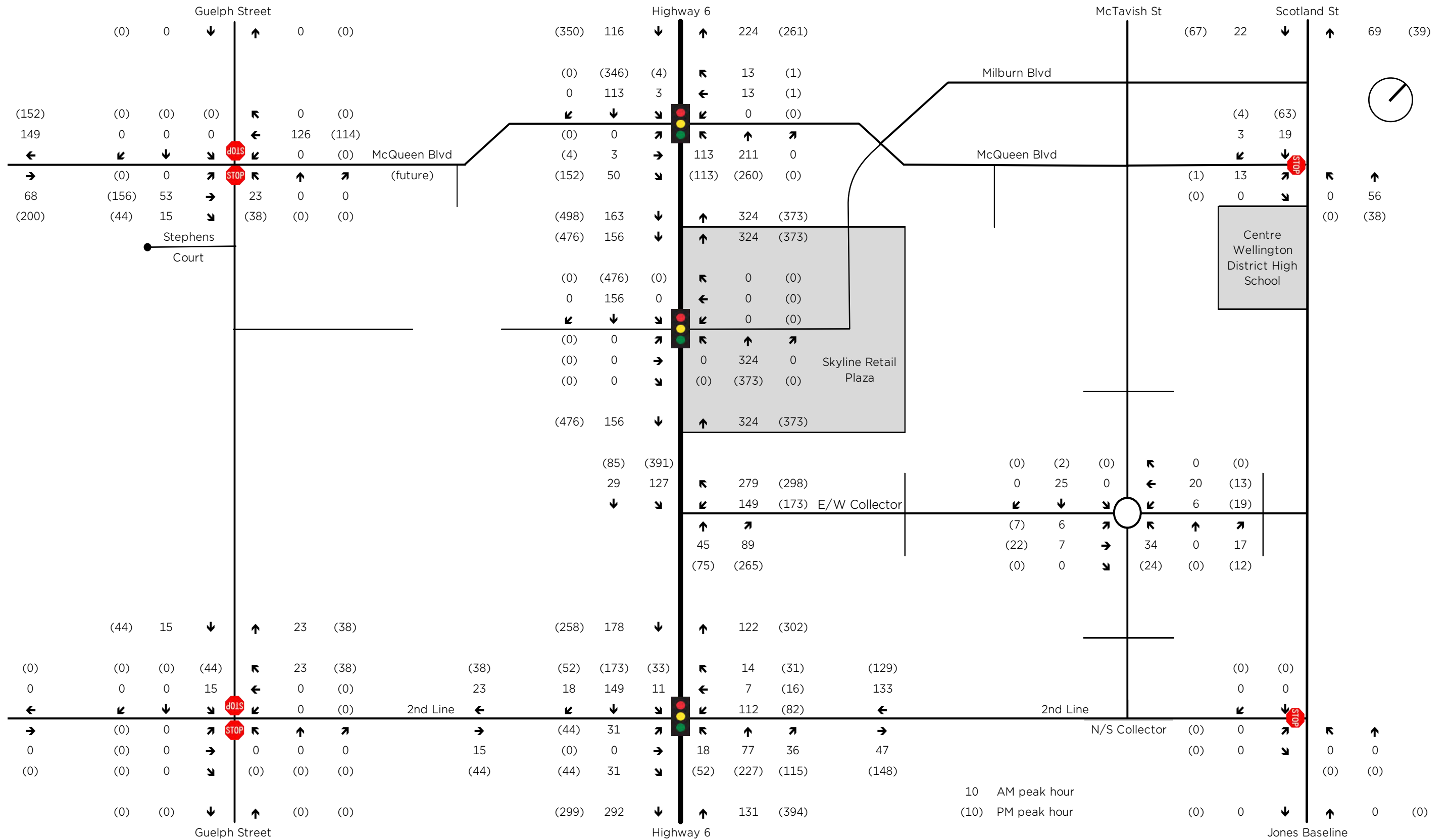




SOUTH FERGUSSON MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 16: Traffic Volumes - SFSPA Phase 2

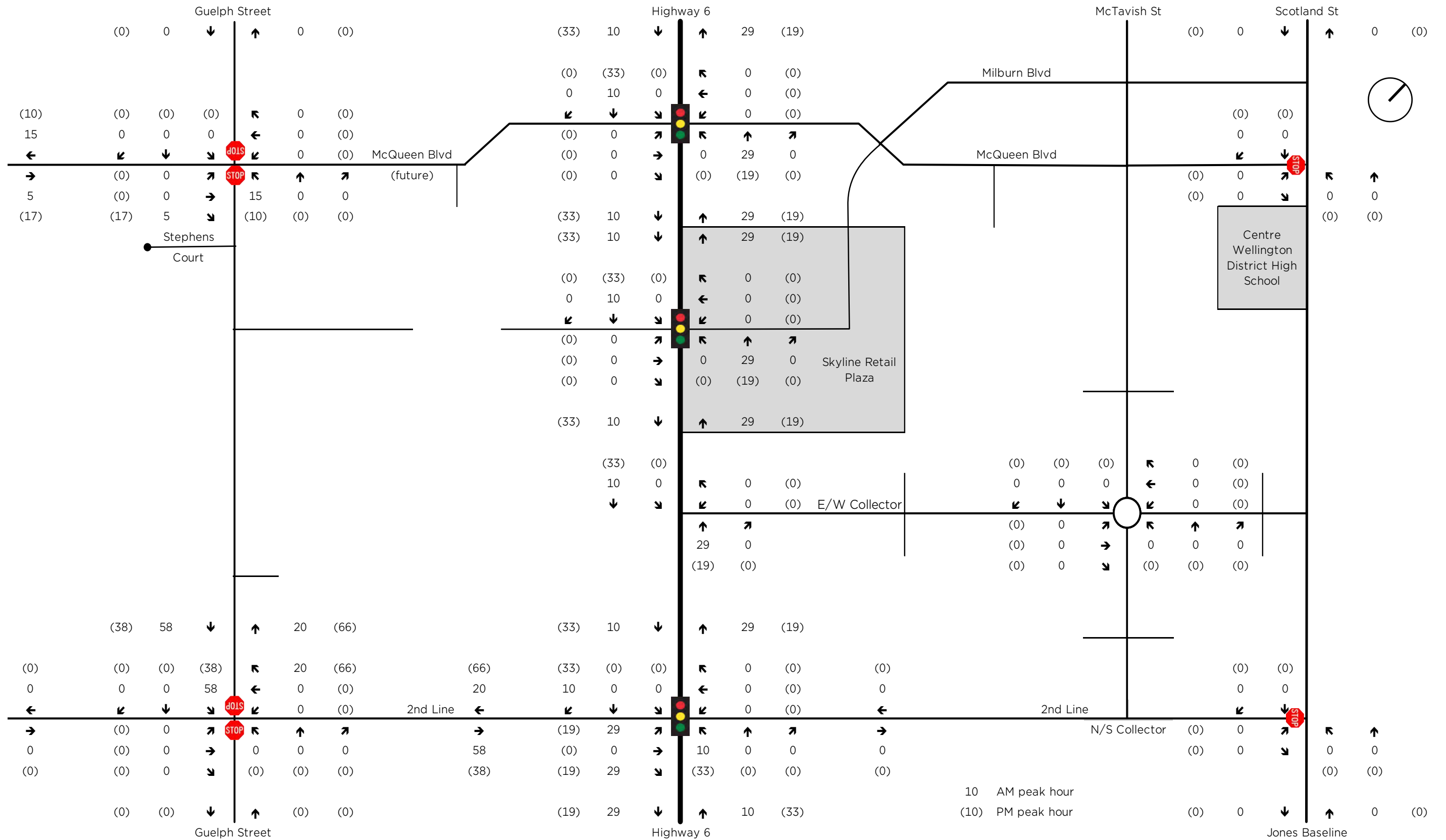




SOUTH FERGUSS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 17: Traffic Volumes - SFSPA Phase 3

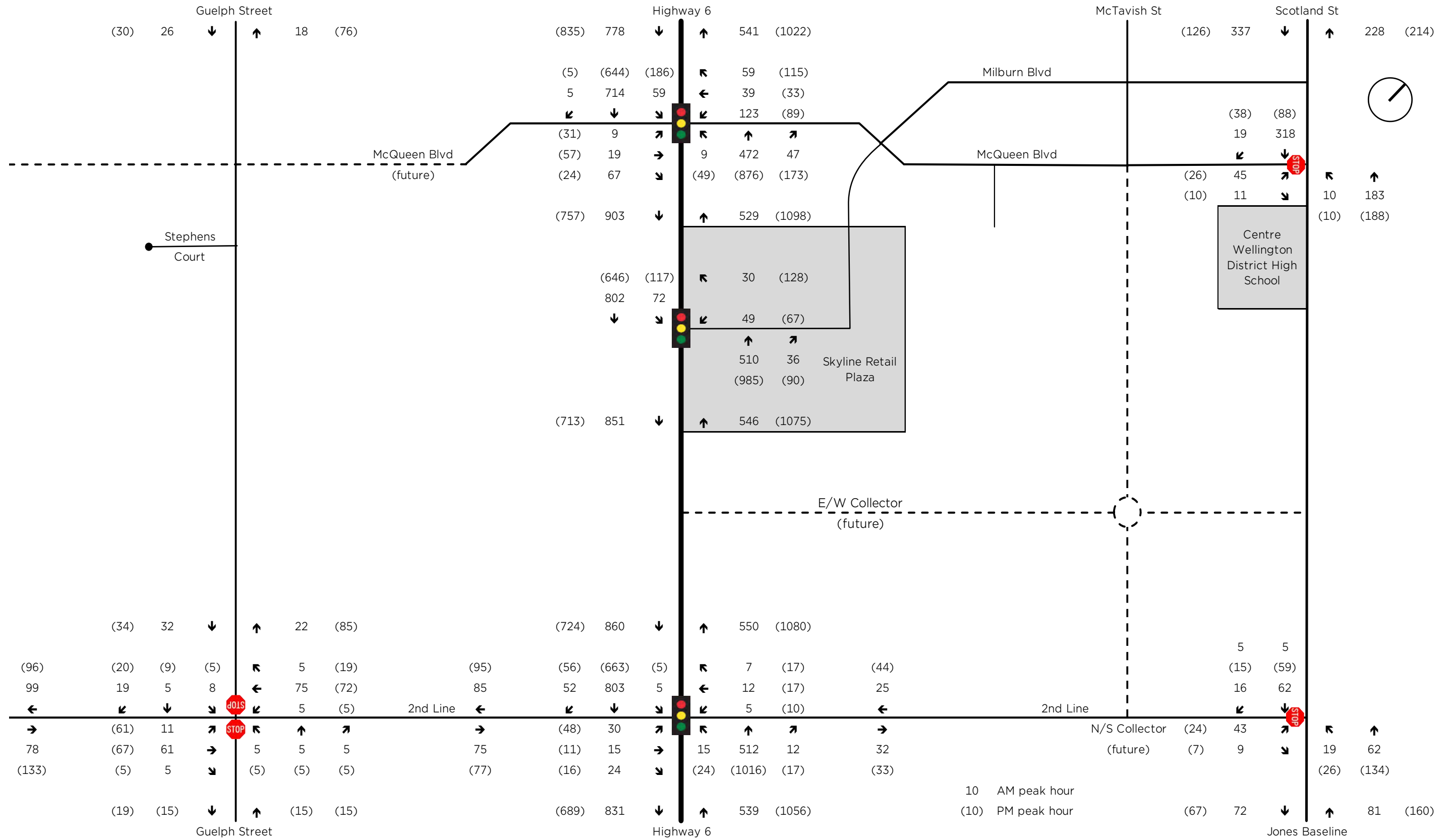




SOUTH FERGUSS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 18: Traffic Volumes - SFSPA Phase 4

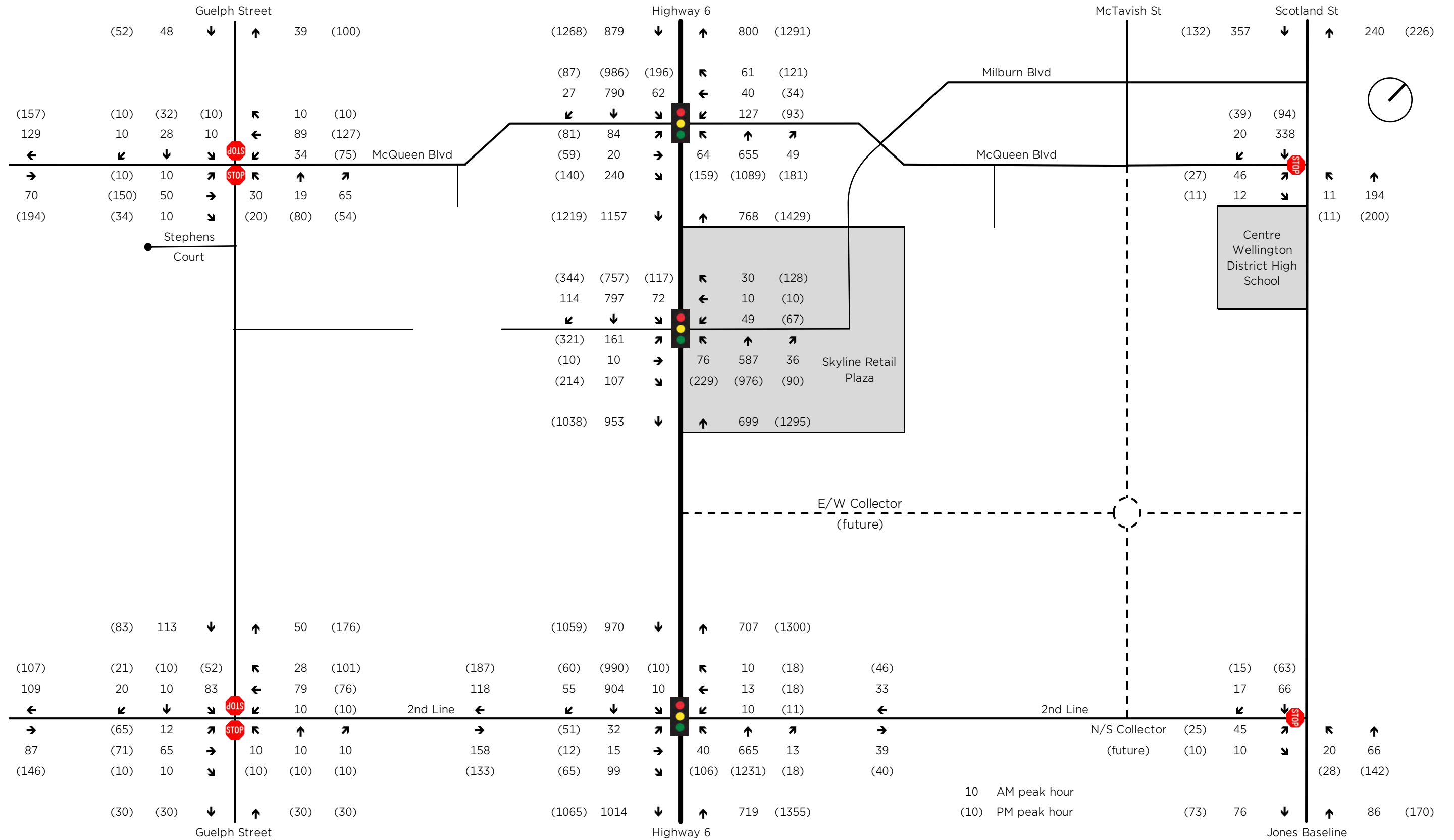




SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 19: Traffic Volumes - 2025 Total

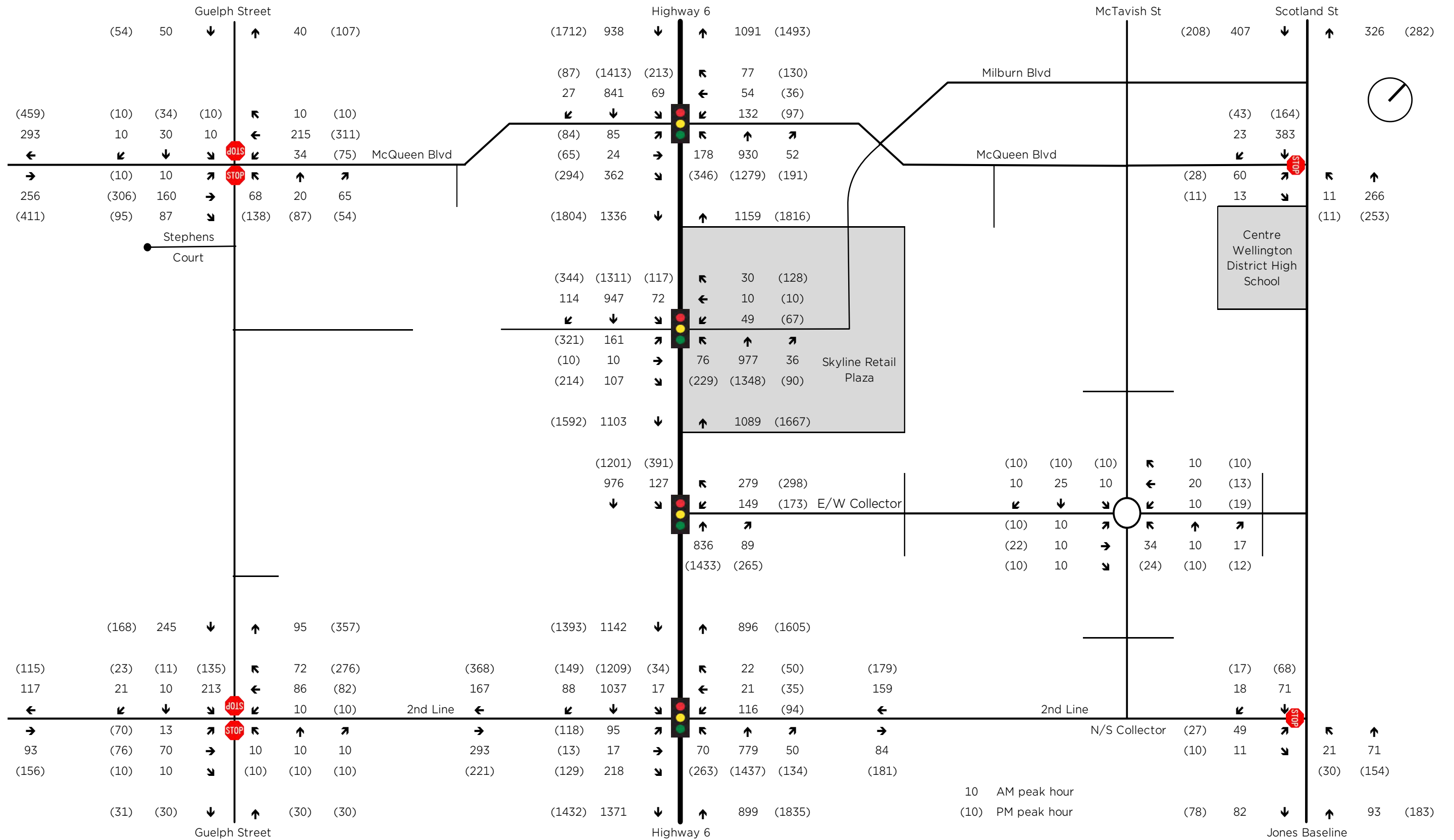




SOUTH FERGUSSON MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 20: Traffic Volumes - 2031 Total

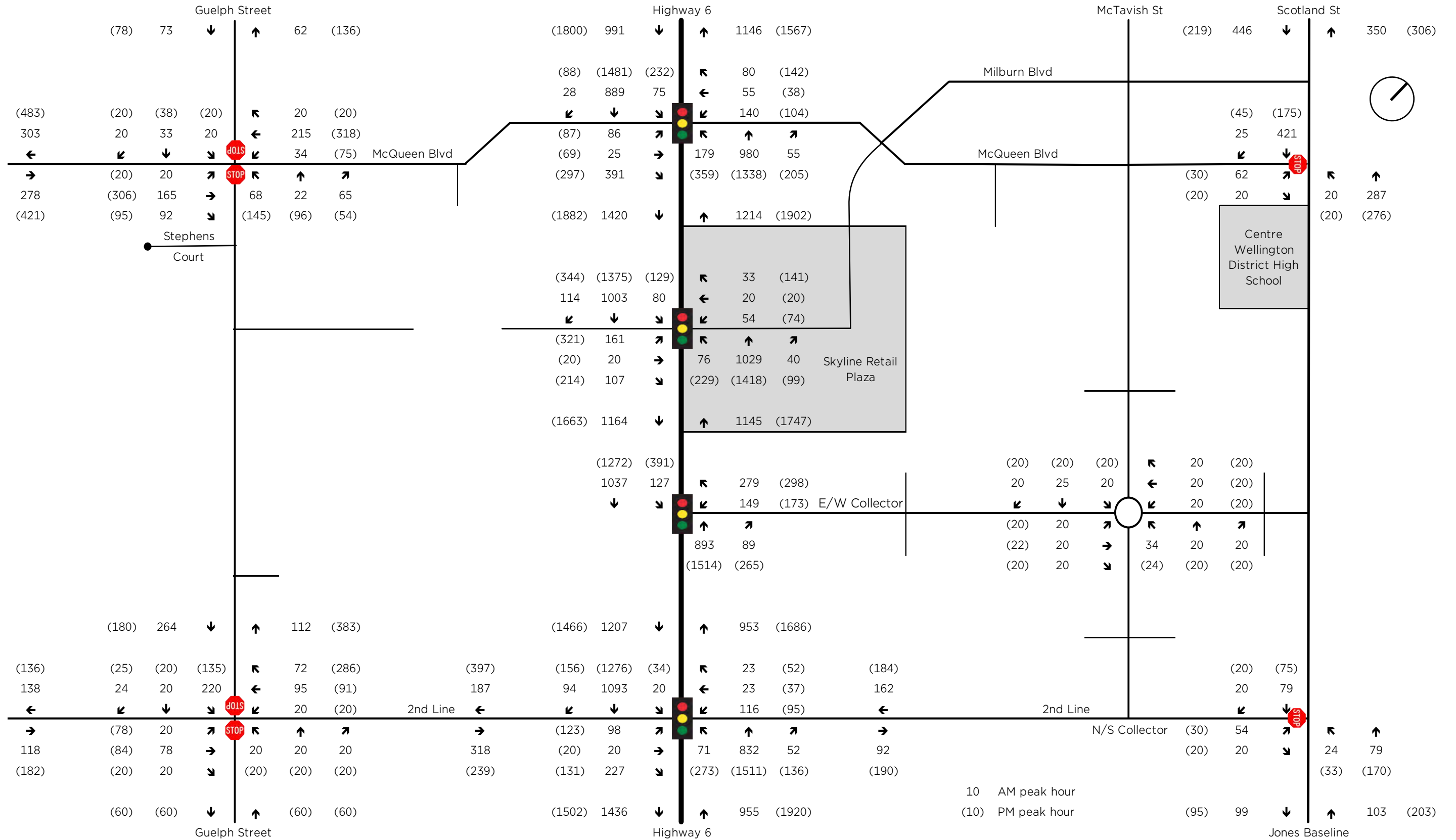




SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 21: Traffic Volumes - 2039 Total





SOUTH FERGUS MESP & SECONDARY PLAN - TRANSPORTATION PLAN

Figure 22: Traffic Volumes - 2049 Total



Appendix A: Preferred Land Use Plan

**Figure #
Preferred Land Use Plan**

South Fergus MESP and Secondary Plan
Town of Fergus
Township of Centre Wellington
County of Wellington

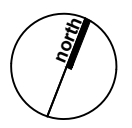
- Legend**
- South Fergus Planning Area
 - Property Lines (Approximate)
 - Natural Heritage Features
 - 30 m Natural Heritage Feature Buffer
 - Creek
 - Natural Hazard Limit
- Proposed Land Use**
- Low Density Residential
 - Medium Density Residential
 - Mixed Use Corridor
 - Gateway Commercial
 - Natural Heritage
 - Highway Commercial
- Future School Location
 - Community Park Location
 - Neighbourhood Park Locations
 - Preliminary SWM Locations
 - Trail Corridor
 - Proposed Collector Roads
 - Potential Roundabout
 - Future Intersection Improvements
 - Property of Cultural Heritage Value or Interest

DATE: February 13, 2023

SCALE: N.T.S

FILE: 19144A

DRAWN: JB



K:\19144A - South Fergus MESP and Secondary Plan\CP



Appendix B: Traffic Counts



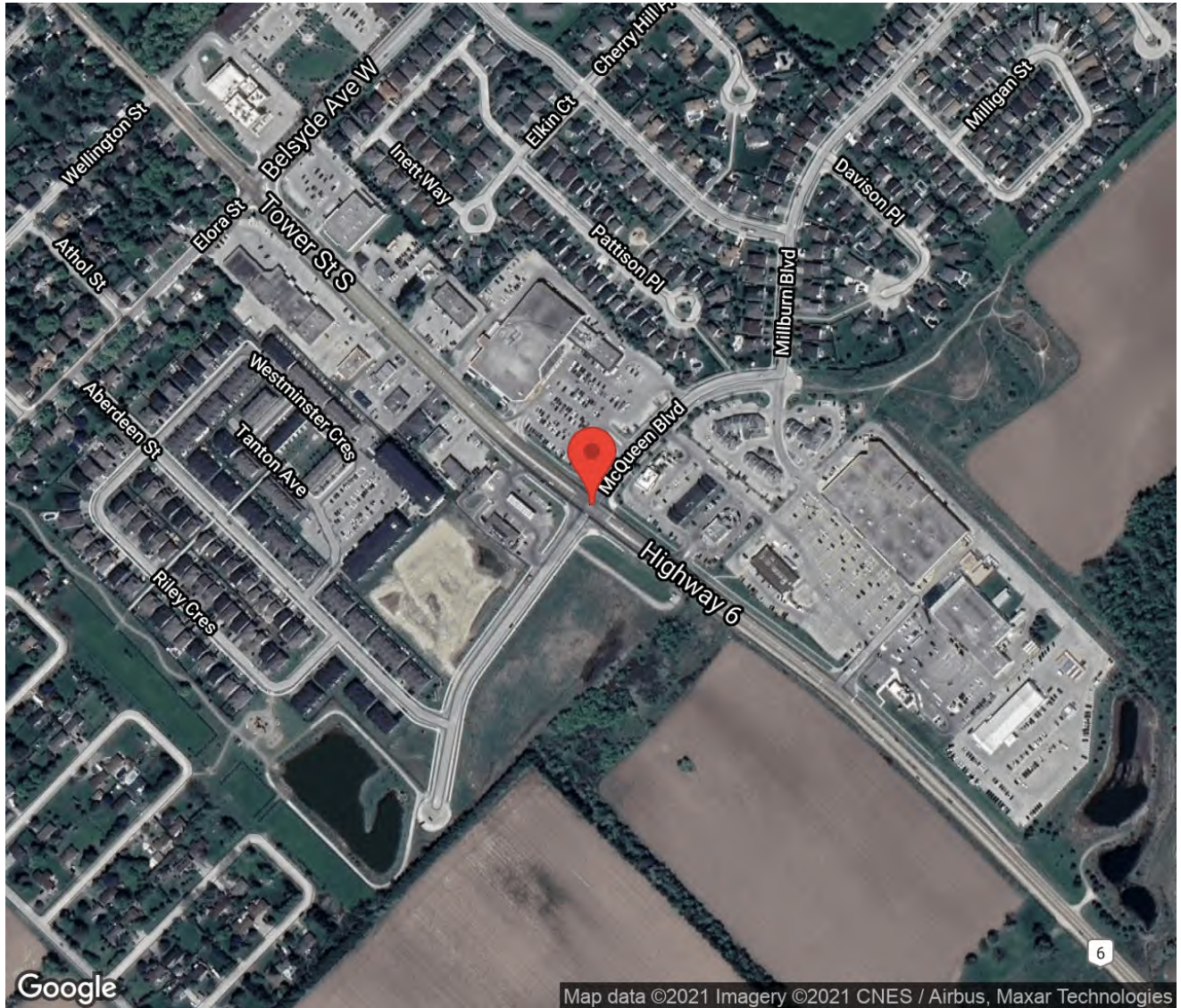
Project #21-222 - Tatham Engineering Ltd

Intersection Count Report

| | |
|--------------------------|-------------------------------------|
| Intersection: | Hwy 6 & McQueen Blvd |
| Municipality: | South Fergus |
| Count Date: | Oct 28, 2021 |
| Site Code: | 2122200001 |
| Count Categories: | Cars, Trucks, Bicycles, Pedestrians |
| Count Period: | 07:00-09:00, 16:00-18:00 |
| Weather: | Clear |

Traffic Count Map

Intersection: Hwy 6 & McQueen Blvd
Site Code: 2122200001
Municipality: South Fergus
Count Date: Oct 28, 2021



Traffic Count Summary

Intersection: Hwy 6 & McQueen Blvd
 Site Code: 2122200001
 Municipality: South Fergus
 Count Date: Oct 28, 2021

Hwy 6 - Traffic Summary

| Hour | North Approach Totals | | | | | | South Approach Totals | | | | | | Total |
|----------------------|---------------------------------|-------------|-----------|----------|-------------|-----------|---------------------------------|-------------|------------|----------|-------------|----------|-------------|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | | |
| | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds | |
| 07:00 - 08:00 | 47 | 579 | 1 | 0 | 627 | 1 | 12 | 369 | 26 | 0 | 407 | 1 | 1034 |
| 08:00 - 09:00 | 73 | 490 | 3 | 0 | 566 | 10 | 15 | 417 | 44 | 0 | 476 | 2 | 1042 |
| BREAK | | | | | | | | | | | | | |
| 16:00 - 17:00 | 135 | 540 | 4 | 0 | 679 | 6 | 41 | 735 | 108 | 0 | 884 | 4 | 1563 |
| 17:00 - 18:00 | 151 | 483 | 7 | 0 | 641 | 3 | 47 | 673 | 103 | 0 | 823 | 0 | 1464 |
| GRAND TOTAL | 406 | 2092 | 15 | 0 | 2513 | 20 | 115 | 2194 | 281 | 0 | 2590 | 7 | 5103 |



Traffic Count Summary

Intersection: Hwy 6 & McQueen Blvd
 Site Code: 2122200001
 Municipality: South Fergus
 Count Date: Oct 28, 2021

McQueen Blvd - Traffic Summary

| Hour | East Approach Totals | | | | | | West Approach Totals | | | | | | Total |
|----------------------|---------------------------------|-----------|------------|----------|------------|-----------|---------------------------------|-----------|------------|----------|------------|----------|------------|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | | |
| | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds | |
| 07:00 - 08:00 | 60 | 8 | 25 | 0 | 93 | 2 | 8 | 10 | 60 | 0 | 78 | 1 | 171 |
| 08:00 - 09:00 | 55 | 19 | 32 | 0 | 106 | 4 | 18 | 17 | 41 | 0 | 76 | 1 | 182 |
| BREAK | | | | | | | | | | | | | |
| 16:00 - 17:00 | 51 | 19 | 88 | 0 | 158 | 4 | 26 | 28 | 32 | 0 | 86 | 0 | 244 |
| 17:00 - 18:00 | 53 | 21 | 86 | 0 | 160 | 1 | 38 | 24 | 25 | 0 | 87 | 0 | 247 |
| GRAND TOTAL | 219 | 67 | 231 | 0 | 517 | 11 | 90 | 79 | 158 | 0 | 327 | 2 | 844 |



Traffic Count Data

Intersection: Hwy 6 & McQueen Blvd
 Site Code: 2122200001
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Hwy 6

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|------|---|---|-------|--------|----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 11 | 103 | 0 | 0 | 114 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 8 | 147 | 0 | 0 | 155 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 1 |
| 07:30 | 13 | 151 | 0 | 0 | 164 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 15 | 143 | 1 | 0 | 159 | 0 | 7 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 1 | 0 |
| 08:00 | 12 | 118 | 1 | 0 | 131 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 12 | 113 | 0 | 0 | 125 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 4 |
| 08:30 | 26 | 127 | 0 | 0 | 153 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 5 |
| 08:45 | 22 | 101 | 2 | 0 | 125 | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 |
| SUBTOTAL | 119 | 1003 | 4 | 0 | 1126 | 1 | 65 | 0 | 0 | 66 | 0 | 1 | 0 | 0 | 1 | 11 |



Traffic Count Data

Intersection: Hwy 6 & McQueen Blvd
 Site Code: 2122200001
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Hwy 6

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------------|-------------|-----------|----------|-------------|----------|------------|----------|----------|------------|----------|----------|----------|----------|----------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 37 | 126 | 1 | 0 | 164 | 0 | 13 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 36 | 152 | 1 | 0 | 189 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 |
| 16:30 | 33 | 128 | 1 | 0 | 162 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 29 | 105 | 1 | 0 | 135 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 |
| 17:00 | 54 | 141 | 2 | 0 | 197 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 36 | 128 | 2 | 0 | 166 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 |
| 17:30 | 28 | 108 | 2 | 0 | 138 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 31 | 89 | 1 | 0 | 121 | 2 | 7 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 2 |
| SUBTOTAL | 284 | 977 | 11 | 0 | 1272 | 2 | 46 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 9 |
| GRAND TOTAL | 403 | 1980 | 15 | 0 | 2398 | 3 | 111 | 0 | 0 | 114 | 0 | 1 | 0 | 0 | 1 | 20 |



Traffic Count Data

Intersection: Hwy 6 & McQueen Blvd
 Site Code: 2122200001
 Municipality: South Fergus
 Count Date: Oct 28, 2021

South Approach - Hwy 6

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|-----|----|---|-------|--------|----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 4 | 60 | 5 | 0 | 69 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 1 | 75 | 7 | 0 | 83 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 3 | 83 | 8 | 0 | 94 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 4 | 115 | 4 | 0 | 123 | 0 | 11 | 2 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 1 |
| 08:00 | 1 | 87 | 8 | 0 | 96 | 0 | 13 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 2 | 103 | 3 | 0 | 108 | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 2 |
| 08:30 | 4 | 76 | 20 | 0 | 100 | 1 | 9 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 6 | 105 | 12 | 0 | 123 | 1 | 13 | 1 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 25 | 704 | 67 | 0 | 796 | 2 | 82 | 3 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 3 |



Traffic Count Data

Intersection: Hwy 6 & McQueen Blvd
 Site Code: 2122200001
 Municipality: South Fergus
 Count Date: Oct 28, 2021

South Approach - Hwy 6

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|------|-----|---|-------|--------|-----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 8 | 169 | 18 | 0 | 195 | 0 | 10 | 1 | 0 | 11 | 1 | 0 | 0 | 0 | 1 | 4 |
| 16:15 | 6 | 175 | 31 | 0 | 212 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 16 | 187 | 32 | 0 | 235 | 0 | 4 | 2 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 10 | 177 | 24 | 0 | 211 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 15 | 172 | 25 | 0 | 212 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 12 | 182 | 33 | 0 | 227 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 13 | 139 | 21 | 0 | 173 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 7 | 165 | 24 | 0 | 196 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 87 | 1366 | 208 | 0 | 1661 | 0 | 42 | 3 | 0 | 45 | 1 | 0 | 0 | 0 | 1 | 4 |
| GRAND TOTAL | 112 | 2070 | 275 | 0 | 2457 | 2 | 124 | 6 | 0 | 132 | 1 | 0 | 0 | 0 | 1 | 7 |



Traffic Count Data

Intersection: Hwy 6 & McQueen Blvd
 Site Code: 2122200001
 Municipality: South Fergus
 Count Date: Oct 28, 2021

East Approach - McQueen Blvd

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|----|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 10 | 0 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 13 | 2 | 5 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 07:30 | 14 | 4 | 4 | 0 | 22 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 23 | 2 | 11 | 0 | 36 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 15 | 3 | 4 | 0 | 22 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 14 | 3 | 4 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 08:30 | 7 | 5 | 14 | 0 | 26 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 19 | 8 | 6 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| SUBTOTAL | 115 | 27 | 48 | 0 | 190 | 0 | 0 | 9 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 6 |



Traffic Count Data

Intersection: Hwy 6 & McQueen Blvd
 Site Code: 2122200001
 Municipality: South Fergus
 Count Date: Oct 28, 2021

West Approach - McQueen Blvd

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds | |
|-----------------|------|----|-----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|---|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | | |
| 07:00 | 1 | 2 | 8 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 1 | 5 | 13 | 0 | 19 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 4 | 3 | 22 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 2 | 0 | 16 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 08:00 | 1 | 2 | 12 | 0 | 15 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 5 | 3 | 8 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 08:30 | 7 | 4 | 14 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 08:45 | 4 | 7 | 7 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 25 | 26 | 100 | 0 | 151 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | | 2 |



Traffic Count Data

Intersection: Hwy 6 & McQueen Blvd
 Site Code: 2122200001
 Municipality: South Fergus
 Count Date: Oct 28, 2021

West Approach - McQueen Blvd

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds | |
|--------------------|------|----|-----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|---|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | | |
| 16:00 | 4 | 5 | 13 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 7 | 5 | 4 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 4 | 8 | 6 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 11 | 10 | 9 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 8 | 5 | 4 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 10 | 5 | 10 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 9 | 10 | 6 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 11 | 4 | 5 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 64 | 52 | 57 | 0 | 173 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 89 | 78 | 157 | 0 | 324 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | | 2 |

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 07:15:00
To: 08:15:00

Intersection: Hwy 6 & McQueen Blvd
Site Code: 2122200001
Count Date: Oct 28, 2021

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Hwy 6 runs N/S

North Approach

| | Out | In | Total |
|---------------|------------|------------|-------------|
| | 609 | 392 | 1001 |
| | 34 | 49 | 83 |
| | 1 | 0 | 1 |
| Totals | 644 | 441 | 1085 |

Hwy 6

| | | | | |
|---------------|----------|------------|-----------|----------|
| | 0 | 1 | 0 | 0 |
| | 0 | 34 | 0 | 0 |
| | 2 | 559 | 48 | 0 |
| Totals | 2 | 594 | 48 | 0 |

East Approach

| | Out | In | Total |
|---------------|------------|-----------|------------|
| | 100 | 85 | 185 |
| | 6 | 2 | 8 |
| | 0 | 0 | 0 |
| Totals | 106 | 87 | 193 |

McQueen Blvd

| | | | | Totals |
|--|---|---|----|--------|
| | 0 | 0 | 0 | 0 |
| | 0 | 1 | 8 | 9 |
| | 0 | 0 | 10 | 10 |
| | 0 | 1 | 63 | 64 |

Peds: 1

Peds: 1



Peds: 2

Peds: 1

McQueen Blvd

| Totals | | | |
|--------|----|---|---|
| 0 | 0 | 0 | 0 |
| 30 | 24 | 6 | 0 |
| 11 | 11 | 0 | 0 |
| 65 | 65 | 0 | 0 |

West Approach

| | Out | In | Total |
|---------------|-----------|-----------|------------|
| | 81 | 22 | 103 |
| | 2 | 0 | 2 |
| | 0 | 0 | 0 |
| Totals | 83 | 22 | 105 |

| Totals | | | |
|--------|-----|----|---|
| 9 | 402 | 29 | 0 |
| 9 | 360 | 27 | 0 |
| 0 | 42 | 2 | 0 |
| 0 | 0 | 0 | 0 |

Hwy 6

South Approach

| | Out | In | Total |
|---------------|------------|------------|-------------|
| | 396 | 687 | 1083 |
| | 44 | 35 | 79 |
| | 0 | 1 | 1 |
| Totals | 440 | 723 | 1163 |

- Cars

- Trucks

- Bicycles

Comments



Peak Hour Summary

Intersection: Hwy 6 & McQueen Blvd
 Site Code: 2122200001
 Count Date: Oct 28, 2021
 Period: 07:00 - 09:00

Peak Hour Data (07:15 - 08:15)

| Start Time | North Approach Hwy 6 | | | | | | South Approach Hwy 6 | | | | | | East Approach McQueen Blvd | | | | | | West Approach McQueen Blvd | | | | | | Total Vehicles |
|--------------------|----------------------|-------------|------------|----------|-------------|------------|----------------------|------------|-------------|----------|-------------|------------|----------------------------|-------------|-------------|----------|------------|------------|----------------------------|------------|-------------|----------|-------------|-------------|----------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | |
| 07:15 | 8 | 157 | 0 | 0 | 1 | 165 | 1 | 83 | 7 | 0 | 0 | 91 | 13 | 2 | 5 | 0 | 2 | 20 | 1 | 5 | 14 | 0 | 0 | 20 | 296 |
| 07:30 | 13 | 160 | 0 | 0 | 0 | 173 | 3 | 93 | 8 | 0 | 0 | 104 | 14 | 4 | 6 | 0 | 0 | 24 | 4 | 3 | 22 | 0 | 0 | 29 | 330 |
| 07:45 | 15 | 151 | 1 | 0 | 0 | 167 | 4 | 126 | 6 | 0 | 1 | 136 | 23 | 2 | 13 | 0 | 0 | 38 | 2 | 0 | 16 | 0 | 1 | 18 | 359 |
| 08:00 | 12 | 126 | 1 | 0 | 0 | 139 | 1 | 100 | 8 | 0 | 0 | 109 | 15 | 3 | 6 | 0 | 0 | 24 | 2 | 2 | 12 | 0 | 0 | 16 | 288 |
| Grand Total | 48 | 594 | 2 | 0 | 1 | 644 | 9 | 402 | 29 | 0 | 1 | 440 | 65 | 11 | 30 | 0 | 2 | 106 | 9 | 10 | 64 | 0 | 1 | 83 | 1273 |
| Approach % | 7.5 | 92.2 | 0.3 | 0 | - | - | 2 | 91.4 | 6.6 | 0 | - | - | 61.3 | 10.4 | 28.3 | 0 | - | - | 10.8 | 12 | 77.1 | 0 | - | - | |
| Totals % | 3.8 | 46.7 | 0.2 | 0 | 50.6 | | 0.7 | 31.6 | 2.3 | 0 | 34.6 | | 5.1 | 0.9 | 2.4 | 0 | 8.3 | | 0.7 | 0.8 | 5 | 0 | 6.5 | | |
| PHF | 0.8 | 0.93 | 0.5 | 0 | 0.93 | | 0.56 | 0.8 | 0.91 | 0 | 0.81 | | 0.71 | 0.69 | 0.58 | 0 | 0.7 | | 0.56 | 0.5 | 0.73 | 0 | 0.72 | 0.89 | |
| Cars | 48 | 559 | 2 | 0 | 609 | | 9 | 360 | 27 | 0 | 396 | | 65 | 11 | 24 | 0 | 100 | | 8 | 10 | 63 | 0 | 81 | 1186 | |
| % Cars | 100 | 94.1 | 100 | 0 | 94.6 | | 100 | 89.6 | 93.1 | 0 | 90 | | 100 | 100 | 80 | 0 | 94.3 | | 88.9 | 100 | 98.4 | 0 | 97.6 | 93.2 | |
| Trucks | 0 | 34 | 0 | 0 | 34 | | 0 | 42 | 2 | 0 | 44 | | 0 | 0 | 6 | 0 | 6 | | 1 | 0 | 1 | 0 | 2 | 86 | |
| % Trucks | 0 | 5.7 | 0 | 0 | 5.3 | | 0 | 10.4 | 6.9 | 0 | 10 | | 0 | 0 | 20 | 0 | 5.7 | | 11.1 | 0 | 1.6 | 0 | 2.4 | 6.8 | |
| Bicycles | 0 | 1 | 0 | 0 | 1 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 1 | |
| % Bicycles | 0 | 0.2 | 0 | 0 | 0.2 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0.1 | |
| Peds | | | | | 1 | - | | | | | 1 | - | | | | | 2 | - | | | | | 1 | - | 5 |
| % Peds | | | | | 20 | - | | | | | 20 | - | | | | | 40 | - | | | | | 20 | - | |

Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 16:15:00
To: 17:15:00

Intersection: Hwy 6 & McQueen Blvd
Site Code: 2122200001
Count Date: Oct 28, 2021

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Hwy 6 runs N/S

North Approach

| | Out | In | Total |
|---------------|------------|------------|-------------|
| | 683 | 835 | 1518 |
| | 20 | 24 | 44 |
| | 0 | 0 | 0 |
| Totals | 703 | 859 | 1562 |

Hwy 6

| | | | | |
|---------------|----------|------------|------------|----------|
| | 0 | 0 | 0 | 0 |
| | 0 | 20 | 0 | 0 |
| | 5 | 526 | 152 | 0 |
| Totals | 5 | 546 | 152 | 0 |

East Approach

| | Out | In | Total |
|---------------|------------|------------|------------|
| | 164 | 292 | 456 |
| | 2 | 2 | 4 |
| | 0 | 0 | 0 |
| Totals | 166 | 294 | 460 |

McQueen Blvd

| | | | | Totals |
|--|---|---|----|--------|
| | 0 | 0 | 0 | 0 |
| | 0 | 0 | 30 | 30 |
| | 0 | 0 | 28 | 28 |
| | 0 | 0 | 23 | 23 |

Peds: 6

Peds: 0



Peds: 2

Peds: 0

McQueen Blvd

| Totals | | | |
|--------|----|---|---|
| 0 | 0 | 0 | 0 |
| 95 | 94 | 1 | 0 |
| 16 | 16 | 0 | 0 |
| 55 | 54 | 1 | 0 |

West Approach

| | Out | In | Total |
|---------------|-----------|-----------|------------|
| | 81 | 68 | 149 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| Totals | 81 | 68 | 149 |

| Totals | | | | |
|--------|----|-----|-----|---|
| 47 | 47 | 711 | 112 | 0 |
| 0 | 0 | 23 | 2 | 0 |
| 0 | 0 | 0 | 0 | 0 |

Hwy 6

South Approach

| | Out | In | Total |
|---------------|------------|------------|-------------|
| | 870 | 603 | 1473 |
| | 25 | 21 | 46 |
| | 0 | 0 | 0 |
| Totals | 895 | 624 | 1519 |

- Cars

- Trucks

- Bicycles

Comments



Peak Hour Summary

Intersection: Hwy 6 & McQueen Blvd
 Site Code: 2122200001
 Count Date: Oct 28, 2021
 Period: 16:00 - 18:00

Peak Hour Data (16:15 - 17:15)

| Start Time | North Approach Hwy 6 | | | | | | South Approach Hwy 6 | | | | | | East Approach McQueen Blvd | | | | | | West Approach McQueen Blvd | | | | | | Total Vehicles |
|--------------------|----------------------|-------------|-------------|----------|-------------|------------|----------------------|-------------|-------------|----------|-------------|------------|----------------------------|-------------|------------|----------|-------------|------------|----------------------------|------------|-------------|----------|----------|-------------|----------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | |
| 16:15 | 36 | 157 | 1 | 0 | 3 | 194 | 6 | 182 | 31 | 0 | 0 | 219 | 16 | 2 | 16 | 0 | 2 | 34 | 7 | 5 | 4 | 0 | 0 | 16 | 463 |
| 16:30 | 33 | 136 | 1 | 0 | 0 | 170 | 16 | 191 | 34 | 0 | 0 | 241 | 12 | 4 | 18 | 0 | 0 | 34 | 4 | 8 | 6 | 0 | 0 | 18 | 463 |
| 16:45 | 29 | 108 | 1 | 0 | 3 | 138 | 10 | 183 | 24 | 0 | 0 | 217 | 15 | 6 | 34 | 0 | 0 | 55 | 11 | 10 | 9 | 0 | 0 | 30 | 440 |
| 17:00 | 54 | 145 | 2 | 0 | 0 | 201 | 15 | 178 | 25 | 0 | 0 | 218 | 12 | 4 | 27 | 0 | 0 | 43 | 8 | 5 | 4 | 0 | 0 | 17 | 479 |
| Grand Total | 152 | 546 | 5 | 0 | 6 | 703 | 47 | 734 | 114 | 0 | 0 | 895 | 55 | 16 | 95 | 0 | 2 | 166 | 30 | 28 | 23 | 0 | 0 | 81 | 1845 |
| Approach % | 21.6 | 77.7 | 0.7 | 0 | - | - | 5.3 | 82 | 12.7 | 0 | - | - | 33.1 | 9.6 | 57.2 | 0 | - | - | 37 | 34.6 | 28.4 | 0 | - | - | - |
| Totals % | 8.2 | 29.6 | 0.3 | 0 | 38.1 | - | 2.5 | 39.8 | 6.2 | 0 | 48.5 | - | 3 | 0.9 | 5.1 | 0 | 9 | - | 1.6 | 1.5 | 1.2 | 0 | - | 4.4 | - |
| PHF | 0.7 | 0.87 | 0.63 | 0 | 0.87 | - | 0.73 | 0.96 | 0.84 | 0 | 0.93 | - | 0.86 | 0.67 | 0.7 | 0 | 0.75 | - | 0.68 | 0.7 | 0.64 | 0 | - | 0.68 | 0.96 |
| Cars | 152 | 526 | 5 | 0 | 683 | 683 | 47 | 711 | 112 | 0 | 870 | 870 | 54 | 16 | 94 | 0 | 164 | 164 | 30 | 28 | 23 | 0 | 81 | 1798 | |
| % Cars | 100 | 96.3 | 100 | 0 | 97.2 | 97.2 | 100 | 96.9 | 98.2 | 0 | 97.2 | 97.2 | 98.2 | 100 | 98.9 | 0 | 98.8 | 98.8 | 100 | 100 | 100 | 0 | 100 | 100 | 97.5 |
| Trucks | 0 | 20 | 0 | 0 | 20 | 20 | 0 | 23 | 2 | 0 | 25 | 25 | 1 | 0 | 1 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 47 |
| % Trucks | 0 | 3.7 | 0 | 0 | 2.8 | 2.8 | 0 | 3.1 | 1.8 | 0 | 2.8 | 2.8 | 1.8 | 0 | 1.1 | 0 | 1.2 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 2.5 |
| Bicycles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| % Bicycles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Peds | | | | | 6 | - | | | | | 0 | - | | | | | 2 | - | | | | | 0 | - | 8 |
| % Peds | | | | | 75 | - | | | | | 0 | - | | | | | 25 | - | | | | | 0 | - | - |



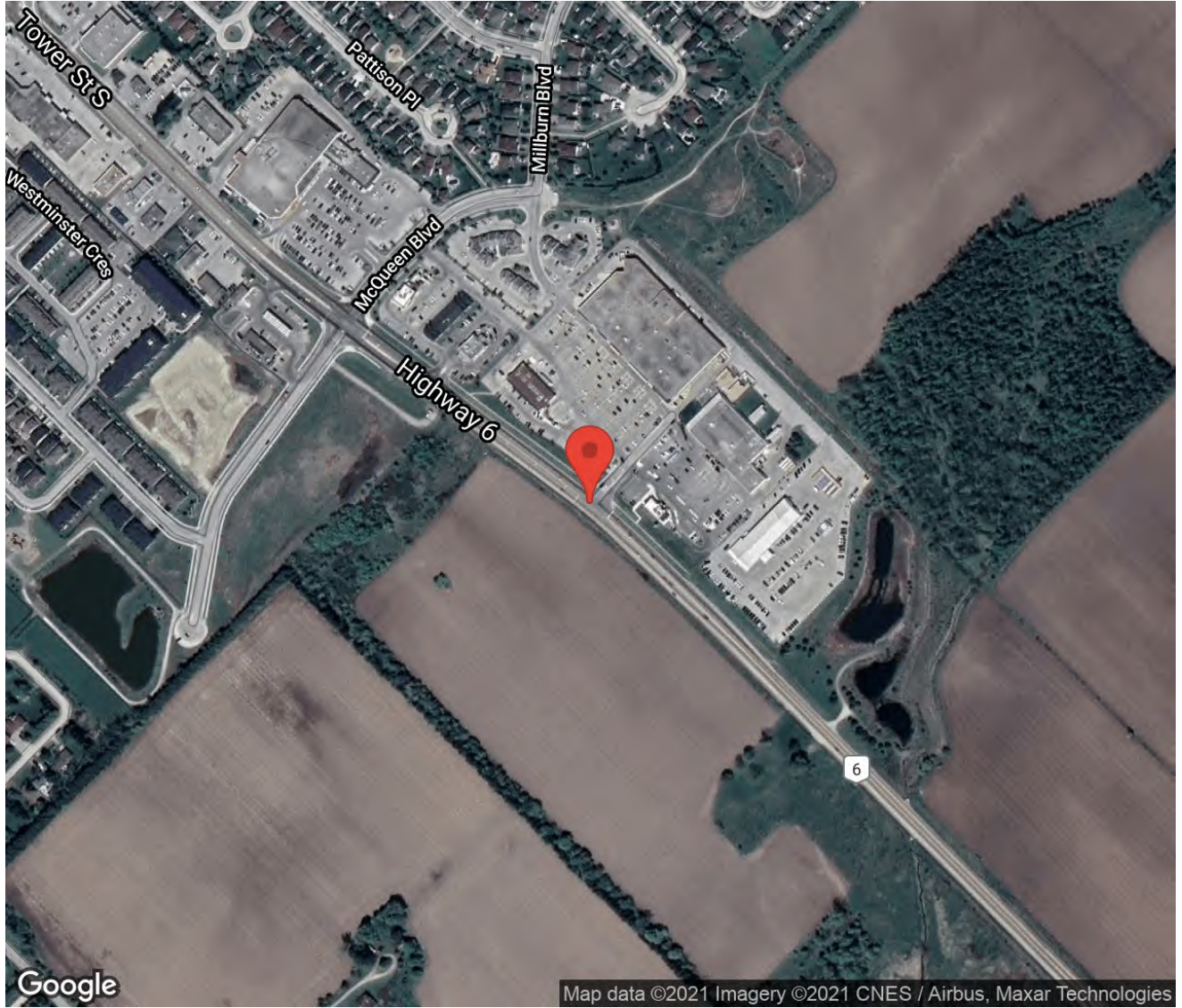
Project #21-222 - Tatham Engineering Ltd

Intersection Count Report

| | |
|--------------------------|-------------------------------------|
| Intersection: | Hwy 6 & Retail Plaza |
| Municipality: | South Fergus |
| Count Date: | Oct 28, 2021 |
| Site Code: | 2122200002 |
| Count Categories: | Cars, Trucks, Bicycles, Pedestrians |
| Count Period: | 07:00-09:00, 16:00-18:00 |
| Weather: | Clear |

Traffic Count Map

Intersection: Hwy 6 & Retail Plaza
Site Code: 2122200002
Municipality: South Fergus
Count Date: Oct 28, 2021



Traffic Count Summary

Intersection: Hwy 6 & Retail Plaza
 Site Code: 2122200002
 Municipality: South Fergus
 Count Date: Oct 28, 2021

Hwy 6 - Traffic Summary

| Hour | North Approach Totals | | | | | | South Approach Totals | | | | | | Total |
|----------------------|---------------------------------|-------------|----------|----------|-------------|----------|---------------------------------|-------------|------------|----------|-------------|----------|-------------|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | | |
| | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds | |
| 07:00 - 08:00 | 51 | 618 | 0 | 0 | 669 | 0 | 0 | 385 | 20 | 0 | 405 | 0 | 1074 |
| 08:00 - 09:00 | 69 | 546 | 0 | 0 | 615 | 0 | 0 | 429 | 36 | 0 | 465 | 0 | 1080 |
| BREAK | | | | | | | | | | | | | |
| 16:00 - 17:00 | 122 | 509 | 0 | 0 | 631 | 0 | 0 | 780 | 85 | 0 | 865 | 0 | 1496 |
| 17:00 - 18:00 | 84 | 462 | 0 | 0 | 546 | 0 | 0 | 687 | 77 | 0 | 764 | 0 | 1310 |
| GRAND TOTAL | 326 | 2135 | 0 | 0 | 2461 | 0 | 0 | 2281 | 218 | 0 | 2499 | 0 | 4960 |



Traffic Count Data

Intersection: Hwy 6 & Retail Plaza
 Site Code: 2122200002
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Hwy 6

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|------|---|---|-------|--------|----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 5 | 129 | 0 | 0 | 134 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 8 | 148 | 0 | 0 | 156 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 15 | 169 | 0 | 0 | 184 | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 22 | 144 | 0 | 0 | 166 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 22 | 136 | 0 | 0 | 158 | 2 | 7 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 10 | 145 | 0 | 0 | 155 | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 12 | 126 | 0 | 0 | 138 | 1 | 9 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 22 | 105 | 0 | 0 | 127 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 116 | 1102 | 0 | 0 | 1218 | 4 | 62 | 0 | 0 | 66 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Hwy 6 & Retail Plaza
 Site Code: 2122200002
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Hwy 6

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|------|---|---|-------|--------|-----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 31 | 116 | 0 | 0 | 147 | 1 | 12 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 30 | 116 | 0 | 0 | 146 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 30 | 131 | 0 | 0 | 161 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 30 | 114 | 0 | 0 | 144 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 27 | 130 | 0 | 0 | 157 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 22 | 124 | 0 | 0 | 146 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 13 | 105 | 0 | 0 | 118 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 22 | 90 | 0 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 205 | 926 | 0 | 0 | 1131 | 1 | 45 | 0 | 0 | 46 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 321 | 2028 | 0 | 0 | 2349 | 5 | 107 | 0 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Hwy 6 & Retail Plaza
 Site Code: 2122200002
 Municipality: South Fergus
 Count Date: Oct 28, 2021

South Approach - Hwy 6

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|-----|----|---|-------|--------|----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 0 | 70 | 2 | 0 | 72 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 0 | 86 | 3 | 0 | 89 | 0 | 7 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 0 | 84 | 4 | 0 | 88 | 0 | 11 | 1 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 0 | 111 | 8 | 0 | 119 | 0 | 9 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 0 | 77 | 8 | 0 | 85 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 0 | 105 | 14 | 0 | 119 | 0 | 18 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 0 | 103 | 6 | 0 | 109 | 0 | 7 | 2 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 0 | 96 | 6 | 0 | 102 | 0 | 16 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 0 | 732 | 51 | 0 | 783 | 0 | 82 | 5 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Hwy 6 & Retail Plaza
 Site Code: 2122200002
 Municipality: South Fergus
 Count Date: Oct 28, 2021

South Approach - Hwy 6

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|------|-----|---|-------|--------|-----|----|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 0 | 158 | 18 | 0 | 176 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 0 | 191 | 27 | 0 | 218 | 0 | 7 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 0 | 211 | 26 | 0 | 237 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 0 | 193 | 13 | 0 | 206 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 0 | 168 | 22 | 0 | 190 | 0 | 6 | 1 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 0 | 187 | 17 | 0 | 204 | 0 | 2 | 3 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 0 | 170 | 18 | 0 | 188 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 0 | 149 | 16 | 0 | 165 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 0 | 1427 | 157 | 0 | 1584 | 0 | 40 | 5 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 0 | 2159 | 208 | 0 | 2367 | 0 | 122 | 10 | 0 | 132 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Hwy 6 & Retail Plaza
 Site Code: 2122200002
 Municipality: South Fergus
 Count Date: Oct 28, 2021

East Approach - Retail Plaza

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|---|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 9 | 0 | 2 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 10 | 0 | 4 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 9 | 0 | 4 | 0 | 13 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 11 | 0 | 8 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 14 | 0 | 4 | 0 | 18 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 12 | 0 | 13 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 7 | 0 | 6 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 7 | 0 | 9 | 0 | 16 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 79 | 0 | 50 | 0 | 129 | 4 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Hwy 6 & Retail Plaza
 Site Code: 2122200002
 Municipality: South Fergus
 Count Date: Oct 28, 2021

East Approach - Retail Plaza

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|---|-----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 10 | 0 | 31 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 22 | 0 | 33 | 0 | 55 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 14 | 0 | 22 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 14 | 0 | 36 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 16 | 0 | 37 | 0 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 14 | 0 | 31 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 9 | 0 | 20 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 12 | 0 | 20 | 0 | 32 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 111 | 0 | 230 | 0 | 341 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 190 | 0 | 280 | 0 | 470 | 6 | 0 | 1 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 07:30:00
To: 08:30:00




Intersection: Hwy 6 & Retail Plaza
Site Code: 2122200002
Count Date: Oct 28, 2021

Weather conditions: Clear




**** Signalized Intersection ****

Major Road: Hwy 6 runs N/S

North Approach

| | Out | In | Total |
|---|------------|------------|-------------|
|  | 663 | 406 | 1069 |
|  | 34 | 46 | 80 |
|  | 0 | 0 | 0 |
| Totals | 697 | 452 | 1149 |

Hwy 6

| | | | |
|---|------------|-----------|----------|
|  | 0 | 0 | 0 |
|  | 31 | 3 | 0 |
|  | 594 | 69 | 0 |
| Totals | 625 | 72 | 0 |






Peds: 0

Peds: 0






Peds: 0

Peds: 0







| | | | |
|---|------------|-----------|----------|
| Totals | 422 | 36 | 0 |
|  | 377 | 34 | 0 |
|  | 45 | 2 | 0 |
|  | 0 | 0 | 0 |

Hwy 6




East Approach

| | Out | In | Total |
|---|-----------|------------|------------|
|  | 75 | 103 | 178 |
|  | 4 | 5 | 9 |
|  | 0 | 0 | 0 |
| Totals | 79 | 108 | 187 |


Retail Plaza

| Totals |  |  |  |
|---|---|---|---|
|  | 0 | 0 | 0 |
|  | 30 | 29 | 1 |
|  | 49 | 46 | 3 |

South Approach

| | Out | In | Total |
|---|------------|------------|-------------|
|  | 411 | 640 | 1051 |
|  | 47 | 34 | 81 |
|  | 0 | 0 | 0 |
| Totals | 458 | 674 | 1132 |

 - Cars

 - Trucks

 - Bicycles

Comments



Peak Hour Summary

Intersection: Hwy 6 & Retail Plaza
 Site Code: 2122200002
 Count Date: Oct 28, 2021
 Period: 07:00 - 09:00

Peak Hour Data (07:30 - 08:30)

| Start Time | North Approach Hwy 6 | | | | | South Approach Hwy 6 | | | | | East Approach Retail Plaza | | | | | West Approach | | | | | Total Vehicles | | | | |
|--------------------|----------------------|-------------|---|----------|-------------|----------------------|-------------|-------------|-----------|-------------|----------------------------|-------------|-----------|-------------|-----------|---------------|----------|-----------|---|---|----------------|---|----------|----------|-------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | | → | ↻ | Peds | Total |
| 07:30 | 16 | 175 | | 0 | 0 | 191 | | 95 | 5 | 0 | 0 | 100 | 12 | | 4 | 0 | 0 | 16 | | | | | 0 | | 307 |
| 07:45 | 22 | 151 | | 0 | 0 | 173 | | 120 | 9 | 0 | 0 | 129 | 11 | | 8 | 0 | 0 | 19 | | | | | 0 | | 321 |
| 08:00 | 24 | 143 | | 0 | 0 | 167 | | 84 | 8 | 0 | 0 | 92 | 14 | | 5 | 0 | 0 | 19 | | | | | 0 | | 278 |
| 08:15 | 10 | 156 | | 0 | 0 | 166 | | 123 | 14 | 0 | 0 | 137 | 12 | | 13 | 0 | 0 | 25 | | | | | 0 | | 328 |
| Grand Total | 72 | 625 | | 0 | 0 | 697 | | 422 | 36 | 0 | 0 | 458 | 49 | | 30 | 0 | 0 | 79 | | | | | 0 | 0 | 1234 |
| Approach % | 10.3 | 89.7 | | 0 | - | - | | 92.1 | 7.9 | 0 | - | - | 62 | | 38 | 0 | - | - | | | | | 0 | | - |
| Totals % | 5.8 | 50.6 | | 0 | 56.5 | | 34.2 | 2.9 | 0 | 37.1 | | 4 | | 2.4 | 0 | 6.4 | | | | | | | 0 | | |
| PHF | 0.75 | 0.89 | | 0 | 0.91 | | 0.86 | 0.64 | 0 | 0.84 | | 0.88 | | 0.58 | 0 | 0.79 | | | | | | | 0 | | 0.94 |
| Cars | 69 | 594 | | 0 | 663 | | 377 | 34 | 0 | 411 | | 46 | | 29 | 0 | 75 | | | | | | 0 | | 1149 | |
| % Cars | 95.8 | 95 | | 0 | 95.1 | | 89.3 | 94.4 | 0 | 89.7 | | 93.9 | | 96.7 | 0 | 94.9 | | | | | | 0 | | 93.1 | |
| Trucks | 3 | 31 | | 0 | 34 | | 45 | 2 | 0 | 47 | | 3 | | 1 | 0 | 4 | | | | | | 0 | | 85 | |
| % Trucks | 4.2 | 5 | | 0 | 4.9 | | 10.7 | 5.6 | 0 | 10.3 | | 6.1 | | 3.3 | 0 | 5.1 | | | | | | 0 | | 6.9 | |
| Bicycles | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | | | | | | 0 | | 0 | |
| % Bicycles | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | | | | | | 0 | | 0 | |
| Peds | | | | 0 | - | | | | 0 | - | | | | | 0 | - | | | | | | 0 | | - | 0 |
| % Peds | | | | 0 | - | | | | 0 | - | | | | | 0 | - | | | | | | 0 | | - | 0 |

Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 16:15:00
To: 17:15:00




Intersection: Hwy 6 & Retail Plaza
Site Code: 2122200002
Count Date: Oct 28, 2021

Weather conditions: Clear




**** Signalized Intersection ****

Major Road: Hwy 6 runs N/S

North Approach

| | Out | In | Total |
|---|------------|------------|-------------|
|  | 608 | 891 | 1499 |
|  | 26 | 23 | 49 |
|  | 0 | 0 | 0 |
| Totals | 634 | 914 | 1548 |

Hwy 6




| | | | |
|---|------------|------------|----------|
|  | 0 | 0 | 0 |
|  | 26 | 0 | 0 |
|  | 491 | 117 | 0 |
| Totals | 517 | 117 | 0 |



Peds: 0






Peds: 0




| | ↑ | → | ↻ |
|---|------------|-----------|----------|
| Totals | 786 | 90 | 0 |
|  | 763 | 88 | 0 |
|  | 23 | 2 | 0 |
|  | 0 | 0 | 0 |

Hwy 6




East Approach

| | Out | In | Total |
|---|------------|------------|------------|
|  | 194 | 205 | 399 |
|  | 1 | 2 | 3 |
|  | 0 | 0 | 0 |
| Totals | 195 | 207 | 402 |


Retail Plaza

| Totals |  |  |  |
|------------|---|---|---|
| 0 | 0 | 0 | 0 |
| 128 | 128 | 0 | 0 |
| 67 | 66 | 1 | 0 |

South Approach

| | Out | In | Total |
|---|------------|------------|-------------|
|  | 851 | 557 | 1408 |
|  | 25 | 27 | 52 |
|  | 0 | 0 | 0 |
| Totals | 876 | 584 | 1460 |

 - Cars

 - Trucks

 - Bicycles

Comments



Peak Hour Summary

Intersection: Hwy 6 & Retail Plaza
 Site Code: 2122200002
 Count Date: Oct 28, 2021
 Period: 16:00 - 18:00

Peak Hour Data (16:15 - 17:15)

| Start Time | North Approach Hwy 6 | | | | | | South Approach Hwy 6 | | | | | | East Approach Retail Plaza | | | | | | West Approach | | | | | | Total Vehicles |
|--------------------|----------------------|-------------|---|----------|-------------|------------|----------------------|------------|-----------|------------|----------|-------------|----------------------------|-------------|------------|-------------|----------|------------|---------------|---|---|----------|----------|-------------|----------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | |
| 16:15 | 30 | 123 | | 0 | 0 | 153 | | 198 | 28 | 0 | 0 | 226 | 23 | | 33 | 0 | 0 | 56 | | | | | 0 | | 435 |
| 16:30 | 30 | 140 | | 0 | 0 | 170 | | 217 | 26 | 0 | 0 | 243 | 14 | | 22 | 0 | 0 | 36 | | | | | 0 | | 449 |
| 16:45 | 30 | 118 | | 0 | 0 | 148 | | 197 | 13 | 0 | 0 | 210 | 14 | | 36 | 0 | 0 | 50 | | | | | 0 | | 408 |
| 17:00 | 27 | 136 | | 0 | 0 | 163 | | 174 | 23 | 0 | 0 | 197 | 16 | | 37 | 0 | 0 | 53 | | | | | 0 | | 413 |
| Grand Total | 117 | 517 | | 0 | 0 | 634 | | 786 | 90 | 0 | 0 | 876 | 67 | | 128 | 0 | 0 | 195 | | | | | 0 | 0 | 1705 |
| Approach % | 18.5 | 81.5 | | 0 | - | - | | 89.7 | 10.3 | 0 | - | - | 34.4 | | 65.6 | 0 | - | - | | | | | - | - | - |
| Totals % | 6.9 | 30.3 | | 0 | 37.2 | | 46.1 | 5.3 | 0 | 51.4 | | 3.9 | | 7.5 | 0 | 11.4 | | | | | | | 0 | | |
| PHF | 0.98 | 0.92 | | 0 | 0.93 | | 0.91 | 0.8 | 0 | 0.9 | | 0.73 | | 0.86 | 0 | 0.87 | | | | | | 0 | | 0.95 | |
| Cars | 117 | 491 | | 0 | 608 | | 763 | 88 | 0 | 851 | | 66 | | 128 | 0 | 194 | | | | | | 0 | | 1653 | |
| % Cars | 100 | 95 | | 0 | 95.9 | | 97.1 | 97.8 | 0 | 97.1 | | 98.5 | | 100 | 0 | 99.5 | | | | | | 0 | | 97 | |
| Trucks | 0 | 26 | | 0 | 26 | | 23 | 2 | 0 | 25 | | 1 | | 0 | 0 | 1 | | | | | | 0 | | 52 | |
| % Trucks | 0 | 5 | | 0 | 4.1 | | 2.9 | 2.2 | 0 | 2.9 | | 1.5 | | 0 | 0 | 0.5 | | | | | | 0 | | 3 | |
| Bicycles | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | | | | | | 0 | | 0 | |
| % Bicycles | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | 0 | | | | | | 0 | | 0 | |
| Peds | | | | | 0 | - | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | 0 | |
| % Peds | | | | | 0 | - | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | 0 | |



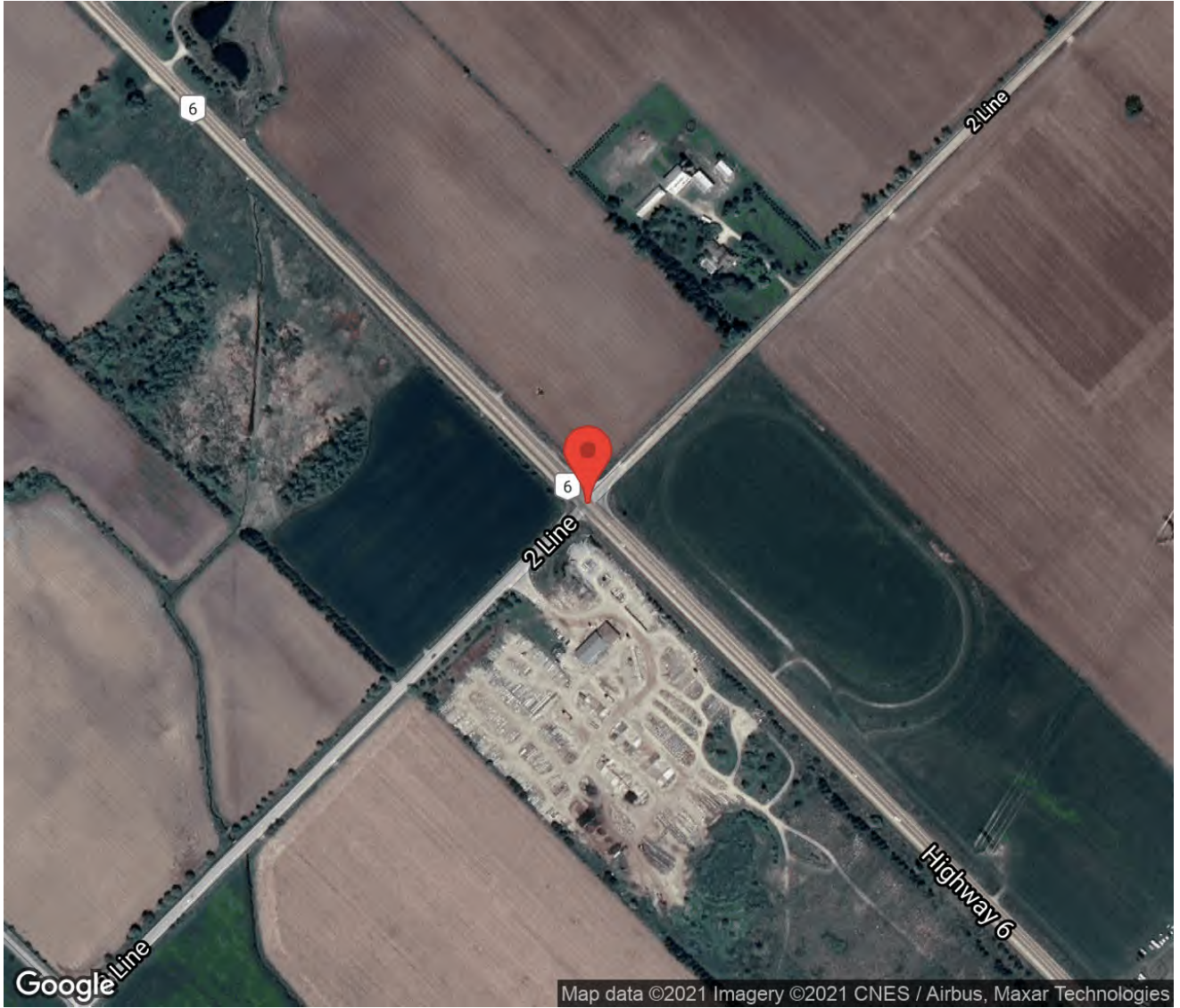
Project #21-222 - Tatham Engineering Ltd

Intersection Count Report

| | |
|--------------------------|-------------------------------------|
| Intersection: | Hwy 6 & 2nd Line |
| Municipality: | South Fergus |
| Count Date: | Oct 28, 2021 |
| Site Code: | 2122200003 |
| Count Categories: | Cars, Trucks, Bicycles, Pedestrians |
| Count Period: | 07:00-09:00, 16:00-18:00 |
| Weather: | Clear |

Traffic Count Map

Intersection: Hwy 6 & 2nd Line
Site Code: 2122200003
Municipality: South Fergus
Count Date: Oct 28, 2021





Traffic Count Summary

Intersection: Hwy 6 & 2nd Line
 Site Code: 2122200003
 Municipality: South Fergus
 Count Date: Oct 28, 2021

Hwy 6 - Traffic Summary

| Hour | North Approach Totals | | | | | | South Approach Totals | | | | | | Total |
|----------------------|---------------------------------|-------------|------------|----------|-------------|----------|---------------------------------|-------------|-----------|----------|-------------|----------|-------------|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | | |
| | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds | |
| 07:00 - 08:00 | 3 | 622 | 44 | 0 | 669 | 0 | 11 | 382 | 8 | 0 | 401 | 0 | 1070 |
| 08:00 - 09:00 | 8 | 522 | 44 | 0 | 574 | 0 | 13 | 415 | 13 | 0 | 441 | 0 | 1015 |
| BREAK | | | | | | | | | | | | | |
| 16:00 - 17:00 | 4 | 524 | 53 | 0 | 581 | 0 | 23 | 806 | 12 | 0 | 841 | 0 | 1422 |
| 17:00 - 18:00 | 7 | 449 | 47 | 0 | 503 | 0 | 19 | 712 | 16 | 0 | 747 | 0 | 1250 |
| GRAND TOTAL | 22 | 2117 | 188 | 0 | 2327 | 0 | 66 | 2315 | 49 | 0 | 2430 | 0 | 4757 |

Traffic Count Summary

Intersection: Hwy 6 & 2nd Line
 Site Code: 2122200003
 Municipality: South Fergus
 Count Date: Oct 28, 2021

2nd Line - Traffic Summary

| Hour | East Approach Totals | | | | | | West Approach Totals | | | | | | Total |
|----------------------|---------------------------------|-----------|-----------|----------|------------|----------|---------------------------------|-----------|-----------|----------|------------|----------|------------|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | | |
| | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds | |
| 07:00 - 08:00 | 2 | 9 | 3 | 0 | 14 | 0 | 27 | 11 | 12 | 0 | 50 | 0 | 64 |
| 08:00 - 09:00 | 8 | 13 | 12 | 0 | 33 | 0 | 33 | 28 | 17 | 0 | 78 | 0 | 111 |
| BREAK | | | | | | | | | | | | | |
| 16:00 - 17:00 | 8 | 11 | 14 | 0 | 33 | 0 | 45 | 14 | 14 | 0 | 73 | 0 | 106 |
| 17:00 - 18:00 | 7 | 10 | 8 | 0 | 25 | 0 | 42 | 11 | 12 | 0 | 65 | 0 | 90 |
| GRAND TOTAL | 25 | 43 | 37 | 0 | 105 | 0 | 147 | 64 | 55 | 0 | 266 | 0 | 371 |



Traffic Count Data

Intersection: Hwy 6 & 2nd Line
 Site Code: 2122200003
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Hwy 6

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|------|----|---|-------|--------|----|----|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 0 | 124 | 10 | 0 | 134 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 1 | 138 | 8 | 0 | 147 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 0 | 181 | 9 | 0 | 190 | 0 | 6 | 3 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 2 | 153 | 12 | 0 | 167 | 0 | 5 | 2 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 1 | 134 | 6 | 0 | 141 | 0 | 7 | 2 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 2 | 131 | 14 | 0 | 147 | 0 | 9 | 2 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 2 | 137 | 8 | 0 | 147 | 0 | 6 | 1 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 3 | 92 | 9 | 0 | 104 | 0 | 6 | 2 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 11 | 1090 | 76 | 0 | 1177 | 0 | 54 | 12 | 0 | 66 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Hwy 6 & 2nd Line
 Site Code: 2122200003
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Hwy 6

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|------|-----|---|-------|--------|----|----|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 3 | 109 | 13 | 0 | 125 | 0 | 9 | 2 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 0 | 124 | 10 | 0 | 134 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 0 | 134 | 17 | 0 | 151 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 1 | 129 | 9 | 0 | 139 | 0 | 2 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 0 | 124 | 14 | 0 | 138 | 0 | 4 | 2 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 2 | 129 | 6 | 0 | 137 | 0 | 5 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 1 | 96 | 13 | 0 | 110 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 4 | 88 | 11 | 0 | 103 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 11 | 933 | 93 | 0 | 1037 | 0 | 40 | 7 | 0 | 47 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 22 | 2023 | 169 | 0 | 2214 | 0 | 94 | 19 | 0 | 113 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Hwy 6 & 2nd Line
 Site Code: 2122200003
 Municipality: South Fergus
 Count Date: Oct 28, 2021

South Approach - Hwy 6

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|-----|----|---|-------|--------|----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 2 | 64 | 1 | 0 | 67 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 3 | 85 | 2 | 0 | 90 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 2 | 85 | 1 | 0 | 88 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 4 | 115 | 4 | 0 | 123 | 0 | 12 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 4 | 73 | 3 | 0 | 80 | 1 | 11 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 3 | 109 | 3 | 0 | 115 | 0 | 9 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 1 | 99 | 2 | 0 | 102 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 4 | 93 | 4 | 0 | 101 | 0 | 12 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 23 | 723 | 20 | 0 | 766 | 1 | 74 | 1 | 0 | 76 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Hwy 6 & 2nd Line
 Site Code: 2122200003
 Municipality: South Fergus
 Count Date: Oct 28, 2021

East Approach - 2nd Line

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds | |
|-----------------|------|----|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|---|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | | |
| 07:00 | 0 | 2 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 1 | 4 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 1 | 3 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 1 | 3 | 5 | 0 | 9 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 2 | 1 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 4 | 4 | 5 | 0 | 13 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 10 | 20 | 15 | 0 | 45 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Hwy 6 & 2nd Line
 Site Code: 2122200003
 Municipality: South Fergus
 Count Date: Oct 28, 2021

East Approach - 2nd Line

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|----|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 3 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 4 | 1 | 4 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 0 | 5 | 5 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 1 | 4 | 5 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 5 | 5 | 2 | 0 | 12 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 1 | 2 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 1 | 2 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 15 | 19 | 22 | 0 | 56 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 25 | 39 | 37 | 0 | 101 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Hwy 6 & 2nd Line
 Site Code: 2122200003
 Municipality: South Fergus
 Count Date: Oct 28, 2021

West Approach - 2nd Line

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|----|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 7 | 4 | 2 | 0 | 13 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 4 | 3 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 3 | 2 | 4 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 9 | 2 | 6 | 0 | 17 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 7 | 4 | 7 | 0 | 18 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 6 | 6 | 4 | 0 | 16 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 7 | 8 | 2 | 0 | 17 | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 6 | 8 | 2 | 0 | 16 | 3 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 49 | 37 | 27 | 0 | 113 | 11 | 2 | 2 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Hwy 6 & 2nd Line
 Site Code: 2122200003
 Municipality: South Fergus
 Count Date: Oct 28, 2021

West Approach - 2nd Line

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|----|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 6 | 4 | 2 | 0 | 12 | 1 | 1 | 3 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 10 | 1 | 2 | 0 | 13 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 12 | 7 | 6 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 13 | 1 | 1 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 7 | 2 | 6 | 0 | 15 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 6 | 2 | 0 | 0 | 8 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 13 | 4 | 3 | 0 | 20 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 12 | 3 | 3 | 0 | 18 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 79 | 24 | 23 | 0 | 126 | 8 | 1 | 3 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 128 | 61 | 50 | 0 | 239 | 19 | 3 | 5 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 |

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 07:30:00
To: 08:30:00

Intersection: Hwy 6 & 2nd Line
Site Code: 2122200003
Count Date: Oct 28, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Hwy 6 runs N/S

North Approach

| | Out | In | Total |
|---------------|------------|------------|-------------|
| | 645 | 414 | 1059 |
| | 36 | 46 | 82 |
| | 0 | 0 | 0 |
| Totals | 681 | 460 | 1141 |

Hwy 6

| | | | | |
|---------------|-----------|------------|----------|----------|
| | 0 | 0 | 0 | 0 |
| | 9 | 27 | 0 | 0 |
| | 41 | 599 | 5 | 0 |
| Totals | 50 | 626 | 5 | 0 |

East Approach

| | Out | In | Total |
|---------------|-----------|-----------|-----------|
| | 21 | 30 | 51 |
| | 1 | 1 | 2 |
| | 0 | 0 | 0 |
| Totals | 22 | 31 | 53 |

2nd Line

| | | | | Totals |
|--|---|---|----|-----------|
| | 0 | 0 | 0 | 0 |
| | 0 | 4 | 25 | 29 |
| | 0 | 0 | 14 | 14 |
| | 0 | 2 | 21 | 23 |

Peds: 0

Peds: 0



Peds: 0

Peds: 0

2nd Line

| Totals | | | |
|-----------|----|---|---|
| 0 | 0 | 0 | 0 |
| 7 | 7 | 0 | 0 |
| 12 | 11 | 1 | 0 |
| 3 | 3 | 0 | 0 |

West Approach

| | Out | In | Total |
|---------------|-----------|-----------|------------|
| | 60 | 65 | 125 |
| | 6 | 11 | 17 |
| | 0 | 0 | 0 |
| Totals | 66 | 76 | 142 |

| Totals | | | | |
|-----------|------------|-----------|----------|---|
| 14 | 424 | 12 | 0 | |
| | 13 | 382 | 11 | 0 |
| | 1 | 42 | 1 | 0 |
| | 0 | 0 | 0 | 0 |

Hwy 6

South Approach

| | Out | In | Total |
|---------------|------------|------------|-------------|
| | 406 | 623 | 1029 |
| | 44 | 29 | 73 |
| | 0 | 0 | 0 |
| Totals | 450 | 652 | 1102 |

- Cars

- Trucks

- Bicycles

Comments



Peak Hour Summary

Intersection: Hwy 6 & 2nd Line
 Site Code: 2122200003
 Count Date: Oct 28, 2021
 Period: 07:00 - 09:00

Peak Hour Data (07:30 - 08:30)

| Start Time | North Approach Hwy 6 | | | | | | South Approach Hwy 6 | | | | | | East Approach 2nd Line | | | | | | West Approach 2nd Line | | | | | | Total Vehicles |
|--------------------|----------------------|-------------|-------------|----------|----------|-------------|----------------------|-------------|-------------|----------|----------|-------------|------------------------|-------------|-------------|----------|----------|-------------|------------------------|-------------|-------------|----------|----------|-------------|----------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | |
| 07:30 | 0 | 187 | 12 | 0 | 0 | 199 | 2 | 95 | 1 | 0 | 0 | 98 | 0 | 1 | 1 | 0 | 0 | 2 | 3 | 2 | 4 | 0 | 0 | 9 | 308 |
| 07:45 | 2 | 158 | 14 | 0 | 0 | 174 | 4 | 127 | 4 | 0 | 0 | 135 | 1 | 4 | 0 | 0 | 0 | 5 | 11 | 2 | 6 | 0 | 0 | 19 | 333 |
| 08:00 | 1 | 141 | 8 | 0 | 0 | 150 | 5 | 84 | 3 | 0 | 0 | 92 | 1 | 3 | 1 | 0 | 0 | 5 | 9 | 4 | 7 | 0 | 0 | 20 | 267 |
| 08:15 | 2 | 140 | 16 | 0 | 0 | 158 | 3 | 118 | 4 | 0 | 0 | 125 | 1 | 4 | 5 | 0 | 0 | 10 | 6 | 6 | 6 | 0 | 0 | 18 | 311 |
| Grand Total | 5 | 626 | 50 | 0 | 0 | 681 | 14 | 424 | 12 | 0 | 0 | 450 | 3 | 12 | 7 | 0 | 0 | 22 | 29 | 14 | 23 | 0 | 0 | 66 | 1219 |
| Approach % | 0.7 | 91.9 | 7.3 | 0 | - | - | 3.1 | 94.2 | 2.7 | 0 | - | - | 13.6 | 54.5 | 31.8 | 0 | - | - | 43.9 | 21.2 | 34.8 | 0 | - | - | - |
| Totals % | 0.4 | 51.4 | 4.1 | 0 | - | 55.9 | 1.1 | 34.8 | 1 | 0 | - | 36.9 | 0.2 | 1 | 0.6 | 0 | - | 1.8 | 2.4 | 1.1 | 1.9 | 0 | - | 5.4 | - |
| PHF | 0.63 | 0.84 | 0.78 | 0 | - | 0.86 | 0.7 | 0.83 | 0.75 | 0 | - | 0.83 | 0.75 | 0.75 | 0.35 | 0 | - | 0.55 | 0.66 | 0.58 | 0.82 | 0 | - | 0.83 | 0.92 |
| Cars | 5 | 599 | 41 | 0 | - | 645 | 13 | 382 | 11 | 0 | - | 406 | 3 | 11 | 7 | 0 | - | 21 | 25 | 14 | 21 | 0 | - | 60 | 1132 |
| % Cars | 100 | 95.7 | 82 | 0 | - | 94.7 | 92.9 | 90.1 | 91.7 | 0 | - | 90.2 | 100 | 91.7 | 100 | 0 | - | 95.5 | 86.2 | 100 | 91.3 | 0 | - | 90.9 | 92.9 |
| Trucks | 0 | 27 | 9 | 0 | - | 36 | 1 | 42 | 1 | 0 | - | 44 | 0 | 1 | 0 | 0 | - | 1 | 4 | 0 | 2 | 0 | - | 6 | 87 |
| % Trucks | 0 | 4.3 | 18 | 0 | - | 5.3 | 7.1 | 9.9 | 8.3 | 0 | - | 9.8 | 0 | 8.3 | 0 | 0 | - | 4.5 | 13.8 | 0 | 8.7 | 0 | - | 9.1 | 7.1 |
| Bicycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 |
| Peds | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | 0 |
| % Peds | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | - | - | - | - | 0 | - | 0 |

Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 16:15:00
To: 17:15:00

Intersection: Hwy 6 & 2nd Line
Site Code: 2122200003
Count Date: Oct 28, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Hwy 6 runs N/S

North Approach

| | Out | In | Total |
|---------------|------------|------------|-------------|
| | 562 | 857 | 1419 |
| | 27 | 23 | 50 |
| | 0 | 0 | 0 |
| Totals | 589 | 880 | 1469 |

Hwy 6

| | | | | |
|---------------|-----------|------------|----------|----------|
| | 0 | 0 | 0 | 0 |
| | 4 | 23 | 0 | 0 |
| | 50 | 511 | 1 | 0 |
| Totals | 54 | 534 | 1 | 0 |

East Approach

| | Out | In | Total |
|---------------|-----------|-----------|-----------|
| | 41 | 28 | 69 |
| | 1 | 0 | 1 |
| | 0 | 0 | 0 |
| Totals | 42 | 28 | 70 |

2nd Line

| | | | | Totals |
|--|---|---|----|-----------|
| | 0 | 0 | 0 | 0 |
| | 0 | 4 | 42 | 46 |
| | 0 | 0 | 11 | 11 |
| | 0 | 0 | 15 | 15 |

Peds: 0

Peds: 0



Peds: 0

Peds: 0

2nd Line

| Totals | | | |
|-----------|----|---|---|
| 0 | 0 | 0 | 0 |
| 16 | 16 | 0 | 0 |
| 16 | 15 | 1 | 0 |
| 10 | 10 | 0 | 0 |

West Approach

| | Out | In | Total |
|---------------|-----------|-----------|------------|
| | 68 | 86 | 154 |
| | 4 | 7 | 11 |
| | 0 | 0 | 0 |
| Totals | 72 | 93 | 165 |

| Totals | | | | |
|-----------|----|-----|----|----------|
| 23 | 21 | 799 | 16 | 0 |
| 2 | 2 | 19 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 |

Hwy 6

South Approach

| | Out | In | Total |
|---------------|------------|------------|-------------|
| | 836 | 536 | 1372 |
| | 21 | 23 | 44 |
| | 0 | 0 | 0 |
| Totals | 857 | 559 | 1416 |

- Cars

- Trucks

- Bicycles

Comments



Peak Hour Summary

Intersection: Hwy 6 & 2nd Line
 Site Code: 2122200003
 Count Date: Oct 28, 2021
 Period: 16:00 - 18:00

Peak Hour Data (16:15 - 17:15)

| Start Time | North Approach Hwy 6 | | | | | | South Approach Hwy 6 | | | | | | East Approach 2nd Line | | | | | | West Approach 2nd Line | | | | | | Total Vehicles |
|--------------------|----------------------|-------------|-------------|----------|-------------|------------|----------------------|-------------|-------------|----------|-------------|------------|------------------------|-------------|------------|----------|-------------|-----------|------------------------|-------------|-------------|----------|-------------|-------------|----------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | |
| 16:15 | 0 | 132 | 10 | 0 | 0 | 142 | 7 | 210 | 4 | 0 | 0 | 221 | 4 | 1 | 4 | 0 | 0 | 9 | 13 | 1 | 2 | 0 | 0 | 16 | 388 |
| 16:30 | 0 | 143 | 17 | 0 | 0 | 160 | 9 | 206 | 2 | 0 | 0 | 217 | 0 | 5 | 5 | 0 | 0 | 10 | 12 | 7 | 6 | 0 | 0 | 25 | 412 |
| 16:45 | 1 | 131 | 11 | 0 | 0 | 143 | 4 | 216 | 4 | 0 | 0 | 224 | 1 | 4 | 5 | 0 | 0 | 10 | 13 | 1 | 1 | 0 | 0 | 15 | 392 |
| 17:00 | 0 | 128 | 16 | 0 | 0 | 144 | 3 | 186 | 6 | 0 | 0 | 195 | 5 | 6 | 2 | 0 | 0 | 13 | 8 | 2 | 6 | 0 | 0 | 16 | 368 |
| Grand Total | 1 | 534 | 54 | 0 | 0 | 589 | 23 | 818 | 16 | 0 | 0 | 857 | 10 | 16 | 16 | 0 | 0 | 42 | 46 | 11 | 15 | 0 | 0 | 72 | 1560 |
| Approach % | 0.2 | 90.7 | 9.2 | 0 | - | - | 2.7 | 95.4 | 1.9 | 0 | - | - | 23.8 | 38.1 | 38.1 | 0 | - | - | 63.9 | 15.3 | 20.8 | 0 | - | - | - |
| Totals % | 0.1 | 34.2 | 3.5 | 0 | 37.8 | - | 1.5 | 52.4 | 1 | 0 | 54.9 | - | 0.6 | 1 | 1 | 0 | 2.7 | - | 2.9 | 0.7 | 1 | 0 | 4.6 | - | - |
| PHF | 0.25 | 0.93 | 0.79 | 0 | 0.92 | - | 0.64 | 0.95 | 0.67 | 0 | 0.96 | - | 0.5 | 0.67 | 0.8 | 0 | 0.81 | - | 0.88 | 0.39 | 0.63 | 0 | 0.72 | 0.95 | - |
| Cars | 1 | 511 | 50 | 0 | 0 | 562 | 21 | 799 | 16 | 0 | 0 | 836 | 10 | 15 | 16 | 0 | 41 | 42 | 11 | 15 | 0 | 0 | 68 | 1507 | |
| % Cars | 100 | 95.7 | 92.6 | 0 | 0 | 95.4 | 91.3 | 97.7 | 100 | 0 | 0 | 97.5 | 100 | 93.8 | 100 | 0 | 97.6 | 91.3 | 100 | 100 | 0 | 0 | 94.4 | 96.6 | |
| Trucks | 0 | 23 | 4 | 0 | 0 | 27 | 2 | 19 | 0 | 0 | 0 | 21 | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 4 | 53 | |
| % Trucks | 0 | 4.3 | 7.4 | 0 | 0 | 4.6 | 8.7 | 2.3 | 0 | 0 | 0 | 2.5 | 0 | 6.3 | 0 | 0 | 2.4 | 8.7 | 0 | 0 | 0 | 0 | 5.6 | 3.4 | |
| Bicycles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| % Bicycles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peds | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | 0 |
| % Peds | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | 0 |



Project #21-222 - Tatham Engineering Ltd

Intersection Count Report

| | |
|--------------------------|-------------------------------------|
| Intersection: | Guelph St & 2nd Line |
| Municipality: | South Fergus |
| Count Date: | Oct 28, 2021 |
| Site Code: | 2122200004 |
| Count Categories: | Cars, Trucks, Bicycles, Pedestrians |
| Count Period: | 07:00-09:00, 16:00-18:00 |
| Weather: | Clear |

Traffic Count Map

Intersection: Guelph St & 2nd Line
Site Code: 2122200004
Municipality: South Fergus
Count Date: Oct 28, 2021



Traffic Count Summary

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Municipality: South Fergus
 Count Date: Oct 28, 2021

Guelph St - Traffic Summary

| Hour | North Approach Totals | | | | | | South Approach Totals | | | | | | Total |
|----------------------|---------------------------------|-----------|-----------|----------|------------|----------|---------------------------------|-----------|----------|----------|-----------|----------|------------|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | | |
| | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds | |
| 07:00 - 08:00 | 3 | 9 | 19 | 0 | 31 | 0 | 1 | 15 | 0 | 0 | 16 | 0 | 47 |
| 08:00 - 09:00 | 8 | 2 | 11 | 0 | 21 | 0 | 1 | 4 | 2 | 0 | 7 | 0 | 28 |
| BREAK | | | | | | | | | | | | | |
| 16:00 - 17:00 | 1 | 5 | 16 | 0 | 22 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 24 |
| 17:00 - 18:00 | 6 | 8 | 12 | 0 | 26 | 0 | 1 | 5 | 0 | 0 | 6 | 0 | 32 |
| GRAND TOTAL | 18 | 24 | 58 | 0 | 100 | 0 | 3 | 26 | 2 | 0 | 31 | 0 | 131 |

Traffic Count Summary

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Municipality: South Fergus
 Count Date: Oct 28, 2021

2nd Line - Traffic Summary

| Hour | East Approach Totals | | | | | | West Approach Totals | | | | | | Total |
|----------------------|---------------------------------|------------|-----------|----------|------------|----------|---------------------------------|------------|----------|----------|------------|----------|------------|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | | |
| | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds | |
| 07:00 - 08:00 | 2 | 62 | 1 | 0 | 65 | 0 | 10 | 43 | 3 | 0 | 56 | 0 | 121 |
| 08:00 - 09:00 | 0 | 65 | 4 | 0 | 69 | 0 | 11 | 72 | 2 | 0 | 85 | 0 | 154 |
| BREAK | | | | | | | | | | | | | |
| 16:00 - 17:00 | 1 | 68 | 13 | 0 | 82 | 0 | 59 | 70 | 1 | 0 | 130 | 0 | 212 |
| 17:00 - 18:00 | 0 | 63 | 15 | 0 | 78 | 0 | 40 | 62 | 0 | 0 | 102 | 0 | 180 |
| GRAND TOTAL | 3 | 258 | 33 | 0 | 294 | 0 | 120 | 247 | 6 | 0 | 373 | 0 | 667 |



Traffic Count Data

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Guelph St

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds | |
|-----------------|------|----|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|---|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | | |
| 07:00 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 0 | 4 | 6 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 2 | 1 | 2 | 0 | 5 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 1 | 1 | 9 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 2 | 0 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 2 | 0 | 3 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 2 | 2 | 3 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 1 | 0 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 10 | 11 | 28 | 0 | 49 | 1 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Guelph St

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds | |
|--------------------|------|----|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|---|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | | |
| 16:00 | 0 | 2 | 4 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 0 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 1 | 2 | 4 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 0 | 0 | 5 | 0 | 5 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 2 | 3 | 6 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 1 | 4 | 3 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 1 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 2 | 1 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 7 | 13 | 27 | 0 | 47 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 17 | 24 | 55 | 0 | 96 | 1 | 0 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Municipality: South Fergus
 Count Date: Oct 28, 2021

South Approach - Guelph St

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|----|---|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 0 | 8 | 0 | 0 | 8 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 1 | 16 | 2 | 0 | 19 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Municipality: South Fergus
 Count Date: Oct 28, 2021

South Approach - Guelph St

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds | |
|--------------------|------|----|---|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|---|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | | |
| 16:00 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 1 | 7 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 2 | 23 | 2 | 0 | 27 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Municipality: South Fergus
 Count Date: Oct 28, 2021

East Approach - 2nd Line

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|-----|---|---|-------|--------|----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 0 | 15 | 0 | 0 | 15 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 1 | 11 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 1 | 12 | 0 | 0 | 13 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 0 | 18 | 1 | 0 | 19 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 0 | 11 | 1 | 0 | 12 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 0 | 20 | 0 | 0 | 20 | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 0 | 11 | 0 | 0 | 11 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 0 | 13 | 2 | 0 | 15 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 2 | 111 | 4 | 0 | 117 | 0 | 16 | 1 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Municipality: South Fergus
 Count Date: Oct 28, 2021

East Approach - 2nd Line

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|-----|----|---|-------|--------|----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 0 | 14 | 3 | 0 | 17 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 1 | 15 | 1 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 0 | 19 | 6 | 0 | 25 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 0 | 14 | 3 | 0 | 17 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 0 | 16 | 5 | 0 | 21 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 0 | 12 | 4 | 0 | 16 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 0 | 18 | 4 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 0 | 13 | 2 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 1 | 121 | 28 | 0 | 150 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 3 | 232 | 32 | 0 | 267 | 0 | 26 | 1 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Municipality: South Fergus
 Count Date: Oct 28, 2021

West Approach - 2nd Line

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|-----|---|---|-------|--------|----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 0 | 10 | 0 | 0 | 10 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 4 | 8 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 5 | 9 | 3 | 0 | 17 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 1 | 13 | 0 | 0 | 14 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 2 | 15 | 2 | 0 | 19 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 3 | 17 | 0 | 0 | 20 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 2 | 13 | 0 | 0 | 15 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 3 | 16 | 0 | 0 | 19 | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 20 | 101 | 5 | 0 | 126 | 1 | 14 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Municipality: South Fergus
 Count Date: Oct 28, 2021

West Approach - 2nd Line

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|-----|---|---|-------|--------|----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 11 | 14 | 0 | 0 | 25 | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 11 | 11 | 0 | 0 | 22 | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 20 | 26 | 0 | 0 | 46 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 14 | 11 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 9 | 12 | 0 | 0 | 21 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 15 | 12 | 0 | 0 | 27 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 8 | 15 | 0 | 0 | 23 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 8 | 18 | 0 | 0 | 26 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 96 | 119 | 0 | 0 | 215 | 3 | 13 | 1 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 116 | 220 | 5 | 0 | 341 | 4 | 27 | 1 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 |

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 07:30:00
To: 08:30:00

Intersection: Guelph St & 2nd Line
Site Code: 2122200004
Count Date: Oct 28, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: 2nd Line runs E/W

North Approach

| | Out | In | Total |
|---------------|-----------|-----------|-----------|
| | 25 | 17 | 42 |
| | 3 | 2 | 5 |
| | 0 | 0 | 0 |
| Totals | 28 | 19 | 47 |

Guelph St

| | | | | |
|---------------|-----------|----------|----------|----------|
| | 0 | 0 | 0 | 0 |
| | 2 | 0 | 1 | 0 |
| | 16 | 2 | 7 | 0 |
| Totals | 18 | 2 | 8 | 0 |

East Approach

| | Out | In | Total |
|---------------|-----------|-----------|------------|
| | 64 | 61 | 125 |
| | 12 | 6 | 18 |
| | 0 | 0 | 0 |
| Totals | 76 | 67 | 143 |

2nd Line

| | | | | Totals |
|--|---|---|----|-----------|
| | 0 | 0 | 0 | 0 |
| | 0 | 0 | 11 | 11 |
| | 0 | 5 | 54 | 59 |
| | 0 | 0 | 5 | 5 |

Peds: 0

Peds: 0



Peds: 0

Peds: 0

2nd Line

| Totals | | | |
|-----------|----|----|---|
| 0 | 0 | 0 | 0 |
| 3 | 2 | 1 | 0 |
| 72 | 61 | 11 | 0 |
| 1 | 1 | 0 | 0 |

West Approach

| | Out | In | Total |
|---------------|-----------|-----------|------------|
| | 70 | 78 | 148 |
| | 5 | 14 | 19 |
| | 0 | 0 | 0 |
| Totals | 75 | 92 | 167 |

| Totals | | | |
|----------|---|---|---|
| 2 | 5 | 0 | 0 |
| 5 | 4 | 0 | 0 |
| 0 | 1 | 0 | 0 |
| 0 | 0 | 0 | 0 |

Guelph St

South Approach

| Out | In | Total |
|----------|----------|-----------|
| 5 | 8 | 13 |
| 2 | 0 | 2 |
| 0 | 0 | 0 |
| 7 | 8 | 15 |

- Cars

- Trucks

- Bicycles

Comments



Peak Hour Summary

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Count Date: Oct 28, 2021
 Period: 07:00 - 09:00

Peak Hour Data (07:30 - 08:30)

| Start Time | North Approach Guelph St | | | | | | South Approach Guelph St | | | | | | East Approach 2nd Line | | | | | | West Approach 2nd Line | | | | | | Total Vehicles |
|--------------------|-----------------------------|------------|------------|----------|-------------|-------------|-----------------------------|-------------|----------|----------|-------------|-------------|---------------------------|-------------|----------|-------------|-------------|-------------|---------------------------|-----------|-------------|-------------|----------|-----------|-------------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | |
| 07:30 | 2 | 1 | 4 | 0 | 0 | 7 | 1 | 2 | 0 | 0 | 0 | 3 | 1 | 14 | 0 | 0 | 0 | 15 | 5 | 10 | 3 | 0 | 0 | 18 | 43 |
| 07:45 | 1 | 1 | 9 | 0 | 0 | 11 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 21 | 1 | 0 | 0 | 22 | 1 | 14 | 0 | 0 | 0 | 15 | 49 |
| 08:00 | 2 | 0 | 2 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 14 | 1 | 0 | 0 | 15 | 2 | 17 | 2 | 0 | 0 | 21 | 41 |
| 08:15 | 3 | 0 | 3 | 0 | 0 | 6 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 23 | 1 | 0 | 0 | 24 | 3 | 18 | 0 | 0 | 0 | 21 | 53 |
| Grand Total | 8 | 2 | 18 | 0 | 0 | 28 | 2 | 5 | 0 | 0 | 0 | 7 | 1 | 72 | 3 | 0 | 0 | 76 | 11 | 59 | 5 | 0 | 0 | 75 | 186 |
| Approach % | 28.6 | 7.1 | 64.3 | 0 | - | - | 28.6 | 71.4 | 0 | 0 | - | - | 1.3 | 94.7 | 3.9 | 0 | - | 14.7 | 78.7 | 6.7 | 0 | - | - | | |
| Totals % | 4.3 | 1.1 | 9.7 | 0 | 15.1 | 3.8 | 1.1 | 2.7 | 0 | 0 | 3.8 | 0.5 | 38.7 | 1.6 | 0 | 40.9 | 5.9 | 31.7 | 2.7 | 0 | 40.3 | | | | |
| PHF | 0.67 | 0.5 | 0.5 | 0 | 0.64 | 0.58 | 0.5 | 0.63 | 0 | 0 | 0.58 | 0.25 | 0.78 | 0.75 | 0 | 0.79 | 0.55 | 0.82 | 0.42 | 0 | 0.89 | 0.88 | | | |
| Cars | 7 | 2 | 16 | 0 | 25 | 5 | 1 | 4 | 0 | 0 | 5 | 1 | 61 | 2 | 0 | 64 | 11 | 54 | 5 | 0 | 70 | 164 | | | |
| % Cars | 87.5 | 100 | 88.9 | 0 | 89.3 | 71.4 | 50 | 80 | 0 | 0 | 71.4 | 100 | 84.7 | 66.7 | 0 | 84.2 | 100 | 91.5 | 100 | 0 | 93.3 | 88.2 | | | |
| Trucks | 1 | 0 | 2 | 0 | 3 | 2 | 1 | 1 | 0 | 0 | 2 | 0 | 11 | 1 | 0 | 12 | 0 | 5 | 0 | 0 | 5 | 22 | | | |
| % Trucks | 12.5 | 0 | 11.1 | 0 | 10.7 | 28.6 | 50 | 20 | 0 | 0 | 28.6 | 0 | 15.3 | 33.3 | 0 | 15.8 | 0 | 8.5 | 0 | 0 | 6.7 | 11.8 | | | |
| Bicycles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| % Bicycles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Peds | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | |
| % Peds | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | |

Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 16:30:00
To: 17:30:00

Intersection: Guelph St & 2nd Line
Site Code: 2122200004
Count Date: Oct 28, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: 2nd Line runs E/W

North Approach

| | Out | In | Total |
|---------------|-----------|-----------|------------|
| | 31 | 80 | 111 |
| | 1 | 1 | 2 |
| | 0 | 0 | 0 |
| Totals | 32 | 81 | 113 |

Guelph St

| | | | | |
|---------------|-----------|----------|----------|----------|
| | 0 | 0 | 0 | 0 |
| | 1 | 0 | 0 | 0 |
| | 18 | 9 | 4 | 0 |
| Totals | 19 | 9 | 4 | 0 |

East Approach

| | Out | In | Total |
|---------------|-----------|-----------|------------|
| | 79 | 65 | 144 |
| | 8 | 3 | 11 |
| | 0 | 0 | 0 |
| Totals | 87 | 68 | 155 |

2nd Line

| | Out | In | Total |
|---------------|----------|----------|------------|
| | 0 | 0 | 0 |
| | 0 | 1 | 58 |
| | 0 | 3 | 61 |
| Totals | 0 | 4 | 119 |

Peds: 0

Peds: 0



Peds: 0

Peds: 0

2nd Line

| Totals | Out | In | Total |
|---------------|----------|----------|----------|
| | 0 | 0 | 0 |
| | 18 | 18 | 0 |
| | 69 | 61 | 8 |
| Totals | 0 | 0 | 0 |

West Approach

| | Out | In | Total |
|---------------|------------|-----------|------------|
| | 119 | 79 | 198 |
| | 4 | 9 | 13 |
| | 0 | 0 | 0 |
| Totals | 123 | 88 | 211 |

| Totals | Out | In | Total |
|--------|-----|----|-------|
| | 0 | 4 | 0 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |

Guelph St

South Approach

| | Out | In | Total |
|---------------|----------|----------|-----------|
| | 4 | 9 | 13 |
| | 0 | 0 | 0 |
| | 0 | 0 | 0 |
| Totals | 4 | 9 | 13 |

- Cars

- Trucks

- Bicycles

Comments



Peak Hour Summary

Intersection: Guelph St & 2nd Line
 Site Code: 2122200004
 Count Date: Oct 28, 2021
 Period: 16:00 - 18:00

Peak Hour Data (16:30 - 17:30)

| Start Time | North Approach Guelph St | | | | | | South Approach Guelph St | | | | | | East Approach 2nd Line | | | | | | West Approach 2nd Line | | | | | | Total Vehicles |
|--------------------|-----------------------------|-------------|-------------|----------|----------|-------------|-----------------------------|-------------|----------|----------|-------------|----------|---------------------------|-------------|-----------|-------------|------------|-------------|---------------------------|-----------|----------|-------------|-------------|------------|-------------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | |
| 16:30 | 1 | 2 | 4 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 6 | 0 | 0 | 27 | 21 | 27 | 0 | 0 | 0 | 48 | 82 |
| 16:45 | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 3 | 0 | 0 | 19 | 14 | 11 | 0 | 0 | 0 | 25 | 50 |
| 17:00 | 2 | 3 | 6 | 0 | 0 | 11 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 19 | 5 | 0 | 0 | 24 | 9 | 13 | 0 | 0 | 0 | 22 | 60 |
| 17:15 | 1 | 4 | 3 | 0 | 0 | 8 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 13 | 4 | 0 | 0 | 17 | 15 | 13 | 0 | 0 | 0 | 28 | 54 |
| Grand Total | 4 | 9 | 19 | 0 | 0 | 32 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 69 | 18 | 0 | 0 | 87 | 59 | 64 | 0 | 0 | 0 | 123 | 246 |
| Approach % | 12.5 | 28.1 | 59.4 | 0 | - | - | 0 | 100 | 0 | 0 | - | - | 0 | 79.3 | 20.7 | 0 | - | 48 | 52 | 0 | 0 | - | - | | |
| Totals % | 1.6 | 3.7 | 7.7 | 0 | - | 13 | 0 | 1.6 | 0 | 0 | 1.6 | 0 | 28 | 7.3 | 0 | 35.4 | 24 | 26 | 0 | 0 | - | 50 | | | |
| PHF | 0.5 | 0.56 | 0.79 | 0 | 0 | 0.73 | 0 | 0.33 | 0 | 0 | 0.33 | 0 | 0.82 | 0.75 | 0 | 0.81 | 0.7 | 0.59 | 0 | 0 | 0 | 0.64 | 0.75 | | |
| Cars | 4 | 9 | 18 | 0 | - | 31 | 0 | 4 | 0 | 0 | 4 | 0 | 61 | 18 | 0 | 79 | 58 | 61 | 0 | 0 | - | 119 | 233 | | |
| % Cars | 100 | 100 | 94.7 | 0 | - | 96.9 | 0 | 100 | 0 | 0 | 100 | 0 | 88.4 | 100 | 0 | 90.8 | 98.3 | 95.3 | 0 | 0 | - | 96.7 | 94.7 | | |
| Trucks | 0 | 0 | 1 | 0 | - | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 1 | 3 | 0 | 0 | - | 4 | 13 | | |
| % Trucks | 0 | 0 | 5.3 | 0 | - | 3.1 | 0 | 0 | 0 | 0 | 0 | 0 | 11.6 | 0 | 0 | 9.2 | 1.7 | 4.7 | 0 | 0 | - | 3.3 | 5.3 | | |
| Bicycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | | |
| % Bicycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | | |
| Peds | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | 0 |
| % Peds | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | 0 |



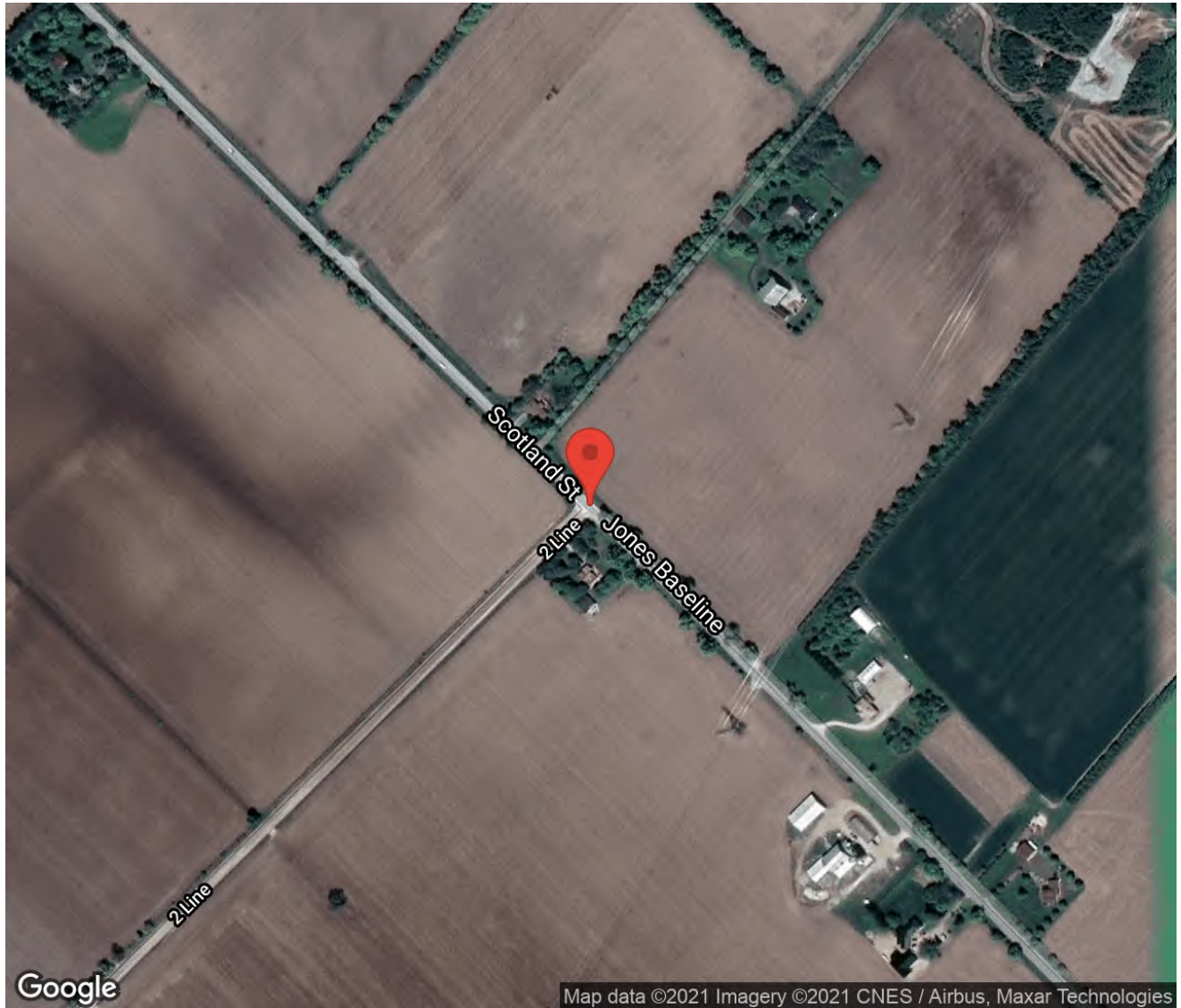
Project #21-222 - Tatham Engineering Ltd

Intersection Count Report

| | |
|--------------------------|---------------------------------------|
| Intersection: | Scotland St-Jones Baseline & 2nd Line |
| Municipality: | South Fergus |
| Count Date: | Oct 28, 2021 |
| Site Code: | 2122200005 |
| Count Categories: | Cars, Trucks, Bicycles, Pedestrians |
| Count Period: | 07:00-09:00, 16:00-18:00 |
| Weather: | Clear |

Traffic Count Map

Intersection: Scotland St-Jones Baseline & 2nd Line
Site Code: 2122200005
Municipality: South Fergus
Count Date: Oct 28, 2021



Traffic Count Summary

Intersection: Scotland St-Jones Baseline & 2nd Line
 Site Code: 2122200005
 Municipality: South Fergus
 Count Date: Oct 28, 2021

Scotland St - Traffic Summary

| Hour | North Approach Totals | | | | | | South Approach Totals | | | | | | Total |
|----------------------|---------------------------------|------------|-----------|----------|------------|----------|---------------------------------|------------|----------|----------|------------|----------|------------|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | | |
| | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds | |
| 07:00 - 08:00 | 0 | 54 | 5 | 0 | 59 | 0 | 8 | 28 | 0 | 0 | 36 | 0 | 95 |
| 08:00 - 09:00 | 0 | 60 | 15 | 0 | 75 | 0 | 18 | 60 | 0 | 0 | 78 | 0 | 153 |
| BREAK | | | | | | | | | | | | | |
| 16:00 - 17:00 | 0 | 51 | 11 | 0 | 62 | 0 | 21 | 117 | 0 | 0 | 138 | 0 | 200 |
| 17:00 - 18:00 | 0 | 48 | 11 | 0 | 59 | 0 | 13 | 104 | 0 | 0 | 117 | 0 | 176 |
| GRAND TOTAL | 0 | 213 | 42 | 0 | 255 | 0 | 60 | 309 | 0 | 0 | 369 | 0 | 624 |

Traffic Count Summary

Intersection: Scotland St-Jones Baseline & 2nd Line
 Site Code: 2122200005
 Municipality: South Fergus
 Count Date: Oct 28, 2021

2nd Line - Traffic Summary

| Hour | East Approach Totals | | | | | | West Approach Totals | | | | | | Total |
|--------------------|---------------------------------|----------|----------|----------|----------|----------|---------------------------------|----------|-----------|----------|------------|----------|------------|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | | |
| | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds | |
| 07:00 - 08:00 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 8 | 0 | 21 | 0 | 21 |
| 08:00 - 09:00 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 0 | 9 | 0 | 50 | 0 | 50 |
| BREAK | | | | | | | | | | | | | |
| 16:00 - 17:00 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 12 | 0 | 32 | 0 | 32 |
| 17:00 - 18:00 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 14 | 0 | 32 | 0 | 32 |
| GRAND TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 92 | 0 | 43 | 0 | 135 | 0 | 135 |



Traffic Count Data

Intersection: Scotland St-Jones Baseline & 2nd Line
 Site Code: 2122200005
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Scotland St

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|-----|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 0 | 11 | 3 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 0 | 13 | 1 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 0 | 18 | 0 | 0 | 18 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 0 | 11 | 1 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 0 | 10 | 2 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 0 | 19 | 1 | 0 | 20 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 0 | 15 | 3 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 0 | 14 | 9 | 0 | 23 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 0 | 111 | 20 | 0 | 131 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Scotland St-Jones Baseline & 2nd Line
 Site Code: 2122200005
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Scotland St

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|-----|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 0 | 13 | 4 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 0 | 4 | 3 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 0 | 18 | 2 | 0 | 20 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 0 | 15 | 2 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 0 | 19 | 7 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 0 | 9 | 2 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 0 | 7 | 1 | 0 | 8 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 0 | 10 | 1 | 0 | 11 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 0 | 95 | 22 | 0 | 117 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 0 | 206 | 42 | 0 | 248 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Scotland St-Jones Baseline & 2nd Line
 Site Code: 2122200005
 Municipality: South Fergus
 Count Date: Oct 28, 2021

South Approach - Jones Baseline

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|----|---|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 2 | 5 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 1 | 10 | 0 | 0 | 11 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 4 | 9 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 4 | 6 | 0 | 0 | 10 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 7 | 13 | 0 | 0 | 20 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 2 | 16 | 0 | 0 | 18 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 3 | 22 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 24 | 84 | 0 | 0 | 108 | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Scotland St-Jones Baseline & 2nd Line
 Site Code: 2122200005
 Municipality: South Fergus
 Count Date: Oct 28, 2021

South Approach - Jones Baseline

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|-----|---|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 0 | 23 | 0 | 0 | 23 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 5 | 23 | 0 | 0 | 28 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 7 | 36 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 9 | 31 | 0 | 0 | 40 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 3 | 35 | 0 | 0 | 38 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 4 | 16 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 3 | 36 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 2 | 16 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 33 | 216 | 0 | 0 | 249 | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 57 | 300 | 0 | 0 | 357 | 3 | 9 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Scotland St-Jones Baseline & 2nd Line
 Site Code: 2122200005
 Municipality: South Fergus
 Count Date: Oct 28, 2021

West Approach - 2nd Line

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|---|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 3 | 0 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 3 | 0 | 4 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 5 | 0 | 2 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 9 | 0 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 8 | 0 | 3 | 0 | 11 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 10 | 0 | 2 | 0 | 12 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 12 | 0 | 3 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 52 | 0 | 17 | 0 | 69 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Scotland St-Jones Baseline & 2nd Line
 Site Code: 2122200005
 Municipality: South Fergus
 Count Date: Oct 28, 2021

West Approach - 2nd Line

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|---|----|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 4 | 0 | 5 | 0 | 9 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 3 | 0 | 2 | 0 | 5 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 7 | 0 | 2 | 0 | 9 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 4 | 0 | 2 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 8 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 6 | 0 | 4 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 1 | 0 | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 3 | 0 | 4 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 36 | 0 | 25 | 0 | 61 | 2 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 88 | 0 | 42 | 0 | 130 | 4 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 08:00:00
To: 09:00:00




Intersection: Scotland St-Jones Baseline & 2nd Line
Site Code: 2122200005
Count Date: Oct 28, 2021

Weather conditions: Clear




**** Unsignalized Intersection ****

Major Road: Scotland St runs N/S

North Approach







| | Out | In | Total |
|---|-----------|------------|------------|
|  | 73 | 96 | 169 |
|  | 2 | 5 | 7 |
|  | 0 | 0 | 0 |
| Totals | 75 | 101 | 176 |

Scotland St

| | | | |
|---|-----------|-----------|----------|
|  | 0 | 0 | 0 |
|  | 0 | 2 | 0 |
|  | 15 | 58 | 0 |
| Totals | 15 | 60 | 0 |

Peds: 0

2nd Line

|  |  |  | Totals |
|---|---|---|--|
| 0 | 0 | 0 | 0  |
| 0 | 2 | 39 | 41  |
| 0 | 0 | 9 | 9  |




Peds: 0






Peds: 0

Peds: 0




West Approach

| | Out | In | Total |
|---|-----------|-----------|-----------|
|  | 48 | 31 | 79 |
|  | 2 | 2 | 4 |
|  | 0 | 0 | 0 |
| Totals | 50 | 33 | 83 |


| | | | |
|---|-----------|-----------|----------|
| Totals | 18 | 60 | 0 |
|  | 16 | 57 | 0 |
|  | 2 | 3 | 0 |
|  | 0 | 0 | 0 |

Jones Baseline

South Approach

| | Out | In | Total |
|---|-----------|-----------|------------|
|  | 73 | 67 | 140 |
|  | 5 | 2 | 7 |
|  | 0 | 0 | 0 |
| Totals | 78 | 69 | 147 |

 - Cars

 - Trucks

 - Bicycles

Comments



Peak Hour Summary

Intersection: Scotland St-Jones Baseline & 2nd Line
 Site Code: 2122200005
 Count Date: Oct 28, 2021
 Period: 07:00 - 09:00

Peak Hour Data (08:00 - 09:00)

| Start Time | North Approach Scotland St | | | | | | South Approach Jones Baseline | | | | | | East Approach | | | | | | West Approach 2nd Line | | | | | | Total Vehicles |
|--------------------|-------------------------------|-------------|-------------|----------|----------|-------------|----------------------------------|-------------|---|----------|-------------|-----------|---------------|---|---|----------|----------|-------------|---------------------------|----------|----------|-------------|-------------|------------|-------------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | |
| 08:00 | | 10 | 2 | 0 | 0 | 12 | 4 | 7 | | 0 | 0 | 11 | | | | | 0 | | 9 | | 1 | 0 | 0 | 10 | 33 |
| 08:15 | | 20 | 1 | 0 | 0 | 21 | 8 | 13 | | 0 | 0 | 21 | | | | | 0 | | 9 | | 3 | 0 | 0 | 12 | 54 |
| 08:30 | | 15 | 3 | 0 | 0 | 18 | 3 | 18 | | 0 | 0 | 21 | | | | | 0 | | 11 | | 2 | 0 | 0 | 13 | 52 |
| 08:45 | | 15 | 9 | 0 | 0 | 24 | 3 | 22 | | 0 | 0 | 25 | | | | | 0 | | 12 | | 3 | 0 | 0 | 15 | 64 |
| Grand Total | | 60 | 15 | 0 | 0 | 75 | 18 | 60 | | 0 | 0 | 78 | | | | | 0 | 0 | 41 | 9 | 0 | 0 | 50 | 203 | |
| Approach % | | 80 | 20 | 0 | - | - | 23.1 | 76.9 | | 0 | - | - | | | | | - | - | 82 | 18 | 0 | - | - | - | |
| Totals % | | 29.6 | 7.4 | 0 | - | 36.9 | 8.9 | 29.6 | | 0 | - | 38.4 | | | | | 0 | - | 20.2 | 4.4 | 0 | - | - | 24.6 | |
| PHF | | 0.75 | 0.42 | 0 | 0 | 0.78 | 0.56 | 0.68 | | 0 | 0.78 | | | | | 0 | 0 | 0.85 | 0.75 | 0 | 0 | 0.83 | 0.79 | | |
| Cars | | 58 | 15 | 0 | - | 73 | 16 | 57 | | 0 | - | 73 | | | | | 0 | - | 39 | 9 | 0 | - | - | 48 | 194 |
| % Cars | | 96.7 | 100 | 0 | - | 97.3 | 88.9 | 95 | | 0 | - | 93.6 | | | | | 0 | - | 95.1 | 100 | 0 | - | - | 96 | 95.6 |
| Trucks | | 2 | 0 | 0 | - | 2 | 2 | 3 | | 0 | - | 5 | | | | | 0 | - | 2 | 0 | 0 | - | - | 2 | 9 |
| % Trucks | | 3.3 | 0 | 0 | - | 2.7 | 11.1 | 5 | | 0 | - | 6.4 | | | | | 0 | - | 4.9 | 0 | 0 | - | - | 4 | 4.4 |
| Bicycles | | 0 | 0 | 0 | - | 0 | 0 | 0 | | 0 | - | 0 | | | | | 0 | - | 0 | 0 | 0 | - | - | 0 | 0 |
| % Bicycles | | 0 | 0 | 0 | - | 0 | 0 | 0 | | 0 | - | 0 | | | | | 0 | - | 0 | 0 | 0 | - | - | 0 | 0 |
| Peds | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | 0 |
| % Peds | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | 0 |

Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 16:15:00
To: 17:15:00




Intersection: Scotland St-Jones Baseline & 2nd Line
Site Code: 2122200005
Count Date: Oct 28, 2021

Weather conditions: Clear




**** Unsignalized Intersection ****

Major Road: Scotland St runs N/S

North Approach




| | Out | In | Total |
|---|-----------|------------|------------|
|  | 70 | 147 | 217 |
|  | 1 | 5 | 6 |
|  | 0 | 0 | 0 |
| Totals | 71 | 152 | 223 |

Scotland St

| | | | |
|---|-----------|-----------|----------|
|  | 0 | 0 | 0 |
|  | 0 | 1 | 0 |
|  | 14 | 56 | 0 |
| Totals | 14 | 57 | 0 |

Peds: 0

2nd Line

| |  |  |  | Totals |
|--|---|---|---|--------|
| | 0 | 0 | 0 | 0 |
| | 0 | 1 | 22 | 23 |
| | 0 | 1 | 6 | 7 |




Peds: 0






Peds: 0

Peds: 0




West Approach

| | Out | In | Total |
|---|-----------|-----------|-----------|
|  | 28 | 38 | 66 |
|  | 2 | 1 | 3 |
|  | 0 | 0 | 0 |
| Totals | 30 | 39 | 69 |


| Totals | 25 | 129 | 0 |
|---|----|-----|---|
|  | 24 | 125 | 0 |
|  | 1 | 4 | 0 |
|  | 0 | 0 | 0 |

Jones Baseline

South Approach

| | Out | In | Total |
|---|------------|-----------|------------|
|  | 149 | 62 | 211 |
|  | 5 | 2 | 7 |
|  | 0 | 0 | 0 |
| Totals | 154 | 64 | 218 |

 - Cars

 - Trucks

 - Bicycles

Comments



Peak Hour Summary

Intersection: Scotland St-Jones Baseline & 2nd Line
 Site Code: 2122200005
 Count Date: Oct 28, 2021
 Period: 16:00 - 18:00

Peak Hour Data (16:15 - 17:15)

| Start Time | North Approach Scotland St | | | | | | South Approach Jones Baseline | | | | | | East Approach | | | | | | West Approach 2nd Line | | | | | | Total Vehicles |
|--------------------|-------------------------------|-------------|------------|----------|----------|-------------|----------------------------------|------------|---|----------|----------|------------|---------------|---|---|---|----------|----------|---------------------------|-------------|----------|----------|----------|-------------|-------------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | |
| 16:15 | | 4 | 3 | 0 | 0 | 7 | 5 | 25 | | 0 | 0 | 30 | | | | | 0 | | 3 | | 3 | 0 | 0 | 6 | 43 |
| 16:30 | | 19 | 2 | 0 | 0 | 21 | 7 | 36 | | 0 | 0 | 43 | | | | | 0 | | 8 | | 2 | 0 | 0 | 10 | 74 |
| 16:45 | | 15 | 2 | 0 | 0 | 17 | 9 | 32 | | 0 | 0 | 41 | | | | | 0 | | 4 | | 2 | 0 | 0 | 6 | 64 |
| 17:00 | | 19 | 7 | 0 | 0 | 26 | 4 | 36 | | 0 | 0 | 40 | | | | | 0 | | 8 | | 0 | 0 | 0 | 8 | 74 |
| Grand Total | | 57 | 14 | 0 | 0 | 71 | 25 | 129 | | 0 | 0 | 154 | | | | | 0 | 0 | 23 | 7 | 0 | 0 | 0 | 30 | 255 |
| Approach % | | 80.3 | 19.7 | 0 | - | - | 16.2 | 83.8 | | 0 | - | - | | | | | - | - | 76.7 | 23.3 | 0 | - | - | - | |
| Totals % | | 22.4 | 5.5 | 0 | - | 27.8 | 9.8 | 50.6 | | 0 | - | 60.4 | | | | | 0 | - | 9 | 2.7 | 0 | - | - | 11.8 | |
| PHF | | 0.75 | 0.5 | 0 | - | 0.68 | 0.69 | 0.9 | | 0 | - | 0.9 | | | | | 0 | - | 0.72 | 0.58 | 0 | - | - | 0.75 | 0.86 |
| Cars | | 56 | 14 | 0 | - | 70 | 24 | 125 | | 0 | - | 149 | | | | | 0 | - | 22 | 6 | 0 | - | - | 28 | 247 |
| % Cars | | 98.2 | 100 | 0 | - | 98.6 | 96 | 96.9 | | 0 | - | 96.8 | | | | | 0 | - | 95.7 | 85.7 | 0 | - | - | 93.3 | 96.9 |
| Trucks | | 1 | 0 | 0 | - | 1 | 1 | 4 | | 0 | - | 5 | | | | | 0 | - | 1 | 1 | 0 | - | - | 2 | 8 |
| % Trucks | | 1.8 | 0 | 0 | - | 1.4 | 4 | 3.1 | | 0 | - | 3.2 | | | | | 0 | - | 4.3 | 14.3 | 0 | - | - | 6.7 | 3.1 |
| Bicycles | | 0 | 0 | 0 | - | 0 | 0 | 0 | | 0 | - | 0 | | | | | 0 | - | 0 | 0 | 0 | - | - | 0 | 0 |
| % Bicycles | | 0 | 0 | 0 | - | 0 | 0 | 0 | | 0 | - | 0 | | | | | 0 | - | 0 | 0 | 0 | - | - | 0 | 0 |
| Peds | | | | | 0 | - | | | | 0 | - | - | | | | | 0 | - | | | | 0 | - | - | 0 |
| % Peds | | | | | 0 | - | | | | 0 | - | - | | | | | 0 | - | | | | 0 | - | - | 0 |



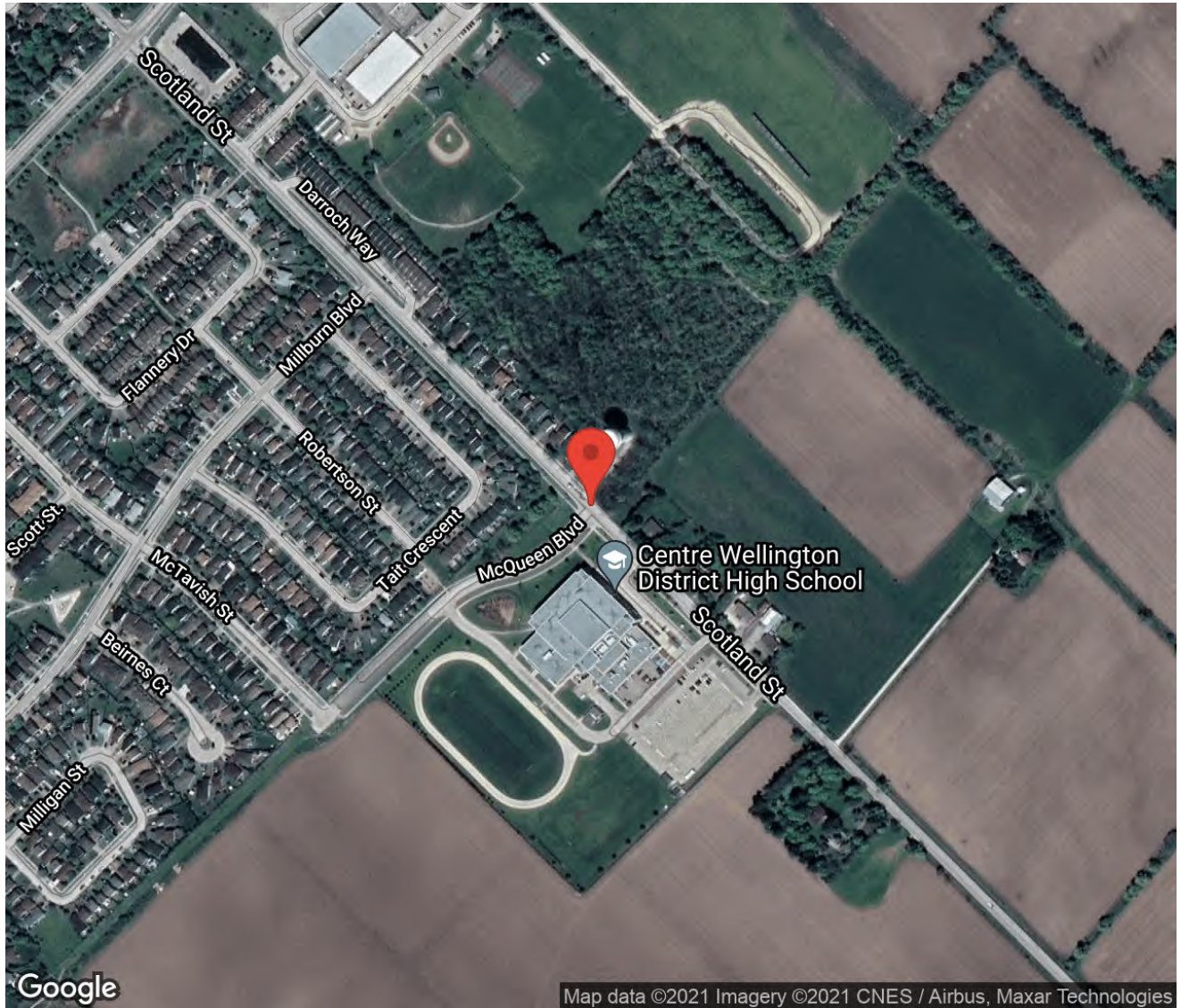
Project #21-222 - Tatham Engineering Ltd

Intersection Count Report

| | |
|--------------------------|-------------------------------------|
| Intersection: | Scotland St & McQueen Blvd |
| Municipality: | South Fergus |
| Count Date: | Oct 28, 2021 |
| Site Code: | 2122200006 |
| Count Categories: | Cars, Trucks, Bicycles, Pedestrians |
| Count Period: | 07:00-09:00, 16:00-18:00 |
| Weather: | Clear |

Traffic Count Map

Intersection: Scotland St & McQueen Blvd
Site Code: 2122200006
Municipality: South Fergus
Count Date: Oct 28, 2021





Traffic Count Summary

Intersection: Scotland St & McQueen Blvd
 Site Code: 2122200006
 Municipality: South Fergus
 Count Date: Oct 28, 2021

Scotland St - Traffic Summary

| Hour | North Approach Totals | | | | | | South Approach Totals | | | | | | Total |
|----------------------|---------------------------------|------------|----------|----------|------------|----------|---------------------------------|------------|----------|----------|------------|----------|-------------|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | | |
| | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds | |
| 07:00 - 08:00 | 0 | 87 | 0 | 0 | 87 | 0 | 0 | 41 | 0 | 0 | 41 | 0 | 128 |
| 08:00 - 09:00 | 0 | 306 | 0 | 0 | 306 | 3 | 0 | 176 | 0 | 0 | 176 | 0 | 482 |
| BREAK | | | | | | | | | | | | | |
| 16:00 - 17:00 | 0 | 71 | 0 | 0 | 71 | 4 | 0 | 162 | 0 | 0 | 162 | 0 | 233 |
| 17:00 - 18:00 | 0 | 80 | 0 | 0 | 80 | 0 | 0 | 153 | 0 | 0 | 153 | 0 | 233 |
| GRAND TOTAL | 0 | 544 | 0 | 0 | 544 | 7 | 0 | 532 | 0 | 0 | 532 | 0 | 1076 |



Traffic Count Summary

Intersection: Scotland St & McQueen Blvd
 Site Code: 2122200006
 Municipality: South Fergus
 Count Date: Oct 28, 2021

McQueen Blvd - Traffic Summary

| Hour | East Approach Totals | | | | | | West Approach Totals | | | | | | Total |
|--------------------|---------------------------------|----------|----------|----------|----------|----------|---------------------------------|----------|----------|----------|-----------|-----------|-----------|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | | |
| | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds | |
| 07:00 - 08:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 - 09:00 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 1 | 0 | 17 | 55 | 17 |
| BREAK | | | | | | | | | | | | | |
| 16:00 - 17:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 17:00 - 18:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| GRAND TOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 1 | 0 | 17 | 60 | 17 |



Traffic Count Data

Intersection: Scotland St & McQueen Blvd
 Site Code: 2122200006
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Scotland St

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds | |
|-----------------|------|-----|---|---|-------|--------|----|---|---|-------|----------|---|---|---|-------|------------|---|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | | |
| 07:00 | 0 | 13 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 0 | 18 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 0 | 26 | 0 | 0 | 26 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 0 | 28 | 0 | 0 | 28 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 0 | 27 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 0 | 46 | 0 | 0 | 46 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 08:30 | 0 | 73 | 0 | 0 | 73 | 0 | 7 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 08:45 | 0 | 135 | 0 | 0 | 135 | 0 | 14 | 0 | 0 | 14 | 0 | 2 | 0 | 0 | 2 | 0 | 2 |
| SUBTOTAL | 0 | 366 | 0 | 0 | 366 | 0 | 24 | 0 | 0 | 24 | 0 | 3 | 0 | 0 | 3 | | 3 |



Traffic Count Data

Intersection: Scotland St & McQueen Blvd
 Site Code: 2122200006
 Municipality: South Fergus
 Count Date: Oct 28, 2021

North Approach - Scotland St

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|-----|---|---|-------|--------|----|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 0 | 18 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 16:30 | 0 | 25 | 0 | 0 | 25 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 16:45 | 0 | 18 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 17:00 | 0 | 32 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 0 | 14 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 0 | 19 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 0 | 150 | 0 | 0 | 150 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| GRAND TOTAL | 0 | 516 | 0 | 0 | 516 | 0 | 25 | 0 | 0 | 25 | 0 | 3 | 0 | 0 | 3 | 7 |



Traffic Count Data

Intersection: Scotland St & McQueen Blvd
 Site Code: 2122200006
 Municipality: South Fergus
 Count Date: Oct 28, 2021

South Approach - Scotland St

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|-----------------|------|-----|---|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 07:00 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 0 | 15 | 0 | 0 | 15 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 0 | 18 | 0 | 0 | 18 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 0 | 51 | 0 | 0 | 51 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 0 | 93 | 0 | 0 | 93 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 0 | 212 | 0 | 0 | 212 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Scotland St & McQueen Blvd
 Site Code: 2122200006
 Municipality: South Fergus
 Count Date: Oct 28, 2021

South Approach - Scotland St

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|--------------------|------|-----|---|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | |
| 16:00 | 0 | 33 | 0 | 0 | 33 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 0 | 35 | 0 | 0 | 35 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 0 | 42 | 0 | 0 | 42 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 0 | 48 | 0 | 0 | 48 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 0 | 54 | 0 | 0 | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 0 | 26 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 0 | 43 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 0 | 30 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 0 | 311 | 0 | 0 | 311 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 0 | 523 | 0 | 0 | 523 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |



Traffic Count Data

Intersection: Scotland St & McQueen Blvd
 Site Code: 2122200006
 Municipality: South Fergus
 Count Date: Oct 28, 2021

West Approach - McQueen Blvd

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds | |
|-----------------|------|---|---|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|----|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | | |
| 07:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 08:30 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 08:45 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 1 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| SUBTOTAL | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 1 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 55 |



Traffic Count Data

Intersection: Scotland St & McQueen Blvd
 Site Code: 2122200006
 Municipality: South Fergus
 Count Date: Oct 28, 2021

West Approach - McQueen Blvd

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds | |
|--------------------|------|---|---|---|-------|--------|---|---|---|-------|----------|---|---|---|-------|------------|----|
| | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | ← | ↑ | → | ↻ | Total | | |
| 16:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 16:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 17:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 17:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| GRAND TOTAL | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 1 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 60 |

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 08:00:00
To: 09:00:00




Intersection: Scotland St & McQueen Blvd
Site Code: 2122200006
Count Date: Oct 28, 2021

Weather conditions: Clear




**** Unsignalized Intersection ****

Major Road: Scotland St runs N/S

North Approach

| | Out | In | Total |
|---|------------|------------|------------|
|  | 281 | 172 | 453 |
|  | 22 | 20 | 42 |
|  | 3 | 0 | 3 |
| Totals | 306 | 192 | 498 |

Scotland St

| | | | |
|---|----------|------------|----------|
|  | 0 | 3 | 0 |
|  | 0 | 22 | 0 |
|  | 0 | 281 | 0 |
| Totals | 0 | 306 | 0 |



Peds: 3






Peds: 55

Peds: 0




Peds: 0




McQueen Blvd

|  |  |  | Totals |
|---|---|---|--------|
| 0 | 0 | 0 | 0 |
| 0 | 16 | 0 | 16 |
| 0 | 1 | 0 | 1 |



West Approach




| | Out | In | Total |
|---|-----------|----------|-----------|
|  | 0 | 0 | 0 |
|  | 17 | 0 | 17 |
|  | 0 | 0 | 0 |
| Totals | 17 | 0 | 17 |

| Totals | 0 | 176 | 0 |
|---|---|-----|---|
|  | 0 | 172 | 0 |
|  | 0 | 4 | 0 |
|  | 0 | 0 | 0 |




Scotland St

South Approach

| | Out | In | Total |
|---|------------|------------|------------|
|  | 172 | 281 | 453 |
|  | 4 | 23 | 27 |
|  | 0 | 3 | 3 |
| Totals | 176 | 307 | 483 |

 - Cars

 - Trucks

 - Bicycles

Comments



Peak Hour Summary

Intersection: Scotland St & McQueen Blvd
 Site Code: 2122200006
 Count Date: Oct 28, 2021
 Period: 07:00 - 09:00

Peak Hour Data (08:00 - 09:00)

| Start Time | North Approach Scotland St | | | | | | South Approach Scotland St | | | | | | East Approach | | | | | | West Approach McQueen Blvd | | | | | | Total Vehicles |
|--------------------|-------------------------------|-------------|----------|----------|-------------|-------------|-------------------------------|-------------|---|----------|-------------|-------------|---------------|---|---|---|----------|----------|-------------------------------|-------------|----------|-------------|-------------|-------------|-------------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | |
| 08:00 | | 27 | 0 | 0 | 0 | 27 | 0 | 10 | | 0 | 0 | 10 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 37 |
| 08:15 | | 47 | 0 | 0 | 1 | 47 | 0 | 19 | | 0 | 0 | 19 | | | | | 0 | | 0 | 0 | 4 | 0 | 0 | 66 | |
| 08:30 | | 81 | 0 | 0 | 0 | 81 | 0 | 52 | | 0 | 0 | 52 | | | | | 6 | | 0 | 0 | 23 | 6 | 0 | 139 | |
| 08:45 | | 151 | 0 | 0 | 2 | 151 | 0 | 95 | | 0 | 0 | 95 | | | | | 10 | | 1 | 0 | 28 | 11 | 0 | 257 | |
| Grand Total | | 306 | 0 | 0 | 3 | 306 | 0 | 176 | | 0 | 0 | 176 | | | | | 0 | 0 | 16 | 1 | 0 | 55 | 17 | 499 | |
| Approach % | | 100 | 0 | 0 | - | - | 0 | 100 | | 0 | - | - | | | | | 94.1 | | 5.9 | 0 | - | - | - | - | |
| Totals % | | 61.3 | 0 | 0 | 61.3 | 61.3 | 0 | 35.3 | | 0 | 35.3 | 35.3 | | | | | 3.2 | | 0.2 | 0 | 3.4 | 3.4 | 3.4 | 3.4 | |
| PHF | | 0.51 | 0 | 0 | 0.51 | 0.51 | 0 | 0.46 | | 0 | 0.46 | 0.46 | | | | | 0 | 0 | 0.4 | 0.25 | 0 | 0.39 | 0.39 | 0.49 | |
| Cars | | 281 | 0 | 0 | 281 | 281 | 0 | 172 | | 0 | 172 | 172 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 453 | |
| % Cars | | 91.8 | 0 | 0 | 91.8 | 91.8 | 0 | 97.7 | | 0 | 97.7 | 97.7 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 90.8 | |
| Trucks | | 22 | 0 | 0 | 22 | 22 | 0 | 4 | | 0 | 4 | 4 | | | | | 0 | | 16 | 1 | 0 | 17 | 17 | 43 | |
| % Trucks | | 7.2 | 0 | 0 | 7.2 | 7.2 | 0 | 2.3 | | 0 | 2.3 | 2.3 | | | | | 0 | | 100 | 100 | 0 | 100 | 100 | 8.6 | |
| Bicycles | | 3 | 0 | 0 | 3 | 3 | 0 | 0 | | 0 | 0 | 0 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 3 | |
| % Bicycles | | 1 | 0 | 0 | 1 | 1 | 0 | 0 | | 0 | 0 | 0 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 0.6 | |
| Peds | | | | | 3 | 3 | | | | | 0 | 0 | | | | | 0 | | | | 55 | 55 | 55 | 58 | |
| % Peds | | | | | 5.2 | 5.2 | | | | | 0 | 0 | | | | | 0 | | | | 94.8 | 94.8 | 94.8 | 94.8 | |

Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 16:15:00
To: 17:15:00




Intersection: Scotland St & McQueen Blvd
Site Code: 2122200006
Count Date: Oct 28, 2021

Weather conditions: Clear




**** Unsignalized Intersection ****

Major Road: Scotland St runs N/S

North Approach

| | Out | In | Total |
|---|-----------|------------|------------|
|  | 84 | 179 | 263 |
|  | 1 | 2 | 3 |
|  | 0 | 0 | 0 |
| Totals | 85 | 181 | 266 |







Scotland St

| | | | |
|---|----------|-----------|----------|
|  | 0 | 0 | 0 |
|  | 0 | 1 | 0 |
|  | 0 | 84 | 0 |
| Totals | 0 | 85 | 0 |



Peds: 4

McQueen Blvd

|  |  |  | Totals |
|---|---|---|---|
| 0 | 0 | 0 | 0  |
| 0 | 0 | 0 | 0  |
| 0 | 0 | 0 | 0  |




Peds: 3









Peds: 0

Peds: 0




West Approach

| | Out | In | Total |
|---|----------|----------|----------|
|  | 0 | 0 | 0 |
|  | 0 | 0 | 0 |
|  | 0 | 0 | 0 |
| Totals | 0 | 0 | 0 |


| Totals |  |  |  |
|---|---|---|---|
| | 0 | 181 | 0 |
|  | 0 | 179 | 0 |
|  | 0 | 2 | 0 |
|  | 0 | 0 | 0 |

Scotland St

South Approach

| | Out | In | Total |
|---|------------|-----------|------------|
|  | 179 | 84 | 263 |
|  | 2 | 1 | 3 |
|  | 0 | 0 | 0 |
| Totals | 181 | 85 | 266 |

 - Cars

 - Trucks

 - Bicycles

Comments



Peak Hour Summary

Intersection: Scotland St & McQueen Blvd
 Site Code: 2122200006
 Count Date: Oct 28, 2021
 Period: 16:00 - 18:00

Peak Hour Data (16:15 - 17:15)

| Start Time | North Approach Scotland St | | | | | | South Approach Scotland St | | | | | | East Approach | | | | | | West Approach McQueen Blvd | | | | | | Total Vehic es |
|--------------------|-------------------------------|-------------|----------|----------|-------------|-------------|-------------------------------|-------------|---|----------|----------|-------------|---------------|---|---|---|----------|-------|-------------------------------|----------|----------|----------|------------|-------------|----------------------|
| | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | ← | ↑ | → | ↻ | Peds | Total | |
| 16:15 | | 9 | 0 | 0 | 2 | 9 | 0 | 36 | | 0 | 0 | 36 | | | | | 0 | | 0 | 0 | 0 | 2 | 0 | 45 | |
| 16:30 | | 26 | 0 | 0 | 1 | 26 | 0 | 42 | | 0 | 0 | 42 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 68 | |
| 16:45 | | 18 | 0 | 0 | 1 | 18 | 0 | 49 | | 0 | 0 | 49 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 67 | |
| 17:00 | | 32 | 0 | 0 | 0 | 32 | 0 | 54 | | 0 | 0 | 54 | | | | | 0 | | 0 | 0 | 1 | 0 | 86 | | |
| Grand Total | | 85 | 0 | 0 | 4 | 85 | 0 | 181 | | 0 | 0 | 181 | | | | | 0 | | 0 | 0 | 3 | 0 | 266 | | |
| Approach % | | 100 | 0 | 0 | - | - | 0 | 100 | | 0 | 0 | - | | | | | 0 | | 0 | 0 | - | - | - | | |
| Totals % | | 32 | 0 | 0 | 32 | 32 | 0 | 68 | | 0 | 0 | 68 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | | |
| PHF | | 0.66 | 0 | 0 | 0.66 | 0.66 | 0 | 0.84 | | 0 | 0 | 0.84 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 0.77 | |
| Cars | | 84 | 0 | 0 | 84 | 84 | 0 | 179 | | 0 | 0 | 179 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 263 | |
| % Cars | | 98.8 | 0 | 0 | 98.8 | 98.8 | 0 | 98.9 | | 0 | 0 | 98.9 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 98.9 | |
| Trucks | | 1 | 0 | 0 | 1 | 1 | 0 | 2 | | 0 | 0 | 2 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 3 | |
| % Trucks | | 1.2 | 0 | 0 | 1.2 | 1.2 | 0 | 1.1 | | 0 | 0 | 1.1 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 1.1 | |
| Bicycles | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | |
| % Bicycles | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | | | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peds | | | | | 4 | - | | | | | | - | | | | | 0 | | | | 3 | - | - | 7 | |
| % Peds | | | | | 57.1 | - | | | | | | - | | | | | 0 | | | | 42.9 | - | - | | |

Appendix C: LOS Definitions

CAPACITY ANALYSIS AT UNSIGNALIZED INTERSECTIONS

Highway Capacity Manual Methodology

The level of service at an unsignalized intersection is determined on the basis of control delay for each critical lane. This method of analysis is taken from the Highway Capacity Manual, Special Report 209, by the Transportation Research Board, 1997.

The average control delay for any particular critical movement (control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay) is a function of the service rate or capacity of the approach and degree of saturation. The level of service criteria for unsignalized intersections is outlined below and is related to ranges in vehicle delay.

| Level of Service | Expected Delay to Minor Street Traffic | Average Control Delay 'd' (sec/veh) |
|------------------|--|-------------------------------------|
| A | Little or no delays | $0 < d \leq 10$ |
| B | Short traffic delays | $10 \leq d \leq 15$ |
| C | Average traffic delays | $15 \leq d \leq 25$ |
| D | Long traffic delays | $25 \leq d \leq 35$ |
| E | Very long traffic delays | $35 \leq d \leq 50$ |
| F | Extreme delays with queuing which may cause congestion affecting other traffic movements in the intersection | $d > 50$ |

CAPACITY ANALYSIS AT SIGNALIZED INTERSECTIONS

Highway Capacity Manual Methodology

The capacity of signalized intersections has been determined in terms of delay taken from Chapter 9 of the Highway Capacity Manual, Special Report 209, by the Transportation Research Board, 2000.

To assist in clarifying the arithmetic analysis associated with traffic engineering, it is often useful to refer to "Level of Service". Level of Service (LOS) for signalized intersections is defined in terms of delay, which is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Only the portion of total delay attributed to the control facility is quantified. This control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay. The following table describes in detail the characteristics of each level:

| Level of Service | Expected Delay to Minor Street Traffic | Average Control Delay 'd' (sec/veh) |
|------------------|--|-------------------------------------|
| A | Describes operations with very low control delay, up to 10 seconds/vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all at this LOS. Short cycle lengths may also contribute to low delay. | $d \leq 10$ |
| B | Describes operations with control delay greater than 10 seconds and up to 20 seconds/vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop at this level than at LOS A, causing longer average delays. | $10 \leq d \leq 20$ |
| C | Describes operations with control delay greater than 20 seconds and up to 35 seconds/vehicle. These higher delays may result from fair progression, longer cycle length, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though many still pass through the intersection without stopping. | $20 \leq d \leq 35$ |
| D | Describes operations with control delay greater than 35 seconds and up to 55 seconds/vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures become noticeable. | $35 \leq d \leq 55$ |
| E | Describes operations with control delay greater than 55 seconds and up to 80 seconds/vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences. | $55 \leq d \leq 80$ |
| F | LOS F describes operations with control delay in excess of 80 seconds/vehicle. This <i>oversaturation</i> , considered to be unacceptable to most drivers, occurs when arrival flow rates exceed the design capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such high delay levels. | $d > 80$ |

Appendix D: Existing Operations

HCM Unsignalized Intersection Capacity Analysis
2: Scotland St & McQueen Blvd

2022 Existing Conditions
Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 16 | 1 | 0 | 178 | 309 | 0 |
| Future Volume (Veh/h) | 16 | 1 | 0 | 178 | 309 | 0 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 16 | 1 | 0 | 178 | 309 | 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 | 487 | 309 | 309 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 487 | 309 | 309 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 97 | 100 | 100 | | | |
| cM capacity (veh/h) | 540 | 731 | 1252 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 17 | 178 | 309 | | | |
| Volume Left | 16 | 0 | 0 | | | |
| Volume Right | 1 | 0 | 0 | | | |
| cSH | 548 | 1252 | 1700 | | | |
| Volume to Capacity | 0.03 | 0.00 | 0.18 | | | |
| Queue Length 95th (m) | 0.7 | 0.0 | 0.0 | | | |
| Control Delay (s) | 11.8 | 0.0 | 0.0 | | | |
| Lane LOS | B | | | | | |
| Approach Delay (s) | 11.8 | 0.0 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.4 | | | |
| Intersection Capacity Utilization | | | 26.3% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2022 Existing Conditions
Weekday AM Peak Hour



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|-------|------|------|------|------|------|-------|-------|------|
| Lane Configurations | ↖ | ↑ | ↗ | ↖ | ↗ | | ↖ | ↑↗ | | ↖ | ↑↗ | |
| Traffic Volume (vph) | 9 | 10 | 65 | 66 | 11 | 30 | 9 | 406 | 29 | 48 | 600 | 2 |
| Future Volume (vph) | 9 | 10 | 65 | 66 | 11 | 30 | 9 | 406 | 29 | 48 | 600 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1658 | | 1770 | 3504 | | 1770 | 3537 | |
| Flt Permitted | 0.83 | 1.00 | 1.00 | 0.83 | 1.00 | | 0.42 | 1.00 | | 0.42 | 1.00 | |
| Satd. Flow (perm) | 1552 | 1863 | 1583 | 1552 | 1658 | | 790 | 3504 | | 790 | 3537 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 9 | 10 | 65 | 66 | 11 | 30 | 9 | 406 | 29 | 48 | 600 | 2 |
| RTOR Reduction (vph) | 0 | 0 | 58 | 0 | 27 | 0 | 0 | 7 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 9 | 10 | 7 | 66 | 14 | 0 | 9 | 428 | 0 | 48 | 602 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | | 22.6 | 22.6 | | 32.8 | 32.8 | |
| Effective Green, g (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | | 22.6 | 22.6 | | 32.8 | 32.8 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | | 0.47 | 0.47 | | 0.69 | 0.69 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 156 | 187 | 159 | 156 | 167 | | 375 | 1663 | | 672 | 2437 | |
| v/s Ratio Prot | | 0.01 | | | 0.01 | | | 0.12 | | 0.01 | c0.17 | |
| v/s Ratio Perm | 0.01 | | 0.00 | c0.04 | | | 0.01 | | | 0.04 | | |
| v/c Ratio | 0.06 | 0.05 | 0.04 | 0.42 | 0.08 | | 0.02 | 0.26 | | 0.07 | 0.25 | |
| Uniform Delay, d1 | 19.4 | 19.3 | 19.3 | 20.1 | 19.4 | | 6.6 | 7.5 | | 2.5 | 2.8 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.2 | 0.1 | 0.1 | 1.9 | 0.2 | | 0.1 | 0.4 | | 0.2 | 0.2 | |
| Delay (s) | 19.5 | 19.5 | 19.4 | 22.0 | 19.6 | | 6.8 | 7.9 | | 2.7 | 3.0 | |
| Level of Service | B | B | B | C | B | | A | A | | A | A | |
| Approach Delay (s) | | 19.4 | | | 21.1 | | | 7.8 | | | 3.0 | |
| Approach LOS | | B | | | C | | | A | | | A | |

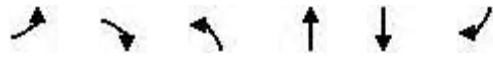
Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 7.2 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.30 | | |
| Actuated Cycle Length (s) | 47.6 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 43.6% | ICU Level of Service | A |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2022 Existing Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 41 | 9 | 18 | 61 | 61 | 15 |
| Future Volume (Veh/h) | 41 | 9 | 18 | 61 | 61 | 15 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 41 | 9 | 18 | 61 | 61 | 15 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 166 | 68 | 76 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 166 | 68 | 76 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 99 | 99 | | | |
| cM capacity (veh/h) | 815 | 995 | 1523 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 50 | 79 | 76 | | | |
| Volume Left | 41 | 18 | 0 | | | |
| Volume Right | 9 | 0 | 15 | | | |
| cSH | 843 | 1523 | 1700 | | | |
| Volume to Capacity | 0.06 | 0.01 | 0.04 | | | |
| Queue Length 95th (m) | 1.4 | 0.3 | 0.0 | | | |
| Control Delay (s) | 9.5 | 1.8 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.5 | 1.8 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.0 | | | |
| Intersection Capacity Utilization | | | 20.9% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2022 Existing Conditions
 Weekday AM Peak Hour



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|-------|-------|
| Lane Configurations | W | | T | R | L | R |
| Traffic Volume (vph) | 49 | 30 | 426 | 36 | 72 | 631 |
| Future Volume (vph) | 49 | 30 | 426 | 36 | 72 | 631 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | 4.0 | | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | 1.00 | 1.00 |
| Frt | 0.95 | | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.97 | | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1714 | | 3498 | | 1770 | 1863 |
| Flt Permitted | 0.97 | | 1.00 | | 0.43 | 1.00 |
| Satd. Flow (perm) | 1714 | | 3498 | | 809 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 49 | 30 | 426 | 36 | 72 | 631 |
| RTOR Reduction (vph) | 27 | 0 | 6 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 52 | 0 | 456 | 0 | 72 | 631 |
| Turn Type | Perm | | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | | | | 6 | |
| Actuated Green, G (s) | 4.9 | | 33.3 | | 40.4 | 40.4 |
| Effective Green, g (s) | 4.9 | | 33.3 | | 40.4 | 40.4 |
| Actuated g/C Ratio | 0.09 | | 0.62 | | 0.76 | 0.76 |
| Clearance Time (s) | 4.0 | | 4.0 | | 4.0 | 4.0 |
| Vehicle Extension (s) | 3.0 | | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 157 | | 2185 | | 669 | 1412 |
| v/s Ratio Prot | | | 0.13 | | 0.01 | c0.34 |
| v/s Ratio Perm | c0.03 | | | | 0.08 | |
| v/c Ratio | 0.33 | | 0.21 | | 0.11 | 0.45 |
| Uniform Delay, d1 | 22.7 | | 4.3 | | 1.8 | 2.4 |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.2 | | 0.2 | | 0.1 | 1.0 |
| Delay (s) | 23.9 | | 4.5 | | 1.9 | 3.4 |
| Level of Service | C | | A | | A | A |
| Approach Delay (s) | 23.9 | | 4.5 | | | 3.2 |
| Approach LOS | C | | A | | | A |



















Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 5.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.48 | | |
| Actuated Cycle Length (s) | 53.3 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 44.4% | ICU Level of Service | A |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

















HCM Unsignalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2022 Existing Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | |  |  | |  |  | |
| Traffic Volume (veh/h) | 29 | 14 | 23 | 3 | 12 | 7 | 14 | 428 | 12 | 5 | 632 | 51 |
| Future Volume (Veh/h) | 29 | 14 | 23 | 3 | 12 | 7 | 14 | 428 | 12 | 5 | 632 | 51 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 29 | 14 | 23 | 3 | 12 | 7 | 14 | 428 | 12 | 5 | 632 | 51 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | | | | | |
| | | | | | | | | None | | | None | |
| Median storage veh | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1136 | 1136 | 658 | 1134 | 1155 | 434 | 683 | | | 440 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1136 | 1136 | 658 | 1134 | 1155 | 434 | 683 | | | 440 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 83 | 93 | 95 | 98 | 94 | 99 | 98 | | | 100 | | |
| cM capacity (veh/h) | 166 | 198 | 465 | 159 | 193 | 622 | 910 | | | 1120 | | |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 | | | | | | |
| Volume Total | 66 | 22 | 14 | 440 | 5 | 683 | | | | | | |
| Volume Left | 29 | 3 | 14 | 0 | 5 | 0 | | | | | | |
| Volume Right | 23 | 7 | 0 | 12 | 0 | 51 | | | | | | |
| cSH | 224 | 238 | 910 | 1700 | 1120 | 1700 | | | | | | |
| Volume to Capacity | 0.29 | 0.09 | 0.02 | 0.26 | 0.00 | 0.40 | | | | | | |
| Queue Length 95th (m) | 9.2 | 2.3 | 0.4 | 0.0 | 0.1 | 0.0 | | | | | | |
| Control Delay (s) | 27.7 | 21.6 | 9.0 | 0.0 | 8.2 | 0.0 | | | | | | |
| Lane LOS | D | C | A | | A | | | | | | | |
| Approach Delay (s) | 27.7 | 21.6 | 0.3 | | 0.1 | | | | | | | |
| Approach LOS | D | C | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 2.0 | | | | | | | | | |
| Intersection Capacity Utilization | | | 52.2% | | ICU Level of Service | | | | | A | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2022 Existing Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 11 | 60 | 5 | 1 | 73 | 3 | 2 | 5 | 0 | 8 | 2 | 18 |
| Future Volume (Veh/h) | 11 | 60 | 5 | 1 | 73 | 3 | 2 | 5 | 0 | 8 | 2 | 18 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 11 | 60 | 5 | 1 | 73 | 3 | 2 | 5 | 0 | 8 | 2 | 18 |
| 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 | 76 | | | 65 | | | 180 | 162 | 62 | 164 | 164 | 74 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 76 | | | 65 | | | 180 | 162 | 62 | 164 | 164 | 74 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 100 | | | 100 | 99 | 100 | 99 | 100 | 98 |
| cM capacity (veh/h) | 1523 | | | 1537 | | | 761 | 724 | 1002 | 792 | 723 | 987 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 76 | 77 | 7 | 28 | | | | | | | | |
| Volume Left | 11 | 1 | 2 | 8 | | | | | | | | |
| Volume Right | 5 | 3 | 0 | 18 | | | | | | | | |
| cSH | 1523 | 1537 | 734 | 900 | | | | | | | | |
| Volume to Capacity | 0.01 | 0.00 | 0.01 | 0.03 | | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.2 | 0.7 | | | | | | | | |
| Control Delay (s) | 1.1 | 0.1 | 9.9 | 9.1 | | | | | | | | |
| Lane LOS | A | A | A | A | | | | | | | | |
| Approach Delay (s) | 1.1 | 0.1 | 9.9 | 9.1 | | | | | | | | |
| Approach LOS | | | A | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 2.2 | | | | | | | | | |
| Intersection Capacity Utilization | | | 20.5% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
2: Scotland St & McQueen Blvd

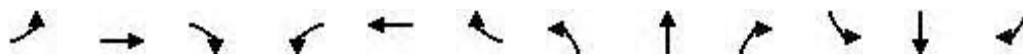
2022 Existing Conditions
Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 183 | 86 | 0 |
| Future Volume (Veh/h) | 0 | 0 | 0 | 183 | 86 | 0 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 0 | 0 | 183 | 86 | 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 | 269 | 86 | 86 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 269 | 86 | 86 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 100 | 100 | 100 | | | |
| cM capacity (veh/h) | 720 | 973 | 1510 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 0 | 183 | 86 | | | |
| Volume Left | 0 | 0 | 0 | | | |
| Volume Right | 0 | 0 | 0 | | | |
| cSH | 1700 | 1510 | 1700 | | | |
| Volume to Capacity | 0.00 | 0.00 | 0.05 | | | |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | | | |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | | | |
| Lane LOS | A | | | | | |
| Approach Delay (s) | 0.0 | 0.0 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 0.0 | | | | | |
| Intersection Capacity Utilization | 13.0% | | | ICU Level of Service | A | |
| Analysis Period (min) | 30 | | | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2022 Existing Conditions
Weekday PM Peak Hour



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|-------|------|------|------|-------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 30 | 28 | 23 | 66 | 11 | 30 | 47 | 741 | 115 | 154 | 551 | 5 |
| Future Volume (vph) | 30 | 28 | 23 | 66 | 11 | 30 | 47 | 741 | 115 | 154 | 551 | 5 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.98 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1658 | | 1770 | 3468 | | 1770 | 3534 | |
| Flt Permitted | 0.82 | 1.00 | 1.00 | 0.82 | 1.00 | | 0.44 | 1.00 | | 0.24 | 1.00 | |
| Satd. Flow (perm) | 1521 | 1863 | 1583 | 1521 | 1658 | | 827 | 3468 | | 445 | 3534 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 28 | 23 | 66 | 11 | 30 | 47 | 741 | 115 | 154 | 551 | 5 |
| RTOR Reduction (vph) | 0 | 0 | 21 | 0 | 27 | 0 | 0 | 17 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 30 | 28 | 2 | 66 | 14 | 0 | 47 | 839 | 0 | 154 | 555 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 4.9 | 4.9 | 4.9 | 4.9 | 4.9 | | 22.6 | 22.6 | | 32.8 | 32.8 | |
| Effective Green, g (s) | 4.9 | 4.9 | 4.9 | 4.9 | 4.9 | | 22.6 | 22.6 | | 32.8 | 32.8 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | | 0.47 | 0.47 | | 0.69 | 0.69 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 156 | 191 | 162 | 156 | 170 | | 391 | 1643 | | 478 | 2430 | |
| v/s Ratio Prot | | 0.02 | | | 0.01 | | | c0.24 | | c0.04 | 0.16 | |
| v/s Ratio Perm | 0.02 | | 0.00 | c0.04 | | | 0.06 | | | 0.18 | | |
| v/c Ratio | 0.19 | 0.15 | 0.01 | 0.42 | 0.08 | | 0.12 | 0.51 | | 0.32 | 0.23 | |
| Uniform Delay, d1 | 19.6 | 19.5 | 19.2 | 20.1 | 19.4 | | 7.0 | 8.7 | | 3.3 | 2.8 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.4 | 0.0 | 1.9 | 0.2 | | 0.6 | 1.1 | | 1.8 | 0.2 | |
| Delay (s) | 20.2 | 19.9 | 19.3 | 21.9 | 19.6 | | 7.6 | 9.9 | | 5.1 | 3.0 | |
| Level of Service | C | B | B | C | B | | A | A | | A | A | |
| Approach Delay (s) | | 19.8 | | | 21.0 | | | 9.7 | | | 3.4 | |
| Approach LOS | | B | | | C | | | A | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 8.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.47 | | |
| Actuated Cycle Length (s) | 47.7 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 54.7% | ICU Level of Service | A |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2022 Existing Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 23 | 7 | 25 | 130 | 58 | 14 |
| Future Volume (Veh/h) | 23 | 7 | 25 | 130 | 58 | 14 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 23 | 7 | 25 | 130 | 58 | 14 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 245 | 65 | 72 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 245 | 65 | 72 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 97 | 99 | 98 | | | |
| cM capacity (veh/h) | 731 | 999 | 1528 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 30 | 155 | 72 | | | |
| Volume Left | 23 | 25 | 0 | | | |
| Volume Right | 7 | 0 | 14 | | | |
| cSH | 780 | 1528 | 1700 | | | |
| Volume to Capacity | 0.04 | 0.02 | 0.04 | | | |
| Queue Length 95th (m) | 0.9 | 0.4 | 0.0 | | | |
| Control Delay (s) | 9.8 | 1.3 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.8 | 1.3 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.9 | | | |
| Intersection Capacity Utilization | | | 24.9% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2022 Existing Conditions
 Weekday PM Peak Hour





















| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|-------|------|-------|-------|
| Lane Configurations | W | | T | | L | R |
| Traffic Volume (vph) | 67 | 128 | 794 | 90 | 117 | 522 |
| Future Volume (vph) | 67 | 128 | 794 | 90 | 117 | 522 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | 4.0 | | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | 1.00 | 1.00 |
| Frt | 0.91 | | 0.98 | | 1.00 | 1.00 |
| Flt Protected | 0.98 | | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1669 | | 3485 | | 1770 | 1863 |
| Flt Permitted | 0.98 | | 1.00 | | 0.22 | 1.00 |
| Satd. Flow (perm) | 1669 | | 3485 | | 417 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 67 | 128 | 794 | 90 | 117 | 522 |
| RTOR Reduction (vph) | 108 | 0 | 11 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 87 | 0 | 873 | 0 | 117 | 522 |
| Turn Type | Perm | | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | | | | 6 | |
| Actuated Green, G (s) | 8.0 | | 25.4 | | 35.0 | 35.0 |
| Effective Green, g (s) | 8.0 | | 25.4 | | 35.0 | 35.0 |
| Actuated g/C Ratio | 0.16 | | 0.50 | | 0.69 | 0.69 |
| Clearance Time (s) | 4.0 | | 4.0 | | 4.0 | 4.0 |
| Vehicle Extension (s) | 3.0 | | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 261 | | 1735 | | 434 | 1278 |
| v/s Ratio Prot | | | c0.25 | | 0.03 | c0.28 |
| v/s Ratio Perm | c0.05 | | | | 0.16 | |
| v/c Ratio | 0.33 | | 0.50 | | 0.27 | 0.41 |
| Uniform Delay, d1 | 19.1 | | 8.6 | | 3.7 | 3.5 |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.8 | | 1.0 | | 0.3 | 1.0 |
| Delay (s) | 19.9 | | 9.6 | | 4.0 | 4.5 |
| Level of Service | B | | A | | A | A |
| Approach Delay (s) | 19.9 | | 9.6 | | | 4.4 |
| Approach LOS | B | | A | | | A |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 8.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.47 | | |
| Actuated Cycle Length (s) | 51.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 52.9% | ICU Level of Service | A |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

















HCM Unsignalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2022 Existing Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | |  |  | |  |  | |
| Traffic Volume (veh/h) | 46 | 11 | 15 | 10 | 16 | 16 | 23 | 824 | 16 | 1 | 539 | 54 |
| Future Volume (Veh/h) | 46 | 11 | 15 | 10 | 16 | 16 | 23 | 824 | 16 | 1 | 539 | 54 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 46 | 11 | 15 | 10 | 16 | 16 | 23 | 824 | 16 | 1 | 539 | 54 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1462 | 1454 | 566 | 1440 | 1473 | 832 | 593 | | | 840 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1462 | 1454 | 566 | 1440 | 1473 | 832 | 593 | | | 840 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 49 | 91 | 97 | 90 | 87 | 96 | 98 | | | 100 | | |
| cM capacity (veh/h) | 90 | 127 | 524 | 98 | 124 | 369 | 983 | | | 795 | | |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 | | | | | | |
| Volume Total | 72 | 42 | 23 | 840 | 1 | 593 | | | | | | |
| Volume Left | 46 | 10 | 23 | 0 | 1 | 0 | | | | | | |
| Volume Right | 15 | 16 | 0 | 16 | 0 | 54 | | | | | | |
| cSH | 115 | 153 | 983 | 1700 | 795 | 1700 | | | | | | |
| Volume to Capacity | 0.62 | 0.27 | 0.02 | 0.49 | 0.00 | 0.35 | | | | | | |
| Queue Length 95th (m) | 28.3 | 8.3 | 0.5 | 0.0 | 0.0 | 0.0 | | | | | | |
| Control Delay (s) | 82.1 | 37.3 | 8.8 | 0.0 | 9.5 | 0.0 | | | | | | |
| Lane LOS | F | E | A | | A | | | | | | | |
| Approach Delay (s) | 82.1 | 37.3 | 0.2 | | 0.0 | | | | | | | |
| Approach LOS | F | E | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 4.9 | | | | | | | | | |
| Intersection Capacity Utilization | | | 60.3% | | ICU Level of Service | | | | B | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2022 Existing Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 59 | 64 | 0 | 0 | 69 | 18 | 0 | 4 | 0 | 4 | 9 | 19 |
| Future Volume (Veh/h) | 59 | 64 | 0 | 0 | 69 | 18 | 0 | 4 | 0 | 4 | 9 | 19 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 59 | 64 | 0 | 0 | 69 | 18 | 0 | 4 | 0 | 4 | 9 | 19 |
| 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 | 87 | | | 64 | | | 284 | 269 | 64 | 262 | 260 | 78 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 87 | | | 64 | | | 284 | 269 | 64 | 262 | 260 | 78 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 96 | | | 100 | | | 100 | 99 | 100 | 99 | 99 | 98 |
| cM capacity (veh/h) | 1509 | | | 1538 | | | 629 | 612 | 1000 | 667 | 619 | 983 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 123 | 87 | 4 | 32 | | | | | | | | |
| Volume Left | 59 | 0 | 0 | 4 | | | | | | | | |
| Volume Right | 0 | 18 | 0 | 19 | | | | | | | | |
| cSH | 1509 | 1538 | 612 | 803 | | | | | | | | |
| Volume to Capacity | 0.04 | 0.00 | 0.01 | 0.04 | | | | | | | | |
| Queue Length 95th (m) | 0.9 | 0.0 | 0.1 | 0.9 | | | | | | | | |
| Control Delay (s) | 3.7 | 0.0 | 10.9 | 9.7 | | | | | | | | |
| Lane LOS | A | | B | A | | | | | | | | |
| Approach Delay (s) | 3.7 | 0.0 | 10.9 | 9.7 | | | | | | | | |
| Approach LOS | | | B | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 3.3 | | | | | | | | | |
| Intersection Capacity Utilization | | | 25.3% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

Intersection: 2: Scotland St & McQueen Blvd

| Movement | EB |
|-----------------------|------|
| Directions Served | LR |
| Maximum Queue (m) | 11.4 |
| Average Queue (m) | 3.9 |
| 95th Queue (m) | 11.3 |
| Link Distance (m) | |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (m) | |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | EB | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|------|------|------|------|------|-------|-------|------|-------|-------|
| Directions Served | L | T | R | L | TR | L | T | TR | L | T | TR |
| Maximum Queue (m) | 8.2 | 11.3 | 16.4 | 21.7 | 14.7 | 9.4 | 27.3 | 32.5 | 15.4 | 29.6 | 38.3 |
| Average Queue (m) | 2.3 | 1.5 | 8.7 | 11.1 | 5.6 | 1.4 | 12.7 | 14.5 | 5.2 | 7.1 | 18.1 |
| 95th Queue (m) | 8.1 | 7.2 | 14.6 | 19.9 | 13.1 | 6.4 | 24.0 | 27.1 | 13.8 | 18.8 | 33.2 |
| Link Distance (m) | | | | | | | 273.6 | 273.6 | | 363.4 | 363.4 |
| Upstream Blk Time (%) | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | 50.0 | 30.0 | | 30.0 | | | 30.0 | | |
| Storage Blk Time (%) | | | | 0 | | | 0 | | | 0 | |
| Queuing Penalty (veh) | | | | 0 | | | 0 | | | 0 | |

Intersection: 8: Jones Baseline/Scotland St & 2nd Line

| Movement | EB | NB |
|-----------------------|-------|-------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 13.0 | 8.0 |
| Average Queue (m) | 6.3 | 0.6 |
| 95th Queue (m) | 12.1 | 3.8 |
| Link Distance (m) | 304.8 | 382.5 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 10: Tower St S & Commerical Access

| Movement | WB | NB | NB | SB | SB |
|-----------------------|------|-------|-------|-------|-------|
| Directions Served | LR | T | TR | L | T |
| Maximum Queue (m) | 18.3 | 27.4 | 30.4 | 17.2 | 45.0 |
| Average Queue (m) | 11.2 | 9.7 | 9.6 | 7.5 | 14.7 |
| 95th Queue (m) | 19.3 | 20.4 | 23.0 | 15.5 | 33.6 |
| Link Distance (m) | | 243.2 | 243.2 | 273.6 | 273.6 |
| Upstream Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |
| Storage Bay Dist (m) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

Intersection: 15: Highway 6/Tower St S & 2nd Line

| Movement | EB | WB | NB | SB |
|-----------------------|-------|-------|-------|-------|
| Directions Served | LTR | LTR | L | L |
| Maximum Queue (m) | 25.7 | 12.9 | 8.4 | 7.0 |
| Average Queue (m) | 9.6 | 4.2 | 2.2 | 0.5 |
| 95th Queue (m) | 18.8 | 11.3 | 8.0 | 3.7 |
| Link Distance (m) | 663.4 | 719.9 | | |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | 100.0 | 100.0 |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

Intersection: 16: Guelph St & 2nd Line

| Movement | EB | NB | SB |
|-----------------------|-------|-------|--------|
| Directions Served | LTR | LTR | LTR |
| Maximum Queue (m) | 6.0 | 9.0 | 12.0 |
| Average Queue (m) | 0.4 | 1.5 | 5.2 |
| 95th Queue (m) | 3.1 | 6.9 | 12.8 |
| Link Distance (m) | 164.0 | 266.0 | 1012.3 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (m) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 2: Scotland St & McQueen Blvd

Movement

Directions Served
 Maximum Queue (m)
 Average Queue (m)
 95th Queue (m)
 Link Distance (m)
 Upstream Blk Time (%)
 Queuing Penalty (veh)
 Storage Bay Dist (m)
 Storage Blk Time (%)
 Queuing Penalty (veh)

Intersection: 7: Tower St S & McQueen Blvd

| Movement | EB | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|------|------|------|------|------|-------|-------|------|-------|-------|
| Directions Served | L | T | R | L | TR | L | T | TR | L | T | TR |
| Maximum Queue (m) | 16.8 | 16.9 | 11.5 | 23.0 | 20.0 | 18.5 | 45.6 | 58.3 | 28.7 | 19.2 | 39.8 |
| Average Queue (m) | 6.7 | 5.3 | 4.2 | 11.1 | 6.3 | 7.5 | 24.4 | 31.0 | 13.9 | 7.0 | 17.3 |
| 95th Queue (m) | 14.7 | 13.6 | 11.4 | 21.0 | 15.1 | 16.6 | 42.1 | 49.8 | 23.9 | 17.7 | 31.9 |
| Link Distance (m) | | | | | | | 273.6 | 273.6 | | 363.4 | 363.4 |
| Upstream Blk Time (%) | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | 50.0 | 30.0 | | 30.0 | | | 30.0 | | |
| Storage Blk Time (%) | | | | 0 | 0 | 0 | 3 | | 0 | 0 | |
| Queuing Penalty (veh) | | | | 0 | 0 | 0 | 1 | | 0 | 0 | |

Intersection: 8: Jones Baseline/Scotland St & 2nd Line

| Movement | EB | NB |
|-----------------------|-------|-------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 9.0 | 7.5 |
| Average Queue (m) | 4.9 | 0.6 |
| 95th Queue (m) | 10.7 | 3.9 |
| Link Distance (m) | 304.8 | 382.5 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 10: Tower St S & Commerical Access

| Movement | WB | NB | NB | SB | SB |
|-----------------------|------|-------|-------|-------|-------|
| Directions Served | LR | T | TR | L | T |
| Maximum Queue (m) | 22.2 | 41.9 | 50.4 | 24.7 | 46.3 |
| Average Queue (m) | 16.5 | 19.6 | 24.2 | 11.6 | 18.8 |
| 95th Queue (m) | 21.6 | 34.1 | 42.6 | 20.9 | 36.4 |
| Link Distance (m) | | 243.2 | 243.2 | 273.6 | 273.6 |
| Upstream Blk Time (%) | 0 | | | | |
| Queuing Penalty (veh) | 0 | | | | |
| Storage Bay Dist (m) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

Intersection: 15: Highway 6/Tower St S & 2nd Line

| Movement | EB | WB | NB | SB | SB |
|-----------------------|-------|-------|-------|-------|-------|
| Directions Served | LTR | LTR | L | L | TR |
| Maximum Queue (m) | 38.0 | 24.9 | 10.4 | 1.7 | 1.4 |
| Average Queue (m) | 14.0 | 8.4 | 2.4 | 0.1 | 0.1 |
| 95th Queue (m) | 29.9 | 18.3 | 8.7 | 1.2 | 1.4 |
| Link Distance (m) | 663.4 | 719.9 | | | 335.4 |
| Upstream Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |
| Storage Bay Dist (m) | | | 100.0 | 100.0 | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

Intersection: 16: Guelph St & 2nd Line

| Movement | EB | NB | SB |
|-----------------------|-------|-------|--------|
| Directions Served | LTR | LTR | LTR |
| Maximum Queue (m) | 10.1 | 9.1 | 13.4 |
| Average Queue (m) | 1.2 | 1.0 | 5.8 |
| 95th Queue (m) | 6.3 | 5.7 | 13.3 |
| Link Distance (m) | 164.0 | 266.0 | 1012.3 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (m) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

Zone Summary

| |
|------------------------------|
| Zone wide Queuing Penalty: 2 |
|------------------------------|

Appendix E: Future Background Operations

HCM Unsignalized Intersection Capacity Analysis
 2: Scotland St & McQueen Blvd

2025 Background Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 17 | 11 | 10 | 183 | 319 | 10 |
| Future Volume (Veh/h) | 17 | 11 | 10 | 183 | 319 | 10 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 17 | 11 | 10 | 183 | 319 | 10 |
| 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 | 527 | 324 | 329 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 527 | 324 | 329 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 97 | 98 | 99 | | | |
| cM capacity (veh/h) | 507 | 717 | 1231 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 28 | 193 | 329 | | | |
| Volume Left | 17 | 10 | 0 | | | |
| Volume Right | 11 | 0 | 10 | | | |
| cSH | 573 | 1231 | 1700 | | | |
| Volume to Capacity | 0.05 | 0.01 | 0.19 | | | |
| Queue Length 95th (m) | 1.2 | 0.2 | 0.0 | | | |
| Control Delay (s) | 11.6 | 0.5 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 11.6 | 0.5 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.8 | | | |
| Intersection Capacity Utilization | | | 27.8% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2025 Background Conditions
Weekday AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|-------|------|------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 9 | 10 | 67 | 68 | 11 | 31 | 9 | 473 | 30 | 50 | 715 | 2 |
| Future Volume (vph) | 9 | 10 | 67 | 68 | 11 | 31 | 9 | 473 | 30 | 50 | 715 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1657 | | 1770 | 3508 | | 1770 | 3538 | |
| Flt Permitted | 0.82 | 1.00 | 1.00 | 0.82 | 1.00 | | 0.38 | 1.00 | | 0.40 | 1.00 | |
| Satd. Flow (perm) | 1521 | 1863 | 1583 | 1521 | 1657 | | 706 | 3508 | | 740 | 3538 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 9 | 10 | 67 | 68 | 11 | 31 | 9 | 473 | 30 | 50 | 715 | 2 |
| RTOR Reduction (vph) | 0 | 0 | 60 | 0 | 28 | 0 | 0 | 6 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 9 | 10 | 7 | 68 | 14 | 0 | 9 | 497 | 0 | 50 | 717 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 4.9 | 4.9 | 4.9 | 4.9 | 4.9 | | 22.6 | 22.6 | | 32.8 | 32.8 | |
| Effective Green, g (s) | 4.9 | 4.9 | 4.9 | 4.9 | 4.9 | | 22.6 | 22.6 | | 32.8 | 32.8 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | | 0.47 | 0.47 | | 0.69 | 0.69 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 156 | 191 | 162 | 156 | 170 | | 334 | 1662 | | 642 | 2432 | |
| v/s Ratio Prot | | 0.01 | | | 0.01 | | | 0.14 | | 0.01 | c0.20 | |
| v/s Ratio Perm | 0.01 | | 0.00 | c0.04 | | | 0.01 | | | 0.04 | | |
| v/c Ratio | 0.06 | 0.05 | 0.04 | 0.44 | 0.08 | | 0.03 | 0.30 | | 0.08 | 0.29 | |
| Uniform Delay, d1 | 19.3 | 19.3 | 19.3 | 20.1 | 19.4 | | 6.7 | 7.7 | | 2.6 | 2.9 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.2 | 0.1 | 0.1 | 2.0 | 0.2 | | 0.1 | 0.5 | | 0.2 | 0.3 | |
| Delay (s) | 19.5 | 19.4 | 19.4 | 22.1 | 19.6 | | 6.8 | 8.2 | | 2.8 | 3.2 | |
| Level of Service | B | B | B | C | B | | A | A | | A | A | |
| Approach Delay (s) | | 19.4 | | | 21.1 | | | 8.1 | | | 3.2 | |
| Approach LOS | | B | | | C | | | A | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 7.2 | | | | | | | | | A |
| HCM 2000 Volume to Capacity ratio | | | 0.35 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 47.7 | | | | | | | 14.0 | | |
| Intersection Capacity Utilization | | | 46.9% | | | | | | | | | A |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2025 Background Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 43 | 9 | 19 | 62 | 62 | 16 |
| Future Volume (Veh/h) | 43 | 9 | 19 | 62 | 62 | 16 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 43 | 9 | 19 | 62 | 62 | 16 |
| 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 | 170 | 70 | 78 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 170 | 70 | 78 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 99 | 99 | | | |
| cM capacity (veh/h) | 810 | 993 | 1520 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 52 | 81 | 78 | | | |
| Volume Left | 43 | 19 | 0 | | | |
| Volume Right | 9 | 0 | 16 | | | |
| cSH | 837 | 1520 | 1700 | | | |
| Volume to Capacity | 0.06 | 0.01 | 0.05 | | | |
| Queue Length 95th (m) | 1.5 | 0.3 | 0.0 | | | |
| Control Delay (s) | 9.6 | 1.8 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.6 | 1.8 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.1 | | | |
| Intersection Capacity Utilization | | | 21.0% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2025 Background Conditions
 Weekday AM Peak Hour



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|-------|-------|
| Lane Configurations | W | | T | T | W | T |
| Traffic Volume (vph) | 49 | 30 | 494 | 36 | 72 | 748 |
| Future Volume (vph) | 49 | 30 | 494 | 36 | 72 | 748 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | 4.0 | | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | 1.00 | 1.00 |
| Frt | 0.95 | | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.97 | | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1714 | | 3503 | | 1770 | 1863 |
| Flt Permitted | 0.97 | | 1.00 | | 0.41 | 1.00 |
| Satd. Flow (perm) | 1714 | | 3503 | | 757 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 49 | 30 | 494 | 36 | 72 | 748 |
| RTOR Reduction (vph) | 27 | 0 | 6 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 52 | 0 | 524 | 0 | 72 | 748 |
| Turn Type | Perm | | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | | | | 6 | |
| Actuated Green, G (s) | 4.9 | | 33.3 | | 40.4 | 40.4 |
| Effective Green, g (s) | 4.9 | | 33.3 | | 40.4 | 40.4 |
| Actuated g/C Ratio | 0.09 | | 0.62 | | 0.76 | 0.76 |
| Clearance Time (s) | 4.0 | | 4.0 | | 4.0 | 4.0 |
| Vehicle Extension (s) | 3.0 | | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 157 | | 2188 | | 632 | 1412 |
| v/s Ratio Prot | | | 0.15 | | 0.01 | c0.40 |
| v/s Ratio Perm | c0.03 | | | | 0.08 | |
| v/c Ratio | 0.33 | | 0.24 | | 0.11 | 0.53 |
| Uniform Delay, d1 | 22.7 | | 4.4 | | 1.8 | 2.6 |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.2 | | 0.3 | | 0.1 | 1.4 |
| Delay (s) | 23.9 | | 4.7 | | 1.9 | 4.0 |
| Level of Service | C | | A | | A | A |
| Approach Delay (s) | 23.9 | | 4.7 | | | 3.8 |
| Approach LOS | C | | A | | | A |

















Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 5.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.56 | | |
| Actuated Cycle Length (s) | 53.3 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 50.6% | ICU Level of Service | A |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

















2025 Background Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
| Lane Configurations | |  | | |  | |  |  | | | | | |
| Traffic Volume (vph) | 30 | 15 | 24 | 3 | 12 | 7 | 15 | 496 | 12 | 5 | 749 | 52 | |
| Future Volume (vph) | 30 | 15 | 24 | 3 | 12 | 7 | 15 | 496 | 12 | 5 | 749 | 52 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | |
| Frt | | 0.95 | | | 0.96 | | 1.00 | 1.00 | | 1.00 | 0.99 | | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | | |
| Satd. Flow (prot) | | 1738 | | | 1771 | | 1770 | 1856 | | 1770 | 1845 | | |
| Flt Permitted | | 0.85 | | | 0.94 | | 0.29 | 1.00 | | 0.46 | 1.00 | | |
| Satd. Flow (perm) | | 1508 | | | 1673 | | 547 | 1856 | | 866 | 1845 | | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Adj. Flow (vph) | 30 | 15 | 24 | 3 | 12 | 7 | 15 | 496 | 12 | 5 | 749 | 52 | |
| RTOR Reduction (vph) | 0 | 22 | 0 | 0 | 6 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | |
| Lane Group Flow (vph) | 0 | 47 | 0 | 0 | 16 | 0 | 15 | 507 | 0 | 5 | 798 | 0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | | |
| Actuated Green, G (s) | | 6.0 | | | 6.0 | | 44.1 | 44.1 | | 44.1 | 44.1 | | |
| Effective Green, g (s) | | 6.0 | | | 6.0 | | 44.1 | 44.1 | | 44.1 | 44.1 | | |
| Actuated g/C Ratio | | 0.10 | | | 0.10 | | 0.71 | 0.71 | | 0.71 | 0.71 | | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | |
| Lane Grp Cap (vph) | | 145 | | | 161 | | 388 | 1318 | | 614 | 1310 | | |
| v/s Ratio Prot | | | | | | | | 0.27 | | | c0.43 | | |
| v/s Ratio Perm | | c0.03 | | | 0.01 | | 0.03 | | | 0.01 | | | |
| v/c Ratio | | 0.33 | | | 0.10 | | 0.04 | 0.38 | | 0.01 | 0.61 | | |
| Uniform Delay, d1 | | 26.2 | | | 25.6 | | 2.7 | 3.6 | | 2.6 | 4.6 | | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | |
| Incremental Delay, d2 | | 1.3 | | | 0.3 | | 0.2 | 0.9 | | 0.0 | 2.1 | | |
| Delay (s) | | 27.5 | | | 25.8 | | 2.9 | 4.4 | | 2.6 | 6.7 | | |
| Level of Service | | C | | | C | | A | A | | A | A | | |
| Approach Delay (s) | | 27.5 | | | 25.8 | | | 4.4 | | | 6.7 | | |
| Approach LOS | | C | | | C | | | A | | | A | | |
| Intersection Summary | | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 7.2 | | | | | | | | | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | | | 0.57 | | | | | | | | | | |
| Actuated Cycle Length (s) | | | 62.1 | | | | | | | | | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | | | 62.1% | | | | | | | | | ICU Level of Service | B |
| Analysis Period (min) | | | 30 | | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2025 Background Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 11 | 61 | 5 | 1 | 75 | 3 | 2 | 5 | 0 | 8 | 2 | 19 |
| Future Volume (Veh/h) | 11 | 61 | 5 | 1 | 75 | 3 | 2 | 5 | 0 | 8 | 2 | 19 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 11 | 61 | 5 | 1 | 75 | 3 | 2 | 5 | 0 | 8 | 2 | 19 |
| 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 | 78 | | | 66 | | | 184 | 166 | 64 | 166 | 166 | 76 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 78 | | | 66 | | | 184 | 166 | 64 | 166 | 166 | 76 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 100 | | | 100 | 99 | 100 | 99 | 100 | 98 |
| cM capacity (veh/h) | 1520 | | | 1536 | | | 756 | 721 | 1001 | 789 | 720 | 985 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 77 | 79 | 7 | 29 | | | | | | | | |
| Volume Left | 11 | 1 | 2 | 8 | | | | | | | | |
| Volume Right | 5 | 3 | 0 | 19 | | | | | | | | |
| cSH | 1520 | 1536 | 731 | 900 | | | | | | | | |
| Volume to Capacity | 0.01 | 0.00 | 0.01 | 0.03 | | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.2 | 0.8 | | | | | | | | |
| Control Delay (s) | 1.1 | 0.1 | 10.0 | 9.1 | | | | | | | | |
| Lane LOS | A | A | A | A | | | | | | | | |
| Approach Delay (s) | 1.1 | 0.1 | 10.0 | 9.1 | | | | | | | | |
| Approach LOS | | | A | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 2.2 | | | | | | | | | |
| Intersection Capacity Utilization | | | 20.6% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
2: Scotland St & McQueen Blvd

2025 Background Conditions
Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 10 | 10 | 188 | 88 | 10 |
| Future Volume (Veh/h) | 10 | 10 | 10 | 188 | 88 | 10 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 10 | 10 | 10 | 188 | 88 | 10 |
| 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 | 301 | 93 | 98 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 301 | 93 | 98 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 99 | 99 | 99 | | | |
| cM capacity (veh/h) | 686 | 964 | 1495 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 20 | 198 | 98 | | | |
| Volume Left | 10 | 10 | 0 | | | |
| Volume Right | 10 | 0 | 10 | | | |
| cSH | 802 | 1495 | 1700 | | | |
| Volume to Capacity | 0.02 | 0.01 | 0.06 | | | |
| Queue Length 95th (m) | 0.6 | 0.2 | 0.0 | | | |
| Control Delay (s) | 9.6 | 0.4 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.6 | 0.4 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.9 | | | |
| Intersection Capacity Utilization | | | 27.1% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2025 Background Conditions
Weekday PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|-------|------|---------------------------|------|-------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 31 | 29 | 24 | 68 | 11 | 31 | 49 | 877 | 119 | 158 | 645 | 5 |
| Future Volume (vph) | 31 | 29 | 24 | 68 | 11 | 31 | 49 | 877 | 119 | 158 | 645 | 5 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.98 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1657 | | 1770 | 3476 | | 1770 | 3535 | |
| Flt Permitted | 0.82 | 1.00 | 1.00 | 0.82 | 1.00 | | 0.40 | 1.00 | | 0.19 | 1.00 | |
| Satd. Flow (perm) | 1521 | 1863 | 1583 | 1521 | 1657 | | 754 | 3476 | | 348 | 3535 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 31 | 29 | 24 | 68 | 11 | 31 | 49 | 877 | 119 | 158 | 645 | 5 |
| RTOR Reduction (vph) | 0 | 0 | 22 | 0 | 28 | 0 | 0 | 15 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 31 | 29 | 2 | 68 | 14 | 0 | 49 | 981 | 0 | 158 | 649 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 4.9 | 4.9 | 4.9 | 4.9 | 4.9 | | 22.6 | 22.6 | | 32.8 | 32.8 | |
| Effective Green, g (s) | 4.9 | 4.9 | 4.9 | 4.9 | 4.9 | | 22.6 | 22.6 | | 32.8 | 32.8 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | | 0.47 | 0.47 | | 0.69 | 0.69 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 156 | 191 | 162 | 156 | 170 | | 357 | 1646 | | 424 | 2430 | |
| v/s Ratio Prot | | 0.02 | | | 0.01 | | | c0.28 | | c0.05 | 0.18 | |
| v/s Ratio Perm | 0.02 | | 0.00 | c0.04 | | | 0.06 | | | 0.21 | | |
| v/c Ratio | 0.20 | 0.15 | 0.02 | 0.44 | 0.08 | | 0.14 | 0.60 | | 0.37 | 0.27 | |
| Uniform Delay, d1 | 19.6 | 19.5 | 19.2 | 20.1 | 19.4 | | 7.1 | 9.2 | | 3.8 | 2.9 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.4 | 0.0 | 2.0 | 0.2 | | 0.8 | 1.6 | | 2.5 | 0.3 | |
| Delay (s) | 20.2 | 19.9 | 19.3 | 22.1 | 19.6 | | 7.9 | 10.8 | | 6.4 | 3.1 | |
| Level of Service | C | B | B | C | B | | A | B | | A | A | |
| Approach Delay (s) | | 19.8 | | | 21.1 | | | 10.7 | | | 3.8 | |
| Approach LOS | | B | | | C | | | B | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 8.9 | | | HCM 2000 Level of Service | | | A | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.53 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 47.7 | | | Sum of lost time (s) | | | 14.0 | | | |
| Intersection Capacity Utilization | | | 58.9% | | | ICU Level of Service | | | B | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2025 Background Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 24 | 7 | 26 | 134 | 59 | 15 |
| Future Volume (Veh/h) | 24 | 7 | 26 | 134 | 59 | 15 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 24 | 7 | 26 | 134 | 59 | 15 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 252 | 66 | 74 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 252 | 66 | 74 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 97 | 99 | 98 | | | |
| cM capacity (veh/h) | 724 | 997 | 1526 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 31 | 160 | 74 | | | |
| Volume Left | 24 | 26 | 0 | | | |
| Volume Right | 7 | 0 | 15 | | | |
| cSH | 771 | 1526 | 1700 | | | |
| Volume to Capacity | 0.04 | 0.02 | 0.04 | | | |
| Queue Length 95th (m) | 1.0 | 0.4 | 0.0 | | | |
| Control Delay (s) | 9.9 | 1.3 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.9 | 1.3 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.9 | | | |
| Intersection Capacity Utilization | | | 25.2% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2025 Background Conditions
 Weekday PM Peak Hour



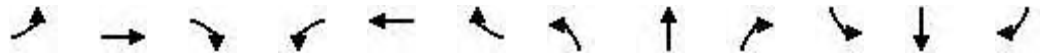
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|-------|------|-------|-------|
| Lane Configurations | W | | T | | T | T |
| Traffic Volume (vph) | 67 | 128 | 931 | 90 | 117 | 615 |
| Future Volume (vph) | 67 | 128 | 931 | 90 | 117 | 615 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | 4.0 | | 4.0 | 4.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | 1.00 | 1.00 |
| Frt | 0.91 | | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.98 | | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1669 | | 3492 | | 1770 | 1863 |
| Flt Permitted | 0.98 | | 1.00 | | 0.18 | 1.00 |
| Satd. Flow (perm) | 1669 | | 3492 | | 329 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 67 | 128 | 931 | 90 | 117 | 615 |
| RTOR Reduction (vph) | 108 | 0 | 9 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 87 | 0 | 1012 | 0 | 117 | 615 |
| Turn Type | Perm | | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | | | | 6 | |
| Actuated Green, G (s) | 8.0 | | 25.4 | | 35.0 | 35.0 |
| Effective Green, g (s) | 8.0 | | 25.4 | | 35.0 | 35.0 |
| Actuated g/C Ratio | 0.16 | | 0.50 | | 0.69 | 0.69 |
| Clearance Time (s) | 4.0 | | 4.0 | | 4.0 | 4.0 |
| Vehicle Extension (s) | 3.0 | | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 261 | | 1739 | | 384 | 1278 |
| v/s Ratio Prot | | | c0.29 | | 0.03 | c0.33 |
| v/s Ratio Perm | c0.05 | | | | 0.18 | |
| v/c Ratio | 0.33 | | 0.58 | | 0.30 | 0.48 |
| Uniform Delay, d1 | 19.1 | | 9.0 | | 4.2 | 3.7 |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.8 | | 1.4 | | 0.5 | 1.3 |
| Delay (s) | 19.9 | | 10.5 | | 4.6 | 5.1 |
| Level of Service | B | | B | | A | A |
| Approach Delay (s) | 19.9 | | 10.5 | | | 5.0 |
| Approach LOS | B | | B | | | A |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 9.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.53 | | |
| Actuated Cycle Length (s) | 51.0 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 56.7% | ICU Level of Service | B |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2025 Background Conditions
 Weekday PM Peak Hour



















| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|-------|------|------|------|------|------|-------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕ | | ↕ | ↕ | |
| Traffic Volume (vph) | 48 | 11 | 16 | 10 | 17 | 17 | 24 | 962 | 17 | 1 | 632 | 56 |
| Future Volume (vph) | 48 | 11 | 16 | 10 | 17 | 17 | 24 | 962 | 17 | 1 | 632 | 56 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Fr _t | | 0.97 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Fl _t Protected | | 0.97 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1753 | | | 1746 | | 1770 | 1858 | | 1770 | 1840 | |
| Fl _t Permitted | | 0.78 | | | 0.90 | | 0.36 | 1.00 | | 0.20 | 1.00 | |
| Satd. Flow (perm) | | 1411 | | | 1589 | | 663 | 1858 | | 367 | 1840 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 48 | 11 | 16 | 10 | 17 | 17 | 24 | 962 | 17 | 1 | 632 | 56 |
| RTOR Reduction (vph) | 0 | 14 | 0 | 0 | 15 | 0 | 0 | 1 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 0 | 61 | 0 | 0 | 29 | 0 | 24 | 978 | 0 | 1 | 684 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 5.7 | | | 5.7 | | 42.2 | 42.2 | | 42.2 | 42.2 | |
| Effective Green, g (s) | | 5.7 | | | 5.7 | | 42.2 | 42.2 | | 42.2 | 42.2 | |
| Actuated g/C Ratio | | 0.10 | | | 0.10 | | 0.70 | 0.70 | | 0.70 | 0.70 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 134 | | | 151 | | 467 | 1308 | | 258 | 1296 | |
| v/s Ratio Prot | | | | | | | | c0.53 | | | 0.37 | |
| v/s Ratio Perm | | c0.04 | | | 0.02 | | 0.04 | | | 0.00 | | |
| v/c Ratio | | 0.45 | | | 0.19 | | 0.05 | 0.75 | | 0.00 | 0.53 | |
| Uniform Delay, d ₁ | | 25.6 | | | 25.0 | | 2.7 | 5.5 | | 2.6 | 4.2 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d ₂ | | 2.4 | | | 0.6 | | 0.2 | 4.0 | | 0.0 | 1.5 | |
| Delay (s) | | 28.0 | | | 25.6 | | 2.9 | 9.5 | | 2.6 | 5.7 | |
| Level of Service | | C | | | C | | A | A | | A | A | |
| Approach Delay (s) | | 28.0 | | | 25.6 | | | 9.4 | | | 5.7 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | |
|-----------------------------------|-------|---------------------------|
| HCM 2000 Control Delay | 9.1 | HCM 2000 Level of Service |
| HCM 2000 Volume to Capacity ratio | 0.71 | A |
| Actuated Cycle Length (s) | 59.9 | Sum of lost time (s) |
| Intersection Capacity Utilization | 71.7% | 12.0 |
| Analysis Period (min) | 30 | ICU Level of Service |
| | | C |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2025 Background Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 61 | 67 | 0 | 0 | 72 | 19 | 0 | 4 | 0 | 4 | 9 | 20 |
| Future Volume (Veh/h) | 61 | 67 | 0 | 0 | 72 | 19 | 0 | 4 | 0 | 4 | 9 | 20 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 61 | 67 | 0 | 0 | 72 | 19 | 0 | 4 | 0 | 4 | 9 | 20 |
| 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 | 91 | | | 67 | | | 295 | 280 | 67 | 272 | 270 | 82 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 91 | | | 67 | | | 295 | 280 | 67 | 272 | 270 | 82 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 96 | | | 100 | | | 100 | 99 | 100 | 99 | 99 | 98 |
| cM capacity (veh/h) | 1504 | | | 1535 | | | 617 | 603 | 997 | 656 | 610 | 978 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 128 | 91 | 4 | 33 | | | | | | | | |
| Volume Left | 61 | 0 | 0 | 4 | | | | | | | | |
| Volume Right | 0 | 19 | 0 | 20 | | | | | | | | |
| cSH | 1504 | 1535 | 603 | 799 | | | | | | | | |
| Volume to Capacity | 0.04 | 0.00 | 0.01 | 0.04 | | | | | | | | |
| Queue Length 95th (m) | 1.0 | 0.0 | 0.2 | 1.0 | | | | | | | | |
| Control Delay (s) | 3.7 | 0.0 | 11.0 | 9.7 | | | | | | | | |
| Lane LOS | A | | B | A | | | | | | | | |
| Approach Delay (s) | 3.7 | 0.0 | 11.0 | 9.7 | | | | | | | | |
| Approach LOS | | | B | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 3.3 | | | | | | | | | |
| Intersection Capacity Utilization | | | 25.6% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
2: Scotland St & McQueen Blvd

2031 Background Conditions
Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 18 | 12 | 11 | 195 | 339 | 11 |
| Future Volume (Veh/h) | 18 | 12 | 11 | 195 | 339 | 11 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 18 | 12 | 11 | 195 | 339 | 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) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 562 | 344 | 350 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 562 | 344 | 350 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 96 | 98 | 99 | | | |
| cM capacity (veh/h) | 484 | 698 | 1209 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 30 | 206 | 350 | | | |
| Volume Left | 18 | 11 | 0 | | | |
| Volume Right | 12 | 0 | 11 | | | |
| cSH | 552 | 1209 | 1700 | | | |
| Volume to Capacity | 0.05 | 0.01 | 0.21 | | | |
| Queue Length 95th (m) | 1.3 | 0.2 | 0.0 | | | |
| Control Delay (s) | 11.9 | 0.5 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 11.9 | 0.5 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.8 | | | |
| Intersection Capacity Utilization | | | 29.2% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2031 Background Conditions
Weekday AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|---------------------------|------|------|------|-------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 10 | 11 | 202 | 72 | 12 | 33 | 10 | 549 | 32 | 53 | 716 | 2 |
| Future Volume (vph) | 10 | 11 | 202 | 72 | 12 | 33 | 10 | 549 | 32 | 53 | 716 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1658 | | 1770 | 3510 | | 1770 | 3538 | |
| Flt Permitted | 0.73 | 1.00 | 1.00 | 0.75 | 1.00 | | 0.38 | 1.00 | | 0.35 | 1.00 | |
| Satd. Flow (perm) | 1356 | 1863 | 1583 | 1398 | 1658 | | 705 | 3510 | | 647 | 3538 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 10 | 11 | 202 | 72 | 12 | 33 | 10 | 549 | 32 | 53 | 716 | 2 |
| RTOR Reduction (vph) | 0 | 0 | 158 | 0 | 28 | 0 | 0 | 6 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 10 | 11 | 44 | 72 | 17 | 0 | 10 | 575 | 0 | 53 | 718 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | 21.0 | 21.0 | | 32.0 | 32.0 | |
| Effective Green, g (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | 21.0 | 21.0 | | 32.0 | 32.0 | |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | | 0.42 | 0.42 | | 0.64 | 0.64 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 216 | 298 | 253 | 223 | 265 | | 296 | 1474 | | 571 | 2264 | |
| v/s Ratio Prot | | 0.01 | | | 0.01 | | | c0.16 | | 0.01 | c0.20 | |
| v/s Ratio Perm | 0.01 | | 0.03 | c0.05 | | | 0.01 | | | 0.05 | | |
| v/c Ratio | 0.05 | 0.04 | 0.17 | 0.32 | 0.07 | | 0.03 | 0.39 | | 0.09 | 0.32 | |
| Uniform Delay, d1 | 17.8 | 17.7 | 18.1 | 18.6 | 17.8 | | 8.5 | 10.1 | | 3.6 | 4.1 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.1 | 0.3 | 0.8 | 0.1 | | 0.2 | 0.8 | | 0.3 | 0.4 | |
| Delay (s) | 17.9 | 17.8 | 18.5 | 19.4 | 17.9 | | 8.7 | 10.8 | | 3.9 | 4.4 | |
| Level of Service | B | B | B | B | B | | A | B | | A | A | |
| Approach Delay (s) | | 18.4 | | | 18.9 | | | 10.8 | | | 4.4 | |
| Approach LOS | | B | | | B | | | B | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 9.5 | HCM 2000 Level of Service | | | | A | | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.37 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 50.0 | Sum of lost time (s) | | | | 14.0 | | | | |
| Intersection Capacity Utilization | | | 49.0% | ICU Level of Service | | | | A | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2031 Background Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 45 | 10 | 20 | 66 | 66 | 17 |
| Future Volume (Veh/h) | 45 | 10 | 20 | 66 | 66 | 17 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 45 | 10 | 20 | 66 | 66 | 17 |
| 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 | 180 | 74 | 83 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 180 | 74 | 83 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 94 | 99 | 99 | | | |
| cM capacity (veh/h) | 798 | 987 | 1514 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 55 | 86 | 83 | | | |
| Volume Left | 45 | 20 | 0 | | | |
| Volume Right | 10 | 0 | 17 | | | |
| cSH | 827 | 1514 | 1700 | | | |
| Volume to Capacity | 0.07 | 0.01 | 0.05 | | | |
| Queue Length 95th (m) | 1.6 | 0.3 | 0.0 | | | |
| Control Delay (s) | 9.7 | 1.8 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.7 | 1.8 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.1 | | | |
| Intersection Capacity Utilization | | | 21.2% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2031 Background Conditions
 Weekday AM Peak Hour



















| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|-------|-------|
| Lane Configurations | W | | T | | T | T |
| Traffic Volume (vph) | 49 | 30 | 571 | 36 | 72 | 743 |
| Future Volume (vph) | 49 | 30 | 571 | 36 | 72 | 743 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | 1.00 | 1.00 |
| Frt | 0.95 | | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.97 | | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1714 | | 3508 | | 1770 | 1863 |
| Flt Permitted | 0.97 | | 1.00 | | 0.38 | 1.00 |
| Satd. Flow (perm) | 1714 | | 3508 | | 699 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 49 | 30 | 571 | 36 | 72 | 743 |
| RTOR Reduction (vph) | 27 | 0 | 5 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 52 | 0 | 602 | 0 | 72 | 743 |
| Turn Type | Perm | | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | | | | 6 | |
| Actuated Green, G (s) | 4.9 | | 31.8 | | 39.5 | 39.5 |
| Effective Green, g (s) | 4.9 | | 31.8 | | 39.5 | 39.5 |
| Actuated g/C Ratio | 0.09 | | 0.58 | | 0.73 | 0.73 |
| Clearance Time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 154 | | 2050 | | 580 | 1352 |
| v/s Ratio Prot | | | 0.17 | | 0.01 | c0.40 |
| v/s Ratio Perm | c0.03 | | | | 0.08 | |
| v/c Ratio | 0.34 | | 0.29 | | 0.12 | 0.55 |
| Uniform Delay, d1 | 23.2 | | 5.7 | | 2.3 | 3.4 |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.3 | | 0.4 | | 0.1 | 1.6 |
| Delay (s) | 24.5 | | 6.0 | | 2.4 | 5.0 |
| Level of Service | C | | A | | A | A |
| Approach Delay (s) | 24.5 | | 6.0 | | | 4.8 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 6.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 54.4 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 52.0% | ICU Level of Service | A |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

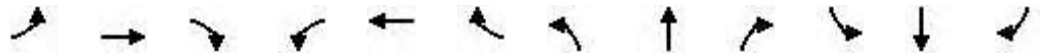
HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2031 Background Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 28 | 0 |
| Future Volume (Veh/h) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 28 | 0 |
| Sign Control | Free | | | Free | | | Stop | | | Stop | | |
| Grade | 0% | | | 0% | | | 0% | | | 0% | | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 28 | 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 | 0 | | | 0 | | | 14 | 0 | 0 | 10 | 0 | 0 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 0 | | | 0 | | | 14 | 0 | 0 | 10 | 0 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 100 | 98 | 100 | 100 | 97 | 100 |
| cM capacity (veh/h) | 1623 | | | 1623 | | | 978 | 896 | 1085 | 993 | 896 | 1085 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 0 | 0 | 19 | 28 | | | | | | | | |
| Volume Left | 0 | 0 | 0 | 0 | | | | | | | | |
| Volume Right | 0 | 0 | 0 | 0 | | | | | | | | |
| cSH | 1700 | 1700 | 896 | 896 | | | | | | | | |
| Volume to Capacity | 0.00 | 0.00 | 0.02 | 0.03 | | | | | | | | |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.5 | 0.7 | | | | | | | | |
| Control Delay (s) | 0.0 | 0.0 | 9.1 | 9.1 | | | | | | | | |
| Lane LOS | | | A | A | | | | | | | | |
| Approach Delay (s) | 0.0 | 0.0 | 9.1 | 9.1 | | | | | | | | |
| Approach LOS | | | A | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 9.1 | | | | | | | | | |
| Intersection Capacity Utilization | | | 6.7% | ICU Level of Service | A | | | | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2031 Background Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|------|------|------|------|------|------|-------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕ | | ↕ | ↕ | |
| Traffic Volume (vph) | 32 | 15 | 25 | 3 | 13 | 8 | 15 | 573 | 13 | 6 | 744 | 55 |
| Future Volume (vph) | 32 | 15 | 25 | 3 | 13 | 8 | 15 | 573 | 13 | 6 | 744 | 55 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.95 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1737 | | | 1768 | | 1770 | 1857 | | 1770 | 1844 | |
| Flt Permitted | | 0.90 | | | 0.94 | | 0.30 | 1.00 | | 0.42 | 1.00 | |
| Satd. Flow (perm) | | 1603 | | | 1677 | | 555 | 1857 | | 789 | 1844 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 32 | 15 | 25 | 3 | 13 | 8 | 15 | 573 | 13 | 6 | 744 | 55 |
| RTOR Reduction (vph) | 0 | 23 | 0 | 0 | 7 | 0 | 0 | 2 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 0 | 49 | 0 | 0 | 17 | 0 | 15 | 584 | 0 | 6 | 794 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 3.2 | | | 3.2 | | 30.7 | 30.7 | | 30.7 | 30.7 | |
| Effective Green, g (s) | | 3.2 | | | 3.2 | | 30.7 | 30.7 | | 30.7 | 30.7 | |
| Actuated g/C Ratio | | 0.07 | | | 0.07 | | 0.70 | 0.70 | | 0.70 | 0.70 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 116 | | | 122 | | 388 | 1298 | | 551 | 1289 | |
| v/s Ratio Prot | | | | | | | | 0.31 | | | c0.43 | |
| v/s Ratio Perm | | c0.03 | | | 0.01 | | 0.03 | | | 0.01 | | |
| v/c Ratio | | 0.42 | | | 0.14 | | 0.04 | 0.45 | | 0.01 | 0.62 | |
| Uniform Delay, d1 | | 19.5 | | | 19.1 | | 2.0 | 2.9 | | 2.0 | 3.5 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 2.5 | | | 0.5 | | 0.2 | 1.1 | | 0.0 | 2.2 | |
| Delay (s) | | 21.9 | | | 19.6 | | 2.2 | 4.0 | | 2.0 | 5.7 | |
| Level of Service | | C | | | B | | A | A | | A | A | |
| Approach Delay (s) | | 21.9 | | | 19.6 | | | 4.0 | | | 5.7 | |
| Approach LOS | | C | | | B | | | A | | | A | |

















Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 6.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 43.9 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 61.5% | ICU Level of Service | B |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2031 Background Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 12 | 65 | 6 | 1 | 80 | 3 | 2 | 6 | 0 | 9 | 2 | 20 |
| Future Volume (Veh/h) | 12 | 65 | 6 | 1 | 80 | 3 | 2 | 6 | 0 | 9 | 2 | 20 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 12 | 65 | 6 | 1 | 80 | 3 | 2 | 6 | 0 | 9 | 2 | 20 |
| 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 | 83 | | | 71 | | | 196 | 177 | 68 | 178 | 178 | 82 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 83 | | | 71 | | | 196 | 177 | 68 | 178 | 178 | 82 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 100 | | | 100 | 99 | 100 | 99 | 100 | 98 |
| cM capacity (veh/h) | 1514 | | | 1529 | | | 740 | 710 | 995 | 773 | 709 | 978 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 83 | 84 | 8 | 31 | | | | | | | | |
| Volume Left | 12 | 1 | 2 | 9 | | | | | | | | |
| Volume Right | 6 | 3 | 0 | 20 | | | | | | | | |
| cSH | 1514 | 1529 | 718 | 888 | | | | | | | | |
| Volume to Capacity | 0.01 | 0.00 | 0.01 | 0.03 | | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.3 | 0.8 | | | | | | | | |
| Control Delay (s) | 1.1 | 0.1 | 10.1 | 9.2 | | | | | | | | |
| Lane LOS | A | A | B | A | | | | | | | | |
| Approach Delay (s) | 1.1 | 0.1 | 10.1 | 9.2 | | | | | | | | |
| Approach LOS | | | B | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 2.3 | | | | | | | | | |
| Intersection Capacity Utilization | | | 21.1% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
2: Scotland St & McQueen Blvd

2031 Background Conditions
Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 11 | 11 | 11 | 200 | 94 | 11 |
| Future Volume (Veh/h) | 11 | 11 | 11 | 200 | 94 | 11 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 11 | 11 | 11 | 200 | 94 | 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) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 322 | 100 | 105 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 322 | 100 | 105 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 99 | 99 | | | |
| cM capacity (veh/h) | 667 | 956 | 1486 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 22 | 211 | 105 | | | |
| Volume Left | 11 | 11 | 0 | | | |
| Volume Right | 11 | 0 | 11 | | | |
| cSH | 786 | 1486 | 1700 | | | |
| Volume to Capacity | 0.03 | 0.01 | 0.06 | | | |
| Queue Length 95th (m) | 0.7 | 0.2 | 0.0 | | | |
| Control Delay (s) | 9.7 | 0.4 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.7 | 0.4 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.9 | | | |
| Intersection Capacity Utilization | | | 27.8% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2031 Background Conditions
Weekday PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|---------------------------|------|------|------|-------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 33 | 31 | 25 | 72 | 12 | 33 | 52 | 877 | 126 | 168 | 759 | 6 |
| Future Volume (vph) | 33 | 31 | 25 | 72 | 12 | 33 | 52 | 877 | 126 | 168 | 759 | 6 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.98 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1658 | | 1770 | 3473 | | 1770 | 3535 | |
| Flt Permitted | 0.80 | 1.00 | 1.00 | 0.80 | 1.00 | | 0.36 | 1.00 | | 0.18 | 1.00 | |
| Satd. Flow (perm) | 1490 | 1863 | 1583 | 1490 | 1658 | | 674 | 3473 | | 344 | 3535 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 33 | 31 | 25 | 72 | 12 | 33 | 52 | 877 | 126 | 168 | 759 | 6 |
| RTOR Reduction (vph) | 0 | 0 | 22 | 0 | 30 | 0 | 0 | 16 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 33 | 31 | 3 | 72 | 15 | 0 | 52 | 987 | 0 | 168 | 764 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 22.7 | 22.7 | | 32.9 | 32.9 | |
| Effective Green, g (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 22.7 | 22.7 | | 32.9 | 32.9 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | | 0.47 | 0.47 | | 0.69 | 0.69 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 155 | 194 | 165 | 155 | 173 | | 319 | 1645 | | 420 | 2428 | |
| v/s Ratio Prot | | 0.02 | | | 0.01 | | | c0.28 | | c0.05 | 0.22 | |
| v/s Ratio Perm | 0.02 | | 0.00 | c0.05 | | | 0.08 | | | 0.22 | | |
| v/c Ratio | 0.21 | 0.16 | 0.02 | 0.46 | 0.09 | | 0.16 | 0.60 | | 0.40 | 0.31 | |
| Uniform Delay, d1 | 19.6 | 19.5 | 19.2 | 20.2 | 19.4 | | 7.2 | 9.3 | | 4.0 | 3.0 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.7 | 0.4 | 0.0 | 2.2 | 0.2 | | 1.1 | 1.6 | | 2.8 | 0.3 | |
| Delay (s) | 20.3 | 19.9 | 19.3 | 22.4 | 19.6 | | 8.3 | 10.9 | | 6.8 | 3.3 | |
| Level of Service | C | B | B | C | B | | A | B | | A | A | |
| Approach Delay (s) | | 19.9 | | | 21.3 | | | 10.8 | | | 4.0 | |
| Approach LOS | | B | | | C | | | B | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 8.8 | HCM 2000 Level of Service | | | | A | | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.55 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 47.9 | Sum of lost time (s) | | | | 14.0 | | | | |
| Intersection Capacity Utilization | | | 59.9% | ICU Level of Service | | | | B | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |
| c Critical Lane Group | | | | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2031 Background Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 25 | 8 | 28 | 143 | 63 | 15 |
| Future Volume (Veh/h) | 25 | 8 | 28 | 143 | 63 | 15 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 25 | 8 | 28 | 143 | 63 | 15 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 270 | 70 | 78 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 270 | 70 | 78 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 96 | 99 | 98 | | | |
| cM capacity (veh/h) | 707 | 992 | 1520 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 33 | 171 | 78 | | | |
| Volume Left | 25 | 28 | 0 | | | |
| Volume Right | 8 | 0 | 15 | | | |
| cSH | 760 | 1520 | 1700 | | | |
| Volume to Capacity | 0.04 | 0.02 | 0.05 | | | |
| Queue Length 95th (m) | 1.0 | 0.4 | 0.0 | | | |
| Control Delay (s) | 10.0 | 1.3 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 10.0 | 1.3 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 2.0 | | | |
| Intersection Capacity Utilization | | | 25.7% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2031 Background Conditions
 Weekday PM Peak Hour



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|-------|-------|
| Lane Configurations | W | | T | | L | T |
| Traffic Volume (vph) | 67 | 128 | 923 | 90 | 117 | 727 |
| Future Volume (vph) | 67 | 128 | 923 | 90 | 117 | 727 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | 1.00 | 1.00 |
| Frt | 0.91 | | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.98 | | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1669 | | 3492 | | 1770 | 1863 |
| Flt Permitted | 0.98 | | 1.00 | | 0.19 | 1.00 |
| Satd. Flow (perm) | 1669 | | 3492 | | 347 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 67 | 128 | 923 | 90 | 117 | 727 |
| RTOR Reduction (vph) | 109 | 0 | 10 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 86 | 0 | 1003 | 0 | 117 | 727 |
| Turn Type | Perm | | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | | | | 6 | |
| Actuated Green, G (s) | 8.1 | | 26.4 | | 35.4 | 35.4 |
| Effective Green, g (s) | 8.1 | | 26.4 | | 35.4 | 35.4 |
| Actuated g/C Ratio | 0.15 | | 0.49 | | 0.66 | 0.66 |
| Clearance Time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 252 | | 1723 | | 362 | 1232 |
| v/s Ratio Prot | | | 0.29 | | 0.03 | c0.39 |
| v/s Ratio Perm | c0.05 | | | | 0.18 | |
| v/c Ratio | 0.34 | | 0.58 | | 0.32 | 0.59 |
| Uniform Delay, d1 | 20.3 | | 9.6 | | 4.6 | 5.0 |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.8 | | 1.5 | | 0.5 | 2.1 |
| Delay (s) | 21.1 | | 11.1 | | 5.1 | 7.1 |
| Level of Service | C | | B | | A | A |
| Approach Delay (s) | 21.1 | | 11.1 | | | 6.8 |
| Approach LOS | C | | B | | | A |

















Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 10.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 53.5 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 58.2% | ICU Level of Service | B |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

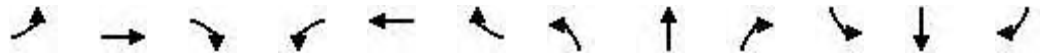
HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2031 Background Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 | 0 | 0 | 32 | 0 |
| Future Volume (Veh/h) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 | 0 | 0 | 32 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 | 0 | 0 | 32 | 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 | 0 | | | 0 | | | 16 | 0 | 0 | 40 | 0 | 0 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 0 | | | 0 | | | 16 | 0 | 0 | 40 | 0 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 100 | 91 | 100 | 100 | 96 | 100 |
| cM capacity (veh/h) | 1623 | | | 1623 | | | 972 | 896 | 1085 | 897 | 896 | 1085 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 0 | 0 | 81 | 32 | | | | | | | | |
| Volume Left | 0 | 0 | 0 | 0 | | | | | | | | |
| Volume Right | 0 | 0 | 0 | 0 | | | | | | | | |
| cSH | 1700 | 1700 | 896 | 896 | | | | | | | | |
| Volume to Capacity | 0.00 | 0.00 | 0.09 | 0.04 | | | | | | | | |
| Queue Length 95th (m) | 0.0 | 0.0 | 2.3 | 0.8 | | | | | | | | |
| Control Delay (s) | 0.0 | 0.0 | 9.4 | 9.2 | | | | | | | | |
| Lane LOS | | | A | A | | | | | | | | |
| Approach Delay (s) | 0.0 | 0.0 | 9.4 | 9.2 | | | | | | | | |
| Approach LOS | | | A | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 9.3 | | | | | | | | | |
| Intersection Capacity Utilization | | | 7.6% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2031 Background Conditions
 Weekday PM Peak Hour



















| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|-------|------|------|------|------|------|-------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕ | | ↕ | ↕ | |
| Traffic Volume (vph) | 51 | 12 | 17 | 11 | 18 | 18 | 25 | 949 | 18 | 1 | 745 | 60 |
| Future Volume (vph) | 51 | 12 | 17 | 11 | 18 | 18 | 25 | 949 | 18 | 1 | 745 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Fr _t | | 0.97 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Fl _t Protected | | 0.97 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1753 | | | 1746 | | 1770 | 1858 | | 1770 | 1842 | |
| Fl _t Permitted | | 1.00 | | | 0.90 | | 0.29 | 1.00 | | 0.21 | 1.00 | |
| Satd. Flow (perm) | | 1809 | | | 1582 | | 549 | 1858 | | 384 | 1842 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 51 | 12 | 17 | 11 | 18 | 18 | 25 | 949 | 18 | 1 | 745 | 60 |
| RTOR Reduction (vph) | 0 | 16 | 0 | 0 | 17 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 0 | 64 | 0 | 0 | 30 | 0 | 25 | 965 | 0 | 1 | 799 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 3.2 | | | 3.2 | | 30.7 | 30.7 | | 30.7 | 30.7 | |
| Effective Green, g (s) | | 3.2 | | | 3.2 | | 30.7 | 30.7 | | 30.7 | 30.7 | |
| Actuated g/C Ratio | | 0.07 | | | 0.07 | | 0.70 | 0.70 | | 0.70 | 0.70 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 131 | | | 115 | | 383 | 1299 | | 268 | 1288 | |
| v/s Ratio Prot | | | | | | | | c0.52 | | | | 0.43 |
| v/s Ratio Perm | | c0.04 | | | 0.02 | | 0.05 | | | 0.00 | | |
| v/c Ratio | | 0.49 | | | 0.26 | | 0.07 | 0.74 | | 0.00 | 0.62 | |
| Uniform Delay, d ₁ | | 19.6 | | | 19.2 | | 2.1 | 4.1 | | 2.0 | 3.5 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d ₂ | | 2.9 | | | 1.2 | | 0.3 | 3.9 | | 0.0 | 2.3 | |
| Delay (s) | | 22.5 | | | 20.5 | | 2.4 | 8.1 | | 2.0 | 5.8 | |
| Level of Service | | C | | | C | | A | A | | A | A | |
| Approach Delay (s) | | 22.5 | | | 20.5 | | | 7.9 | | | 5.8 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | |
|-----------------------------------|-------|---------------------------|
| HCM 2000 Control Delay | 7.9 | HCM 2000 Level of Service |
| HCM 2000 Volume to Capacity ratio | 0.72 | A |
| Actuated Cycle Length (s) | 43.9 | Sum of lost time (s) |
| Intersection Capacity Utilization | 69.8% | 10.0 |
| Analysis Period (min) | 30 | ICU Level of Service |
| | | C |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2031 Background Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 65 | 71 | 0 | 0 | 76 | 20 | 0 | 4 | 0 | 4 | 10 | 21 |
| Future Volume (Veh/h) | 65 | 71 | 0 | 0 | 76 | 20 | 0 | 4 | 0 | 4 | 10 | 21 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 65 | 71 | 0 | 0 | 76 | 20 | 0 | 4 | 0 | 4 | 10 | 21 |
| 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 | 96 | | | 71 | | | 313 | 297 | 71 | 289 | 287 | 86 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 96 | | | 71 | | | 313 | 297 | 71 | 289 | 287 | 86 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 96 | | | 100 | | | 100 | 99 | 100 | 99 | 98 | 98 |
| cM capacity (veh/h) | 1498 | | | 1529 | | | 597 | 588 | 991 | 638 | 596 | 973 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 136 | 96 | 4 | 35 | | | | | | | | |
| Volume Left | 65 | 0 | 0 | 4 | | | | | | | | |
| Volume Right | 0 | 20 | 0 | 21 | | | | | | | | |
| cSH | 1498 | 1529 | 588 | 784 | | | | | | | | |
| Volume to Capacity | 0.04 | 0.00 | 0.01 | 0.04 | | | | | | | | |
| Queue Length 95th (m) | 1.0 | 0.0 | 0.2 | 1.1 | | | | | | | | |
| Control Delay (s) | 3.8 | 0.0 | 11.2 | 9.8 | | | | | | | | |
| Lane LOS | A | | B | A | | | | | | | | |
| Approach Delay (s) | 3.8 | 0.0 | 11.2 | 9.8 | | | | | | | | |
| Approach LOS | | | B | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 3.3 | | | | | | | | | |
| Intersection Capacity Utilization | | | 26.2% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
2: Scotland St & McQueen Blvd
























2039 Background Conditions
Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 19 | 13 | 11 | 211 | 366 | 11 |
| Future Volume (Veh/h) | 19 | 13 | 11 | 211 | 366 | 11 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 19 | 13 | 11 | 211 | 366 | 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) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 604 | 372 | 377 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 604 | 372 | 377 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 96 | 98 | 99 | | | |
| cM capacity (veh/h) | 457 | 674 | 1181 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 32 | 222 | 377 | | | |
| Volume Left | 19 | 11 | 0 | | | |
| Volume Right | 13 | 0 | 11 | | | |
| cSH | 526 | 1181 | 1700 | | | |
| Volume to Capacity | 0.06 | 0.01 | 0.22 | | | |
| Queue Length 95th (m) | 1.5 | 0.2 | 0.0 | | | |
| Control Delay (s) | 12.3 | 0.5 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 12.3 | 0.5 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.8 | | | |
| Intersection Capacity Utilization | | | 30.1% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

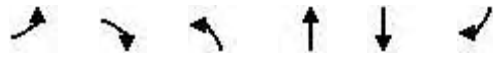
2039 Background Conditions
Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  | |  |  |  |  |  |  |
| Traffic Volume (vph) | 11 | 12 | 276 | 78 | 13 | 36 | 11 | 585 | 35 | 57 | 645 | 2 |
| Future Volume (vph) | 11 | 12 | 276 | 78 | 13 | 36 | 11 | 585 | 35 | 57 | 645 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1657 | | 1770 | 3509 | | 1770 | 3538 | |
| Flt Permitted | 0.73 | 1.00 | 1.00 | 0.75 | 1.00 | | 0.41 | 1.00 | | 0.32 | 1.00 | |
| Satd. Flow (perm) | 1351 | 1863 | 1583 | 1397 | 1657 | | 756 | 3509 | | 604 | 3538 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 11 | 12 | 276 | 78 | 13 | 36 | 11 | 585 | 35 | 57 | 645 | 2 |
| RTOR Reduction (vph) | 0 | 0 | 186 | 0 | 30 | 0 | 0 | 6 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 11 | 12 | 90 | 78 | 19 | 0 | 11 | 614 | 0 | 57 | 647 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | | 21.1 | 21.1 | | 32.1 | 32.1 | |
| Effective Green, g (s) | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | | 21.1 | 21.1 | | 32.1 | 32.1 | |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | | 0.42 | 0.42 | | 0.63 | 0.63 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 231 | 319 | 271 | 239 | 283 | | 314 | 1457 | | 542 | 2235 | |
| v/s Ratio Prot | | 0.01 | | | 0.01 | | | c0.17 | | 0.01 | c0.18 | |
| v/s Ratio Perm | 0.01 | | c0.06 | 0.06 | | | 0.01 | | | 0.05 | | |
| v/c Ratio | 0.05 | 0.04 | 0.33 | 0.33 | 0.07 | | 0.04 | 0.42 | | 0.11 | 0.29 | |
| Uniform Delay, d1 | 17.6 | 17.6 | 18.5 | 18.5 | 17.6 | | 8.8 | 10.5 | | 3.9 | 4.2 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.0 | 0.7 | 0.8 | 0.1 | | 0.2 | 0.9 | | 0.4 | 0.3 | |
| Delay (s) | 17.7 | 17.6 | 19.2 | 19.3 | 17.8 | | 9.0 | 11.4 | | 4.3 | 4.5 | |
| Level of Service | B | B | B | B | B | | A | B | | A | A | |
| Approach Delay (s) | | 19.1 | | | 18.7 | | | 11.4 | | | 4.5 | |
| Approach LOS | | B | | | B | | | B | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 10.5 | | | | HCM 2000 Level of Service | | | | B | |
| HCM 2000 Volume to Capacity ratio | | | 0.39 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 50.8 | | | | Sum of lost time (s) | | | 14.0 | | |
| Intersection Capacity Utilization | | | 51.8% | | | | ICU Level of Service | | | A | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2039 Background Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 49 | 11 | 22 | 72 | 72 | 18 |
| Future Volume (Veh/h) | 49 | 11 | 22 | 72 | 72 | 18 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 49 | 11 | 22 | 72 | 72 | 18 |
| 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 | 197 | 81 | 90 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 197 | 81 | 90 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 94 | 99 | 99 | | | |
| cM capacity (veh/h) | 780 | 979 | 1505 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 60 | 94 | 90 | | | |
| Volume Left | 49 | 22 | 0 | | | |
| Volume Right | 11 | 0 | 18 | | | |
| cSH | 810 | 1505 | 1700 | | | |
| Volume to Capacity | 0.07 | 0.01 | 0.05 | | | |
| Queue Length 95th (m) | 1.8 | 0.3 | 0.0 | | | |
| Control Delay (s) | 9.8 | 1.8 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.8 | 1.8 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.1 | | | |
| Intersection Capacity Utilization | | | 21.7% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2039 Background Conditions
 Weekday AM Peak Hour



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|-------|-------|
| Lane Configurations | W | | T | | L | R |
| Traffic Volume (vph) | 49 | 30 | 609 | 36 | 72 | 728 |
| Future Volume (vph) | 49 | 30 | 609 | 36 | 72 | 728 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | 1.00 | 1.00 |
| Frt | 0.95 | | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.97 | | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1714 | | 3510 | | 1770 | 1863 |
| Flt Permitted | 0.97 | | 1.00 | | 0.36 | 1.00 |
| Satd. Flow (perm) | 1714 | | 3510 | | 668 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 49 | 30 | 609 | 36 | 72 | 728 |
| RTOR Reduction (vph) | 27 | 0 | 5 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 52 | 0 | 640 | 0 | 72 | 728 |
| Turn Type | Perm | | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | | | | 6 | |
| Actuated Green, G (s) | 4.9 | | 31.8 | | 39.5 | 39.5 |
| Effective Green, g (s) | 4.9 | | 31.8 | | 39.5 | 39.5 |
| Actuated g/C Ratio | 0.09 | | 0.58 | | 0.73 | 0.73 |
| Clearance Time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 154 | | 2051 | | 559 | 1352 |
| v/s Ratio Prot | | | 0.18 | | 0.01 | c0.39 |
| v/s Ratio Perm | c0.03 | | | | 0.08 | |
| v/c Ratio | 0.34 | | 0.31 | | 0.13 | 0.54 |
| Uniform Delay, d1 | 23.2 | | 5.7 | | 2.3 | 3.4 |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.3 | | 0.4 | | 0.1 | 1.5 |
| Delay (s) | 24.5 | | 6.1 | | 2.4 | 4.9 |
| Level of Service | C | | A | | A | A |
| Approach Delay (s) | 24.5 | | 6.1 | | | 4.7 |
| Approach LOS | C | | A | | | A |

















Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 6.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.57 | | |
| Actuated Cycle Length (s) | 54.4 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 51.2% | ICU Level of Service | A |
| Analysis Period (min) | 30 | | |

c Critical Lane Group



















HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2039 Background Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 0 | 57 | 57 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 30 | 0 |
| Future Volume (Veh/h) | 0 | 57 | 57 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 30 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 57 | 57 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 30 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 0 | | | 114 | | | 100 | 86 | 86 | 96 | 114 | 0 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 0 | | | 114 | | | 100 | 86 | 86 | 96 | 114 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 100 | 98 | 100 | 100 | 96 | 100 |
| cM capacity (veh/h) | 1623 | | | 1475 | | | 855 | 805 | 973 | 870 | 776 | 1085 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 114 | 0 | 20 | 30 | | | | | | | | |
| Volume Left | 0 | 0 | 0 | 0 | | | | | | | | |
| Volume Right | 57 | 0 | 0 | 0 | | | | | | | | |
| cSH | 1623 | 1700 | 805 | 776 | | | | | | | | |
| Volume to Capacity | 0.00 | 0.00 | 0.02 | 0.04 | | | | | | | | |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.6 | 0.9 | | | | | | | | |
| Control Delay (s) | 0.0 | 0.0 | 9.6 | 9.8 | | | | | | | | |
| Lane LOS | | | A | A | | | | | | | | |
| Approach Delay (s) | 0.0 | 0.0 | 9.6 | 9.8 | | | | | | | | |
| Approach LOS | | | A | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 3.0 | | | | | | | | | |
| Intersection Capacity Utilization | | | 16.5% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

















2039 Background Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
| Lane Configurations | |  | | |  | |  |  | |  |  | | |
| Traffic Volume (vph) | 35 | 17 | 84 | 4 | 14 | 8 | 17 | 612 | 14 | 6 | 729 | 60 | |
| Future Volume (vph) | 35 | 17 | 84 | 4 | 14 | 8 | 17 | 612 | 14 | 6 | 729 | 60 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | |
| Frt | | 0.92 | | | 0.96 | | 1.00 | 1.00 | | 1.00 | 0.99 | | |
| Flt Protected | | 0.99 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | | |
| Satd. Flow (prot) | | 1686 | | | 1772 | | 1770 | 1856 | | 1770 | 1841 | | |
| Flt Permitted | | 0.90 | | | 0.96 | | 0.29 | 1.00 | | 0.39 | 1.00 | | |
| Satd. Flow (perm) | | 1543 | | | 1713 | | 538 | 1856 | | 725 | 1841 | | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Adj. Flow (vph) | 35 | 17 | 84 | 4 | 14 | 8 | 17 | 612 | 14 | 6 | 729 | 60 | |
| RTOR Reduction (vph) | 0 | 76 | 0 | 0 | 7 | 0 | 0 | 2 | 0 | 0 | 7 | 0 | |
| Lane Group Flow (vph) | 0 | 60 | 0 | 0 | 19 | 0 | 17 | 624 | 0 | 6 | 782 | 0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | | |
| Actuated Green, G (s) | | 4.1 | | | 4.1 | | 28.1 | 28.1 | | 28.1 | 28.1 | | |
| Effective Green, g (s) | | 4.1 | | | 4.1 | | 28.1 | 28.1 | | 28.1 | 28.1 | | |
| Actuated g/C Ratio | | 0.10 | | | 0.10 | | 0.67 | 0.67 | | 0.67 | 0.67 | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | |
| Lane Grp Cap (vph) | | 149 | | | 166 | | 358 | 1235 | | 482 | 1225 | | |
| v/s Ratio Prot | | | | | | | | 0.34 | | | c0.42 | | |
| v/s Ratio Perm | | c0.04 | | | 0.01 | | 0.03 | | | 0.01 | | | |
| v/c Ratio | | 0.40 | | | 0.11 | | 0.05 | 0.51 | | 0.01 | 0.64 | | |
| Uniform Delay, d1 | | 17.9 | | | 17.4 | | 2.4 | 3.6 | | 2.4 | 4.1 | | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | |
| Incremental Delay, d2 | | 1.8 | | | 0.3 | | 0.3 | 1.5 | | 0.0 | 2.6 | | |
| Delay (s) | | 19.7 | | | 17.7 | | 2.7 | 5.0 | | 2.4 | 6.7 | | |
| Level of Service | | B | | | B | | A | A | | A | A | | |
| Approach Delay (s) | | 19.7 | | | 17.7 | | | 5.0 | | | 6.6 | | |
| Approach LOS | | B | | | B | | | A | | | A | | |
| Intersection Summary | | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 7.3 | | | | | | | | | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | | | 0.61 | | | | | | | | | | |
| Actuated Cycle Length (s) | | | 42.2 | | | | | | | | | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | | | 63.5% | | | | | | | | | ICU Level of Service | B |
| Analysis Period (min) | | | 30 | | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2039 Background Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 13 | 71 | 6 | 1 | 86 | 4 | 2 | 6 | 0 | 66 | 2 | 22 |
| Future Volume (Veh/h) | 13 | 71 | 6 | 1 | 86 | 4 | 2 | 6 | 0 | 66 | 2 | 22 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 13 | 71 | 6 | 1 | 86 | 4 | 2 | 6 | 0 | 66 | 2 | 22 |
| 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 | 90 | | | 77 | | | 213 | 192 | 74 | 193 | 193 | 88 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 90 | | | 77 | | | 213 | 192 | 74 | 193 | 193 | 88 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 100 | | | 100 | 99 | 100 | 91 | 100 | 98 |
| cM capacity (veh/h) | 1505 | | | 1522 | | | 720 | 697 | 988 | 756 | 696 | 970 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 90 | 91 | 8 | 90 | | | | | | | | |
| Volume Left | 13 | 1 | 2 | 66 | | | | | | | | |
| Volume Right | 6 | 4 | 0 | 22 | | | | | | | | |
| cSH | 1505 | 1522 | 702 | 798 | | | | | | | | |
| Volume to Capacity | 0.01 | 0.00 | 0.01 | 0.11 | | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.3 | 2.9 | | | | | | | | |
| Control Delay (s) | 1.1 | 0.1 | 10.2 | 10.1 | | | | | | | | |
| Lane LOS | A | A | B | B | | | | | | | | |
| Approach Delay (s) | 1.1 | 0.1 | 10.2 | 10.1 | | | | | | | | |
| Approach LOS | | | B | B | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 3.9 | | | | | | | | | |
| Intersection Capacity Utilization | | | 29.9% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis

2: Scotland St & McQueen Blvd
























2039 Background Conditions
Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 11 | 11 | 11 | 217 | 102 | 11 |
| Future Volume (Veh/h) | 11 | 11 | 11 | 217 | 102 | 11 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 11 | 11 | 11 | 217 | 102 | 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) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 346 | 108 | 113 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 346 | 108 | 113 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 99 | 99 | | | |
| cM capacity (veh/h) | 645 | 946 | 1476 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 22 | 228 | 113 | | | |
| Volume Left | 11 | 11 | 0 | | | |
| Volume Right | 11 | 0 | 11 | | | |
| cSH | 767 | 1476 | 1700 | | | |
| Volume to Capacity | 0.03 | 0.01 | 0.07 | | | |
| Queue Length 95th (m) | 0.7 | 0.2 | 0.0 | | | |
| Control Delay (s) | 9.8 | 0.4 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.8 | 0.4 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.9 | | | |
| Intersection Capacity Utilization | | | 28.7% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2039 Background Conditions
Weekday PM Peak Hour

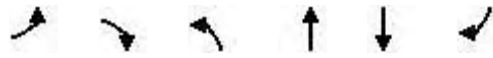
| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  | |  |  |  |  |  |  |
| Traffic Volume (vph) | 36 | 34 | 28 | 78 | 13 | 36 | 127 | 789 | 136 | 182 | 808 | 6 |
| Future Volume (vph) | 36 | 34 | 28 | 78 | 13 | 36 | 127 | 789 | 136 | 182 | 808 | 6 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.98 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1657 | | 1770 | 3461 | | 1770 | 3535 | |
| Flt Permitted | 0.73 | 1.00 | 1.00 | 0.73 | 1.00 | | 0.34 | 1.00 | | 0.20 | 1.00 | |
| Satd. Flow (perm) | 1351 | 1863 | 1583 | 1369 | 1657 | | 642 | 3461 | | 380 | 3535 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 36 | 34 | 28 | 78 | 13 | 36 | 127 | 789 | 136 | 182 | 808 | 6 |
| RTOR Reduction (vph) | 0 | 0 | 24 | 0 | 31 | 0 | 0 | 20 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 36 | 34 | 4 | 78 | 18 | 0 | 127 | 905 | 0 | 182 | 813 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 | | 22.5 | 22.5 | | 32.6 | 32.6 | |
| Effective Green, g (s) | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 | | 22.5 | 22.5 | | 32.6 | 32.6 | |
| Actuated g/C Ratio | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | | 0.46 | 0.46 | | 0.66 | 0.66 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 185 | 256 | 217 | 188 | 228 | | 292 | 1576 | | 422 | 2332 | |
| v/s Ratio Prot | | 0.02 | | | 0.01 | | | c0.26 | | c0.05 | 0.23 | |
| v/s Ratio Perm | 0.03 | | 0.00 | c0.06 | | | 0.20 | | | 0.23 | | |
| v/c Ratio | 0.19 | 0.13 | 0.02 | 0.41 | 0.08 | | 0.43 | 0.57 | | 0.43 | 0.35 | |
| Uniform Delay, d1 | 18.9 | 18.7 | 18.4 | 19.5 | 18.6 | | 9.1 | 9.9 | | 4.4 | 3.7 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.2 | 0.0 | 1.5 | 0.1 | | 4.7 | 1.5 | | 3.2 | 0.4 | |
| Delay (s) | 19.4 | 18.9 | 18.4 | 21.0 | 18.7 | | 13.8 | 11.5 | | 7.6 | 4.1 | |
| Level of Service | B | B | B | C | B | | B | B | | A | A | |
| Approach Delay (s) | | 19.0 | | | 20.1 | | | 11.7 | | | 4.8 | |
| Approach LOS | | B | | | C | | | B | | | A | |

| Intersection Summary | | |
|-----------------------------------|-------|---------------------------|
| HCM 2000 Control Delay | 9.5 | HCM 2000 Level of Service |
| HCM 2000 Volume to Capacity ratio | 0.52 | A |
| Actuated Cycle Length (s) | 49.4 | Sum of lost time (s) |
| Intersection Capacity Utilization | 58.9% | 14.0 |
| Analysis Period (min) | 30 | ICU Level of Service |
| | | B |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2039 Background Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 28 | 8 | 30 | 154 | 68 | 17 |
| Future Volume (Veh/h) | 28 | 8 | 30 | 154 | 68 | 17 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 28 | 8 | 30 | 154 | 68 | 17 |
| 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 | 290 | 76 | 85 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 290 | 76 | 85 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 96 | 99 | 98 | | | |
| cM capacity (veh/h) | 686 | 985 | 1512 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 36 | 184 | 85 | | | |
| Volume Left | 28 | 30 | 0 | | | |
| Volume Right | 8 | 0 | 17 | | | |
| cSH | 736 | 1512 | 1700 | | | |
| Volume to Capacity | 0.05 | 0.02 | 0.05 | | | |
| Queue Length 95th (m) | 1.2 | 0.5 | 0.0 | | | |
| Control Delay (s) | 10.1 | 1.3 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 10.1 | 1.3 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 2.0 | | | |
| Intersection Capacity Utilization | | | 26.4% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2039 Background Conditions
 Weekday PM Peak Hour



















| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|-------|-------|
| Lane Configurations | W | | T | | T | T |
| Traffic Volume (vph) | 67 | 128 | 904 | 90 | 117 | 773 |
| Future Volume (vph) | 67 | 128 | 904 | 90 | 117 | 773 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | 1.00 | 1.00 |
| Frt | 0.91 | | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.98 | | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1669 | | 3491 | | 1770 | 1863 |
| Flt Permitted | 0.98 | | 1.00 | | 0.19 | 1.00 |
| Satd. Flow (perm) | 1669 | | 3491 | | 359 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 67 | 128 | 904 | 90 | 117 | 773 |
| RTOR Reduction (vph) | 109 | 0 | 10 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 86 | 0 | 984 | 0 | 117 | 773 |
| Turn Type | Perm | | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | | | | 6 | |
| Actuated Green, G (s) | 8.1 | | 26.4 | | 35.4 | 35.4 |
| Effective Green, g (s) | 8.1 | | 26.4 | | 35.4 | 35.4 |
| Actuated g/C Ratio | 0.15 | | 0.49 | | 0.66 | 0.66 |
| Clearance Time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 252 | | 1722 | | 369 | 1232 |
| v/s Ratio Prot | | | 0.28 | | 0.03 | c0.41 |
| v/s Ratio Perm | c0.05 | | | | 0.18 | |
| v/c Ratio | 0.34 | | 0.57 | | 0.32 | 0.63 |
| Uniform Delay, d1 | 20.3 | | 9.6 | | 4.5 | 5.2 |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.8 | | 1.4 | | 0.5 | 2.4 |
| Delay (s) | 21.1 | | 10.9 | | 5.0 | 7.7 |
| Level of Service | C | | B | | A | A |
| Approach Delay (s) | 21.1 | | 10.9 | | | 7.3 |
| Approach LOS | C | | B | | | A |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 10.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 53.5 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 60.6% | ICU Level of Service | B |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

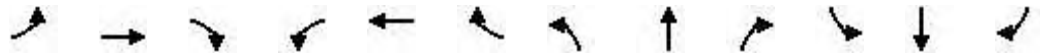
HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2039 Background Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 0 | 70 | 0 | 70 | 87 | 0 | 0 | 34 | 0 |
| Future Volume (Veh/h) | 0 | 0 | 0 | 0 | 70 | 0 | 70 | 87 | 0 | 0 | 34 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 0 | 0 | 0 | 70 | 0 | 70 | 87 | 0 | 0 | 34 | 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 | 70 | | | 0 | | | 87 | 70 | 0 | 114 | 70 | 70 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 70 | | | 0 | | | 87 | 70 | 0 | 114 | 70 | 70 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 92 | 89 | 100 | 100 | 96 | 100 |
| cM capacity (veh/h) | 1531 | | | 1623 | | | 870 | 821 | 1085 | 794 | 821 | 993 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 0 | 70 | 157 | 34 | | | | | | | | |
| Volume Left | 0 | 0 | 70 | 0 | | | | | | | | |
| Volume Right | 0 | 0 | 0 | 0 | | | | | | | | |
| cSH | 1700 | 1623 | 842 | 821 | | | | | | | | |
| Volume to Capacity | 0.00 | 0.00 | 0.19 | 0.04 | | | | | | | | |
| Queue Length 95th (m) | 0.0 | 0.0 | 5.2 | 1.0 | | | | | | | | |
| Control Delay (s) | 0.0 | 0.0 | 10.3 | 9.6 | | | | | | | | |
| Lane LOS | | | B | A | | | | | | | | |
| Approach Delay (s) | 0.0 | 0.0 | 10.3 | 9.6 | | | | | | | | |
| Approach LOS | | | B | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 7.4 | | | | | | | | | |
| Intersection Capacity Utilization | | | 25.5% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2039 Background Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|------|------|------|-------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↗ | ↖ | | ↗ | ↖ | |
| Traffic Volume (vph) | 55 | 13 | 18 | 12 | 19 | 19 | 98 | 930 | 19 | 1 | 794 | 65 |
| Future Volume (vph) | 55 | 13 | 18 | 12 | 19 | 19 | 98 | 930 | 19 | 1 | 794 | 65 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flt Protected | | 0.97 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1754 | | | 1746 | | 1770 | 1857 | | 1770 | 1842 | |
| Flt Permitted | | 1.00 | | | 0.89 | | 0.26 | 1.00 | | 0.22 | 1.00 | |
| Satd. Flow (perm) | | 1810 | | | 1575 | | 493 | 1857 | | 402 | 1842 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 55 | 13 | 18 | 12 | 19 | 19 | 98 | 930 | 19 | 1 | 794 | 65 |
| RTOR Reduction (vph) | 0 | 17 | 0 | 0 | 18 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 0 | 69 | 0 | 0 | 32 | 0 | 98 | 947 | 0 | 1 | 853 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 3.2 | | | 3.2 | | 30.7 | 30.7 | | 30.7 | 30.7 | |
| Effective Green, g (s) | | 3.2 | | | 3.2 | | 30.7 | 30.7 | | 30.7 | 30.7 | |
| Actuated g/C Ratio | | 0.07 | | | 0.07 | | 0.70 | 0.70 | | 0.70 | 0.70 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 131 | | | 114 | | 344 | 1298 | | 281 | 1288 | |
| v/s Ratio Prot | | | | | | | | c0.51 | | | 0.46 | |
| v/s Ratio Perm | | c0.04 | | | 0.02 | | 0.20 | | | 0.00 | | |
| v/c Ratio | | 0.53 | | | 0.28 | | 0.28 | 0.73 | | 0.00 | 0.66 | |
| Uniform Delay, d1 | | 19.6 | | | 19.3 | | 2.5 | 4.1 | | 2.0 | 3.7 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 3.9 | | | 1.4 | | 2.1 | 3.7 | | 0.0 | 2.7 | |
| Delay (s) | | 23.5 | | | 20.6 | | 4.6 | 7.7 | | 2.0 | 6.4 | |
| Level of Service | | C | | | C | | A | A | | A | A | |
| Approach Delay (s) | | 23.5 | | | 20.6 | | | 7.4 | | | 6.4 | |
| Approach LOS | | C | | | C | | | A | | | A | |

















Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 8.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.71 | | |
| Actuated Cycle Length (s) | 43.9 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 77.8% | ICU Level of Service | D |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2039 Background Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 71 | 77 | 0 | 0 | 83 | 92 | 0 | 5 | 0 | 5 | 11 | 23 |
| Future Volume (Veh/h) | 71 | 77 | 0 | 0 | 83 | 92 | 0 | 5 | 0 | 5 | 11 | 23 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 71 | 77 | 0 | 0 | 83 | 92 | 0 | 5 | 0 | 5 | 11 | 23 |
| 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 | 175 | | | 77 | | | 376 | 394 | 77 | 350 | 348 | 129 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 175 | | | 77 | | | 376 | 394 | 77 | 350 | 348 | 129 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 95 | | | 100 | | | 100 | 99 | 100 | 99 | 98 | 98 |
| cM capacity (veh/h) | 1401 | | | 1522 | | | 536 | 515 | 984 | 577 | 547 | 921 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 148 | 175 | 5 | 39 | | | | | | | | |
| Volume Left | 71 | 0 | 0 | 5 | | | | | | | | |
| Volume Right | 0 | 92 | 0 | 23 | | | | | | | | |
| cSH | 1401 | 1522 | 515 | 725 | | | | | | | | |
| Volume to Capacity | 0.05 | 0.00 | 0.01 | 0.05 | | | | | | | | |
| Queue Length 95th (m) | 1.2 | 0.0 | 0.2 | 1.3 | | | | | | | | |
| Control Delay (s) | 3.9 | 0.0 | 12.1 | 10.2 | | | | | | | | |
| Lane LOS | A | | B | B | | | | | | | | |
| Approach Delay (s) | 3.9 | 0.0 | 12.1 | 10.2 | | | | | | | | |
| Approach LOS | | | B | B | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 2.8 | | | | | | | | | |
| Intersection Capacity Utilization | | | 34.6% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
2: Scotland St & McQueen Blvd

2049 Background Conditions
Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 21 | 14 | 13 | 233 | 405 | 13 |
| Future Volume (Veh/h) | 21 | 14 | 13 | 233 | 405 | 13 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 21 | 14 | 13 | 233 | 405 | 13 |
| 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 | 670 | 412 | 418 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 670 | 412 | 418 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 98 | 99 | | | |
| cM capacity (veh/h) | 417 | 640 | 1141 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 35 | 246 | 418 | | | |
| Volume Left | 21 | 13 | 0 | | | |
| Volume Right | 14 | 0 | 13 | | | |
| cSH | 485 | 1141 | 1700 | | | |
| Volume to Capacity | 0.07 | 0.01 | 0.25 | | | |
| Queue Length 95th (m) | 1.8 | 0.3 | 0.0 | | | |
| Control Delay (s) | 13.0 | 0.5 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 13.0 | 0.5 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.8 | | | |
| Intersection Capacity Utilization | | | 32.9% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

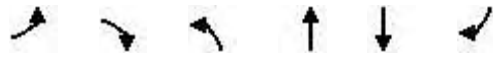
2049 Background Conditions
Weekday AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|-------|------|------|---------------------------|-------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 12 | 13 | 304 | 86 | 15 | 40 | 12 | 636 | 38 | 63 | 692 | 3 |
| Future Volume (vph) | 12 | 13 | 304 | 86 | 15 | 40 | 12 | 636 | 38 | 63 | 692 | 3 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1660 | | 1770 | 3509 | | 1770 | 3537 | |
| Flt Permitted | 0.72 | 1.00 | 1.00 | 0.75 | 1.00 | | 0.39 | 1.00 | | 0.31 | 1.00 | |
| Satd. Flow (perm) | 1343 | 1863 | 1583 | 1395 | 1660 | | 722 | 3509 | | 581 | 3537 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 12 | 13 | 304 | 86 | 15 | 40 | 12 | 636 | 38 | 63 | 692 | 3 |
| RTOR Reduction (vph) | 0 | 0 | 254 | 0 | 34 | 0 | 0 | 6 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 12 | 13 | 50 | 86 | 21 | 0 | 12 | 668 | 0 | 63 | 695 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | | 25.4 | 24.3 | | 34.3 | 29.2 | |
| Effective Green, g (s) | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | | 25.4 | 24.3 | | 34.3 | 29.2 | |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | | 0.48 | 0.46 | | 0.65 | 0.55 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 216 | 299 | 254 | 224 | 267 | | 369 | 1614 | | 512 | 1956 | |
| v/s Ratio Prot | | 0.01 | | | 0.01 | | 0.00 | c0.19 | | c0.01 | c0.20 | |
| v/s Ratio Perm | 0.01 | | 0.03 | c0.06 | | | 0.01 | | | 0.07 | | |
| v/c Ratio | 0.06 | 0.04 | 0.20 | 0.38 | 0.08 | | 0.03 | 0.41 | | 0.12 | 0.36 | |
| Uniform Delay, d1 | 18.8 | 18.7 | 19.2 | 19.8 | 18.8 | | 7.2 | 9.5 | | 3.7 | 6.6 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.1 | 0.4 | 1.1 | 0.1 | | 0.0 | 0.8 | | 0.5 | 0.5 | |
| Delay (s) | 18.9 | 18.8 | 19.6 | 20.9 | 19.0 | | 7.2 | 10.3 | | 4.2 | 7.1 | |
| Level of Service | B | B | B | C | B | | A | B | | A | A | |
| Approach Delay (s) | | 19.5 | | | 20.1 | | | 10.2 | | | 6.8 | |
| Approach LOS | | B | | | C | | | B | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 11.2 | | | | HCM 2000 Level of Service | | | | B | |
| HCM 2000 Volume to Capacity ratio | | | 0.37 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 52.8 | | | | Sum of lost time (s) | | | 14.0 | | |
| Intersection Capacity Utilization | | | 55.3% | | | | ICU Level of Service | | | B | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2049 Background Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 54 | 12 | 24 | 79 | 79 | 20 |
| Future Volume (Veh/h) | 54 | 12 | 24 | 79 | 79 | 20 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 54 | 12 | 24 | 79 | 79 | 20 |
| 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 | 216 | 89 | 99 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 216 | 89 | 99 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 93 | 99 | 98 | | | |
| cM capacity (veh/h) | 760 | 969 | 1494 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 66 | 103 | 99 | | | |
| Volume Left | 54 | 24 | 0 | | | |
| Volume Right | 12 | 0 | 20 | | | |
| cSH | 791 | 1494 | 1700 | | | |
| Volume to Capacity | 0.08 | 0.02 | 0.06 | | | |
| Queue Length 95th (m) | 2.1 | 0.4 | 0.0 | | | |
| Control Delay (s) | 10.0 | 1.8 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 10.0 | 1.8 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.2 | | | |
| Intersection Capacity Utilization | | | 22.5% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2049 Background Conditions
 Weekday AM Peak Hour



















| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|-------|-------|
| Lane Configurations | W | R | T | R | L | R |
| Traffic Volume (vph) | 54 | 33 | 662 | 40 | 80 | 785 |
| Future Volume (vph) | 54 | 33 | 662 | 40 | 80 | 785 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | 1.00 | 1.00 |
| Frt | 0.95 | | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.97 | | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1714 | | 3509 | | 1770 | 1863 |
| Flt Permitted | 0.97 | | 1.00 | | 0.33 | 1.00 |
| Satd. Flow (perm) | 1714 | | 3509 | | 619 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 54 | 33 | 662 | 40 | 80 | 785 |
| RTOR Reduction (vph) | 30 | 0 | 5 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 57 | 0 | 697 | 0 | 80 | 785 |
| Turn Type | Perm | | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | | | | 6 | |
| Actuated Green, G (s) | 5.0 | | 31.8 | | 39.5 | 39.5 |
| Effective Green, g (s) | 5.0 | | 31.8 | | 39.5 | 39.5 |
| Actuated g/C Ratio | 0.09 | | 0.58 | | 0.72 | 0.72 |
| Clearance Time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 157 | | 2047 | | 526 | 1350 |
| v/s Ratio Prot | | | 0.20 | | 0.01 | c0.42 |
| v/s Ratio Perm | c0.03 | | | | 0.10 | |
| v/c Ratio | 0.36 | | 0.34 | | 0.15 | 0.58 |
| Uniform Delay, d1 | 23.3 | | 5.9 | | 2.4 | 3.6 |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.4 | | 0.5 | | 0.1 | 1.8 |
| Delay (s) | 24.7 | | 6.4 | | 2.5 | 5.4 |
| Level of Service | C | | A | | A | A |
| Approach Delay (s) | 24.7 | | 6.4 | | | 5.1 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 6.7 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 54.5 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 54.7% | ICU Level of Service | A |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2049 Background Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 0 | 63 | 63 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 33 | 0 |
| Future Volume (Veh/h) | 0 | 63 | 63 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 33 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 63 | 63 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 33 | 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 | 0 | | | 126 | | | 111 | 94 | 94 | 106 | 126 | 0 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 0 | | | 126 | | | 111 | 94 | 94 | 106 | 126 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 100 | 97 | 100 | 100 | 96 | 100 |
| cM capacity (veh/h) | 1623 | | | 1460 | | | 838 | 796 | 962 | 854 | 764 | 1085 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 126 | 0 | 23 | 33 | | | | | | | | |
| Volume Left | 0 | 0 | 0 | 0 | | | | | | | | |
| Volume Right | 63 | 0 | 0 | 0 | | | | | | | | |
| cSH | 1623 | 1700 | 796 | 764 | | | | | | | | |
| Volume to Capacity | 0.00 | 0.00 | 0.03 | 0.04 | | | | | | | | |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.7 | 1.0 | | | | | | | | |
| Control Delay (s) | 0.0 | 0.0 | 9.7 | 9.9 | | | | | | | | |
| Lane LOS | | | A | A | | | | | | | | |
| Approach Delay (s) | 0.0 | 0.0 | 9.7 | 9.9 | | | | | | | | |
| Approach LOS | | | A | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 3.0 | | | | | | | | | |
| Intersection Capacity Utilization | | | 17.2% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

















2049 Background Conditions
 Weekday AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
|-----------------------------------|------|-------|-------|------|------|------|------|------|------|------|-------|---------------------------|------|
| Lane Configurations | | | | | | | | | | | | | |
| Traffic Volume (vph) | 38 | 19 | 93 | 4 | 16 | 9 | 19 | 665 | 16 | 7 | 786 | 66 | |
| Future Volume (vph) | 38 | 19 | 93 | 4 | 16 | 9 | 19 | 665 | 16 | 7 | 786 | 66 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | |
| Frt | | 0.92 | | | 0.96 | | 1.00 | 1.00 | | 1.00 | 0.99 | | |
| Flt Protected | | 0.99 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | | |
| Satd. Flow (prot) | | 1685 | | | 1772 | | 1770 | 1856 | | 1770 | 1841 | | |
| Flt Permitted | | 0.90 | | | 0.96 | | 0.25 | 1.00 | | 0.35 | 1.00 | | |
| Satd. Flow (perm) | | 1543 | | | 1717 | | 467 | 1856 | | 659 | 1841 | | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Adj. Flow (vph) | 38 | 19 | 93 | 4 | 16 | 9 | 19 | 665 | 16 | 7 | 786 | 66 | |
| RTOR Reduction (vph) | 0 | 84 | 0 | 0 | 8 | 0 | 0 | 2 | 0 | 0 | 7 | 0 | |
| Lane Group Flow (vph) | 0 | 66 | 0 | 0 | 21 | 0 | 19 | 679 | 0 | 7 | 845 | 0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | | |
| Actuated Green, G (s) | | 4.1 | | | 4.1 | | 27.8 | 27.8 | | 27.8 | 27.8 | | |
| Effective Green, g (s) | | 4.1 | | | 4.1 | | 27.8 | 27.8 | | 27.8 | 27.8 | | |
| Actuated g/C Ratio | | 0.10 | | | 0.10 | | 0.66 | 0.66 | | 0.66 | 0.66 | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | |
| Lane Grp Cap (vph) | | 150 | | | 168 | | 309 | 1231 | | 437 | 1221 | | |
| v/s Ratio Prot | | | | | | | | 0.37 | | | c0.46 | | |
| v/s Ratio Perm | | c0.04 | | | 0.01 | | 0.04 | | | 0.01 | | | |
| v/c Ratio | | 0.44 | | | 0.12 | | 0.06 | 0.55 | | 0.02 | 0.69 | | |
| Uniform Delay, d1 | | 17.8 | | | 17.3 | | 2.5 | 3.7 | | 2.4 | 4.4 | | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | |
| Incremental Delay, d2 | | 2.1 | | | 0.3 | | 0.4 | 1.8 | | 0.1 | 3.3 | | |
| Delay (s) | | 19.9 | | | 17.6 | | 2.9 | 5.5 | | 2.5 | 7.7 | | |
| Level of Service | | B | | | B | | A | A | | A | A | | |
| Approach Delay (s) | | 19.9 | | | 17.6 | | | 5.5 | | | 7.6 | | |
| Approach LOS | | B | | | B | | | A | | | A | | |
| Intersection Summary | | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 8.0 | | | | | | | | | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | | | 0.66 | | | | | | | | | | |
| Actuated Cycle Length (s) | | | 41.9 | | | | | | | | | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | | | 68.8% | | | | | | | | | ICU Level of Service | C |
| Analysis Period (min) | | | 30 | | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2049 Background Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 15 | 78 | 7 | 1 | 95 | 4 | 3 | 7 | 0 | 73 | 3 | 24 |
| Future Volume (Veh/h) | 15 | 78 | 7 | 1 | 95 | 4 | 3 | 7 | 0 | 73 | 3 | 24 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 15 | 78 | 7 | 1 | 95 | 4 | 3 | 7 | 0 | 73 | 3 | 24 |
| 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 | 99 | | | 85 | | | 236 | 212 | 82 | 214 | 214 | 97 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 99 | | | 85 | | | 236 | 212 | 82 | 214 | 214 | 97 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 100 | | | 100 | 99 | 100 | 90 | 100 | 97 |
| cM capacity (veh/h) | 1494 | | | 1512 | | | 692 | 678 | 978 | 731 | 676 | 959 |
| Direction, Lane # | | | | | | | | | | | | |
| | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 100 | 100 | 10 | 100 | | | | | | | | |
| Volume Left | 15 | 1 | 3 | 73 | | | | | | | | |
| Volume Right | 7 | 4 | 0 | 24 | | | | | | | | |
| cSH | 1494 | 1512 | 682 | 773 | | | | | | | | |
| Volume to Capacity | 0.01 | 0.00 | 0.01 | 0.13 | | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.3 | 3.4 | | | | | | | | |
| Control Delay (s) | 1.2 | 0.1 | 10.4 | 10.3 | | | | | | | | |
| Lane LOS | A | A | B | B | | | | | | | | |
| Approach Delay (s) | 1.2 | 0.1 | 10.4 | 10.3 | | | | | | | | |
| Approach LOS | | | B | B | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 4.1 | | | | | | | | | |
| Intersection Capacity Utilization | | | 30.9% | ICU Level of Service | | A | | | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
2: Scotland St & McQueen Blvd

2049 Background Conditions
Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 13 | 13 | 13 | 239 | 112 | 13 |
| Future Volume (Veh/h) | 13 | 13 | 13 | 239 | 112 | 13 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 13 | 13 | 13 | 239 | 112 | 13 |
| 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 | 384 | 118 | 125 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 384 | 118 | 125 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 99 | 99 | | | |
| cM capacity (veh/h) | 614 | 933 | 1462 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 26 | 252 | 125 | | | |
| Volume Left | 13 | 13 | 0 | | | |
| Volume Right | 13 | 0 | 13 | | | |
| cSH | 740 | 1462 | 1700 | | | |
| Volume to Capacity | 0.04 | 0.01 | 0.07 | | | |
| Queue Length 95th (m) | 0.8 | 0.2 | 0.0 | | | |
| Control Delay (s) | 10.0 | 0.5 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 10.0 | 0.5 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 0.9 | | | |
| Intersection Capacity Utilization | | | 33.2% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

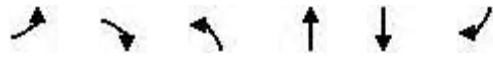
2049 Background Conditions
Weekday PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|-------|------|---------------------------|-------|-------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 40 | 37 | 30 | 86 | 15 | 40 | 140 | 848 | 151 | 201 | 876 | 7 |
| Future Volume (vph) | 40 | 37 | 30 | 86 | 15 | 40 | 140 | 848 | 151 | 201 | 876 | 7 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.98 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1660 | | 1770 | 3459 | | 1770 | 3535 | |
| Flt Permitted | 0.72 | 1.00 | 1.00 | 0.73 | 1.00 | | 0.30 | 1.00 | | 0.18 | 1.00 | |
| Satd. Flow (perm) | 1343 | 1863 | 1583 | 1365 | 1660 | | 565 | 3459 | | 338 | 3535 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 40 | 37 | 30 | 86 | 15 | 40 | 140 | 848 | 151 | 201 | 876 | 7 |
| RTOR Reduction (vph) | 0 | 0 | 26 | 0 | 34 | 0 | 0 | 21 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 40 | 37 | 4 | 86 | 21 | 0 | 140 | 978 | 0 | 201 | 882 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 26.9 | 22.4 | | 32.1 | 25.0 | |
| Effective Green, g (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | 26.9 | 22.4 | | 32.1 | 25.0 | |
| Actuated g/C Ratio | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | | 0.53 | 0.44 | | 0.64 | 0.50 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 186 | 258 | 219 | 189 | 230 | | 408 | 1534 | | 416 | 1750 | |
| v/s Ratio Prot | | 0.02 | | | 0.01 | | 0.03 | c0.28 | | c0.07 | 0.25 | |
| v/s Ratio Perm | 0.03 | | 0.00 | c0.06 | | | 0.15 | | | 0.24 | | |
| v/c Ratio | 0.22 | 0.14 | 0.02 | 0.46 | 0.09 | | 0.34 | 0.64 | | 0.48 | 0.50 | |
| Uniform Delay, d1 | 19.3 | 19.1 | 18.8 | 20.0 | 19.0 | | 6.0 | 10.9 | | 5.1 | 8.6 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.3 | 0.0 | 1.7 | 0.2 | | 0.5 | 2.1 | | 4.0 | 1.0 | |
| Delay (s) | 19.9 | 19.4 | 18.8 | 21.7 | 19.1 | | 6.5 | 13.0 | | 9.1 | 9.6 | |
| Level of Service | B | B | B | C | B | | A | B | | A | A | |
| Approach Delay (s) | | 19.4 | | | 20.7 | | | 12.2 | | | 9.5 | |
| Approach LOS | | B | | | C | | | B | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 11.8 | | | HCM 2000 Level of Service | | B | | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.57 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 50.5 | | | Sum of lost time (s) | | 14.0 | | | | |
| Intersection Capacity Utilization | | | 62.5% | | | ICU Level of Service | | B | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2049 Background Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 30 | 9 | 33 | 171 | 75 | 19 |
| Future Volume (Veh/h) | 30 | 9 | 33 | 171 | 75 | 19 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 30 | 9 | 33 | 171 | 75 | 19 |
| 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 | 322 | 84 | 94 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 322 | 84 | 94 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 99 | 98 | | | |
| cM capacity (veh/h) | 657 | 975 | 1500 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 39 | 204 | 94 | | | |
| Volume Left | 30 | 33 | 0 | | | |
| Volume Right | 9 | 0 | 19 | | | |
| cSH | 711 | 1500 | 1700 | | | |
| Volume to Capacity | 0.05 | 0.02 | 0.06 | | | |
| Queue Length 95th (m) | 1.3 | 0.5 | 0.0 | | | |
| Control Delay (s) | 10.4 | 1.4 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 10.4 | 1.4 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 2.0 | | | |
| Intersection Capacity Utilization | | | 27.5% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2049 Background Conditions
 Weekday PM Peak Hour



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|-------|-------|
| Lane Configurations | W | | T | | L | R |
| Traffic Volume (vph) | 74 | 141 | 975 | 99 | 129 | 838 |
| Future Volume (vph) | 74 | 141 | 975 | 99 | 129 | 838 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Lane Util. Factor | 1.00 | | 0.95 | | 1.00 | 1.00 |
| Frt | 0.91 | | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.98 | | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1669 | | 3490 | | 1770 | 1863 |
| Flt Permitted | 0.98 | | 1.00 | | 0.17 | 1.00 |
| Satd. Flow (perm) | 1669 | | 3490 | | 308 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 74 | 141 | 975 | 99 | 129 | 838 |
| RTOR Reduction (vph) | 119 | 0 | 10 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 96 | 0 | 1064 | 0 | 129 | 838 |
| Turn Type | Perm | | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | | | | 6 | |
| Actuated Green, G (s) | 8.4 | | 26.5 | | 35.5 | 35.5 |
| Effective Green, g (s) | 8.4 | | 26.5 | | 35.5 | 35.5 |
| Actuated g/C Ratio | 0.16 | | 0.49 | | 0.66 | 0.66 |
| Clearance Time (s) | 5.0 | | 5.0 | | 4.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 260 | | 1715 | | 338 | 1227 |
| v/s Ratio Prot | | | 0.30 | | 0.04 | c0.45 |
| v/s Ratio Perm | c0.06 | | | | 0.22 | |
| v/c Ratio | 0.37 | | 0.62 | | 0.38 | 0.68 |
| Uniform Delay, d1 | 20.4 | | 10.0 | | 5.1 | 5.7 |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.9 | | 1.7 | | 0.7 | 3.1 |
| Delay (s) | 21.3 | | 11.7 | | 5.8 | 8.8 |
| Level of Service | C | | B | | A | A |
| Approach Delay (s) | 21.3 | | 11.7 | | | 8.4 |
| Approach LOS | C | | B | | | A |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 11.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.69 | | |
| Actuated Cycle Length (s) | 53.9 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 65.2% | ICU Level of Service | C |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

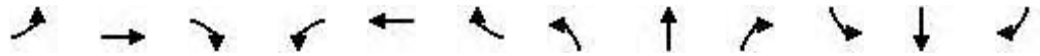
HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2049 Background Conditions
 Weekday PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|------|------|------|------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 0 | 78 | 0 | 78 | 96 | 0 | 0 | 38 | 0 |
| Future Volume (Veh/h) | 0 | 0 | 0 | 0 | 78 | 0 | 78 | 96 | 0 | 0 | 38 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 0 | 0 | 0 | 78 | 0 | 78 | 96 | 0 | 0 | 38 | 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 | 78 | | | 0 | | | 97 | 78 | 0 | 126 | 78 | 78 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 78 | | | 0 | | | 97 | 78 | 0 | 126 | 78 | 78 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 91 | 88 | 100 | 100 | 95 | 100 |
| cM capacity (veh/h) | 1520 | | | 1623 | | | 854 | 812 | 1085 | 771 | 812 | 983 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 0 | 78 | 174 | 38 | | | | | | | | |
| Volume Left | 0 | 0 | 78 | 0 | | | | | | | | |
| Volume Right | 0 | 0 | 0 | 0 | | | | | | | | |
| cSH | 1700 | 1623 | 830 | 812 | | | | | | | | |
| Volume to Capacity | 0.00 | 0.00 | 0.21 | 0.05 | | | | | | | | |
| Queue Length 95th (m) | 0.0 | 0.0 | 6.0 | 1.1 | | | | | | | | |
| Control Delay (s) | 0.0 | 0.0 | 10.5 | 9.6 | | | | | | | | |
| Lane LOS | | | B | A | | | | | | | | |
| Approach Delay (s) | 0.0 | 0.0 | 10.5 | 9.6 | | | | | | | | |
| Approach LOS | | | B | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 7.6 | | | | | | | | | |
| Intersection Capacity Utilization | | | 26.8% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2049 Background Conditions
 Weekday PM Peak Hour



















| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|------|------|------|-------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↗ | ↖ | | ↗ | ↖ | |
| Traffic Volume (vph) | 61 | 15 | 20 | 13 | 21 | 21 | 108 | 1004 | 21 | 1 | 860 | 71 |
| Future Volume (vph) | 61 | 15 | 20 | 13 | 21 | 21 | 108 | 1004 | 21 | 1 | 860 | 71 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flt Protected | | 0.97 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1755 | | | 1746 | | 1770 | 1857 | | 1770 | 1841 | |
| Flt Permitted | | 1.00 | | | 0.90 | | 0.23 | 1.00 | | 0.17 | 1.00 | |
| Satd. Flow (perm) | | 1810 | | | 1598 | | 421 | 1857 | | 326 | 1841 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 61 | 15 | 20 | 13 | 21 | 21 | 108 | 1004 | 21 | 1 | 860 | 71 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 20 | 0 | 0 | 2 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 0 | 77 | 0 | 0 | 35 | 0 | 108 | 1023 | 0 | 1 | 925 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 3.1 | | | 3.1 | | 30.4 | 30.4 | | 30.4 | 30.4 | |
| Effective Green, g (s) | | 3.1 | | | 3.1 | | 30.4 | 30.4 | | 30.4 | 30.4 | |
| Actuated g/C Ratio | | 0.07 | | | 0.07 | | 0.70 | 0.70 | | 0.70 | 0.70 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 128 | | | 113 | | 294 | 1297 | | 227 | 1286 | |
| v/s Ratio Prot | | | | | | | | c0.55 | | | 0.50 | |
| v/s Ratio Perm | | c0.04 | | | 0.02 | | 0.26 | | | 0.00 | | |
| v/c Ratio | | 0.60 | | | 0.31 | | 0.37 | 0.79 | | 0.00 | 0.72 | |
| Uniform Delay, d1 | | 19.6 | | | 19.2 | | 2.7 | 4.4 | | 2.0 | 4.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 8.0 | | | 1.6 | | 3.5 | 5.1 | | 0.0 | 3.5 | |
| Delay (s) | | 27.6 | | | 20.8 | | 6.2 | 9.5 | | 2.0 | 7.5 | |
| Level of Service | | C | | | C | | A | A | | A | A | |
| Approach Delay (s) | | 27.6 | | | 20.8 | | | 9.1 | | | 7.5 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 9.5 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.77 | | |
| Actuated Cycle Length (s) | 43.5 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 82.8% | ICU Level of Service | E |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2049 Background Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 78 | 85 | 0 | 0 | 91 | 101 | 0 | 5 | 0 | 5 | 12 | 25 |
| Future Volume (Veh/h) | 78 | 85 | 0 | 0 | 91 | 101 | 0 | 5 | 0 | 5 | 12 | 25 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 78 | 85 | 0 | 0 | 91 | 101 | 0 | 5 | 0 | 5 | 12 | 25 |
| 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 | 192 | | | 85 | | | 414 | 433 | 85 | 385 | 382 | 142 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 192 | | | 85 | | | 414 | 433 | 85 | 385 | 382 | 142 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 94 | | | 100 | | | 100 | 99 | 100 | 99 | 98 | 97 |
| cM capacity (veh/h) | 1381 | | | 1512 | | | 502 | 487 | 974 | 544 | 520 | 906 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 163 | 192 | 5 | 42 | | | | | | | | |
| Volume Left | 78 | 0 | 0 | 5 | | | | | | | | |
| Volume Right | 0 | 101 | 0 | 25 | | | | | | | | |
| cSH | 1381 | 1512 | 487 | 702 | | | | | | | | |
| Volume to Capacity | 0.06 | 0.00 | 0.01 | 0.06 | | | | | | | | |
| Queue Length 95th (m) | 1.4 | 0.0 | 0.2 | 1.5 | | | | | | | | |
| Control Delay (s) | 4.0 | 0.0 | 12.5 | 10.5 | | | | | | | | |
| Lane LOS | A | | B | B | | | | | | | | |
| Approach Delay (s) | 4.0 | 0.0 | 12.5 | 10.5 | | | | | | | | |
| Approach LOS | | | B | B | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 2.9 | | | | | | | | | |
| Intersection Capacity Utilization | | | 36.5% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

Intersection: 2: Scotland St & McQueen Blvd

| Movement | EB | NB |
|-----------------------|-------|------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 12.8 | 13.1 |
| Average Queue (m) | 5.8 | 1.2 |
| 95th Queue (m) | 13.1 | 6.7 |
| Link Distance (m) | 306.7 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | EB | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB | |
|-----------------------|------|------|------|------|------|-----|-------|-------|-------|------|-------|--|
| Directions Served | L | T | R | L | TR | L | T | TR | L | T | TR | |
| Maximum Queue (m) | 8.2 | 11.2 | 43.0 | 29.3 | 18.3 | 9.3 | 46.3 | 53.0 | 18.0 | 30.9 | 43.5 | |
| Average Queue (m) | 1.8 | 2.4 | 20.5 | 12.9 | 6.2 | 2.4 | 21.8 | 25.2 | 6.8 | 13.1 | 22.5 | |
| 95th Queue (m) | 7.2 | 8.9 | 34.6 | 24.4 | 14.8 | 8.6 | 38.5 | 46.2 | 15.5 | 26.9 | 36.6 | |
| Link Distance (m) | | | | | | | 273.6 | 273.6 | 363.4 | | 363.4 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | 50.0 | | 30.0 | 30.0 | | | 30.0 | | | | |
| Storage Blk Time (%) | 0 | | | 0 | 2 | | | | | 0 | | |
| Queuing Penalty (veh) | 0 | | | 0 | 0 | | | | | 0 | | |

Intersection: 8: Jones Baseline/Scotland St & 2nd Line

| Movement | EB | NB |
|-----------------------|-------|-------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 14.8 | 6.8 |
| Average Queue (m) | 7.2 | 0.4 |
| 95th Queue (m) | 12.7 | 3.5 |
| Link Distance (m) | 304.8 | 382.5 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 10: Tower St S & Commerical Access

| Movement | WB | NB | NB | SB | SB |
|-----------------------|------|-------|-------|-------|-------|
| Directions Served | LR | T | TR | L | T |
| Maximum Queue (m) | 21.1 | 30.0 | 33.8 | 17.3 | 54.0 |
| Average Queue (m) | 11.4 | 12.9 | 14.8 | 8.0 | 21.0 |
| 95th Queue (m) | 20.1 | 26.0 | 29.1 | 16.3 | 45.2 |
| Link Distance (m) | | 243.2 | 243.2 | 273.6 | 273.6 |
| Upstream Blk Time (%) | 0 | | | | |
| Queuing Penalty (veh) | 0 | | | | |
| Storage Bay Dist (m) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

Intersection: 14: Guelph St & McQueen Blvd Extension

| Movement | NB | SB |
|-----------------------|--------|-------|
| Directions Served | LTR | LTR |
| Maximum Queue (m) | 12.1 | 15.9 |
| Average Queue (m) | 4.4 | 6.4 |
| 95th Queue (m) | 12.1 | 14.5 |
| Link Distance (m) | 1012.4 | 325.0 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 15: Highway 6/Tower St S & 2nd Line

| Movement | EB | WB | NB | NB | SB | SB |
|-----------------------|-------|-------|-------|-------|-------|-------|
| Directions Served | LTR | LTR | L | TR | L | TR |
| Maximum Queue (m) | 32.4 | 12.8 | 10.3 | 38.1 | 9.1 | 57.0 |
| Average Queue (m) | 16.2 | 4.9 | 3.1 | 17.9 | 1.1 | 29.0 |
| 95th Queue (m) | 27.6 | 11.8 | 9.6 | 33.0 | 5.8 | 50.9 |
| Link Distance (m) | 663.4 | 719.9 | | 374.4 | | 335.4 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (m) | | | 100.0 | | 100.0 | |
| Storage Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |

Intersection: 16: Guelph St & 2nd Line

| Movement | EB | WB | NB | SB |
|-----------------------|-------|-------|-------|--------|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (m) | 3.0 | 1.4 | 9.2 | 19.0 |
| Average Queue (m) | 0.2 | 0.0 | 1.2 | 10.7 |
| 95th Queue (m) | 1.9 | 1.0 | 6.2 | 17.5 |
| Link Distance (m) | 164.0 | 663.4 | 266.0 | 1012.4 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

Zone Summary

Zone wide Queuing Penalty: 1

Intersection: 2: Scotland St & McQueen Blvd

| Movement | EB | NB |
|-----------------------|-------|-----|
| Directions Served | LR | LT |
| Maximum Queue (m) | 10.2 | 3.7 |
| Average Queue (m) | 4.0 | 0.1 |
| 95th Queue (m) | 11.2 | 1.9 |
| Link Distance (m) | 306.7 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | EB | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB | |
|-----------------------|------|------|------|------|------|------|-------|-------|-------|------|-------|--|
| Directions Served | L | T | R | L | TR | L | T | TR | L | T | TR | |
| Maximum Queue (m) | 18.8 | 16.1 | 15.0 | 28.4 | 24.8 | 51.4 | 64.1 | 66.3 | 31.8 | 39.5 | 48.8 | |
| Average Queue (m) | 5.8 | 5.2 | 5.4 | 12.6 | 7.6 | 20.2 | 29.4 | 36.0 | 15.6 | 13.4 | 25.4 | |
| 95th Queue (m) | 14.8 | 13.6 | 13.2 | 24.0 | 17.8 | 39.5 | 53.1 | 57.5 | 26.9 | 31.2 | 44.4 | |
| Link Distance (m) | | | | | | | 273.6 | 273.6 | 363.4 | | 363.4 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | 50.0 | | 30.0 | 30.0 | | | 30.0 | | | | |
| Storage Blk Time (%) | | | | 0 | 0 | 5 | 4 | 0 | | 0 | | |
| Queuing Penalty (veh) | | | | 0 | 0 | 18 | 6 | 1 | | 0 | | |

Intersection: 8: Jones Baseline/Scotland St & 2nd Line

| Movement | EB | NB |
|-----------------------|-------|-------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 15.9 | 11.0 |
| Average Queue (m) | 5.6 | 0.9 |
| 95th Queue (m) | 12.8 | 5.4 |
| Link Distance (m) | 304.8 | 382.5 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 10: Tower St S & Commerical Access

| Movement | WB | NB | NB | SB | SB |
|-----------------------|------|-------|-------|-------|-------|
| Directions Served | LR | T | TR | L | T |
| Maximum Queue (m) | 24.6 | 54.8 | 60.6 | 35.0 | 110.1 |
| Average Queue (m) | 16.5 | 26.8 | 31.7 | 13.5 | 41.9 |
| 95th Queue (m) | 22.3 | 46.9 | 54.0 | 25.3 | 84.4 |
| Link Distance (m) | | 243.2 | 243.2 | 273.6 | 273.6 |
| Upstream Blk Time (%) | 0 | | | | |
| Queuing Penalty (veh) | 0 | | | | |
| Storage Bay Dist (m) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

Intersection: 14: Guelph St & McQueen Blvd Extension

| Movement | NB | SB |
|-----------------------|--------|-------|
| Directions Served | LTR | LTR |
| Maximum Queue (m) | 23.6 | 13.0 |
| Average Queue (m) | 13.8 | 6.0 |
| 95th Queue (m) | 21.0 | 13.5 |
| Link Distance (m) | 1012.4 | 325.0 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 15: Highway 6/Tower St S & 2nd Line

| Movement | EB | WB | NB | NB | SB | SB |
|-----------------------|-------|-------|-------|-------|-------|-------|
| Directions Served | LTR | LTR | L | TR | L | TR |
| Maximum Queue (m) | 27.8 | 18.2 | 54.0 | 95.2 | 3.5 | 83.2 |
| Average Queue (m) | 11.2 | 7.4 | 17.7 | 34.7 | 0.1 | 37.1 |
| 95th Queue (m) | 21.4 | 15.6 | 41.9 | 72.3 | 1.9 | 72.1 |
| Link Distance (m) | 663.4 | 719.9 | | 374.4 | | 335.4 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (m) | | | 100.0 | | 100.0 | |
| Storage Blk Time (%) | | | | 1 | | 0 |
| Queuing Penalty (veh) | | | | 1 | | 0 |

Intersection: 16: Guelph St & 2nd Line

| Movement | EB | WB | NB | SB |
|-----------------------|-------|-------|-------|--------|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (m) | 16.5 | 1.3 | 9.0 | 13.6 |
| Average Queue (m) | 3.4 | 0.0 | 1.2 | 6.1 |
| 95th Queue (m) | 11.1 | 0.9 | 6.1 | 14.0 |
| Link Distance (m) | 164.0 | 663.4 | 266.0 | 1012.4 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

Zone Summary

Zone wide Queuing Penalty: 26

Intersection: 2: Scotland St & McQueen Blvd

| Movement | EB | NB |
|-----------------------|-------|------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 17.0 | 12.7 |
| Average Queue (m) | 6.5 | 1.7 |
| 95th Queue (m) | 14.5 | 8.3 |
| Link Distance (m) | 306.7 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | EB | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB | |
|-----------------------|------|------|------|------|------|-----|-------|-------|------|------|-------|--|
| Directions Served | L | T | R | L | TR | L | T | TR | L | T | TR | |
| Maximum Queue (m) | 10.6 | 12.3 | 58.9 | 33.0 | 22.7 | 8.1 | 44.8 | 46.7 | 20.7 | 51.1 | 53.3 | |
| Average Queue (m) | 2.3 | 2.0 | 25.4 | 13.6 | 6.8 | 2.1 | 24.3 | 28.1 | 7.3 | 17.1 | 26.3 | |
| 95th Queue (m) | 8.6 | 8.1 | 46.0 | 25.5 | 15.9 | 7.8 | 40.7 | 44.0 | 16.5 | 35.4 | 45.8 | |
| Link Distance (m) | | | | | | | 273.6 | 273.6 | | | 363.4 | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | 50.0 | | 30.0 | 30.0 | | | 30.0 | | | | |
| Storage Blk Time (%) | | | 1 | 0 | 0 | 3 | | 0 | | | | |
| Queuing Penalty (veh) | | | 0 | 0 | 0 | 0 | | 0 | | | | |

Intersection: 8: Jones Baseline/Scotland St & 2nd Line

| Movement | EB | NB |
|-----------------------|-------|-------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 16.0 | 7.6 |
| Average Queue (m) | 7.6 | 0.6 |
| 95th Queue (m) | 12.6 | 3.9 |
| Link Distance (m) | 304.8 | 382.5 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 10: Tower St S & Commerical Access

| Movement | WB | NB | NB | SB | SB |
|-----------------------|------|-------|-------|-------|-------|
| Directions Served | LR | T | TR | L | T |
| Maximum Queue (m) | 19.6 | 33.8 | 35.8 | 21.0 | 57.6 |
| Average Queue (m) | 12.0 | 14.5 | 16.7 | 9.5 | 23.5 |
| 95th Queue (m) | 20.6 | 27.0 | 31.2 | 17.7 | 48.5 |
| Link Distance (m) | | 243.2 | 243.2 | 273.6 | 273.6 |
| Upstream Blk Time (%) | 0 | | | | |
| Queuing Penalty (veh) | 0 | | | | |
| Storage Bay Dist (m) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

Intersection: 14: Guelph St & McQueen Blvd Extension

| Movement | EB | NB | SB |
|-----------------------|-------|--------|-------|
| Directions Served | LTR | LTR | LTR |
| Maximum Queue (m) | 2.6 | 10.7 | 15.9 |
| Average Queue (m) | 0.1 | 4.9 | 6.8 |
| 95th Queue (m) | 1.3 | 12.5 | 14.5 |
| Link Distance (m) | 118.4 | 1012.4 | 325.0 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (m) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

Intersection: 15: Highway 6/Tower St S & 2nd Line

| Movement | EB | WB | NB | NB | SB | SB |
|-----------------------|-------|-------|-------|-------|-------|-------|
| Directions Served | LTR | LTR | L | TR | L | TR |
| Maximum Queue (m) | 45.6 | 14.3 | 12.9 | 37.8 | 9.1 | 76.0 |
| Average Queue (m) | 17.9 | 4.4 | 4.2 | 19.1 | 1.4 | 34.3 |
| 95th Queue (m) | 32.9 | 11.8 | 11.4 | 31.9 | 6.7 | 63.3 |
| Link Distance (m) | 663.4 | 719.9 | | 374.4 | | 335.4 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (m) | | | 100.0 | | 100.0 | |
| Storage Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |

Intersection: 16: Guelph St & 2nd Line

| Movement | EB | NB | SB |
|-----------------------|-------|-------|--------|
| Directions Served | LTR | LTR | LTR |
| Maximum Queue (m) | 9.1 | 9.2 | 22.5 |
| Average Queue (m) | 0.6 | 2.4 | 11.2 |
| 95th Queue (m) | 4.3 | 8.8 | 17.6 |
| Link Distance (m) | 164.0 | 266.0 | 1012.4 |
| Upstream Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |
| Storage Bay Dist (m) | | | |
| Storage Blk Time (%) | | | |
| Queuing Penalty (veh) | | | |

Zone Summary

Zone wide Queuing Penalty: 1

Intersection: 2: Scotland St & McQueen Blvd

| Movement | EB | NB |
|-----------------------|-------|-----|
| Directions Served | LR | LT |
| Maximum Queue (m) | 9.0 | 5.6 |
| Average Queue (m) | 4.6 | 0.4 |
| 95th Queue (m) | 11.7 | 3.3 |
| Link Distance (m) | 306.7 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | EB | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB | |
|-----------------------|------|------|------|------|------|------|-------|-------|------|------|-------|-------|
| Directions Served | L | T | R | L | TR | L | T | TR | L | T | TR | |
| Maximum Queue (m) | 21.3 | 22.8 | 16.6 | 26.7 | 19.8 | 51.1 | 75.9 | 85.6 | 42.8 | 69.2 | 79.6 | |
| Average Queue (m) | 6.8 | 6.8 | 5.6 | 13.7 | 6.5 | 18.3 | 37.7 | 46.1 | 19.2 | 26.9 | 39.8 | |
| 95th Queue (m) | 17.3 | 16.7 | 13.9 | 23.5 | 15.0 | 35.8 | 63.4 | 71.5 | 33.6 | 54.1 | 65.6 | |
| Link Distance (m) | | | | | | | 273.6 | 273.6 | | | 363.4 | 363.4 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | 50.0 | | 30.0 | 30.0 | | | 30.0 | | | | |
| Storage Blk Time (%) | | | | 0 | 0 | 1 | 11 | | | 1 | 2 | |
| Queuing Penalty (veh) | | | | 0 | 0 | 6 | 15 | | | 6 | 4 | |

Intersection: 8: Jones Baseline/Scotland St & 2nd Line

| Movement | EB | NB |
|-----------------------|-------|-------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 15.4 | 7.9 |
| Average Queue (m) | 6.1 | 0.7 |
| 95th Queue (m) | 12.6 | 4.4 |
| Link Distance (m) | 304.8 | 382.5 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 10: Tower St S & Commerical Access

| Movement | WB | NB | NB | SB | SB |
|-----------------------|------|-------|-------|-------|-------|
| Directions Served | LR | T | TR | L | T |
| Maximum Queue (m) | 22.4 | 55.9 | 61.1 | 38.3 | 134.3 |
| Average Queue (m) | 16.7 | 29.9 | 35.6 | 16.7 | 46.7 |
| 95th Queue (m) | 21.7 | 49.7 | 56.8 | 30.0 | 103.1 |
| Link Distance (m) | | 243.2 | 243.2 | 273.6 | 273.6 |
| Upstream Blk Time (%) | 0 | | | | |
| Queuing Penalty (veh) | 0 | | | | |
| Storage Bay Dist (m) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

Intersection: 14: Guelph St & McQueen Blvd Extension

| Movement | NB | SB |
|-----------------------|--------|-------|
| Directions Served | LTR | LTR |
| Maximum Queue (m) | 27.2 | 13.4 |
| Average Queue (m) | 13.8 | 6.6 |
| 95th Queue (m) | 21.7 | 14.2 |
| Link Distance (m) | 1012.4 | 325.0 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 15: Highway 6/Tower St S & 2nd Line

| Movement | EB | WB | NB | NB | SB | SB |
|-----------------------|-------|-------|-------|-------|-------|-------|
| Directions Served | LTR | LTR | L | TR | L | TR |
| Maximum Queue (m) | 28.7 | 17.9 | 78.2 | 138.8 | 1.8 | 129.3 |
| Average Queue (m) | 12.1 | 7.0 | 23.5 | 47.8 | 0.1 | 45.7 |
| 95th Queue (m) | 23.4 | 15.0 | 61.1 | 110.1 | 1.3 | 90.3 |
| Link Distance (m) | 663.4 | 719.9 | | 374.4 | | 335.4 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (m) | | | 100.0 | | 100.0 | |
| Storage Blk Time (%) | | | | 2 | | 1 |
| Queuing Penalty (veh) | | | | 3 | | 0 |

Intersection: 16: Guelph St & 2nd Line

| Movement | EB | WB | NB | SB |
|-----------------------|-------|-------|-------|--------|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (m) | 13.0 | 2.5 | 9.2 | 13.2 |
| Average Queue (m) | 3.8 | 0.1 | 1.4 | 6.7 |
| 95th Queue (m) | 11.4 | 1.3 | 6.8 | 14.3 |
| Link Distance (m) | 164.0 | 663.4 | 266.0 | 1012.4 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

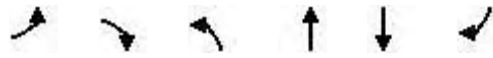
Zone Summary

Zone wide Queuing Penalty: 33

Appendix F: Future Total Operations

HCM Unsignalized Intersection Capacity Analysis
 2: Scotland St & McQueen Blvd
























2025 Total Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 47 | 11 | 10 | 183 | 319 | 19 |
| Future Volume (Veh/h) | 47 | 11 | 10 | 183 | 319 | 19 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 47 | 11 | 10 | 183 | 319 | 19 |
| 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 | 532 | 328 | 338 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 532 | 328 | 338 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 91 | 98 | 99 | | | |
| cM capacity (veh/h) | 504 | 713 | 1221 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 58 | 193 | 338 | | | |
| Volume Left | 47 | 10 | 0 | | | |
| Volume Right | 11 | 0 | 19 | | | |
| cSH | 534 | 1221 | 1700 | | | |
| Volume to Capacity | 0.11 | 0.01 | 0.20 | | | |
| Queue Length 95th (m) | 2.8 | 0.2 | 0.0 | | | |
| Control Delay (s) | 12.6 | 0.5 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 12.6 | 0.5 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.4 | | | |
| Intersection Capacity Utilization | | | 27.9% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2025 Total Conditions
Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  | |  |  |  |  |  |  |
| Traffic Volume (vph) | 9 | 19 | 67 | 127 | 41 | 61 | 9 | 473 | 48 | 59 | 715 | 5 |
| Future Volume (vph) | 9 | 19 | 67 | 127 | 41 | 61 | 9 | 473 | 48 | 59 | 715 | 5 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1696 | | 1770 | 3490 | | 1770 | 3536 | |
| Flt Permitted | 0.69 | 1.00 | 1.00 | 0.75 | 1.00 | | 0.38 | 1.00 | | 0.41 | 1.00 | |
| Satd. Flow (perm) | 1287 | 1863 | 1583 | 1388 | 1696 | | 704 | 3490 | | 771 | 3536 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 9 | 19 | 67 | 127 | 41 | 61 | 9 | 473 | 48 | 59 | 715 | 5 |
| RTOR Reduction (vph) | 0 | 0 | 56 | 0 | 51 | 0 | 0 | 6 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 9 | 19 | 11 | 127 | 51 | 0 | 9 | 515 | 0 | 59 | 720 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 11.4 | 11.4 | 11.4 | 11.4 | 11.4 | | 40.1 | 40.1 | | 48.4 | 48.4 | |
| Effective Green, g (s) | 11.4 | 11.4 | 11.4 | 11.4 | 11.4 | | 40.1 | 40.1 | | 48.4 | 48.4 | |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | | 0.57 | 0.57 | | 0.69 | 0.69 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 210 | 304 | 258 | 226 | 276 | | 404 | 2005 | | 596 | 2451 | |
| v/s Ratio Prot | | 0.01 | | | 0.03 | | | 0.15 | | 0.01 | c0.20 | |
| v/s Ratio Perm | 0.01 | | 0.01 | c0.09 | | | 0.01 | | | 0.06 | | |
| v/c Ratio | 0.04 | 0.06 | 0.04 | 0.56 | 0.18 | | 0.02 | 0.26 | | 0.10 | 0.29 | |
| Uniform Delay, d1 | 24.6 | 24.7 | 24.6 | 26.9 | 25.2 | | 6.4 | 7.4 | | 3.5 | 4.1 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.1 | 0.1 | 3.2 | 0.3 | | 0.1 | 0.3 | | 0.1 | 0.3 | |
| Delay (s) | 24.7 | 24.8 | 24.7 | 30.1 | 25.5 | | 6.5 | 7.7 | | 3.6 | 4.4 | |
| Level of Service | C | C | C | C | C | | A | A | | A | A | |
| Approach Delay (s) | | 24.7 | | | 28.1 | | | 7.7 | | | 4.4 | |
| Approach LOS | | C | | | C | | | A | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 10.0 | | | | | | | | | A |
| HCM 2000 Volume to Capacity ratio | | | 0.37 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 69.8 | | | | | | | 14.0 | | |
| Intersection Capacity Utilization | | | 52.0% | | | | | | | | | A |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2025 Total Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 43 | 9 | 19 | 62 | 62 | 16 |
| Future Volume (Veh/h) | 43 | 9 | 19 | 62 | 62 | 16 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 43 | 9 | 19 | 62 | 62 | 16 |
| 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 | 170 | 70 | 78 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 170 | 70 | 78 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 99 | 99 | | | |
| cM capacity (veh/h) | 810 | 993 | 1520 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 52 | 81 | 78 | | | |
| Volume Left | 43 | 19 | 0 | | | |
| Volume Right | 9 | 0 | 16 | | | |
| cSH | 837 | 1520 | 1700 | | | |
| Volume to Capacity | 0.06 | 0.01 | 0.05 | | | |
| Queue Length 95th (m) | 1.5 | 0.3 | 0.0 | | | |
| Control Delay (s) | 9.6 | 1.8 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.6 | 1.8 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.1 | | | |
| Intersection Capacity Utilization | | | 21.0% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2025 Total Conditions
 Weekday AM Peak Hour





















| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|-------|-------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 49 | 30 | 512 | 36 | 72 | 807 |
| Future Volume (vph) | 49 | 30 | 512 | 36 | 72 | 807 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | | 4.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 3504 | | 1770 | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | 0.42 | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 3504 | | 775 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 49 | 30 | 512 | 36 | 72 | 807 |
| RTOR Reduction (vph) | 0 | 28 | 6 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 49 | 2 | 542 | 0 | 72 | 807 |
| Turn Type | Perm | Perm | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | 8 | | | 6 | |
| Actuated Green, G (s) | 6.3 | 6.3 | 53.2 | | 62.8 | 62.8 |
| Effective Green, g (s) | 6.3 | 6.3 | 53.2 | | 62.8 | 62.8 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.66 | | 0.77 | 0.77 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | | 4.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 137 | 122 | 2298 | | 668 | 1442 |
| v/s Ratio Prot | | | 0.15 | | 0.01 | c0.43 |
| v/s Ratio Perm | c0.03 | 0.00 | | | 0.08 | |
| v/c Ratio | 0.36 | 0.02 | 0.24 | | 0.11 | 0.56 |
| Uniform Delay, d1 | 35.5 | 34.5 | 5.7 | | 2.3 | 3.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.6 | 0.1 | 0.2 | | 0.1 | 1.6 |
| Delay (s) | 37.1 | 34.6 | 5.9 | | 2.3 | 5.2 |
| Level of Service | D | C | A | | A | A |
| Approach Delay (s) | 36.1 | | 5.9 | | | 5.0 |
| Approach LOS | D | | A | | | A |

| Intersection Summary | | | | |
|-----------------------------------|--|-------|---------------------------|------|
| HCM 2000 Control Delay | | 7.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | | 0.57 | | |
| Actuated Cycle Length (s) | | 81.1 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | | 55.8% | ICU Level of Service | B |
| Analysis Period (min) | | 30 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2025 Total Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|------|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
| Lane Configurations | |  | | |  | |  |  | |  |  | | |
| Traffic Volume (vph) | 30 | 15 | 24 | 5 | 12 | 7 | 15 | 514 | 12 | 5 | 808 | 52 | |
| Future Volume (vph) | 30 | 15 | 24 | 5 | 12 | 7 | 15 | 514 | 12 | 5 | 808 | 52 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | |
| Frt | | 0.95 | | | 0.96 | | 1.00 | 1.00 | | 1.00 | 0.99 | | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | | |
| Satd. Flow (prot) | | 1738 | | | 1771 | | 1770 | 1856 | | 1770 | 1846 | | |
| Flt Permitted | | 0.85 | | | 0.94 | | 0.29 | 1.00 | | 0.45 | 1.00 | | |
| Satd. Flow (perm) | | 1506 | | | 1677 | | 532 | 1856 | | 845 | 1846 | | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Adj. Flow (vph) | 30 | 15 | 24 | 5 | 12 | 7 | 15 | 514 | 12 | 5 | 808 | 52 | |
| RTOR Reduction (vph) | 0 | 22 | 0 | 0 | 6 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | |
| Lane Group Flow (vph) | 0 | 47 | 0 | 0 | 18 | 0 | 15 | 525 | 0 | 5 | 858 | 0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | | |
| Actuated Green, G (s) | | 6.9 | | | 6.9 | | 62.0 | 62.0 | | 62.0 | 62.0 | | |
| Effective Green, g (s) | | 6.9 | | | 6.9 | | 62.0 | 62.0 | | 62.0 | 62.0 | | |
| Actuated g/C Ratio | | 0.09 | | | 0.09 | | 0.79 | 0.79 | | 0.79 | 0.79 | | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | |
| Lane Grp Cap (vph) | | 131 | | | 146 | | 418 | 1458 | | 664 | 1450 | | |
| v/s Ratio Prot | | | | | | | | 0.28 | | | c0.46 | | |
| v/s Ratio Perm | | c0.03 | | | 0.01 | | 0.03 | | | 0.01 | | | |
| v/c Ratio | | 0.36 | | | 0.12 | | 0.04 | 0.36 | | 0.01 | 0.59 | | |
| Uniform Delay, d1 | | 33.9 | | | 33.2 | | 1.9 | 2.5 | | 1.8 | 3.4 | | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | |
| Incremental Delay, d2 | | 1.7 | | | 0.4 | | 0.2 | 0.7 | | 0.0 | 1.8 | | |
| Delay (s) | | 35.6 | | | 33.6 | | 2.0 | 3.2 | | 1.8 | 5.2 | | |
| Level of Service | | D | | | C | | A | A | | A | A | | |
| Approach Delay (s) | | 35.6 | | | 33.6 | | | 3.2 | | | 5.2 | | |
| Approach LOS | | D | | | C | | | A | | | A | | |
| Intersection Summary | | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 6.3 | | | | | | | | | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | | | 0.57 | | | | | | | | | | |
| Actuated Cycle Length (s) | | | 78.9 | | | | | | | | | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | | | 61.5% | | | | | | | | | ICU Level of Service | B |
| Analysis Period (min) | | | 30 | | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2025 Total Conditions
 Weekday AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|------|------|------|------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 11 | 61 | 5 | 5 | 75 | 5 | 5 | 5 | 5 | 8 | 5 | 19 |
| Future Volume (Veh/h) | 11 | 61 | 5 | 5 | 75 | 5 | 5 | 5 | 5 | 8 | 5 | 19 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 11 | 61 | 5 | 5 | 75 | 5 | 5 | 5 | 5 | 8 | 5 | 19 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | TWLTL | | | | | | | |
| Median storage veh | | | | | 2 | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 80 | | | 66 | | | 194 | 176 | 64 | 180 | 176 | 78 |
| vC1, stage 1 conf vol | | | | | | | 86 | 86 | | 88 | 88 | |
| vC2, stage 2 conf vol | | | | | | | 109 | 90 | | 93 | 88 | |
| vCu, unblocked vol | 80 | | | 66 | | | 194 | 176 | 64 | 180 | 176 | 78 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 100 | | | 99 | 99 | 100 | 99 | 99 | 98 |
| cM capacity (veh/h) | 1518 | | | 1536 | | | 814 | 760 | 1001 | 837 | 762 | 983 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 77 | 85 | 15 | 32 | | | | | | | | |
| Volume Left | 11 | 5 | 5 | 8 | | | | | | | | |
| Volume Right | 5 | 5 | 5 | 19 | | | | | | | | |
| cSH | 1518 | 1536 | 847 | 903 | | | | | | | | |
| Volume to Capacity | 0.01 | 0.00 | 0.02 | 0.04 | | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.1 | 0.4 | 0.8 | | | | | | | | |
| Control Delay (s) | 1.1 | 0.5 | 9.3 | 9.1 | | | | | | | | |
| Lane LOS | A | A | A | A | | | | | | | | |
| Approach Delay (s) | 1.1 | 0.5 | 9.3 | 9.1 | | | | | | | | |
| Approach LOS | | | A | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 2.7 | | | | | | | | | |
| Intersection Capacity Utilization | | | 17.2% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
2: Scotland St & McQueen Blvd
























2025 Total Conditions
Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 28 | 10 | 10 | 188 | 88 | 40 |
| Future Volume (Veh/h) | 28 | 10 | 10 | 188 | 88 | 40 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 28 | 10 | 10 | 188 | 88 | 40 |
| 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 | 316 | 108 | 128 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 316 | 108 | 128 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 96 | 99 | 99 | | | |
| cM capacity (veh/h) | 672 | 946 | 1458 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 38 | 198 | 128 | | | |
| Volume Left | 28 | 10 | 0 | | | |
| Volume Right | 10 | 0 | 40 | | | |
| cSH | 728 | 1458 | 1700 | | | |
| Volume to Capacity | 0.05 | 0.01 | 0.08 | | | |
| Queue Length 95th (m) | 1.3 | 0.2 | 0.0 | | | |
| Control Delay (s) | 10.2 | 0.4 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 10.2 | 0.4 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.3 | | | |
| Intersection Capacity Utilization | | | 28.1% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

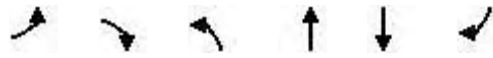
2025 Total Conditions
Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  | |  |  |  |  |  |  |
| Traffic Volume (vph) | 31 | 59 | 24 | 127 | 41 | 61 | 49 | 877 | 178 | 188 | 645 | 5 |
| Future Volume (vph) | 31 | 59 | 24 | 127 | 41 | 61 | 49 | 877 | 178 | 188 | 645 | 5 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 0.97 | | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1696 | | 1770 | 3450 | | 1770 | 3535 | |
| Flt Permitted | 0.69 | 1.00 | 1.00 | 0.72 | 1.00 | | 0.40 | 1.00 | | 0.18 | 1.00 | |
| Satd. Flow (perm) | 1287 | 1863 | 1583 | 1338 | 1696 | | 754 | 3450 | | 337 | 3535 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 31 | 59 | 24 | 127 | 41 | 61 | 49 | 877 | 178 | 188 | 645 | 5 |
| RTOR Reduction (vph) | 0 | 0 | 20 | 0 | 51 | 0 | 0 | 18 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 31 | 59 | 4 | 127 | 51 | 0 | 49 | 1037 | 0 | 188 | 649 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | | 39.6 | 39.6 | | 52.2 | 52.2 | |
| Effective Green, g (s) | 12.2 | 12.2 | 12.2 | 12.2 | 12.2 | | 39.6 | 39.6 | | 52.2 | 52.2 | |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | | 0.53 | 0.53 | | 0.70 | 0.70 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 211 | 305 | 259 | 219 | 278 | | 401 | 1836 | | 402 | 2480 | |
| v/s Ratio Prot | | 0.03 | | | 0.03 | | | c0.30 | | c0.05 | 0.18 | |
| v/s Ratio Perm | 0.02 | | 0.00 | c0.09 | | | 0.06 | | | 0.27 | | |
| v/c Ratio | 0.15 | 0.19 | 0.02 | 0.58 | 0.18 | | 0.12 | 0.56 | | 0.47 | 0.26 | |
| Uniform Delay, d1 | 26.6 | 26.9 | 26.1 | 28.7 | 26.8 | | 8.7 | 11.6 | | 6.0 | 4.1 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 0.3 | 0.0 | 3.7 | 0.3 | | 0.6 | 1.3 | | 0.9 | 0.3 | |
| Delay (s) | 27.0 | 27.2 | 26.1 | 32.5 | 27.1 | | 9.3 | 12.9 | | 6.8 | 4.3 | |
| Level of Service | C | C | C | C | C | | A | B | | A | A | |
| Approach Delay (s) | | 26.9 | | | 30.1 | | | 12.7 | | | 4.9 | |
| Approach LOS | | C | | | C | | | B | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 12.3 | | | | HCM 2000 Level of Service | | | | B | |
| HCM 2000 Volume to Capacity ratio | | | 0.56 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 74.4 | | | | Sum of lost time (s) | | | 14.0 | | |
| Intersection Capacity Utilization | | | 65.7% | | | | ICU Level of Service | | | C | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2025 Total Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 24 | 7 | 26 | 134 | 59 | 15 |
| Future Volume (Veh/h) | 24 | 7 | 26 | 134 | 59 | 15 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 24 | 7 | 26 | 134 | 59 | 15 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 252 | 66 | 74 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 252 | 66 | 74 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 97 | 99 | 98 | | | |
| cM capacity (veh/h) | 724 | 997 | 1526 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 31 | 160 | 74 | | | |
| Volume Left | 24 | 26 | 0 | | | |
| Volume Right | 7 | 0 | 15 | | | |
| cSH | 771 | 1526 | 1700 | | | |
| Volume to Capacity | 0.04 | 0.02 | 0.04 | | | |
| Queue Length 95th (m) | 1.0 | 0.4 | 0.0 | | | |
| Control Delay (s) | 9.9 | 1.3 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.9 | 1.3 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.9 | | | |
| Intersection Capacity Utilization | | | 25.2% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & Commerical Access

2025 Total Conditions
 Weekday PM Peak Hour





















| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|-------|------|-------|-------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 67 | 128 | 990 | 90 | 117 | 650 |
| Future Volume (vph) | 67 | 128 | 990 | 90 | 117 | 650 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | | 4.0 | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 0.99 | | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | 0.95 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 3495 | | 1770 | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | 0.20 | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 3495 | | 378 | 1863 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 67 | 128 | 990 | 90 | 117 | 650 |
| RTOR Reduction (vph) | 0 | 115 | 7 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 67 | 13 | 1073 | 0 | 117 | 650 |
| Turn Type | Perm | Perm | NA | | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | 8 | | | 6 | |
| Actuated Green, G (s) | 7.9 | 7.9 | 45.8 | | 55.5 | 55.5 |
| Effective Green, g (s) | 7.9 | 7.9 | 45.8 | | 55.5 | 55.5 |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.61 | | 0.74 | 0.74 |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | | 4.0 | 6.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 185 | 165 | 2122 | | 383 | 1371 |
| v/s Ratio Prot | | | c0.31 | | 0.02 | c0.35 |
| v/s Ratio Perm | c0.04 | 0.01 | | | 0.20 | |
| v/c Ratio | 0.36 | 0.08 | 0.51 | | 0.31 | 0.47 |
| Uniform Delay, d1 | 31.4 | 30.5 | 8.4 | | 4.0 | 4.0 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.2 | 0.2 | 0.9 | | 0.5 | 1.2 |
| Delay (s) | 32.6 | 30.7 | 9.3 | | 4.4 | 5.2 |
| Level of Service | C | C | A | | A | A |
| Approach Delay (s) | 31.3 | | 9.3 | | | 5.1 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 9.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.50 | | |
| Actuated Cycle Length (s) | 75.4 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 58.4% | ICU Level of Service | B |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

















2025 Total Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | |  |  | |  |  | |
| Traffic Volume (vph) | 48 | 11 | 16 | 10 | 17 | 17 | 24 | 1021 | 17 | 5 | 667 | 56 |
| Future Volume (vph) | 48 | 11 | 16 | 10 | 17 | 17 | 24 | 1021 | 17 | 5 | 667 | 56 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flt Protected | | 0.97 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1753 | | | 1746 | | 1770 | 1858 | | 1770 | 1841 | |
| Flt Permitted | | 0.78 | | | 0.93 | | 0.35 | 1.00 | | 0.20 | 1.00 | |
| Satd. Flow (perm) | | 1411 | | | 1644 | | 646 | 1858 | | 372 | 1841 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 48 | 11 | 16 | 10 | 17 | 17 | 24 | 1021 | 17 | 5 | 667 | 56 |
| RTOR Reduction (vph) | 0 | 14 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 61 | 0 | 0 | 29 | 0 | 24 | 1038 | 0 | 5 | 721 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 7.5 | | | 7.5 | | 60.1 | 60.1 | | 60.1 | 60.1 | |
| Effective Green, g (s) | | 7.5 | | | 7.5 | | 60.1 | 60.1 | | 60.1 | 60.1 | |
| Actuated g/C Ratio | | 0.10 | | | 0.10 | | 0.77 | 0.77 | | 0.77 | 0.77 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 136 | | | 158 | | 500 | 1438 | | 288 | 1425 | |
| v/s Ratio Prot | | | | | | | | c0.56 | | | 0.39 | |
| v/s Ratio Perm | | c0.04 | | | 0.02 | | 0.04 | | | 0.01 | | |
| v/c Ratio | | 0.45 | | | 0.18 | | 0.05 | 0.72 | | 0.02 | 0.51 | |
| Uniform Delay, d1 | | 33.1 | | | 32.2 | | 2.0 | 4.5 | | 2.0 | 3.2 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 2.3 | | | 0.6 | | 0.2 | 3.2 | | 0.1 | 1.3 | |
| Delay (s) | | 35.4 | | | 32.8 | | 2.2 | 7.7 | | 2.1 | 4.5 | |
| Level of Service | | D | | | C | | A | A | | A | A | |
| Approach Delay (s) | | 35.4 | | | 32.8 | | | 7.6 | | | 4.5 | |
| Approach LOS | | D | | | C | | | A | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 8.1 | | | | | | | | | A |
| HCM 2000 Volume to Capacity ratio | | | 0.69 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 77.6 | | | | | | | 10.0 | | |
| Intersection Capacity Utilization | | | 73.1% | | | | | | | | | D |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2025 Total Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 61 | 67 | 5 | 5 | 72 | 19 | 5 | 5 | 5 | 5 | 9 | 20 |
| Future Volume (Veh/h) | 61 | 67 | 5 | 5 | 72 | 19 | 5 | 5 | 5 | 5 | 9 | 20 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 61 | 67 | 5 | 5 | 72 | 19 | 5 | 5 | 5 | 5 | 9 | 20 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | TWLTL | | | | | | | |
| Median storage veh | | | | | 2 | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 91 | | | 72 | | | 308 | 292 | 70 | 290 | 286 | 82 |
| vC1, stage 1 conf vol | | | | | | | 192 | 192 | | 92 | 92 | |
| vC2, stage 2 conf vol | | | | | | | 116 | 101 | | 199 | 194 | |
| vCu, unblocked vol | 91 | | | 72 | | | 308 | 292 | 70 | 290 | 286 | 82 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 96 | | | 100 | | | 99 | 99 | 99 | 99 | 99 | 98 |
| cM capacity (veh/h) | 1504 | | | 1528 | | | 709 | 665 | 993 | 724 | 673 | 978 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 133 | 96 | 15 | 34 | | | | | | | | |
| Volume Left | 61 | 5 | 5 | 5 | | | | | | | | |
| Volume Right | 5 | 19 | 5 | 20 | | | | | | | | |
| cSH | 1504 | 1528 | 765 | 835 | | | | | | | | |
| Volume to Capacity | 0.04 | 0.00 | 0.02 | 0.04 | | | | | | | | |
| Queue Length 95th (m) | 1.0 | 0.1 | 0.5 | 1.0 | | | | | | | | |
| Control Delay (s) | 3.6 | 0.4 | 9.8 | 9.5 | | | | | | | | |
| Lane LOS | A | A | A | A | | | | | | | | |
| Approach Delay (s) | 3.6 | 0.4 | 9.8 | 9.5 | | | | | | | | |
| Approach LOS | | | A | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 3.6 | | | | | | | | | |
| Intersection Capacity Utilization | | | 23.9% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
 2: Scotland St & McQueen Blvd

2031 Total Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 48 | 12 | 11 | 195 | 339 | 20 |
| Future Volume (Veh/h) | 48 | 12 | 11 | 195 | 339 | 20 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 48 | 12 | 11 | 195 | 339 | 20 |
| 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 | 566 | 349 | 359 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 566 | 349 | 359 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 90 | 98 | 99 | | | |
| cM capacity (veh/h) | 481 | 694 | 1200 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 60 | 206 | 359 | | | |
| Volume Left | 48 | 11 | 0 | | | |
| Volume Right | 12 | 0 | 20 | | | |
| cSH | 513 | 1200 | 1700 | | | |
| Volume to Capacity | 0.12 | 0.01 | 0.21 | | | |
| Queue Length 95th (m) | 3.0 | 0.2 | 0.0 | | | |
| Control Delay (s) | 13.0 | 0.5 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 13.0 | 0.5 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.4 | | | |
| Intersection Capacity Utilization | | | 29.3% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2031 Total Conditions
Weekday AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|-------|------|------|---------------------------|------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 88 | 20 | 240 | 131 | 42 | 63 | 64 | 656 | 50 | 62 | 792 | 28 |
| Future Volume (vph) | 88 | 20 | 240 | 131 | 42 | 63 | 64 | 656 | 50 | 62 | 792 | 28 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1695 | | 1770 | 3502 | | 1770 | 3521 | |
| Flt Permitted | 0.69 | 1.00 | 1.00 | 0.74 | 1.00 | | 0.34 | 1.00 | | 0.32 | 1.00 | |
| Satd. Flow (perm) | 1284 | 1863 | 1583 | 1386 | 1695 | | 638 | 3502 | | 604 | 3521 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 88 | 20 | 240 | 131 | 42 | 63 | 64 | 656 | 50 | 62 | 792 | 28 |
| RTOR Reduction (vph) | 0 | 0 | 170 | 0 | 52 | 0 | 0 | 6 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 88 | 20 | 70 | 131 | 53 | 0 | 64 | 700 | 0 | 62 | 817 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 11.7 | 11.7 | 11.7 | 11.7 | 11.7 | | 39.3 | 39.3 | | 47.1 | 47.1 | |
| Effective Green, g (s) | 11.7 | 11.7 | 11.7 | 11.7 | 11.7 | | 39.3 | 39.3 | | 47.1 | 47.1 | |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | | 0.57 | 0.57 | | 0.68 | 0.68 | |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | |
| 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) | 218 | 316 | 269 | 235 | 288 | | 364 | 2000 | | 477 | 2410 | |
| v/s Ratio Prot | | 0.01 | | | 0.03 | | | 0.20 | | 0.01 | c0.23 | |
| v/s Ratio Perm | 0.07 | | 0.04 | c0.09 | | | 0.10 | | | 0.08 | | |
| v/c Ratio | 0.40 | 0.06 | 0.26 | 0.56 | 0.18 | | 0.18 | 0.35 | | 0.13 | 0.34 | |
| Uniform Delay, d1 | 25.4 | 24.0 | 24.8 | 26.2 | 24.5 | | 7.0 | 7.9 | | 3.9 | 4.5 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.2 | 0.1 | 0.5 | 2.9 | 0.3 | | 1.1 | 0.5 | | 0.1 | 0.4 | |
| Delay (s) | 26.7 | 24.0 | 25.3 | 29.1 | 24.8 | | 8.1 | 8.4 | | 4.0 | 4.8 | |
| Level of Service | C | C | C | C | C | | A | A | | A | A | |
| Approach Delay (s) | | 25.6 | | | 27.1 | | | 8.4 | | | 4.8 | |
| Approach LOS | | C | | | C | | | A | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 11.6 | | | | HCM 2000 Level of Service | | | B | | |
| HCM 2000 Volume to Capacity ratio | | | 0.41 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 68.8 | | | | Sum of lost time (s) | | | 14.0 | | |
| Intersection Capacity Utilization | | | 57.4% | | | | ICU Level of Service | | | B | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

2031 Total Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 45 | 10 | 20 | 66 | 66 | 17 |
| Future Volume (Veh/h) | 45 | 10 | 20 | 66 | 66 | 17 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 45 | 10 | 20 | 66 | 66 | 17 |
| 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 | 180 | 74 | 83 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 180 | 74 | 83 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 94 | 99 | 99 | | | |
| cM capacity (veh/h) | 798 | 987 | 1514 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 55 | 86 | 83 | | | |
| Volume Left | 45 | 20 | 0 | | | |
| Volume Right | 10 | 0 | 17 | | | |
| cSH | 827 | 1514 | 1700 | | | |
| Volume to Capacity | 0.07 | 0.01 | 0.05 | | | |
| Queue Length 95th (m) | 1.6 | 0.3 | 0.0 | | | |
| Control Delay (s) | 9.7 | 1.8 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.7 | 1.8 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.1 | | | |
| Intersection Capacity Utilization | | | 21.2% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & New Collector Road/Commerical Access




















2031 Total Conditions
 Weekday AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|-------|------|-------|------|------|------|---------------------------|------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 161 | 10 | 107 | 49 | 10 | 30 | 76 | 589 | 36 | 72 | 802 | 114 |
| Future Volume (vph) | 161 | 10 | 107 | 49 | 10 | 30 | 76 | 589 | 36 | 72 | 802 | 114 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.86 | | 1.00 | 0.89 | | 1.00 | 0.99 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1607 | | 1770 | 1653 | | 1770 | 3509 | | 1770 | 3473 | |
| Flt Permitted | 0.73 | 1.00 | | 0.68 | 1.00 | | 0.26 | 1.00 | | 0.40 | 1.00 | |
| Satd. Flow (perm) | 1362 | 1607 | | 1270 | 1653 | | 484 | 3509 | | 742 | 3473 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 161 | 10 | 107 | 49 | 10 | 30 | 76 | 589 | 36 | 72 | 802 | 114 |
| RTOR Reduction (vph) | 0 | 88 | 0 | 0 | 25 | 0 | 0 | 4 | 0 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 161 | 29 | 0 | 49 | 15 | 0 | 76 | 621 | 0 | 72 | 906 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 14.7 | 14.7 | | 14.7 | 14.7 | | 51.8 | 46.0 | | 51.2 | 45.7 | |
| Effective Green, g (s) | 14.7 | 14.7 | | 14.7 | 14.7 | | 51.8 | 46.0 | | 51.2 | 45.7 | |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.63 | 0.56 | | 0.62 | 0.56 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 243 | 287 | | 227 | 295 | | 395 | 1963 | | 530 | 1930 | |
| v/s Ratio Prot | | 0.02 | | | 0.01 | | c0.01 | 0.18 | | 0.01 | c0.26 | |
| v/s Ratio Perm | c0.12 | | | 0.04 | | | 0.11 | | | 0.08 | | |
| v/c Ratio | 0.66 | 0.10 | | 0.22 | 0.05 | | 0.19 | 0.32 | | 0.14 | 0.47 | |
| Uniform Delay, d1 | 31.4 | 28.2 | | 28.8 | 28.0 | | 6.3 | 9.7 | | 6.1 | 11.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 6.8 | 0.2 | | 0.5 | 0.1 | | 0.2 | 0.4 | | 0.1 | 0.8 | |
| Delay (s) | 38.2 | 28.4 | | 29.3 | 28.0 | | 6.5 | 10.1 | | 6.2 | 11.8 | |
| Level of Service | D | C | | C | C | | A | B | | A | B | |
| Approach Delay (s) | | 34.1 | | | 28.7 | | | 9.7 | | | 11.4 | |
| Approach LOS | | C | | | C | | | A | | | B | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 14.6 | | | | HCM 2000 Level of Service | | | | B | |
| HCM 2000 Volume to Capacity ratio | | | 0.49 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 82.2 | | | | Sum of lost time (s) | | | 16.0 | | |
| Intersection Capacity Utilization | | | 60.6% | | | | ICU Level of Service | | | B | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

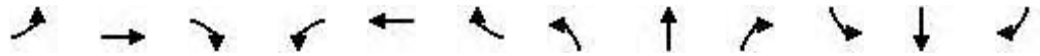
HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2031 Total Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  | | | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|------|--|--|-----|--|--|-----|--|--|-----|--|--|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | | | | | | | | | | | | |
| Lane Configurations |  |  | |  |  | | |  | | |  |  | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 50 | 11 | 36 | 92 | 10 | 32 | 19 | 68 | 10 | 28 | 10 | | | | | | | | | | | | |
| Future Volume (Veh/h) | 10 | 50 | 11 | 36 | 92 | 10 | 32 | 19 | 68 | 10 | 28 | 10 | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | | | | | | | | | | | | | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | | | | | | | | | | | | | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | | | | | | | | | |
| Hourly flow rate (vph) | 10 | 50 | 11 | 36 | 92 | 10 | 32 | 19 | 68 | 10 | 28 | 10 | | | | | | | | | | | | |
| Pedestrians | | | | | | | | | | | | | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | | | | | | | | | | | | | |
| Median type | | | | | | | | | | | | | | | | | | | | | | | | |
| | TWLTL | | | | | TWLTL | | | | | | | | | | | | | | | | | | |
| Median storage veh | 2 | | | | | 2 | | | | | | | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | | | | | | | | | | | | | |
| vC, conflicting volume | 102 | | | 61 | | | 264 | | | 250 | | | 56 | | | 316 | | | 250 | | | 97 | | |
| vC1, stage 1 conf vol | | | | | | | 76 | | | 76 | | | 169 | | | 169 | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | 188 | | | 174 | | | 148 | | | 81 | | | | | | | | |
| vCu, unblocked vol | 102 | | | 61 | | | 264 | | | 250 | | | 56 | | | 316 | | | 250 | | | 97 | | |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | | | 6.5 | | | 6.2 | | | 7.1 | | | 6.5 | | | 6.2 | | |
| tC, 2 stage (s) | | | | | | | 6.1 | | | 5.5 | | | 6.1 | | | 5.5 | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | | | 4.0 | | | 3.3 | | | 3.5 | | | 4.0 | | | 3.3 | | |
| p0 queue free % | 99 | | | 98 | | | 96 | | | 97 | | | 93 | | | 99 | | | 96 | | | 99 | | |
| cM capacity (veh/h) | 1490 | | | 1542 | | | 721 | | | 698 | | | 1011 | | | 684 | | | 700 | | | 959 | | |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | | | | | | | | | | | | | | | | | | |
| Volume Total | 10 | 61 | 36 | 102 | 119 | 48 | | | | | | | | | | | | | | | | | | |
| Volume Left | 10 | 0 | 36 | 0 | 32 | 10 | | | | | | | | | | | | | | | | | | |
| Volume Right | 0 | 11 | 0 | 10 | 68 | 10 | | | | | | | | | | | | | | | | | | |
| cSH | 1490 | 1700 | 1542 | 1700 | 857 | 738 | | | | | | | | | | | | | | | | | | |
| Volume to Capacity | 0.01 | 0.04 | 0.02 | 0.06 | 0.14 | 0.07 | | | | | | | | | | | | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.5 | 0.0 | 3.7 | 1.6 | | | | | | | | | | | | | | | | | | |
| Control Delay (s) | 7.4 | 0.0 | 7.4 | 0.0 | 9.9 | 10.2 | | | | | | | | | | | | | | | | | | |
| Lane LOS | A | | A | | A | B | | | | | | | | | | | | | | | | | | |
| Approach Delay (s) | 1.0 | | 1.9 | | 9.9 | 10.2 | | | | | | | | | | | | | | | | | | |
| Approach LOS | | | | | A | B | | | | | | | | | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | | | | | | | | | | | | | |
| Average Delay | 5.3 | | | | | | | | | | | | | | | | | | | | | | | |
| Intersection Capacity Utilization | 25.6% | | | | | ICU Level of Service | | | | | A | | | | | | | | | | | | | |
| Analysis Period (min) | 30 | | | | | | | | | | | | | | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2031 Total Conditions
 Weekday AM Peak Hour



















| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|------|------|------|------|------|------|-------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕ | | ↕ | ↕ | |
| Traffic Volume (vph) | 32 | 15 | 103 | 10 | 13 | 10 | 41 | 667 | 13 | 10 | 910 | 55 |
| Future Volume (vph) | 32 | 15 | 103 | 10 | 13 | 10 | 41 | 667 | 13 | 10 | 910 | 55 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.91 | | | 0.96 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flt Protected | | 0.99 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1672 | | | 1760 | | 1770 | 3529 | | 1770 | 3509 | |
| Flt Permitted | | 0.92 | | | 0.84 | | 0.28 | 1.00 | | 0.39 | 1.00 | |
| Satd. Flow (perm) | | 1550 | | | 1501 | | 530 | 3529 | | 732 | 3509 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 32 | 15 | 103 | 10 | 13 | 10 | 41 | 667 | 13 | 10 | 910 | 55 |
| RTOR Reduction (vph) | 0 | 91 | 0 | 0 | 9 | 0 | 0 | 1 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 0 | 59 | 0 | 0 | 24 | 0 | 41 | 679 | 0 | 10 | 962 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 8.9 | | | 8.9 | | 59.6 | 59.6 | | 59.6 | 59.6 | |
| Effective Green, g (s) | | 8.9 | | | 8.9 | | 59.6 | 59.6 | | 59.6 | 59.6 | |
| Actuated g/C Ratio | | 0.11 | | | 0.11 | | 0.76 | 0.76 | | 0.76 | 0.76 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 175 | | | 170 | | 402 | 2679 | | 555 | 2664 | |
| v/s Ratio Prot | | | | | | | | 0.19 | | | c0.27 | |
| v/s Ratio Perm | | c0.04 | | | 0.02 | | 0.08 | | | 0.01 | | |
| v/c Ratio | | 0.34 | | | 0.14 | | 0.10 | 0.25 | | 0.02 | 0.36 | |
| Uniform Delay, d1 | | 32.1 | | | 31.4 | | 2.5 | 2.8 | | 2.3 | 3.1 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 1.1 | | | 0.4 | | 0.5 | 0.2 | | 0.1 | 0.4 | |
| Delay (s) | | 33.2 | | | 31.7 | | 3.0 | 3.0 | | 2.4 | 3.5 | |
| Level of Service | | C | | | C | | A | A | | A | A | |
| Approach Delay (s) | | 33.2 | | | 31.7 | | | 3.0 | | | 3.5 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | |
|-----------------------------------|-------|---------------------------|
| HCM 2000 Control Delay | 6.2 | HCM 2000 Level of Service |
| HCM 2000 Volume to Capacity ratio | 0.36 | A |
| Actuated Cycle Length (s) | 78.5 | Sum of lost time (s) |
| Intersection Capacity Utilization | 53.0% | 10.0 |
| Analysis Period (min) | 30 | ICU Level of Service |
| | | A |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2031 Total Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 12 | 65 | 10 | 10 | 80 | 29 | 10 | 10 | 10 | 87 | 10 | 20 |
| Future Volume (Veh/h) | 12 | 65 | 10 | 10 | 80 | 29 | 10 | 10 | 10 | 87 | 10 | 20 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 12 | 65 | 10 | 10 | 80 | 29 | 10 | 10 | 10 | 87 | 10 | 20 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | TWLTL | | | | | | | |
| Median storage veh | | | | | 2 | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 109 | | | 75 | | | 234 | 223 | 70 | 224 | 214 | 94 |
| vC1, stage 1 conf vol | | | | | | | 94 | 94 | | 114 | 114 | |
| vC2, stage 2 conf vol | | | | | | | 140 | 129 | | 109 | 99 | |
| vCu, unblocked vol | 109 | | | 75 | | | 234 | 223 | 70 | 224 | 214 | 94 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 99 | | | 99 | 99 | 99 | 89 | 99 | 98 |
| cM capacity (veh/h) | 1481 | | | 1524 | | | 776 | 729 | 993 | 797 | 737 | 962 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 87 | 119 | 30 | 117 | | | | | | | | |
| Volume Left | 12 | 10 | 10 | 87 | | | | | | | | |
| Volume Right | 10 | 29 | 10 | 20 | | | | | | | | |
| cSH | 1481 | 1524 | 818 | 816 | | | | | | | | |
| Volume to Capacity | 0.01 | 0.01 | 0.04 | 0.14 | | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.2 | 0.9 | 3.8 | | | | | | | | |
| Control Delay (s) | 1.1 | 0.7 | 9.6 | 10.2 | | | | | | | | |
| Lane LOS | A | A | A | B | | | | | | | | |
| Approach Delay (s) | 1.1 | 0.7 | 9.6 | 10.2 | | | | | | | | |
| Approach LOS | | | A | B | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 4.7 | | | | | | | | | |
| Intersection Capacity Utilization | | | 27.7% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
 2: Scotland St & McQueen Blvd























2031 Total Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 29 | 11 | 11 | 200 | 94 | 41 |
| Future Volume (Veh/h) | 29 | 11 | 11 | 200 | 94 | 41 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 29 | 11 | 11 | 200 | 94 | 41 |
| 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 | 336 | 114 | 135 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 336 | 114 | 135 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 96 | 99 | 99 | | | |
| cM capacity (veh/h) | 654 | 938 | 1449 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 40 | 211 | 135 | | | |
| Volume Left | 29 | 11 | 0 | | | |
| Volume Right | 11 | 0 | 41 | | | |
| cSH | 713 | 1449 | 1700 | | | |
| Volume to Capacity | 0.06 | 0.01 | 0.08 | | | |
| Queue Length 95th (m) | 1.4 | 0.2 | 0.0 | | | |
| Control Delay (s) | 10.3 | 0.5 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 10.3 | 0.5 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.3 | | | |
| Intersection Capacity Utilization | | | 29.5% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2031 Total Conditions
Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  |  |  |  | |  |  | |  |  |  |
| Traffic Volume (vph) | 84 | 61 | 140 | 96 | 36 | 123 | 159 | 1091 | 185 | 198 | 988 | 92 |
| Future Volume (vph) | 84 | 61 | 140 | 96 | 36 | 123 | 159 | 1091 | 185 | 198 | 988 | 92 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.88 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1647 | | 1770 | 3462 | | 1770 | 3494 | |
| Flt Permitted | 0.59 | 1.00 | 1.00 | 0.72 | 1.00 | | 0.26 | 1.00 | | 0.14 | 1.00 | |
| Satd. Flow (perm) | 1108 | 1863 | 1583 | 1336 | 1647 | | 493 | 3462 | | 261 | 3494 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 84 | 61 | 140 | 96 | 36 | 123 | 159 | 1091 | 185 | 198 | 988 | 92 |
| RTOR Reduction (vph) | 0 | 0 | 121 | 0 | 106 | 0 | 0 | 14 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 84 | 61 | 19 | 96 | 53 | 0 | 159 | 1262 | 0 | 198 | 1074 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Perm | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 11.6 | 11.6 | 11.6 | 11.6 | 11.6 | | 49.4 | 49.4 | | 61.1 | 61.1 | |
| Effective Green, g (s) | 11.6 | 11.6 | 11.6 | 11.6 | 11.6 | | 49.4 | 49.4 | | 61.1 | 61.1 | |
| Actuated g/C Ratio | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | | 0.58 | 0.58 | | 0.72 | 0.72 | |
| Clearance Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 151 | 255 | 216 | 182 | 225 | | 287 | 2019 | | 325 | 2520 | |
| v/s Ratio Prot | | 0.03 | | | 0.03 | | | 0.36 | | c0.06 | 0.31 | |
| v/s Ratio Perm | c0.08 | | 0.01 | 0.07 | | | 0.32 | | | c0.38 | | |
| v/c Ratio | 0.56 | 0.24 | 0.09 | 0.53 | 0.23 | | 0.55 | 0.63 | | 0.61 | 0.43 | |
| Uniform Delay, d1 | 34.1 | 32.6 | 31.9 | 34.0 | 32.6 | | 10.9 | 11.6 | | 7.9 | 4.7 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 4.4 | 0.5 | 0.2 | 2.8 | 0.5 | | 7.6 | 1.5 | | 3.3 | 0.5 | |
| Delay (s) | 38.6 | 33.1 | 32.1 | 36.8 | 33.1 | | 18.5 | 13.1 | | 11.1 | 5.3 | |
| Level of Service | D | C | C | D | C | | B | B | | B | A | |
| Approach Delay (s) | | 34.2 | | | 34.5 | | | 13.7 | | | 6.2 | |
| Approach LOS | | C | | | C | | | B | | | A | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 14.2 | | | HCM 2000 Level of Service | | | B | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.62 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 84.7 | | | Sum of lost time (s) | | | 16.0 | | | |
| Intersection Capacity Utilization | | | 80.7% | | | ICU Level of Service | | | D | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

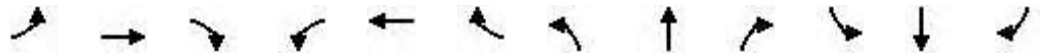
2031 Total Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 25 | 10 | 28 | 143 | 63 | 15 |
| Future Volume (Veh/h) | 25 | 10 | 28 | 143 | 63 | 15 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 25 | 10 | 28 | 143 | 63 | 15 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 270 | 70 | 78 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 270 | 70 | 78 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 96 | 99 | 98 | | | |
| cM capacity (veh/h) | 707 | 992 | 1520 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 35 | 171 | 78 | | | |
| Volume Left | 25 | 28 | 0 | | | |
| Volume Right | 10 | 0 | 15 | | | |
| cSH | 770 | 1520 | 1700 | | | |
| Volume to Capacity | 0.05 | 0.02 | 0.05 | | | |
| Queue Length 95th (m) | 1.1 | 0.4 | 0.0 | | | |
| Control Delay (s) | 9.9 | 1.3 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.9 | 1.3 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 2.0 | | | |
| Intersection Capacity Utilization | | | 25.7% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & New Collector Road/Commerical Access

2031 Total Conditions
 Weekday PM Peak Hour






















| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|-------|------|------|-------|------|------|
| Lane Configurations | ↗ | ↘ | | ↗ | ↘ | | ↗ | ↕ | | ↗ | ↕ | |
| Traffic Volume (vph) | 321 | 10 | 214 | 67 | 10 | 128 | 229 | 982 | 90 | 117 | 762 | 344 |
| Future Volume (vph) | 321 | 10 | 214 | 67 | 10 | 128 | 229 | 982 | 90 | 117 | 762 | 344 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.86 | | 1.00 | 0.86 | | 1.00 | 0.99 | | 1.00 | 0.95 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1596 | | 1770 | 1604 | | 1770 | 3495 | | 1770 | 3374 | |
| Flt Permitted | 0.67 | 1.00 | | 0.55 | 1.00 | | 0.11 | 1.00 | | 0.19 | 1.00 | |
| Satd. Flow (perm) | 1246 | 1596 | | 1022 | 1604 | | 204 | 3495 | | 358 | 3374 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 321 | 10 | 214 | 67 | 10 | 128 | 229 | 982 | 90 | 117 | 762 | 344 |
| RTOR Reduction (vph) | 0 | 152 | 0 | 0 | 91 | 0 | 0 | 7 | 0 | 0 | 55 | 0 |
| Lane Group Flow (vph) | 321 | 72 | 0 | 67 | 47 | 0 | 229 | 1065 | 0 | 117 | 1051 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 25.1 | 25.1 | | 25.1 | 25.1 | | 50.2 | 40.8 | | 40.9 | 35.5 | |
| Effective Green, g (s) | 25.1 | 25.1 | | 25.1 | 25.1 | | 50.2 | 40.8 | | 40.9 | 35.5 | |
| Actuated g/C Ratio | 0.29 | 0.29 | | 0.29 | 0.29 | | 0.58 | 0.47 | | 0.47 | 0.41 | |
| Clearance Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.0 | 6.0 | | 4.0 | 6.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 358 | 458 | | 293 | 461 | | 309 | 1633 | | 255 | 1372 | |
| v/s Ratio Prot | | 0.04 | | | 0.03 | | c0.09 | 0.30 | | 0.03 | 0.31 | |
| v/s Ratio Perm | c0.26 | | | 0.07 | | | c0.34 | | | 0.19 | | |
| v/c Ratio | 0.90 | 0.16 | | 0.23 | 0.10 | | 0.74 | 0.65 | | 0.46 | 0.77 | |
| Uniform Delay, d1 | 29.9 | 23.2 | | 23.7 | 22.8 | | 16.8 | 17.8 | | 13.9 | 22.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 27.7 | 0.2 | | 0.4 | 0.1 | | 9.5 | 2.1 | | 1.3 | 4.2 | |
| Delay (s) | 57.6 | 23.4 | | 24.1 | 22.9 | | 26.3 | 19.9 | | 15.3 | 26.5 | |
| Level of Service | E | C | | C | C | | C | B | | B | C | |
| Approach Delay (s) | | 43.5 | | | 23.3 | | | 21.0 | | | 25.4 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Intersection Summary | | |
|-----------------------------------|-------|-----------------------------|
| HCM 2000 Control Delay | 26.6 | HCM 2000 Level of Service C |
| HCM 2000 Volume to Capacity ratio | 0.82 | |
| Actuated Cycle Length (s) | 87.3 | Sum of lost time (s) 16.0 |
| Intersection Capacity Utilization | 89.3% | ICU Level of Service E |
| Analysis Period (min) | 30 | |

c Critical Lane Group

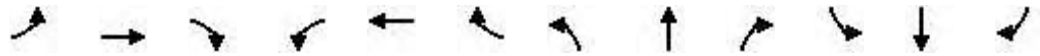
HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2031 Total Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  | |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|-----|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
| Lane Configurations |  |  | |  |  | | |  | | |  |  | |
| Traffic Volume (veh/h) | 10 | 153 | 36 | 80 | 130 | 10 | 21 | 81 | 57 | 10 | 32 | 10 | |
| Future Volume (Veh/h) | 10 | 153 | 36 | 80 | 130 | 10 | 21 | 81 | 57 | 10 | 32 | 10 | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Hourly flow rate (vph) | 10 | 153 | 36 | 80 | 130 | 10 | 21 | 81 | 57 | 10 | 32 | 10 | |
| Pedestrians | | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | | |
| Median type | | | | | | | | | | | | | |
| | TWLTL | | | | | TWLTL | | | | | | | |
| Median storage veh | 2 | | | | | 2 | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | | |
| vC, conflicting volume | 140 | | 189 | | | | 507 | | 491 | 171 | 566 | 504 | 135 |
| vC1, stage 1 conf vol | | | | | | | 191 | | 191 | | 295 | 295 | |
| vC2, stage 2 conf vol | | | | | | | 316 | | 300 | | 270 | 209 | |
| vCu, unblocked vol | 140 | | 189 | | | | 507 | | 491 | 171 | 566 | 504 | 135 |
| tC, single (s) | 4.1 | | 4.1 | | | | 7.1 | | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | 2.2 | | | | 3.5 | | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | 94 | | | | 96 | | 86 | 93 | 98 | 94 | 99 |
| cM capacity (veh/h) | 1443 | | 1385 | | | | 568 | | 573 | 873 | 485 | 558 | 914 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | | | | | | | |
| Volume Total | 10 | 189 | 80 | 140 | 159 | 52 | | | | | | | |
| Volume Left | 10 | 0 | 80 | 0 | 21 | 10 | | | | | | | |
| Volume Right | 0 | 36 | 0 | 10 | 57 | 10 | | | | | | | |
| cSH | 1443 | 1700 | 1385 | 1700 | 653 | 585 | | | | | | | |
| Volume to Capacity | 0.01 | 0.11 | 0.06 | 0.08 | 0.24 | 0.09 | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.0 | 1.4 | 0.0 | 7.3 | 2.2 | | | | | | | |
| Control Delay (s) | 7.5 | 0.0 | 7.8 | 0.0 | 12.3 | 11.8 | | | | | | | |
| Lane LOS | A | | A | | B | B | | | | | | | |
| Approach Delay (s) | 0.4 | | 2.8 | | 12.3 | 11.8 | | | | | | | |
| Approach LOS | | | | | B | B | | | | | | | |
| Intersection Summary | | | | | | | | | | | | | |
| Average Delay | | | 5.2 | | | | | | | | | | |
| Intersection Capacity Utilization | | | 35.5% | | | | ICU Level of Service | | A | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2031 Total Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|------|------|------|-------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕ | | ↕ | ↕ | |
| Traffic Volume (vph) | 51 | 12 | 68 | 11 | 18 | 18 | 111 | 1237 | 18 | 10 | 994 | 60 |
| Future Volume (vph) | 51 | 12 | 68 | 11 | 18 | 18 | 111 | 1237 | 18 | 10 | 994 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.93 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1699 | | | 1746 | | 1770 | 3532 | | 1770 | 3509 | |
| Flt Permitted | | 0.85 | | | 0.91 | | 0.25 | 1.00 | | 0.20 | 1.00 | |
| Satd. Flow (perm) | | 1476 | | | 1600 | | 474 | 3532 | | 368 | 3509 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 51 | 12 | 68 | 11 | 18 | 18 | 111 | 1237 | 18 | 10 | 994 | 60 |
| RTOR Reduction (vph) | 0 | 48 | 0 | 0 | 16 | 0 | 0 | 1 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 0 | 83 | 0 | 0 | 31 | 0 | 111 | 1254 | 0 | 10 | 1050 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | | 10.4 | | | 10.4 | | 63.5 | 63.5 | | 63.5 | 63.5 | |
| Effective Green, g (s) | | 10.4 | | | 10.4 | | 63.5 | 63.5 | | 63.5 | 63.5 | |
| Actuated g/C Ratio | | 0.12 | | | 0.12 | | 0.74 | 0.74 | | 0.74 | 0.74 | |
| Clearance Time (s) | | 6.0 | | | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 178 | | | 193 | | 350 | 2610 | | 272 | 2593 | |
| v/s Ratio Prot | | | | | | | | c0.36 | | | | 0.30 |
| v/s Ratio Perm | | c0.06 | | | 0.02 | | 0.23 | | | 0.03 | | |
| v/c Ratio | | 0.46 | | | 0.16 | | 0.32 | 0.48 | | 0.04 | 0.41 | |
| Uniform Delay, d1 | | 35.2 | | | 33.8 | | 3.8 | 4.5 | | 3.0 | 4.2 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 1.9 | | | 0.4 | | 2.4 | 0.6 | | 0.3 | 0.5 | |
| Delay (s) | | 37.1 | | | 34.2 | | 6.2 | 5.2 | | 3.3 | 4.6 | |
| Level of Service | | D | | | C | | A | A | | A | A | |
| Approach Delay (s) | | 37.1 | | | 34.2 | | | 5.3 | | | 4.6 | |
| Approach LOS | | D | | | C | | | A | | | A | |

















Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 7.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.48 | | |
| Actuated Cycle Length (s) | 85.9 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 68.4% | ICU Level of Service | C |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2031 Total Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 65 | 71 | 10 | 10 | 76 | 106 | 10 | 10 | 10 | 55 | 10 | 21 |
| Future Volume (Veh/h) | 65 | 71 | 10 | 10 | 76 | 106 | 10 | 10 | 10 | 55 | 10 | 21 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 65 | 71 | 10 | 10 | 76 | 106 | 10 | 10 | 10 | 55 | 10 | 21 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | TWLTL | | | | | | | |
| Median storage (veh) | | | | | 2 | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 182 | | | 81 | | | 381 | 408 | 76 | 370 | 360 | 129 |
| vC1, stage 1 conf vol | | | | | | | 206 | 206 | | 149 | 149 | |
| vC2, stage 2 conf vol | | | | | | | 175 | 202 | | 221 | 211 | |
| vCu, unblocked vol | 182 | | | 81 | | | 381 | 408 | 76 | 370 | 360 | 129 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 95 | | | 99 | | | 98 | 98 | 99 | 92 | 98 | 98 |
| cM capacity (veh/h) | 1393 | | | 1517 | | | 656 | 606 | 985 | 673 | 639 | 921 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 146 | 192 | 30 | 86 | | | | | | | | |
| Volume Left | 65 | 10 | 10 | 55 | | | | | | | | |
| Volume Right | 10 | 106 | 10 | 21 | | | | | | | | |
| cSH | 1393 | 1517 | 716 | 715 | | | | | | | | |
| Volume to Capacity | 0.05 | 0.01 | 0.04 | 0.12 | | | | | | | | |
| Queue Length 95th (m) | 1.1 | 0.2 | 1.0 | 3.1 | | | | | | | | |
| Control Delay (s) | 3.6 | 0.4 | 10.2 | 10.7 | | | | | | | | |
| Lane LOS | A | A | B | B | | | | | | | | |
| Approach Delay (s) | 3.6 | 0.4 | 10.2 | 10.7 | | | | | | | | |
| Approach LOS | | | B | B | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 4.1 | | | | | | | | | |
| Intersection Capacity Utilization | | | 37.8% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis

2: Scotland St & McQueen Blvd

2039 Total Conditions
Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 62 | 13 | 11 | 270 | 386 | 23 |
| Future Volume (Veh/h) | 62 | 13 | 11 | 270 | 386 | 23 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 62 | 13 | 11 | 270 | 386 | 23 |
| 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 | 690 | 398 | 409 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 690 | 398 | 409 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 85 | 98 | 99 | | | |
| cM capacity (veh/h) | 407 | 652 | 1150 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 75 | 281 | 409 | | | |
| Volume Left | 62 | 11 | 0 | | | |
| Volume Right | 13 | 0 | 23 | | | |
| cSH | 436 | 1150 | 1700 | | | |
| Volume to Capacity | 0.17 | 0.01 | 0.24 | | | |
| Queue Length 95th (m) | 4.7 | 0.2 | 0.0 | | | |
| Control Delay (s) | 15.0 | 0.4 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 15.0 | 0.4 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.6 | | | |
| Intersection Capacity Utilization | | | 34.0% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2039 Total Conditions
Weekday AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|-------|------|-------|---------------------------|------|------|-------|-------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 89 | 24 | 364 | 137 | 56 | 79 | 183 | 918 | 53 | 69 | 869 | 28 |
| Future Volume (vph) | 89 | 24 | 364 | 137 | 56 | 79 | 183 | 918 | 53 | 69 | 869 | 28 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1699 | | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 |
| Flt Permitted | 0.67 | 1.00 | 1.00 | 0.74 | 1.00 | | 0.18 | 1.00 | 1.00 | 0.24 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1249 | 1863 | 1583 | 1381 | 1699 | | 329 | 3539 | 1583 | 442 | 3539 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 89 | 24 | 364 | 137 | 56 | 79 | 183 | 918 | 53 | 69 | 869 | 28 |
| RTOR Reduction (vph) | 0 | 0 | 310 | 0 | 68 | 0 | 0 | 0 | 31 | 0 | 0 | 18 |
| Lane Group Flow (vph) | 89 | 24 | 54 | 137 | 67 | 0 | 183 | 918 | 22 | 69 | 869 | 10 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | 2 | 6 | | 6 |
| Actuated Green, G (s) | 14.3 | 8.9 | 8.9 | 14.3 | 8.9 | | 32.2 | 25.1 | 25.1 | 26.0 | 22.0 | 22.0 |
| Effective Green, g (s) | 14.3 | 8.9 | 8.9 | 14.3 | 8.9 | | 32.2 | 25.1 | 25.1 | 26.0 | 22.0 | 22.0 |
| Actuated g/C Ratio | 0.23 | 0.14 | 0.14 | 0.23 | 0.14 | | 0.52 | 0.41 | 0.41 | 0.42 | 0.36 | 0.36 |
| Clearance Time (s) | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 336 | 270 | 229 | 355 | 246 | | 339 | 1446 | 647 | 273 | 1268 | 567 |
| v/s Ratio Prot | 0.02 | 0.01 | | c0.03 | 0.04 | | c0.06 | c0.26 | | 0.02 | 0.25 | |
| v/s Ratio Perm | 0.04 | | 0.03 | c0.06 | | | 0.22 | | 0.01 | 0.09 | | 0.01 |
| v/c Ratio | 0.26 | 0.09 | 0.23 | 0.39 | 0.27 | | 0.54 | 0.63 | 0.03 | 0.25 | 0.69 | 0.02 |
| Uniform Delay, d1 | 19.0 | 22.7 | 23.2 | 19.6 | 23.4 | | 9.3 | 14.5 | 10.9 | 10.9 | 16.8 | 12.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.4 | 0.1 | 0.5 | 0.7 | 0.6 | | 1.7 | 2.2 | 0.1 | 0.5 | 3.1 | 0.1 |
| Delay (s) | 19.4 | 22.9 | 23.8 | 20.3 | 24.0 | | 11.0 | 16.6 | 11.0 | 11.4 | 19.8 | 12.8 |
| Level of Service | B | C | C | C | C | | B | B | B | B | B | B |
| Approach Delay (s) | | 22.9 | | | 22.1 | | | 15.5 | | | 19.0 | |
| Approach LOS | | C | | | C | | | B | | | B | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 18.5 | HCM 2000 Level of Service | | | | B | | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.57 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 61.4 | Sum of lost time (s) | | | | 18.0 | | | | |
| Intersection Capacity Utilization | | | 65.8% | ICU Level of Service | | | | C | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

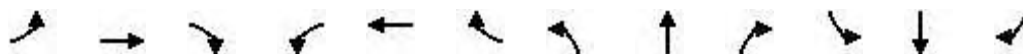
2039 Total Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 49 | 11 | 22 | 72 | 72 | 18 |
| Future Volume (Veh/h) | 49 | 11 | 22 | 72 | 72 | 18 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 49 | 11 | 22 | 72 | 72 | 18 |
| 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 | 197 | 81 | 90 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 197 | 81 | 90 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 94 | 99 | 99 | | | |
| cM capacity (veh/h) | 780 | 979 | 1505 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 60 | 94 | 90 | | | |
| Volume Left | 49 | 22 | 0 | | | |
| Volume Right | 11 | 0 | 18 | | | |
| cSH | 810 | 1505 | 1700 | | | |
| Volume to Capacity | 0.07 | 0.01 | 0.05 | | | |
| Queue Length 95th (m) | 1.8 | 0.3 | 0.0 | | | |
| Control Delay (s) | 9.8 | 1.8 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.8 | 1.8 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.1 | | | |
| Intersection Capacity Utilization | | | 21.7% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Unsignalized Intersection Capacity Analysis
 9: Future N/S Collector/McTavish Extension & Future E/W Collector

2039 Total Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 10 | 10 | 10 | 10 | 21 | 10 | 36 | 10 | 18 | 10 | 25 | 10 |
| Future Volume (vph) | 10 | 10 | 10 | 10 | 21 | 10 | 36 | 10 | 18 | 10 | 25 | 10 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 10 | 10 | 10 | 10 | 21 | 10 | 36 | 10 | 18 | 10 | 25 | 10 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|-----------------------|-------|-------|-------|-------|
| Volume Total (vph) | 30 | 41 | 64 | 45 |
| Volume Left (vph) | 10 | 10 | 36 | 10 |
| Volume Right (vph) | 10 | 10 | 18 | 10 |
| Hadj (s) | -0.10 | -0.06 | -0.02 | -0.05 |
| Departure Headway (s) | 4.1 | 4.1 | 4.1 | 4.1 |
| Degree Utilization, x | 0.03 | 0.05 | 0.07 | 0.05 |
| Capacity (veh/h) | 854 | 851 | 857 | 865 |
| Control Delay (s) | 7.2 | 7.3 | 7.4 | 7.3 |
| Approach Delay (s) | 7.2 | 7.3 | 7.4 | 7.3 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|-----------------------------------|-------|-----|------------------------|
| Delay | | 7.3 | |
| Level of Service | | A | |
| Intersection Capacity Utilization | 17.9% | | ICU Level of Service A |
| Analysis Period (min) | | 30 | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & New Collector Road/Commerical Access

2039 Total Conditions
 Weekday AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|-------|------|-------|------|------|------|---------------------------|-------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 161 | 10 | 107 | 49 | 10 | 30 | 76 | 971 | 36 | 72 | 978 | 114 |
| Future Volume (vph) | 161 | 10 | 107 | 49 | 10 | 30 | 76 | 971 | 36 | 72 | 978 | 114 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 0.86 | | 1.00 | 0.89 | | 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) | 1770 | 1607 | | 1770 | 1653 | | 1770 | 3520 | | 1770 | 3539 | 1583 |
| Flt Permitted | 0.73 | 1.00 | | 0.68 | 1.00 | | 0.22 | 1.00 | | 0.21 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1362 | 1607 | | 1270 | 1653 | | 417 | 3520 | | 396 | 3539 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 161 | 10 | 107 | 49 | 10 | 30 | 76 | 971 | 36 | 72 | 978 | 114 |
| RTOR Reduction (vph) | 0 | 87 | 0 | 0 | 25 | 0 | 0 | 4 | 0 | 0 | 0 | 59 |
| Lane Group Flow (vph) | 161 | 30 | 0 | 49 | 15 | 0 | 76 | 1003 | 0 | 72 | 978 | 55 |
| 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) | 9.6 | 9.6 | | 9.6 | 9.6 | | 28.9 | 25.2 | | 28.9 | 25.2 | 25.2 |
| Effective Green, g (s) | 9.6 | 9.6 | | 9.6 | 9.6 | | 28.9 | 25.2 | | 28.9 | 25.2 | 25.2 |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.55 | 0.48 | | 0.55 | 0.48 | 0.48 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 |
| 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) | 249 | 293 | | 232 | 302 | | 324 | 1689 | | 314 | 1698 | 759 |
| v/s Ratio Prot | | 0.02 | | | 0.01 | | c0.02 | c0.29 | | 0.02 | 0.28 | |
| v/s Ratio Perm | c0.12 | | | 0.04 | | | 0.11 | | | 0.11 | | 0.03 |
| v/c Ratio | 0.65 | 0.10 | | 0.21 | 0.05 | | 0.23 | 0.59 | | 0.23 | 0.58 | 0.07 |
| Uniform Delay, d1 | 19.9 | 17.9 | | 18.2 | 17.7 | | 5.9 | 9.9 | | 6.0 | 9.8 | 7.4 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 5.8 | 0.2 | | 0.5 | 0.1 | | 0.4 | 1.6 | | 0.4 | 1.4 | 0.2 |
| Delay (s) | 25.6 | 18.0 | | 18.7 | 17.8 | | 6.3 | 11.5 | | 6.4 | 11.2 | 7.5 |
| Level of Service | C | B | | B | B | | A | B | | A | B | A |
| Approach Delay (s) | | 22.4 | | | 18.3 | | | 11.1 | | | 10.6 | |
| Approach LOS | | C | | | B | | | B | | | B | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 12.3 | | | | HCM 2000 Level of Service | | | | B | |
| HCM 2000 Volume to Capacity ratio | | | 0.57 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 52.5 | | | | Sum of lost time (s) | | | 14.0 | | |
| Intersection Capacity Utilization | | | 61.1% | | | | ICU Level of Service | | | B | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 13: Tower St S & Future E/W Collector

2039 Total Conditions
 Weekday AM Peak Hour



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|-------|------|-------|-------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 154 | 290 | 821 | 91 | 129 | 1005 |
| Future Volume (vph) | 154 | 290 | 821 | 91 | 129 | 1005 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 4.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 3539 | 1583 | 1770 | 3539 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.24 | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 3539 | 1583 | 441 | 3539 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 154 | 290 | 821 | 91 | 129 | 1005 |
| RTOR Reduction (vph) | 0 | 235 | 0 | 51 | 0 | 0 |
| Lane Group Flow (vph) | 154 | 55 | 821 | 40 | 129 | 1005 |
| Turn Type | Perm | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 10.1 | 10.1 | 23.5 | 23.5 | 33.4 | 33.4 |
| Effective Green, g (s) | 10.1 | 10.1 | 23.5 | 23.5 | 33.4 | 33.4 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.44 | 0.44 | 0.62 | 0.62 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 4.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 334 | 298 | 1554 | 695 | 421 | 2209 |
| v/s Ratio Prot | | | c0.23 | | 0.03 | c0.28 |
| v/s Ratio Perm | c0.09 | 0.03 | | 0.03 | 0.16 | |
| v/c Ratio | 0.46 | 0.18 | 0.53 | 0.06 | 0.31 | 0.45 |
| Uniform Delay, d1 | 19.3 | 18.2 | 11.0 | 8.6 | 4.9 | 5.3 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.0 | 0.3 | 1.3 | 0.2 | 0.4 | 0.7 |
| Delay (s) | 20.3 | 18.5 | 12.2 | 8.8 | 5.3 | 6.0 |
| Level of Service | C | B | B | A | A | A |
| Approach Delay (s) | 19.1 | | 11.9 | | | 5.9 |
| Approach LOS | B | | B | | | A |




















Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 10.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.52 | | |
| Actuated Cycle Length (s) | 53.5 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 50.0% | ICU Level of Service | A |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

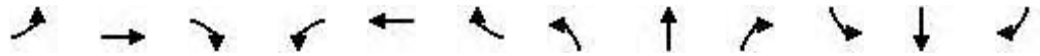
HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2039 Total Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  | |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|-----|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
| Lane Configurations |  |  | |  |  | | |  | | |  |  | |
| Traffic Volume (veh/h) | 10 | 160 | 100 | 36 | 223 | 10 | 59 | 20 | 68 | 10 | 30 | 10 | |
| Future Volume (Veh/h) | 10 | 160 | 100 | 36 | 223 | 10 | 59 | 20 | 68 | 10 | 30 | 10 | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Hourly flow rate (vph) | 10 | 160 | 100 | 36 | 223 | 10 | 59 | 20 | 68 | 10 | 30 | 10 | |
| Pedestrians | | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | | |
| Median type | | | | | | | | | | | | | |
| | TWLTL | | | | | TWLTL | | | | | | | |
| Median storage veh | 2 | | | | | 2 | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | | |
| vC, conflicting volume | 233 | | 260 | | | | 550 | | 535 | 210 | 558 | 580 | 228 |
| vC1, stage 1 conf vol | | | | | | | 230 | | 230 | | 300 | 300 | |
| vC2, stage 2 conf vol | | | | | | | 320 | | 305 | | 258 | 280 | |
| vCu, unblocked vol | 233 | | 260 | | | | 550 | | 535 | 210 | 558 | 580 | 228 |
| tC, single (s) | 4.1 | | 4.1 | | | | 7.1 | | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | 2.2 | | | | 3.5 | | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | 97 | | | | 90 | | 97 | 92 | 98 | 95 | 99 |
| cM capacity (veh/h) | 1335 | | 1304 | | | | 571 | | 574 | 830 | 549 | 552 | 811 |
| Direction, Lane # | | | | | | | | | | | | | |
| | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | | | | | | | |
| Volume Total | 10 | 260 | 36 | 233 | 147 | 50 | | | | | | | |
| Volume Left | 10 | 0 | 36 | 0 | 59 | 10 | | | | | | | |
| Volume Right | 0 | 100 | 0 | 10 | 68 | 10 | | | | | | | |
| cSH | 1335 | 1700 | 1304 | 1700 | 668 | 589 | | | | | | | |
| Volume to Capacity | 0.01 | 0.15 | 0.03 | 0.14 | 0.22 | 0.08 | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.6 | 0.0 | 6.4 | 2.1 | | | | | | | |
| Control Delay (s) | 7.7 | 0.0 | 7.8 | 0.0 | 11.9 | 11.7 | | | | | | | |
| Lane LOS | A | | A | | B | B | | | | | | | |
| Approach Delay (s) | 0.3 | | 1.0 | | 11.9 | 11.7 | | | | | | | |
| Approach LOS | | | | | B | B | | | | | | | |
| Intersection Summary | | | | | | | | | | | | | |
| Average Delay | | | 3.7 | | | | | | | | | | |
| Intersection Capacity Utilization | | | 43.0% | | | | ICU Level of Service | | A | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2039 Total Conditions
 Weekday AM Peak Hour



















| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|-------|------|------|-------|------|------|-------|-------|------|
| Lane Configurations | ↖ | ↗ | | ↖ | ↗ | | ↖ | ↕ | ↗ | ↖ | ↕ | |
| Traffic Volume (vph) | 75 | 17 | 202 | 120 | 21 | 22 | 94 | 785 | 51 | 17 | 1049 | 111 |
| Future Volume (vph) | 75 | 17 | 202 | 120 | 21 | 22 | 94 | 785 | 51 | 17 | 1049 | 111 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.86 | | 1.00 | 0.92 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1605 | | 1770 | 1720 | | 1770 | 3507 | | 1770 | 3488 | |
| Flt Permitted | 0.73 | 1.00 | | 0.38 | 1.00 | | 0.13 | 1.00 | | 0.32 | 1.00 | |
| Satd. Flow (perm) | 1358 | 1605 | | 703 | 1720 | | 235 | 3507 | | 592 | 3488 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 75 | 17 | 202 | 120 | 21 | 22 | 94 | 785 | 51 | 17 | 1049 | 111 |
| RTOR Reduction (vph) | 0 | 176 | 0 | 0 | 19 | 0 | 0 | 4 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 75 | 43 | 0 | 120 | 24 | 0 | 94 | 832 | 0 | 17 | 1152 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 13.3 | 9.3 | | 15.9 | 10.6 | | 43.5 | 38.2 | | 35.5 | 34.2 | |
| Effective Green, g (s) | 13.3 | 9.3 | | 15.9 | 10.6 | | 43.5 | 38.2 | | 35.5 | 34.2 | |
| Actuated g/C Ratio | 0.18 | 0.13 | | 0.22 | 0.15 | | 0.60 | 0.53 | | 0.49 | 0.47 | |
| Clearance Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 273 | 207 | | 233 | 252 | | 254 | 1858 | | 312 | 1654 | |
| v/s Ratio Prot | 0.02 | 0.03 | | c0.04 | 0.01 | | c0.03 | 0.24 | | 0.00 | c0.33 | |
| v/s Ratio Perm | 0.04 | | | c0.08 | | | 0.20 | | | 0.03 | | |
| v/c Ratio | 0.27 | 0.21 | | 0.52 | 0.10 | | 0.37 | 0.45 | | 0.05 | 0.70 | |
| Uniform Delay, d1 | 25.0 | 28.1 | | 23.7 | 26.6 | | 9.0 | 10.4 | | 9.4 | 14.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.5 | | 1.9 | 0.2 | | 0.9 | 0.8 | | 0.1 | 2.5 | |
| Delay (s) | 25.6 | 28.6 | | 25.6 | 26.8 | | 9.9 | 11.2 | | 9.5 | 17.3 | |
| Level of Service | C | C | | C | C | | A | B | | A | B | |
| Approach Delay (s) | | 27.8 | | | 25.9 | | | 11.1 | | | 17.2 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 16.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 72.1 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 73.4% | ICU Level of Service | D |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2039 Total Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 13 | 71 | 10 | 10 | 86 | 102 | 10 | 10 | 10 | 198 | 10 | 22 |
| Future Volume (Veh/h) | 13 | 71 | 10 | 10 | 86 | 102 | 10 | 10 | 10 | 198 | 10 | 22 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 13 | 71 | 10 | 10 | 86 | 102 | 10 | 10 | 10 | 198 | 10 | 22 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | TWLTL | | | | | | | |
| Median storage (veh) | | | | | 2 | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 188 | | | 81 | | | 286 | 310 | 76 | 274 | 264 | 137 |
| vC1, stage 1 conf vol | | | | | | | 102 | 102 | | 157 | 157 | |
| vC2, stage 2 conf vol | | | | | | | 184 | 208 | | 117 | 107 | |
| vCu, unblocked vol | 188 | | | 81 | | | 286 | 310 | 76 | 274 | 264 | 137 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 99 | | | 99 | 99 | 99 | 74 | 99 | 98 |
| cM capacity (veh/h) | 1386 | | | 1517 | | | 732 | 676 | 985 | 763 | 709 | 911 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 94 | 198 | 30 | 230 | | | | | | | | |
| Volume Left | 13 | 10 | 10 | 198 | | | | | | | | |
| Volume Right | 10 | 102 | 10 | 22 | | | | | | | | |
| cSH | 1386 | 1517 | 777 | 773 | | | | | | | | |
| Volume to Capacity | 0.01 | 0.01 | 0.04 | 0.30 | | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.2 | 0.9 | 9.6 | | | | | | | | |
| Control Delay (s) | 1.1 | 0.4 | 9.8 | 11.6 | | | | | | | | |
| Lane LOS | A | A | A | B | | | | | | | | |
| Approach Delay (s) | 1.1 | 0.4 | 9.8 | 11.6 | | | | | | | | |
| Approach LOS | | | A | B | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 5.7 | | | | | | | | | |
| Intersection Capacity Utilization | | | 38.7% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
2: Scotland St & McQueen Blvd

2039 Total Conditions
Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 30 | 11 | 11 | 256 | 168 | 45 |
| Future Volume (Veh/h) | 30 | 11 | 11 | 256 | 168 | 45 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 30 | 11 | 11 | 256 | 168 | 45 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 468 | 190 | 213 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 468 | 190 | 213 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 99 | 99 | | | |
| cM capacity (veh/h) | 549 | 851 | 1357 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 41 | 267 | 213 | | | |
| Volume Left | 30 | 11 | 0 | | | |
| Volume Right | 11 | 0 | 45 | | | |
| cSH | 606 | 1357 | 1700 | | | |
| Volume to Capacity | 0.07 | 0.01 | 0.13 | | | |
| Queue Length 95th (m) | 1.7 | 0.2 | 0.0 | | | |
| Control Delay (s) | 11.4 | 0.4 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 11.4 | 0.4 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.1 | | | |
| Intersection Capacity Utilization | | | 32.4% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2039 Total Conditions
Weekday PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 87 | 68 | 301 | 137 | 56 | 79 | 350 | 1294 | 195 | 216 | 1406 | 92 |
| Future Volume (vph) | 87 | 68 | 301 | 137 | 56 | 79 | 350 | 1294 | 195 | 216 | 1406 | 92 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 5.0 | 5.0 | 3.0 | 5.0 | | 3.0 | 5.0 | 5.0 | 3.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1699 | | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 |
| Flt Permitted | 0.61 | 1.00 | 1.00 | 0.62 | 1.00 | | 0.07 | 1.00 | 1.00 | 0.15 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1134 | 1863 | 1583 | 1154 | 1699 | | 130 | 3539 | 1583 | 280 | 3539 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 87 | 68 | 301 | 137 | 56 | 79 | 350 | 1294 | 195 | 216 | 1406 | 92 |
| RTOR Reduction (vph) | 0 | 0 | 269 | 0 | 44 | 0 | 0 | 0 | 37 | 0 | 0 | 47 |
| Lane Group Flow (vph) | 87 | 68 | 32 | 137 | 91 | 0 | 350 | 1294 | 158 | 216 | 1406 | 45 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | 2 | 6 | | 6 |
| Actuated Green, G (s) | 18.2 | 12.0 | 12.0 | 21.8 | 13.8 | | 78.3 | 62.7 | 62.7 | 66.8 | 54.2 | 54.2 |
| Effective Green, g (s) | 18.2 | 12.0 | 12.0 | 21.8 | 13.8 | | 78.3 | 62.7 | 62.7 | 66.8 | 54.2 | 54.2 |
| Actuated g/C Ratio | 0.16 | 0.11 | 0.11 | 0.20 | 0.12 | | 0.70 | 0.56 | 0.56 | 0.60 | 0.49 | 0.49 |
| Clearance Time (s) | 3.0 | 5.0 | 5.0 | 3.0 | 5.0 | | 3.0 | 5.0 | 5.0 | 3.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 220 | 200 | 170 | 270 | 210 | | 402 | 1993 | 891 | 336 | 1723 | 770 |
| v/s Ratio Prot | 0.02 | 0.04 | | c0.04 | 0.05 | | c0.16 | 0.37 | | 0.07 | 0.40 | |
| v/s Ratio Perm | 0.04 | | 0.02 | c0.06 | | | c0.45 | | 0.10 | 0.31 | | 0.03 |
| v/c Ratio | 0.40 | 0.34 | 0.19 | 0.51 | 0.43 | | 0.87 | 0.65 | 0.18 | 0.64 | 0.82 | 0.06 |
| Uniform Delay, d1 | 41.0 | 46.0 | 45.2 | 39.0 | 45.1 | | 33.6 | 16.7 | 11.8 | 12.7 | 24.3 | 15.1 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.2 | 1.0 | 0.5 | 1.5 | 1.4 | | 20.3 | 1.7 | 0.4 | 4.2 | 4.5 | 0.1 |
| Delay (s) | 42.1 | 47.0 | 45.8 | 40.5 | 46.6 | | 54.0 | 18.4 | 12.2 | 16.9 | 28.8 | 15.2 |
| Level of Service | D | D | D | D | D | | D | B | B | B | C | B |
| Approach Delay (s) | | 45.3 | | | 43.5 | | | 24.5 | | | 26.6 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | |
|-----------------------------------|-------|-----------------------------|
| HCM 2000 Control Delay | 28.8 | HCM 2000 Level of Service C |
| HCM 2000 Volume to Capacity ratio | 0.83 | |
| Actuated Cycle Length (s) | 111.3 | Sum of lost time (s) 16.0 |
| Intersection Capacity Utilization | 86.9% | ICU Level of Service E |
| Analysis Period (min) | 30 | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

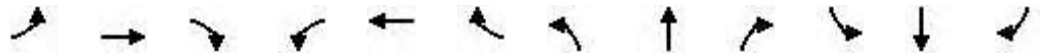
2039 Total Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 28 | 10 | 30 | 154 | 68 | 17 |
| Future Volume (Veh/h) | 28 | 10 | 30 | 154 | 68 | 17 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 28 | 10 | 30 | 154 | 68 | 17 |
| 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 | 290 | 76 | 85 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 290 | 76 | 85 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 96 | 99 | 98 | | | |
| cM capacity (veh/h) | 686 | 985 | 1512 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 38 | 184 | 85 | | | |
| Volume Left | 28 | 30 | 0 | | | |
| Volume Right | 10 | 0 | 17 | | | |
| cSH | 746 | 1512 | 1700 | | | |
| Volume to Capacity | 0.05 | 0.02 | 0.05 | | | |
| Queue Length 95th (m) | 1.2 | 0.5 | 0.0 | | | |
| Control Delay (s) | 10.1 | 1.3 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 10.1 | 1.3 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 2.1 | | | |
| Intersection Capacity Utilization | | | 26.4% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Unsignalized Intersection Capacity Analysis
 9: Future N/S Collector/McTavish Extension & Future E/W Collector

2039 Total Conditions
 Weekday PM Peak Hour



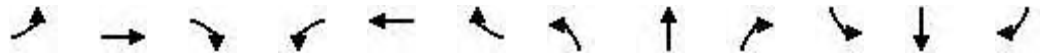
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 10 | 23 | 10 | 20 | 14 | 10 | 24 | 10 | 12 | 10 | 10 | 10 |
| Future Volume (vph) | 10 | 23 | 10 | 20 | 14 | 10 | 24 | 10 | 12 | 10 | 10 | 10 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 10 | 23 | 10 | 20 | 14 | 10 | 24 | 10 | 12 | 10 | 10 | 10 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|-----------------------|-------|-------|-------|-------|
| Volume Total (vph) | 43 | 44 | 46 | 30 |
| Volume Left (vph) | 10 | 20 | 24 | 10 |
| Volume Right (vph) | 10 | 10 | 12 | 10 |
| Hadj (s) | -0.06 | -0.01 | -0.02 | -0.10 |
| Departure Headway (s) | 4.0 | 4.1 | 4.1 | 4.0 |
| Degree Utilization, x | 0.05 | 0.05 | 0.05 | 0.03 |
| Capacity (veh/h) | 866 | 858 | 849 | 868 |
| Control Delay (s) | 7.3 | 7.3 | 7.3 | 7.2 |
| Approach Delay (s) | 7.3 | 7.3 | 7.3 | 7.2 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|-----------------------------------|-------|-----|------------------------|
| Delay | | 7.3 | |
| Level of Service | | A | |
| Intersection Capacity Utilization | 15.4% | | ICU Level of Service A |
| Analysis Period (min) | | 30 | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & New Collector Road/Commerical Access

2039 Total Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|-------|------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 321 | 10 | 214 | 67 | 10 | 128 | 229 | 1370 | 90 | 117 | 1312 | 344 |
| Future Volume (vph) | 321 | 10 | 214 | 67 | 10 | 128 | 229 | 1370 | 90 | 117 | 1312 | 344 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 0.86 | | 1.00 | 0.86 | | 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) | 1770 | 1596 | | 1770 | 1604 | | 1770 | 3506 | | 1770 | 3539 | 1583 |
| Flt Permitted | 0.64 | 1.00 | | 0.50 | 1.00 | | 0.08 | 1.00 | | 0.08 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1194 | 1596 | | 938 | 1604 | | 151 | 3506 | | 147 | 3539 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 321 | 10 | 214 | 67 | 10 | 128 | 229 | 1370 | 90 | 117 | 1312 | 344 |
| RTOR Reduction (vph) | 0 | 142 | 0 | 0 | 91 | 0 | 0 | 4 | 0 | 0 | 0 | 119 |
| Lane Group Flow (vph) | 321 | 82 | 0 | 67 | 47 | 0 | 229 | 1456 | 0 | 117 | 1312 | 225 |
| 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) | 31.2 | 31.2 | | 31.2 | 31.2 | | 65.9 | 55.2 | | 58.5 | 50.8 | 50.8 |
| Effective Green, g (s) | 31.2 | 31.2 | | 31.2 | 31.2 | | 65.9 | 55.2 | | 58.5 | 50.8 | 50.8 |
| Actuated g/C Ratio | 0.29 | 0.29 | | 0.29 | 0.29 | | 0.62 | 0.52 | | 0.55 | 0.47 | 0.47 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | 5.0 |
| 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) | 347 | 464 | | 273 | 467 | | 275 | 1807 | | 196 | 1678 | 750 |
| v/s Ratio Prot | | 0.05 | | | 0.03 | | c0.09 | 0.42 | | 0.04 | 0.37 | |
| v/s Ratio Perm | c0.27 | | | 0.07 | | | c0.42 | | | 0.28 | | 0.14 |
| v/c Ratio | 0.93 | 0.18 | | 0.25 | 0.10 | | 0.83 | 0.81 | | 0.60 | 0.78 | 0.30 |
| Uniform Delay, d1 | 36.8 | 28.4 | | 29.0 | 27.7 | | 27.5 | 21.5 | | 17.8 | 23.5 | 17.3 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 36.3 | 0.2 | | 0.5 | 0.1 | | 20.8 | 4.0 | | 4.9 | 3.8 | 1.0 |
| Delay (s) | 73.1 | 28.5 | | 29.4 | 27.8 | | 48.4 | 25.5 | | 22.7 | 27.3 | 18.3 |
| Level of Service | E | C | | C | C | | D | C | | C | C | B |
| Approach Delay (s) | | 54.8 | | | 28.3 | | | 28.6 | | | 25.2 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Intersection Summary | | |
|-----------------------------------|-------|-----------------------------|
| HCM 2000 Control Delay | 30.6 | HCM 2000 Level of Service C |
| HCM 2000 Volume to Capacity ratio | 0.88 | |
| Actuated Cycle Length (s) | 107.1 | Sum of lost time (s) 13.0 |
| Intersection Capacity Utilization | 91.0% | ICU Level of Service F |
| Analysis Period (min) | 30 | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 13: Tower St S & Future E/W Collector

2039 Total Conditions
 Weekday PM Peak Hour



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|-------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 177 | 305 | 1453 | 273 | 404 | 1189 |
| Future Volume (vph) | 177 | 305 | 1453 | 273 | 404 | 1189 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 3.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 3539 | 1583 | 1770 | 3539 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.08 | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 3539 | 1583 | 143 | 3539 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 177 | 305 | 1453 | 273 | 404 | 1189 |
| RTOR Reduction (vph) | 0 | 265 | 0 | 103 | 0 | 0 |
| Lane Group Flow (vph) | 177 | 40 | 1453 | 170 | 404 | 1189 |
| Turn Type | Perm | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 15.6 | 15.6 | 63.2 | 63.2 | 92.1 | 92.1 |
| Effective Green, g (s) | 15.6 | 15.6 | 63.2 | 63.2 | 92.1 | 92.1 |
| Actuated g/C Ratio | 0.13 | 0.13 | 0.54 | 0.54 | 0.78 | 0.78 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 3.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 234 | 209 | 1900 | 850 | 469 | 2769 |
| v/s Ratio Prot | | | 0.41 | | c0.19 | 0.34 |
| v/s Ratio Perm | c0.10 | 0.03 | | 0.11 | c0.48 | |
| v/c Ratio | 0.76 | 0.19 | 0.76 | 0.20 | 0.86 | 0.43 |
| Uniform Delay, d1 | 49.2 | 45.4 | 21.4 | 14.1 | 33.8 | 4.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 13.7 | 0.5 | 3.0 | 0.5 | 16.4 | 0.5 |
| Delay (s) | 62.9 | 45.9 | 24.4 | 14.7 | 50.2 | 4.7 |
| Level of Service | E | D | C | B | D | A |
| Approach Delay (s) | 52.2 | | 22.9 | | | 16.2 |
| Approach LOS | D | | C | | | B |




















Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 23.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.86 | | |
| Actuated Cycle Length (s) | 117.7 | Sum of lost time (s) | 13.0 |
| Intersection Capacity Utilization | 84.0% | ICU Level of Service | E |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

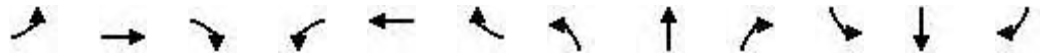
HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2039 Total Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  | |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|-----|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
| Lane Configurations |  |  | |  |  | | |  | | |  |  | |
| Traffic Volume (veh/h) | 10 | 315 | 87 | 80 | 317 | 10 | 143 | 87 | 57 | 10 | 34 | 10 | |
| Future Volume (Veh/h) | 10 | 315 | 87 | 80 | 317 | 10 | 143 | 87 | 57 | 10 | 34 | 10 | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Hourly flow rate (vph) | 10 | 315 | 87 | 80 | 317 | 10 | 143 | 87 | 57 | 10 | 34 | 10 | |
| Pedestrians | | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | | |
| Median type | | | | | | | | | | | | | |
| | TWLTL | | | | | TWLTL | | | | | | | |
| Median storage veh | 2 | | | | | 2 | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | | |
| vC, conflicting volume | 327 | | 402 | | | | 882 | | 866 | 358 | 918 | 904 | 322 |
| vC1, stage 1 conf vol | | | | | | | 378 | | 378 | | 482 | 482 | |
| vC2, stage 2 conf vol | | | | | | | 504 | | 487 | | 436 | 422 | |
| vCu, unblocked vol | 327 | | 402 | | | | 882 | | 866 | 358 | 918 | 904 | 322 |
| tC, single (s) | 4.1 | | 4.1 | | | | 7.1 | | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | 2.2 | | | | 3.5 | | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | 93 | | | | 65 | | 80 | 92 | 97 | 92 | 99 |
| cM capacity (veh/h) | 1233 | | 1157 | | | | 413 | | 441 | 686 | 342 | 414 | 719 |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | | | | | | | |
| Volume Total | 10 | 402 | 80 | 327 | 287 | 54 | | | | | | | |
| Volume Left | 10 | 0 | 80 | 0 | 143 | 10 | | | | | | | |
| Volume Right | 0 | 87 | 0 | 10 | 57 | 10 | | | | | | | |
| cSH | 1233 | 1700 | 1157 | 1700 | 458 | 431 | | | | | | | |
| Volume to Capacity | 0.01 | 0.24 | 0.07 | 0.19 | 0.63 | 0.13 | | | | | | | |
| Queue Length 95th (m) | 0.2 | 0.0 | 1.7 | 0.0 | 34.6 | 3.2 | | | | | | | |
| Control Delay (s) | 7.9 | 0.0 | 8.3 | 0.0 | 25.6 | 14.5 | | | | | | | |
| Lane LOS | A | | A | | D | B | | | | | | | |
| Approach Delay (s) | 0.2 | | 1.6 | | 25.6 | 14.5 | | | | | | | |
| Approach LOS | | | | | D | B | | | | | | | |
| Intersection Summary | | | | | | | | | | | | | |
| Average Delay | | | 7.7 | | | | | | | | | | |
| Intersection Capacity Utilization | | | 58.9% | | | | ICU Level of Service | | B | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2039 Total Conditions
 Weekday PM Peak Hour



















| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 126 | 13 | 140 | 96 | 35 | 50 | 251 | 1451 | 138 | 34 | 1220 | 132 |
| Future Volume (vph) | 126 | 13 | 140 | 96 | 35 | 50 | 251 | 1451 | 138 | 34 | 1220 | 132 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.86 | | 1.00 | 0.91 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1607 | | 1770 | 1698 | | 1770 | 3493 | | 1770 | 3487 | |
| Flt Permitted | 0.68 | 1.00 | | 0.55 | 1.00 | | 0.09 | 1.00 | | 0.10 | 1.00 | |
| Satd. Flow (perm) | 1261 | 1607 | | 1024 | 1698 | | 177 | 3493 | | 190 | 3487 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 126 | 13 | 140 | 96 | 35 | 50 | 251 | 1451 | 138 | 34 | 1220 | 132 |
| RTOR Reduction (vph) | 0 | 125 | 0 | 0 | 45 | 0 | 0 | 6 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 126 | 28 | 0 | 96 | 40 | 0 | 251 | 1583 | 0 | 34 | 1344 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 15.4 | 8.5 | | 14.8 | 8.2 | | 52.2 | 46.5 | | 41.9 | 39.2 | |
| Effective Green, g (s) | 15.4 | 8.5 | | 14.8 | 8.2 | | 52.2 | 46.5 | | 41.9 | 39.2 | |
| Actuated g/C Ratio | 0.19 | 0.11 | | 0.18 | 0.10 | | 0.65 | 0.58 | | 0.52 | 0.49 | |
| Clearance Time (s) | 3.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 285 | 170 | | 250 | 173 | | 313 | 2022 | | 152 | 1702 | |
| v/s Ratio Prot | c0.04 | 0.02 | | 0.03 | 0.02 | | c0.10 | 0.45 | | 0.01 | 0.39 | |
| v/s Ratio Perm | c0.05 | | | 0.04 | | | c0.42 | | | 0.11 | | |
| v/c Ratio | 0.44 | 0.16 | | 0.38 | 0.23 | | 0.80 | 0.78 | | 0.22 | 0.79 | |
| Uniform Delay, d1 | 28.2 | 32.7 | | 28.3 | 33.2 | | 18.9 | 13.0 | | 11.4 | 17.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.1 | 0.5 | | 1.0 | 0.7 | | 14.6 | 3.2 | | 0.7 | 3.9 | |
| Delay (s) | 29.3 | 33.1 | | 29.2 | 33.8 | | 33.5 | 16.2 | | 12.1 | 21.0 | |
| Level of Service | C | C | | C | C | | C | B | | B | C | |
| Approach Delay (s) | | 31.4 | | | 31.4 | | | 18.5 | | | 20.8 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 21.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 80.3 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 82.0% | ICU Level of Service | E |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2039 Total Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 71 | 77 | 10 | 10 | 83 | 261 | 10 | 10 | 10 | 148 | 11 | 23 |
| Future Volume (Veh/h) | 71 | 77 | 10 | 10 | 83 | 261 | 10 | 10 | 10 | 148 | 11 | 23 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 71 | 77 | 10 | 10 | 83 | 261 | 10 | 10 | 10 | 148 | 11 | 23 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | TWLTL | | | | | | | |
| Median storage (veh) | | | | | 2 | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 344 | | | 87 | | | 486 | 588 | 82 | 472 | 462 | 214 |
| vC1, stage 1 conf vol | | | | | | | 224 | 224 | | 234 | 234 | |
| vC2, stage 2 conf vol | | | | | | | 262 | 364 | | 239 | 229 | |
| vCu, unblocked vol | 344 | | | 87 | | | 486 | 588 | 82 | 472 | 462 | 214 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 94 | | | 99 | | | 98 | 98 | 99 | 76 | 98 | 97 |
| cM capacity (veh/h) | 1215 | | | 1509 | | | 582 | 511 | 978 | 621 | 595 | 827 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 158 | 354 | 30 | 182 | | | | | | | | |
| Volume Left | 71 | 10 | 10 | 148 | | | | | | | | |
| Volume Right | 10 | 261 | 10 | 23 | | | | | | | | |
| cSH | 1215 | 1509 | 639 | 639 | | | | | | | | |
| Volume to Capacity | 0.06 | 0.01 | 0.05 | 0.28 | | | | | | | | |
| Queue Length 95th (m) | 1.4 | 0.2 | 1.1 | 9.0 | | | | | | | | |
| Control Delay (s) | 3.9 | 0.3 | 10.9 | 12.9 | | | | | | | | |
| Lane LOS | A | A | B | B | | | | | | | | |
| Approach Delay (s) | 3.9 | 0.3 | 10.9 | 12.9 | | | | | | | | |
| Approach LOS | | | B | B | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 4.7 | | | | | | | | | |
| Intersection Capacity Utilization | | | 56.4% | | ICU Level of Service | | | | | B | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
2: Scotland St & McQueen Blvd

2049 Total Conditions
Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 64 | 20 | 20 | 292 | 425 | 25 |
| Future Volume (Veh/h) | 64 | 20 | 20 | 292 | 425 | 25 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 64 | 20 | 20 | 292 | 425 | 25 |
| 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 | 770 | 438 | 450 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 770 | 438 | 450 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 82 | 97 | 98 | | | |
| cM capacity (veh/h) | 362 | 619 | 1110 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 84 | 312 | 450 | | | |
| Volume Left | 64 | 20 | 0 | | | |
| Volume Right | 20 | 0 | 25 | | | |
| cSH | 402 | 1110 | 1700 | | | |
| Volume to Capacity | 0.21 | 0.02 | 0.26 | | | |
| Queue Length 95th (m) | 6.0 | 0.4 | 0.0 | | | |
| Control Delay (s) | 16.3 | 0.7 | 0.0 | | | |
| Lane LOS | C | A | | | | |
| Approach Delay (s) | 16.3 | 0.7 | 0.0 | | | |
| Approach LOS | C | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.9 | | | |
| Intersection Capacity Utilization | | | 43.2% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

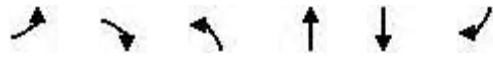
2049 Total Conditions
Weekday AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|-------|------|-------|-------|------|---------------------------|-------|-------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 90 | 25 | 392 | 145 | 58 | 83 | 184 | 969 | 56 | 75 | 916 | 29 |
| Future Volume (vph) | 90 | 25 | 392 | 145 | 58 | 83 | 184 | 969 | 56 | 75 | 916 | 29 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1698 | | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 |
| Flt Permitted | 0.67 | 1.00 | 1.00 | 0.74 | 1.00 | | 0.16 | 1.00 | 1.00 | 0.21 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1243 | 1863 | 1583 | 1380 | 1698 | | 295 | 3539 | 1583 | 390 | 3539 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 90 | 25 | 392 | 145 | 58 | 83 | 184 | 969 | 56 | 75 | 916 | 29 |
| RTOR Reduction (vph) | 0 | 0 | 301 | 0 | 70 | 0 | 0 | 0 | 33 | 0 | 0 | 19 |
| Lane Group Flow (vph) | 90 | 25 | 91 | 145 | 71 | 0 | 184 | 969 | 23 | 75 | 916 | 10 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | 2 | 6 | | 6 |
| Actuated Green, G (s) | 15.1 | 9.7 | 9.7 | 15.1 | 9.7 | | 32.4 | 25.3 | 25.3 | 26.0 | 22.1 | 22.1 |
| Effective Green, g (s) | 15.1 | 9.7 | 9.7 | 15.1 | 9.7 | | 32.4 | 25.3 | 25.3 | 26.0 | 22.1 | 22.1 |
| Actuated g/C Ratio | 0.24 | 0.16 | 0.16 | 0.24 | 0.16 | | 0.52 | 0.41 | 0.41 | 0.42 | 0.35 | 0.35 |
| Clearance Time (s) | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 346 | 290 | 246 | 368 | 264 | | 321 | 1437 | 642 | 249 | 1255 | 561 |
| v/s Ratio Prot | 0.02 | 0.01 | | c0.03 | 0.04 | | c0.07 | c0.27 | | 0.02 | 0.26 | |
| v/s Ratio Perm | 0.04 | | 0.06 | c0.06 | | | 0.23 | | 0.01 | 0.11 | | 0.01 |
| v/c Ratio | 0.26 | 0.09 | 0.37 | 0.39 | 0.27 | | 0.57 | 0.67 | 0.04 | 0.30 | 0.73 | 0.02 |
| Uniform Delay, d1 | 18.8 | 22.5 | 23.6 | 19.5 | 23.2 | | 9.9 | 15.1 | 11.1 | 11.4 | 17.5 | 13.1 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.4 | 0.1 | 1.0 | 0.7 | 0.6 | | 2.5 | 2.6 | 0.1 | 0.7 | 3.8 | 0.1 |
| Delay (s) | 19.2 | 22.6 | 24.5 | 20.2 | 23.7 | | 12.4 | 17.7 | 11.3 | 12.1 | 21.3 | 13.1 |
| Level of Service | B | C | C | C | C | | B | B | B | B | C | B |
| Approach Delay (s) | | 23.5 | | | 21.9 | | | 16.6 | | | 20.4 | |
| Approach LOS | | C | | | C | | | B | | | C | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 19.5 | | | HCM 2000 Level of Service | | | B | | | |
| HCM 2000 Volume to Capacity ratio | | | 0.60 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 62.3 | | | Sum of lost time (s) | | 18.0 | | | | |
| Intersection Capacity Utilization | | | 69.3% | | | ICU Level of Service | | | C | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

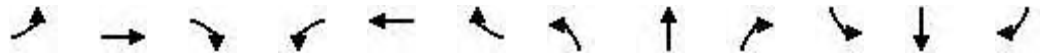
2049 Total Conditions
 Weekday AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 54 | 20 | 24 | 79 | 79 | 20 |
| Future Volume (Veh/h) | 54 | 20 | 24 | 79 | 79 | 20 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 54 | 20 | 24 | 79 | 79 | 20 |
| 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 | 216 | 89 | 99 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 216 | 89 | 99 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 93 | 98 | 98 | | | |
| cM capacity (veh/h) | 760 | 969 | 1494 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 74 | 103 | 99 | | | |
| Volume Left | 54 | 24 | 0 | | | |
| Volume Right | 20 | 0 | 20 | | | |
| cSH | 807 | 1494 | 1700 | | | |
| Volume to Capacity | 0.09 | 0.02 | 0.06 | | | |
| Queue Length 95th (m) | 2.3 | 0.4 | 0.0 | | | |
| Control Delay (s) | 9.9 | 1.8 | 0.0 | | | |
| Lane LOS | A | A | | | | |
| Approach Delay (s) | 9.9 | 1.8 | 0.0 | | | |
| Approach LOS | A | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.3 | | | |
| Intersection Capacity Utilization | | | 23.0% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Unsignalized Intersection Capacity Analysis
 9: Future N/S Collector/McTavish Extension & Future E/W Collector

2049 Total Conditions
 Weekday AM Peak Hour



| 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 | 20 | 20 | 20 | 21 | 20 | 36 | 20 | 20 | 20 | 25 | 20 |
| Future Volume (vph) | 20 | 20 | 20 | 20 | 21 | 20 | 36 | 20 | 20 | 20 | 25 | 20 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 20 | 20 | 20 | 20 | 21 | 20 | 36 | 20 | 20 | 20 | 25 | 20 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total (vph) | 60 | 61 | 76 | 65 | | | | | | | | |
| Volume Left (vph) | 20 | 20 | 36 | 20 | | | | | | | | |
| Volume Right (vph) | 20 | 20 | 20 | 20 | | | | | | | | |
| Hadj (s) | -0.10 | -0.10 | -0.03 | -0.09 | | | | | | | | |
| Departure Headway (s) | 4.2 | 4.2 | 4.2 | 4.2 | | | | | | | | |
| Degree Utilization, x | 0.07 | 0.07 | 0.09 | 0.07 | | | | | | | | |
| Capacity (veh/h) | 828 | 828 | 823 | 836 | | | | | | | | |
| Control Delay (s) | 7.5 | 7.5 | 7.6 | 7.5 | | | | | | | | |
| Approach Delay (s) | 7.5 | 7.5 | 7.6 | 7.5 | | | | | | | | |
| Approach LOS | A | A | A | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Delay | | | 7.5 | | | | | | | | | |
| Level of Service | | | A | | | | | | | | | |
| Intersection Capacity Utilization | | | 18.0% | ICU Level of Service | A | | | | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & New Collector Road/Commerical Access

2049 Total Conditions
 Weekday AM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|-------|------|-------|------|------|------|---------------------------|-------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 161 | 20 | 107 | 54 | 20 | 33 | 76 | 1024 | 40 | 80 | 1035 | 114 |
| Future Volume (vph) | 161 | 20 | 107 | 54 | 20 | 33 | 76 | 1024 | 40 | 80 | 1035 | 114 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 0.87 | | 1.00 | 0.91 | | 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) | 1770 | 1627 | | 1770 | 1689 | | 1770 | 3519 | | 1770 | 3539 | 1583 |
| Flt Permitted | 0.72 | 1.00 | | 0.68 | 1.00 | | 0.20 | 1.00 | | 0.19 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1346 | 1627 | | 1258 | 1689 | | 375 | 3519 | | 354 | 3539 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 161 | 20 | 107 | 54 | 20 | 33 | 76 | 1024 | 40 | 80 | 1035 | 114 |
| RTOR Reduction (vph) | 0 | 87 | 0 | 0 | 27 | 0 | 0 | 4 | 0 | 0 | 0 | 59 |
| Lane Group Flow (vph) | 161 | 40 | 0 | 54 | 26 | 0 | 76 | 1060 | 0 | 80 | 1035 | 55 |
| 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) | 9.7 | 9.7 | | 9.7 | 9.7 | | 28.9 | 25.2 | | 28.9 | 25.2 | 25.2 |
| Effective Green, g (s) | 9.7 | 9.7 | | 9.7 | 9.7 | | 28.9 | 25.2 | | 28.9 | 25.2 | 25.2 |
| Actuated g/C Ratio | 0.18 | 0.18 | | 0.18 | 0.18 | | 0.55 | 0.48 | | 0.55 | 0.48 | 0.48 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 |
| 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) | 248 | 300 | | 231 | 311 | | 304 | 1685 | | 294 | 1695 | 758 |
| v/s Ratio Prot | | 0.02 | | | 0.02 | | 0.02 | c0.30 | | c0.02 | 0.29 | |
| v/s Ratio Perm | c0.12 | | | 0.04 | | | 0.12 | | | 0.13 | | 0.03 |
| v/c Ratio | 0.65 | 0.13 | | 0.23 | 0.08 | | 0.25 | 0.63 | | 0.27 | 0.61 | 0.07 |
| Uniform Delay, d1 | 19.9 | 17.9 | | 18.3 | 17.8 | | 6.1 | 10.2 | | 6.2 | 10.1 | 7.4 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 5.9 | 0.2 | | 0.5 | 0.1 | | 0.4 | 1.8 | | 0.5 | 1.7 | 0.2 |
| Delay (s) | 25.7 | 18.1 | | 18.8 | 17.9 | | 6.5 | 12.0 | | 6.7 | 11.7 | 7.6 |
| Level of Service | C | B | | B | B | | A | B | | A | B | A |
| Approach Delay (s) | | 22.4 | | | 18.3 | | | 11.7 | | | 11.0 | |
| Approach LOS | | C | | | B | | | B | | | B | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 12.8 | | | | HCM 2000 Level of Service | | | | B | |
| HCM 2000 Volume to Capacity ratio | | | 0.60 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 52.6 | | | | Sum of lost time (s) | | | 14.0 | | |
| Intersection Capacity Utilization | | | 66.0% | | | | ICU Level of Service | | | C | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 13: Tower St S & Future E/W Collector

2049 Total Conditions
 Weekday AM Peak Hour



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|-------|------|-------|-------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 154 | 290 | 878 | 91 | 129 | 1067 |
| Future Volume (vph) | 154 | 290 | 878 | 91 | 129 | 1067 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 4.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 3539 | 1583 | 1770 | 3539 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.21 | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 3539 | 1583 | 397 | 3539 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 154 | 290 | 878 | 91 | 129 | 1067 |
| RTOR Reduction (vph) | 0 | 235 | 0 | 51 | 0 | 0 |
| Lane Group Flow (vph) | 154 | 55 | 878 | 40 | 129 | 1067 |
| Turn Type | Perm | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 10.1 | 10.1 | 23.5 | 23.5 | 33.4 | 33.4 |
| Effective Green, g (s) | 10.1 | 10.1 | 23.5 | 23.5 | 33.4 | 33.4 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.44 | 0.44 | 0.62 | 0.62 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 4.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 334 | 298 | 1554 | 695 | 399 | 2209 |
| v/s Ratio Prot | | | c0.25 | | 0.04 | c0.30 |
| v/s Ratio Perm | c0.09 | 0.03 | | 0.03 | 0.17 | |
| v/c Ratio | 0.46 | 0.18 | 0.56 | 0.06 | 0.32 | 0.48 |
| Uniform Delay, d1 | 19.3 | 18.2 | 11.2 | 8.6 | 5.1 | 5.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.0 | 0.3 | 1.5 | 0.2 | 0.5 | 0.8 |
| Delay (s) | 20.3 | 18.5 | 12.7 | 8.8 | 5.6 | 6.2 |
| Level of Service | C | B | B | A | A | A |
| Approach Delay (s) | 19.1 | | 12.3 | | | 6.1 |
| Approach LOS | B | | B | | | A |




















Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 10.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.54 | | |
| Actuated Cycle Length (s) | 53.5 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 51.6% | ICU Level of Service | A |
| Analysis Period (min) | 30 | | |

c Critical Lane Group























HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2049 Total Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  | | | | |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|-----|--|-----|--|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | | | | |
| Lane Configurations |  |  | |  |  | | |  | | |  |  | | | | |
| Traffic Volume (veh/h) | 20 | 166 | 106 | 36 | 223 | 20 | 59 | 23 | 68 | 20 | 33 | 20 | | | | |
| Future Volume (Veh/h) | 20 | 166 | 106 | 36 | 223 | 20 | 59 | 23 | 68 | 20 | 33 | 20 | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | | | | | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | | | | | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | |
| Hourly flow rate (vph) | 20 | 166 | 106 | 36 | 223 | 20 | 59 | 23 | 68 | 20 | 33 | 20 | | | | |
| Pedestrians | | | | | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | | | | | |
| Median type | TWLTL | | | | TWLTL | | | | | | | | | | | |
| Median storage veh | 2 | | | | 2 | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | | | | | |
| vC, conflicting volume | 243 | | 272 | | 590 | | 574 | | 219 | | 590 | | 617 | | 233 | |
| vC1, stage 1 conf vol | | | | | 259 | | 259 | | | | 305 | | 305 | | | |
| vC2, stage 2 conf vol | | | | | 332 | | 315 | | | | 286 | | 312 | | | |
| vCu, unblocked vol | 243 | | 272 | | 590 | | 574 | | 219 | | 590 | | 617 | | 233 | |
| tC, single (s) | 4.1 | | 4.1 | | 7.1 | | 6.5 | | 6.2 | | 7.1 | | 6.5 | | 6.2 | |
| tC, 2 stage (s) | | | | | 6.1 | | 5.5 | | | | 6.1 | | 5.5 | | | |
| tF (s) | 2.2 | | 2.2 | | 3.5 | | 4.0 | | 3.3 | | 3.5 | | 4.0 | | 3.3 | |
| p0 queue free % | 98 | | 97 | | 89 | | 96 | | 92 | | 96 | | 94 | | 98 | |
| cM capacity (veh/h) | 1323 | | 1291 | | 540 | | 553 | | 821 | | 527 | | 534 | | 806 | |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | | | | | | | | | | |
| Volume Total | 20 | 272 | 36 | 243 | 150 | 73 | | | | | | | | | | |
| Volume Left | 20 | 0 | 36 | 0 | 59 | 20 | | | | | | | | | | |
| Volume Right | 0 | 106 | 0 | 20 | 68 | 20 | | | | | | | | | | |
| cSH | 1323 | 1700 | 1291 | 1700 | 642 | 586 | | | | | | | | | | |
| Volume to Capacity | 0.02 | 0.16 | 0.03 | 0.14 | 0.23 | 0.12 | | | | | | | | | | |
| Queue Length 95th (m) | 0.3 | 0.0 | 0.7 | 0.0 | 6.9 | 3.2 | | | | | | | | | | |
| Control Delay (s) | 7.8 | 0.0 | 7.9 | 0.0 | 12.3 | 12.0 | | | | | | | | | | |
| Lane LOS | A | | A | | B | B | | | | | | | | | | |
| Approach Delay (s) | 0.5 | | 1.0 | | 12.3 | 12.0 | | | | | | | | | | |
| Approach LOS | | | | | B | B | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | | | | | |
| Average Delay | | | 4.0 | | | | | | | | | | | | | |
| Intersection Capacity Utilization | | | 41.9% | | ICU Level of Service | | A | | | | | | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

















2049 Total Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|--|---|---|--|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |  |  | |  |  | |  |   | |  |   | |
| Traffic Volume (vph) | 78 | 20 | 211 | 120 | 23 | 23 | 96 | 838 | 53 | 20 | 1106 | 117 |
| Future Volume (vph) | 78 | 20 | 211 | 120 | 23 | 23 | 96 | 838 | 53 | 20 | 1106 | 117 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.86 | | 1.00 | 0.93 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1608 | | 1770 | 1723 | | 1770 | 3508 | | 1770 | 3488 | |
| Flt Permitted | 0.73 | 1.00 | | 0.37 | 1.00 | | 0.11 | 1.00 | | 0.29 | 1.00 | |
| Satd. Flow (perm) | 1354 | 1608 | | 690 | 1723 | | 200 | 3508 | | 545 | 3488 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 78 | 20 | 211 | 120 | 23 | 23 | 96 | 838 | 53 | 20 | 1106 | 117 |
| RTOR Reduction (vph) | 0 | 183 | 0 | 0 | 20 | 0 | 0 | 4 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 78 | 48 | 0 | 120 | 26 | 0 | 96 | 887 | 0 | 20 | 1215 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 13.3 | 9.4 | | 16.1 | 10.8 | | 43.2 | 38.0 | | 35.1 | 33.9 | |
| Effective Green, g (s) | 13.3 | 9.4 | | 16.1 | 10.8 | | 43.2 | 38.0 | | 35.1 | 33.9 | |
| Actuated g/C Ratio | 0.18 | 0.13 | | 0.22 | 0.15 | | 0.60 | 0.53 | | 0.49 | 0.47 | |
| Clearance Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | | 4.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 273 | 210 | | 234 | 258 | | 235 | 1854 | | 286 | 1644 | |
| v/s Ratio Prot | 0.02 | 0.03 | | c0.04 | 0.02 | | c0.03 | 0.25 | | 0.00 | c0.35 | |
| v/s Ratio Perm | 0.04 | | | c0.08 | | | 0.21 | | | 0.03 | | |
| v/c Ratio | 0.29 | 0.23 | | 0.51 | 0.10 | | 0.41 | 0.48 | | 0.07 | 0.74 | |
| Uniform Delay, d1 | 25.0 | 28.0 | | 23.5 | 26.4 | | 9.7 | 10.7 | | 9.6 | 15.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.6 | | 1.9 | 0.2 | | 1.2 | 0.9 | | 0.1 | 3.1 | |
| Delay (s) | 25.6 | 28.5 | | 25.4 | 26.5 | | 10.9 | 11.6 | | 9.7 | 18.5 | |
| Level of Service | C | C | | C | C | | B | B | | A | B | |
| Approach Delay (s) | | 27.8 | | | 25.7 | | | 11.5 | | | 18.3 | |
| Approach LOS | | C | | | C | | | B | | | B | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 17.4 | | | | HCM 2000 Level of Service | | | | B | |
| HCM 2000 Volume to Capacity ratio | | | 0.66 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 71.9 | | | | Sum of lost time (s) | | | 18.0 | | |
| Intersection Capacity Utilization | | | 75.9% | | | | ICU Level of Service | | | D | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2049 Total Conditions
 Weekday AM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 20 | 78 | 20 | 20 | 95 | 102 | 20 | 20 | 20 | 205 | 20 | 24 |
| Future Volume (Veh/h) | 20 | 78 | 20 | 20 | 95 | 102 | 20 | 20 | 20 | 205 | 20 | 24 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 20 | 78 | 20 | 20 | 95 | 102 | 20 | 20 | 20 | 205 | 20 | 24 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | TWLTL | | | | | | | |
| Median storage veh | | | | | 2 | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 197 | | | 98 | | | 348 | 365 | 88 | 344 | 324 | 146 |
| vC1, stage 1 conf vol | | | | | | | 128 | 128 | | 186 | 186 | |
| vC2, stage 2 conf vol | | | | | | | 220 | 237 | | 158 | 138 | |
| vCu, unblocked vol | 197 | | | 98 | | | 348 | 365 | 88 | 344 | 324 | 146 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 99 | | | 97 | 97 | 98 | 71 | 97 | 97 |
| cM capacity (veh/h) | 1376 | | | 1495 | | | 674 | 641 | 970 | 699 | 671 | 901 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 118 | 217 | 60 | 249 | | | | | | | | |
| Volume Left | 20 | 20 | 20 | 205 | | | | | | | | |
| Volume Right | 20 | 102 | 20 | 24 | | | | | | | | |
| cSH | 1376 | 1495 | 737 | 712 | | | | | | | | |
| Volume to Capacity | 0.01 | 0.01 | 0.08 | 0.35 | | | | | | | | |
| Queue Length 95th (m) | 0.3 | 0.3 | 2.0 | 12.1 | | | | | | | | |
| Control Delay (s) | 1.4 | 0.8 | 10.3 | 12.8 | | | | | | | | |
| Lane LOS | A | A | B | B | | | | | | | | |
| Approach Delay (s) | 1.4 | 0.8 | 10.3 | 12.8 | | | | | | | | |
| Approach LOS | | | B | B | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 6.4 | | | | | | | | | |
| Intersection Capacity Utilization | | | 41.6% | | ICU Level of Service | | | | A | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Unsignalized Intersection Capacity Analysis
 2: Scotland St & McQueen Blvd

2049 Total Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 32 | 20 | 20 | 278 | 178 | 47 |
| Future Volume (Veh/h) | 32 | 20 | 20 | 278 | 178 | 47 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 32 | 20 | 20 | 278 | 178 | 47 |
| 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 | 520 | 202 | 225 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 520 | 202 | 225 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 94 | 98 | 99 | | | |
| cM capacity (veh/h) | 509 | 839 | 1344 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 52 | 298 | 225 | | | |
| Volume Left | 32 | 20 | 0 | | | |
| Volume Right | 20 | 0 | 47 | | | |
| cSH | 600 | 1344 | 1700 | | | |
| Volume to Capacity | 0.09 | 0.01 | 0.13 | | | |
| Queue Length 95th (m) | 2.2 | 0.3 | 0.0 | | | |
| Control Delay (s) | 11.6 | 0.6 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 11.6 | 0.6 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.4 | | | |
| Intersection Capacity Utilization | | | 41.1% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Signalized Intersection Capacity Analysis
7: Tower St S & McQueen Blvd

2049 Total Conditions
Weekday PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|-------|------|-------|-------|------|------|---------------------------|------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 91 | 71 | 303 | 145 | 58 | 83 | 363 | 1353 | 210 | 235 | 1474 | 93 |
| Future Volume (vph) | 91 | 71 | 303 | 145 | 58 | 83 | 363 | 1353 | 210 | 235 | 1474 | 93 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 5.0 | 5.0 | 3.0 | 5.0 | | 3.0 | 5.0 | 5.0 | 3.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 1770 | 1698 | | 1770 | 3539 | 1583 | 1770 | 3539 | 1583 |
| Flt Permitted | 0.57 | 1.00 | 1.00 | 0.63 | 1.00 | | 0.07 | 1.00 | 1.00 | 0.13 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1070 | 1863 | 1583 | 1164 | 1698 | | 128 | 3539 | 1583 | 245 | 3539 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 91 | 71 | 303 | 145 | 58 | 83 | 363 | 1353 | 210 | 235 | 1474 | 93 |
| RTOR Reduction (vph) | 0 | 0 | 270 | 0 | 45 | 0 | 0 | 0 | 39 | 0 | 0 | 48 |
| Lane Group Flow (vph) | 91 | 71 | 33 | 145 | 96 | 0 | 363 | 1353 | 171 | 235 | 1474 | 45 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | 2 | 6 | | 6 |
| Actuated Green, G (s) | 18.7 | 12.4 | 12.4 | 22.1 | 14.1 | | 79.8 | 63.6 | 63.6 | 68.4 | 55.2 | 55.2 |
| Effective Green, g (s) | 18.7 | 12.4 | 12.4 | 22.1 | 14.1 | | 79.8 | 63.6 | 63.6 | 68.4 | 55.2 | 55.2 |
| Actuated g/C Ratio | 0.17 | 0.11 | 0.11 | 0.20 | 0.12 | | 0.70 | 0.56 | 0.56 | 0.60 | 0.49 | 0.49 |
| Clearance Time (s) | 3.0 | 5.0 | 5.0 | 3.0 | 5.0 | | 3.0 | 5.0 | 5.0 | 3.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 215 | 204 | 173 | 270 | 211 | | 403 | 1988 | 889 | 325 | 1725 | 771 |
| v/s Ratio Prot | 0.02 | 0.04 | | c0.04 | 0.06 | | c0.17 | 0.38 | | 0.08 | 0.42 | |
| v/s Ratio Perm | 0.05 | | 0.02 | c0.07 | | | c0.46 | | 0.11 | 0.35 | | 0.03 |
| v/c Ratio | 0.42 | 0.35 | 0.19 | 0.54 | 0.46 | | 0.90 | 0.68 | 0.19 | 0.72 | 0.85 | 0.06 |
| Uniform Delay, d1 | 41.6 | 46.7 | 45.8 | 40.0 | 46.0 | | 35.3 | 17.6 | 12.2 | 14.5 | 25.5 | 15.3 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.3 | 1.0 | 0.5 | 2.1 | 1.6 | | 26.3 | 1.9 | 0.5 | 8.0 | 5.9 | 0.1 |
| Delay (s) | 42.9 | 47.7 | 46.4 | 42.0 | 47.6 | | 61.6 | 19.5 | 12.7 | 22.5 | 31.3 | 15.4 |
| Level of Service | D | D | D | D | D | | E | B | B | C | C | B |
| Approach Delay (s) | | 45.9 | | | 44.8 | | | 26.7 | | | 29.4 | |
| Approach LOS | | D | | | D | | | C | | | C | |
| Intersection Summary | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 30.9 | | | | HCM 2000 Level of Service | | | C | | |
| HCM 2000 Volume to Capacity ratio | | | 0.86 | | | | | | | | | |
| Actuated Cycle Length (s) | | | 113.2 | | | | Sum of lost time (s) | | | 16.0 | | |
| Intersection Capacity Utilization | | | 89.8% | | | | ICU Level of Service | | | E | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 8: Jones Baseline/Scotland St & 2nd Line

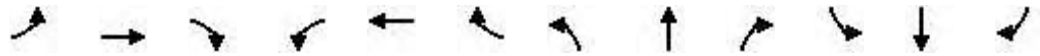
2049 Total Conditions
 Weekday PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 30 | 20 | 33 | 171 | 75 | 20 |
| Future Volume (Veh/h) | 30 | 20 | 33 | 171 | 75 | 20 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 30 | 20 | 33 | 171 | 75 | 20 |
| 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 | 322 | 85 | 95 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 322 | 85 | 95 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 98 | 98 | | | |
| cM capacity (veh/h) | 657 | 974 | 1499 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 50 | 204 | 95 | | | |
| Volume Left | 30 | 33 | 0 | | | |
| Volume Right | 20 | 0 | 20 | | | |
| cSH | 755 | 1499 | 1700 | | | |
| Volume to Capacity | 0.07 | 0.02 | 0.06 | | | |
| Queue Length 95th (m) | 1.6 | 0.5 | 0.0 | | | |
| Control Delay (s) | 10.1 | 1.4 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 10.1 | 1.4 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 2.2 | | | |
| Intersection Capacity Utilization | | | 27.5% | ICU Level of Service | A | |
| Analysis Period (min) | | | 30 | | | |

HCM Unsignalized Intersection Capacity Analysis
 9: Future N/S Collector/McTavish Extension & Future E/W Collector

2049 Total Conditions
 Weekday PM Peak Hour



| 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 | 23 | 20 | 20 | 20 | 20 | 24 | 20 | 20 | 20 | 20 | 20 |
| Future Volume (vph) | 20 | 23 | 20 | 20 | 20 | 20 | 24 | 20 | 20 | 20 | 20 | 20 |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 20 | 23 | 20 | 20 | 20 | 20 | 24 | 20 | 20 | 20 | 20 | 20 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total (vph) | 63 | 60 | 64 | 60 | | | | | | | | |
| Volume Left (vph) | 20 | 20 | 24 | 20 | | | | | | | | |
| Volume Right (vph) | 20 | 20 | 20 | 20 | | | | | | | | |
| Hadj (s) | -0.09 | -0.10 | -0.08 | -0.10 | | | | | | | | |
| Departure Headway (s) | 4.1 | 4.1 | 4.1 | 4.1 | | | | | | | | |
| Degree Utilization, x | 0.07 | 0.07 | 0.07 | 0.07 | | | | | | | | |
| Capacity (veh/h) | 839 | 840 | 832 | 841 | | | | | | | | |
| Control Delay (s) | 7.5 | 7.4 | 7.5 | 7.4 | | | | | | | | |
| Approach Delay (s) | 7.5 | 7.4 | 7.5 | 7.4 | | | | | | | | |
| Approach LOS | A | A | A | A | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Delay | | | 7.5 | | | | | | | | | |
| Level of Service | | | A | | | | | | | | | |
| Intersection Capacity Utilization | | | 16.2% | ICU Level of Service | A | | | | | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 10: Tower St S & New Collector Road/Commerical Access

2049 Total Conditions
 Weekday PM Peak Hour

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|-------|------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 321 | 20 | 214 | 74 | 20 | 141 | 229 | 1441 | 99 | 129 | 1377 | 344 |
| Future Volume (vph) | 321 | 20 | 214 | 74 | 20 | 141 | 229 | 1441 | 99 | 129 | 1377 | 344 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | 1.00 |
| Frt | 1.00 | 0.86 | | 1.00 | 0.87 | | 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) | 1770 | 1607 | | 1770 | 1618 | | 1770 | 3505 | | 1770 | 3539 | 1583 |
| Flt Permitted | 0.60 | 1.00 | | 0.49 | 1.00 | | 0.07 | 1.00 | | 0.07 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1122 | 1607 | | 919 | 1618 | | 131 | 3505 | | 138 | 3539 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 321 | 20 | 214 | 74 | 20 | 141 | 229 | 1441 | 99 | 129 | 1377 | 344 |
| RTOR Reduction (vph) | 0 | 138 | 0 | 0 | 97 | 0 | 0 | 4 | 0 | 0 | 0 | 103 |
| Lane Group Flow (vph) | 321 | 96 | 0 | 74 | 64 | 0 | 229 | 1536 | 0 | 129 | 1377 | 241 |
| 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) | 35.7 | 35.7 | | 35.7 | 35.7 | | 70.0 | 59.2 | | 61.7 | 53.9 | 53.9 |
| Effective Green, g (s) | 35.7 | 35.7 | | 35.7 | 35.7 | | 70.0 | 59.2 | | 61.7 | 53.9 | 53.9 |
| Actuated g/C Ratio | 0.31 | 0.31 | | 0.31 | 0.31 | | 0.61 | 0.51 | | 0.53 | 0.47 | 0.47 |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | 5.0 |
| 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) | 346 | 495 | | 283 | 499 | | 264 | 1793 | | 183 | 1648 | 737 |
| v/s Ratio Prot | | 0.06 | | | 0.04 | | c0.10 | 0.44 | | 0.05 | 0.39 | |
| v/s Ratio Perm | c0.29 | | | 0.08 | | | c0.43 | | | 0.33 | | 0.15 |
| v/c Ratio | 0.93 | 0.19 | | 0.26 | 0.13 | | 0.87 | 0.86 | | 0.70 | 0.84 | 0.33 |
| Uniform Delay, d1 | 38.8 | 29.4 | | 30.1 | 28.8 | | 33.4 | 24.6 | | 21.7 | 27.0 | 19.5 |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 37.1 | 0.2 | | 0.5 | 0.1 | | 28.0 | 5.7 | | 12.1 | 5.4 | 1.2 |
| Delay (s) | 75.8 | 29.6 | | 30.6 | 28.9 | | 61.4 | 30.3 | | 33.8 | 32.4 | 20.7 |
| Level of Service | E | C | | C | C | | E | C | | C | C | C |
| Approach Delay (s) | | 56.3 | | | 29.4 | | | 34.3 | | | 30.3 | |
| Approach LOS | | E | | | C | | | C | | | C | |

| Intersection Summary | | |
|-----------------------------------|-------|-----------------------------|
| HCM 2000 Control Delay | 35.2 | HCM 2000 Level of Service D |
| HCM 2000 Volume to Capacity ratio | 0.91 | |
| Actuated Cycle Length (s) | 115.7 | Sum of lost time (s) 13.0 |
| Intersection Capacity Utilization | 94.1% | ICU Level of Service F |
| Analysis Period (min) | 30 | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 13: Tower St S & Future E/W Collector

2049 Total Conditions
 Weekday PM Peak Hour



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|-------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 177 | 305 | 1535 | 273 | 404 | 1261 |
| Future Volume (vph) | 177 | 305 | 1535 | 273 | 404 | 1261 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 3.0 | 5.0 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | 1.00 | 0.85 | 1.00 | 0.85 | 1.00 | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 3539 | 1583 | 1770 | 3539 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 1.00 | 0.06 | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 3539 | 1583 | 113 | 3539 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 177 | 305 | 1535 | 273 | 404 | 1261 |
| RTOR Reduction (vph) | 0 | 265 | 0 | 97 | 0 | 0 |
| Lane Group Flow (vph) | 177 | 40 | 1535 | 176 | 404 | 1261 |
| Turn Type | Perm | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | | | 2 | | 1 | 6 |
| Permitted Phases | 8 | 8 | | 2 | 6 | |
| Actuated Green, G (s) | 15.6 | 15.6 | 63.2 | 63.2 | 92.1 | 92.1 |
| Effective Green, g (s) | 15.6 | 15.6 | 63.2 | 63.2 | 92.1 | 92.1 |
| Actuated g/C Ratio | 0.13 | 0.13 | 0.54 | 0.54 | 0.78 | 0.78 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 3.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 234 | 209 | 1900 | 850 | 453 | 2769 |
| v/s Ratio Prot | | | 0.43 | | c0.20 | 0.36 |
| v/s Ratio Perm | c0.10 | 0.03 | | 0.11 | c0.50 | |
| v/c Ratio | 0.76 | 0.19 | 0.81 | 0.21 | 0.89 | 0.46 |
| Uniform Delay, d1 | 49.2 | 45.4 | 22.3 | 14.2 | 36.7 | 4.3 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 13.7 | 0.5 | 3.9 | 0.6 | 22.0 | 0.5 |
| Delay (s) | 62.9 | 45.9 | 26.2 | 14.7 | 58.7 | 4.9 |
| Level of Service | E | D | C | B | E | A |
| Approach Delay (s) | 52.2 | | 24.5 | | | 17.9 |
| Approach LOS | D | | C | | | B |




















Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 25.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.89 | | |
| Actuated Cycle Length (s) | 117.7 | Sum of lost time (s) | 13.0 |
| Intersection Capacity Utilization | 86.3% | ICU Level of Service | E |
| Analysis Period (min) | 30 | | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 14: Guelph St & McQueen Blvd Extension

2049 Total Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  | | | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|-----|--|--|-----|--|--|-----|--|--|-----|--|--|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | | | | | | | | | | | | |
| Lane Configurations |  |  | |  |  | | |  | | |  |  | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 20 | 315 | 87 | 80 | 325 | 20 | 151 | 96 | 57 | 20 | 38 | 20 | | | | | | | | | | | | |
| Future Volume (Veh/h) | 20 | 315 | 87 | 80 | 325 | 20 | 151 | 96 | 57 | 20 | 38 | 20 | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | | | | | | | | | | | | | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | | | | | | | | | | | | | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | | | | | | | | | |
| Hourly flow rate (vph) | 20 | 315 | 87 | 80 | 325 | 20 | 151 | 96 | 57 | 20 | 38 | 20 | | | | | | | | | | | | |
| Pedestrians | | | | | | | | | | | | | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | | | | | | | | | | | | | |
| Median type | | | | | | | | | | | | | | | | | | | | | | | | |
| | TWLTL | | | | | TWLTL | | | | | | | | | | | | | | | | | | |
| Median storage veh | 2 | | | | | 2 | | | | | | | | | | | | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | | | | | | | | | | | | | |
| vC, conflicting volume | 345 | | | 402 | | | 922 | | | 904 | | | 358 | | | 955 | | | 937 | | | 335 | | |
| vC1, stage 1 conf vol | | | | | | | 398 | | | 398 | | | | | | 495 | | | 495 | | | | | |
| vC2, stage 2 conf vol | | | | | | | 524 | | | 505 | | | | | | 460 | | | 442 | | | | | |
| vCu, unblocked vol | 345 | | | 402 | | | 922 | | | 904 | | | 358 | | | 955 | | | 937 | | | 335 | | |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | | | 6.5 | | | 6.2 | | | 7.1 | | | 6.5 | | | 6.2 | | |
| tC, 2 stage (s) | | | | | | | 6.1 | | | 5.5 | | | | | | 6.1 | | | 5.5 | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | | | 4.0 | | | 3.3 | | | 3.5 | | | 4.0 | | | 3.3 | | |
| p0 queue free % | 98 | | | 93 | | | 61 | | | 77 | | | 92 | | | 94 | | | 91 | | | 97 | | |
| cM capacity (veh/h) | 1214 | | | 1157 | | | 385 | | | 423 | | | 686 | | | 321 | | | 402 | | | 707 | | |
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | | | | | | | | | | | | | | | | | | |
| Volume Total | 20 | 402 | 80 | 345 | 304 | 78 | | | | | | | | | | | | | | | | | | |
| Volume Left | 20 | 0 | 80 | 0 | 151 | 20 | | | | | | | | | | | | | | | | | | |
| Volume Right | 0 | 87 | 0 | 20 | 57 | 20 | | | | | | | | | | | | | | | | | | |
| cSH | 1214 | 1700 | 1157 | 1700 | 433 | 421 | | | | | | | | | | | | | | | | | | |
| Volume to Capacity | 0.02 | 0.24 | 0.07 | 0.20 | 0.70 | 0.19 | | | | | | | | | | | | | | | | | | |
| Queue Length 95th (m) | 0.4 | 0.0 | 1.7 | 0.0 | 45.3 | 5.1 | | | | | | | | | | | | | | | | | | |
| Control Delay (s) | 8.0 | 0.0 | 8.3 | 0.0 | 31.6 | 15.5 | | | | | | | | | | | | | | | | | | |
| Lane LOS | A | | A | | D | | C | | | | | | | | | | | | | | | | | |
| Approach Delay (s) | 0.4 | | 1.6 | | 31.6 | | 15.5 | | | | | | | | | | | | | | | | | |
| Approach LOS | | | | | D | | C | | | | | | | | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | | | | | | | | | | | | | |
| Average Delay | 9.5 | | | | | | | | | | | | | | | | | | | | | | | |
| Intersection Capacity Utilization | 59.8% | | | | | ICU Level of Service | | | | | B | | | | | | | | | | | | | |
| Analysis Period (min) | 30 | | | | | | | | | | | | | | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 15: Highway 6/Tower St S & 2nd Line

2049 Total Conditions
 Weekday PM Peak Hour

















| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 132 | 20 | 142 | 97 | 37 | 52 | 261 | 1525 | 140 | 34 | 1286 | 138 |
| Future Volume (vph) | 132 | 20 | 142 | 97 | 37 | 52 | 261 | 1525 | 140 | 34 | 1286 | 138 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | 1.00 | 0.87 | | 1.00 | 0.91 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1618 | | 1770 | 1699 | | 1770 | 3495 | | 1770 | 3488 | |
| Flt Permitted | 0.68 | 1.00 | | 0.51 | 1.00 | | 0.10 | 1.00 | | 0.10 | 1.00 | |
| Satd. Flow (perm) | 1258 | 1618 | | 959 | 1699 | | 177 | 3495 | | 191 | 3488 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 132 | 20 | 142 | 97 | 37 | 52 | 261 | 1525 | 140 | 34 | 1286 | 138 |
| RTOR Reduction (vph) | 0 | 127 | 0 | 0 | 47 | 0 | 0 | 5 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 132 | 35 | 0 | 97 | 42 | 0 | 261 | 1660 | 0 | 34 | 1416 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Actuated Green, G (s) | 15.6 | 8.7 | | 15.0 | 8.4 | | 52.1 | 46.5 | | 41.6 | 39.0 | |
| Effective Green, g (s) | 15.6 | 8.7 | | 15.0 | 8.4 | | 52.1 | 46.5 | | 41.6 | 39.0 | |
| Actuated g/C Ratio | 0.19 | 0.11 | | 0.19 | 0.10 | | 0.65 | 0.58 | | 0.52 | 0.49 | |
| Clearance Time (s) | 3.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 288 | 175 | | 245 | 177 | | 314 | 2021 | | 149 | 1691 | |
| v/s Ratio Prot | c0.04 | 0.02 | | 0.03 | 0.02 | | c0.10 | 0.47 | | 0.01 | 0.41 | |
| v/s Ratio Perm | c0.05 | | | 0.04 | | | c0.43 | | | 0.11 | | |
| v/c Ratio | 0.46 | 0.20 | | 0.40 | 0.24 | | 0.83 | 0.82 | | 0.23 | 0.84 | |
| Uniform Delay, d1 | 28.2 | 32.7 | | 28.2 | 33.1 | | 20.0 | 13.6 | | 12.2 | 18.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.2 | 0.6 | | 1.1 | 0.7 | | 18.3 | 4.0 | | 0.8 | 5.3 | |
| Delay (s) | 29.4 | 33.3 | | 29.2 | 33.8 | | 38.3 | 17.6 | | 13.0 | 23.2 | |
| Level of Service | C | C | | C | C | | D | B | | B | C | |
| Approach Delay (s) | | 31.5 | | | 31.4 | | | 20.4 | | | 23.0 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | | |
|-----------------------------------|-------|-----------------------------|
| HCM 2000 Control Delay | 22.8 | HCM 2000 Level of Service C |
| HCM 2000 Volume to Capacity ratio | 0.78 | |
| Actuated Cycle Length (s) | 80.4 | Sum of lost time (s) 16.0 |
| Intersection Capacity Utilization | 85.1% | ICU Level of Service E |
| Analysis Period (min) | 30 | |

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 16: Guelph St & 2nd Line

2049 Total Conditions
 Weekday PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  | | |  | | |  | |
| Traffic Volume (veh/h) | 78 | 85 | 20 | 20 | 91 | 270 | 20 | 20 | 20 | 148 | 20 | 25 |
| Future Volume (Veh/h) | 78 | 85 | 20 | 20 | 91 | 270 | 20 | 20 | 20 | 148 | 20 | 25 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 78 | 85 | 20 | 20 | 91 | 270 | 20 | 20 | 20 | 148 | 20 | 25 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (m) | | | | | | | | | | | | |
| Walking Speed (m/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | TWLTL | | | | | | | |
| Median storage (veh) | | | | | 2 | | | | | | | |
| Upstream signal (m) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 361 | | | 105 | | | 552 | 652 | 95 | 547 | 527 | 226 |
| vC1, stage 1 conf vol | | | | | | | 251 | 251 | | 266 | 266 | |
| vC2, stage 2 conf vol | | | | | | | 301 | 401 | | 281 | 261 | |
| vCu, unblocked vol | 361 | | | 105 | | | 552 | 652 | 95 | 547 | 527 | 226 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 93 | | | 99 | | | 96 | 96 | 98 | 74 | 96 | 97 |
| cM capacity (veh/h) | 1198 | | | 1486 | | | 532 | 479 | 962 | 562 | 560 | 813 |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 | | | | | | | | |
| Volume Total | 183 | 381 | 60 | 193 | | | | | | | | |
| Volume Left | 78 | 20 | 20 | 148 | | | | | | | | |
| Volume Right | 20 | 270 | 20 | 25 | | | | | | | | |
| cSH | 1198 | 1486 | 599 | 585 | | | | | | | | |
| Volume to Capacity | 0.07 | 0.01 | 0.10 | 0.33 | | | | | | | | |
| Queue Length 95th (m) | 1.6 | 0.3 | 2.5 | 11.1 | | | | | | | | |
| Control Delay (s) | 3.8 | 0.5 | 11.7 | 14.2 | | | | | | | | |
| Lane LOS | A | A | B | B | | | | | | | | |
| Approach Delay (s) | 3.8 | 0.5 | 11.7 | 14.2 | | | | | | | | |
| Approach LOS | | | B | B | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 5.3 | | | | | | | | | |
| Intersection Capacity Utilization | | | 59.9% | | ICU Level of Service | | | | B | | | |
| Analysis Period (min) | | | 30 | | | | | | | | | |

Intersection: 2: Scotland St & McQueen Blvd

| Movement | EB | NB |
|-----------------------|------|------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 18.9 | 10.5 |
| Average Queue (m) | 9.8 | 0.9 |
| 95th Queue (m) | 17.2 | 5.7 |
| Link Distance (m) | | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | EB | EB | EB | WB | WB | NB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|------|------|------|------|------|-------|-------|------|------|-------|-------|
| Directions Served | L | T | R | L | TR | L | T | T | R | L | T | T |
| Maximum Queue (m) | 30.3 | 30.5 | 63.5 | 37.2 | 45.7 | 60.7 | 78.5 | 83.9 | 45.8 | 25.2 | 91.9 | 87.8 |
| Average Queue (m) | 12.6 | 4.8 | 30.1 | 18.6 | 16.4 | 24.6 | 39.3 | 43.9 | 7.4 | 10.3 | 54.0 | 47.4 |
| 95th Queue (m) | 24.5 | 19.1 | 50.9 | 31.9 | 32.5 | 43.7 | 63.6 | 68.9 | 28.9 | 19.8 | 82.9 | 79.2 |
| Link Distance (m) | | | | | | | 268.2 | 268.2 | | | 363.6 | 363.6 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | 50.0 | 30.0 | | 50.0 | | | 30.0 | 75.0 | | |
| Storage Blk Time (%) | 0 | | 1 | 2 | 1 | 1 | 2 | 17 | | | 2 | 22 |
| Queuing Penalty (veh) | 0 | | 1 | 3 | 1 | 4 | 4 | 9 | | | 2 | 6 |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | SB |
|-----------------------|------|
| Directions Served | R |
| Maximum Queue (m) | 46.8 |
| Average Queue (m) | 7.2 |
| 95th Queue (m) | 28.7 |
| Link Distance (m) | |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (m) | 30.0 |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

Intersection: 8: Jones Baseline/Scotland St & 2nd Line

| Movement | EB | NB |
|-----------------------|-------|-----|
| Directions Served | LR | LT |
| Maximum Queue (m) | 15.8 | 6.4 |
| Average Queue (m) | 7.1 | 0.4 |
| 95th Queue (m) | 12.5 | 3.2 |
| Link Distance (m) | 382.5 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 9: Future N/S Collector/McTavish Extension & Future E/W Collector

| Movement | EB | WB | NB | SB |
|-----------------------|-------|------|------|------|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (m) | 10.6 | 10.6 | 12.2 | 16.7 |
| Average Queue (m) | 5.1 | 6.4 | 8.5 | 7.7 |
| 95th Queue (m) | 12.6 | 13.4 | 13.5 | 15.0 |
| Link Distance (m) | 709.6 | | | |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

Intersection: 10: Tower St S & New Collector Road/Commerical Access

| Movement | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB | SB | |
|-----------------------|------|------|------|------|-------|------|-------|-------|------|-------|------|--|
| Directions Served | L | TR | L | TR | L | T | TR | L | T | T | R | |
| Maximum Queue (m) | 42.8 | 29.0 | 18.5 | 17.9 | 24.8 | 58.8 | 63.8 | 19.7 | 61.0 | 62.5 | 20.3 | |
| Average Queue (m) | 19.2 | 11.4 | 8.9 | 7.0 | 10.4 | 30.4 | 34.2 | 9.5 | 31.5 | 34.5 | 8.8 | |
| 95th Queue (m) | 33.5 | 22.9 | 18.0 | 15.4 | 20.4 | 52.8 | 56.6 | 17.6 | 52.9 | 56.3 | 18.6 | |
| Link Distance (m) | 74.1 | | | | 240.4 | | 240.4 | 268.2 | | 268.2 | | |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | 50.0 | | 100.0 | | 75.0 | | | | 50.0 | |
| Storage Blk Time (%) | 0 | | | | | | | | | | 1 | |
| Queuing Penalty (veh) | 0 | | | | | | | | | | 2 | |

Intersection: 13: Tower St S & Future E/W Collector

| Movement | WB | WB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|-------|-------|-------|------|-------|-------|-------|
| Directions Served | L | R | T | T | R | L | T | T |
| Maximum Queue (m) | 44.7 | 47.5 | 69.0 | 66.8 | 23.2 | 36.1 | 53.2 | 63.7 |
| Average Queue (m) | 19.2 | 20.4 | 31.5 | 32.4 | 8.4 | 16.1 | 26.0 | 32.5 |
| 95th Queue (m) | 34.0 | 36.7 | 53.0 | 56.3 | 18.4 | 28.7 | 49.5 | 55.3 |
| Link Distance (m) | | 709.6 | 331.9 | 331.9 | | | 244.8 | 244.8 |
| Upstream Blk Time (%) | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | | | 75.0 | 100.0 | | |
| Storage Blk Time (%) | 0 | 0 | | 0 | | | | |
| Queuing Penalty (veh) | 0 | 0 | | 0 | | | | |

Intersection: 14: Guelph St & McQueen Blvd Extension

| Movement | EB | EB | WB | NB | SB |
|-----------------------|------|-------|------|--------|-------|
| Directions Served | L | TR | L | LTR | LTR |
| Maximum Queue (m) | 7.2 | 5.3 | 9.0 | 30.4 | 18.7 |
| Average Queue (m) | 0.7 | 0.3 | 2.4 | 13.6 | 8.1 |
| 95th Queue (m) | 4.7 | 2.8 | 8.9 | 22.5 | 15.6 |
| Link Distance (m) | | 118.4 | | 1008.8 | 323.2 |
| Upstream Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |
| Storage Bay Dist (m) | 30.0 | | 30.0 | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

Intersection: 15: Highway 6/Tower St S & 2nd Line

| Movement | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| Directions Served | L | TR | L | TR | L | T | TR | L | T | TR |
| Maximum Queue (m) | 29.2 | 49.1 | 39.0 | 20.2 | 27.4 | 58.0 | 55.4 | 12.7 | 77.6 | 87.1 |
| Average Queue (m) | 12.3 | 23.9 | 18.0 | 7.7 | 13.1 | 27.7 | 23.2 | 3.5 | 43.2 | 48.4 |
| 95th Queue (m) | 23.2 | 39.4 | 32.7 | 17.9 | 23.4 | 48.0 | 45.3 | 11.1 | 73.7 | 79.5 |
| Link Distance (m) | | 659.7 | | | | 372.6 | 372.6 | | 331.9 | 331.9 |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | 30.0 | | 100.0 | | | 100.0 | | |
| Storage Blk Time (%) | | 0 | 3 | 0 | | | | | | |
| Queuing Penalty (veh) | | 0 | 1 | 0 | | | | | | |

Intersection: 16: Guelph St & 2nd Line

| Movement | EB | WB | NB | SB |
|-----------------------|-------|-------|-------|--------|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (m) | 9.1 | 6.6 | 9.3 | 28.9 |
| Average Queue (m) | 0.7 | 0.3 | 5.3 | 15.7 |
| 95th Queue (m) | 4.7 | 3.0 | 12.0 | 24.5 |
| Link Distance (m) | 164.1 | 659.7 | 264.2 | 1008.8 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

Zone Summary

Zone wide Queuing Penalty: 34

Intersection: 2: Scotland St & McQueen Blvd

| Movement | EB | NB |
|-----------------------|------|-----|
| Directions Served | LR | LT |
| Maximum Queue (m) | 18.7 | 8.8 |
| Average Queue (m) | 7.2 | 0.5 |
| 95th Queue (m) | 15.7 | 4.3 |
| Link Distance (m) | | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | EB | EB | EB | WB | WB | NB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|------|------|------|------|------|-------|-------|------|-------|-------|-------|
| Directions Served | L | T | R | L | TR | L | T | T | R | L | T | T |
| Maximum Queue (m) | 62.5 | 89.0 | 74.7 | 53.7 | 81.7 | 74.9 | 178.7 | 184.7 | 55.0 | 99.9 | 243.5 | 233.9 |
| Average Queue (m) | 18.5 | 25.4 | 44.4 | 30.9 | 33.2 | 65.5 | 95.0 | 94.2 | 30.7 | 61.5 | 136.8 | 133.8 |
| 95th Queue (m) | 42.5 | 66.5 | 74.1 | 52.5 | 65.0 | 88.3 | 163.0 | 161.6 | 68.9 | 119.6 | 230.1 | 221.5 |
| Link Distance (m) | | | | | | | 268.2 | 268.2 | | | 363.6 | 363.6 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | 50.0 | 30.0 | | 50.0 | | | 30.0 | 75.0 | | |
| Storage Blk Time (%) | 0 | 1 | 10 | 18 | 10 | 34 | 13 | 29 | 0 | 0 | 29 | 43 |
| Queuing Penalty (veh) | 0 | 3 | 16 | 24 | 14 | 223 | 46 | 56 | 1 | 2 | 62 | 40 |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | SB |
|-----------------------|------|
| Directions Served | R |
| Maximum Queue (m) | 55.0 |
| Average Queue (m) | 22.2 |
| 95th Queue (m) | 58.6 |
| Link Distance (m) | |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (m) | 30.0 |
| Storage Blk Time (%) | 0 |
| Queuing Penalty (veh) | 0 |

Intersection: 8: Jones Baseline/Scotland St & 2nd Line

| Movement | EB | NB |
|-----------------------|-------|------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 13.2 | 12.6 |
| Average Queue (m) | 5.8 | 1.0 |
| 95th Queue (m) | 11.8 | 6.3 |
| Link Distance (m) | 382.5 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 9: Future N/S Collector/McTavish Extension & Future E/W Collector

| Movement | EB | WB | NB | SB |
|-----------------------|-------|------|------|------|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (m) | 12.2 | 12.0 | 12.1 | 11.7 |
| Average Queue (m) | 6.6 | 7.4 | 7.7 | 5.9 |
| 95th Queue (m) | 13.5 | 13.5 | 13.3 | 13.1 |
| Link Distance (m) | 709.6 | | | |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

Intersection: 10: Tower St S & New Collector Road/Commerical Access

| Movement | EB | EB | WB | WB | NB | NB | NB | B28 | SB | SB | SB | SB |
|-----------------------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Directions Served | L | TR | L | TR | L | T | TR | T | L | T | T | R |
| Maximum Queue (m) | 73.8 | 78.9 | 18.9 | 21.8 | 124.8 | 160.2 | 160.1 | 3.5 | 99.6 | 158.6 | 184.2 | 75.0 |
| Average Queue (m) | 54.0 | 38.5 | 10.5 | 16.0 | 46.5 | 80.8 | 84.7 | 0.1 | 29.2 | 84.1 | 86.2 | 42.6 |
| 95th Queue (m) | 79.7 | 77.5 | 21.1 | 22.4 | 91.7 | 149.0 | 151.6 | 2.5 | 72.1 | 149.8 | 159.9 | 89.0 |
| Link Distance (m) | 74.1 | | | | | | 240.4 | 240.4 | 244.8 | 268.2 | | 268.2 |
| Upstream Blk Time (%) | 1 | 2 | 0 | | | | | | | | 0 | |
| Queuing Penalty (veh) | 0 | 0 | 0 | | | | | | | | 0 | |
| Storage Bay Dist (m) | 50.0 | | 50.0 | | 100.0 | | | | 75.0 | | 50.0 | |
| Storage Blk Time (%) | 19 | 1 | 0 | | 0 | 4 | | | 12 | | 19 | 0 |
| Queuing Penalty (veh) | 43 | 3 | 0 | | 0 | 10 | | | 14 | | 67 | 0 |

Intersection: 13: Tower St S & Future E/W Collector

| Movement | WB | WB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|-------|-------|-------|-------|-------|-------|-------|
| Directions Served | L | R | T | T | R | L | T | T |
| Maximum Queue (m) | 74.8 | 106.1 | 197.5 | 199.4 | 100.0 | 121.7 | 118.9 | 100.1 |
| Average Queue (m) | 44.3 | 50.9 | 110.3 | 111.9 | 56.1 | 71.0 | 37.3 | 37.8 |
| 95th Queue (m) | 74.6 | 90.9 | 179.4 | 185.0 | 122.5 | 117.7 | 96.9 | 86.6 |
| Link Distance (m) | | 709.6 | 331.9 | 331.9 | | | 244.8 | 244.8 |
| Upstream Blk Time (%) | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | | | 75.0 | 100.0 | | |
| Storage Blk Time (%) | 12 | 9 | | 20 | | 6 | | |
| Queuing Penalty (veh) | 36 | 16 | | 56 | | 33 | | |

Intersection: 14: Guelph St & McQueen Blvd Extension

| Movement | EB | EB | WB | WB | NB | SB |
|-----------------------|------|-------|------|-----|--------|-------|
| Directions Served | L | TR | L | TR | LTR | LTR |
| Maximum Queue (m) | 9.0 | 5.1 | 16.9 | 3.6 | 61.4 | 19.9 |
| Average Queue (m) | 0.6 | 0.2 | 6.3 | 0.1 | 27.9 | 8.1 |
| 95th Queue (m) | 4.2 | 2.3 | 14.5 | 1.5 | 47.0 | 16.6 |
| Link Distance (m) | | 118.4 | | | 1008.8 | 323.2 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (m) | 30.0 | | 30.0 | | | |
| Storage Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |

Intersection: 15: Highway 6/Tower St S & 2nd Line

| Movement | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| Directions Served | L | TR | L | TR | L | T | TR | L | T | TR |
| Maximum Queue (m) | 47.1 | 38.3 | 36.6 | 38.1 | 92.1 | 108.4 | 155.7 | 18.1 | 128.8 | 132.0 |
| Average Queue (m) | 21.0 | 19.1 | 15.6 | 14.5 | 40.0 | 55.8 | 60.5 | 7.1 | 70.4 | 77.0 |
| 95th Queue (m) | 37.4 | 32.8 | 29.2 | 28.4 | 71.5 | 96.3 | 117.7 | 16.4 | 117.0 | 123.2 |
| Link Distance (m) | | 659.7 | | | | 372.6 | 372.6 | | 331.9 | 331.9 |
| Upstream Blk Time (%) | 0 | | | | | | | | | |
| Queuing Penalty (veh) | 0 | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | 30.0 | | 100.0 | | | 100.0 | | |
| Storage Blk Time (%) | 0 | 0 | 1 | 1 | 0 | 1 | | | 2 | |
| Queuing Penalty (veh) | 0 | 0 | 1 | 1 | 0 | 1 | | | 1 | |

Intersection: 16: Guelph St & 2nd Line

| Movement | EB | WB | NB | SB |
|-----------------------|-------|-------|-------|--------|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (m) | 20.9 | 13.2 | 11.9 | 35.8 |
| Average Queue (m) | 6.0 | 1.1 | 6.0 | 16.1 |
| 95th Queue (m) | 15.6 | 7.0 | 13.1 | 26.4 |
| Link Distance (m) | 164.1 | 659.7 | 264.2 | 1008.8 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

Zone Summary

Zone wide Queuing Penalty: 768

Intersection: 2: Scotland St & McQueen Blvd

| Movement | EB | NB |
|-----------------------|------|------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 19.9 | 16.1 |
| Average Queue (m) | 10.6 | 2.2 |
| 95th Queue (m) | 17.2 | 9.8 |
| Link Distance (m) | | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | EB | EB | EB | WB | WB | NB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|------|------|------|------|------|-------|-------|------|------|-------|-------|
| Directions Served | L | T | R | L | TR | L | T | T | R | L | T | T |
| Maximum Queue (m) | 26.6 | 36.4 | 63.6 | 43.0 | 45.5 | 70.4 | 103.0 | 102.4 | 55.0 | 51.4 | 103.7 | 96.1 |
| Average Queue (m) | 12.0 | 4.9 | 33.3 | 19.1 | 16.7 | 27.1 | 48.9 | 52.9 | 14.0 | 13.4 | 58.2 | 51.8 |
| 95th Queue (m) | 23.4 | 21.2 | 54.5 | 34.7 | 33.2 | 53.4 | 82.4 | 85.2 | 46.0 | 34.3 | 94.7 | 87.6 |
| Link Distance (m) | | | | | | | 268.2 | 268.2 | | | 363.6 | 363.6 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | 50.0 | 30.0 | | 50.0 | | | 30.0 | 75.0 | | |
| Storage Blk Time (%) | | | 2 | 2 | 1 | 1 | 7 | 25 | | | 4 | 23 |
| Queuing Penalty (veh) | | | 2 | 2 | 2 | 3 | 12 | 14 | | | 3 | 7 |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | SB |
|-----------------------|------|
| Directions Served | R |
| Maximum Queue (m) | 54.9 |
| Average Queue (m) | 8.0 |
| 95th Queue (m) | 30.8 |
| Link Distance (m) | |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (m) | 30.0 |
| Storage Blk Time (%) | |
| Queuing Penalty (veh) | |

Intersection: 8: Jones Baseline/Scotland St & 2nd Line

| Movement | EB | NB |
|-----------------------|-------|-----|
| Directions Served | LR | LT |
| Maximum Queue (m) | 17.5 | 7.5 |
| Average Queue (m) | 7.6 | 0.6 |
| 95th Queue (m) | 13.8 | 4.2 |
| Link Distance (m) | 382.5 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 9: Future N/S Collector/McTavish Extension & Future E/W Collector

| Movement | EB | WB | NB | SB |
|-----------------------|-------|------|------|------|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (m) | 14.9 | 13.2 | 18.0 | 14.6 |
| Average Queue (m) | 8.4 | 8.3 | 9.0 | 8.5 |
| 95th Queue (m) | 14.9 | 13.4 | 14.8 | 14.2 |
| Link Distance (m) | 709.6 | | | |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

Intersection: 10: Tower St S & New Collector Road/Commerical Access

| Movement | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB | SB | |
|-----------------------|------|------|------|------|-------|------|-------|-------|------|-------|------|--|
| Directions Served | L | TR | L | TR | L | T | TR | L | T | T | R | |
| Maximum Queue (m) | 41.2 | 26.2 | 20.2 | 18.8 | 26.1 | 71.9 | 72.8 | 28.4 | 66.5 | 71.4 | 31.7 | |
| Average Queue (m) | 19.5 | 11.1 | 9.1 | 8.7 | 10.7 | 36.3 | 39.0 | 10.9 | 32.4 | 36.1 | 8.7 | |
| 95th Queue (m) | 33.6 | 21.9 | 19.0 | 17.8 | 21.0 | 62.2 | 64.3 | 21.5 | 57.5 | 59.3 | 21.4 | |
| Link Distance (m) | 74.1 | | | | 240.4 | | 240.4 | 268.2 | | 268.2 | | |
| Upstream Blk Time (%) | 0 | | | | | | | | | | | |
| Queuing Penalty (veh) | 0 | | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | 50.0 | | 100.0 | | 75.0 | | | | 50.0 | |
| Storage Blk Time (%) | 0 | | 0 | | | | | | 0 | 2 | | |
| Queuing Penalty (veh) | 0 | | 0 | | | | | | 0 | 2 | | |

Intersection: 13: Tower St S & Future E/W Collector

| Movement | WB | WB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|-------|-------|-------|------|-------|-------|-------|
| Directions Served | L | R | T | T | R | L | T | T |
| Maximum Queue (m) | 36.6 | 47.6 | 66.2 | 71.3 | 21.0 | 30.3 | 53.9 | 57.6 |
| Average Queue (m) | 18.6 | 20.9 | 33.5 | 36.2 | 8.3 | 15.4 | 26.6 | 32.0 |
| 95th Queue (m) | 31.8 | 37.2 | 59.0 | 63.3 | 17.4 | 25.5 | 47.9 | 54.2 |
| Link Distance (m) | | 709.6 | 331.9 | 331.9 | | | 244.8 | 244.8 |
| Upstream Blk Time (%) | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | | | 75.0 | 100.0 | | |
| Storage Blk Time (%) | | 0 | | 0 | | | | |
| Queuing Penalty (veh) | | 0 | | 0 | | | | |

Intersection: 14: Guelph St & McQueen Blvd Extension

| Movement | EB | EB | WB | WB | NB | SB |
|-----------------------|------|-------|------|-----|--------|-------|
| Directions Served | L | TR | L | TR | LTR | LTR |
| Maximum Queue (m) | 8.5 | 2.7 | 9.0 | 1.2 | 29.4 | 17.9 |
| Average Queue (m) | 0.8 | 0.2 | 3.1 | 0.0 | 14.8 | 9.4 |
| 95th Queue (m) | 5.2 | 2.1 | 10.0 | 0.8 | 24.2 | 16.1 |
| Link Distance (m) | | 118.4 | | | 1008.8 | 323.2 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (m) | 30.0 | | 30.0 | | | |
| Storage Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |

Intersection: 15: Highway 6/Tower St S & 2nd Line

| Movement | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| Directions Served | L | TR | L | TR | L | T | TR | L | T | TR |
| Maximum Queue (m) | 39.6 | 61.1 | 37.9 | 19.6 | 28.4 | 59.5 | 58.9 | 14.5 | 99.4 | 103.4 |
| Average Queue (m) | 12.8 | 26.8 | 19.2 | 8.4 | 13.8 | 30.0 | 27.3 | 3.9 | 52.0 | 57.6 |
| 95th Queue (m) | 27.2 | 48.6 | 32.9 | 17.8 | 24.1 | 50.4 | 47.4 | 11.8 | 88.0 | 93.7 |
| Link Distance (m) | | 659.7 | | | | 372.6 | 372.6 | | 331.9 | 331.9 |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | 30.0 | | 100.0 | | | 100.0 | | |
| Storage Blk Time (%) | | 1 | 2 | | | | | | 0 | |
| Queuing Penalty (veh) | | 1 | 1 | | | | | | 0 | |

Intersection: 16: Guelph St & 2nd Line

| Movement | EB | WB | NB | SB |
|-----------------------|-------|-------|-------|--------|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (m) | 8.0 | 8.0 | 16.9 | 38.7 |
| Average Queue (m) | 1.0 | 0.5 | 8.0 | 17.7 |
| 95th Queue (m) | 5.3 | 4.1 | 14.1 | 28.7 |
| Link Distance (m) | 164.1 | 659.7 | 264.2 | 1008.8 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

Zone Summary

Zone wide Queuing Penalty: 50

Intersection: 2: Scotland St & McQueen Blvd

| Movement | EB | NB |
|-----------------------|------|------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 18.6 | 14.9 |
| Average Queue (m) | 8.4 | 1.8 |
| 95th Queue (m) | 15.7 | 8.9 |
| Link Distance (m) | | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | EB | EB | EB | WB | WB | NB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|-------|------|------|-------|------|-------|-------|------|-------|-------|-------|
| Directions Served | L | T | R | L | TR | L | T | T | R | L | T | T |
| Maximum Queue (m) | 63.6 | 100.8 | 74.9 | 54.9 | 100.3 | 75.0 | 243.9 | 246.9 | 55.0 | 100.0 | 301.9 | 301.4 |
| Average Queue (m) | 21.0 | 30.1 | 48.4 | 36.3 | 45.1 | 71.5 | 153.5 | 152.8 | 36.7 | 77.8 | 200.0 | 193.6 |
| 95th Queue (m) | 43.4 | 77.9 | 75.2 | 60.0 | 93.4 | 85.9 | 270.1 | 274.4 | 73.8 | 125.4 | 330.7 | 323.8 |
| Link Distance (m) | | | | | | | 268.2 | 268.2 | | | 363.6 | 363.6 |
| Upstream Blk Time (%) | | | | | | | 0 | 1 | | | 3 | 3 |
| Queuing Penalty (veh) | | | | | | | 4 | 6 | | | 0 | 0 |
| Storage Bay Dist (m) | 50.0 | | 50.0 | 30.0 | | 50.0 | | | 30.0 | 75.0 | | |
| Storage Blk Time (%) | 0 | 1 | 14 | 33 | 9 | 53 | 17 | 34 | 0 | 3 | 38 | 49 |
| Queuing Penalty (veh) | 0 | 3 | 23 | 47 | 13 | 360 | 60 | 71 | 1 | 22 | 90 | 45 |

Intersection: 7: Tower St S & McQueen Blvd

| Movement | SB |
|-----------------------|------|
| Directions Served | R |
| Maximum Queue (m) | 55.0 |
| Average Queue (m) | 24.2 |
| 95th Queue (m) | 62.8 |
| Link Distance (m) | |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (m) | 30.0 |
| Storage Blk Time (%) | 0 |
| Queuing Penalty (veh) | 1 |

Intersection: 8: Jones Baseline/Scotland St & 2nd Line

| Movement | EB | NB |
|-----------------------|-------|------|
| Directions Served | LR | LT |
| Maximum Queue (m) | 14.3 | 11.7 |
| Average Queue (m) | 6.2 | 1.0 |
| 95th Queue (m) | 12.3 | 6.5 |
| Link Distance (m) | 382.5 | |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (m) | | |
| Storage Blk Time (%) | | |
| Queuing Penalty (veh) | | |

Intersection: 9: Future N/S Collector/McTavish Extension & Future E/W Collector

| Movement | EB | WB | NB | SB |
|-----------------------|-------|------|------|------|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (m) | 16.2 | 16.1 | 13.5 | 13.3 |
| Average Queue (m) | 8.5 | 8.5 | 8.3 | 7.9 |
| 95th Queue (m) | 14.3 | 14.1 | 13.4 | 13.7 |
| Link Distance (m) | 709.6 | | | |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

Intersection: 10: Tower St S & New Collector Road/Commerical Access

| Movement | EB | EB | WB | WB | NB | NB | NB | B28 | B28 | SB | SB | SB | |
|-----------------------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Directions Served | L | TR | L | TR | L | T | TR | T | T | L | T | T | |
| Maximum Queue (m) | 73.7 | 79.6 | 18.9 | 24.9 | 124.6 | 222.4 | 221.3 | 55.9 | 54.7 | 99.9 | 172.8 | 173.3 | |
| Average Queue (m) | 57.2 | 43.4 | 11.6 | 17.0 | 68.4 | 122.8 | 125.6 | 7.9 | 8.0 | 43.5 | 98.9 | 101.2 | |
| 95th Queue (m) | 79.8 | 84.4 | 22.4 | 23.8 | 133.8 | 231.2 | 231.4 | 69.1 | 69.9 | 100.7 | 164.7 | 167.9 | |
| Link Distance (m) | | 74.1 | | | | | 240.4 | 240.4 | 244.8 | 244.8 | | 268.2 | 268.2 |
| Upstream Blk Time (%) | 3 | 5 | | 0 | | | 3 | 3 | 0 | 0 | | | |
| Queuing Penalty (veh) | 0 | 0 | | 0 | | | 27 | 30 | 0 | 0 | | | |
| Storage Bay Dist (m) | 50.0 | | 50.0 | | 100.0 | | | | | | 75.0 | | |
| Storage Blk Time (%) | 23 | 2 | | 0 | 1 | 16 | | | | 0 | 15 | 24 | |
| Queuing Penalty (veh) | 54 | 7 | | 0 | 9 | 37 | | | | 0 | 20 | 82 | |

Intersection: 10: Tower St S & New Collector Road/Commerical Access

| Movement | SB |
|-----------------------|------|
| Directions Served | R |
| Maximum Queue (m) | 75.0 |
| Average Queue (m) | 51.7 |
| 95th Queue (m) | 97.5 |
| Link Distance (m) | |
| Upstream Blk Time (%) | |
| Queuing Penalty (veh) | |
| Storage Bay Dist (m) | 50.0 |
| Storage Blk Time (%) | 0 |
| Queuing Penalty (veh) | 2 |

Intersection: 13: Tower St S & Future E/W Collector

| Movement | WB | WB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|-------|-------|-------|-------|-------|-------|-------|
| Directions Served | L | R | T | T | R | L | T | T |
| Maximum Queue (m) | 74.8 | 148.0 | 197.1 | 212.0 | 100.0 | 123.2 | 129.3 | 101.9 |
| Average Queue (m) | 45.2 | 56.5 | 118.6 | 123.2 | 60.6 | 81.8 | 39.0 | 40.4 |
| 95th Queue (m) | 77.5 | 115.2 | 189.3 | 200.0 | 128.0 | 124.3 | 90.9 | 84.2 |
| Link Distance (m) | | 709.6 | 331.9 | 331.9 | | | 244.8 | 244.8 |
| Upstream Blk Time (%) | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | | | 75.0 | 100.0 | | |
| Storage Blk Time (%) | 16 | 12 | | 24 | | 8 | 0 | |
| Queuing Penalty (veh) | 48 | 21 | | 66 | | 49 | 0 | |

Intersection: 14: Guelph St & McQueen Blvd Extension

| Movement | EB | EB | WB | WB | NB | SB |
|-----------------------|------|-------|------|-----|--------|-------|
| Directions Served | L | TR | L | TR | LTR | LTR |
| Maximum Queue (m) | 9.1 | 6.5 | 16.6 | 6.5 | 74.3 | 22.9 |
| Average Queue (m) | 2.1 | 0.5 | 5.9 | 0.3 | 33.7 | 10.9 |
| 95th Queue (m) | 8.2 | 3.2 | 15.1 | 2.3 | 60.5 | 19.3 |
| Link Distance (m) | | 118.4 | | | 1008.8 | 323.2 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (m) | 30.0 | | 30.0 | | | |
| Storage Blk Time (%) | | | 0 | | | |
| Queuing Penalty (veh) | | | 0 | | | |

Intersection: 15: Highway 6/Tower St S & 2nd Line

| Movement | EB | EB | WB | WB | NB | NB | NB | SB | SB | SB |
|-----------------------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| Directions Served | L | TR | L | TR | L | T | TR | L | T | TR |
| Maximum Queue (m) | 46.7 | 41.3 | 36.4 | 42.4 | 87.2 | 118.6 | 122.2 | 39.8 | 142.6 | 142.8 |
| Average Queue (m) | 23.0 | 21.2 | 16.3 | 16.3 | 43.0 | 66.0 | 72.4 | 8.2 | 83.8 | 89.9 |
| 95th Queue (m) | 40.5 | 36.4 | 30.0 | 32.0 | 74.7 | 105.5 | 112.9 | 26.6 | 130.5 | 137.3 |
| Link Distance (m) | | 659.7 | | | | 372.6 | 372.6 | | 331.9 | 331.9 |
| Upstream Blk Time (%) | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | |
| Storage Bay Dist (m) | 50.0 | | 30.0 | | 100.0 | | | 100.0 | | |
| Storage Blk Time (%) | 0 | 0 | 2 | 1 | | 1 | | | 4 | |
| Queuing Penalty (veh) | 0 | 0 | 2 | 1 | | 2 | | | 2 | |

Intersection: 16: Guelph St & 2nd Line

| Movement | EB | WB | NB | SB |
|-----------------------|-------|-------|-------|--------|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (m) | 24.3 | 15.7 | 20.6 | 33.4 |
| Average Queue (m) | 7.3 | 2.2 | 8.3 | 17.1 |
| 95th Queue (m) | 18.2 | 9.5 | 15.8 | 27.7 |
| Link Distance (m) | 164.1 | 659.7 | 264.2 | 1008.8 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

Zone Summary

Zone wide Queuing Penalty: 1207

Appendix G: Roundabout Operations

| |
|--|
| Junctions 9 |
| ARCADY 9 - Roundabout Module |
| Version: 9.5.1.7462 © Copyright TRL Limited, 2019 |
| For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 379777 software@trl.co.uk 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: Highway 6 & 2nd Line.j9

Path: I:\2020 Projects\120157 - South Fergus MESP and Secondary Plan\Design\Transportation\ARCADY

Report generation date: 1/9/2023 9:43:18 AM

»2049 Total - 2049, AM

»2049 Total - 2049, PM

Summary of intersection performance

| | AM | | | | | | | | | PM | | | | | | | | | |
|-------------------|--------|---------|-----------|-----------|------|-----|-------------|---------|---------|----------------|---------|-----------|-----------|--------|------|-------------|---------|---------|-------|
| | Set ID | Q (Veh) | Q95 (Veh) | Delay (s) | V/C | LOS | Int Del (s) | Int LOS | Res Cap | Set ID | Q (Veh) | Q95 (Veh) | Delay (s) | V/C | LOS | Int Del (s) | Int LOS | Res Cap | |
| 2049 Total - 2049 | | | | | | | | | | | | | | | | | | | |
| 1 - 2nd Line | D1 | 0.3 | 1.2 | 5.40 | 0.22 | A | 6.47 | A | 25 % | [3 - 2nd Line] | D2 | 0.9 | 4.2 | 16.01 | 0.48 | C | 114.54 | F | -14 % |
| 2 - Highway 6 | | 2.8 | 6.4 | 7.56 | 0.74 | A | | | | | | 9.3 | 50.6 | 22.14 | 0.91 | C | | | |
| 3 - 2nd Line | | 0.9 | 3.8 | 9.76 | 0.48 | A | | | | | | 1.1 | 4.8 | 12.63 | 0.53 | B | | | |
| 4 - Highway 6 | | 1.3 | 1.7 | 4.27 | 0.56 | A | | | | | | 129.7 | 200.0 | 209.30 | 1.13 | F | | | |

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 Av. delay per arriving vehicle. Int LOS and Int Del are demand-weighted Av.s. Res Cap indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

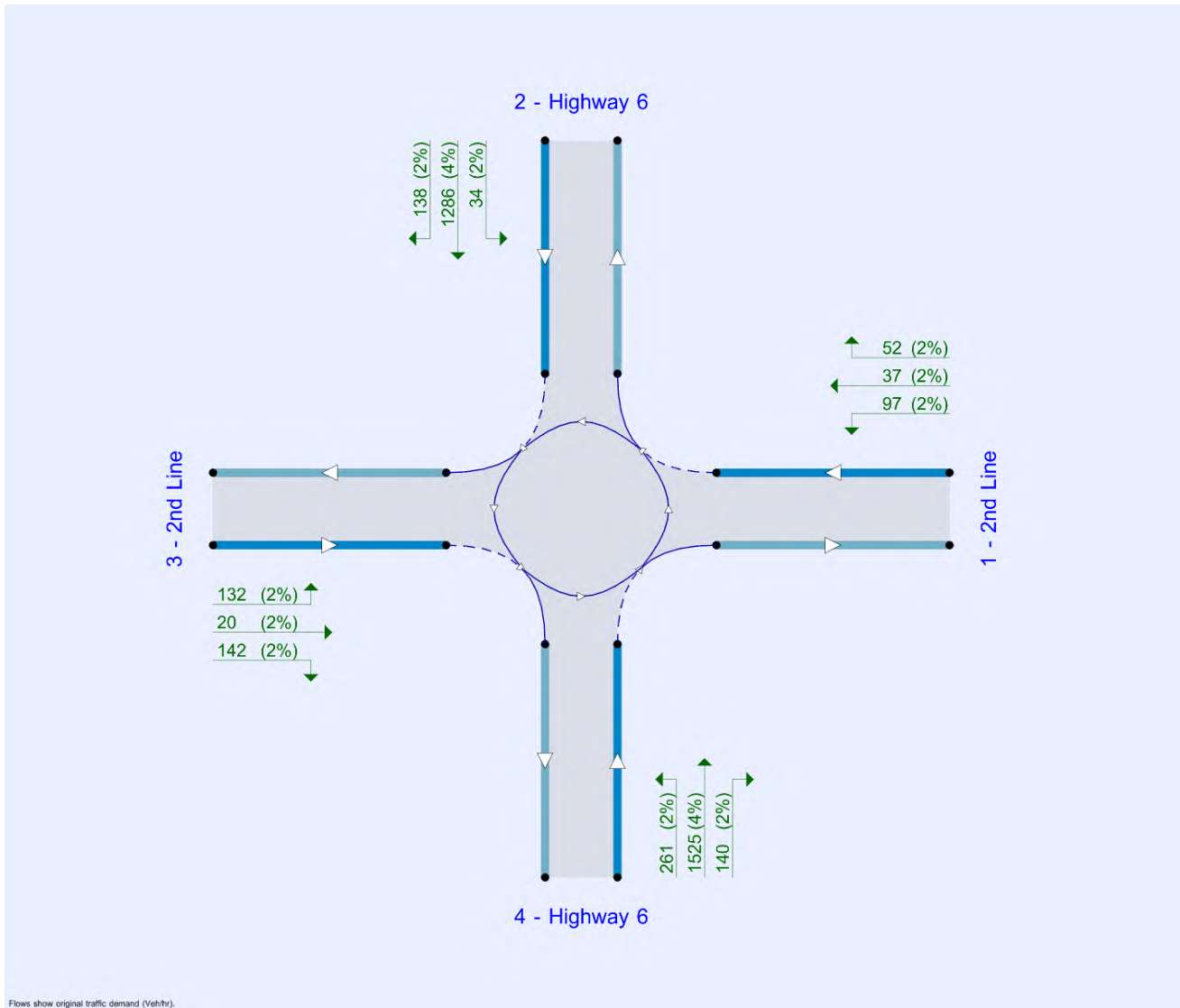
File summary

File Description

| | |
|-------------|-----------------------------|
| Title | South Fergus Secondary Plan |
| Location | |
| Site number | |
| Date | 3/14/2022 |
| Version | |
| Status | (new file) |
| Identifier | |
| Client | |
| Jobnumber | |
| Analyst | B-D9MT0B3\DPPerks |
| Description | |

Units

| Distance units | Speed units | Traffic units input | Traffic units results | Flow units | Av. delay units | Total delay units | Rate of delay units |
|----------------|-------------|---------------------|-----------------------|------------|-----------------|-------------------|---------------------|
| m | kph | Veh | Veh | perHour | s | -Min | perMin |



Analysis Options

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

Demand Set Summary

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Results for central hour only | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------------------|-------------------|
| D1 | 2049 | AM | ONE HOUR | 07:00 | 08:30 | 15 | ✓ | ✓ |
| D2 | 2049 | PM | ONE HOUR | 16:00 | 17:30 | 15 | ✓ | ✓ |

Analysis Set Details

| ID | Name | Include in report | Network flow scaling factor (%) | Network capacity scaling factor (%) |
|----|------------|-------------------|---------------------------------|-------------------------------------|
| A1 | 2049 Total | ✓ | 100.000 | 100.000 |

2049 Total - 2049, AM

Data Errors and Warnings

| Severity | Area | Item | Description |
|----------|------------------|------------------|---|
| Warning | Demand Sets | D1 - 2049, AM | Time results are shown for central hour only. (Model is run for a 90 minute period.) |
| Warning | Queue variations | Analysis Options | Q percentiles may be unreliable if the mean queue in any time segment is very low or very high. |

Intersection Network

Intersections

| Intersection | Name | Intersection type | Use circulating lanes | Leg order | Int Del (s) | Int LOS |
|--------------|----------|---------------------|-----------------------|------------|-------------|---------|
| 1 | untitled | Standard Roundabout | | 1, 2, 3, 4 | 6.47 | A |

Intersection Network Options

| Driving side | Lighting | Res Cap (%) | First leg reaching threshold |
|--------------|----------------|-------------|------------------------------|
| Right | Normal/unknown | 25 | 3 - 2nd Line |

Legs

Legs

| Leg | Name | Description |
|-----|-----------|-------------|
| 1 | 2nd Line | |
| 2 | Highway 6 | |
| 3 | 2nd Line | |
| 4 | Highway 6 | |

Roundabout Geometry

| Leg | V (m) | E (m) | I' (m) | R (m) | D (m) | PHI (deg) | Exit only |
|---------------|-------|-------|--------|-------|-------|-----------|-----------|
| 1 - 2nd Line | 3.00 | 5.00 | 30.0 | 20.0 | 60.0 | 15.0 | |
| 2 - Highway 6 | 3.50 | 8.00 | 30.0 | 20.0 | 60.0 | 15.0 | |
| 3 - 2nd Line | 3.00 | 5.00 | 30.0 | 20.0 | 60.0 | 15.0 | |
| 4 - Highway 6 | 3.50 | 8.00 | 30.0 | 20.0 | 60.0 | 15.0 | |

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

| Leg | Final slope | Final intercept (PCE/hr) |
|---------------|-------------|--------------------------|
| 1 - 2nd Line | 0.533 | 1482 |
| 2 - Highway 6 | 0.637 | 2085 |
| 3 - 2nd Line | 0.533 | 1482 |
| 4 - Highway 6 | 0.637 | 2085 |

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Results for central hour only | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------------------|-------------------|
| D1 | 2049 | AM | ONE HOUR | 07:00 | 08:30 | 15 | ✓ | ✓ |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCE Factor for a Truck (PCE) |
|------------------------------|-------------------------------|--------------------|------------------------------|
| ✓ | ✓ | Truck %s | 2.00 |

Demand overview (Traffic)

| Leg | Linked leg | Profile type | Use O-D data | Av. Demand (Veh/hr) | Scaling Factor (%) |
|---------------|------------|--------------|--------------|---------------------|--------------------|
| 1 - 2nd Line | | ONE HOUR | ✓ | 166 | 100.000 |
| 2 - Highway 6 | | ONE HOUR | ✓ | 1243 | 100.000 |
| 3 - 2nd Line | | ONE HOUR | ✓ | 309 | 100.000 |
| 4 - Highway 6 | | ONE HOUR | ✓ | 987 | 100.000 |

Origin-Destination Data

Demand (Veh/hr)

| | | To | | | |
|------|---------------|--------------|---------------|--------------|---------------|
| | | 1 - 2nd Line | 2 - Highway 6 | 3 - 2nd Line | 4 - Highway 6 |
| From | 1 - 2nd Line | 0 | 23 | 23 | 120 |
| | 2 - Highway 6 | 20 | 0 | 117 | 1106 |
| | 3 - 2nd Line | 20 | 78 | 0 | 211 |
| | 4 - Highway 6 | 53 | 838 | 96 | 0 |

Vehicle Mix

Truck %s

| | | To | | | |
|------|---------------|--------------|---------------|--------------|---------------|
| | | 1 - 2nd Line | 2 - Highway 6 | 3 - 2nd Line | 4 - Highway 6 |
| From | 1 - 2nd Line | 0 | 2 | 2 | 2 |
| | 2 - Highway 6 | 2 | 0 | 2 | 4 |
| | 3 - 2nd Line | 2 | 2 | 0 | 2 |
| | 4 - Highway 6 | 2 | 4 | 2 | 0 |

Results

Results Summary for whole modelled period

| Leg | Max V/C | Max Delay (s) | Max Q (Veh) | Max Q95 (Veh) | Max LOS | Av. Demand (Veh/hr) | Total Intersection Arrivals (Veh) |
|---------------|---------|---------------|-------------|---------------|---------|---------------------|-----------------------------------|
| 1 - 2nd Line | 0.22 | 5.40 | 0.3 | 1.2 | A | 166 | 166 |
| 2 - Highway 6 | 0.74 | 7.56 | 2.8 | 6.4 | A | 1243 | 1243 |
| 3 - 2nd Line | 0.48 | 9.76 | 0.9 | 3.8 | A | 309 | 309 |
| 4 - Highway 6 | 0.56 | 4.27 | 1.3 | 1.7 | A | 987 | 987 |

Main Results for each time segment

07:15 - 07:30

| Leg | Total Demand (Veh/hr) | Intersection Arrivals (Veh) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | V/C | Throughput (Veh/hr) | Throughput (exit) (Veh/hr) | Start queue (Veh) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---------------|-----------------------|-----------------------------|---------------------------|-------------------|-------|---------------------|----------------------------|-------------------|-----------------|-----------|-------------------------------|
| 1 - 2nd Line | 149 | 37 | 909 | 961 | 0.155 | 149 | 83 | 0.1 | 0.2 | 4.435 | A |
| 2 - Highway 6 | 1117 | 279 | 215 | 1875 | 0.596 | 1115 | 843 | 1.0 | 1.5 | 4.730 | A |
| 3 - 2nd Line | 278 | 69 | 1118 | 846 | 0.328 | 277 | 212 | 0.3 | 0.5 | 6.317 | A |
| 4 - Highway 6 | 887 | 222 | 106 | 1944 | 0.456 | 886 | 1290 | 0.6 | 0.8 | 3.399 | A |

07:30 - 07:45

| Leg | Total Demand (Veh/hr) | Intersection Arrivals (Veh) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | V/C | Throughput (Veh/hr) | Throughput (exit) (Veh/hr) | Start queue (Veh) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---------------|-----------------------|-----------------------------|---------------------------|-------------------|-------|---------------------|----------------------------|-------------------|-----------------|-----------|-------------------------------|
| 1 - 2nd Line | 183 | 46 | 1112 | 850 | 0.215 | 182 | 102 | 0.2 | 0.3 | 5.387 | A |
| 2 - Highway 6 | 1369 | 342 | 263 | 1844 | 0.742 | 1363 | 1032 | 1.5 | 2.8 | 7.398 | A |
| 3 - 2nd Line | 340 | 85 | 1367 | 712 | 0.478 | 339 | 259 | 0.5 | 0.9 | 9.606 | A |
| 4 - Highway 6 | 1087 | 272 | 129 | 1930 | 0.563 | 1085 | 1576 | 0.8 | 1.3 | 4.254 | A |

07:45 - 08:00

| Leg | Total Demand (Veh/hr) | Intersection Arrivals (Veh) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | V/C | Throughput (Veh/hr) | Throughput (exit) (Veh/hr) | Start queue (Veh) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---------------|-----------------------|-----------------------------|---------------------------|-------------------|-------|---------------------|----------------------------|-------------------|-----------------|-----------|-------------------------------|
| 1 - 2nd Line | 183 | 46 | 1114 | 849 | 0.215 | 183 | 102 | 0.3 | 0.3 | 5.400 | A |
| 2 - Highway 6 | 1369 | 342 | 263 | 1844 | 0.742 | 1368 | 1034 | 2.8 | 2.8 | 7.559 | A |
| 3 - 2nd Line | 340 | 85 | 1372 | 709 | 0.480 | 340 | 260 | 0.9 | 0.9 | 9.757 | A |
| 4 - Highway 6 | 1087 | 272 | 130 | 1929 | 0.563 | 1087 | 1582 | 1.3 | 1.3 | 4.273 | A |

08:00 - 08:15

| Leg | Total Demand (Veh/hr) | Intersection Arrivals (Veh) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | V/C | Throughput (Veh/hr) | Throughput (exit) (Veh/hr) | Start queue (Veh) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---------------|-----------------------|-----------------------------|---------------------------|-------------------|-------|---------------------|----------------------------|-------------------|-----------------|-----------|-------------------------------|
| 1 - 2nd Line | 149 | 37 | 912 | 959 | 0.156 | 150 | 84 | 0.3 | 0.2 | 4.451 | A |
| 2 - Highway 6 | 1117 | 279 | 215 | 1874 | 0.596 | 1123 | 846 | 2.8 | 1.5 | 4.826 | A |
| 3 - 2nd Line | 278 | 69 | 1125 | 843 | 0.330 | 279 | 213 | 0.9 | 0.5 | 6.412 | A |
| 4 - Highway 6 | 887 | 222 | 107 | 1944 | 0.457 | 889 | 1298 | 1.3 | 0.8 | 3.420 | A |

Q Variation Results for each time segment

07:15 - 07:30

| Leg | Mean (Veh) | Q05 (Veh) | Q50 (Veh) | Q90 (Veh) | Q95 (Veh) | Percentile message | Marker message | Probability of reaching or exceeding marker | Probability of exactly reaching marker |
|---------------|------------|-----------|-----------|-----------|-----------|--------------------|----------------|---|--|
| 1 - 2nd Line | 0.18 | 0.00 | 0.00 | 0.18 | 0.18 | | | N/A | N/A |
| 2 - Highway 6 | 1.46 | 0.05 | 0.49 | 3.67 | 5.66 | | | N/A | N/A |
| 3 - 2nd Line | 0.48 | 0.00 | 0.00 | 0.48 | 0.48 | | | N/A | N/A |
| 4 - Highway 6 | 0.83 | 0.08 | 0.82 | 1.20 | 1.67 | | | N/A | N/A |

07:30 - 07:45

| Leg | Mean (Veh) | Q05 (Veh) | Q50 (Veh) | Q90 (Veh) | Q95 (Veh) | Percentile message | Marker message | Probability of reaching or exceeding marker | Probability of exactly reaching marker |
|---------------|------------|-----------|-----------|-----------|-----------|--------------------|----------------|---|--|
| 1 - 2nd Line | 0.27 | 0.03 | 0.25 | 0.46 | 0.48 | | | N/A | N/A |
| 2 - Highway 6 | 2.79 | 0.03 | 0.28 | 2.79 | 6.43 | | | N/A | N/A |
| 3 - 2nd Line | 0.90 | 0.03 | 0.26 | 0.90 | 0.90 | | | N/A | N/A |
| 4 - Highway 6 | 1.28 | 0.03 | 0.26 | 1.28 | 1.28 | | | N/A | N/A |

07:45 - 08:00

| Leg | Mean (Veh) | Q05 (Veh) | Q50 (Veh) | Q90 (Veh) | Q95 (Veh) | Percentile message | Marker message | Probability of reaching or exceeding marker | Probability of exactly reaching marker |
|---------------|------------|-----------|-----------|-----------|-----------|--------------------|----------------|---|--|
| 1 - 2nd Line | 0.27 | 0.03 | 0.29 | 0.84 | 1.18 | | | N/A | N/A |
| 2 - Highway 6 | 2.83 | 0.03 | 0.27 | 2.83 | 2.83 | | | N/A | N/A |
| 3 - 2nd Line | 0.91 | 0.03 | 0.29 | 1.19 | 3.82 | | | N/A | N/A |
| 4 - Highway 6 | 1.28 | 0.03 | 0.26 | 1.28 | 1.28 | | | N/A | N/A |

08:00 - 08:15

| Leg | Mean (Veh) | Q05 (Veh) | Q50 (Veh) | Q90 (Veh) | Q95 (Veh) | Percentile message | Marker message | Probability of reaching or exceeding marker | Probability of exactly reaching marker |
|---------------|------------|-----------|-----------|-----------|-----------|--------------------|----------------|---|--|
| 1 - 2nd Line | 0.19 | 0.00 | 0.00 | 0.19 | 0.19 | | | N/A | N/A |
| 2 - Highway 6 | 1.50 | 0.08 | 1.05 | 3.12 | 4.32 | | | N/A | N/A |
| 3 - 2nd Line | 0.50 | 0.05 | 0.46 | 1.28 | 1.39 | | | N/A | N/A |
| 4 - Highway 6 | 0.85 | 0.52 | 0.98 | 1.40 | 1.45 | | | N/A | N/A |

2049 Total - 2049, PM

Data Errors and Warnings

| Severity | Area | Item | Description |
|----------|------------------|------------------|---|
| Warning | Demand Sets | D2 - 2049, PM | Time results are shown for central hour only. (Model is run for a 90 minute period.) |
| Warning | Queue variations | Analysis Options | Q percentiles may be unreliable if the mean queue in any time segment is very low or very high. |

Intersection Network

Intersections

| Intersection | Name | Intersection type | Use circulating lanes | Leg order | Int Del (s) | Int LOS |
|--------------|----------|---------------------|-----------------------|------------|-------------|---------|
| 1 | untitled | Standard Roundabout | | 1, 2, 3, 4 | 114.54 | F |

Intersection Network Options

| Driving side | Lighting | Res Cap (%) | First leg reaching threshold |
|--------------|----------------|-------------|------------------------------|
| Right | Normal/unknown | -14 | 4 - Highway 6 |

Traffic Demand

Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Results for central hour only | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------------------|-------------------|
| D2 | 2049 | PM | ONE HOUR | 16:00 | 17:30 | 15 | ✓ | ✓ |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCE Factor for a Truck (PCE) |
|------------------------------|-------------------------------|--------------------|------------------------------|
| ✓ | ✓ | Truck %s | 2.00 |

Demand overview (Traffic)

| Leg | Linked leg | Profile type | Use O-D data | Av. Demand (Veh/hr) | Scaling Factor (%) |
|---------------|------------|--------------|--------------|---------------------|--------------------|
| 1 - 2nd Line | | ONE HOUR | ✓ | 186 | 100.000 |
| 2 - Highway 6 | | ONE HOUR | ✓ | 1458 | 100.000 |
| 3 - 2nd Line | | ONE HOUR | ✓ | 294 | 100.000 |
| 4 - Highway 6 | | ONE HOUR | ✓ | 1926 | 100.000 |

Origin-Destination Data

Demand (Veh/hr)

| | | To | | | |
|------|---------------|--------------|---------------|--------------|---------------|
| | | 1 - 2nd Line | 2 - Highway 6 | 3 - 2nd Line | 4 - Highway 6 |
| From | 1 - 2nd Line | 0 | 52 | 37 | 97 |
| | 2 - Highway 6 | 34 | 0 | 138 | 1286 |
| | 3 - 2nd Line | 20 | 132 | 0 | 142 |
| | 4 - Highway 6 | 140 | 1525 | 261 | 0 |

Vehicle Mix

Truck %s

| | | To | | | |
|------|---------------|--------------|---------------|--------------|---------------|
| From | | 1 - 2nd Line | 2 - Highway 6 | 3 - 2nd Line | 4 - Highway 6 |
| | 1 - 2nd Line | 0 | 2 | 2 | 2 |
| | 2 - Highway 6 | 2 | 0 | 2 | 4 |
| | 3 - 2nd Line | 2 | 2 | 0 | 2 |
| | 4 - Highway 6 | 2 | 4 | 2 | 0 |

Results

Results Summary for whole modelled period

| Leg | Max V/C | Max Delay (s) | Max Q (Veh) | Max Q95 (Veh) | Max LOS | Av. Demand (Veh/hr) | Total Intersection Arrivals (Veh) |
|---------------|---------|---------------|-------------|---------------|---------|---------------------|-----------------------------------|
| 1 - 2nd Line | 0.48 | 16.01 | 0.9 | 4.2 | C | 186 | 186 |
| 2 - Highway 6 | 0.91 | 22.14 | 9.3 | 50.6 | C | 1458 | 1458 |
| 3 - 2nd Line | 0.53 | 12.63 | 1.1 | 4.8 | B | 294 | 294 |
| 4 - Highway 6 | 1.13 | 209.30 | 129.7 | 200.0 | F | 1926 | 1926 |

Main Results for each time segment
16:15 - 16:30

| Leg | Total Demand (Veh/hr) | Intersection Arrivals (Veh) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | V/C | Throughput (Veh/hr) | Throughput (exit) (Veh/hr) | Start queue (Veh) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---------------|-----------------------|-----------------------------|---------------------------|-------------------|-------|---------------------|----------------------------|-------------------|-----------------|-----------|-------------------------------|
| 1 - 2nd Line | 167 | 42 | 1705 | 530 | 0.315 | 166 | 173 | 0.3 | 0.5 | 9.873 | A |
| 2 - Highway 6 | 1311 | 328 | 352 | 1789 | 0.733 | 1306 | 1519 | 1.5 | 2.7 | 7.382 | A |
| 3 - 2nd Line | 264 | 66 | 1269 | 764 | 0.346 | 264 | 389 | 0.3 | 0.5 | 7.179 | A |
| 4 - Highway 6 | 1731 | 433 | 167 | 1908 | 0.907 | 1711 | 1366 | 3.0 | 8.2 | 16.679 | C |

16:30 - 16:45

| Leg | Total Demand (Veh/hr) | Intersection Arrivals (Veh) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | V/C | Throughput (Veh/hr) | Throughput (exit) (Veh/hr) | Start queue (Veh) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---------------|-----------------------|-----------------------------|---------------------------|-------------------|-------|---------------------|----------------------------|-------------------|-----------------|-----------|-------------------------------|
| 1 - 2nd Line | 205 | 51 | 1880 | 435 | 0.471 | 203 | 195 | 0.5 | 0.9 | 15.409 | C |
| 2 - Highway 6 | 1605 | 401 | 400 | 1759 | 0.913 | 1582 | 1684 | 2.7 | 8.5 | 18.378 | C |
| 3 - 2nd Line | 324 | 81 | 1538 | 618 | 0.523 | 322 | 444 | 0.5 | 1.1 | 12.040 | B |
| 4 - Highway 6 | 2121 | 530 | 203 | 1885 | 1.125 | 1872 | 1657 | 8.2 | 70.3 | 83.901 | F |

16:45 - 17:00

| Leg | Total Demand (Veh/hr) | Intersection Arrivals (Veh) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | V/C | Throughput (Veh/hr) | Throughput (exit) (Veh/hr) | Start queue (Veh) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---------------|-----------------------|-----------------------------|---------------------------|-------------------|-------|---------------------|----------------------------|-------------------|-----------------|-----------|-------------------------------|
| 1 - 2nd Line | 205 | 51 | 1891 | 429 | 0.477 | 205 | 196 | 0.9 | 0.9 | 16.008 | C |
| 2 - Highway 6 | 1605 | 401 | 403 | 1757 | 0.914 | 1602 | 1693 | 8.5 | 9.3 | 22.141 | C |
| 3 - 2nd Line | 324 | 81 | 1557 | 608 | 0.532 | 324 | 447 | 1.1 | 1.1 | 12.629 | B |
| 4 - Highway 6 | 2121 | 530 | 205 | 1884 | 1.125 | 1883 | 1676 | 70.3 | 129.7 | 196.558 | F |

17:00 - 17:15

| Leg | Total Demand (Veh/hr) | Intersection Arrivals (Veh) | Circulating flow (Veh/hr) | Capacity (Veh/hr) | V/C | Throughput (Veh/hr) | Throughput (exit) (Veh/hr) | Start queue (Veh) | End queue (Veh) | Delay (s) | Unsignalised level of service |
|---------------|-----------------------|-----------------------------|---------------------------|-------------------|-------|---------------------|----------------------------|-------------------|-----------------|-----------|-------------------------------|
| 1 - 2nd Line | 167 | 42 | 1874 | 438 | 0.382 | 168 | 187 | 0.9 | 0.6 | 13.385 | B |
| 2 - Highway 6 | 1311 | 328 | 378 | 1773 | 0.739 | 1336 | 1665 | 9.3 | 2.9 | 8.701 | A |
| 3 - 2nd Line | 264 | 66 | 1297 | 749 | 0.353 | 267 | 416 | 1.1 | 0.6 | 7.498 | A |
| 4 - Highway 6 | 1731 | 433 | 169 | 1907 | 0.908 | 1892 | 1395 | 129.7 | 89.5 | 209.297 | F |

Q Variation Results for each time segment

16:15 - 16:30

| Leg | Mean (Veh) | Q05 (Veh) | Q50 (Veh) | Q90 (Veh) | Q95 (Veh) | Percentile message | Marker message | Probability of reaching or exceeding marker | Probability of exactly reaching marker |
|---------------|------------|-----------|-----------|-----------|-----------|--------------------|----------------|---|--|
| 1 - 2nd Line | 0.45 | 0.00 | 0.00 | 0.45 | 0.45 | | | N/A | N/A |
| 2 - Highway 6 | 2.66 | 0.05 | 0.47 | 7.40 | 12.45 | | | N/A | N/A |
| 3 - 2nd Line | 0.52 | 0.06 | 0.59 | 1.32 | 1.41 | | | N/A | N/A |
| 4 - Highway 6 | 8.17 | 0.11 | 2.84 | 22.03 | 32.00 | | | N/A | N/A |

16:30 - 16:45

| Leg | Mean (Veh) | Q05 (Veh) | Q50 (Veh) | Q90 (Veh) | Q95 (Veh) | Percentile message | Marker message | Probability of reaching or exceeding marker | Probability of exactly reaching marker |
|---------------|------------|-----------|-----------|-----------|-----------|--------------------|----------------|---|--|
| 1 - 2nd Line | 0.86 | 0.03 | 0.26 | 0.86 | 0.86 | | | N/A | N/A |
| 2 - Highway 6 | 8.45 | 0.05 | 0.46 | 23.76 | 44.60 | | | N/A | N/A |
| 3 - 2nd Line | 1.07 | 0.03 | 0.26 | 1.07 | 1.07 | | | N/A | N/A |
| 4 - Highway 6 | 70.27 | 29.51 | 65.77 | 108.91 | 123.80 | | | N/A | N/A |

16:45 - 17:00

| Leg | Mean (Veh) | Q05 (Veh) | Q50 (Veh) | Q90 (Veh) | Q95 (Veh) | Percentile message | Marker message | Probability of reaching or exceeding marker | Probability of exactly reaching marker |
|---------------|------------|-----------|-----------|-----------|-----------|--------------------|----------------|---|--|
| 1 - 2nd Line | 0.89 | 0.03 | 0.30 | 1.04 | 4.18 | | | N/A | N/A |
| 2 - Highway 6 | 9.31 | 0.04 | 0.35 | 18.71 | 50.60 | | | N/A | N/A |
| 3 - 2nd Line | 1.11 | 0.03 | 0.29 | 1.37 | 4.77 | | | N/A | N/A |
| 4 - Highway 6 | 129.71 | >199 | >199 | >199 | >199 | | | N/A | N/A |

17:00 - 17:15

| Leg | Mean (Veh) | Q05 (Veh) | Q50 (Veh) | Q90 (Veh) | Q95 (Veh) | Percentile message | Marker message | Probability of reaching or exceeding marker | Probability of exactly reaching marker |
|---------------|------------|-----------|-----------|-----------|-----------|--------------------|----------------|---|--|
| 1 - 2nd Line | 0.63 | 0.10 | 0.84 | 1.37 | 1.43 | | | N/A | N/A |
| 2 - Highway 6 | 2.93 | 0.04 | 0.45 | 8.15 | 14.14 | | | N/A | N/A |
| 3 - 2nd Line | 0.55 | 0.06 | 0.60 | 1.32 | 1.41 | | | N/A | N/A |
| 4 - Highway 6 | 89.53 | 54.58 | 87.03 | 119.75 | 130.29 | | | N/A | N/A |