# Estelle Street Development

## City of Greater Sudbury

### Traffic Impact Study for

### Tulloch Engineering Inc.

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# Executive Summary

This report summarizes the traffic impact study prepared for the proposed residential development located on the west side of Estelle Street midblock between Bancroft Drive and Rheal Street, in the City of Greater Sudbury [City]. The report assesses the impact of traffic related to the development on the adjacent roadway and provides recommendations to accommodate this traffic in a safe and efficient manner.

The proposed development is anticipated to consist of three 5-storey buildings with a total of 120 units and 59 townhouse units.

The proposed development will include two full-movement access driveways onto Estelle Street [North Access & South Access].

The scope of this analysis includes a review of the following intersections:

- Levesque Street / Kingsway;
- Moonlight Avenue / Kingsway;
- Levesque Street / Bancroft Drive;
- Moonlight Avenue & Moonlight Beach Road / Bancroft Drive;
- Estelle Street / Bancroft Drive;
- Estelle Street / North Access; and
- Estelle Street / South Access.

## Conclusions

1. The proposed development is expected to generate a total of 73 AM and 90 PM peak hour trips.
2. An intersection operation analysis was completed at the study area intersections, using the existing (2021) and background (2024 & 2029) traffic volumes, with the adjacent development traffic. This enabled a review of existing and future traffic deficiencies that would be present without the influence of the proposed development. The following improvements are recommended prior to build-out of the Kingsway Entertainment District and Arena / Event Centre and future business park development:

   **Background (2024) Traffic Volumes**

   - **Street 'C' & Levesque Street / Kingsway**
     - Street 'C' be constructed with a left, through and right turn lane configuration;
     - The southbound left turn is constructed with a 75 metre storage length and 55 metre taper length;
     - Adjust eastbound and northbound signal heads to accommodate a protected and permissive left turn signal phase; and
     - Adjust and repaint northbound lane pavement markings to provide 100 metre parallel length and 30 metre taper length for the northbound left turn lane.
3. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area streets and intersections.

4. An intersection operation analysis was completed under total (2024 & 2029) traffic volumes with the proposed development operational at the study area intersections. No further infrastructure improvements were required as a result of the analysis.
5. A supplementary analysis was completed to assess the recommendation for the eastbound double left turn lane at the Street 'C' & Levesque Street / Kingsway intersection, as recommended in the Kingsway Entertainment District and Arena / Event Centre Traffic Impact Study. Based on our review, there are no issues with the recommendation for this improvement.
6. The North Access and South Access will operate efficiently as a full-movement access driveways, with one-way stop control for eastbound movements. No lane improvements are recommended on Estelle Street at the North Access and South Access. The above-noted configuration will provide the necessary capacity to service the proposed development.
7. The sight distance available for the proposed North Access and South Access meet the minimum stopping sight distance requirements.
8. The Developer is committed to providing clear messaging in the sales agreement, which will inform tenants that additional parking is not guaranteed and regular enforcement by the property manager will occur to ensure there is no misuse of parking within the site.
9. Based on our analysis of the residential visitor proxy parking data and the resident parking survey, the proposed parking breakdown, summarized in Table A will provide the necessary capacity to support the proposed.

**Table A – Recommended Minimum Parking Supply**

| Unit Type | Proposed Units | Resident Parking | Visitor Parking | Total Parking |
|---|---|---|---|---|
| Residential Dwelling, Multiple | 143 | 130 spaces (0.91 sp./unit) | 21 spaces (0.15 sp./unit) | 151 spaces |
| Residential Dwelling, Townhouse | 36 | 36 spaces (1 sp./unit) | - | 36 spaces |
| **TOTAL** | **179** | **166 spaces** | **21 spaces** | **187 spaces** |
| Accessible | 2 spaces plus 1 space for each additional 50 spaces greater than 100 spaces | | | 7 spaces |

10. Construction of a sidewalk is recommended on the west side of Estelle Street extending from Bancroft Drive to Rheal Street, to improve pedestrian connectivity.
11. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network; furthermore, the above-noted parking supply will provide the necessary capacity to accommodate the typical peak parking demand for the proposed development.

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# 1 Introduction

## 1.1 Background

**Tulloch Engineering Inc.** [Tulloch] is the lead consultant managing the proposed residential development of the subject site, located on the west side of Estelle Street midblock between Bancroft Drive and Rheal Street, in the City of Greater Sudbury [City]. The proposed development is anticipated to consist of three 5-storey buildings with 120 unit and 59 townhouse units.

The proposed development will include two full-movement access driveways onto Estelle Street [North Access & South Access].

Tulloch has retained **JD Northcote Engineering Inc.** [JD Engineering] to prepare this traffic impact study in support of the proposed development.

## 1.2 Study Area

**Figure 1** illustrates the location of the subject site and study area intersections in relation to the surrounding area. The Draft Plan by Tulloch is attached in **Appendix A**.

The subject site is bound by Estelle Street to the east and existing residential units to the north, west and south.

Through our consultation with the City, the following intersections will be analysed as part of the study:

- Levesque Street / Kingsway;
- Moonlight Avenue / Kingsway;
- Levesque Street / Bancroft Drive;
- Moonlight Avenue & Moonlight Beach Road / Bancroft Drive;
- Estelle Street / Bancroft Drive;
- Estelle Street / North Access; and
- Estelle Street / South Access.

**Figure 1 – Proposed Site Location and Study Area**

## 1.3 Study Scope and Objectives

The purpose of this study is to identify the potential impacts to traffic flow at the site access and on the surrounding roadway network. The study analysis includes the following tasks:

- Determine existing traffic volumes and circulation patterns;
- Estimate future traffic volumes if the proposed development was not constructed, including the impact of additional proposed developments in the area;
- Complete level-of-service [LOS] analysis of horizon year (without the proposed development) traffic conditions and identify operational deficiencies;
- Estimate the amount of traffic that would be generated by the proposed development and assign to the roadway network;
- Complete LOS analysis of horizon year (with the proposed development) traffic conditions and identify additional operational deficiencies;
- Identify improvement options to address operational deficiencies;
- Calculate lane improvements for the Site Access based on the Transportation Association of Canada [TAC] and Ontario Ministry of Transportation [MTO] guidelines;
- Review the proposed configuration of the Site Access;
- Justify the proposed parking supply in a parking assessment; and
- Document findings and recommendations in a final report.

## 1.4 Horizon Year and Analysis Periods

Traffic scenarios for the existing and horizon (2024 & 2029) year were selected for analysis of traffic operations in the study area. The weekday morning [AM] and weekday afternoon [PM] peak hours have been selected as the analysis periods for this study.

# 2 Information Gathering

## 2.1 Street and Intersection Characteristics

***Bancroft Drive (Regional Road 67)*** is a two-lane secondary arterial road with an urban cross-section, sidewalk on both sides of the road and bike lanes on both sides of the road in the study area. Bancroft Drive has an unposted (assumed) speed limit of 60 km/h and is under jurisdiction of the City.

***Kingsway (Regional Road 55)*** is a five-lane primary arterial road with an urban cross-section. Kingsway has a multi-use path along both sides of the road west of Levesque Street. East of Levesque Street, the north side of Kingsway has a multi-use path extending 43 metres east of Levesque Street, where it transitions into a paved shoulder. East of Levesque Street, the south side of Kingsway has a gravel pathway. Kingsway has a posted speed limit of 80 km/h and is under jurisdiction of the City.

***Moonlight Avenue (Regional Road 74)*** is a two-lane collector road with an urban cross-section and a sidewalk along the east side of the road and bike lanes along both sides of the road. Moonlight Avenue has a posted speed limit of 50 km/h and is under jurisdiction of the City.

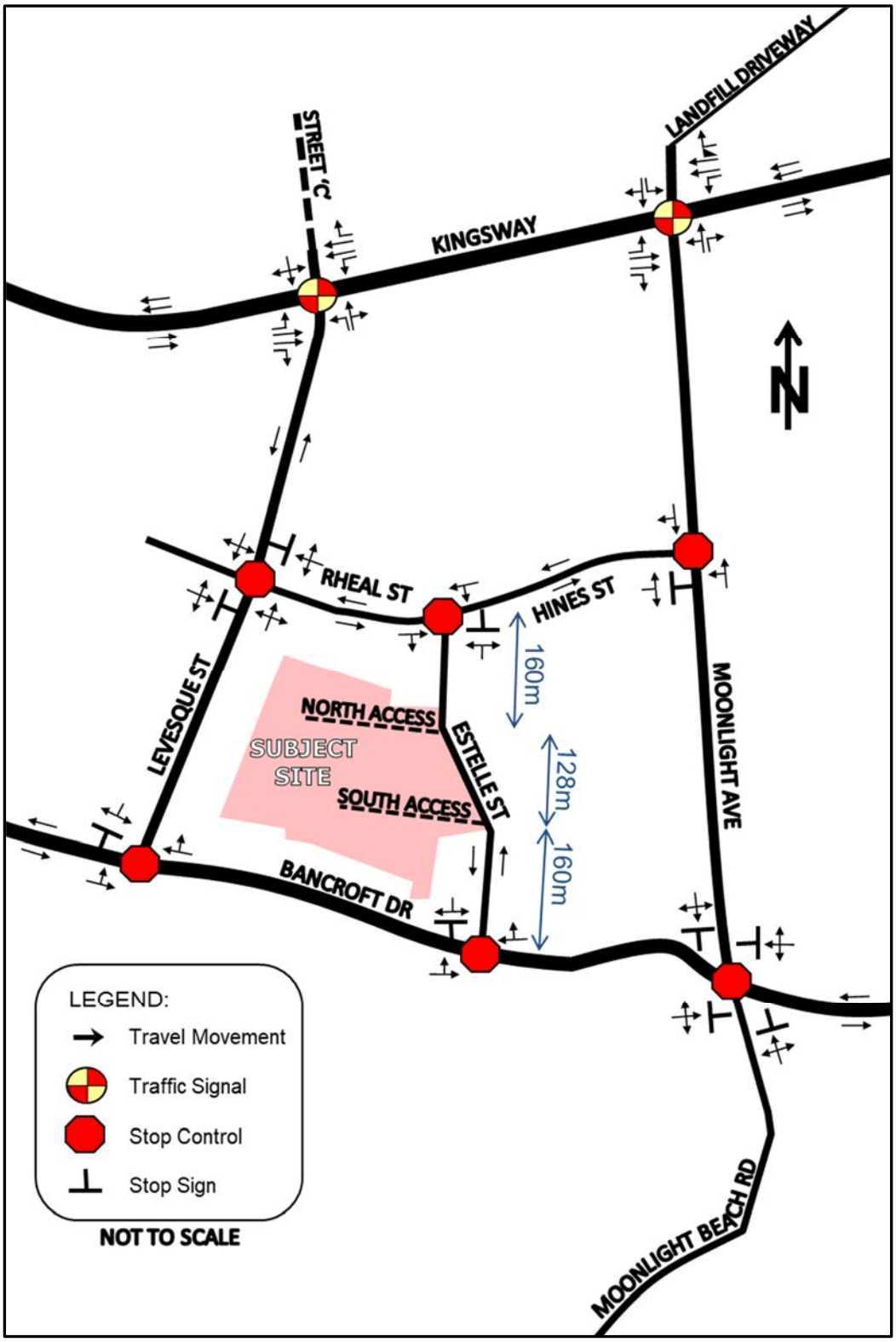
***Levesque Street*** is a two-lane collector road with an urban cross-section and a sidewalk along the east side of the road. Levesque Street has a posted speed limit of 50 km/h and is under jurisdiction of the City.

***Estelle Street*** is a two-lane local road with a rural cross-section and gravel shoulders. Estelle Street has an unposted (assumed) speed limit of 50 km/h and is under jurisdiction of the City.

***Moonlight Beach Road*** is a two-lane local road with a rural cross-section and gravel shoulders. Moonlight Beach Road has an unposted (assumed) speed limit of 50 km/h and is under jurisdiction of the City.

The existing intersection lane configuration within the study area is illustrated in **Figure 2**.

**Figure 2 – Existing Lane Configuration within Study Area**



## 2.2 Local Transportation Infrastructure Improvements

Based on a review of the City's Transportation Master Plan (2016) [TMP] and 2020 Capital Budget, there are no planned road improvements in the study area.

The City's TMP notes a potential extension of the north leg of the Levesque Street / Kingsway intersection and connect onto Hillsend Road, along with other connections via this extension. This improvement is noted as part of "Potential Roads for Future Consideration (after 2031)" and has not been included in this study. It is noted the north leg of Levesque Street / Kingsway intersection will be an access roadway to the adjacent developments noted in Section 2.4.

The proposed Kingsway Entertainment District and Arena / Event Centre [KED] and future business park development are located northwest of the Levesque Street / Kingsway intersection; further details are provided in Section 2.4. Dillon Consulting Ltd. completed a traffic impact study for the KED (dated December 2017) [KED TIS] with an addendum completed to address peer reviewed comments (dated March 2018) [KED TIS Addendum]. The KED TIS recommended a number of improvements at the Street 'C' & Levesque Street / Kingsway intersection; the following improvements were recommended at the Street 'C' & Levesque Street / Kingsway intersection by the 2022 horizon year with the build-out of the KED and future business park development:

- Construct the north leg of the intersection with a left, through and right turn lane configuration. The southbound left turn is recommended with a 75 metre storage length.
- Widen Kingsway to accommodate an eastbound double left turn lane and provide protected eastbound left turn phasing to accommodate this improvement.
- Extend westbound right turn storage to permit 90 metres of storage length.

For the purpose of our analysis, we have assumed the Street 'A' configuration noted above. To assess the impact of the proposed development in our report, we have not applied the eastbound double left turn lane and westbound right turn lane storage length extension in the future horizon years; however, we have completed a supplementary analysis in the critical total (2029) scenario at the Street 'C' & Levesque Street / Kingsway intersection with the eastbound double left turn lane in Section 5.3.

## 2.3 Transit Access

The City's bus service [GOVA Transit] provides two bus routes within the study area. The Route 10 (Lac Minnow Lake) bus route provides connections between the local community and the downtown core. The Route 103 (Coniston) bus route provides connections within the Conniston community.

Route 10 operates from 06:15 – 23:55 on weekends with peak hour service every 30 minutes on weekdays and from 07:15 – 23:15 on the weekend with service every hour and a half. The closest bus stop for Route 10 is located at the northwest corner of the Bancroft Drive / Estelle Street intersection, approximately 170 metres from the subject site.

Route 103 operates from 06:35 – 23:05 on weekdays with hourly service from 07:30 – 22:30 on the weekend with service every hour and a half. The closest westbound bus stop is located at the northwest corner of the Bancroft Drive / Estelle Street intersection, approximately 170 metres from the subject site. The closest eastbound bus stop is located at the southeast corner of the Levesque Street / Kingsway intersection, approximately 800 metres from the subject site.

## 2.4 Other Developments within the Study Area

Based on correspondence with the City's planning department, the Kingsway Entertainment District and future business park development is the only other development that would impact traffic in the study area.

1916596 Ontario Ltd. is proposing the Kingsway Entertainment District and Arena / Event Centre located northwest of the Levesque Street / Kingsway intersection. The KED is anticipated to include an outdoor plaza and a sporting venue with 5,800 seats and capacity for 6,500 spectators for concerts, a casino (780 gaming positions) with ancillary restaurant space and 200-room hotel with meeting space. The KED is located within a previously approved industrial subdivision, with an additional 93.67 acres available for a future business park development. The KED will have two full-movement access intersections onto Kingsway, an access on the north leg of the Levesque Street / Kingsway intersection [Street 'C'] and another access west of this intersection.

Based on correspondence with the City and a review of information available online, the KED is pending LPAT approvals with no timeline for build-out. As noted previously, Dillon Consulting Ltd. completed the KED TIS and KED TIS Addendum to address peer reviewed comments. The KED TIS analyzed traffic for the weekday PM, Saturday and Friday Pre (18:00 – 19:00) / Post (22:00 – 23:00) Game peak hours. The Friday Pre / Post Game peak hours are based on the anticipated timing of scheduled events for the arena.

The KED TIS assumes all components of the KED and the future business park development to be built-out by 2020 and analyzed the 2017 and 2022 horizon years. For the purposes of our study we have assumed all components of the KED and the future business park development to be built-out by 2024, to be conservative.

In Sections 2.4.1 and 2.4.2, we have estimated the traffic generated by the KED and future business park development based on information provided in the KED TIS and KED TIS Addendum.

### 2.4.1 KED & Future Business Park Development Traffic Assignment - PM Peak Hour

For the purpose of our analysis, the traffic assignment for the KED and future business park development in the PM peak hour was based on the KED TIS (excerpts provided in **Appendix B**).

### 2.4.2 KED & Future Business Park Development Traffic Assignment – AM Peak Hour

The traffic generation and assignment for the arena, casino and hotel component of the KED and future business park development in the AM peak hour was estimated based on the methodology and information provided in the KED TIS and KED TIS Addendum.

#### 2.4.2.1 **Arena**

The KED TIS noted that the arena component of the KED would generate most traffic during pre / post scheduled events in the evening; however, the site will generate some traffic during non-event times as the arena may be rented during these times. The KED TIS estimated the traffic during the PM peak hour based on assumptions and proxy site traffic counts at another arena.

During the PM peak hour, the KED TIS estimated there will be 15 inbound and 20 outbound trips (excerpts provided in **Appendix B**). For the purposes of this study, we have assumed the traffic generation during the AM peak hour will be the inverse of trips estimated during the PM peak hour.

**Table 1** in Section 2.4.2.5 illustrates the traffic generation for the arena component in the AM peak hour.

The traffic distribution for the arena component of the KED is illustrated in **Table 2** of Section 2.4.2.6 which was obtained from the KED TIS.

The traffic assignment for the arena component in the KED is illustrated in **Figure 3**.

#### 2.4.2.2 Casino

The KED TIS estimated traffic generated by the casino component of the KED by 24-hour traffic data (taken in 15 minute intervals) obtained at the Point Edward Casino [PEC] proxy site. The PEC proxy site has 576 gaming positions and includes restaurant space. The traffic data for the proxy site was obtained on Thursday, September 1, 2017 and is provided in the KED TIS (excerpts in **Appendix B)**.

Based on the traffic data for the proxy site, the following rates were calculated:

- 0.22 trips per gaming position during the weekday AM peak hour; and
- 0.18 trips per gaming position during the weekday AM peak hour.

The traffic generation for the casino component of the KED in the AM peak hour were estimated based on the above noted rates and is illustrated in **Table 1** in Section 2.4.2.5.

The traffic distribution for the casino component of the KED is illustrated in **Table 2** of Section 2.4.2.6, which was obtained from the KED TIS.

The traffic assignment for the casino component in the KED is illustrated in **Figure 4**.

#### 2.4.2.3 Hotel & Business Park

The traffic generated by the hotel component of the KED and future business park development were estimated in the PM peak hour of the KED TIS, based on the Institute of Transportation Engineers *Trip Generation Manual*. For the purposes of this study we have estimated the trips generated by the hotel component of the KED and future business park development in the AM peak hour based on the Institute of Transportation Engineers [ITE] *Trip Generation Manual* (10th Edition) [ITE Trip Generation Manual]. The following ITE land uses have been applied to estimate the traffic from the proposed development:

- ITE land use 310 (Hotel) – General Urban / Suburban Setting
- ITE land use 770 (Business Park) – General Urban / Suburban Setting

The estimated trip generation of the proposed development is illustrated in **Table 1** in Section 2.4.2.5.

For the hotel component of the KED, the AM peak hour traffic generation for the hotel is not expected to exactly align with the AM and PM peak hour in the traffic counts; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual.

For the business park, the peak hour of generation was applied as peak hour of adjacent street traffic data is not available for this land use. The KED TIS used an acre per trip traffic generator to generate traffic for the business park; however, the most recent version of the ITE trip generation manual is the ITE Trip Generation Manual (10th Edition), which does not have this traffic generation rate. The KED TIS Addendum provided justification that with the proposed size of the future business park development (93.67 acres), this will correlate to the business park employing approximately 4,000

employees; this was determined by comparing ITE trip generation data that was used in the KED TIS (excerpts provided in **Appendix B**). For the purposes of this report, we have assumed the business park will employ 4,000 employees and have used the employee per trip rate in the ITE Trip Generation Manual to generate traffic in the AM peak hour for the future business park development.

The traffic distribution for the hotel component of the KED and future business park development is illustrated in **Table 2** of Section 2.4.2.6 which was obtained from the KED TIS.

The traffic assignment for the hotel component of the KED and future business park development is illustrated in **Figures 5** and **6** respectively.

#### 2.4.2.4 Internal Capture Considerations

The KED TIS considered internal capture considerations for the components in the KED and future business park development. Based on our review of the KED TIS and KED TIS Addendum assumptions and justifications, no internal capture reductions were applied.

#### 2.4.2.5 Traffic Generation Summary

**Table 1** illustrates the AM peak hour traffic generation for the arena, casino and hotel component of the KED and the future business park development, using the methodology noted above.

**Table 1 – Estimated Traffic Generation of the KED and Future Business Park Development**

| Land Use | Size | AM Peak Hour | | |
|---|---|---|---|---|
| | | IN | OUT | TOTAL |
| Arena* | 5,800 seats | 20 | 15 | 35 |
| Casino** | 780 gaming positions | 174 | 140 | 314 |
| Hotel<br>ITE Land Use: 310 | 200 rooms | 55 | 39 | 94 |
| **KED TOTAL TRIP GENERATION** | | **249** | **194** | **443** |
| Business Park<br>ITE Land Use: 770 | 4,000 employees*** | 1395 | 246 | 1641 |
| **TOTAL TRIP GENERATION** | | **1644** | **440** | **2084** |

* The traffic generation for the arena was based on assumptions and proxy site traffic counts at another arena.
** The traffic generation for the casino is based on traffic counts obtained from a proxy site noted in Section 2.4.2.2.
*** The estimation for the number of employees at the business park is based on a conversion of the overall size of the business park lands and number of employees based on ITE trip generation data noted in Section 2.4.2.3.

#### 2.4.2.6 Traffic Distribution

The KED TIS provided the traffic distribution for the arena, hotel and other (casino and business park) traffic generators and have been used as the traffic distribution for the traffic generated above. **Table 2** illustrates the traffic distribution for the adjacent developments.

**Table 2 – Proposed Development Traffic Distribution**

| Travel Direction (to / from) | Arena | Hotel | Other (Hotel & Business Park) |
|---|---|---|---|
| **West** via Kingsway | 62.0% | 35.0% | 59.0% |
| **East** via Kingsway | 26.0% | 65.0% | 26.5% |
| **West** via Bancroft Drive | 9.0% | 0.0% | 11.5% |
| **East** via Bancroft Drive | 3.0% | 0.0% | 3.0% |
| **TOTAL** | **100%** | **100%** | **100%** |

The distribution of traffic to each access driveway for the KED and future business park development has been based on the proposed parking layout. As noted in Section 2.2, there is a potential road extension of Street 'C' to Hillsend Road north of the study area; however, this improvement has not been included in this report, as this is planned as a post 2031 road project.

**Figure 7** illustrates the total adjacent traffic assignment in the AM and PM peak hour.

**Figure 3 – KED (Arena) Traffic Assignment**

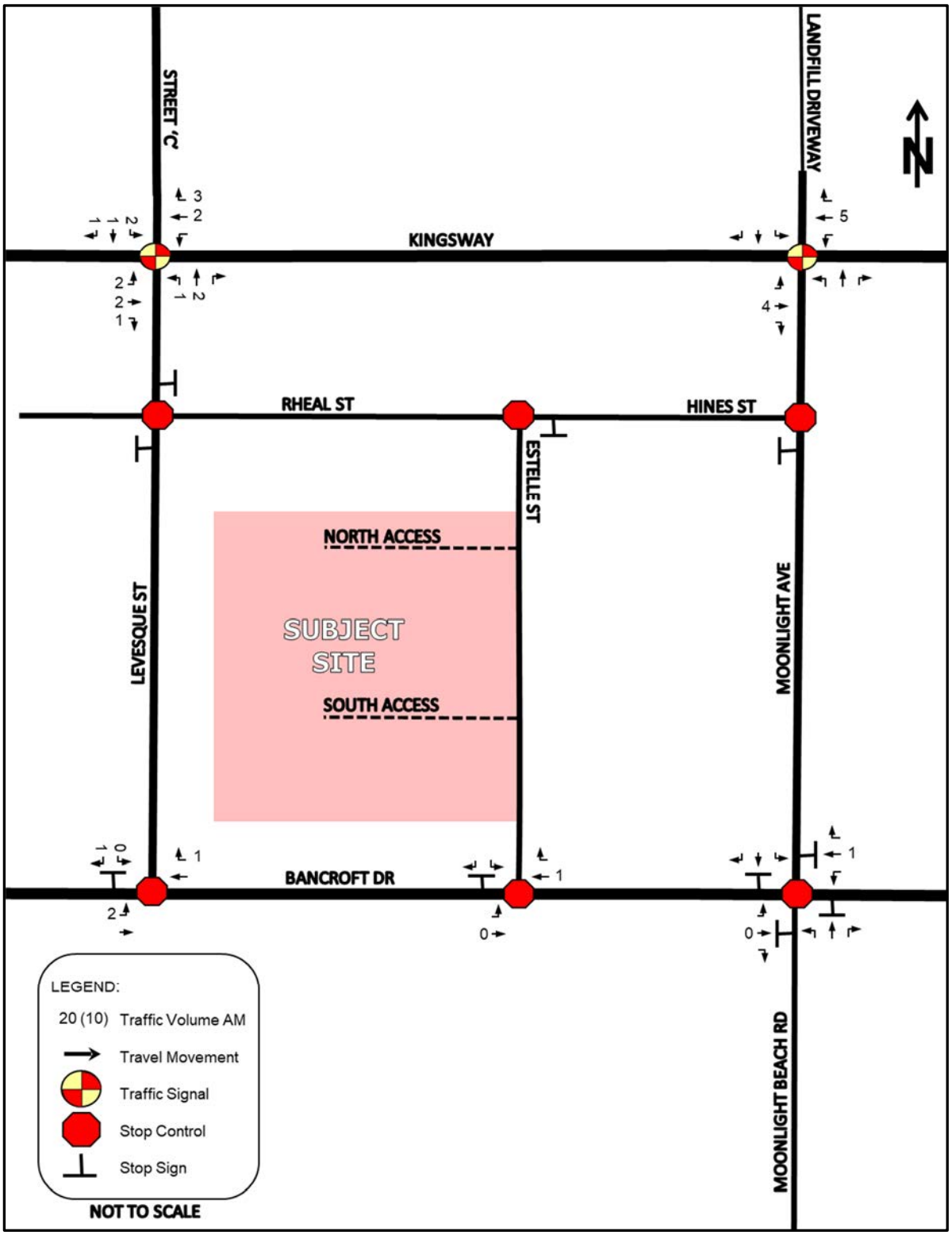


**Figure 4 – KED (Casino) Traffic Assignment**

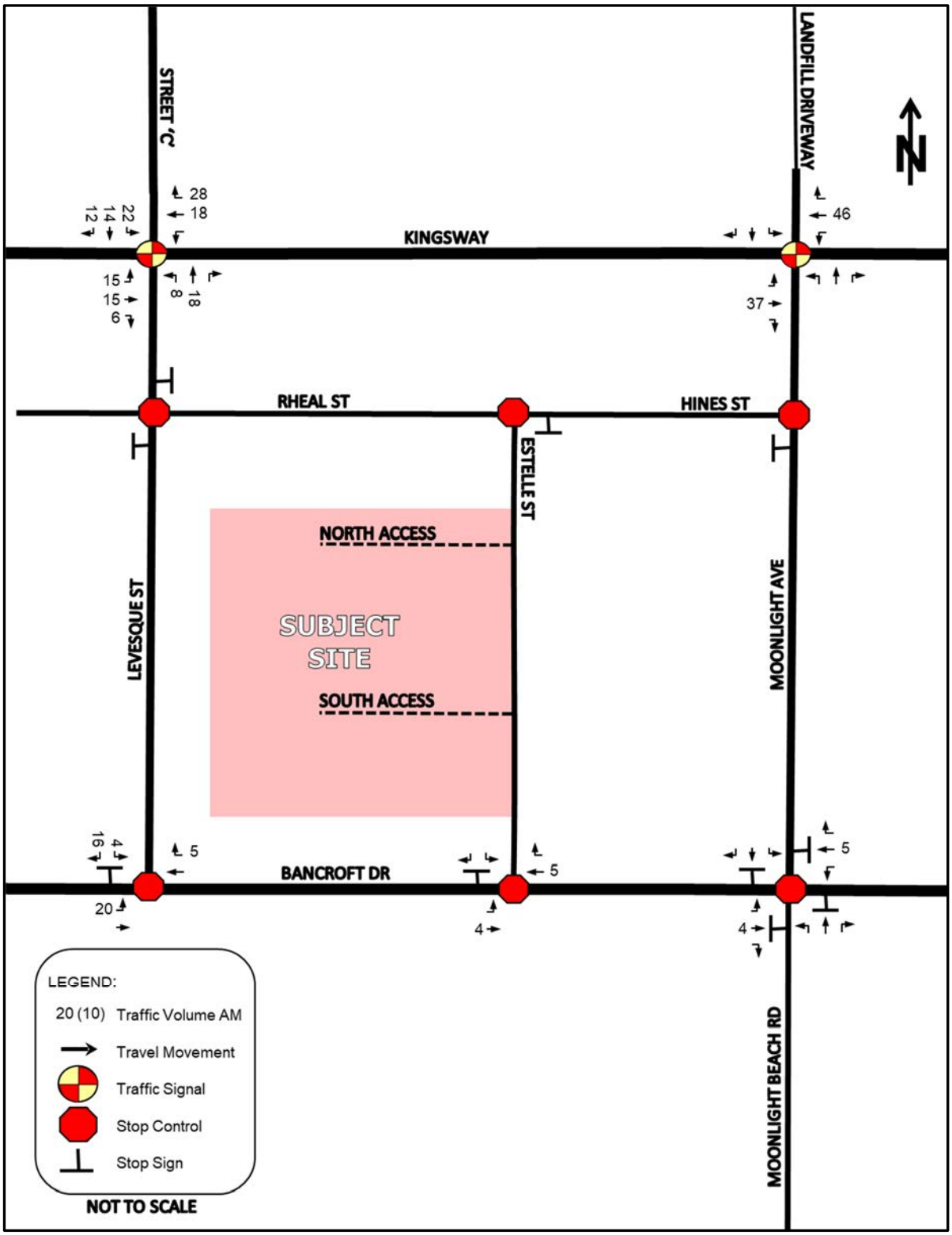


**Figure 5 – KED (Hotel) Traffic Assignment**

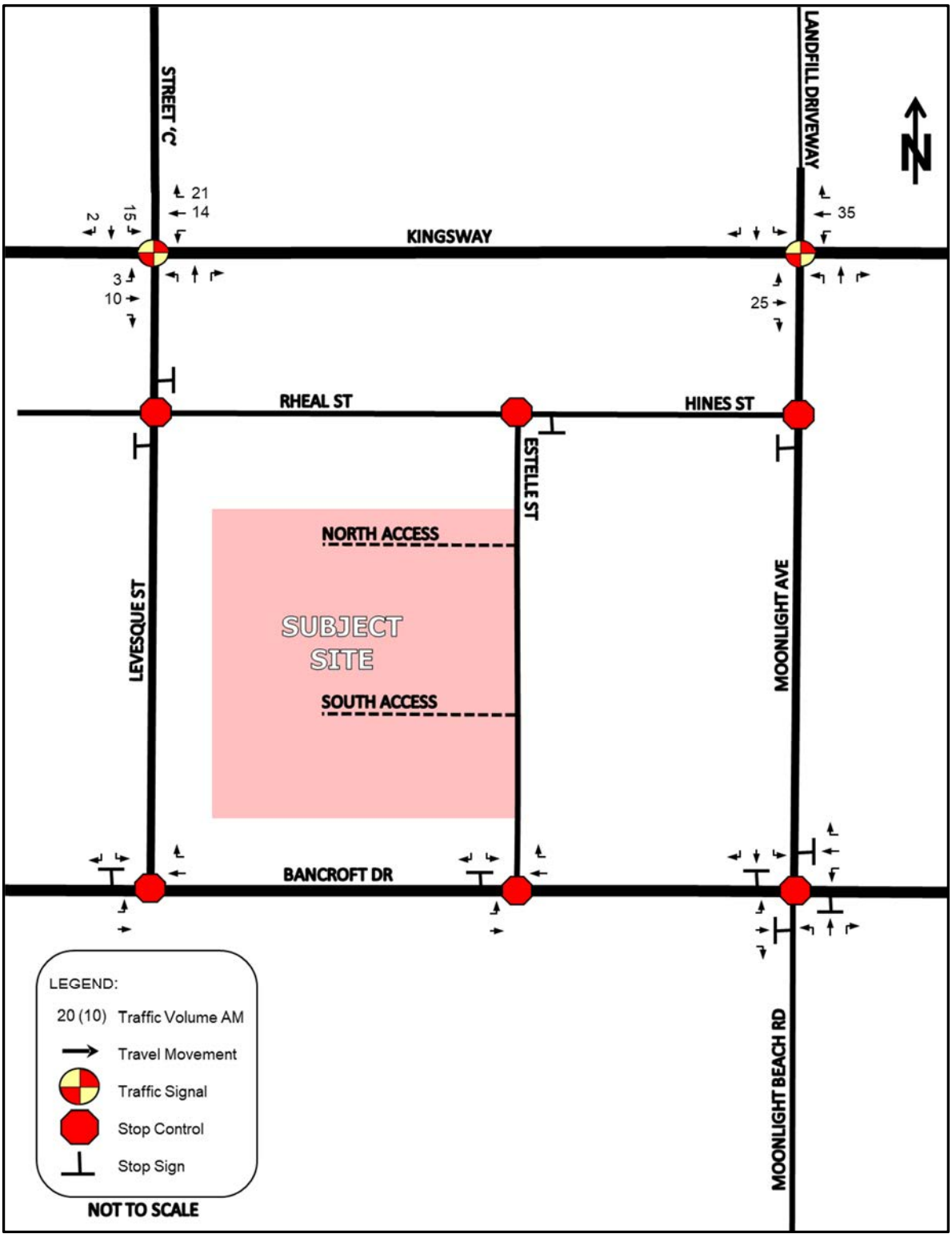


**Figure 6 – Future Business Park Development Traffic Assignment**

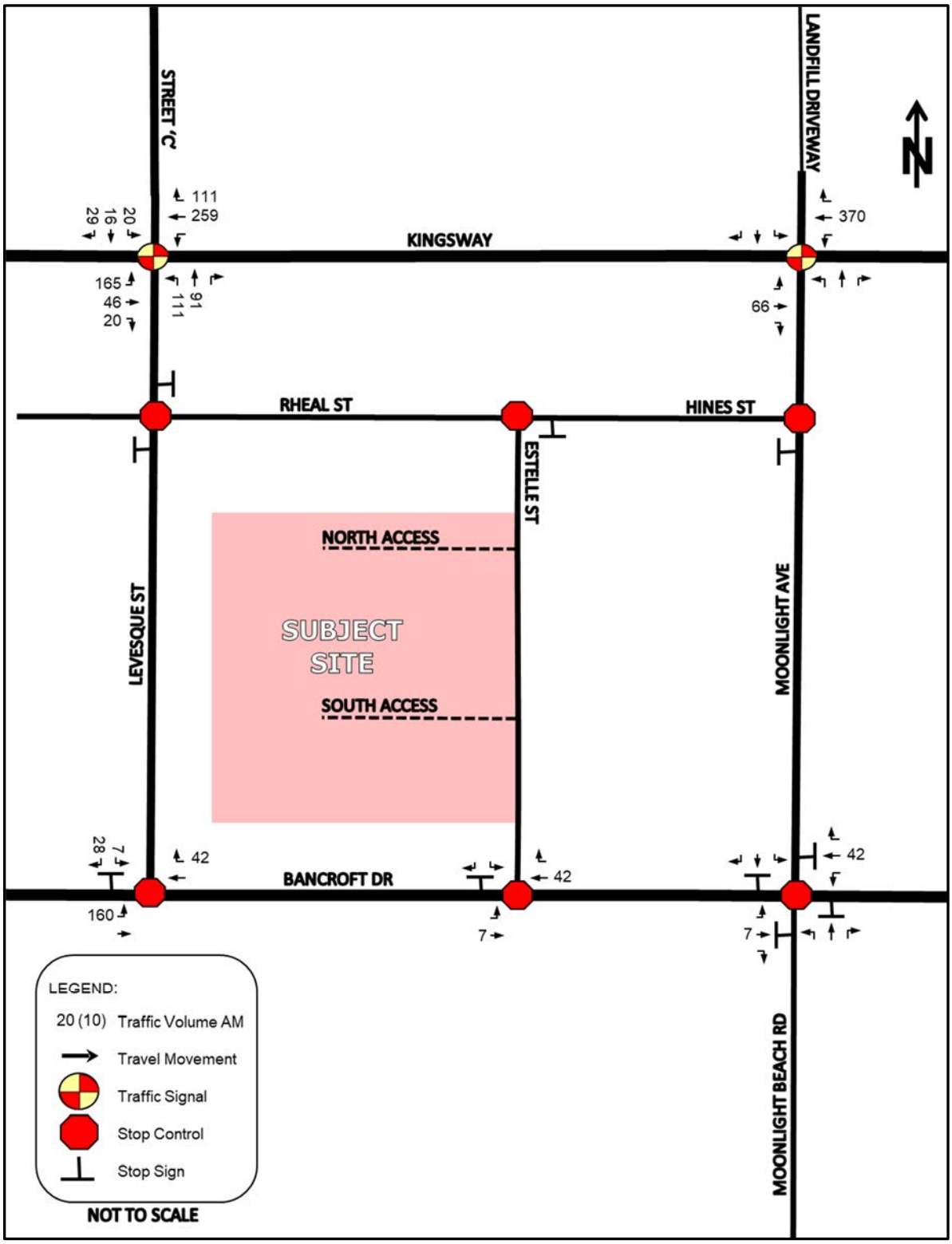
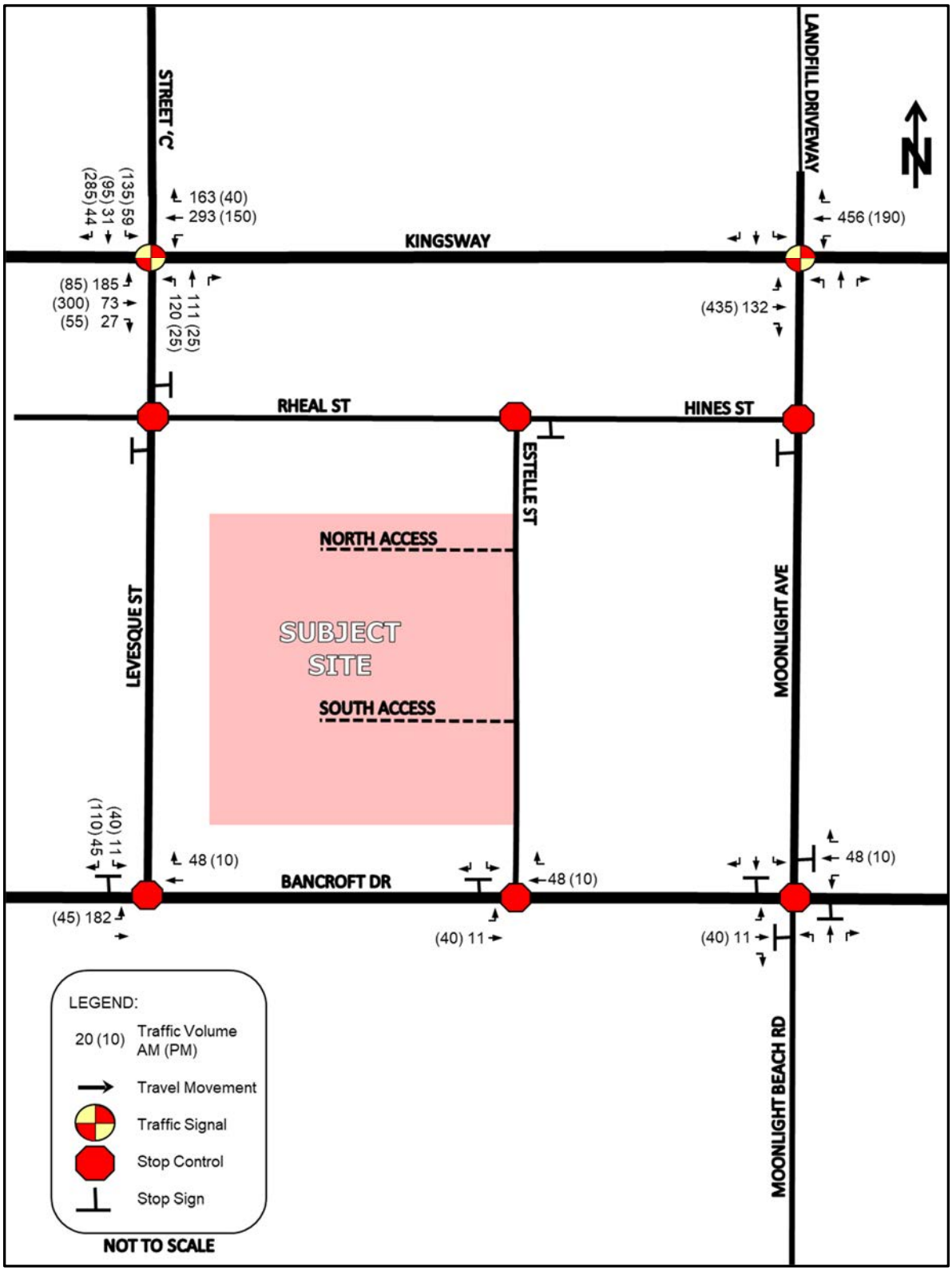


**Figure 7 – Total Adjacent Development Traffic Assignment**



## 2.5 Background Traffic Growth

Based on correspondence with the City a 1.5% background traffic growth rate was applied. The 1.5% background traffic growth rate was applied on Bancroft Drive, Kingsway, Levesque Street, Moonlight Avenue and Moonlight Beach Road. Based on the surrounding development, no background traffic growth was applied on Estelle Street.

## 2.6 Traffic Counts

Detailed turning movements traffic and pedestrian counts were commissioned by JD Engineering at the Estelle Street / Bancroft Drive intersection. Detailed turning movements traffic and pedestrian counts were obtained at all other intersections from the City. **Table 3** summarizes the traffic count data collection information.

**Table 3 - Traffic Count Data**

| **Intersection** (N-S Street / E-W Street) | **Count Date** | **AM Peak Hour** | **PM Peak Hour** | **Source** |
|---|---|---|---|---|
| Levesque Street / Kingsway | Friday, March 24th 2017 | 07:30 – 08:30 | 16:15 – 17:15 | City |
| Moonlight Avenue / Kingsway | Wednesday, April 12th 2017 | 07:30 – 08:30 | 16:15 – 17:15 | City |
| Levesque Street / Bancroft Drive | Friday, March 31st 2017 | 07:30 – 08:30 | 12:00 – 13:00* | City |
| Moonlight Avenue & Moonlight Beach Road / Bancroft Drive | Wednesday, April 12th 2017 | 07:30 – 08:30 | 16:15 – 17:15 | City |
| Estelle Street / Bancroft Drive | Wednesday November 18th, 2020 | 07:15 – 08:15 | 16:00 – 17:00 | JD Eng.** |

* Traffic counts at the Levesque Street / Bancroft Drive intersection were completed between 06:00 – 13:00.
** Traffic counts were completed by Ontario Traffic Inc. on behalf of JD Engineering.

Detailed traffic count data can be found in **Appendix C**.

The traffic counts at the Levesque Street / Bancroft Drive intersection were completed between 06:00 – 13:00; consequently, traffic counts in the afternoon peak hour were not available. We have estimated the traffic at the intersection in the PM peak hour by adjusting the midday peak hour traffic volumes. A midday – PM peak hour adjustment factor was calculated based on the traffic counts obtained at the Moonlight Avenue & Moonlight Beach Road / Bancroft Drive intersection. By comparing the midday peak hour (12:00 – 13:00) and PM peak hour (16:15 – 17:15) traffic volumes, the midday peak hour volumes were 35% lower than the PM peak hour; consequently, we have increased the traffic at the Levesque Street / Bancroft Drive intersection in the PM peak hour by 35%. The eastbound through traffic volumes were also adjusted (increased) at the Levesque Street / Bancroft Drive intersection to match the west leg of the Estelle Street / Bancroft Drive intersection.

As a result of the physical distancing requirements associated with COVID-19, the traffic counts at the Estelle Street / Bancroft Drive intersection reflect lower than expected traffic under normal conditions. Based on a comparison of the traffic volumes on Bancroft Drive at the Estelle Street / Bancroft Drive intersection (Post-COVID) and the Levesque Street / Bancroft Drive and Moonlight Avenue & Moonlight Beach Road / Bancroft Drive intersections (Pre-COVID), a 24% and 11% decrease in traffic volumes was observed in the AM and PM peak hour, respectively. Consequently, we have increased traffic at the Estelle Street / Bancroft Drive intersection by the same factor.

The peak hours of traffic generation for all other peak hours at the study area intersections generally aligned with the anticipated peak hour of traffic generation by the proposed development.

To determine the equivalent existing (2021) traffic volumes, the background traffic growth rate noted in Section 2.5 was applied to the traffic counts completed in 2017 and 2020.

Heavy vehicle percentages and pedestrian crossings from the traffic count data have also been included in the Synchro analysis.

**Figure 8** illustrates the existing (2021) AM and PM peak hour traffic volumes in the study area.

## 2.7 Horizon Year Traffic Volumes

In addition to the adjacent development traffic volumes (outlined in Section 2.4), the background (2024 & 2029) traffic volumes were estimated for the AM and PM peak hour by applying the background traffic growth rates discussed in Section 2.5 to the existing traffic volumes.

**Figures 9** and **10** illustrates the background (2024 & 2029) AM and PM peak hour traffic volumes respectively, in the study area.

**Figure 8 – Existing (2021) Traffic Volumes**

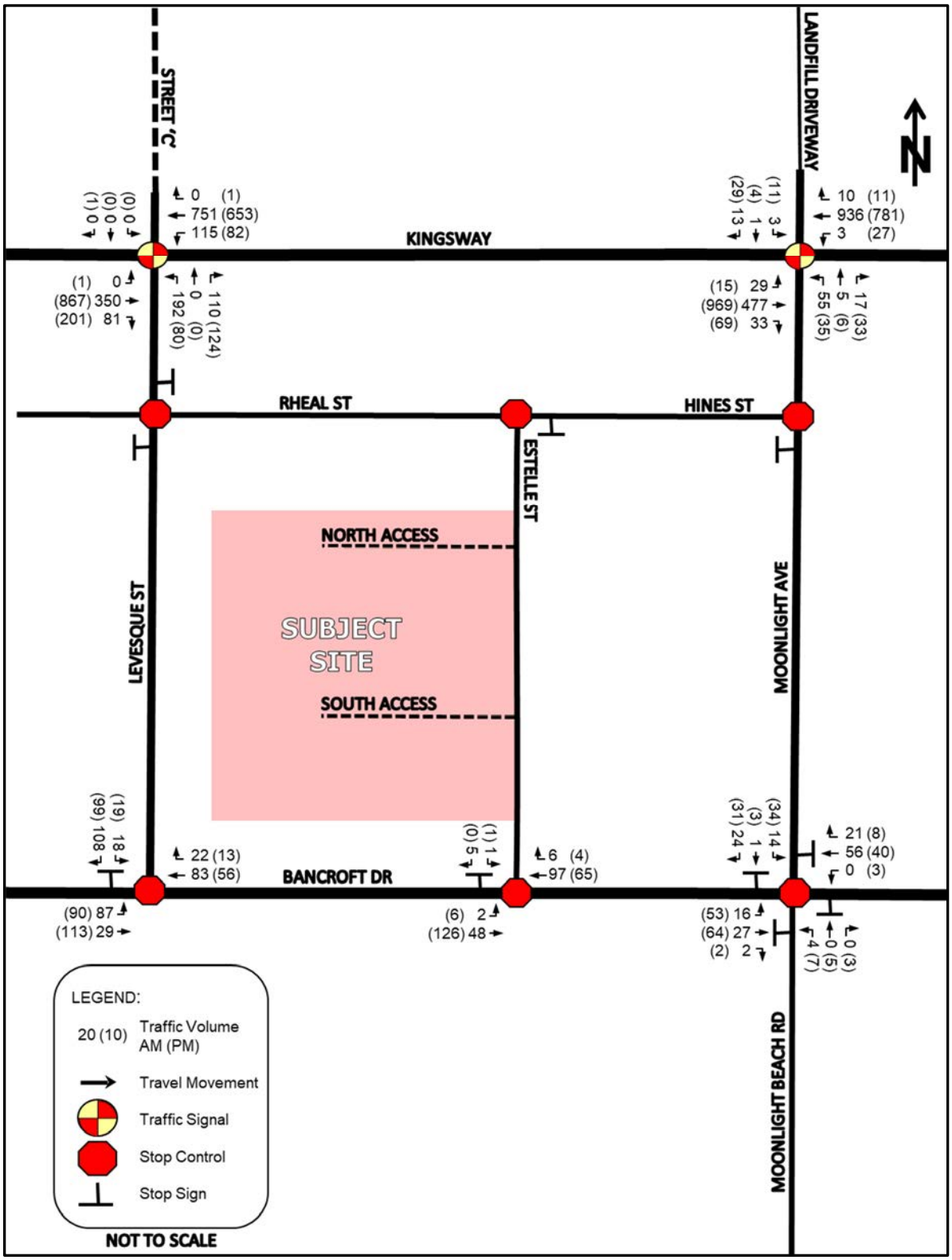


**Figure 9 – Background (2024) Traffic Volumes**

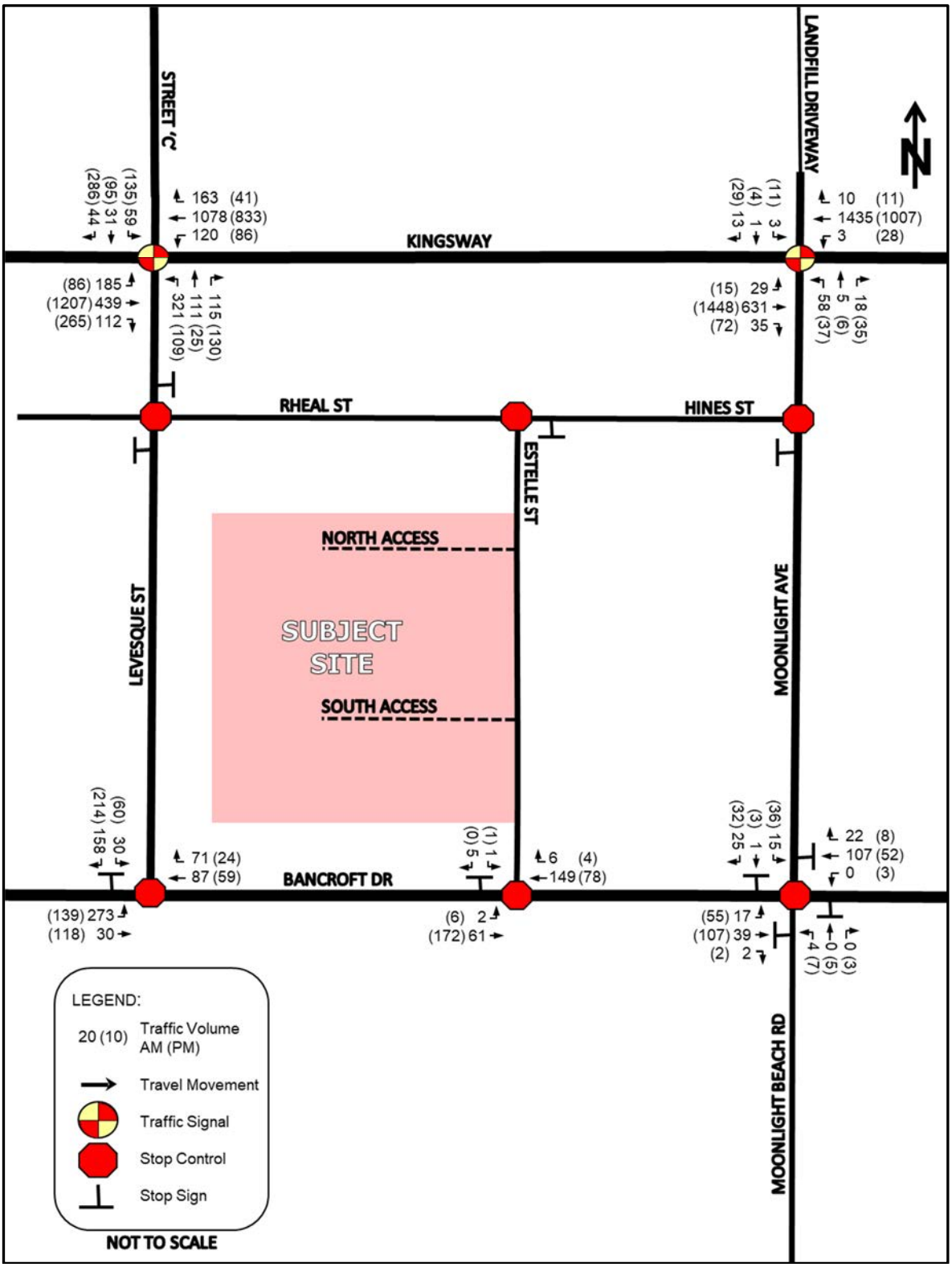
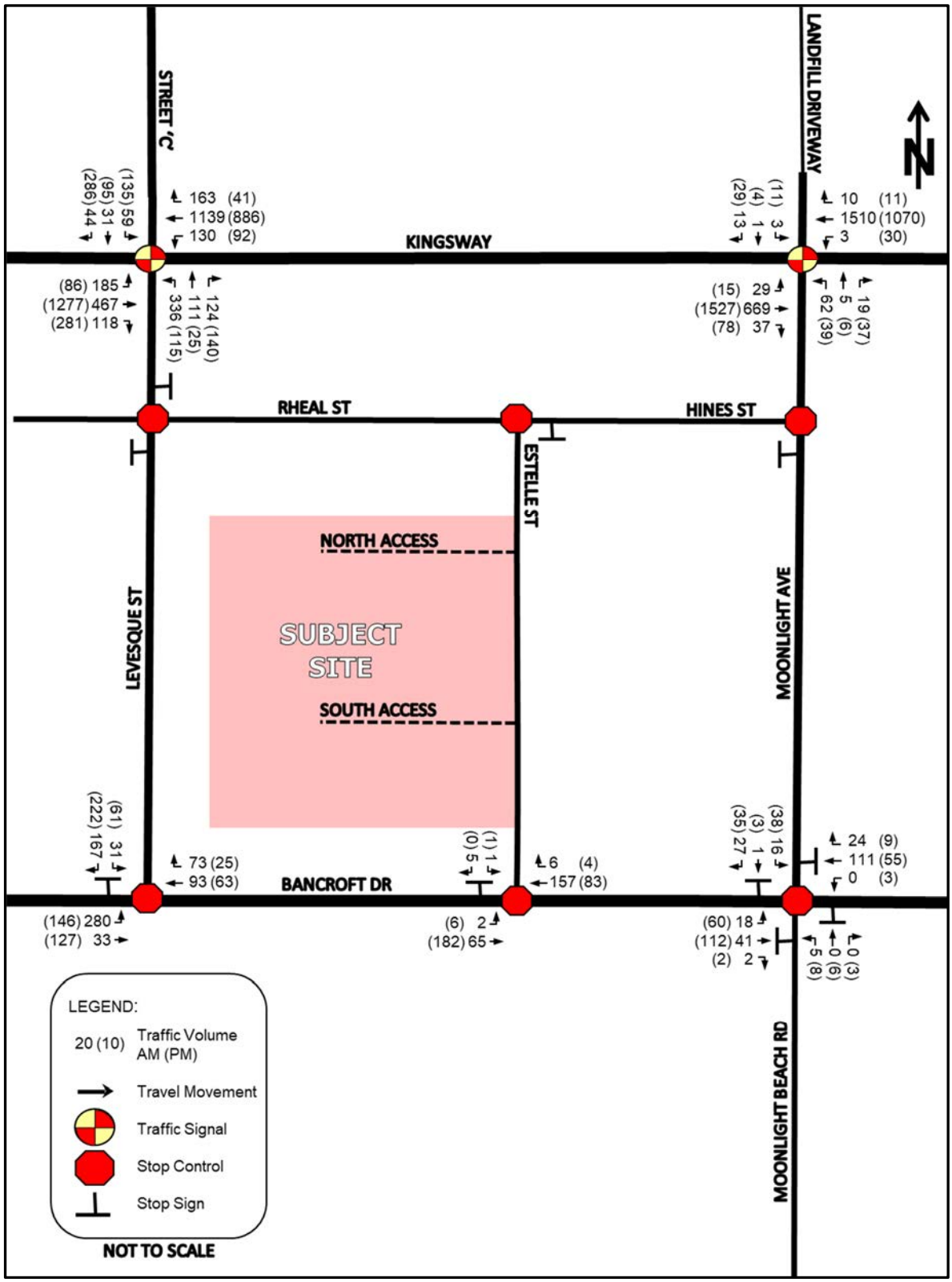


**Figure 10 – Background (2029) Traffic Volumes**



# 3 Intersection Operation with Proposed Development

## 3.1 Intersection Capacity Analysis Criteria

Intersection performance was measured using the traffic analysis software, Synchro 10, a deterministic model that employs Highway Capacity Manual and Intersection Capacity Utilization methodologies for analysing intersection operations. These procedures are accepted by provincial and municipal agencies throughout North America.

Synchro 10 enables the study area to be graphically defined in terms of streets and intersections, along with their geometric and traffic control characteristics. The user is able to evaluate both signalized and unsignalized intersections in relation to each other, thus not only providing level of service for the individual intersections, but also enabling an assessment of the impact the various intersections in a network have on each other in terms of spacing, traffic congestion, delay, and queuing.

Individual turning movements with a volume-to-capacity [V/C] ratio of 0.85 or greater are considered to be critical movements and have been highlighted in the LOS tables.

The intersection operations were also evaluated in terms of the LOS. LOS is a common measure of the quality of performance at an intersection and is defined in terms of vehicular delay. This delay includes deceleration delay, queue move-up time, stopped delay, and acceleration delay. LOS is expressed on a scale of A through F, where LOS A represents very little delay (i.e. less than 10 seconds per vehicle) and LOS F represents very high delay (i.e. greater than 50 seconds per vehicle for a stop sign controlled intersection and greater than 80 seconds per vehicle for a signalized intersection).

The LOS criteria for signalized and stop sign controlled intersections are shown in **Table 4.** A description of traffic performance characteristics is included for each LOS.

**Table 4 – Level of Service Criteria for Intersections**

| LOS | LOS Description | Control Delay (seconds per vehicle) | |
|---|---|---|---|
| | | **Signalized Intersections** | **Stop Controlled Intersections** |
| A | Very low delay; most vehicles do not stop (**Excellent**) | less than 10.0 | less than 10.0 |
| B | Higher delay; more vehicles stop (**Very Good**) | between 10.0 and 20.0 | between 10.0 and 15.0 |
| C | Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping **(Good**) | between 20.0 and 35.0 | between 15.0 and 25.0 |
| D | Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop (**Satisfactory**) | between 35.0 and 55.0 | between 25.0 and 35.0 |
| E | Vehicles must often wait through more than one red light; considered by many agencies to be the limit of **acceptable** delay | between 55.0 and 80.0 | between 35.0 and 50.0 |
| F | This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection (**Unacceptable**) | greater than 80.0 | greater than 50.0 |

## 3.2 Existing (2021) Intersection Operation

The results of the LOS analysis under existing (2021) traffic volumes during the AM and PM peak hours can be found below in **Table 5**. The existing intersection geometry and traffic control has been utilized in this scenario. Detailed output of the Synchro analysis can be found in **Appendix D**.

**Table 5 – Existing (2021) LOS**

| Location (N-S Street / E-W Street) | Weekday AM Peak Hour | | | | | Weekday PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | V/C | Delay (s) | LOS | 95% Queue (m) | | V/C | Delay (s) | LOS | 95% Queue (m) | |
| | | | | Model | Storage | | | | Model | Storage |
| Levesque Street / Kingsway (signalized) | 0.48 | 17.0 | B | - | - | 0.41 | 10.7 | B | - | - |
| EBL | 0.00 | 0.0 | A | 0 | 59 | 0.00 | 6.2 | A | 1 | 59 |
| EBT | 0.20 | 11.6 | B | 34 | - | 0.40 | 8.8 | A | 69 | - |
| EBR | 0.06 | 10.5 | B | 8 | 94 | 0.14 | 7.0 | A | 10 | 94 |
| WBL | 0.18 | 6.2 | A | 16 | 30 | 0.20 | 4.2 | A | 9 | 30 |
| WBT | 0.36 | 7.9 | A | 56 | - | 0.27 | 4.4 | A | 34 | - |
| WBR | 0.00 | 0.0 | A | 0 | - | 0.00 | 3.3 | A | 0 | - |
| NBL | 0.81 | 60.1 | E | 77 | 13 | 0.54 | 48.1 | D | 33 | 13 |
| NBTR | 0.08 | 37.7 | D | 0 | - | 0.08 | 42.6 | D | 0 | - |
| SB | 0.00 | 0.0 | A | 0 | - | 0.00 | 42.0 | D | 0 | - |
| Moonlight Avenue / Kingsway (signalized) | 0.46 | 9.3 | A | - | - | 0.42 | 8.8 | A | - | - |
| EBL | 0.13 | 4.0 | A | 4 | 40 | 0.04 | 4.1 | A | 2 | 40 |
| EBT | 0.24 | 5.3 | A | 33 | - | 0.44 | 7.3 | A | 71 | - |
| EBR | 0.03 | 4.4 | A | 1 | 22 | 0.05 | 4.9 | A | 5 | 22 |
| WBL | 0.01 | 4.7 | A | 1 | 42 | 0.08 | 3.7 | A | 3 | 42 |
| WBT | 0.46 | 8.1 | A | 77 | - | 0.35 | 6.1 | A | 54 | - |
| WBR | 0.01 | 5.1 | A | 0 | 51 | 0.01 | 4.3 | A | 0 | 51 |
| NBL | 0.55 | 49.9 | D | 25 | 20 | 0.38 | 45.7 | D | 18 | 20 |
| NBTR | 0.05 | 42.6 | D | 9 | - | 0.08 | 42.6 | D | 12 | - |
| SBL | 0.04 | 42.7 | D | 4 | 14 | 0.14 | 43.3 | D | 8 | 14 |
| SBTR | 0.02 | 42.4 | D | 6 | - | 0.06 | 42.5 | D | 10 | - |
| Levesque Street / Bancroft Drive (unsignalized) | - | 5.6 | A | - | - | - | 5.0 | A | - | - |
| SB | 0.16 | 9.9 | A | 5 | - | 0.17 | 10.1 | B | 5 | - |
| Moonlight Avenue & Moonlight Beach Road / Bancroft Drive (unsignalized) | - | 7.4 | A | - | - | - | 7.8 | A | - | - |
| EB | 0.06 | 7.5 | A | 0 | - | 0.16 | 8.1 | A | 1 | - |
| WB | 0.10 | 7.4 | A | 2 | - | 0.07 | 7.5 | A | 4 | - |
| NB | 0.01 | 7.5 | A | 2 | - | 0.02 | 7.5 | A | 2 | - |
| SB | 0.05 | 7.4 | A | 2 | - | 0.09 | 7.7 | A | 2 | - |
| Estelle Street / Bancroft Drive (unsignalized) | - | 0.4 | A | - | - | - | 0.3 | A | - | - |
| SB | 0.01 | 9.0 | A | 1 | - | 0.00 | 9.7 | A | 0 | - |

The results of the LOS analysis indicate that all intersections are operating within the typical design limits noted in Section 3.1.

The anticipated queue for the northbound left turn movements at the Street 'C' & Levesque Street / Kingsway intersection extend past the existing storage length; furthermore, the northbound queue will extend past existing commercial driveways along Levesque Street. Based on our review of the SimTraffic model, this queue is experienced for a short period of time and will clear the end of each respective phase and not impact queuing for the adjacent lanes.

The anticipated queue for the eastbound through and westbound through movements extend past the storage and taper length for the auxiliary lanes at the Street 'C' & Levesque Street / Kingsway and Moonlight Avenue / Kingsway intersections; however, the queue will not extend past major intersections and based on our review of the SimTraffic model, these queues are experienced for a short period of time and will clear the end of each intersections eastbound and westbound through phase.

The anticipated queue for the northbound left turn at the Moonlight Avenue / Kingsway intersection will extend past the existing storage length; however, the queuing does not extend beyond the existing left turn taper and no operational issues are anticipated.

There are no other issues regarding the anticipated queuing for all other movements at the study area intersections.

An analysis was completed for left turn movements at the unsignalized intersections in the study area, based on the criteria outlined in Appendix 9A of the Ontario Ministry of Transportation Design Supplement for TAC Geometric Design Guide for Canadian Roads (dated June 2017) [MTO DS]. Based on the above noted criteria a left-turn lane is not warranted at the unsignalized intersections in the study area (results are provided in **Appendix G**).

A review of the need for additional auxiliary right turn lanes was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all right turn movements; consequently, additional right turn lane improvements are not recommended.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the unsignalized intersections in the study area (results are provided in **Appendix H**).

No improvements are recommended for the existing (2021) scenario.

## 3.3 Background (2024) Intersection Operation

The results of the LOS analysis under background (2024) traffic volumes during the AM and PM peak hours can be found below in **Table 6**.

As noted in Section 2.2, the KED TIS recommended the following at the Street 'C' & Levesque Street / Kingsway intersection prior to build-out the KED and future business park development:

- Street 'C' be constructed with a left, through and right turn lane configuration; and
- The southbound left turn is constructed with a 75 metre storage length.

We have assumed these improvements will be complete for the purpose of our analysis. A 55 metre taper length has been assumed for the southbound left turn lane. Existing traffic control has been utilized for this scenario. Detailed output of the Synchro analysis can be found in **Appendix E**.

**Table 6 – Background (2024) LOS**

| Location (N-S Street / E-W Street) | Weekday AM Peak Hour | | | | | Weekday PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | V/C | Delay (s) | LOS | 95% Queue (m) | | V/C | Delay (s) | LOS | 95% Queue (m) | |
| | | | | Model | Storage | | | | Model | Storage |
| Street 'C' & Levesque Street / Kingsway (signalized) | 0.95 | 36.1 | D | - | - | 0.63 | 19.6 | B | - | - |
| EBL | 0.90 | 60.4 | E | 96 | 59 | 0.25 | 11.5 | B | 23 | 59 |
| EBT | 0.27 | 14.1 | B | 43 | - | 0.60 | 14.5 | B | 135 | - |
| EBR | 0.08 | 12.4 | B | 9 | 94 | 0.18 | 9.9 | A | 13 | 94 |
| WBL | 0.21 | 7.6 | A | 17 | 30 | 0.34 | 8.8 | A | 12 | 30 |
| WBT | 0.54 | 11.5 | B | 91 | - | 0.37 | 7.1 | A | 59 | - |
| WBR | 0.16 | 7.9 | A | 21 | - | 0.03 | 5.1 | A | 5 | - |
| NBL | 1.20 | 162.3 | F | 163 | 13 | 0.53 | 44.3 | D | 43 | 13 |
| NBTR | 0.59 | 43.1 | D | 75 | - | 0.19 | 39.8 | D | 24 | - |
| SBL | 0.39 | 40.3 | D | 29 | 75 | 0.80 | 66.6 | E | 55 | 75 |
| SBT | 0.08 | 36.3 | D | 16 | - | 0.32 | 41.0 | D | 37 | - |
| SBR | 0.03 | 35.8 | D | 4 | - | 0.55 | 44.6 | D | 56 | - |
| Moonlight Avenue / Kingsway (signalized) | 0.67 | 11.5 | B | - | - | 0.62 | 10.2 | B | - | - |
| EBL | 0.24 | 8.1 | A | 4 | 40 | 0.05 | 4.2 | A | 2 | 40 |
| EBT | 0.31 | 5.8 | A | 46 | - | 0.66 | 10.2 | B | 136 | - |
| EBR | 0.03 | 4.4 | A | 1 | 22 | 0.05 | 5.0 | A | 6 | 22 |
| WBL | 0.01 | 4.8 | A | 1 | 42 | 0.15 | 5.9 | A | 4 | 42 |
| WBT | 0.71 | 11.8 | B | 152 | - | 0.46 | 7.0 | A | 76 | - |
| WBR | 0.01 | 5.2 | A | 0 | 51 | 0.01 | 4.3 | A | 0 | 51 |
| NBL | 0.57 | 51.0 | D | 25 | 20 | 0.41 | 45.9 | D | 19 | 20 |
| NBTR | 0.06 | 42.6 | D | 9 | - | 0.08 | 42.5 | D | 12 | - |
| SBL | 0.04 | 42.6 | D | 4 | 14 | 0.14 | 43.2 | D | 8 | 14 |
| SBTR | 0.02 | 42.4 | D | 6 | - | 0.06 | 42.4 | D | 10 | - |
| Levesque Street / Bancroft Drive (unsignalized) | - | 7.3 | A | - | - | - | 8.1 | A | - | - |
| SB | 0.31 | 12.7 | B | 11 | - | 0.46 | 13.8 | B | 20 | - |
| Moonlight Avenue & Moonlight Beach Road / Bancroft Drive (unsignalized) | - | 7.8 | A | - | - | - | 8.2 | A | - | - |
| EB | 0.08 | 7.7 | A | 0 | - | 0.23 | 8.5 | A | 1 | - |
| WB | 0.17 | 7.9 | A | 2 | - | 0.09 | 7.7 | A | 5 | - |
| NB | 0.01 | 7.7 | A | 4 | - | 0.02 | 7.7 | A | 2 | - |
| SB | 0.06 | 7.6 | A | 2 | - | 0.10 | 7.9 | A | 3 | - |
| Estelle Street / Bancroft Drive (unsignalized) | - | 0.3 | A | - | - | - | 0.2 | A | - | - |
| SB | 0.01 | 9.3 | A | 1 | - | 0.00 | 10.1 | B | 0 | - |

The results of the LOS analysis indicates that the Street 'C' & Levesque Street / Kingsway intersection is operating outside the typical design limits as noted in Section 3.1 in the AM peak hour. The following

improvements are recommended at the intersection (prior to build-out the KED and future business park development):

- Adjust eastbound and northbound signal heads to accommodate a protected and permissive left turn signal phase; and
- Adjust and repaint northbound lane pavement markings to provide 100 metre parallel length and 30 metre taper length for the northbound left turn lane.

A summary of the results of the Synchro analysis with the above-noted improvements, during the AM peak hour, can be found below in **Table 7**; no adjustments were made to the signal timing and phasing in the PM peak hour as the intersection operates within typical design limits during this period. It is noted the above noted improvements are linked to the build-out of the KED and future business park development; the timing for the construction of these improvements should be reviewed along with the schedule for the KED and future business park. Detailed output of the Synchro analysis can be found in **Appendix E**.

**Table 7 – Background (2024) LOS with Improvements**

| Location (N-S Street / E-W Street) | Weekday AM Peak Hour | | | | | Weekday PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | V/C | Delay (s) | LOS | 95% Queue (m) | | V/C | Delay (s) | LOS | 95% Queue (m) | |
| | | | | Model | Storage | | | | Model | Storage |
| Street 'C' & Levesque Street / Kingsway (signalized) | 0.87 | 31.8 | D | - | - | - | - | - | - | - |
| EBL | 0.82 | 43.6 | D | 74 | 59 | - | - | - | - | 59 |
| EBT | 0.31 | 18.2 | B | 54 | - | - | - | - | - | - |
| EBR | 0.08 | 15.8 | B | 11 | 94 | - | - | - | - | 94 |
| WBL | 0.29 | 17.2 | B | 26 | 30 | - | - | - | - | 30 |
| WBT | 0.83 | 34.4 | C | 189 | - | - | - | - | - | - |
| WBR | 0.15 | 20.1 | C | 22 | - | - | - | - | - | - |
| NBL | 0.80 | 43.2 | D | 98 | 100 | - | - | - | - | 13 |
| NBTR | 0.41 | 31.2 | C | 60 | - | - | - | - | - | - |
| SBL | 0.63 | 60.9 | E | 30 | 75 | - | - | - | - | 75 |
| SBT | 0.20 | 47.5 | D | 18 | - | - | - | - | - | - |
| SBR | 0.03 | 46.3 | D | 4 | - | - | - | - | - | - |

The results of the LOS analysis indicate that the Street 'C' & Levesque Street / Kingsway intersection operates marginally outside the typical design limits noted in Section 3.1 in the AM peak hour; however, no improvements are recommended as the V/C ratio is only marginally outside design limits. Furthermore, as noted below, there are no operational issues with the anticipated queuing for any of the movements. Consequently, no further improvements are recommended at this intersection.

The results of the LOS analysis indicate that all other intersections are operating within the typical design limits noted in Section 3.1.

The anticipated northbound queue will extend past existing commercial driveways along Levesque Street. Based on our review of the SimTraffic model, this queue is experienced for a short period of time and will clear the end of each respective phase and not impact queuing for the adjacent lanes.

The anticipated queue for the eastbound through and westbound through movements extend past the storage and taper length for the auxiliary lanes at the Street 'C' & Levesque Street / Kingsway and Moonlight Avenue / Kingsway intersections; however, the queue will not extend past major intersections

and based on our review of the SimTraffic model, these queues are experienced for a short period of time and will clear the end of each intersections eastbound and westbound through phase.

The anticipated queue for the eastbound left turn movements at the Street 'C' & Levesque Street / Kingsway intersection and northbound left turn at the Moonlight Avenue / Kingsway intersection will extend past the existing storage length; however, the queuing does not extend beyond the existing left turn taper and no operational issues are anticipated.

There are no other issues regarding the anticipated queuing for all other movements at the study area intersections.

An analysis was completed for left turn movements at the unsignalized intersections in the study area, based on the criteria outlined in Appendix 9A of the MTO DS. A left-turn lane is warranted in the eastbound direction at the Levesque Street / Bancroft Drive intersection (results are provided in **Appendix G**); however, based on the low eastbound through volumes at the intersection, it is anticipated there will be no issues regarding delay and queuing for eastbound movements.

Based on the above noted criteria, a left-turn lane is not warranted for all other movements at unsignalized intersections in the study area (results are provided in **Appendix G**).

A review of the need for additional auxiliary right turn lanes was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all right turn movements; consequently, additional right turn lane improvements are not recommended.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the unsignalized intersections in the study area (results are provided in **Appendix H**).

No further improvements are recommended for the background (2024) scenario.

## 3.4 Background (2029) Intersection Operation

The results of the LOS analysis under background (2029) traffic volumes during the AM and PM peak hours can be found below in **Table 8**. The infrastructure improvements and signal timing improvements noted in Section 3.3 have been utilized in this scenario. Detailed output of the Synchro analysis can be found in **Appendix E**.

**Table 8 – Background (2029) LOS**

| Location (N-S Street / E-W Street) | Weekday AM Peak Hour | | | | | Weekday PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | V/C | Delay (s) | LOS | 95% Queue (m) | | V/C | Delay (s) | LOS | 95% Queue (m) | |
| | | | | Model | Storage | | | | Model | Storage |
| Levesque Street / Kingsway (signalized) | 0.91 | 34.4 | C | - | - | 0.67 | 20.5 | C | - | - |
| EBL | 0.88 | 58.3 | E | 82 | 59 | 0.27 | 12.9 | B | 24 | 59 |
| EBT | 0.33 | 18.6 | B | 58 | - | 0.65 | 16.6 | B | 148 | - |
| EBR | 0.08 | 16.0 | B | 12 | 94 | 0.19 | 10.8 | B | 13 | 94 |
| WBL | 0.32 | 17.5 | B | 28 | 30 | 0.38 | 10.5 | B | 13 | 30 |
| WBT | 0.88 | 37.9 | D | 208 | - | 0.40 | 7.6 | A | 64 | - |
| WBR | 0.15 | 20.2 | C | 22 | - | 0.03 | 5.3 | A | 5 | - |
| NBL | 0.83 | 45.7 | D | 103 | 100 | 0.54 | 44.0 | D | 45 | 100 |
| NBTR | 0.42 | 31.3 | C | 62 | - | 0.19 | 39.2 | D | 25 | - |
| SBL | 0.63 | 61.0 | E | 30 | 75 | 0.81 | 67.8 | E | 59 | 75 |
| SBT | 0.20 | 47.5 | D | 18 | | 0.31 | 40.3 | D | 37 | - |
| SBR | 0.03 | 46.3 | D | 0 | - | 0.60 | 45.7 | D | 62 | - |
| Moonlight Avenue / Kingsway (signalized) | 0.71 | 12.3 | B | - | - | 0.65 | 10.8 | B | - | - |
| EBL | 0.27 | 9.7 | A | 4 | 40 | 0.05 | 4.4 | A | 2 | 40 |
| EBT | 0.33 | 6.0 | A | 50 | - | 0.70 | 11.0 | B | 152 | - |
| EBR | 0.03 | 4.5 | A | 1 | 22 | 0.06 | 5.0 | A | 7 | 22 |
| WBL | 0.01 | 4.9 | A | 1 | 42 | 0.18 | 6.9 | A | 4 | 42 |
| WBT | 0.75 | 12.9 | B | 170 | - | 0.49 | 7.3 | A | 83 | - |
| WBR | 0.01 | 5.2 | A | 0 | 51 | 0.01 | 4.4 | A | 0 | 51 |
| NBL | 0.60 | 52.1 | D | 27 | 20 | 0.41 | 45.9 | D | 19 | 20 |
| NBTR | 0.05 | 42.5 | D | 9 | - | 0.08 | 42.4 | D | 12 | - |
| SBL | 0.04 | 42.5 | D | 4 | 14 | 0.14 | 43.0 | D | 8 | 14 |
| SBTR | 0.02 | 42.3 | D | 6 | - | 0.06 | 42.3 | D | 10 | - |
| Levesque Street / Bancroft Drive (unsignalized) | - | 7.4 | A | - | - | - | 8.3 | A | - | - |
| SB | 0.33 | 13.1 | B | 12 | - | 0.48 | 14.4 | B | 22 | - |
| Moonlight Avenue & Moonlight Beach Road / Bancroft Drive (unsignalized) | - | 7.8 | A | - | - | - | 8.3 | A | - | - |
| EB | 0.08 | 7.7 | A | 0 | - | 0.24 | 8.7 | A | 1 | - |
| WB | 0.18 | 8.0 | A | 2 | - | 0.09 | 7.7 | A | 5 | - |
| NB | 0.01 | 7.7 | A | 4 | - | 0.02 | 7.8 | A | 2 | - |
| SB | 0.06 | 7.7 | A | 2 | - | 0.11 | 8.0 | A | 3 | - |
| Estelle Street / Bancroft Drive (unsignalized) | - | 0.3 | A | - | - | - | 0.2 | A | - | - |
| SB | 0.01 | 9.4 | A | 1 | - | 0.00 | 10.2 | B | 0 | - |

The results of the LOS analysis indicate that the Street 'C' & Levesque Street / Kingsway intersection operates outside the typical design limits noted in Section 3.1 in the AM peak hour; however, no improvements are recommended as the intersection is still operating within the ultimate capacity and

there are no operational issues with the anticipated queuing for any of the movements. Consequently, no further improvements are recommended at this intersection.

The results of the LOS analysis indicate that all other intersections are operating within the typical design limits noted in Section 3.1.

The anticipated queue for the northbound left turn movements at the Street 'C' & Levesque Street / Kingsway intersection marginally extend past the proposed storage length; furthermore, the northbound queue will extend past existing commercial driveways along Levesque Street. Based on our review of the SimTraffic model, this queue is experienced for a short period of time and will clear the end of each respective phase and not impact queuing for the adjacent lanes.

The anticipated queue for the eastbound through and westbound through movements extend past the storage and taper length for the auxiliary lanes at the Street 'C' & Levesque Street / Kingsway and Moonlight Avenue / Kingsway intersections; however, the queue will not extend past major intersections and based on our review of the SimTraffic model, these queues are experienced for a short period of time and will clear the end of each intersections eastbound and westbound through phase.

The anticipated queue for the eastbound left turn movements at the Street 'C' & Levesque Street / Kingsway intersection and northbound left turn at the Moonlight Avenue / Kingsway intersection will extend past the existing storage length; however, the queuing does not extend beyond the existing left turn taper and no operational issues are anticipated.

There are no issues regarding the anticipated queuing for all other movements at the study area intersections.

An analysis was completed for left turn movements at the unsignalized intersections in the study area, based on the criteria outlined in Appendix 9A of the MTO DS. A left-turn lane is warranted in the eastbound direction at the Levesque Street / Bancroft Drive intersection (results are provided in **Appendix G**); however, based on the low eastbound through volumes at the intersection, it is anticipated there will be no issues regarding delay and queuing for eastbound movements.

Based on the above noted criteria, a left-turn lane is not warranted for all other movements at unsignalized intersections in the study area (results are provided in **Appendix G**).

A review of the need for additional auxiliary right turn lanes was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all right turn movements; consequently, additional right turn lane improvements are not recommended.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the unsignalized intersections in the study area (results are provided in **Appendix H**).

No further improvements are recommended for the background (2029) scenario.

# 4 Proposed Development Traffic Generation and Assignment

## 4.1 Traffic Generation

The traffic generation for the proposed development has been based on the ITE Trip Generation Manual. The following ITE land uses have been applied to estimate the traffic from the proposed development:

- ITE land use 220 (Multi-Family Housing (Low-Rise)) – General Urban / Suburban Setting
- ITE land use 221 (Multi-Family Housing (Mid-Rise)) – General Urban / Suburban Setting

The estimated trip generation of the proposed development is illustrated below in **Table 9**. The AM and PM peak hour traffic generation for the proposed development is not expected to exactly align with the AM and PM peak hour in the traffic counts; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual.

**Table 9 – Estimated Traffic Generation of Proposed Development**

| Land Use | Size | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | IN | OUT | TOTAL | IN | OUT | TOTAL |
| Multi-Family Housing Low-Rise ITE Land Use: 220 | 59 units | 7 | 22 | 29 | 23 | 14 | 37 |
| Multi-Family Housing Mid-Rise ITE Land Use: 221 | 120 units | 11 | 33 | 44 | 32 | 21 | 53 |
| **TOTAL TRAFFIC GENERATION** | | **18** | **55** | **73** | **55** | **35** | **90** |

In order to be conservative, no transportation modal split reduction has been applied to the above-noted traffic generation calculation.

## 4.2 Traffic Assignment

For the purposes of this study, it has been assumed that all traffic generated by the proposed development will be new traffic and would not be in the study area if the development was not constructed.

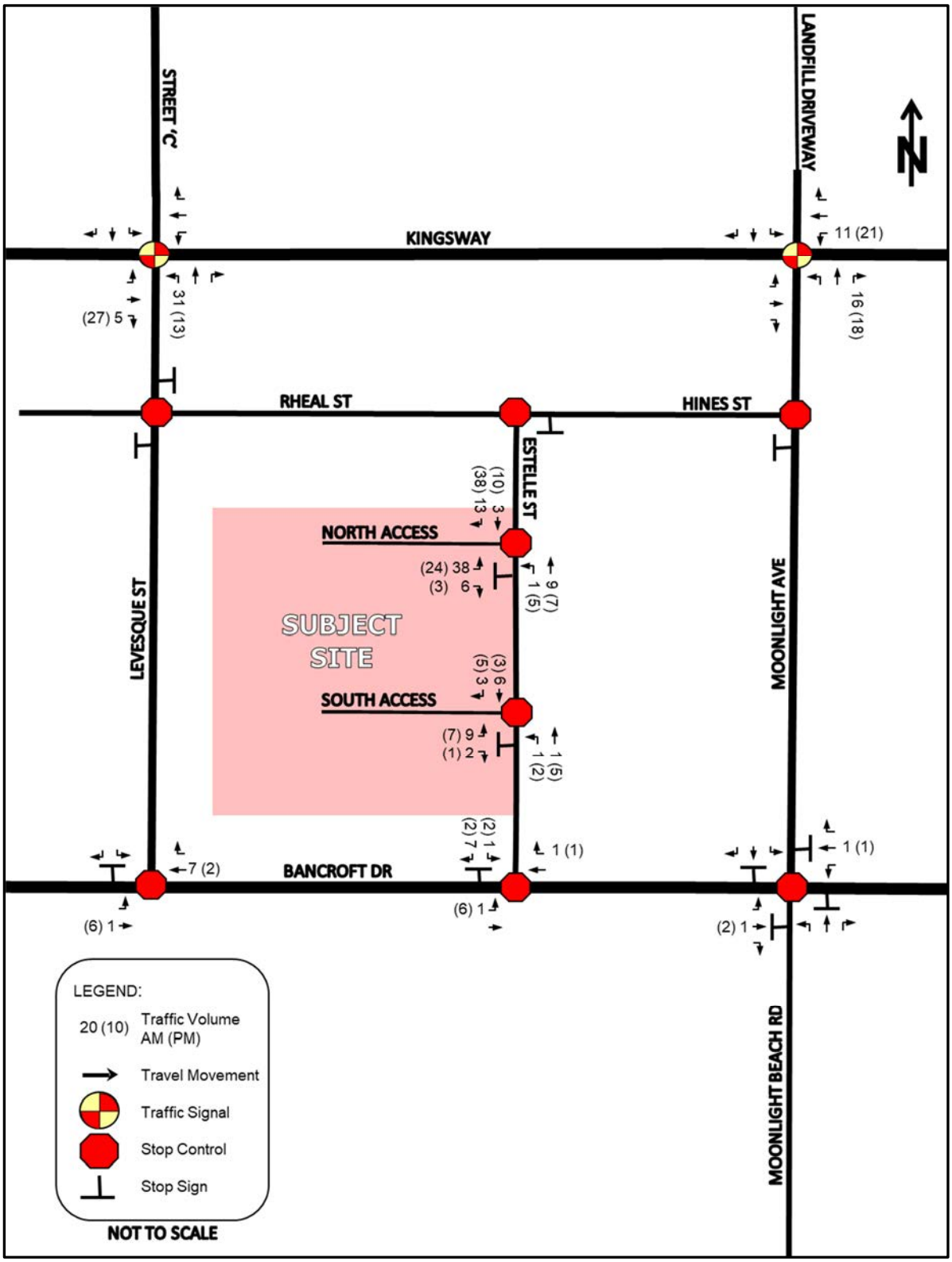
The distribution of traffic for the proposed development is assumed to follow the existing trip distribution of the traffic counts in Section 2.6. The distribution of trips is illustrated in **Table 10** using the methodology outlined above.

**Table 10 – Proposed Development Traffic Distribution Summary**

| Scenario | Direction | Ingress / Egress Traffic Direction | | | |
|---|---|---|---|---|---|
| | | **West** via Kingsway | **East** via Kingsway | **West** via Bancroft Drive | **East** via Bancroft Drive |
| AM | In | 27% | 60% | 7% | 5% |
| | Out | 56% | 30% | 11% | 2% |
| PM | In | 50% | 38% | 9% | 2% |
| | Out | 37% | 51% | 8% | 5% |

Using the traffic distributions pattern noted above, the traffic assignment for the proposed development was calculated for the AM and PM peak hour and is illustrated in **Figure 11**.

**Figure 11 – Subject Site Traffic Assignment**



## 4.3 Total Horizon Year Traffic Volumes with the Proposed Development

For the total (2024 & 2029) horizon year traffic volumes, the proposed development traffic was added to the background (2024 & 2029) traffic volumes. The resulting total (2024 & 2029) horizon year traffic volume for the AM and PM peak hour are illustrated in **Figure 12** and **13,** respectively.

**Figure 12 – Total (2024) Traffic Volumes**

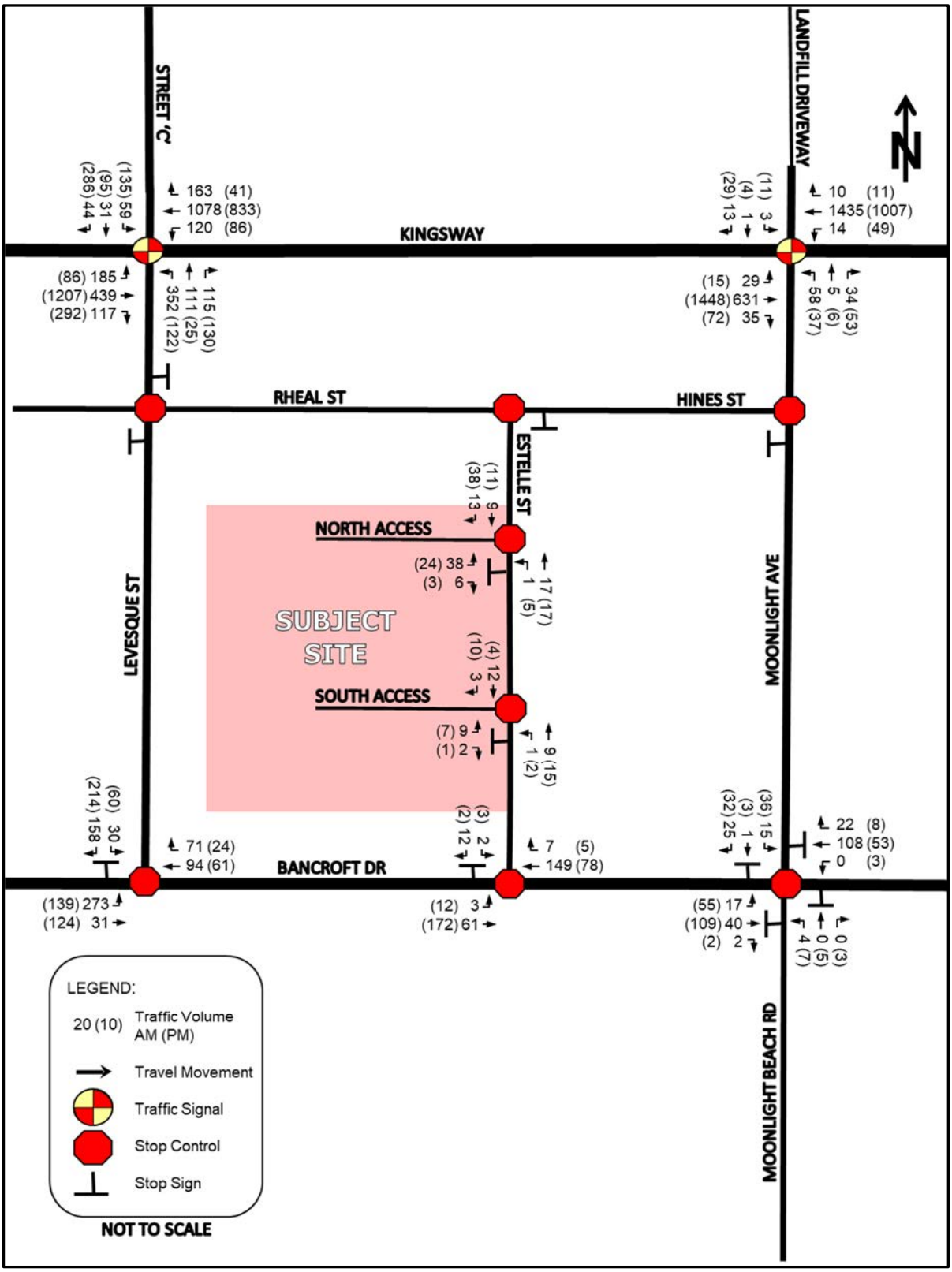
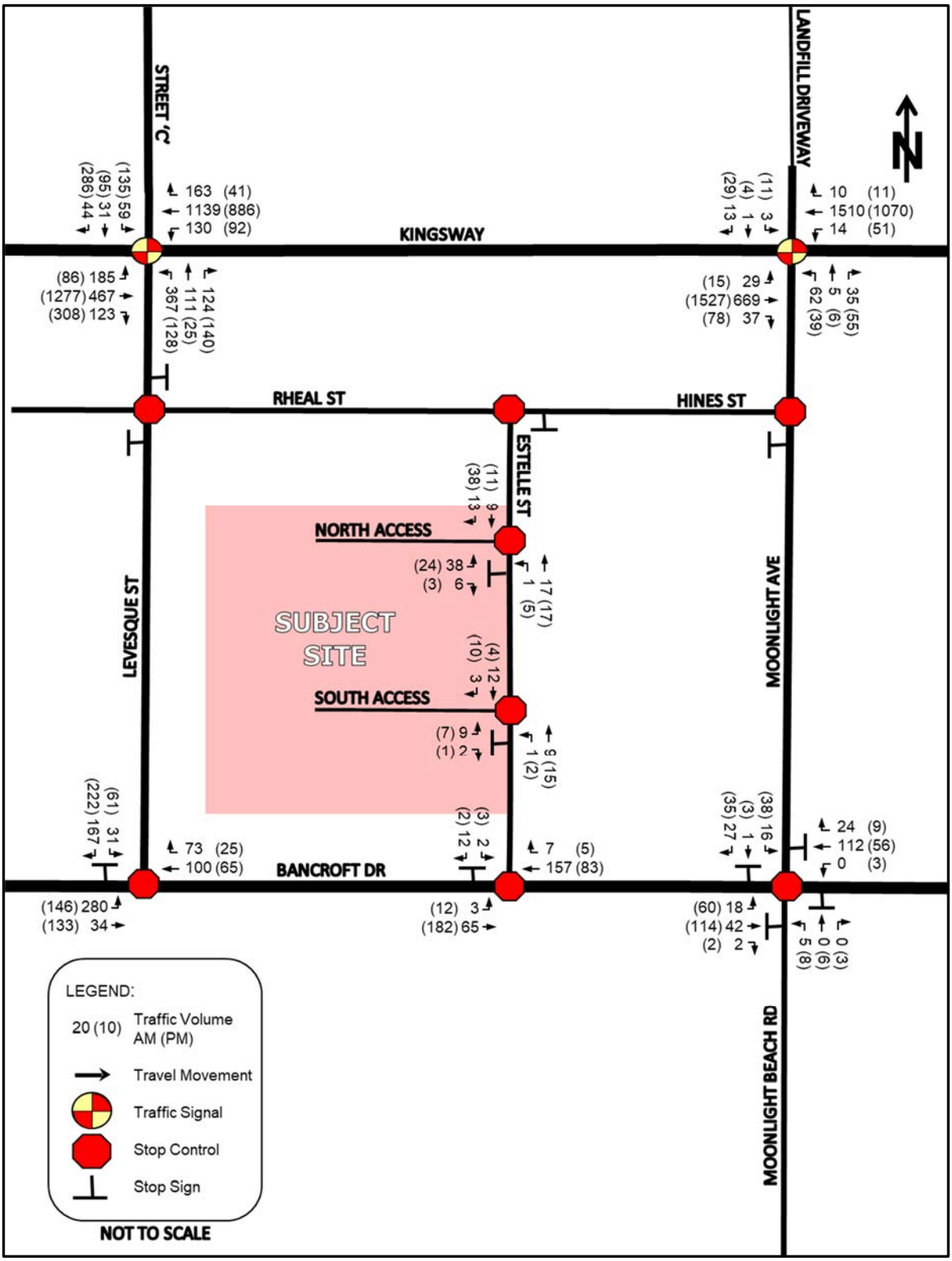


**Figure 13 – Total (2029) Traffic Volumes**



# 5 Intersection Operation with Proposed Development

## 5.1 Total (2024) Intersection Operation

The results of the LOS analysis under total (2024) traffic volumes during the AM and PM peak hours can be found below in **Table 11**. The infrastructure improvements and signal timing improvements noted in Section 3.3 have been utilized in this scenario. Detailed output of the Synchro analysis can be found in **Appendix F**.

**Table 11 – Total (2024) LOS**

| Location (N-S Street / E-W Street) | Weekday AM Peak Hour | | | | | Weekday PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | V/C | Delay (s) | LOS | 95% Queue (m) | | V/C | Delay (s) | LOS | 95% Queue (m) | |
| | | | | Model | Storage | | | | Model | Storage |
| Street 'C' & Levesque Street / Kingsway (signalized) | 0.90 | 33.1 | C | - | - | 0.63 | 19.7 | B | - | - |
| EBL | 0.83 | 45.2 | D | 75 | 59 | 0.25 | 11.5 | B | 23 | 59 |
| EBT | 0.31 | 18.4 | B | 54 | - | 0.60 | 14.5 | B | 135 | - |
| EBR | 0.08 | 16.0 | B | 12 | 94 | 0.20 | 10.0 | B | 13 | 94 |
| WBL | 0.29 | 17.4 | B | 26 | 30 | 0.34 | 8.8 | A | 12 | 30 |
| WBT | 0.84 | 34.8 | C | 189 | - | 0.37 | 7.1 | A | 59 | - |
| WBR | 0.15 | 20.3 | C | 22 | - | 0.03 | 5.1 | A | 5 | - |
| NBL | 0.87 | 50.2 | D | 109 | 100 | 0.59 | 46.7 | D | 48 | 100 |
| NBTR | 0.41 | 31.1 | C | 60 | - | 0.19 | 39.8 | D | 24 | - |
| SBL | 0.63 | 61.1 | E | 30 | 75 | 0.80 | 66.6 | E | 55 | 75 |
| SBT | 0.20 | 47.7 | D | 18 | - | 0.32 | 41.0 | D | 37 | - |
| SBR | 0.03 | 46.5 | D | 0 | - | 0.55 | 44.6 | D | 56 | - |
| Moonlight Avenue / Kingsway (signalized) | 0.68 | 11.8 | B | - | - | 0.63 | 11.0 | B | - | - |
| EBL | 0.24 | 8.1 | A | 4 | 40 | 0.05 | 4.6 | A | 2 | 40 |
| EBT | 0.32 | 6.3 | A | 47 | - | 0.68 | 11.2 | B | 138 | - |
| EBR | 0.03 | 4.8 | A | 1 | 22 | 0.05 | 5.4 | A | 6 | 22 |
| WBL | 0.03 | 4.5 | A | 3 | 42 | 0.24 | 6.8 | A | 5 | 42 |
| WBT | 0.72 | 11.9 | B | 152 | - | 0.46 | 7.1 | A | 76 | - |
| WBR | 0.01 | 5.2 | A | 0 | 51 | 0.01 | 4.4 | A | 0 | 51 |
| NBL | 0.56 | 49.6 | D | 25 | 20 | 0.40 | 45.5 | D | 19 | 20 |
| NBTR | 0.07 | 42.0 | D | 11 | - | 0.09 | 42.3 | D | 14 | - |
| SBL | 0.04 | 42.0 | D | 4 | 14 | 0.14 | 42.9 | D | 8 | 14 |
| SBTR | 0.02 | 41.7 | D | 6 | - | 0.06 | 42.1 | D | 10 | - |
| Levesque Street / Bancroft Drive (unsignalized) | - | 7.2 | A | - | - | - | 8.1 | A | - | - |
| SB | 0.31 | 12.8 | B | 11 | - | 0.46 | 13.9 | B | 20 | - |
| Moonlight Avenue & Moonlight Beach Road / Bancroft Drive (unsignalized) | - | 7.8 | A | - | - | - | 8.2 | A | - | - |
| EB | 0.08 | 7.7 | A | 0 | - | 0.23 | 8.5 | A | 1 | - |
| WB | 0.17 | 7.9 | A | 2 | - | 0.09 | 7.7 | A | 6 | - |
| NB | 0.01 | 7.7 | A | 4 | - | 0.02 | 7.7 | A | 2 | - |
| SB | 0.06 | 7.6 | A | 2 | - | 0.10 | 7.9 | A | 2 | - |
| Estelle Street / Bancroft Drive (unsignalized) | - | 0.7 | A | - | - | - | 0.5 | A | - | - |
| SB | 0.02 | 9.3 | A | 1 | - | 0.01 | 9.6 | A | 1 | - |
| Estelle Street / North Access (unsignalized) | - | 2.8 | A | - | - | - | 2.2 | A | - | - |
| EB | 0.01 | 8.6 | A | 1 | - | 0.01 | 8.6 | A | 1 | - |

| Location (N-S Street / E-W Street) | Weekday AM Peak Hour | | | | | Weekday PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | V/C | Delay (s) | LOS | 95% Queue (m) | | V/C | Delay (s) | LOS | 95% Queue (m) | |
| | | | | Model | Storage | | | | Model | Storage |
| Estelle Street / South Access (unsignalized) | - | 4.7 | A | - | - | - | 2.8 | A | - | - |
| EB | 0.05 | 8.8 | A | 2 | - | 0.03 | 8.9 | A | 1 | - |

The results of the LOS analysis indicate that the Street 'C' & Levesque Street / Kingsway intersection operates marginally outside the typical design limits noted in Section 3.1 in the AM peak hour; however, no improvements are recommended as the V/C ratio is only marginally outside design limits. Furthermore, as noted below there are no operational issues with the anticipated queuing for any of the movements. Consequently, no further improvements are recommended at this intersection.

The results of the LOS analysis indicate that all other intersections are operating within the typical design limits noted in Section 3.1.

The anticipated queue for the northbound left turn movements at the Street 'C' & Levesque Street / Kingsway intersection extend past the proposed storage length; furthermore, the northbound queue will extend past existing commercial driveways along Levesque Street. Based on our review of the SimTraffic model, this queue is experienced for a short period of time and will clear the end of each respective phase and not impact queuing for the adjacent lanes.

The anticipated queue for the eastbound through and westbound through movements extend past the storage and taper length for the auxiliary lanes at the Street 'C' & Levesque Street / Kingsway and Moonlight Avenue / Kingsway intersections; however, the queue will not extend past major intersections and based on our review of the SimTraffic model, these queues are experienced for a short period of time and will clear the end of each intersections eastbound and westbound through phase.

The anticipated queue for the eastbound left turn movements at the Street 'C' & Levesque Street / Kingsway intersection and northbound left turn at the Moonlight Avenue / Kingsway intersection will extend past the existing storage length; however, the queuing does not extend beyond the existing left turn taper and no operational issues are anticipated.

There are no issues regarding the anticipated queuing for all other movements at the study area intersections.

An analysis was completed for left turn movements at the unsignalized intersections in the study area, based on the criteria outlined in Appendix 9A of the MTO DS. A left-turn lane is warranted in the eastbound direction at the Levesque Street / Bancroft Drive intersection (results are provided in **Appendix G**); however, based on the low eastbound through volumes at the intersection, it is anticipated there will be no issues regarding delay and queuing for eastbound movements.

Based on the above noted criteria, a left-turn lane is not warranted for all other movements at unsignalized intersections in the study area (results are provided in **Appendix G**).

A review of the need for additional auxiliary right turn lanes was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all right turn movements; consequently, additional right turn lane improvements are not recommended.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the unsignalized intersections in the study area (results are provided in **Appendix H**).

No further improvements are recommended for the total (2024) scenario.

## 5.2 Total (2029) Intersection Operation

The results of the LOS analysis under total (2029) traffic volumes during the AM and PM peak hours can be found below in **Table 12**. The infrastructure improvements and signal timing improvements noted in Section 3.3 have been utilized in this scenario. Detailed output of the Synchro analysis can be found in **Appendix F**.

**Table 12 – Total (2029) LOS**

| Location (N-S Street / E-W Street) | Weekday AM Peak Hour | | | | | Weekday PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | V/C | Delay (s) | LOS | 95% Queue (m) | | V/C | Delay (s) | LOS | 95% Queue (m) | |
| | | | | Model | Storage | | | | Model | Storage |
| Street 'C' & Levesque Street / Kingsway (signalized) | 0.94 | 35.9 | D | - | - | 0.67 | 20.6 | C | - | - |
| EBL | 0.88 | 59.5 | E | 82 | 59 | 0.27 | 12.9 | B | 24 | 59 |
| EBT | 0.33 | 18.8 | B | 58 | - | 0.65 | 16.6 | B | 148 | - |
| EBR | 0.08 | 16.2 | B | 12 | 94 | 0.21 | 11.0 | B | 14 | 94 |
| WBL | 0.32 | 17.7 | B | 28 | 30 | 0.38 | 10.5 | B | 13 | 30 |
| WBT | 0.89 | 38.4 | D | 208 | - | 0.40 | 7.6 | A | 64 | - |
| WBR | 0.15 | 20.4 | C | 22 | - | 0.03 | 5.3 | A | 5 | - |
| NBL | 0.89 | 54.5 | D | 119 | 100 | 0.60 | 46.4 | D | 50 | 100 |
| NBTR | 0.42 | 31.2 | C | 62 | - | 0.19 | 39.2 | D | 25 | - |
| SBL | 0.63 | 61.2 | E | 30 | 75 | 0.81 | 67.8 | E | 59 | 75 |
| SBT | 0.20 | 47.7 | D | 18 | - | 0.31 | 40.3 | D | 37 | - |
| SBR | 0.03 | 46.5 | D | 0 | - | 0.60 | 45.7 | D | 62 | - |
| Moonlight Avenue / Kingsway (signalized) | 0.71 | 12.7 | B | - | - | 0.66 | 11.5 | B | - | - |
| EBL | 0.27 | 9.7 | A | 4 | 40 | 0.05 | 4.7 | A | 2 | 40 |
| EBT | 0.34 | 6.6 | A | 51 | - | 0.72 | 12.0 | B | 154 | - |
| EBR | 0.03 | 4.9 | A | 1 | 22 | 0.06 | 5.5 | A | 7 | 22 |
| WBL | 0.03 | 4.6 | A | 3 | 42 | 0.28 | 8.1 | A | 5 | 42 |
| WBT | 0.76 | 13.1 | B | 170 | - | 0.49 | 7.4 | A | 83 | - |
| WBR | 0.01 | 5.3 | A | 0 | 51 | 0.01 | 4.4 | A | 0 | 51 |
| NBL | 0.59 | 50.5 | D | 27 | 20 | 0.41 | 45.7 | D | 19 | 20 |
| NBTR | 0.07 | 41.7 | D | 11 | - | 0.09 | 42.3 | D | 14 | - |
| SBL | 0.04 | 41.7 | D | 4 | 14 | 0.14 | 42.9 | D | 8 | 14 |
| SBTR | 0.02 | 41.5 | D | 6 | - | 0.06 | 42.1 | D | 10 | - |
| Levesque Street / Bancroft Drive (unsignalized) | - | 7.4 | A | - | - | - | 8.3 | A | - | - |
| SB | 0.33 | 13.2 | B | 12 | - | 0.49 | 14.6 | B | 22 | - |
| Moonlight Avenue & Moonlight Beach Road / Bancroft Drive (unsignalized) | - | 7.9 | A | - | - | - | 8.3 | A | - | - |
| EB | 0.09 | 7.7 | A | 0 | - | 0.24 | 8.7 | A | 1 | - |
| WB | 0.18 | 8.0 | A | 2 | - | 0.09 | 7.7 | A | 6 | - |
| NB | 0.01 | 7.7 | A | 4 | - | 0.02 | 7.8 | A | 2 | - |
| SB | 0.06 | 7.7 | A | 2 | - | 0.11 | 8.0 | A | 3 | - |

| Location (N-S Street / E-W Street) | Weekday AM Peak Hour | | | | | Weekday PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | V/C | Delay (s) | LOS | 95% Queue (m) | | V/C | Delay (s) | LOS | 95% Queue (m) | |
| | | | | Model | Storage | | | | Model | Storage |
| Estelle Street / Bancroft Drive (unsignalized) | - | 0.6 | A | - | - | - | 0.5 | A | - | - |
| SB | 0.02 | 9.4 | A | 1 | - | 0.01 | 9.7 | A | 1 | - |
| Estelle Street / North Access (unsignalized) | - | 2.8 | A | - | - | - | 2.2 | A | - | - |
| EB | 0.01 | 8.6 | A | 1 | - | 0.01 | 8.6 | A | 1 | - |
| Estelle Street / South Access (unsignalized) | - | 4.7 | A | - | - | - | 2.8 | A | - | - |
| EB | 0.05 | 8.8 | A | 2 | - | 0.03 | 8.9 | A | 1 | - |

The results of the LOS analysis indicate that the Street 'C' & Levesque Street / Kingsway intersection operates outside the typical design limits noted in Section 3.1 in the AM peak hour; however, no improvements are recommended as the intersection is still operating within the ultimate capacity and there are no operational issues with the anticipated queuing for any of the movements. Consequently, no further improvements are recommended at this intersection.

The results of the LOS analysis indicate that all other intersections are operating within the typical design limits noted in Section 3.1.

The anticipated queue for the northbound left turn movements at the Street 'C' & Levesque Street / Kingsway intersection extend past the proposed storage length; furthermore, the northbound queue will extend past existing commercial driveways along Levesque Street. Based on our review of the SimTraffic model, this queue is experienced for a short period of time and will clear the end of each respective phase and not impact queuing for the adjacent lanes.

The anticipated queue for the eastbound through and westbound through movements extend past the storage and taper length for the auxiliary lanes at the Street 'C' & Levesque Street / Kingsway and Moonlight Avenue / Kingsway intersections; however, the queue will not extend past major intersections and based on our review of the SimTraffic model, these queues are experienced for a short period of time and will clear the end of each intersections eastbound and westbound through phase.

The anticipated queue for the eastbound left turn movements at the Street 'C' & Levesque Street / Kingsway intersection and northbound left turn at the Moonlight Avenue / Kingsway intersection will extend past the existing storage length; however, the queuing does not extend beyond the existing left turn taper and no operational issues are anticipated.

There are no issues regarding the anticipated queuing for all other movements at the study area intersections.

An analysis was completed for left turn movements at the unsignalized intersections in the study area, based on the criteria outlined in Appendix 9A of the MTO DS. A left-turn lane is warranted in the eastbound direction at the Levesque Street / Bancroft Drive intersection (results are provided in **Appendix G**); however, based on the low eastbound through volumes at the intersection, it is anticipated there will be no issues regarding delay and queuing for eastbound movements.

Based on the above noted criteria, a left-turn lane is not warranted for all other movements at unsignalized intersections in the study area (results are provided in **Appendix G**).

A review of the need for additional auxiliary right turn lanes was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all right turn movements; consequently, additional right turn lane improvements are not recommended.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the unsignalized intersections in the study area (results are provided in **Appendix H**).

No further improvements are recommended for the total (2029) scenario.

## 5.3 Supplementary Analysis - Street 'C' & Levesque Street / Kingsway Eastbound Double Left Turn Lanes

As noted in Section 2.2, the KED TIS recommended Kingsway be widened to accommodate eastbound double left turn lanes at the Street 'C' & Levesque Street / Kingsway intersection based on traffic volumes observed in the peak hours of analysis in the report (excerpts provided in **Appendix B**). The KED TIS analyzed three main peak periods at this intersection, the PM and Friday Pre / Post Game peak hours. The recommendation for the eastbound double left turn lanes at the Street 'C' & Levesque Street / Kingsway intersection was based on the traffic analysis completed in the Friday Pre / Post Game peak hours; consequently, we have included a supplementary analysis to assess the intersection with these recommendations for the critical total (2029) scenario in the AM and PM peak hours.

The existing storage and taper length were maintained in the recommendation for the eastbound double left turn lanes at the Street 'C' & Levesque Street / Kingsway intersection. With the construction of the eastbound double left turn lanes, protected eastbound left turn phasing is recommended.

The results of the LOS analysis under total (2029) traffic volumes at the Street 'C' & Levesque Street / Kingsway intersection during the AM and PM peak hours can be found below in **Table 13**. Detailed output of the Synchro analysis can be found in **Appendix F**.

**Table 13 – Total (2029) LOS (Eastbound Double Left Turn Lanes)**

| Location (N-S Street / E-W Street) | Weekday AM Peak Hour | | | | | Weekday PM Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | V/C | Delay (s) | LOS | 95% Queue (m) | | V/C | Delay (s) | LOS | 95% Queue (m) | |
| | | | | Model | Storage | | | | Model | Storage |
| Street 'C' & Levesque Street / Kingsway (signalized) | 0.88 | 34.8 | C | - | - | 0.67 | 22.8 | C | - | - |
| EBL | 0.77 | 64.6 | E | 49 | 59 | 0.73 | 72.2 | E | 22 | 59 |
| EBT | 0.33 | 19.5 | B | 60 | - | 0.65 | 16.6 | B | 148 | - |
| EBR | 0.08 | 16.8 | B | 12 | 94 | 0.21 | 11.0 | B | 14 | 94 |
| WBL | 0.31 | 17.2 | B | 29 | 30 | 0.38 | 10.5 | B | 13 | 30 |
| WBT | 0.86 | 36.1 | D | 207 | - | 0.44 | 11.5 | B | 82 | - |
| WBR | 0.18 | 20.3 | C | 29 | - | 0.03 | 8.0 | A | 2 | - |
| NBL | 0.86 | 49.0 | D | 114 | 100 | 0.60 | 46.4 | D | 50 | 100 |
| NBTR | 0.41 | 30.8 | C | 62 | - | 0.19 | 39.1 | D | 25 | - |
| SBL | 0.64 | 62.8 | E | 31 | 75 | 0.81 | 67.6 | E | 59 | 75 |
| SBT | 0.20 | 48.5 | D | 18 | - | 0.31 | 40.2 | D | 37 | - |
| SBR | 0.03 | 47.3 | D | 0 | - | 0.51 | 42.5 | D | 53 | - |

Based on our comparison of the traffic analysis for the total (2029) with and without the eastbound double left turn lanes at the Street 'C' & Levesque Street / Kingsway intersection in Tables 12 and 13, this improvement will marginally improve the overall traffic operations at the intersection during the AM

and PM peak hours of operation and will improve the capacity and queuing length for the eastbound left turn movement. Consequently, there are no issues with the recommendation for the eastbound double left turn lanes at the Street 'C' & Levesque Street / Kingsway intersection; however, it is noted that the impact of the improvement is relatively minor.

## 5.4 Sight Distance Review

A review of the available sight distance for the proposed North Access and South Access was completed as part of this analysis.

The sight distance north (145 metres) and south (140 metres) of the North Access exceed the minimum stopping sight distance requirements as identified in the Transportation Association of Canada Design Guide for Canadian Roads (2017) [TAC Guidelines] for a design speed of 60 km/h (85 metres).

The sight distance north (135 metres) and south (100 metres) of the South Access exceed the minimum stopping sight distance requirements as identified in the TAC Guidelines for a design speed of 60 km/h (85 metres).

The sight distance available at the proposed North Access and South Access are acceptable for the intended use.

## 5.5 Site Access

The North Access and South Access will operate efficiently as full-movement access driveways, with one-way stop control for eastbound movements. A single ingress and egress lane will provide the necessary capacity to service the proposed development.

The proposed spacing between North Access and Rheal Street and South Access and Bancroft Drive (measured corner of driveway to corner of roadway – 148 metres and 148 metres respectively) is greater than the minimum intersection spacing along a local road as per the TAC Guidelines – Section 9.4.2.3 (60 metres between intersections).

The proposed spacing between the North Access and South Access (measured edge of driveway to edge of roadway – 99 metres) is greater than the minimum intersection spacing along a local road as per the TAC Guidelines – Section 9.4.2.3 (60 metres between intersections).

# 6 Parking Review

## 6.1 Municipal By-law Requirement Parking

The Town's Zoning By-law 2010–100Z [Zoning By-law] provides parking requirements for a variety of building types and land uses. According to the description provided in the Zoning By-law, the proposed development includes 143 apartment units and 36 townhouse units. **Table 14** illustrates the parking requirement for the proposed development, according to the Zoning By-law.

**Table 14 – Zoning By-law Requirement Parking Calculation**

| Unit Type | Section | Parking Standard | Proposed Units | Required Parking |
|---|---|---|---|---|
| Residential Dwelling, Multiple | 5.5.1 | 1.5 sp./unit | 143 | 215 spaces |
| Residential Dwelling, Townhouse | | 1 sp./unit | 36 | 36 spaces |
| **TOTAL REQUIRED PARKING SPACES** | | | | **251 spaces** |
| Accessible Parking | 5.2.3.5 | 2 sp. plus 1 space for each additional 50 sp. greater than 100 sp. | - | 6 spaces |
| Bicycle Parking | 5.8 | 0.5 sp./unit | 179 | 90 spaces |

## 6.2 Proxy Parking Counts

In order to estimate the residential visitor parking demand for the apartment units within the proposed development, a proxy parking survey was commissioned by JD Engineering. The site was reviewed by City staff and confirmed to be a suitable proxy site. The surrounding transportation conditions at the proxy parking sites are consistent with the surrounding transportation conditions at the proposed development. The selected proxy survey location is as follows:

1) 568 Greenbriar Drive [Greenbriar Apartments]

The proxy surveys at Greenbrier Apartments were completed at the following times:

1) Friday November 20th, 2020 from 17:00 to 21:00; and
2) Saturday November 21st, 2020 from 11:00 to 21:00.

The proxy parking counts were completed at 30 minute intervals during the above-noted periods.

On-street parking is permitted on Greenbriar Drive and Highgate Road. On-street parking is prohibited from December 1st to March 31st between 00:00 and 07:00.

**Table 15** summarizes the building and parking statistics at the proxy sites.

**Table 15 – Proxy Survey Site Statistics**

| Proxy Site | Number of Units | Total Visitor Parking Supply | Total Resident Parking Supply | Total Parking Supply |
|---|---|---|---|---|
| Greenbriar Apartments | 122 | 30 | 160 | 190 |

## 6.3 Residential Visitor Parking

### 6.3.1 Residential Visitor Proxy Survey Data

**Table 16** summarizes the residential visitor parking survey data for the proxy site. Detailed results are provided in **Appendix I**.

**Table 16 – Residential Visitor Proxy Survey Site Data**

| Proxy Site | Number of Units | Visitor Parking | | | |
|---|---|---|---|---|---|
| | | Peak Period | Supply (spaces) | Demand (spaces) | Demand Rate (spaces/unit) |
| Greenbriar Apartments | 122 | Saturday, 16:00 | 30 | 15 | 0.123 |

### 6.3.2 Analysis - Resident Visitor Parking

The anticipated visitor parking demand for the subject site is anticipated to be approximately 0.123 spaces per unit, based on the proxy parking counts. For this site, it is recommended that the visitor parking supply is designed to exceed the anticipated peak visitor parking demand, as estimated using the proxy parking counts. It is recommended that an 85% visitor parking utilization is adopted as the design target. Consequently, it is recommended that visitor parking is provided at a rate of 0.15 spaces per unit.

It is recommended that the proposed development include 21 visitor parking spaces (143 residential units x 0.15 spaces per unit). The visitor parking generated by the proposed development is not anticipated to impact the surrounding parking infrastructure within the study area.

## 6.4 Apartment Resident Parking

### 6.4.1 Apartment Resident Proxy Survey Data

**Table 17** summarizes the resident parking survey data for the proxy site detailed results are provided in **Appendix I**.

**Table 17 – Apartment Resident Proxy Survey Site Data**

| Proxy Site | Number of Units | Resident Parking | | | |
|---|---|---|---|---|---|
| | | Peak Period | Supply (spaces) | Demand (spaces) | Demand Rate (spaces/unit) |
| Greenbriar Apartments | 122 | Saturday, 19:30 | 190 | 89 | 0.730 |

### 6.4.2 Analysis – Apartment Resident Parking

In the case of residential visitor parking, when the visitor parking demand exceeds the visitor parking supply, the additional parking demand may result unauthorized parking in nearby parking lots or undesignated areas. Consequently, providing a conservative visitor parking supply as outlined in Section 6.4, will ensure overflow visitor parking issues do not occur. Allocation of resident parking is different than visitor parking. Lowering the resident parking supply, in conjunction with clear communication during sales / rental process and ongoing parking enforcement, can increase development efficiency and provide a form of transportation demand management.

Historically, the cost to buy or rent an apartment or condominium unit has included one or more parking spaces, which provides an incentive for private vehicle ownership. The apartment units in the proposed development will have unbundled parking, which will give the tenant the opportunity to pay only for the number of spaces they need. This technique is a more efficient and fair way to pass the cost for the parking space on to those residents that use them. Another benefit of this strategy is that the use of the parking space is viewed as an additional cost associated with private vehicle ownership.

The Client is committed to providing clear messaging in the sales agreement, which will inform buyers / renters that additional parking is not guaranteed and regular enforcement by the property manager will occur to ensure there is no misuse of parking within the site.

With the above-noted resident parking controls, the supply of resident parking becomes a function of marketability. In the case of the proposed development, based on our correspondence with the Client and their sales team, it is our expectation that the majority of the apartment units will be purchased or rented by owners that require one or no parking spaces per unit.

Based on the proxy parking data, the apartment units in the proposed development would generate a peak parking demand of 105 spaces (143 units x 0.73 spaces per unit). Based on our review of the study area, development intent and local parking controls, a minimum resident parking supply of 130 spaces is recommended. This would result in a parking supply that is 24% greater than the anticipated parking demand.

## 6.5 Recommended Minimum Parking Supply

Based on our analysis of the residential proxy parking data, the recommended parking breakdown is provided in **Table 18**. In the event of overflow parking in the proposed development, Section 6.6 identifies the on-street parking available in the study area.

**Table 18 – Recommended Minimum Parking Supply**

| Unit Type | Proposed Units | Resident Parking | Visitor Parking | Total Parking |
|---|---|---|---|---|
| Residential Dwelling, Multiple | 143 | 130 spaces (0.91 sp./unit) | 21 spaces (0.15 sp./unit) | 151 spaces |
| Residential Dwelling, Townhouse | 36 | 36 spaces (1 sp./unit) | - | 36 spaces |
| **TOTAL** | **179** | **166 spaces** | **21 spaces** | **187 spaces** |
| Accessible | 2 spaces plus 1 space for each additional 50 spaces greater than 100 spaces | | | 7 spaces |

## 6.6 Overflow Parking Control

In the unlikely event of overflow parking at the subject site, a review of nearby on-street parking is noted. On-street parking is permitted on both sides of Estelle Street, Rheal Street and Hines Street. It is noted there is no sidewalk on Estelle Street and sidewalks are recommended on Estelle Street as noted in Section 7.0.

# 7 Transportation Demand Management

As noted above, the recommended minimum parking supply will provide the necessary capacity to accommodate the typical peak parking demand for the proposed development; however, it is acknowledged that the recommended parking supply is approximately 25% less than the Zoning By-law requirement. In conjunction with the reduced resident parking supply, the following transportation demand management measures are recommended as part of the proposed development:

- Construct sidewalk on the west side of Estelle Street extending from Bancroft Drive to Rheal Street;
- The proposed development includes an internal sidewalk network with pedestrian connections to the proposed sidewalk on Estelle Street and the existing municipal pedestrian infrastructure on Bancroft Drive and Rheal Street;
- Provide pedestrian connection from the proposed development to the bus stop located on Bancroft Drive;
- The proposed development includes 90 bicycle parking spaces;
- An information display board will be provided in a central location in the apartment buildings to display travel information such as bicycle maps, local transit map/schedule and other relevant information; and
- Information packages will be distributed to new residents including transit and cycling maps;

# 8 Summary

**Tulloch Engineering Inc.** retained **JD Engineering** to prepare this traffic impact study in support of the proposed residential development located on the west side of Estelle Street midblock between Bancroft Drive and Rheal Street, in the City of Greater Sudbury. The proposed Draft Plan by Tulloch is shown in **Appendix A**. This chapter summarizes the conclusions and recommendations from the study.

The proposed development is anticipated to consist of three 5-storey buildings with a total of 120 units and 59 townhouse units.

1. The proposed development is expected to generate a total of 73 AM and 90 PM peak hour trips.
2. An intersection operation analysis was completed at the study area intersections, using the existing (2021) and background (2024 & 2029) traffic volumes, with the adjacent development traffic. This enabled a review of existing and future traffic deficiencies that would be present without the influence of the proposed development. The following improvements are recommended prior to build-out of the Kingsway Entertainment District and Arena / Event Centre and future business park development:

   **Background (2024) Traffic Volumes**

   - **Street 'C' & Levesque Street / Kingsway**
     - Street 'C' be constructed with a left, through and right turn lane configuration;
     - The southbound left turn is constructed with a 75 metre storage length and 55 metre taper length;
     - Adjust eastbound and northbound signal heads to accommodate a protected and permissive left turn signal phase; and
     - Adjust and repaint northbound lane pavement markings to provide 100 metre parallel length and 30 metre taper length for the northbound left turn lane.
3. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area streets and intersections.
4. An intersection operation analysis was completed under total (2024 & 2029) traffic volumes with the proposed development operational at the study area intersections. No further infrastructure improvements were required as a result of the analysis.
5. A supplementary analysis was completed to assess the recommendation for the eastbound double left turn lane at the Street 'C' & Levesque Street / Kingsway intersection, as recommended in the Kingsway Entertainment District and Arena / Event Centre Traffic Impact Study. Based on our review, there are no issues with the recommendation for this improvement.
6. The North Access and South Access will operate efficiently as a full-movement access driveways, with one-way stop control for eastbound movements. No lane improvements are recommended on Estelle Street at the North Access and South Access. The above-noted configuration will provide the necessary capacity to service the proposed development.
7. The sight distance available for the proposed North Access and South Access meets the minimum stopping sight distance requirements.
8. The Developer is committed to providing clear messaging in the sales agreement, which will inform tenants that additional parking is not guaranteed and regular enforcement by the property manager will occur to ensure there is no misuse of parking within the site.

9. Based on our analysis of the residential visitor proxy parking data and the resident parking survey, the proposed parking breakdown, summarized in Table A will provide the necessary capacity to support the proposed.

**Table A – Recommended Minimum Parking Supply**

| Unit Type | Proposed Units | Resident Parking | Visitor Parking | Total Parking |
|---|---|---|---|---|
| Residential Dwelling, Multiple | 143 | 130 spaces (0.91 sp./unit) | 21 spaces (0.15 sp./unit) | 151 spaces |
| Residential Dwelling, Townhouse | 36 | 36 spaces (1 sp./unit) | - | 36 spaces |
| **TOTAL** | **179** | **166 spaces** | **21 spaces** | **187 spaces** |
| Accessible | 2 spaces plus 1 space for each additional 50 spaces greater than 100 spaces | | | 7 spaces |

10. Construction of a sidewalk is recommended on the west side of Estelle Street extending from Bancroft Drive to Rheal Street, to improve pedestrian connectivity.

11. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network; furthermore, the above-noted parking supply will provide the necessary capacity to accommodate the typical peak parking demand for the proposed development.

# Appendix A – Site Plan


| ZONING & ZONING BY-LAW | | | | |
|---|---|---|---|---|
| | Total Lot Area | | ±60048m2 | |
| | Number of Units | | 179 Units | |
| | R3-1 ZONE REQUIREMENTS | | REQUIRED | PROVIDED |
| | Lot Frontage | | 18.0m | 180.0m |
| | Front Yard Setback | | 6.00m | 6.30m |
| | Side Interior Yard Setback North (Abbut Res.) | | 5.00m | 18.50m |
| | Side Interior Yard Setback South (Abbut Res.) | | 5.00m | 20.00m |
| | Rear Yard Setback | | 7.50m | 13.50m |
| | Maximum Height | | 19.00m | 19.00m |
| | Lot Coverage | | 50% | ±15.20% |
| | Landscaped Area | | 30% | ±50% |
| | PARKING REQUIREMENTS | @1.5/unit | @1.0/unit | |
| | 30-Unit Multiple Dwelling | 45 | 30 | 30 |
| | 45-Unit Multiple Dwelling (X2) | 135 | 90 | 90 |
| | 12-Unit Multiple Dwelling | 35 | 23 | 31 |
| | 3-Unit Multiple Dwelling | | | |
| | 8-Unit Multiple Dwelling | | | |
| | 4- Unit Row Dwelling (x5) | 30 | 20 | 20 |
| | 3-Unit Row Dwelling (x2) | 9 | 6 | 6 |
| | 5-Unit Row Dwelling | 8 | 5 | 5 |
| | 2-Unit Multiple Dwelling | 4 | 2 | 2 |
| | 3-Unit Multiple Dwelling | 5 | 3 | 3 |
| | TOTAL | 271 | 179 | 187 |
| | | | | |
| | Width of Parking Spaces | 2.75m | | 2.75m |
| | Length of Parking Spaces | 6.00m | | 6.00m |
| | Parking Spaces Barrier Free | 4 | | 7 |
| | Width of Accessible Parking Space | 4.40m | | 4.40m |
| | Length of Accessible Parking Space | 6.00m | | 6.00m |
| | Minimum Drive Aisle Width | 6.00m | | 6.00m |
| | Bicycle Parking | 68 | | 68 |

LEGEND:

PROPOSED CONTOURS ——— 282 ———

| REVISION: | No. | DATE | BY |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

TULLOCH ENGINEERING

# ESTELLE STREET DEVELOPMENT
# SUDBURY, ONTARIO

## ZONING CONCEPT PLAN

ENGINEER'S SEAL

| | |
|---|---|
| SCALE | 1:750 |
| DRAWN | D.R. |
| CHECKED | T.M. / K.J. |
| DATE | AUGUST 26, 2020 |
| PROJECT No. | 19-1564 |
| SHEET | C1 |

# Appendix B –
# Adjacent Development Excerpts

# KED TIS

DILLON CONSULTING

CITY OF GREATER SUDBURY

# Kingsway Sports and Entertainment Complex

## Traffic Impact Study

December 2017 — 17-6373

# 4.0 Site Traffic and Parking Generation

## 4.1 Trip Generation

The amount of traffic that will be generated by the site was estimated from a combination of sources:

- Trip generation and auto occupancy surveys undertaken at existing sites;
- Trip generation equations published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual* (9th edition); and
- First principles calculations based on anticipated site operations.

### 4.1.1 Arena

Trips generated by the arena were calculated from first principles.

Typically the doors will open one hour prior to the start of a game (or other event). The majority of spectators are projected to arrive within this one-hour period. Prior analyses undertaken by WSP Canada in June 2017 (i.e., the traffic report undertaken during the site selection process) assumed 88% (seven-eighths) of traffic would arrive within this one-hour period, with the remainder arriving either before this period or after it (i.e., arriving late). This figure was compared against typical arrival and departure patterns published by ITE in *Traffic Considerations for Special Events*, which indicated approximately 79% of traffic would arrive within the peak hour (see breakdown by 10-minute intervals shown in *Table 19*). The lower 79% figure has been applied to the analyses, reflecting the greater potential for restaurants and other amenities to draw event goers to the site ahead of time as the business park develops.

Following the conclusion of a game or event, all spectators are assumed to depart within a one-hour period.

An auto occupancy of 2.19 spectators per vehicle has been applied. This occupancy level was determined through surveys undertaken by City staff prior to the start of two Wolves games in 2017 (Friday, September 29; Sunday, October 1). The survey results are summarized in *Table 20*.

Table 19: Temporal Distribution of Attendees Arriving At / Departing From Special Events

| Time before event *(minutes)* | Proportion of attendees arriving in interval | Time after event *(minutes)* | Proportion of attendees departing in interval |
|---|---|---|---|
| 110–100 | 4% | 0–10 | 19% |
| 100–90 | 4% | 10–20 | 11% |
| 90–80 | 4% | 20–30 | 25% |
| 80–70 | 4% | 30–40 | 25% |
| 70–60 | 5% | 40–50 | 10% |
| 60–50 | 7% | 50–60 | 6% |
| 50–40 | 10% | 60–70 | 4% |
| 40–30 | 15% | | |
| 30–20 | 17% | | |
| 20–10 | 16% | | |
| 10–0 | 14% | | |
| Peak hour | 79% | Peak hour | 96% |

*Source: Traffic Considerations for Special Events, ITE, 1976. Data published in "Traffic Impact Study of the Arena / Convention Center and Downtown Events Center Sites." City of Sioux Falls Traffic Engineering, April 2011.*

Table 20: Auto Occupancy Survey Results at 2017 Sudbury Wolves Games

| Auto occupancy | Number of vehicles | |
|---|---|---|
| | Friday | Sunday |
| 1 spectator | 41 | 32 |
| 2 spectators | 75 | 50 |
| 3 spectators | 27 | 19 |
| 4 spectators | 12 | 16 |
| 5 spectators | 7 | 1 |
| Total vehicles | 162 | 118 |
| Total spectators | 355 | 258 |
| Avg. spectators/vehicle | 2.19 | 2.19 |

An adjustment was made to account for trips made by non-auto modes. Given the site's distance from the urban area, it is assumed that the majority of non-auto trips will be made by transit. For an estimate of the potential level of transit ridership, modal split data from the most recent census were reviewed (the 2011 National Household Survey). Over the Sudbury Census Metropolitan Area, 4.5% of respondents reported commuting to work via public transit in the 2011 NHS; in the 2006 census, the percentage was 5.2%. The modal split varies within the City; the central portion of the city experiences transit modal splits of 10% or more, whereas the modal split in the eastern part of the city is generally closer to 5%. It was assumed that 5% of spectators would travel to and from the site via public transit.

It is possible that some spectators may be dropped off prior to the start of an event and then picked up afterward. No adjustment was made for this scenario. There would be no impact on the number of peak direction trips, although there could be an increase in the number of counter-peak direction trips. It was assumed that the proportion of pick-up and drop-off traffic would be low enough as to not substantially affect intersection operations.

The analyses assumed attendance equivalent to the seating capacity for a hockey game (5,800 seats). The capacity for concerts could be higher, potentially in the order of 6,500 spectators, depending on parameters such as the configuration of the stage and temporary seating on the arena floor. However, it was assumed that this type of event would be infrequent enough that the hockey capacity would govern the analyses.

Given that the analyses are based on a sold-out event at the arena, they can be considered to be conservative. As a check, historical attendance figures were reviewed at two levels:

- Attendance for all OHL teams in the 2016-17 season; and
- Attendance for the Wolves over the past six seasons.

Attendance figures were obtained for each game[3] and sorted from highest to lowest attendance. The attendance data are illustrated graphically in *Appendix D*. The attendance data for the Wolves were reviewed as a percentage of the existing Sudbury Community Arena seating capacity, to illustrate the variability in attendance from one game to another and from one season to another. The attendance data for the other teams were reviewed both at an absolute level (to provide context as to how the proposed increased seating capacity at the new arena would compare to the existing attendance for other teams across the league) and at a percentage level (to determine the variability in attendance from one game to another).

Wolves games have typically drawn approximately 3,000 to 4,000 spectators over the past six seasons, or approximately 65–85% of the current arena's seating capacity. Approximately 25% of games in the 2011–12 through 2014–15 seasons attracted attendance in excess of this level, and typically 5–10% of games per season draw a capacity crowd.

Across the league, the majority of teams experienced typical attendance levels between 2,500 and 4,000 spectators per game for most of the 2016–17 season. Attendance in London and Kitchener was typically in the order of 7,000 per game or higher, and five other teams also had games with attendance levels of 5,800 or more (Windsor; Ottawa; Hamilton; Oshawa; Erie), but in most cases those higher-attendance games were only approximately 25% to 35% of the season, and attendance for the rest of the season was around 5,000 spectators per game or fewer.

[3] All attendance figures obtained from *The Internet Hockey Database* (*http://www.hockeydb.com*).

Most teams have experienced levels of variation in game-to-game attendance similar to the pattern in Wolves attendance. Six teams experienced near-maximum attendance for at least one-third to one-half of the season (London, Kitchener, Niagara, Barrie, Oshawa, Owen Sound). The majority of teams (including the Wolves) experienced greater level of variability, with approximately 75% of games having attendance 85% or less of their highest-attendance game.

The review of historical Wolves and OHL attendance figures indicates that basing the analyses on a sold-out game can be considered conservative from two perspectives:

- Current Wolves attendance is typically in the range of 3,000 to 4,000 spectators, and most other OHL teams typically draw similar attendance levels; and
- Most teams draw 5 to 10 near-capacity crowds, but attendance at the majority of games is usually 85% of capacity or less.

*Table 21* summarizes the number of vehicle trips generated by the arena before and after an event and outlines how those numbers were derived.

Table 21: Arena Trip Generation

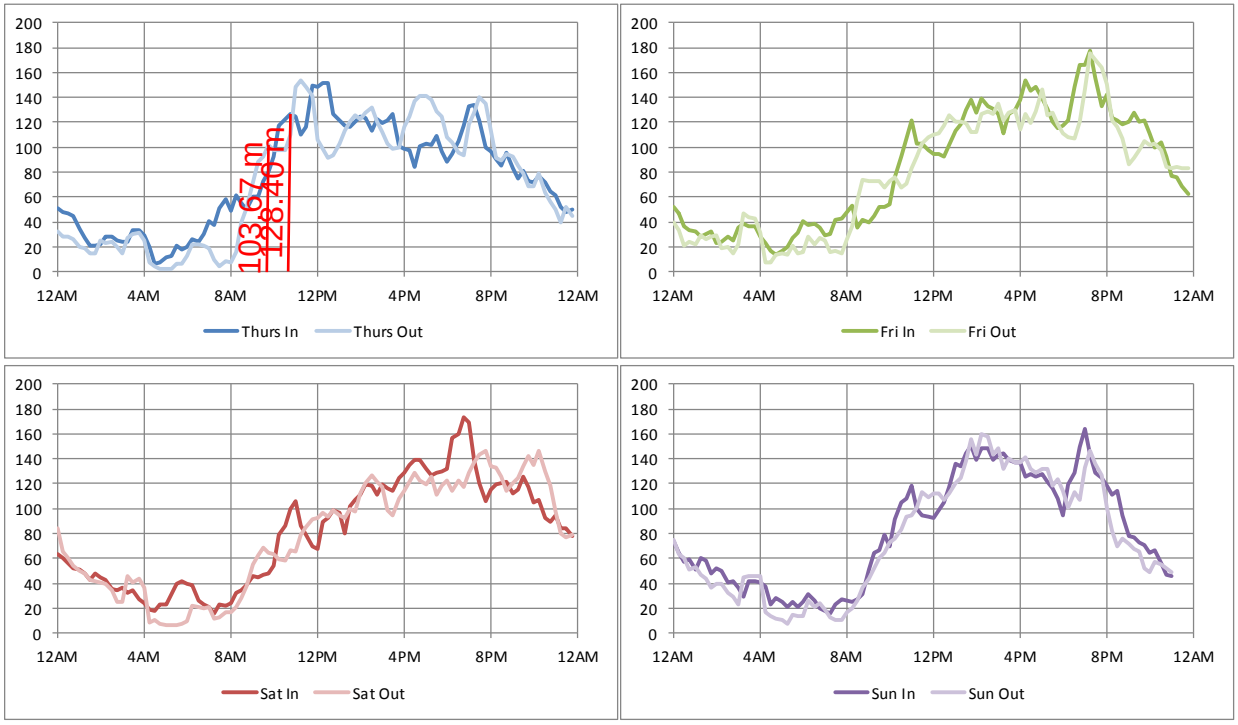
| | Peak direction, peak hour trips | |
|---|---|---|
| | Pre-game inbound | Post-game outbound |
| Number of spectators | 5,800 | 5,800 |
| % traveling via transit | 5% | 5% |
| # traveling via transit | 290 | 290 |
| % traveling via auto | 95% | 95% |
| # traveling via auto | 5,510 | 5,510 |
| Average auto occupancy | 2.19 | 2.19 |
| # of auto trips | 2,515 | 2,515 |
| % traveling during peak hour | 79% | 100% |
| Peak hour auto trips | 1,985 | 2,515 |

While the arena will primarily impact traffic volumes during the pre-game and post-game periods (or before and after other similar special events), the ice surface would likely be rented out for other purposes at other times (as is the case with the existing Sudbury Community Arena). It would therefore generate some traffic during the weekday PM and Saturday peak hours, although at a substantially lower level than pre- and post-game periods. The weekday PM and Saturday peak hour trip generation for the arena is discussed in *Section 4.1.4*.

### 4.1.2 Casino

Trip generation surveys were undertaken at the Point Edward Casino in Sarnia between Thursday, September 28 and Sunday, October 1, 2017. This site was selected as a comparable proxy to the proposed development, and includes 576 gaming positions (slot machines and table games) as well as restaurant space. The number of vehicles entering and exiting each parking lot was surveyed continuously over a four-day period using automatic traffic recorders (ATRs). ***Figure 7*** illustrates the variation in hourly traffic volumes entering and exiting the site throughout the survey period.

**Figure 7: Variation in Surveyed Hourly Traffic Volumes at Point Edward Casino**




*Note: Curves illustrate hourly volumes in rolling 15-minute intervals.*

The busiest one-hour interval was on Friday evening between 7:15 and 8:15, when a total of 353 vehicles entered and exited the site.

Trip generation rates were derived by correlating the number of trips with the number of gaming positions. Since the arena will govern traffic conditions on the approach routes on days when a game or other event is scheduled, trip generation rates were calculated for the pre-game and post-game peak hours rather than for the specific casino peak hours. At Point Edward, there are currently 576 gaming positions. Applying this number to the surveyed demand profile results in the following trip generation rates:

- 0.49 trips per gaming position during the weekday PM peak hour;
- 0.40 trips per gaming position during the weekday pre-game peak hour;
- 0.37 trips per gaming position during the weekday post-game peak hour; and
- 0.34 trips per gaming position during the Saturday midday peak hour.

Although the trip generation rates are correlated to the number of gaming positions on site, they also include trips generated by restaurant space within the casino.

*Table 22* outlines the trip generation rates applied to the casino component of the site, and the resulting number of trips generated during each analysis hour.

Table 22: Casino Trip Generation

| | Weekday PM peak hour | | | Weekday pre-game peak hour | | | Weekday post-game peak hour | | | Saturday peak hour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | In | Out | Total | In | Out | Total | In | Out | Total | In | Out |
| Trip generation rate *(trips per gaming position)* | 0.49 | 0.24 | 0.25 | 0.40 | 0.21 | 0.19 | 0.37 | 0.19 | 0.18 | 0.34 | 0.17 | 0.17 |
| Trips generated *(780 gaming positions)* | 380 | 185 | 195 | 310 | 160 | 150 | 290 | 150 | 140 | 265 | 135 | 130 |

### 4.1.3 Hotel

Trips were generated for the hotel based on ITE trip generation rates (ITE land use code 310) as follows:

- The ITE PM peak hour trip generation rate was assumed to be applicable to the weekday pre-game peak hour.
- The ITE Saturday peak hour trip generation rate was applied to the Saturday peak hour analyses.
- For the weekday post-game peak hour, no ITE data were available. Instead, it was assumed that the inbound peak hour trip generation rate would be one half of the PM peak hour inbound trip generation rate, and the number of outbound trips would be negligible.

*Table 23* outlines the trip generation rates applied to the hotel component of the site, and the resulting number of trips generated during each analysis hour.

Table 23: Hotel Trip Generation

| | Weekday PM and pre-game peak hours | | | Weekday post-game peak hour | | | Saturday peak hour | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | In | Out | Total | In | Out | Total | In | Out |
| Trip generation rate *(trips per room)* | 0.60 | 0.31 | 0.29 | 0.15 | 0.15 | 0.00 | 0.72 | 0.40 | 0.32 |
| Trips generated *(200 rooms)* | 120 | 60 | 60 | 30 | 30 | 0 | 145 | 80 | 65 |

### 4.1.4 Twin Pad Arena

As a subsequent development phase, consideration has been given to the potential for an additional twin pad arena on the subject lands. The site trip generation accounts for the twin pad arena being in place by the 2022 horizon.

For the PM peak hour, the City of Greater Sudbury provided a weekday PM peak period traffic count undertaken at the driveway to the Countryside Sports Complex twin pad arena as a comparable proxy site. The Countryside arenas generated 65 trips during the weekday PM peak hour (25 inbound trips and 40 outbound trips). A similar volume of traffic was applied to the twin pad arena within the subject site.

For other peak hours, the following assumptions and parameters were applied:

- There are two rinks, each of which will accommodate two teams;
- Each team will have 20 vehicles (including a small allowance for coaching staff and additional attendees);
- Ice time will be scheduled in one-hour increments (i.e., the analysis hour will include teams leaving from the preceding hour and teams arriving for the following hour);
- The weekday pre-game peak hour will include inbound trips generated from first principles, and 25 outbound trips (i.e., the inbound trips from the PM peak hour);
- The weekday post-game peak hour will include outbound trips but no inbound trips (no ice time scheduled after 11:00 PM);
- The Saturday peak hour will include both inbound and outbound trips.

On this basis, the twin pad arena will generate the following number of trips:

- 80 inbound trips and 25 outbound trips during the weekday pre-game peak hour;
- 80 outbound trips during the weekday post-game peak hour; and
- 80 inbound trips and 80 outbound trips during the Saturday peak hour.

Further, it is anticipated that the main arena would be rented at times when not required for a major event. City of Greater Sudbury staff indicated that similar assumptions about type and magnitude of use could be assumed as for the twin pad arena based on typical practice at the existing Sudbury Community Arena, although the volume would be reduced by half given that only one ice surface is available.

On this basis, the main arena would generate the following trips during non-event times:

- 15 inbound and 20 outbound trips during the weekday PM peak hour; and
- 40 inbound and 40 outbound trips during the Saturday peak hour.

### 4.1.5 Business Park

The remaining industrial subdivision blocks to the north and west of Street A and to the east of Street C are anticipated to eventually develop for a range of employment uses. However, the specific uses and timeline for development are unknown at this time and will be dependent on what the market will support. Given the uncertainty surrounding the eventual nature of the surrounding blocks, trips were generated based on rates for a generic business park rather than for more specific land uses. The ITE trip generation rates for business parks reflect larger sites containing multiple blocks and a range of employment uses, and therefore are a reasonably good representation of the subject lands.

The ITE trip generation data are presented in terms of trips generated during the full weekday; trips generated during the weekday PM peak hour (based on the peak hour on the surrounding street network); and trips generated during the Saturday peak hour. The weekday rates overstate traffic volumes generated by the business park during the weekday pre- and post-game peak hours, which will occur after the commuter peak hours. To derive traffic volumes generated during these off-peak hours, an hourly distribution of traffic for office uses (i.e., employment) published in the January 2015 edition of *ITE Journal* was referenced. The hourly distributions published in *ITE Journal* are reproduced in *Table 24*; the full article is presented in *Appendix E*.

*Table 25* summarizes the trip generation rates estimated for the subject site during each analysis period and how they were derived.

*Table 26* outlines the trip generation rates applied to the business park component of the site, and the resulting number of trips generated during each analysis hour.

Table 24: Typical Hourly Distribution of Trips Generated by Office Uses

| Time | Average weekday | | Average Saturday | | Average Sunday | |
|---|---|---|---|---|---|---|
| | % of 24-hour entering traffic | % of 24-hour exiting traffic | % of 24-hour entering traffic | % of 24-hour exiting traffic | % of 24-hour entering traffic | % of 24-hour exiting traffic |
| 6–7 a.m. | 4.6 | 0.7 | 4.1 | 1.4 | 1.8 | 2.4 |
| 7–8 a.m. | 14.9 | 1.9 | 5.4 | 2.5 | 3.8 | 1.2 |
| 8–9 a.m. | 20.7 | 3 | 9.1 | 1.5 | 6 | 2.9 |
| 9–10 a.m. | 8.2 | 3.2 | 7.2 | 3.9 | 6.6 | 3.8 |
| 10–11 a.m. | 5 | 3.9 | 6.8 | 4.6 | 9.7 | 7.5 |
| 11–12 p.m. | 5.1 | 8.6 | 7.1 | 11.3 | 8.9 | 9.6 |
| 12–1 p.m. | 8.7 | 10.5 | 8.1 | 14 | 6.9 | 9.1 |
| 1–2 p.m. | 10 | 6.6 | 7.3 | 8.3 | 8.6 | 12 |
| 2–3 p.m. | 5.9 | 6.3 | 7.6 | 7.7 | 6.6 | 8.2 |
| 3–4 p.m. | 4.3 | 9.5 | 6 | 9.6 | 4.6 | 6.3 |
| 4–5 p.m. | 3.4 | 15.4 | 3.1 | 7.9 | 5.5 | 7.5 |
| 5–6 p.m. | 2.5 | 16.5 | 3.2 | 6.9 | 3.1 | 6.7 |
| 6–7 p.m. | 1.4 | 5.5 | 2.5 | 3.2 | 3.5 | 4.1 |
| 7–8 p.m. | 0.9 | 2.5 | 2 | 2.2 | 2.7 | 2.9 |
| 8–9 p.m. | 0.7 | 1.6 | 2.4 | 2.1 | 3.3 | 4.3 |
| 9–10 p.m. | 0.6 | 1.1 | 1.4 | 1.4 | 3.1 | 3.1 |
| 10 p.m.–6 a.m. | 3.2 | 3.2 | 16.9 | 11.4 | 15.3 | 8.4 |

*Source: Aaron T. Zimmeran, PTP. "Hourly Variation in Trip Generation for Office and Residential Land Uses." ITE Journal, January 2015, pp. 20-22.*

Table 25: Development of Business Park Peak Hour Trip Generation Rates

| | Weekday PM peak hour | | | Weekday pre-game peak hour | | | Weekday post-game peak hour | | | Saturday peak hour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | In | Out | Total | In | Out | Total | In | Out | Total | In | Out |
| 24-hour rate (*Trip Generation Manual*) | n/a | | | 149.8 | 74.9 | 74.9 | 149.8 | 74.9 | 74.9 | 32.6 | 16.3 | 16.3 |
| Design hour (*ITE Journal*) | | | | 6-7 PM | | | 9-10 PM | | | Noon-1 PM | | |
| % of traffic during design hour (*ITE Journal*) | | | | 3.5% | 1.4% | 5.5% | 0.8% | 0.5% | 1.0% | 11.1% | 8.1% | 14.0% |
| Design hour rate (calculated)* | 16.84 | 3.37 | 13.47 | 5.17 | 1.05 | 4.12 | 1.12 | 0.37 | 0.75 | 3.60 | 1.32 | 2.28 |

*Note: Trip generation rates presented as trips per acre (net of road rights-of-way and other undevelopable blocks).*
**PM peak hour rates obtained from Trip Generation Manual; all other peak hour rates calculated.*

Table 26: Business Park Trip Generation

| | Weekday PM peak hour | | | Weekday pre-game peak hour | | | Weekday post-game peak hour | | | Saturday peak hour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | In | Out | Total | In | Out | Total | In | Out | Total | In | Out |
| Trip generation rate *(trips per acre)* | 16.84 | 3.37 | 13.47 | 5.17 | 1.05 | 4.12 | 1.12 | 0.37 | 0.75 | 3.60 | 1.32 | 2.28 |
| Trips generated *(93.67 acres)* | 1,575 | 315 | 1,260 | 485 | 100 | 385 | 105 | 35 | 70 | 340 | 125 | 215 |

### 4.1.6 Interaction Between Complementary Land Uses

It is anticipated that some of the trips generated by one use within the site may originate at another use also within the site. The following potential forms of interaction between complementary land uses were considered:

*Business Park to Arena:*
It was assumed that approximately 10% of event goers would be drawn from the surrounding business park. It was also assumed that approximately 10% of business park traffic would be diverted to the arena (including employees that would otherwise leave the study area prior to 6:00 PM, but remain on-site to attend a game or other event). Both types of interaction have been accounted for in a reduction in the pre-game peak hour trips generated by the business park (outbound) and by the arena (inbound).

*Business Park to Casino:*
It was assumed that approximately 5% of business park traffic would be destined to the casino. This interaction has been accounted for in a 5% reduction of outbound business park traffic during the PM and pre-game peak hours. A corresponding reduction has not been applied to inbound casino trips because it is assumed that the increase in daytime population within the study area would result in an increase in activity at the casino, rather than displacing other users.

*Casino to Arena:*
While it is expected that there will be interaction between these two uses, a reduction has not been applied because it is assumed that there would be additional activity at the casino on event nights. The casino and associated uses could result in event goers traveling to the study area prior to the pre-game peak hour; this has been accounted for explicitly in the arena trip generation forecasts.

### 4.1.7 Trip Generation Summary

*Table 27* summarizes the number of trips generated by the subject site (including the surrounding business park).

Table 27: Trip Generation Summary

| | Weekday PM peak hour | | | Weekday pre-game peak hour | | | Weekday post-game peak hour | | | Saturday peak hour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | In | Out | Total | In | Out | Total | In | Out | Total | In | Out |
| Arena | 35 | 15 | 20 | 1,985 | 1,985 | 0 | 2,515 | 0 | 2,515 | 80 | 40 | 40 |
| Casino | 380 | 185 | 195 | 310 | 160 | 150 | 290 | 150 | 140 | 265 | 135 | 130 |
| Hotel | 120 | 60 | 60 | 120 | 60 | 60 | 30 | 30 | 0 | 145 | 80 | 65 |
| Twin pad arena | 65 | 25 | 40 | 105 | 80 | 25 | 80 | 0 | 80 | 160 | 80 | 80 |
| Business park | 1,575 | 315 | 1,260 | 485 | 100 | 385 | 105 | 35 | 70 | 340 | 125 | 215 |
| Subtotal: | 2,175 | 600 | 1,575 | 3,005 | 2,385 | 620 | 3,020 | 215 | 2,805 | 990 | 460 | 530 |
| *Interaction reductions:* | | | | | | | | | | | | |
| Business park to arena | 0 | 0 | 0 | -75 | 0 | -40 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arena from business park | 0 | 0 | 0 | -200 | -200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business park to casino | -65 | 0 | -65 | -40 | 0 | -20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total net site trips: | 2,110 | 600 | 1,510 | 2,690 | 2,185 | 560 | 3,020 | 215 | 2,805 | 990 | 460 | 530 |

The site is anticipated to generate approximately 1,510 trips during a typical (non-event) PM peak hour; 2,690 trips in the hour before a Friday evening game; 3,020 trips in the hour following a Friday evening game; and 990 trips during the Saturday peak hour. These estimates are subject to change depending on the eventual land uses and magnitude of development in the business park.

## 4.2 Parking Generation

The anticipated parking requirements for the site were calculated for each use, and these requirements were then used to identify the approximate area required for parking lots within the site. The approximate location and size of these individual parking lots, along with the anticipated access points to Streets A and C, were then used to inform the assignment of vehicle trips entering and exiting the site from the Kingsway.

Parking requirements were determined through a review of the City's Zoning By-Law 2010-100Z ("the ZBL"), as well as through a first principles assessment.

### 4.2.1 Arena

Parking requirements for the arena were calculated from first principles using the same data from the trip generation calculations.

event days. ***Figure 11*** illustrates the site trips for these uses during the Friday pre- and post-game peak hours.

**Figure 10: Site Traffic Volumes (2022) — Weekday PM / Saturday Peak Hours**

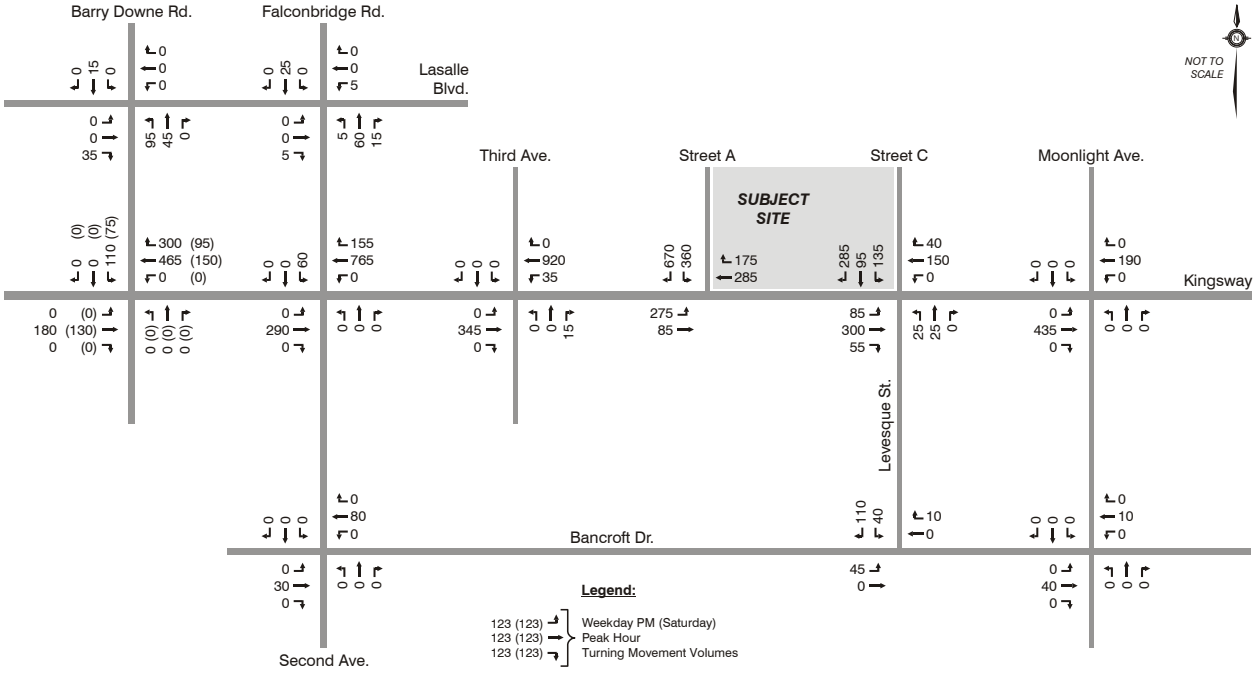
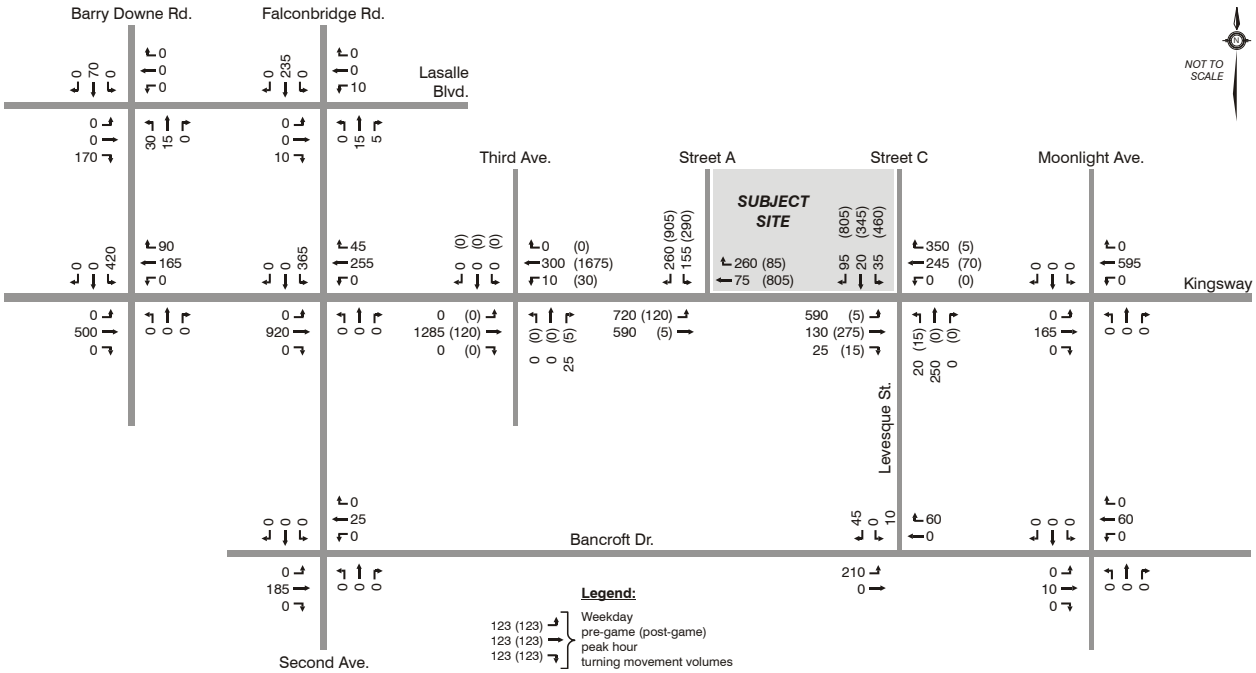



**Figure 11: Site Traffic Volumes (2022) — Friday Pre-Game / Post-Game Peak Hours**



The PM peak hour conditions are largely governed by the business park. The business park will be built out incrementally, and the forecasted volumes would not materialize until full build-out. Further, the forecasted volumes are based on a generic "business park" trip generation rate, while the actual traffic volumes will depend on the specific land uses (and magnitude) that are developed within the individual lots. The incremental development will allow conditions to be monitored as additional lots are developed and occupied.

### 6.7.4 Recommended Mitigation

A two-staged approach to mitigating traffic capacity constraints has been identified, consisting of measures that can be implemented using existing infrastructure (or that can be coordinated with site construction), and measures that would involve more substantial planning, design and/or construction.

The first set of mitigation consists of maximizing capacity at existing intersections to the west of the site through signal timing and/or phasing adjustments, along with localized road modifications on the Kingsway at the new Street A and Street C (Levesque Street) intersections. This would include the following:

- Signal timing adjustments at the Kingsway and Lasalle Boulevard intersections with Barry Downe Road and with Falconbridge Road, as well as at Bancroft Drive and Second Avenue;
- New signal heads at the Kingsway and Barry Downe Road to accommodate a northbound right turn overlap phase;
- Consideration of deactivating the southbound left turn phase at Bancroft Drive and Second Avenue; and
- Provision of eastbound dual left turn lanes (operating under fully protected phasing) and westbound right turn lanes on the Kingsway at Streets A and C.

These adjustments would result in some movements remaining over capacity at the busy Kingsway intersections with Barry Downe Road and Falconbridge Road during the PM peak hour, but this would not materialize until a substantial portion of the business park has been built out. There would also be capacity constraints at those intersections during the pre-game peak hour, but those would be less frequent occurrences and the traffic volumes would be lower than forecast for the majority of games that are not sold out.

Mitigation through optimization of existing infrastructure would support the development of the main site (arena, casino, hotel and twin pads) and part of the business park. However, the traffic generated by full build-out of the business park would require more substantial infrastructure modifications to mitigate constraints on the Kingsway and on Barry Downe Road west of the site. The City's TMP identifies new roadway links (the northerly extension of Street C and westerly connection to Falconbridge Road; bypass around New Sudbury from Highway 17 to Maley Drive) that would provide alternate routes to and from the site and allow site traffic to avoid major intersections on the Kingsway west of the site. Traffic conditions on the surrounding road network should be regularly monitored as

the business park is incrementally developed to confirm that timing required for these new roadway links.

## 6.8 Transportation Demand Management

Given the volume of traffic generated by the site prior to and following an event, as well as other traffic constraints in the west end of the study area, consideration should be given to implementing measures to encourage a reduction in the number of vehicles being driven to the site. This could include measures to encourage spectators to travel via non-auto modes, and measures to encourage increased vehicle occupancy (more spectators per vehicle). In addition to reducing traffic pressure on the road network and decreasing the time required to clear the site after an event, reduced auto travel would reduce the required parking supply and potentially free up additional land for development within the business park.

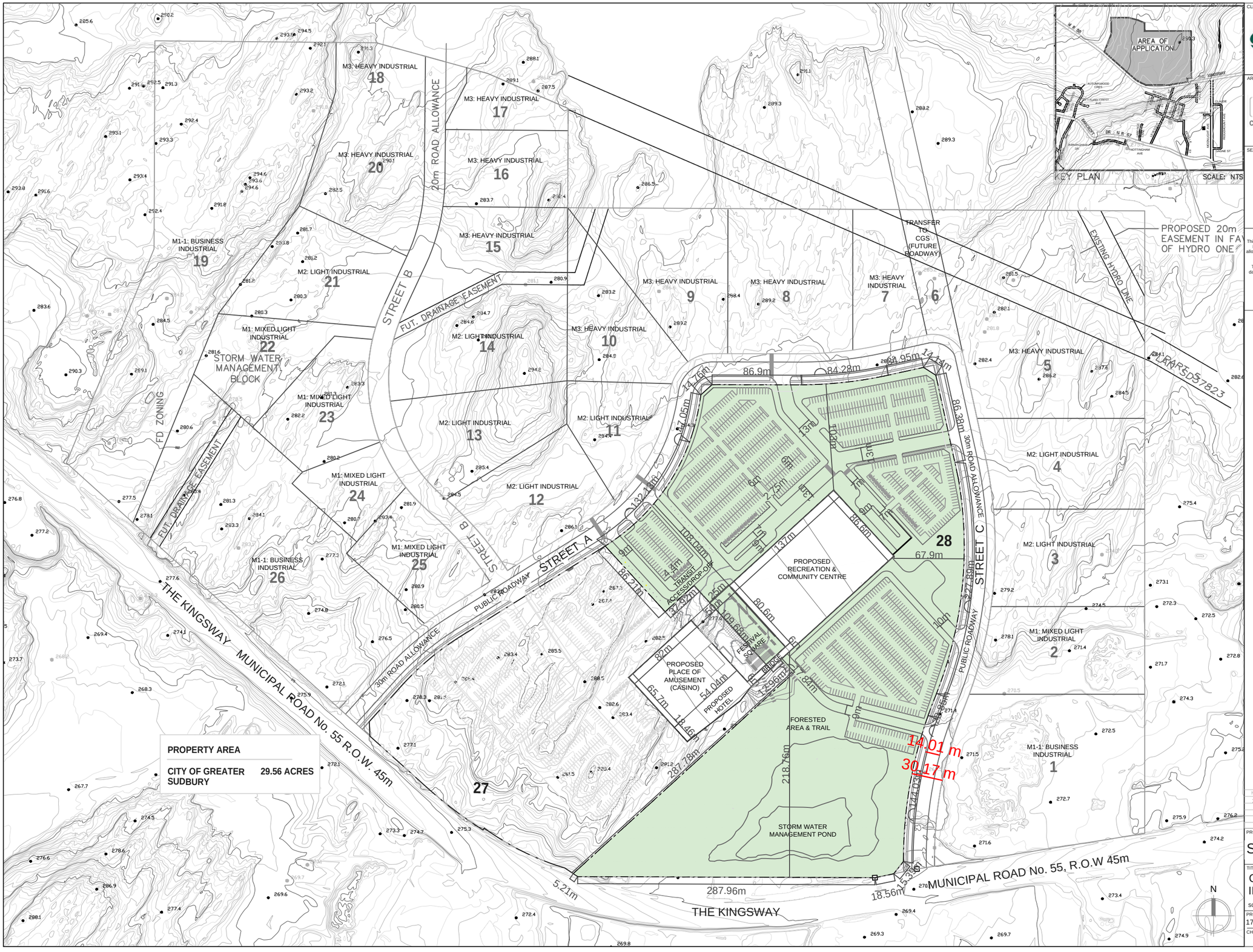
A pick-up and drop-off loop is proposed in front of the main entrances to the arena and casino. It is recommended that this loop be used for staging of shuttle buses before and after major events. The loop would be physically separated from other parking areas to insulate shuttle movements from traffic queues within the site; installation of traffic signals at the bus loop exit would further prioritize bus movements onto Street A over other vehicles exiting from site driveways farther to the east.

Shuttles would provide direct connections to the downtown Sudbury Transit terminal, and potentially also to the New Sudbury Centre terminus. Riders would be able to connect to and from other local routes converging at those two hubs. Consideration should be given to operating "extra" runs on key local routes serving those terminals, both to provide increased capacity for the additional riders and to reduce the waiting time to transfer between the local routes and the express shuttle. Consideration should also be given to allowing ticketholders to travel for free or a reduced fare.

It is also recommended that measures be explored to encourage increased vehicle occupancy, such as the designation of preferred parking areas for vehicles carrying a certain number of spectators (e.g., a "four-plus" parking area).

# Appendix A

## *Proposed Site Plan*

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6085



| No. | Description | Date |
|---|---|---|
| 1 | ZONING BY-LAW AMENDMENT | 15/11/2017 |

PROJECT:

SUDBURY, ONTARIO

TITLE:

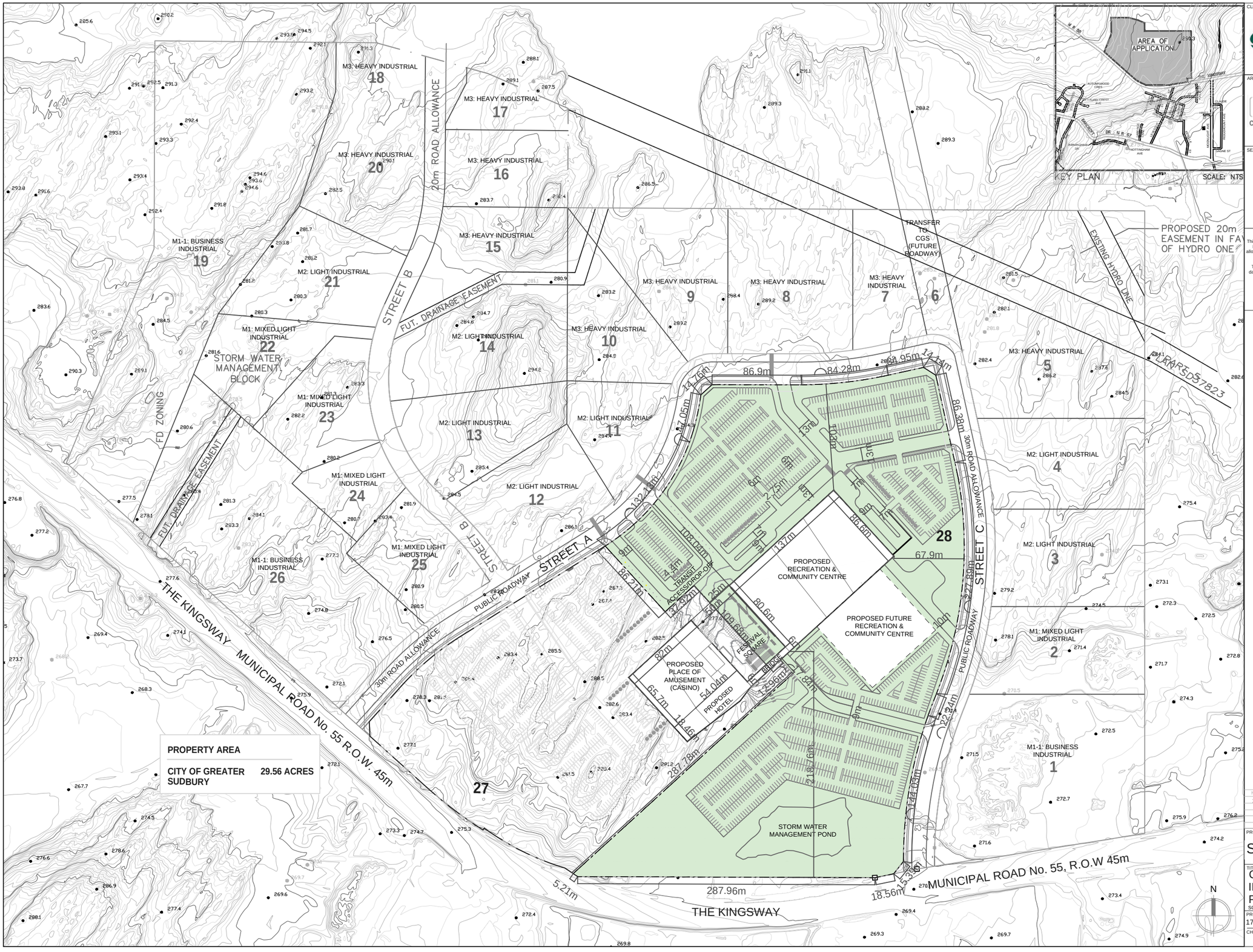
CONCEPTUAL KINGSWAY INTEGRATED SITE PLAN

scale: 1:3500

PROJECT NO: 17056

CHECKED:

DRAWING NO: A110

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JOSEPH SZADKOWSKI
LICENCE
6085



| No. | Description | Date |
|---|---|---|
| 1 | ZONING BY-LAW AMENDMENT | 15/11/2017 |

PROJECT:

SUDBURY, ONTARIO

TITLE:

CONCEPTUAL KINGSWAY INTEGRATED SITE PLAN-PHASE 2

scale: 1:3500

PROJECT NO: 17056

CHECKED:

DRAWING NO: A120

# KED TIS Addendum

# MEMO

| | |
|---|---|
| TO: | David Shelsted, MBA, P. Eng.<br>Director of Roads, City of Greater Sudbury |
| FROM: | Mike Walters, P. Eng. |
| DATE: | March 9, 2018 |
| SUBJECT: | Kingsway Sports and Entertainment Complex<br>Traffic Impact Study Addendum |
| OUR FILE: | 17-6373 |

This memo has been prepared as an addendum to the December 2017 traffic impact study (TIS), and provides additional information and responses to the comments provided by the City of Greater Sudbury on the TIS. The City's comments were documented in a memorandum dated February 16, 2018. Also received was a memorandum prepared by WSP, dated February 16, 2018. WSP was retained by the City of Greater Sudbury to provide an independent peer review of the TIS. Both the City's comments and WSP's comments touch on largely the same points. That said, the comments have been separated out and addressed in this addendum.

The proposed site plan is provided for reference in ***Att****achment 1*.

## 1.0 TIS Comments

The TIS comments from the City focused on:

- Arrival rates for motorists prior to an event. Justification needs to be provided for the arrival rate assumed in the TIS report
- Justification needs to be provided for interaction reductions that are assumed in the TIS report
- Details on the types of agreements that will need to be in place and how they will be enforced to ensure parking is available on event nights needs to be provided
- Identify the amount of site development that can occur prior to the surrounding road intersections operating over capacity and detail what measures could be implemented to mitigate these capacity constraints
- Provide a phasing plan which indicates how much more additional development can occur with the proposed road links added
- Provide a justification for why a dual left turn lane is required on Kingsway
- Discuss the expected delay to transit vehicles accessing the site during event nights
- Provide details on the expected queue length, how the bus loop signals will operate and what the expected delay will be for buses exiting the loop
- Provide details on how vehicles, pedestrians and transit buses will circulate in the area of the bus loop. Include details on where fencing will be provided, where the parking lots will exit and where marked crossing areas are proposed. Details must be provided on how site access will be controlled if and when the temporary parking lot areas are developed.

## 2.2 Interaction Between Land Uses

The December 2017 TIS identified two different types of interaction between complementary land uses within the study area:

- Business park employees staying on-site after work to attend a game or other event; and
- Business park employees staying on-site after work to visit the casino.

The first type of interaction represents a reduction in both the number of outbound business park trips, and the number of inbound arena trips. (The employee is not leaving the site as they normally would after work; a seat at the event is filled by someone who is already on site and does not need to travel on the Kingsway.)

The second type of interaction represents a reduction in the number of outbound business park trips only. Like an employee attending an event, the employee would not be leaving the site as they normally would after work. However, it is assumed that the business park represents an additional market rather than a redistribution of the baseline market.

The interaction calculations were reviewed as part of the comment response, and the calculations for the business park / arena distribution have been adjusted following this review. The procedure for calculating this interaction has been revised as follows:

- The daytime population of the business park has been estimated at approximately 4,000 employees. This calculation has been based upon a comparison of the PM peak hour business park trip generation rates as a function of the total acreage (16.84 trips per acre) vs. the number of employees (0.39 trips per employee). At these rates, both a 93.67-acre business park and a 4,000-employee business park would generate approximately 1,575 vehicle trips during the PM peak hour.
- The population of Greater Sudbury is in the order of 160,000 residents. The daytime population of the adjacent business park (4,000 employees) would be 2.5% of that total population. If event-goers are drawn proportionally according to population, a sold-out 5,800-seat event would draw 2.5% (145 attendees) from the business park. However, the distribution of Wolves season ticket holders is not uniform across the City; some areas are more heavily represented than others. It is anticipated that the adjacent business park would be such an area, given the proximity and relative ease in accessing the site compared to other parts of the city. Therefore, a 2x weighting was applied such that 5% of event-goers, or 290 attendees, are drawn from the business park.
- After applying a 5% modal split reduction, 2.19 vehicle occupancy rate, and 79% peak hour arrival rate, the business park interaction would offset 100 inbound arena trips during the pre-game peak hour.
- The 290 attendees would also offset 30 outbound business park trips during the pre-game peak hour. (There would also be additional offset trips during the preceding hours.)

The interaction calculations between the business park and casino have been maintained as in the TIS. Specifically, it has been assumed that 5% of outbound business park trips will be destined to the casino and will therefore remain on site. This equates to 65 trips during the PM peak hour, and 20 trips during the pre-game peak hour. This was felt to be an appropriate reduction, and possibly conservative, considering that the casino will also include restaurant space that will likely be a draw to some

employees at the end of the work day. The trip reduction could also include trips made to complementary uses within the business park; while exact uses have not yet been defined for individual blocks within the business park, it is envisioned that some blocks could be developed with additional uses that may attract employees at the end of the work day.

*Table 2* illustrates the updated trip generation figures for the site after accounting for the adjusted interaction percentages during the pre-game peak hour. The effect has been an increase of 75 inbound vehicle trips and an increase of 5 outbound vehicle trips, compared to the December 2017 TIS analyses.

*Figure 1* illustrates the adjusted site traffic volumes during the pre-game peak hour, and *Figure 2* illustrates the adjusted total future traffic volumes during the pre-game peak hour. (*Figure 2* also reflects changes to background traffic volumes as outlined in *Section 2.4*.)

Table 2: Updated Trip Generation

| | Weekday PM peak hour | | | Weekday pre-game peak hour | | | Weekday post-game peak hour | | | Saturday peak hour | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | In | Out | Total | In | Out | Total | In | Out | Total | In | Out |
| Arena | 35 | 15 | 20 | 1,985 | 1,985 | 0 | 2,515 | 0 | 2,515 | 80 | 40 | 40 |
| Casino | 380 | 185 | 195 | 310 | 160 | 150 | 290 | 150 | 140 | 265 | 135 | 130 |
| Hotel | 120 | 60 | 60 | 120 | 60 | 60 | 30 | 30 | 0 | 145 | 80 | 65 |
| Twin pad arena | 65 | 25 | 40 | 105 | 80 | 25 | 80 | 0 | 80 | 160 | 80 | 80 |
| Business park | 1,575 | 315 | 1,260 | 485 | 100 | 385 | 105 | 35 | 70 | 340 | 125 | 215 |
| Subtotal: | 2,175 | 600 | 1,575 | 3,005 | 2,385 | 620 | 3,020 | 215 | 2,805 | 990 | 460 | 530 |
| *Interaction reductions:* | | | | | | | | | | | | |
| Business park to arena | 0 | 0 | 0 | -30 | 0 | -30 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arena from business park | 0 | 0 | 0 | -100 | -100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Business park to casino | -65 | 0 | -65 | -20 | 0 | -20 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total net site trips: | 2,110 | 600 | 1,510 | 2,855 | 2,285 | 570 | 3,020 | 215 | 2,805 | 990 | 460 | 530 |

The effect of the additional pre-game trips was reviewed at the Kingsway intersections with Street "A" (see *Table 3*) and with Street "C" / Levesque Street (see *Table 4*). (The additional trips were also included in the analyses of other constrained intersections in New Sudbury, documented in *Section 2.4*.) Intersection analysis worksheets are provided in ***Attachment 2***.

once the actual impact of the Maley Drive extension is known and once more details are available regarding the actual land uses proposed in the business park.

## 2.5 Kingsway Left Turn Lanes

At the two main points of access from the Kingsway (at Street "A" and at Street "C" / Levesque Street), there will be a substantial concentration of eastbound left turn demand prior to an event. The analyses considered intersection configurations with a single left turn lane and with dual left turn lanes on the eastbound Kingsway at both intersections.

*Table 12* presents the v/c ratio, average delay, level of service and 95$^{th}$ percentile queue for the key opposing movements in each direction (eastbound left vs. westbound through; northbound left / southbound left) to illustrate the difference between the single and dual eastbound left turn lane configuration.

Table 12: Comparison of Intersection Operations, Single vs. Dual Eastbound Left Turn Lanes

| Intersection: | | Kingsway at Street "A" | | | | Kingsway at Street "C" | | | |
|---|---|---|---|---|---|---|---|---|---|
| Peak hour: | | PM peak | | Pre-game peak | | PM peak | | Pre-game peak | |
| # of EB left turn lanes: | | 1LT | 2LT | 1LT | 2LT | 1LT | 2LT | 1LT | 2LT |
| Overall | Delay *(s/veh)* | 22.2 | 26.4 | 20.3 | 19.3 | 17.0 | 17.5 | 31.6 | 28.8 |
| | LOS | C | C | C | B | B | B | C | C |
| EB left | v/c | 0.48 | 0.58 | 0.90 | 0.80 | 0.23 | 0.25 | 0.88 | 0.77 |
| | Delay *(s/veh)* | 11.7 | 39.4 | 30.8 | 35.9 | 7.5 | 32.1 | 31.4 | 38.9 |
| | LOS | B | D | C | D | A | C | C | D |
| | 95$^{th}$ %ile queue *(m)* | 19 | 40 | 212 | 95 | 11 | 14 | 156 | 78 |
| WB through | v/c | 0.88 | 0.90 | 0.59 | 0.50 | 0.55 | 0.56 | 0.69 | 0.61 |
| | Delay *(s/veh)* | 36.0 | 39.0 | 34.7 | 25.5 | 15.9 | 17.6 | 36.9 | 29.3 |
| | LOS | D | D | C | C | B | B | D | C |
| | 95$^{th}$ %ile queue *(m)* | 149 | 159 | 83 | 71 | 72 | 79 | 91 | 84 |
| NB left | v/c | — | — | — | — | 0.41 | 0.42 | 0.38 | 0.38 |
| | Delay *(s/veh)* | — | — | — | — | 27.6 | 29.5 | 40.8 | 36.1 |
| | LOS | — | — | — | — | C | C | D | D |
| | 95$^{th}$ %ile queue *(m)* | — | — | — | — | 27 | 28 | 38 | 37 |
| SB left | v/c | 0.73 | 0.76 | 0.65 | 0.58 | 0.56 | 0.57 | 0.51 | 0.37 |
| | Delay *(s/veh)* | 34.8 | 38.2 | 53.0 | 43.1 | 32.4 | 34.5 | 64.1 | 43.7 |
| | LOS | C | D | D | D | C | C | E | D |
| | 95$^{th}$ %ile queue *(m)* | 93 | 99 | 57 | 50 | 34 | 36 | 23 | 18 |

The dual left turn lanes result in a minor overall increase in delay during the PM peak hour when left turn volumes are lower and more easily accommodated in a single lane, and a minor overall decrease in delay during the pre-game peak hour when left turn volumes are higher and can be processed more efficiently in two lanes.

During the pre-game hour:

- The dual left turn lanes result in increased capacity and shorter queues on the eastbound left turn movements, but also slightly longer delays because the left turn phase would "gap out" sooner than a single left turn lane, and because the left turn phase would need to be fully

protected and therefore left-turning vehicles would not be able to make use of gaps in oncoming traffic during the westbound phase.

- The dual left turn lanes result in increased capacity and shorter delays on other intersection movements. With the left turn phase "gapping out" earlier, other movements would receive a green signal sooner and would experience shorter delays.

During the PM peak hour (and other times when eastbound left turn demand is lower), the same capacity benefits are not experienced on the left turn movement, and the increase in delay (due to fully protected left turn phasing) would be more substantial.

There are three other considerations that were not reflected in the scope of analyses:

- AM peak hour business park traffic;
- Potential south leg at Street "A"; and
- Variability in pre-game arrival flows.

The analyses focused on peak conditions for the site overall. The AM peak hour may generate less traffic due to lower activity levels at the casino and arena, but would still experience high eastbound left turn demand once the business park is fully built out. Using the same parameters and assumptions as the PM peak hour analyses, it is estimated that the business park on its own could generate approximately 650 eastbound left turns at Street "A"; this volume is lower than the pre-game demand, but this would be offset by higher opposing westbound traffic. This indicates that the need to accommodate high volumes of left-turning traffic would eventually become a daily occurrence, not limited to infrequent events at the arena.

Also in the longer term, there is the potential to construct a south leg at the Kingsway and Street "A" to serve future residential development. If this link materializes, it would result in increased competition for green time at the intersection, particularly during the AM peak hour (i.e., outbound residential traffic on the northbound left turn would be competing for capacity with inbound business park traffic on the eastbound left turn and general commuting traffic on the westbound approach).

Consideration was given to the potential effect of variability in arrivals on the eastbound left turn before a game or event. The analyses assumed relatively even distribution of left turn demand throughout the peak hour. It is possible that the arrival rate may be more variable within the hour (e.g., increasing closer to the start of the event).

- In the single left turn lane scenario, the left turn capacity at Street "A" is fixed at 220 vehicles during the peak 15-minute interval.
- In the dual left turn lane scenario, the left turn capacity shown in *Table 12* is based on the left turn phase "gapping out" where possible, and the actual left turn capacity could be higher (up to 280 vehicles during the peak 15-minute interval) if the left turn phase consistently reaches its maximum length.

In summary, the dual left turn lane configuration is better able to process site traffic, and with less impact on other background traffic, during high-volume periods when the additional left turn capacity is needed, although it would require a fully protected left turn phase that would result in higher delays for the left turn movement at other times when the lower volumes do not warrant the additional capacity of a dual left turn lane.

In the short term, the high-volume periods will be relatively infrequent (associated with events at the arena, particularly the subset of events with higher attendance). In the longer term, development in the business park would be expected to also generate high left turn volumes on a regular basis, and would potentially also be competing for intersection capacity with residential traffic entering from the south. As such, a potential form of mitigation could be to widen the Kingsway to accommodate a future dual left turn lane, but operate the intersection with a single left turn lane. This would allow for the following:

- It would avoid having to widen the Kingsway twice at Street "A" (once to construct a single left turn lane; a second time to construct the second left turn lane, when required). The conversion could be achieved relatively quickly and at lower cost.
- In the interim, the "hatched-out", unused second left turn lane could be used as a queue jump lane by Sudbury Transit on event nights, to allow buses to access the site more quickly and give them a travel time advantage over general traffic.

The need for the dual left turn lanes is expected to be greatest at Street "A". The projected peak hour left turn volumes are highest at Street "A", and this would also likely be the case during the AM peak hour since a greater proportion of the business park is accessed via Street "A" than via Street "C". Conversely, there are more potential property constraints at Street "C" due to existing development on the south side of the Kingsway. Recognizing that there are benefits and drawbacks to both single and dual left turn lane configurations, a possible solution would be to provide eastbound dual left turn lanes at Street "A", but to continue to serve eastbound left turns at Street "C" in a single lane.

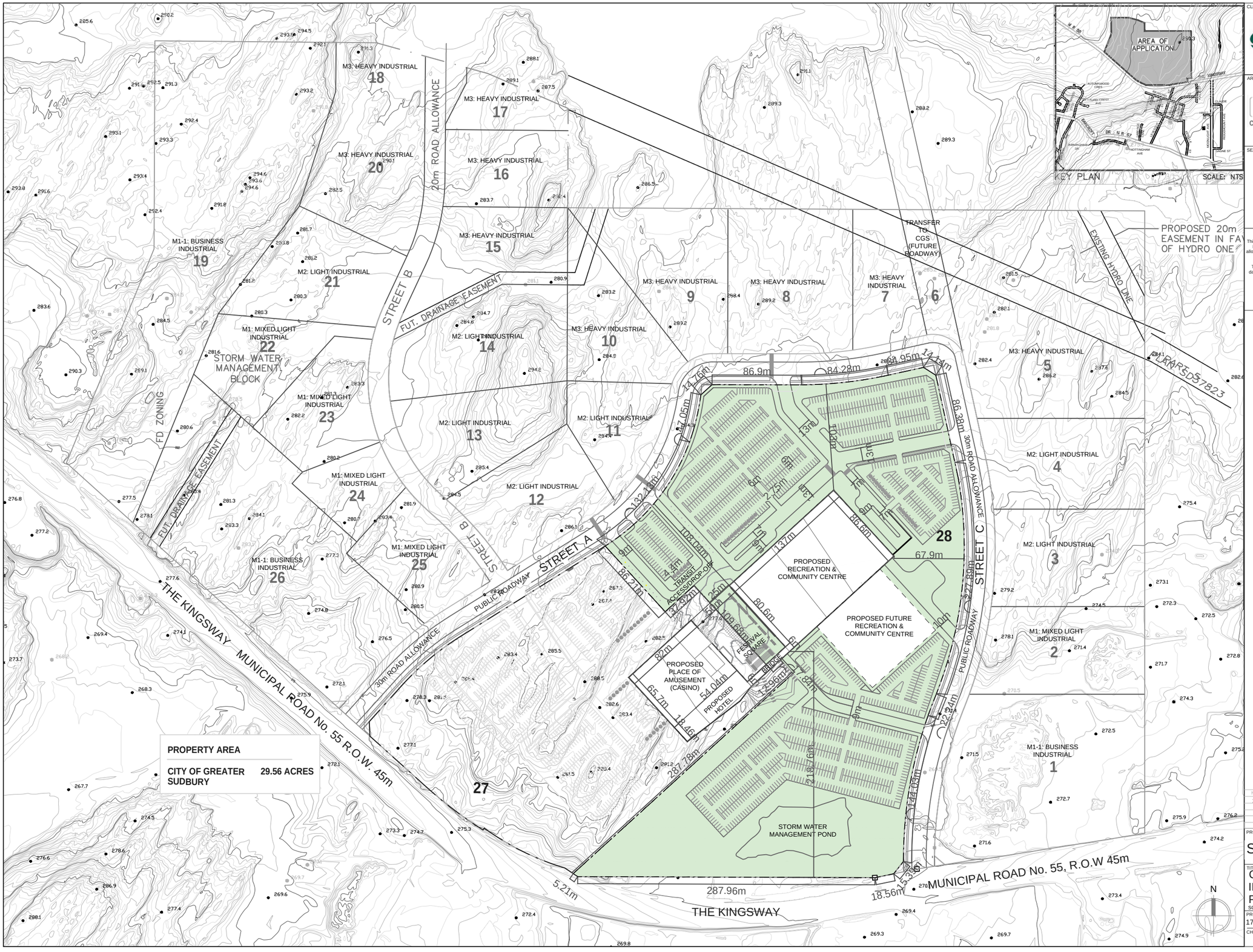
## 2.6 Proposed On-Site Bus Loop

The site plan includes a pick-up and drop-off loop in front of Festival Square, between the main entrances to the casino and the arena. It will operate with one-way traffic traveling in a counter-clockwise direction (i.e., traffic will enter at the south leg of the loop, and will exit at the north leg of the loop). The pick-up and drop-off loop will be reserved for use by buses before and after events at the arena.

Traffic signals are proposed at the exit from the bus loop to enable buses to enter Street "A." The traffic signals will also facilitate pedestrian crossings to the overflow parking (as discussed in *Section 2.3*). The traffic signals will be configured so that a bus receives a green signal as soon as practicable after arriving at Street "A," providing a break in traffic on Street "A" to allow the bus to exit the loop. Once the bus has turned onto Street "A," the time for the bus to reach the Kingsway is estimated at approximately 3 to 4 minutes (or less, depending on the length of the southbound queue on Street "A"). A memo prepared in February 2018 provides further detail on how the post-event travel time on Street "A" was determined. The anticipated operations and timing parameters of this signal will be explored in more detail as part of the site plan application stage.

Pedestrian activity across the bus loop roadway is expected to be low. Pedestrians traveling to the overflow parking area north of Street "A" will use the walkway along the east side of the bus loop, leading to the proposed signalized crossing, and will not need to cross the bus loop roadway. Pedestrian crossing demand to the west side of the bus loop will be low, because the parking area to the west is planned to be reserved for casino visitors. There will be some pedestrian crossing demand to the small parking lot within the interior of the bus loop (approximately 75 spaces). Pedestrian crossing

**Att**achment 1:
*Proposed Site Plan*




CLIENT:

Greater Sudbury / Grand Sudbury
www.greatersudbury.ca

200 Rue Brady Street
Sudbury, Ontario
P3A 5P3
PO Box 5000/ CP 5000

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ARCHITECT:

CUMULUS ARCHITECTS INC.

Suite 412, 160 Pears Ave.
Toronto, ON M5R 3P8
416-539-0763
www.cumulusarch.com

SEAL:

ONTARIO ASSOCIATION OF ARCHITECTS
JOSEPH SZADKOWSKI
LICENCE
6085



| No. | Description | Date |
|---|---|---|
| 1 | ZONING BY-LAW AMENDMENT | 15/11/2017 |

PROJECT:

SUDBURY, ONTARIO

TITLE:

CONCEPTUAL KINGSWAY INTEGRATED SITE PLAN-PHASE 2

scale: 1:3500

PROJECT NO: 17056

CHECKED:

DRAWING NO: A120

# Appendix C –
# Traffic Count Data

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Kingsway @ Levesque
Site Code: 00577103
Start Date: 03/24/2017

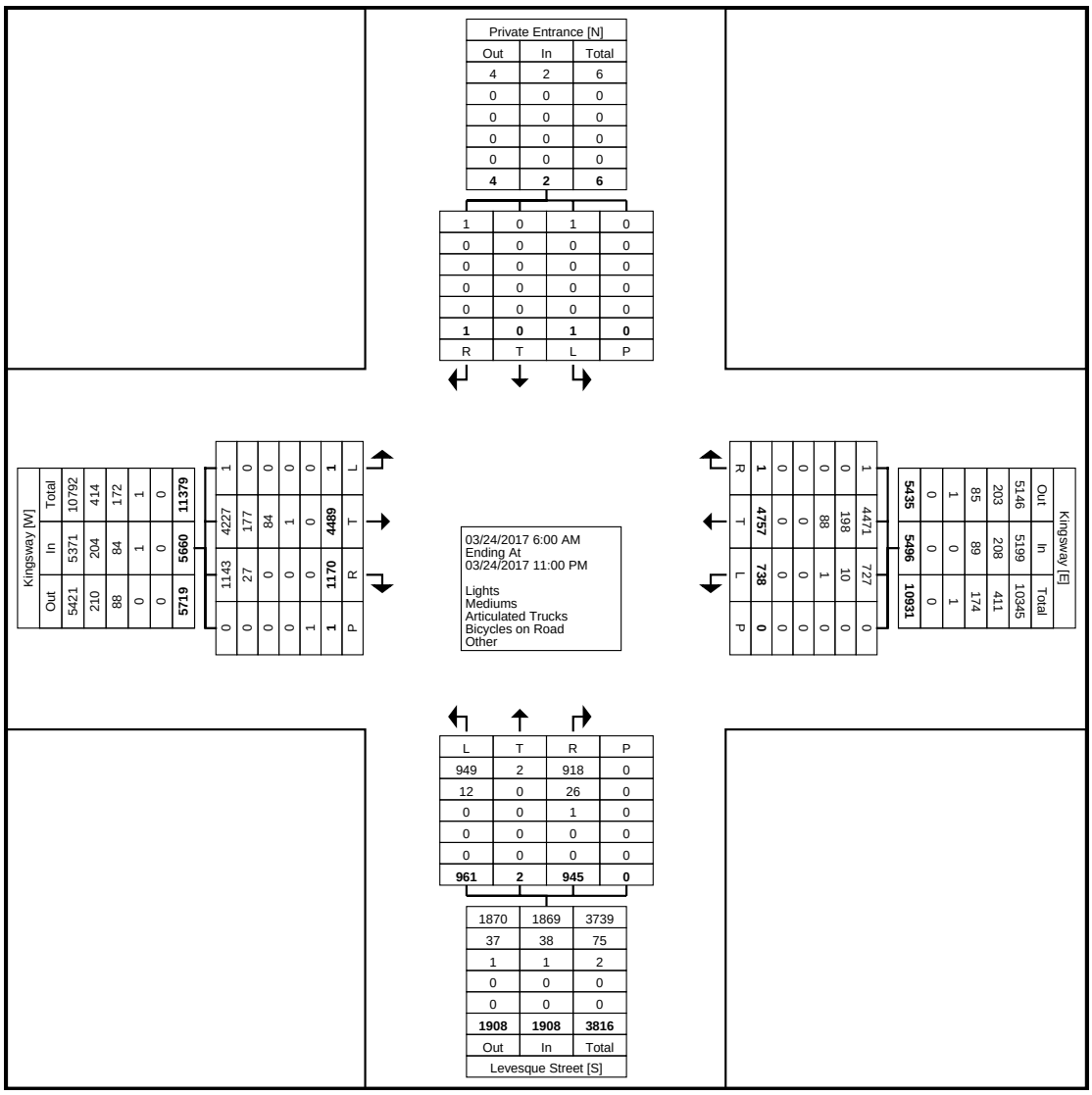

# Turning Movement Data

| Start Time | Private Entrance Southbound | | | | | Kingsway Westbound | | | | | Levesque Street Northbound | | | | | Kingsway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 6:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 15 | 0 | 48 | 10 | 0 | 12 | 0 | 22 | 9 | 20 | 0 | 0 | 29 | 99 |
| 6:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 19 | 0 | 60 | 10 | 0 | 20 | 0 | 30 | 11 | 27 | 0 | 0 | 38 | 128 |
| 6:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 98 | 27 | 0 | 125 | 20 | 0 | 29 | 0 | 49 | 13 | 38 | 0 | 0 | 51 | 225 |
| 6:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 130 | 28 | 0 | 158 | 24 | 0 | 34 | 0 | 58 | 12 | 42 | 0 | 0 | 54 | 270 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 302 | 89 | 0 | 391 | 64 | 0 | 95 | 0 | 159 | 45 | 127 | 0 | 0 | 172 | 722 |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 75 | 24 | 0 | 99 | 27 | 0 | 22 | 0 | 49 | 11 | 55 | 0 | 0 | 66 | 214 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 121 | 32 | 0 | 153 | 25 | 0 | 30 | 0 | 55 | 10 | 69 | 0 | 0 | 79 | 287 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 183 | 33 | 0 | 216 | 29 | 0 | 53 | 0 | 82 | 17 | 86 | 0 | 0 | 103 | 401 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 199 | 31 | 0 | 230 | 32 | 0 | 42 | 0 | 74 | 20 | 94 | 0 | 0 | 114 | 418 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 578 | 120 | 0 | 698 | 113 | 0 | 147 | 0 | 260 | 58 | 304 | 0 | 0 | 362 | 1320 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 192 | 30 | 0 | 222 | 16 | 0 | 40 | 0 | 56 | 21 | 78 | 0 | 0 | 99 | 377 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 134 | 14 | 0 | 148 | 31 | 0 | 48 | 0 | 79 | 18 | 72 | 0 | 0 | 90 | 317 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 144 | 28 | 0 | 172 | 22 | 2 | 31 | 0 | 55 | 18 | 83 | 0 | 0 | 101 | 328 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 140 | 33 | 0 | 173 | 30 | 0 | 39 | 0 | 69 | 26 | 83 | 0 | 0 | 109 | 351 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 610 | 105 | 0 | 715 | 99 | 2 | 158 | 0 | 259 | 83 | 316 | 0 | 0 | 399 | 1373 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 107 | 19 | 0 | 126 | 23 | 0 | 17 | 0 | 40 | 30 | 98 | 0 | 0 | 128 | 294 |
| 11:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 114 | 18 | 0 | 132 | 21 | 0 | 18 | 0 | 39 | 30 | 105 | 0 | 1 | 135 | 306 |
| 11:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 109 | 17 | 0 | 126 | 38 | 0 | 29 | 0 | 67 | 30 | 113 | 0 | 0 | 143 | 336 |
| 11:45 AM | 0 | 0 | 1 | 0 | 1 | 0 | 141 | 6 | 0 | 147 | 30 | 0 | 21 | 0 | 51 | 40 | 105 | 0 | 0 | 145 | 344 |
| Hourly Total | 0 | 0 | 1 | 0 | 1 | 0 | 471 | 60 | 0 | 531 | 112 | 0 | 85 | 0 | 197 | 130 | 421 | 0 | 1 | 551 | 1280 |
| 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 138 | 21 | 0 | 159 | 25 | 0 | 20 | 0 | 45 | 38 | 112 | 0 | 0 | 150 | 354 |
| 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 129 | 21 | 0 | 150 | 17 | 0 | 25 | 0 | 42 | 24 | 119 | 0 | 0 | 143 | 335 |
| 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 19 | 0 | 145 | 25 | 0 | 20 | 0 | 45 | 32 | 105 | 0 | 0 | 137 | 327 |
| 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 112 | 22 | 0 | 134 | 23 | 0 | 25 | 0 | 48 | 28 | 117 | 0 | 0 | 145 | 327 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 505 | 83 | 0 | 588 | 90 | 0 | 90 | 0 | 180 | 122 | 453 | 0 | 0 | 575 | 1343 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 150 | 21 | 0 | 171 | 30 | 0 | 19 | 0 | 49 | 40 | 179 | 0 | 0 | 219 | 439 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 146 | 17 | 0 | 163 | 25 | 0 | 16 | 0 | 41 | 34 | 188 | 0 | 0 | 222 | 426 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 138 | 22 | 0 | 160 | 29 | 0 | 20 | 0 | 49 | 38 | 199 | 0 | 0 | 237 | 446 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 177 | 18 | 0 | 195 | 27 | 0 | 17 | 0 | 44 | 47 | 215 | 1 | 0 | 263 | 502 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 611 | 78 | 0 | 689 | 111 | 0 | 72 | 0 | 183 | 159 | 781 | 1 | 0 | 941 | 1813 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 151 | 19 | 0 | 170 | 28 | 0 | 19 | 0 | 47 | 44 | 216 | 0 | 0 | 260 | 477 |
| 5:15 PM | 1 | 0 | 0 | 0 | 1 | 1 | 149 | 18 | 0 | 168 | 33 | 0 | 19 | 0 | 52 | 60 | 187 | 0 | 0 | 247 | 468 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 163 | 15 | 0 | 178 | 34 | 0 | 16 | 0 | 50 | 37 | 159 | 0 | 0 | 196 | 424 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 113 | 13 | 0 | 126 | 22 | 0 | 17 | 0 | 39 | 33 | 133 | 0 | 0 | 166 | 331 |
| Hourly Total | 1 | 0 | 0 | 0 | 1 | 1 | 576 | 65 | 0 | 642 | 117 | 0 | 71 | 0 | 188 | 174 | 695 | 0 | 0 | 869 | 1700 |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 95 | 13 | 0 | 108 | 21 | 0 | 22 | 0 | 43 | 18 | 110 | 0 | 0 | 128 | 279 |
| 6:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 96 | 14 | 0 | 110 | 17 | 0 | 20 | 0 | 37 | 24 | 122 | 0 | 0 | 146 | 293 |
| 6:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 95 | 19 | 0 | 114 | 20 | 0 | 18 | 0 | 38 | 24 | 125 | 0 | 0 | 149 | 301 |
| 6:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 87 | 5 | 0 | 92 | 14 | 0 | 16 | 0 | 30 | 29 | 74 | 0 | 0 | 103 | 225 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 373 | 51 | 0 | 424 | 72 | 0 | 76 | 0 | 148 | 95 | 431 | 0 | 0 | 526 | 1098 |
| 7:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 78 | 10 | 0 | 88 | 13 | 0 | 16 | 0 | 29 | 31 | 104 | 0 | 0 | 135 | 252 |
| 7:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 75 | 12 | 0 | 87 | 13 | 0 | 17 | 0 | 30 | 19 | 63 | 0 | 0 | 82 | 199 |
| 7:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 82 | 9 | 0 | 91 | 11 | 0 | 11 | 0 | 22 | 20 | 77 | 0 | 0 | 97 | 210 |
| 7:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 55 | 6 | 0 | 61 | 20 | 0 | 14 | 0 | 34 | 27 | 70 | 0 | 0 | 97 | 192 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 290 | 37 | 0 | 327 | 57 | 0 | 58 | 0 | 115 | 97 | 314 | 0 | 0 | 411 | 853 |
| 8:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 5 | 0 | 48 | 15 | 0 | 19 | 0 | 34 | 27 | 81 | 0 | 0 | 108 | 190 |
| 8:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 5 | 0 | 48 | 17 | 0 | 12 | 0 | 29 | 18 | 67 | 0 | 0 | 85 | 162 |
| 8:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 3 | 0 | 55 | 7 | 0 | 8 | 0 | 15 | 21 | 78 | 0 | 0 | 99 | 169 |
| 8:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 53 | 4 | 0 | 57 | 13 | 0 | 12 | 0 | 25 | 25 | 60 | 0 | 0 | 85 | 167 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 191 | 17 | 0 | 208 | 52 | 0 | 51 | 0 | 103 | 91 | 286 | 0 | 0 | 377 | 688 |
| 9:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 5 | 0 | 51 | 12 | 0 | 6 | 0 | 18 | 22 | 57 | 0 | 0 | 79 | 148 |
| 9:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 3 | 0 | 40 | 10 | 0 | 14 | 0 | 24 | 12 | 67 | 0 | 0 | 79 | 143 |
| 9:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 3 | 0 | 33 | 5 | 0 | 7 | 0 | 12 | 14 | 43 | 0 | 0 | 57 | 102 |
| 9:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 5 | 0 | 36 | 9 | 0 | 6 | 0 | 15 | 15 | 52 | 0 | 0 | 67 | 118 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 144 | 16 | 0 | 160 | 36 | 0 | 33 | 0 | 69 | 63 | 219 | 0 | 0 | 282 | 511 |
| 10:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 6 | 0 | 43 | 6 | 0 | 6 | 0 | 12 | 21 | 40 | 0 | 0 | 61 | 116 |
| 10:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 4 | 0 | 30 | 5 | 0 | 12 | 0 | 17 | 11 | 38 | 0 | 0 | 49 | 96 |
| 10:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 4 | 0 | 34 | 7 | 0 | 3 | 0 | 10 | 13 | 31 | 0 | 0 | 44 | 88 |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 3 | 0 | 16 | 4 | 0 | 4 | 0 | 8 | 8 | 33 | 0 | 0 | 41 | 65 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 106 | 17 | 0 | 123 | 22 | 0 | 25 | 0 | 47 | 53 | 142 | 0 | 0 | 195 | 365 |
| Grand Total | 1 | 0 | 1 | 0 | 2 | 1 | 4757 | 738 | 0 | 5496 | 945 | 2 | 961 | 0 | 1908 | 1170 | 4489 | 1 | 1 | 5660 | 13066 |
| Approach % | 50.0 | 0.0 | 50.0 | - | - | 0.0 | 86.6 | 13.4 | - | - | 49.5 | 0.1 | 50.4 | - | - | 20.7 | 79.3 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 36.4 | 5.6 | - | 42.1 | 7.2 | 0.0 | 7.4 | - | 14.6 | 9.0 | 34.4 | 0.0 | - | 43.3 | - |
| Lights | 1 | 0 | 1 | - | 2 | 1 | 4471 | 727 | - | 5199 | 918 | 2 | 949 | - | 1869 | 1143 | 4227 | 1 | - | 5371 | 12441 |
| % Lights | 100.0 | - | 100.0 | - | 100.0 | 100.0 | 94.0 | 98.5 | - | 94.6 | 97.1 | 100.0 | 98.8 | - | 98.0 | 97.7 | 94.2 | 100.0 | - | 94.9 | 95.2 |
| Mediums | 0 | 0 | 0 | - | 0 | 0 | 198 | 10 | - | 208 | 26 | 0 | 12 | - | 38 | 27 | 177 | 0 | - | 204 | 450 |
| % Mediums | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 4.2 | 1.4 | - | 3.8 | 2.8 | 0.0 | 1.2 | - | 2.0 | 2.3 | 3.9 | 0.0 | - | 3.6 | 3.4 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 88 | 1 | - | 89 | 1 | 0 | 0 | - | 1 | 0 | 84 | 0 | - | 84 | 174 |
| % Articulated Trucks | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 1.8 | 0.1 | - | 1.6 | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.0 | 1.9 | 0.0 | - | 1.5 | 1.3 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 1 | 0 | - | 1 | 1 |
| % Bicycles on Road | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Kingsway @ Levesque
Site Code: 00577103
Start Date: 03/24/2017


Turning Movement Data Plot

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

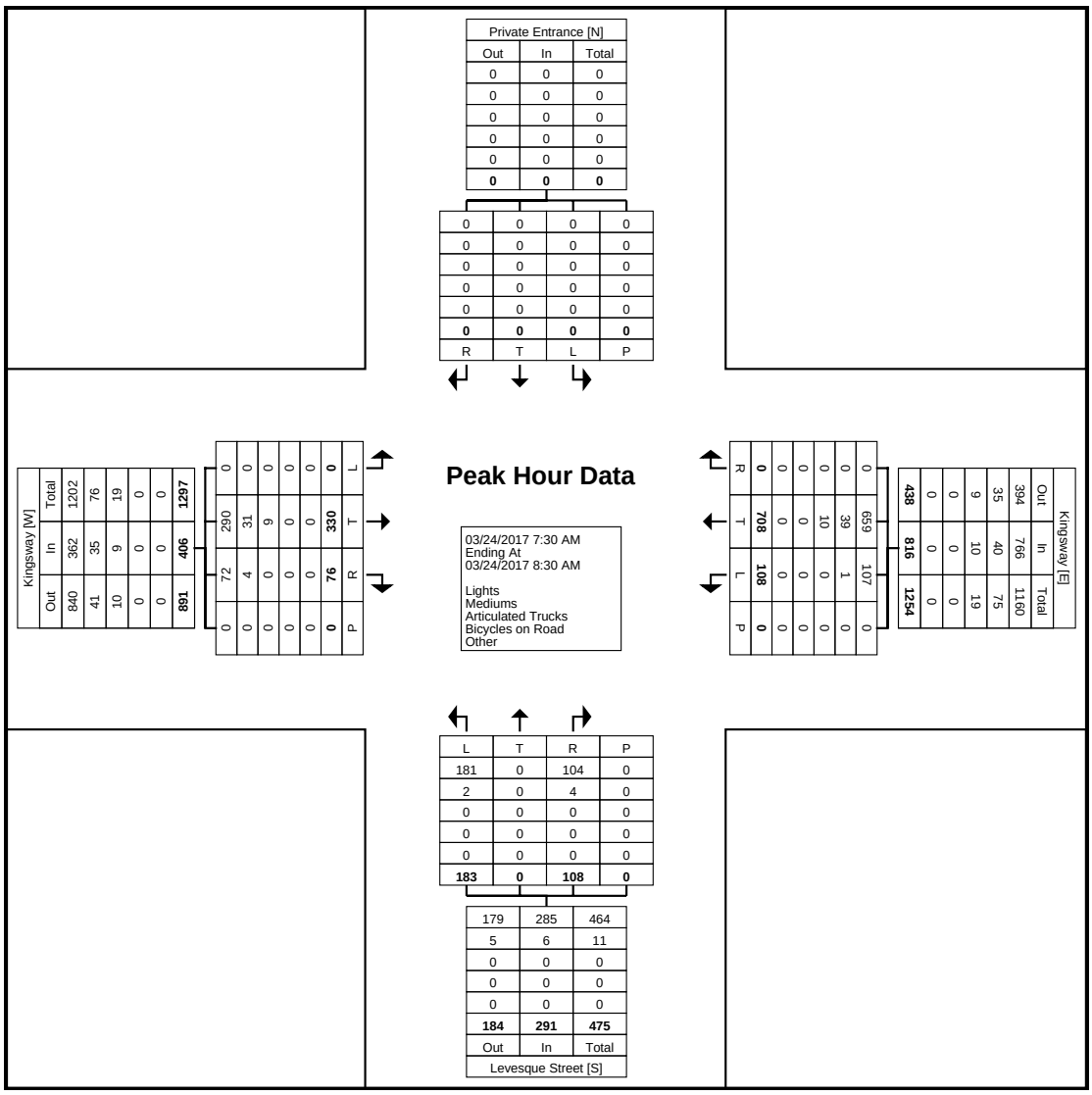
Count Name: Kingsway @ Levesque
Site Code: 00577103
Start Date: 03/24/2017


# Turning Movement Peak Hour Data (7:30 AM)

| Start Time | Private Entrance Southbound | | | | | Kingsway Westbound | | | | | Levesque Street Northbound | | | | | Kingsway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 183 | 33 | 0 | 216 | 29 | 0 | 53 | 0 | 82 | 17 | 86 | 0 | 0 | 103 | 401 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 199 | 31 | 0 | 230 | 32 | 0 | 42 | 0 | 74 | 20 | 94 | 0 | 0 | 114 | 418 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 192 | 30 | 0 | 222 | 16 | 0 | 40 | 0 | 56 | 21 | 78 | 0 | 0 | 99 | 377 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 134 | 14 | 0 | 148 | 31 | 0 | 48 | 0 | 79 | 18 | 72 | 0 | 0 | 90 | 317 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 708 | 108 | 0 | 816 | 108 | 0 | 183 | 0 | 291 | 76 | 330 | 0 | 0 | 406 | 1513 |
| Approach % | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 86.8 | 13.2 | - | - | 37.1 | 0.0 | 62.9 | - | - | 18.7 | 81.3 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 46.8 | 7.1 | - | 53.9 | 7.1 | 0.0 | 12.1 | - | 19.2 | 5.0 | 21.8 | 0.0 | - | 26.8 | - |
| PHF | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.889 | 0.818 | - | 0.887 | 0.844 | 0.000 | 0.863 | - | 0.887 | 0.905 | 0.878 | 0.000 | - | 0.890 | 0.905 |
| Lights | 0 | 0 | 0 | - | 0 | 0 | 659 | 107 | - | 766 | 104 | 0 | 181 | - | 285 | 72 | 290 | 0 | - | 362 | 1413 |
| % Lights | - | - | - | - | - | - | 93.1 | 99.1 | - | 93.9 | 96.3 | - | 98.9 | - | 97.9 | 94.7 | 87.9 | - | - | 89.2 | 93.4 |
| Mediums | 0 | 0 | 0 | - | 0 | 0 | 39 | 1 | - | 40 | 4 | 0 | 2 | - | 6 | 4 | 31 | 0 | - | 35 | 81 |
| % Mediums | - | - | - | - | - | - | 5.5 | 0.9 | - | 4.9 | 3.7 | - | 1.1 | - | 2.1 | 5.3 | 9.4 | - | - | 8.6 | 5.4 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 10 | 0 | - | 10 | 0 | 0 | 0 | - | 0 | 0 | 9 | 0 | - | 9 | 19 |
| % Articulated Trucks | - | - | - | - | - | - | 1.4 | 0.0 | - | 1.2 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 2.7 | - | - | 2.2 | 1.3 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | - | - | - | - | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Kingsway @ Levesque
Site Code: 00577103
Start Date: 03/24/2017


Turning Movement Peak Hour Data Plot (7:30 AM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

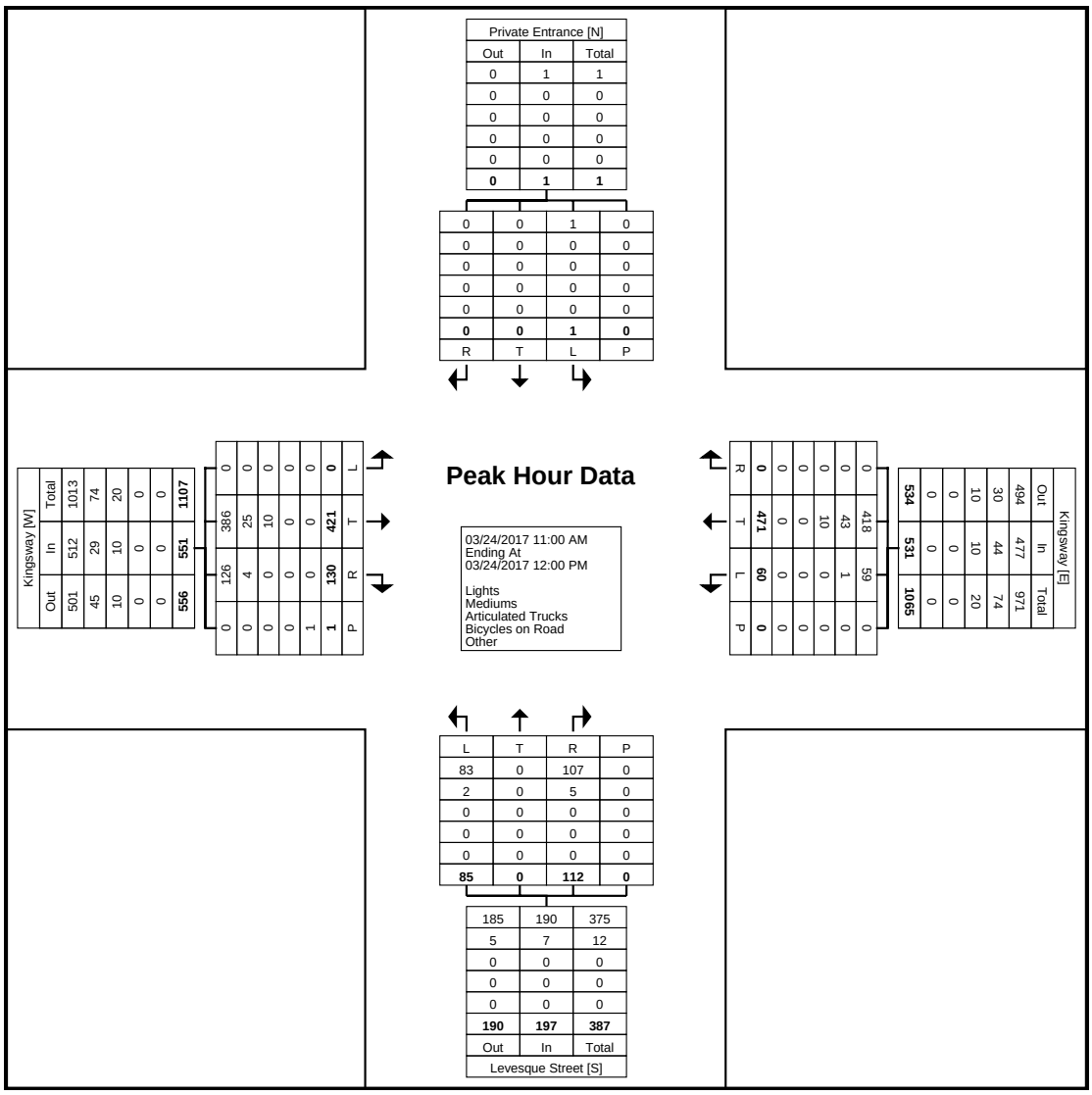
Count Name: Kingsway @ Levesque
Site Code: 00577103
Start Date: 03/24/2017


# Turning Movement Peak Hour Data (11:00 AM)

| Start Time | Private Entrance Southbound | | | | | Kingsway Westbound | | | | | Levesque Street Northbound | | | | | Kingsway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 11:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 107 | 19 | 0 | 126 | 23 | 0 | 17 | 0 | 40 | 30 | 98 | 0 | 0 | 128 | 294 |
| 11:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 114 | 18 | 0 | 132 | 21 | 0 | 18 | 0 | 39 | 30 | 105 | 0 | 1 | 135 | 306 |
| 11:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 109 | 17 | 0 | 126 | 38 | 0 | 29 | 0 | 67 | 30 | 113 | 0 | 0 | 143 | 336 |
| 11:45 AM | 0 | 0 | 1 | 0 | 1 | 0 | 141 | 6 | 0 | 147 | 30 | 0 | 21 | 0 | 51 | 40 | 105 | 0 | 0 | 145 | 344 |
| Total | 0 | 0 | 1 | 0 | 1 | 0 | 471 | 60 | 0 | 531 | 112 | 0 | 85 | 0 | 197 | 130 | 421 | 0 | 1 | 551 | 1280 |
| Approach % | 0.0 | 0.0 | 100.0 | - | - | 0.0 | 88.7 | 11.3 | - | - | 56.9 | 0.0 | 43.1 | - | - | 23.6 | 76.4 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.1 | - | 0.1 | 0.0 | 36.8 | 4.7 | - | 41.5 | 8.8 | 0.0 | 6.6 | - | 15.4 | 10.2 | 32.9 | 0.0 | - | 43.0 | - |
| PHF | 0.000 | 0.000 | 0.250 | - | 0.250 | 0.000 | 0.835 | 0.789 | - | 0.903 | 0.737 | 0.000 | 0.733 | - | 0.735 | 0.813 | 0.931 | 0.000 | - | 0.950 | 0.930 |
| Lights | 0 | 0 | 1 | - | 1 | 0 | 418 | 59 | - | 477 | 107 | 0 | 83 | - | 190 | 126 | 386 | 0 | - | 512 | 1180 |
| % Lights | - | - | 100.0 | - | 100.0 | - | 88.7 | 98.3 | - | 89.8 | 95.5 | - | 97.6 | - | 96.4 | 96.9 | 91.7 | - | - | 92.9 | 92.2 |
| Mediums | 0 | 0 | 0 | - | 0 | 0 | 43 | 1 | - | 44 | 5 | 0 | 2 | - | 7 | 4 | 25 | 0 | - | 29 | 80 |
| % Mediums | - | - | 0.0 | - | 0.0 | - | 9.1 | 1.7 | - | 8.3 | 4.5 | - | 2.4 | - | 3.6 | 3.1 | 5.9 | - | - | 5.3 | 6.3 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 10 | 0 | - | 10 | 0 | 0 | 0 | - | 0 | 0 | 10 | 0 | - | 10 | 20 |
| % Articulated Trucks | - | - | 0.0 | - | 0.0 | - | 2.1 | 0.0 | - | 1.9 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 2.4 | - | - | 1.8 | 1.6 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | - | - | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Kingsway @ Levesque
Site Code: 00577103
Start Date: 03/24/2017


Turning Movement Peak Hour Data Plot (11:00 AM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

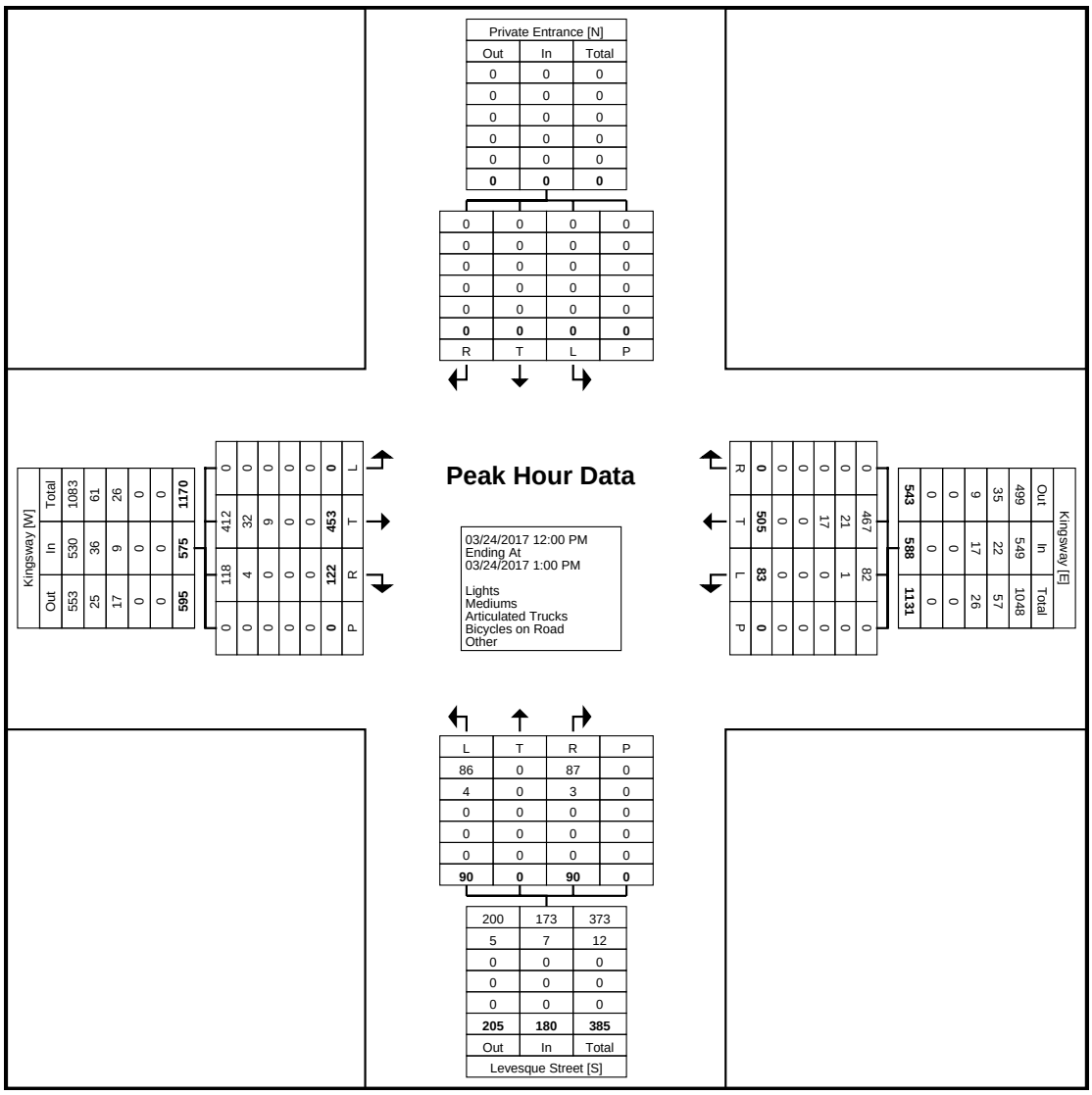
Count Name: Kingsway @ Levesque
Site Code: 00577103
Start Date: 03/24/2017


# Turning Movement Peak Hour Data (12:00 PM)

| Start Time | Private Entrance Southbound | | | | | Kingsway Westbound | | | | | Levesque Street Northbound | | | | | Kingsway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 12:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 138 | 21 | 0 | 159 | 25 | 0 | 20 | 0 | 45 | 38 | 112 | 0 | 0 | 150 | 354 |
| 12:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 129 | 21 | 0 | 150 | 17 | 0 | 25 | 0 | 42 | 24 | 119 | 0 | 0 | 143 | 335 |
| 12:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 19 | 0 | 145 | 25 | 0 | 20 | 0 | 45 | 32 | 105 | 0 | 0 | 137 | 327 |
| 12:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 112 | 22 | 0 | 134 | 23 | 0 | 25 | 0 | 48 | 28 | 117 | 0 | 0 | 145 | 327 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 505 | 83 | 0 | 588 | 90 | 0 | 90 | 0 | 180 | 122 | 453 | 0 | 0 | 575 | 1343 |
| Approach % | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 85.9 | 14.1 | - | - | 50.0 | 0.0 | 50.0 | - | - | 21.2 | 78.8 | 0.0 | - | - | - |
| Total % | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 37.6 | 6.2 | - | 43.8 | 6.7 | 0.0 | 6.7 | - | 13.4 | 9.1 | 33.7 | 0.0 | - | 42.8 | - |
| PHF | 0.000 | 0.000 | 0.000 | - | 0.000 | 0.000 | 0.915 | 0.943 | - | 0.925 | 0.900 | 0.000 | 0.900 | - | 0.938 | 0.803 | 0.952 | 0.000 | - | 0.958 | 0.948 |
| Lights | 0 | 0 | 0 | - | 0 | 0 | 467 | 82 | - | 549 | 87 | 0 | 86 | - | 173 | 118 | 412 | 0 | - | 530 | 1252 |
| % Lights | - | - | - | - | - | - | 92.5 | 98.8 | - | 93.4 | 96.7 | - | 95.6 | - | 96.1 | 96.7 | 90.9 | - | - | 92.2 | 93.2 |
| Mediums | 0 | 0 | 0 | - | 0 | 0 | 21 | 1 | - | 22 | 3 | 0 | 4 | - | 7 | 4 | 32 | 0 | - | 36 | 65 |
| % Mediums | - | - | - | - | - | - | 4.2 | 1.2 | - | 3.7 | 3.3 | - | 4.4 | - | 3.9 | 3.3 | 7.1 | - | - | 6.3 | 4.8 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 17 | 0 | - | 17 | 0 | 0 | 0 | - | 0 | 0 | 9 | 0 | - | 9 | 26 |
| % Articulated Trucks | - | - | - | - | - | - | 3.4 | 0.0 | - | 2.9 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 2.0 | - | - | 1.6 | 1.9 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | - | - | - | - | - | - | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Kingsway @ Levesque
Site Code: 00577103
Start Date: 03/24/2017


Turning Movement Peak Hour Data Plot (12:00 PM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

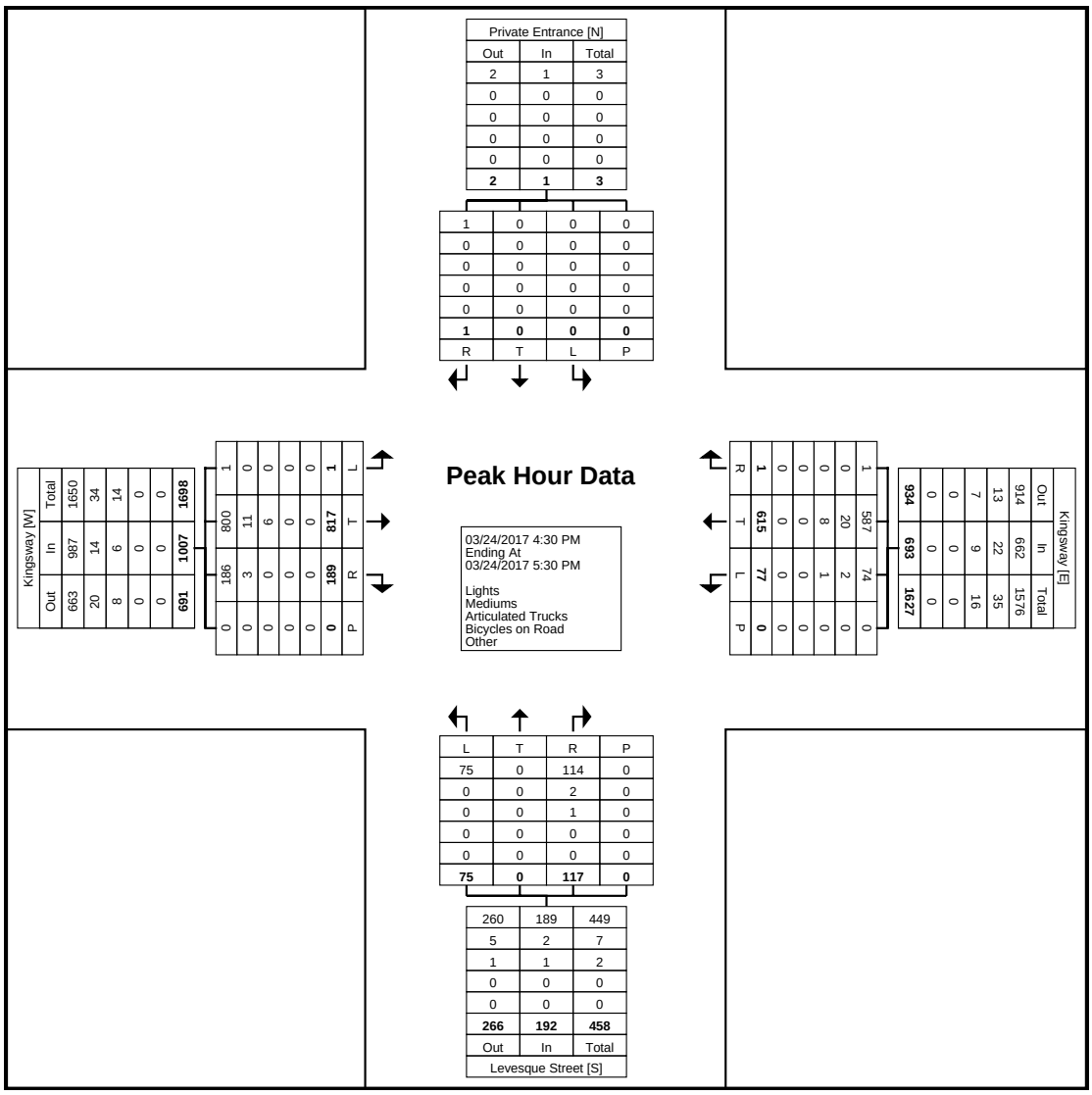
Count Name: Kingsway @ Levesque
Site Code: 00577103
Start Date: 03/24/2017


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

| Start Time | Private Entrance Southbound | | | | | Kingsway Westbound | | | | | Levesque Street Northbound | | | | | Kingsway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 138 | 22 | 0 | 160 | 29 | 0 | 20 | 0 | 49 | 38 | 199 | 0 | 0 | 237 | 446 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 177 | 18 | 0 | 195 | 27 | 0 | 17 | 0 | 44 | 47 | 215 | 1 | 0 | 263 | 502 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 151 | 19 | 0 | 170 | 28 | 0 | 19 | 0 | 47 | 44 | 216 | 0 | 0 | 260 | 477 |
| 5:15 PM | 1 | 0 | 0 | 0 | 1 | 1 | 149 | 18 | 0 | 168 | 33 | 0 | 19 | 0 | 52 | 60 | 187 | 0 | 0 | 247 | 468 |
| Total | 1 | 0 | 0 | 0 | 1 | 1 | 615 | 77 | 0 | 693 | 117 | 0 | 75 | 0 | 192 | 189 | 817 | 1 | 0 | 1007 | 1893 |
| Approach % | 100.0 | 0.0 | 0.0 | - | - | 0.1 | 88.7 | 11.1 | - | - | 60.9 | 0.0 | 39.1 | - | - | 18.8 | 81.1 | 0.1 | - | - | - |
| Total % | 0.1 | 0.0 | 0.0 | - | 0.1 | 0.1 | 32.5 | 4.1 | - | 36.6 | 6.2 | 0.0 | 4.0 | - | 10.1 | 10.0 | 43.2 | 0.1 | - | 53.2 | - |
| PHF | 0.250 | 0.000 | 0.000 | - | 0.250 | 0.250 | 0.869 | 0.875 | - | 0.888 | 0.886 | 0.000 | 0.938 | - | 0.923 | 0.788 | 0.946 | 0.250 | - | 0.957 | 0.943 |
| Lights | 1 | 0 | 0 | - | 1 | 1 | 587 | 74 | - | 662 | 114 | 0 | 75 | - | 189 | 186 | 800 | 1 | - | 987 | 1839 |
| % Lights | 100.0 | - | - | - | 100.0 | 100.0 | 95.4 | 96.1 | - | 95.5 | 97.4 | - | 100.0 | - | 98.4 | 98.4 | 97.9 | 100.0 | - | 98.0 | 97.1 |
| Mediums | 0 | 0 | 0 | - | 0 | 0 | 20 | 2 | - | 22 | 2 | 0 | 0 | - | 2 | 3 | 11 | 0 | - | 14 | 38 |
| % Mediums | 0.0 | - | - | - | 0.0 | 0.0 | 3.3 | 2.6 | - | 3.2 | 1.7 | - | 0.0 | - | 1.0 | 1.6 | 1.3 | 0.0 | - | 1.4 | 2.0 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 8 | 1 | - | 9 | 1 | 0 | 0 | - | 1 | 0 | 6 | 0 | - | 6 | 16 |
| % Articulated Trucks | 0.0 | - | - | - | 0.0 | 0.0 | 1.3 | 1.3 | - | 1.3 | 0.9 | - | 0.0 | - | 0.5 | 0.0 | 0.7 | 0.0 | - | 0.6 | 0.8 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Kingsway @ Levesque
Site Code: 00577103
Start Date: 03/24/2017


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

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada  P3A 5P3
705-674-4455

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Kingsway at Moonlight Ave.
Site Code: 00579103
Start Date: 04/12/2017


# Turning Movement Data

| Start Time | Moonlight Ave. Southbound | | | | | Kingsway Westbound | | | | | Moonlight Ave. Northbound | | | | | Kingsway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 3:00 PM | 10 | 0 | 0 | 0 | 10 | 1 | 132 | 4 | 0 | 137 | 6 | 0 | 8 | 0 | 14 | 11 | 201 | 13 | 0 | 225 | 386 |
| 3:15 PM | 12 | 0 | 0 | 0 | 12 | 3 | 120 | 0 | 0 | 123 | 6 | 0 | 8 | 0 | 14 | 12 | 202 | 9 | 0 | 223 | 372 |
| 3:30 PM | 10 | 0 | 0 | 0 | 10 | 2 | 151 | 3 | 0 | 156 | 9 | 0 | 9 | 0 | 18 | 9 | 194 | 11 | 0 | 214 | 398 |
| 3:45 PM | 11 | 0 | 0 | 0 | 11 | 3 | 173 | 7 | 0 | 183 | 4 | 0 | 10 | 0 | 14 | 15 | 198 | 3 | 0 | 216 | 424 |
| Hourly Total | 43 | 0 | 0 | 0 | 43 | 9 | 576 | 14 | 0 | 599 | 25 | 0 | 35 | 0 | 60 | 47 | 795 | 36 | 0 | 878 | 1580 |
| 4:00 PM | 9 | 0 | 2 | 0 | 11 | 2 | 130 | 4 | 0 | 136 | 8 | 2 | 8 | 0 | 18 | 17 | 193 | 7 | 0 | 217 | 382 |
| 4:15 PM | 7 | 0 | 4 | 0 | 11 | 2 | 157 | 6 | 0 | 165 | 11 | 1 | 6 | 0 | 18 | 13 | 232 | 5 | 0 | 250 | 444 |
| 4:30 PM | 6 | 1 | 1 | 0 | 8 | 5 | 222 | 8 | 0 | 235 | 8 | 3 | 8 | 0 | 19 | 15 | 235 | 4 | 0 | 254 | 516 |
| 4:45 PM | 12 | 2 | 5 | 0 | 19 | 4 | 176 | 5 | 0 | 185 | 6 | 2 | 8 | 0 | 16 | 15 | 213 | 3 | 0 | 231 | 451 |
| Hourly Total | 34 | 3 | 12 | 0 | 49 | 13 | 685 | 23 | 0 | 721 | 33 | 8 | 30 | 0 | 71 | 60 | 873 | 19 | 0 | 952 | 1793 |
| 5:00 PM | 4 | 1 | 1 | 0 | 6 | 0 | 181 | 6 | 0 | 187 | 6 | 0 | 11 | 0 | 17 | 22 | 233 | 3 | 0 | 258 | 468 |
| 5:15 PM | 5 | 0 | 0 | 0 | 5 | 2 | 176 | 7 | 0 | 185 | 3 | 0 | 6 | 0 | 9 | 20 | 191 | 3 | 0 | 214 | 413 |
| 5:30 PM | 5 | 0 | 1 | 0 | 6 | 0 | 139 | 6 | 0 | 145 | 5 | 0 | 12 | 0 | 17 | 13 | 184 | 1 | 0 | 198 | 366 |
| 5:45 PM | 2 | 0 | 0 | 0 | 2 | 0 | 135 | 0 | 0 | 135 | 2 | 0 | 13 | 0 | 15 | 16 | 178 | 0 | 0 | 194 | 346 |
| Hourly Total | 16 | 1 | 2 | 0 | 19 | 2 | 631 | 19 | 0 | 652 | 16 | 0 | 42 | 0 | 58 | 71 | 786 | 7 | 0 | 864 | 1593 |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 67 | 0 | 0 | 67 | 0 | 0 | 3 | 0 | 3 | 0 | 41 | 0 | 0 | 41 | 111 |
| 6:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 95 | 0 | 0 | 95 | 4 | 0 | 5 | 0 | 9 | 4 | 47 | 0 | 0 | 51 | 155 |
| 6:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 146 | 0 | 0 | 146 | 6 | 0 | 11 | 0 | 17 | 8 | 58 | 1 | 0 | 67 | 230 |
| 6:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 113 | 1 | 0 | 114 | 8 | 0 | 2 | 0 | 10 | 3 | 86 | 1 | 0 | 90 | 214 |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 421 | 1 | 0 | 422 | 18 | 0 | 21 | 0 | 39 | 15 | 232 | 2 | 0 | 249 | 710 |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 128 | 2 | 0 | 130 | 8 | 0 | 7 | 0 | 15 | 6 | 89 | 1 | 0 | 96 | 241 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 2 | 173 | 1 | 0 | 176 | 7 | 0 | 13 | 0 | 20 | 3 | 81 | 2 | 0 | 86 | 282 |
| 7:30 AM | 1 | 0 | 0 | 0 | 1 | 1 | 243 | 1 | 0 | 245 | 4 | 1 | 16 | 0 | 21 | 7 | 97 | 7 | 1 | 111 | 378 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 2 | 266 | 2 | 0 | 270 | 7 | 1 | 20 | 0 | 28 | 7 | 122 | 8 | 0 | 137 | 435 |
| Hourly Total | 1 | 0 | 0 | 0 | 1 | 5 | 810 | 6 | 0 | 821 | 26 | 2 | 56 | 0 | 84 | 23 | 389 | 18 | 1 | 430 | 1336 |
| 8:00 AM | 6 | 1 | 0 | 0 | 7 | 3 | 207 | 0 | 0 | 210 | 4 | 0 | 8 | 0 | 12 | 7 | 117 | 5 | 0 | 129 | 358 |
| 8:15 AM | 6 | 0 | 3 | 0 | 9 | 4 | 166 | 0 | 0 | 170 | 1 | 3 | 9 | 0 | 13 | 10 | 113 | 9 | 0 | 132 | 324 |
| 8:30 AM | 13 | 0 | 0 | 0 | 13 | 1 | 185 | 0 | 0 | 186 | 12 | 0 | 10 | 0 | 22 | 10 | 125 | 3 | 0 | 138 | 359 |
| 8:45 AM | 7 | 1 | 2 | 0 | 10 | 3 | 195 | 0 | 0 | 198 | 6 | 0 | 12 | 0 | 18 | 5 | 126 | 5 | 0 | 136 | 362 |
| Hourly Total | 32 | 2 | 5 | 0 | 39 | 11 | 753 | 0 | 0 | 764 | 23 | 3 | 39 | 0 | 65 | 32 | 481 | 22 | 0 | 535 | 1403 |
| 9:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 11:00 AM | 17 | 2 | 1 | 0 | 20 | 6 | 143 | 2 | 0 | 151 | 2 | 2 | 10 | 0 | 14 | 1 | 116 | 8 | 0 | 125 | 310 |
| 11:15 AM | 9 | 0 | 2 | 0 | 11 | 2 | 115 | 1 | 0 | 118 | 2 | 2 | 4 | 0 | 8 | 12 | 127 | 16 | 0 | 155 | 292 |
| 11:30 AM | 15 | 1 | 1 | 0 | 17 | 2 | 148 | 2 | 0 | 152 | 4 | 2 | 6 | 1 | 12 | 9 | 143 | 12 | 0 | 164 | 345 |
| 11:45 AM | 15 | 1 | 1 | 0 | 17 | 5 | 140 | 3 | 0 | 148 | 4 | 2 | 8 | 0 | 14 | 10 | 146 | 13 | 0 | 169 | 348 |
| Hourly Total | 56 | 4 | 5 | 0 | 65 | 15 | 546 | 8 | 0 | 569 | 12 | 8 | 28 | 1 | 48 | 32 | 532 | 49 | 0 | 613 | 1295 |
| 12:00 PM | 18 | 1 | 1 | 0 | 20 | 5 | 158 | 6 | 0 | 169 | 5 | 1 | 7 | 0 | 13 | 14 | 164 | 13 | 0 | 191 | 393 |
| 12:15 PM | 13 | 2 | 6 | 0 | 21 | 8 | 151 | 3 | 0 | 162 | 5 | 1 | 4 | 0 | 10 | 9 | 161 | 11 | 0 | 181 | 374 |
| 12:30 PM | 16 | 0 | 3 | 0 | 19 | 1 | 167 | 4 | 0 | 172 | 6 | 3 | 11 | 0 | 20 | 7 | 142 | 11 | 0 | 160 | 371 |
| 12:45 PM | 16 | 2 | 5 | 0 | 23 | 4 | 150 | 9 | 0 | 163 | 7 | 0 | 13 | 0 | 20 | 8 | 160 | 8 | 0 | 176 | 382 |
| Hourly Total | 63 | 5 | 15 | 0 | 83 | 18 | 626 | 22 | 0 | 666 | 23 | 5 | 35 | 0 | 63 | 38 | 627 | 43 | 0 | 708 | 1520 |
| 1:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Grand Total | 245 | 15 | 39 | 0 | 299 | 73 | 5049 | 93 | 0 | 5215 | 176 | 27 | 286 | 1 | 489 | 318 | 4715 | 196 | 1 | 5229 | 11232 |
| Approach % | 81.9 | 5.0 | 13.0 | - | - | 1.4 | 96.8 | 1.8 | - | - | 36.0 | 5.5 | 58.5 | - | - | 6.1 | 90.2 | 3.7 | - | - | - |
| Total % | 2.2 | 0.1 | 0.3 | - | 2.7 | 0.6 | 45.0 | 0.8 | - | 46.4 | 1.6 | 0.2 | 2.5 | - | 4.4 | 2.8 | 42.0 | 1.7 | - | 46.6 | - |
| Lights | 196 | 14 | 32 | - | 242 | 63 | 4754 | 89 | - | 4906 | 168 | 27 | 280 | - | 475 | 286 | 4414 | 149 | - | 4849 | 10472 |
| % Lights | 80.0 | 93.3 | 82.1 | - | 80.9 | 86.3 | 94.2 | 95.7 | - | 94.1 | 95.5 | 100.0 | 97.9 | - | 97.1 | 89.9 | 93.6 | 76.0 | - | 92.7 | 93.2 |
| Mediums | 46 | 1 | 7 | - | 54 | 10 | 202 | 4 | - | 216 | 6 | 0 | 6 | - | 12 | 31 | 192 | 47 | - | 270 | 552 |
| % Mediums | 18.8 | 6.7 | 17.9 | - | 18.1 | 13.7 | 4.0 | 4.3 | - | 4.1 | 3.4 | 0.0 | 2.1 | - | 2.5 | 9.7 | 4.1 | 24.0 | - | 5.2 | 4.9 |
| Articulated Trucks | 3 | 0 | 0 | - | 3 | 0 | 91 | 0 | - | 91 | 2 | 0 | 0 | - | 2 | 1 | 109 | 0 | - | 110 | 206 |
| % Articulated Trucks | 1.2 | 0.0 | 0.0 | - | 1.0 | 0.0 | 1.8 | 0.0 | - | 1.7 | 1.1 | 0.0 | 0.0 | - | 0.4 | 0.3 | 2.3 | 0.0 | - | 2.1 | 1.8 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 2 | 0 | - | 2 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 2 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | 0.0 | - | - | |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 1 | - | - | - | - | 1 | - | - | |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | 100.0 | - | - | |

Traffic and Transportation Engineering Services
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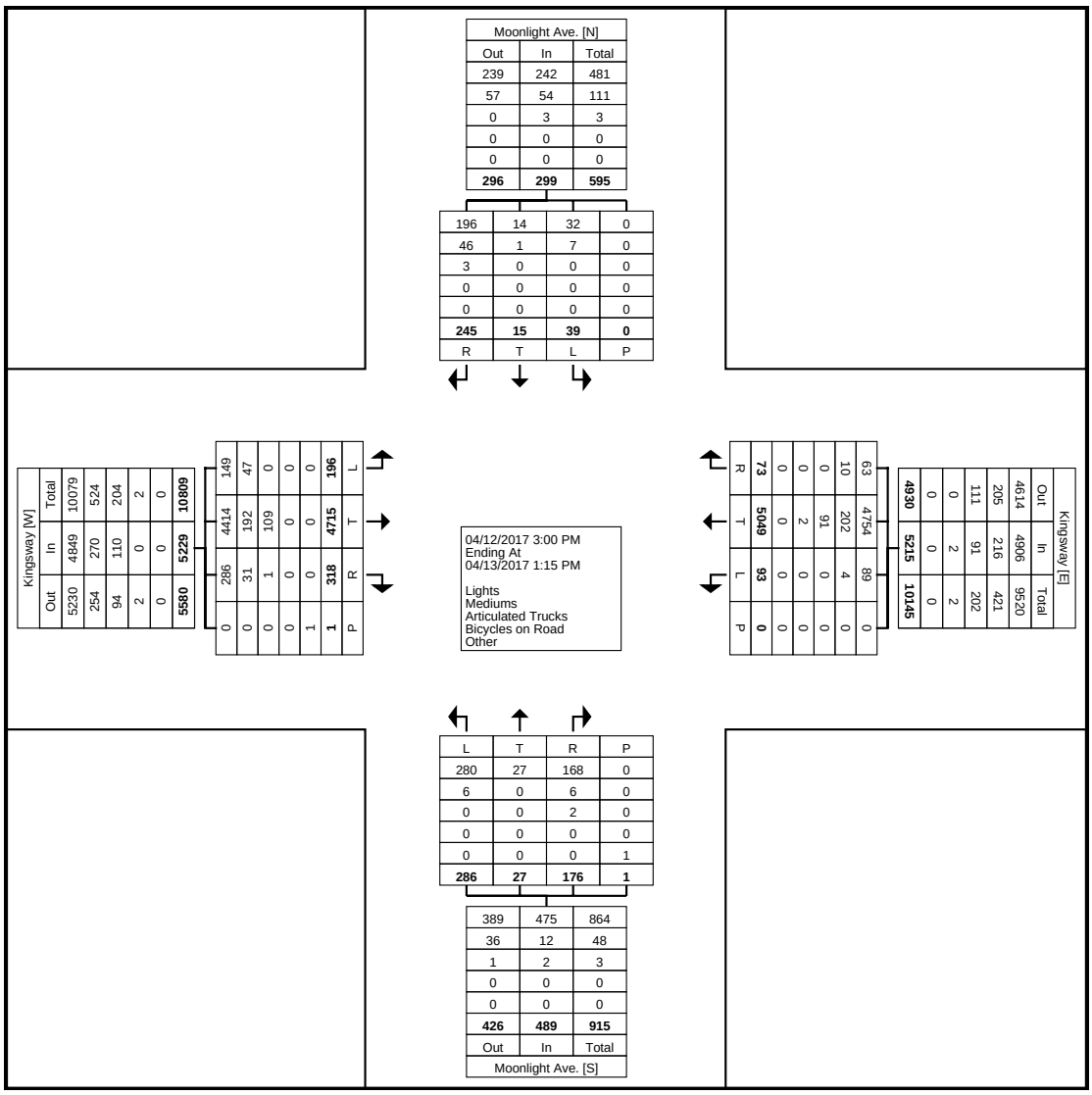
705-674-4455

Count Name: Kingsway at Moonlight Ave.
Site Code: 00579103
Start Date: 04/12/2017


Turning Movement Data Plot

Traffic and Transportation Engineering Services
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PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

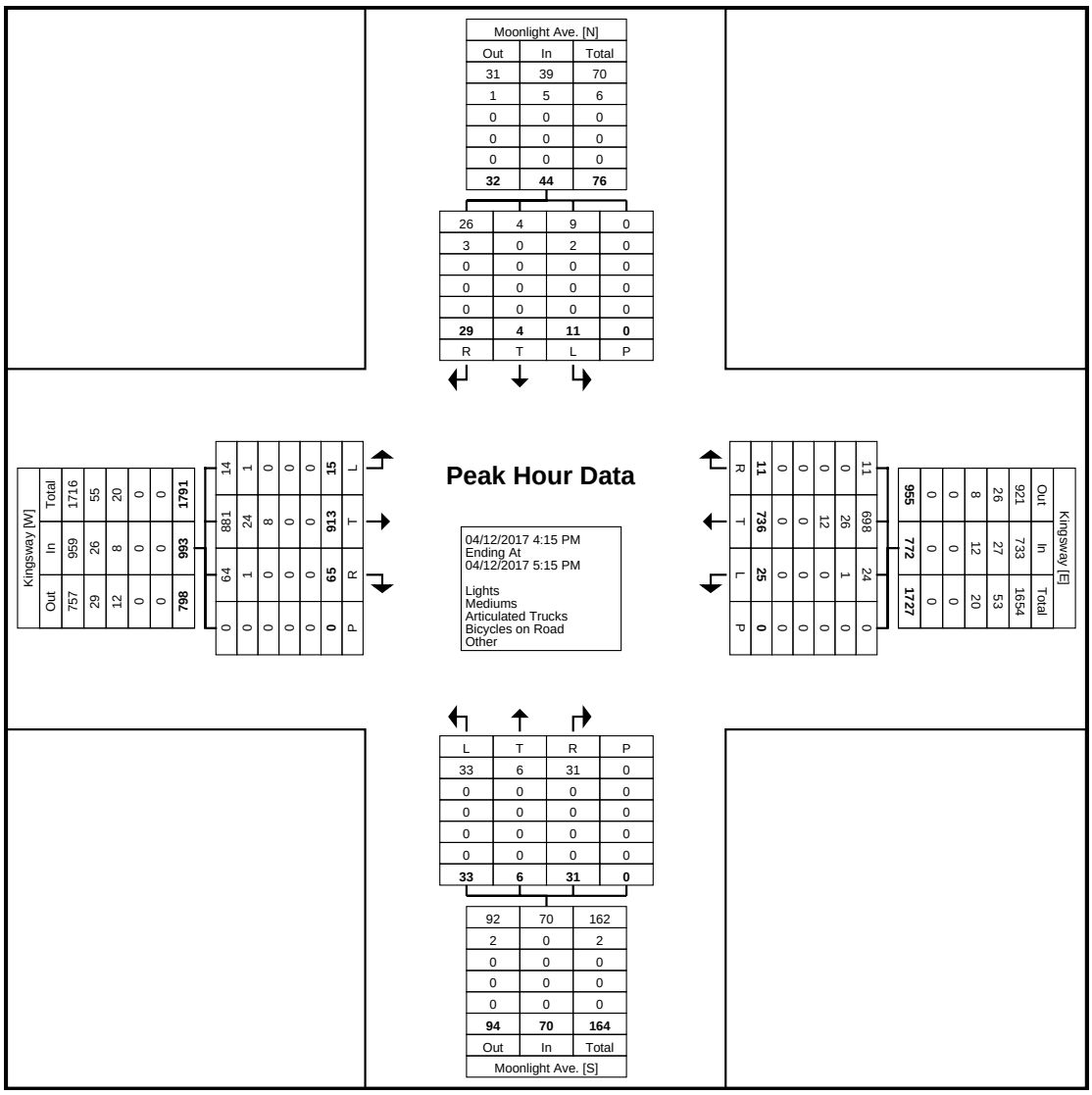
Count Name: Kingsway at Moonlight Ave.
Site Code: 00579103
Start Date: 04/12/2017


# Turning Movement Peak Hour Data (4:15 PM)

| Start Time | Moonlight Ave. Southbound | | | | | Kingsway Westbound | | | | | Moonlight Ave. Northbound | | | | | Kingsway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 4:15 PM | 7 | 0 | 4 | 0 | 11 | 2 | 157 | 6 | 0 | 165 | 11 | 1 | 6 | 0 | 18 | 13 | 232 | 5 | 0 | 250 | 444 |
| 4:30 PM | 6 | 1 | 1 | 0 | 8 | 5 | 222 | 8 | 0 | 235 | 8 | 3 | 8 | 0 | 19 | 15 | 235 | 4 | 0 | 254 | 516 |
| 4:45 PM | 12 | 2 | 5 | 0 | 19 | 4 | 176 | 5 | 0 | 185 | 6 | 2 | 8 | 0 | 16 | 15 | 213 | 3 | 0 | 231 | 451 |
| 5:00 PM | 4 | 1 | 1 | 0 | 6 | 0 | 181 | 6 | 0 | 187 | 6 | 0 | 11 | 0 | 17 | 22 | 233 | 3 | 0 | 258 | 468 |
| Total | 29 | 4 | 11 | 0 | 44 | 11 | 736 | 25 | 0 | 772 | 31 | 6 | 33 | 0 | 70 | 65 | 913 | 15 | 0 | 993 | 1879 |
| Approach % | 65.9 | 9.1 | 25.0 | - | - | 1.4 | 95.3 | 3.2 | - | - | 44.3 | 8.6 | 47.1 | - | - | 6.5 | 91.9 | 1.5 | - | - | - |
| Total % | 1.5 | 0.2 | 0.6 | - | 2.3 | 0.6 | 39.2 | 1.3 | - | 41.1 | 1.6 | 0.3 | 1.8 | - | 3.7 | 3.5 | 48.6 | 0.8 | - | 52.8 | - |
| PHF | 0.604 | 0.500 | 0.550 | - | 0.579 | 0.550 | 0.829 | 0.781 | - | 0.821 | 0.705 | 0.500 | 0.750 | - | 0.921 | 0.739 | 0.971 | 0.750 | - | 0.962 | 0.910 |
| Lights | 26 | 4 | 9 | - | 39 | 11 | 698 | 24 | - | 733 | 31 | 6 | 33 | - | 70 | 64 | 881 | 14 | - | 959 | 1801 |
| % Lights | 89.7 | 100.0 | 81.8 | - | 88.6 | 100.0 | 94.8 | 96.0 | - | 94.9 | 100.0 | 100.0 | 100.0 | - | 100.0 | 98.5 | 96.5 | 93.3 | - | 96.6 | 95.8 |
| Mediums | 3 | 0 | 2 | - | 5 | 0 | 26 | 1 | - | 27 | 0 | 0 | 0 | - | 0 | 1 | 24 | 1 | - | 26 | 58 |
| % Mediums | 10.3 | 0.0 | 18.2 | - | 11.4 | 0.0 | 3.5 | 4.0 | - | 3.5 | 0.0 | 0.0 | 0.0 | - | 0.0 | 1.5 | 2.6 | 6.7 | - | 2.6 | 3.1 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 12 | 0 | - | 12 | 0 | 0 | 0 | - | 0 | 0 | 8 | 0 | - | 8 | 20 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 1.6 | 0.0 | - | 1.6 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.9 | 0.0 | - | 0.8 | 1.1 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Kingsway at Moonlight Ave.
Site Code: 00579103
Start Date: 04/12/2017


Turning Movement Peak Hour Data Plot (4:15 PM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

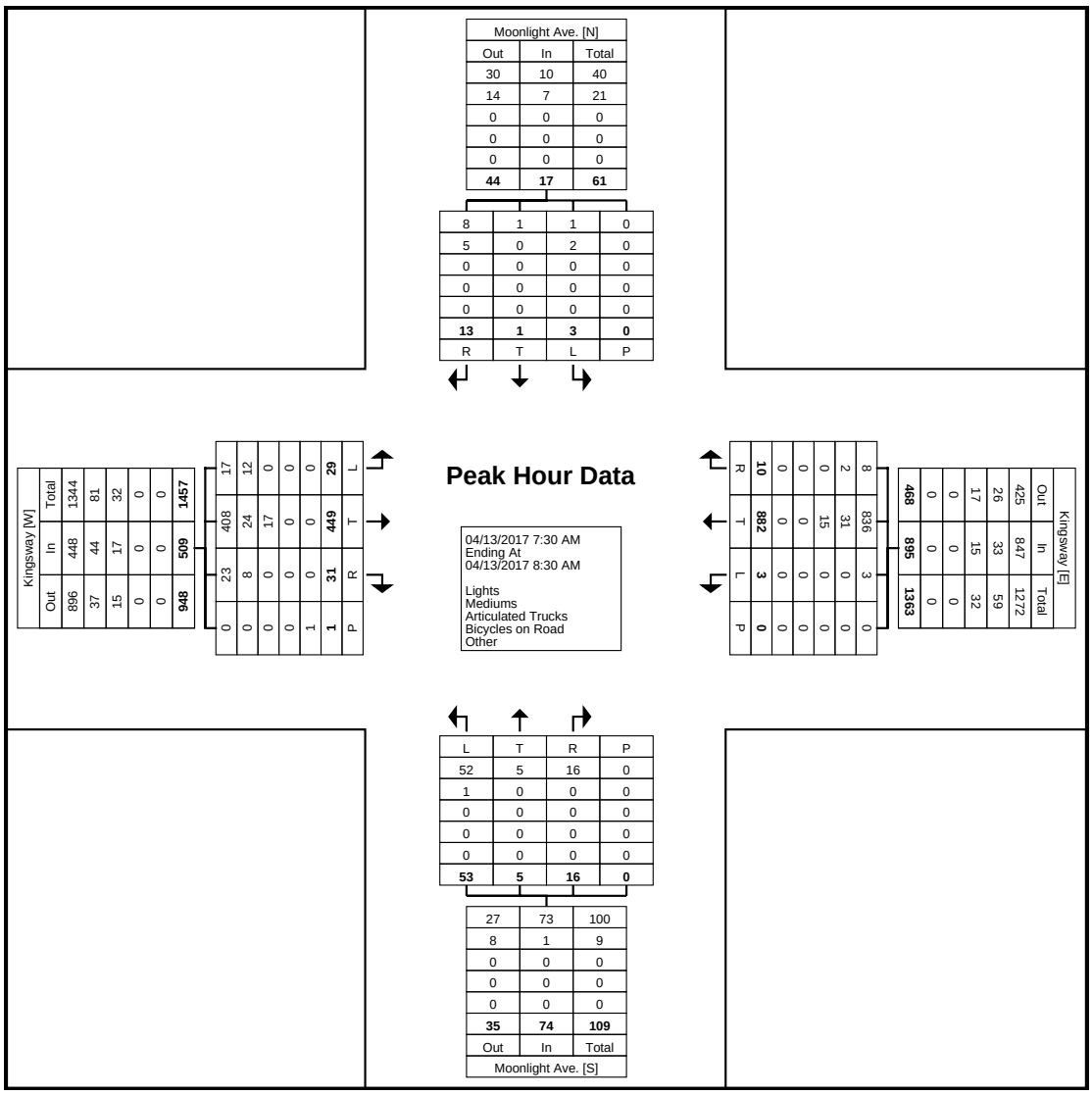
Count Name: Kingsway at Moonlight Ave.
Site Code: 00579103
Start Date: 04/12/2017


# Turning Movement Peak Hour Data (7:30 AM)

| Start Time | Moonlight Ave. Southbound | | | | | Kingsway Westbound | | | | | Moonlight Ave. Northbound | | | | | Kingsway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 7:30 AM | 1 | 0 | 0 | 0 | 1 | 1 | 243 | 1 | 0 | 245 | 4 | 1 | 16 | 0 | 21 | 7 | 97 | 7 | 1 | 111 | 378 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 2 | 266 | 2 | 0 | 270 | 7 | 1 | 20 | 0 | 28 | 7 | 122 | 8 | 0 | 137 | 435 |
| 8:00 AM | 6 | 1 | 0 | 0 | 7 | 3 | 207 | 0 | 0 | 210 | 4 | 0 | 8 | 0 | 12 | 7 | 117 | 5 | 0 | 129 | 358 |
| 8:15 AM | 6 | 0 | 3 | 0 | 9 | 4 | 166 | 0 | 0 | 170 | 1 | 3 | 9 | 0 | 13 | 10 | 113 | 9 | 0 | 132 | 324 |
| Total | 13 | 1 | 3 | 0 | 17 | 10 | 882 | 3 | 0 | 895 | 16 | 5 | 53 | 0 | 74 | 31 | 449 | 29 | 1 | 509 | 1495 |
| Approach % | 76.5 | 5.9 | 17.6 | - | - | 1.1 | 98.5 | 0.3 | - | - | 21.6 | 6.8 | 71.6 | - | - | 6.1 | 88.2 | 5.7 | - | - | - |
| Total % | 0.9 | 0.1 | 0.2 | - | 1.1 | 0.7 | 59.0 | 0.2 | - | 59.9 | 1.1 | 0.3 | 3.5 | - | 4.9 | 2.1 | 30.0 | 1.9 | - | 34.0 | - |
| PHF | 0.542 | 0.250 | 0.250 | - | 0.472 | 0.625 | 0.829 | 0.375 | - | 0.829 | 0.571 | 0.417 | 0.663 | - | 0.661 | 0.775 | 0.920 | 0.806 | - | 0.929 | 0.859 |
| Lights | 8 | 1 | 1 | - | 10 | 8 | 836 | 3 | - | 847 | 16 | 5 | 52 | - | 73 | 23 | 408 | 17 | - | 448 | 1378 |
| % Lights | 61.5 | 100.0 | 33.3 | - | 58.8 | 80.0 | 94.8 | 100.0 | - | 94.6 | 100.0 | 100.0 | 98.1 | - | 98.6 | 74.2 | 90.9 | 58.6 | - | 88.0 | 92.2 |
| Mediums | 5 | 0 | 2 | - | 7 | 2 | 31 | 0 | - | 33 | 0 | 0 | 1 | - | 1 | 8 | 24 | 12 | - | 44 | 85 |
| % Mediums | 38.5 | 0.0 | 66.7 | - | 41.2 | 20.0 | 3.5 | 0.0 | - | 3.7 | 0.0 | 0.0 | 1.9 | - | 1.4 | 25.8 | 5.3 | 41.4 | - | 8.6 | 5.7 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 15 | 0 | - | 15 | 0 | 0 | 0 | - | 0 | 0 | 17 | 0 | - | 17 | 32 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 1.7 | 0.0 | - | 1.7 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 3.8 | 0.0 | - | 3.3 | 2.1 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Kingsway at Moonlight Ave.
Site Code: 00579103
Start Date: 04/12/2017


Turning Movement Peak Hour Data Plot (7:30 AM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

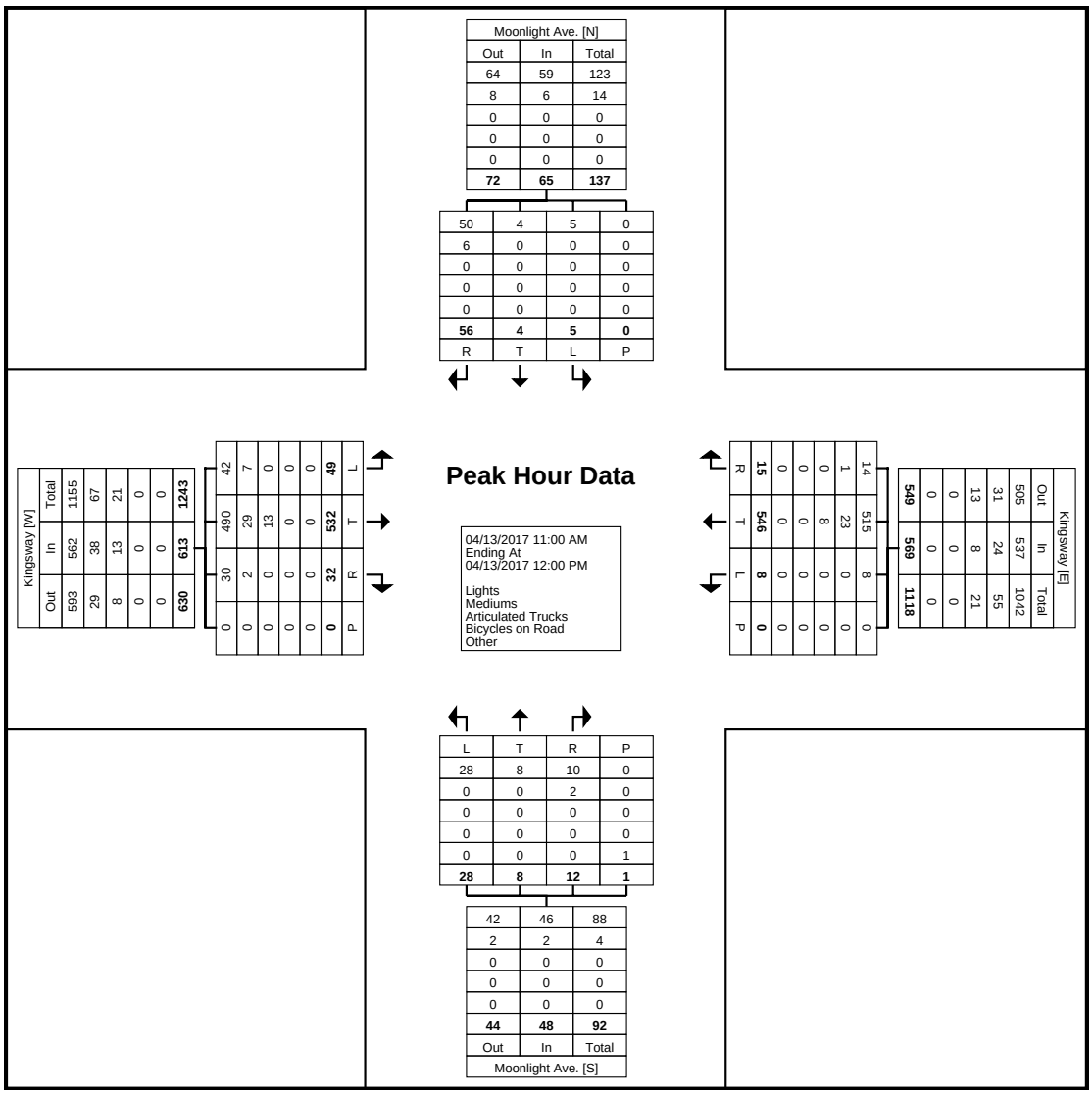
Count Name: Kingsway at Moonlight Ave.
Site Code: 00579103
Start Date: 04/12/2017


# Turning Movement Peak Hour Data (11:00 AM)

| Start Time | Moonlight Ave. Southbound | | | | | Kingsway Westbound | | | | | Moonlight Ave. Northbound | | | | | Kingsway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 11:00 AM | 17 | 2 | 1 | 0 | 20 | 6 | 143 | 2 | 0 | 151 | 2 | 2 | 10 | 0 | 14 | 1 | 116 | 8 | 0 | 125 | 310 |
| 11:15 AM | 9 | 0 | 2 | 0 | 11 | 2 | 115 | 1 | 0 | 118 | 2 | 2 | 4 | 0 | 8 | 12 | 127 | 16 | 0 | 155 | 292 |
| 11:30 AM | 15 | 1 | 1 | 0 | 17 | 2 | 148 | 2 | 0 | 152 | 4 | 2 | 6 | 1 | 12 | 9 | 143 | 12 | 0 | 164 | 345 |
| 11:45 AM | 15 | 1 | 1 | 0 | 17 | 5 | 140 | 3 | 0 | 148 | 4 | 2 | 8 | 0 | 14 | 10 | 146 | 13 | 0 | 169 | 348 |
| Total | 56 | 4 | 5 | 0 | 65 | 15 | 546 | 8 | 0 | 569 | 12 | 8 | 28 | 1 | 48 | 32 | 532 | 49 | 0 | 613 | 1295 |
| Approach % | 86.2 | 6.2 | 7.7 | - | - | 2.6 | 96.0 | 1.4 | - | - | 25.0 | 16.7 | 58.3 | - | - | 5.2 | 86.8 | 8.0 | - | - | - |
| Total % | 4.3 | 0.3 | 0.4 | - | 5.0 | 1.2 | 42.2 | 0.6 | - | 43.9 | 0.9 | 0.6 | 2.2 | - | 3.7 | 2.5 | 41.1 | 3.8 | - | 47.3 | - |
| PHF | 0.824 | 0.500 | 0.625 | - | 0.813 | 0.625 | 0.922 | 0.667 | - | 0.936 | 0.750 | 1.000 | 0.700 | - | 0.857 | 0.667 | 0.911 | 0.766 | - | 0.907 | 0.930 |
| Lights | 50 | 4 | 5 | - | 59 | 14 | 515 | 8 | - | 537 | 10 | 8 | 28 | - | 46 | 30 | 490 | 42 | - | 562 | 1204 |
| % Lights | 89.3 | 100.0 | 100.0 | - | 90.8 | 93.3 | 94.3 | 100.0 | - | 94.4 | 83.3 | 100.0 | 100.0 | - | 95.8 | 93.8 | 92.1 | 85.7 | - | 91.7 | 93.0 |
| Mediums | 6 | 0 | 0 | - | 6 | 1 | 23 | 0 | - | 24 | 2 | 0 | 0 | - | 2 | 2 | 29 | 7 | - | 38 | 70 |
| % Mediums | 10.7 | 0.0 | 0.0 | - | 9.2 | 6.7 | 4.2 | 0.0 | - | 4.2 | 16.7 | 0.0 | 0.0 | - | 4.2 | 6.3 | 5.5 | 14.3 | - | 6.2 | 5.4 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 8 | 0 | - | 8 | 0 | 0 | 0 | - | 0 | 0 | 13 | 0 | - | 13 | 21 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 1.5 | 0.0 | - | 1.4 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 2.4 | 0.0 | - | 2.1 | 1.6 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 1 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - | - | - | - | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Kingsway at Moonlight Ave.
Site Code: 00579103
Start Date: 04/12/2017


Turning Movement Peak Hour Data Plot (11:00 AM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

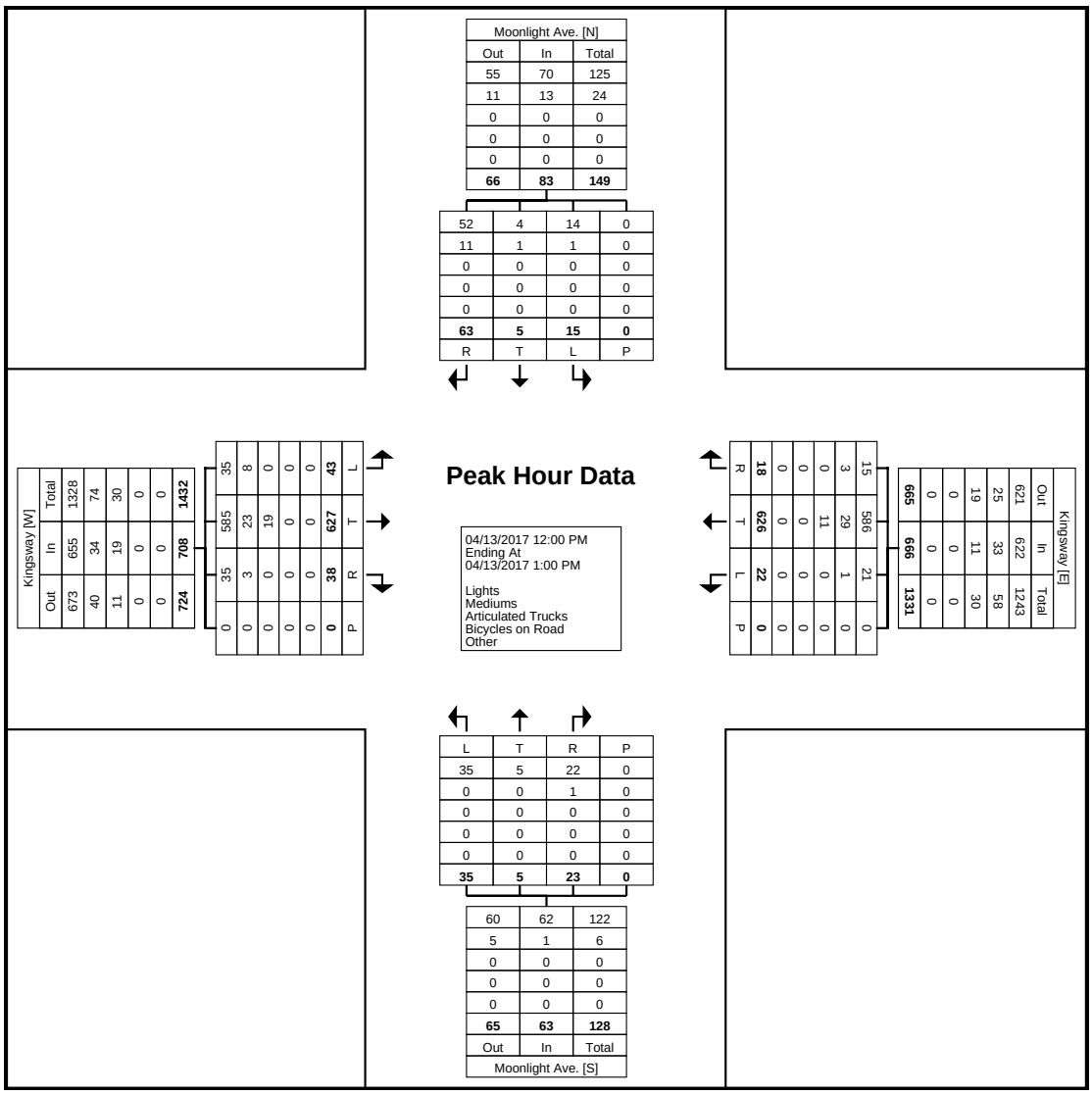
Count Name: Kingsway at Moonlight Ave.
Site Code: 00579103
Start Date: 04/12/2017


# Turning Movement Peak Hour Data (12:00 PM)

| Start Time | Moonlight Ave. Southbound | | | | | Kingsway Westbound | | | | | Moonlight Ave. Northbound | | | | | Kingsway Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 12:00 PM | 18 | 1 | 1 | 0 | 20 | 5 | 158 | 6 | 0 | 169 | 5 | 1 | 7 | 0 | 13 | 14 | 164 | 13 | 0 | 191 | 393 |
| 12:15 PM | 13 | 2 | 6 | 0 | 21 | 8 | 151 | 3 | 0 | 162 | 5 | 1 | 4 | 0 | 10 | 9 | 161 | 11 | 0 | 181 | 374 |
| 12:30 PM | 16 | 0 | 3 | 0 | 19 | 1 | 167 | 4 | 0 | 172 | 6 | 3 | 11 | 0 | 20 | 7 | 142 | 11 | 0 | 160 | 371 |
| 12:45 PM | 16 | 2 | 5 | 0 | 23 | 4 | 150 | 9 | 0 | 163 | 7 | 0 | 13 | 0 | 20 | 8 | 160 | 8 | 0 | 176 | 382 |
| Total | 63 | 5 | 15 | 0 | 83 | 18 | 626 | 22 | 0 | 666 | 23 | 5 | 35 | 0 | 63 | 38 | 627 | 43 | 0 | 708 | 1520 |
| Approach % | 75.9 | 6.0 | 18.1 | - | - | 2.7 | 94.0 | 3.3 | - | - | 36.5 | 7.9 | 55.6 | - | - | 5.4 | 88.6 | 6.1 | - | - | - |
| Total % | 4.1 | 0.3 | 1.0 | - | 5.5 | 1.2 | 41.2 | 1.4 | - | 43.8 | 1.5 | 0.3 | 2.3 | - | 4.1 | 2.5 | 41.3 | 2.8 | - | 46.6 | - |
| PHF | 0.875 | 0.625 | 0.625 | - | 0.902 | 0.563 | 0.937 | 0.611 | - | 0.968 | 0.821 | 0.417 | 0.673 | - | 0.788 | 0.679 | 0.956 | 0.827 | - | 0.927 | 0.967 |
| Lights | 52 | 4 | 14 | - | 70 | 15 | 586 | 21 | - | 622 | 22 | 5 | 35 | - | 62 | 35 | 585 | 35 | - | 655 | 1409 |
| % Lights | 82.5 | 80.0 | 93.3 | - | 84.3 | 83.3 | 93.6 | 95.5 | - | 93.4 | 95.7 | 100.0 | 100.0 | - | 98.4 | 92.1 | 93.3 | 81.4 | - | 92.5 | 92.7 |
| Mediums | 11 | 1 | 1 | - | 13 | 3 | 29 | 1 | - | 33 | 1 | 0 | 0 | - | 1 | 3 | 23 | 8 | - | 34 | 81 |
| % Mediums | 17.5 | 20.0 | 6.7 | - | 15.7 | 16.7 | 4.6 | 4.5 | - | 5.0 | 4.3 | 0.0 | 0.0 | - | 1.6 | 7.9 | 3.7 | 18.6 | - | 4.8 | 5.3 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 11 | 0 | - | 11 | 0 | 0 | 0 | - | 0 | 0 | 19 | 0 | - | 19 | 30 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 1.8 | 0.0 | - | 1.7 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 3.0 | 0.0 | - | 2.7 | 2.0 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Kingsway at Moonlight Ave.
Site Code: 00579103
Start Date: 04/12/2017


Turning Movement Peak Hour Data Plot (12:00 PM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
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Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft @ Levesque
Site Code: 00855103
Start Date: 03/31/2017


# Turning Movement Data

| Start Time | Levesque Southbound | | | | Bancroft Westbound | | | | Bancroft Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Left | Peds | App. Total | Right | Thru | Peds | App. Total | Thru | Left | Peds | App. Total | Int. Total |
| 6:00 AM | 8 | 0 | 0 | 8 | 1 | 2 | 0 | 3 | 1 | 10 | 0 | 11 | 22 |
| 6:15 AM | 5 | 0 | 0 | 5 | 2 | 5 | 0 | 7 | 2 | 5 | 0 | 7 | 19 |
| 6:30 AM | 13 | 2 | 0 | 15 | 5 | 17 | 0 | 22 | 3 | 11 | 0 | 14 | 51 |
| 6:45 AM | 18 | 5 | 0 | 23 | 9 | 11 | 0 | 20 | 8 | 15 | 0 | 23 | 66 |
| Hourly Total | 44 | 7 | 0 | 51 | 17 | 35 | 0 | 52 | 14 | 41 | 0 | 55 | 158 |
| 7:00 AM | 24 | 2 | 0 | 26 | 6 | 19 | 0 | 25 | 6 | 18 | 0 | 24 | 75 |
| 7:15 AM | 19 | 1 | 4 | 20 | 2 | 25 | 0 | 27 | 9 | 24 | 0 | 33 | 80 |
| 7:30 AM | 26 | 3 | 0 | 29 | 6 | 21 | 0 | 27 | 7 | 28 | 0 | 35 | 91 |
| 7:45 AM | 25 | 7 | 1 | 32 | 6 | 12 | 0 | 18 | 9 | 21 | 0 | 30 | 80 |
| Hourly Total | 94 | 13 | 5 | 107 | 20 | 77 | 0 | 97 | 31 | 91 | 0 | 122 | 326 |
| 8:00 AM | 22 | 3 | 0 | 25 | 6 | 22 | 0 | 28 | 7 | 12 | 0 | 19 | 72 |
| 8:15 AM | 29 | 4 | 0 | 33 | 3 | 23 | 0 | 26 | 4 | 21 | 0 | 25 | 84 |
| 8:30 AM | 18 | 5 | 0 | 23 | 4 | 20 | 0 | 24 | 7 | 23 | 0 | 30 | 77 |
| 8:45 AM | 25 | 8 | 0 | 33 | 1 | 17 | 0 | 18 | 8 | 23 | 0 | 31 | 82 |
| Hourly Total | 94 | 20 | 0 | 114 | 14 | 82 | 0 | 96 | 26 | 79 | 0 | 105 | 315 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 11:00 AM | 10 | 4 | 0 | 14 | 3 | 8 | 0 | 11 | 13 | 14 | 0 | 27 | 52 |
| 11:15 AM | 17 | 2 | 0 | 19 | 5 | 13 | 0 | 18 | 17 | 16 | 0 | 33 | 70 |
| 11:30 AM | 13 | 3 | 0 | 16 | 3 | 11 | 0 | 14 | 9 | 17 | 0 | 26 | 56 |
| 11:45 AM | 16 | 2 | 0 | 18 | 4 | 12 | 1 | 16 | 13 | 15 | 1 | 28 | 62 |
| Hourly Total | 56 | 11 | 0 | 67 | 15 | 44 | 1 | 59 | 52 | 62 | 1 | 114 | 240 |
| 12:00 PM | 18 | 2 | 0 | 20 | 0 | 6 | 0 | 6 | 10 | 15 | 0 | 25 | 51 |
| 12:15 PM | 15 | 3 | 0 | 18 | 2 | 10 | 0 | 12 | 7 | 14 | 1 | 21 | 51 |
| 12:30 PM | 16 | 2 | 0 | 18 | 2 | 12 | 0 | 14 | 10 | 18 | 0 | 28 | 60 |
| 12:45 PM | 20 | 6 | 0 | 26 | 5 | 11 | 0 | 16 | 16 | 16 | 0 | 32 | 74 |
| Hourly Total | 69 | 13 | 0 | 82 | 9 | 39 | 0 | 48 | 43 | 63 | 1 | 106 | 236 |
| Grand Total | 357 | 64 | 5 | 421 | 75 | 277 | 1 | 352 | 166 | 336 | 2 | 502 | 1275 |
| Approach % | 84.8 | 15.2 | - | - | 21.3 | 78.7 | - | - | 33.1 | 66.9 | - | - | - |
| Total % | 28.0 | 5.0 | - | 33.0 | 5.9 | 21.7 | - | 27.6 | 13.0 | 26.4 | - | 39.4 | - |
| Lights | 342 | 62 | - | 404 | 71 | 264 | - | 335 | 161 | 320 | - | 481 | 1220 |
| % Lights | 95.8 | 96.9 | - | 96.0 | 94.7 | 95.3 | - | 95.2 | 97.0 | 95.2 | - | 95.8 | 95.7 |
| Mediums | 15 | 1 | - | 16 | 4 | 13 | - | 17 | 5 | 16 | - | 21 | 54 |
| % Mediums | 4.2 | 1.6 | - | 3.8 | 5.3 | 4.7 | - | 4.8 | 3.0 | 4.8 | - | 4.2 | 4.2 |
| Articulated Trucks | 0 | 1 | - | 1 | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 1 |
| % Articulated Trucks | 0.0 | 1.6 | - | 0.2 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.1 |
| Bicycles on Road | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | 0.0 | - | - | - | 0.0 | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | 5 | - | - | - | 1 | - | - | - | 2 | - | - |
| % Pedestrians | - | - | 100.0 | - | - | - | 100.0 | - | - | - | 100.0 | - | - |

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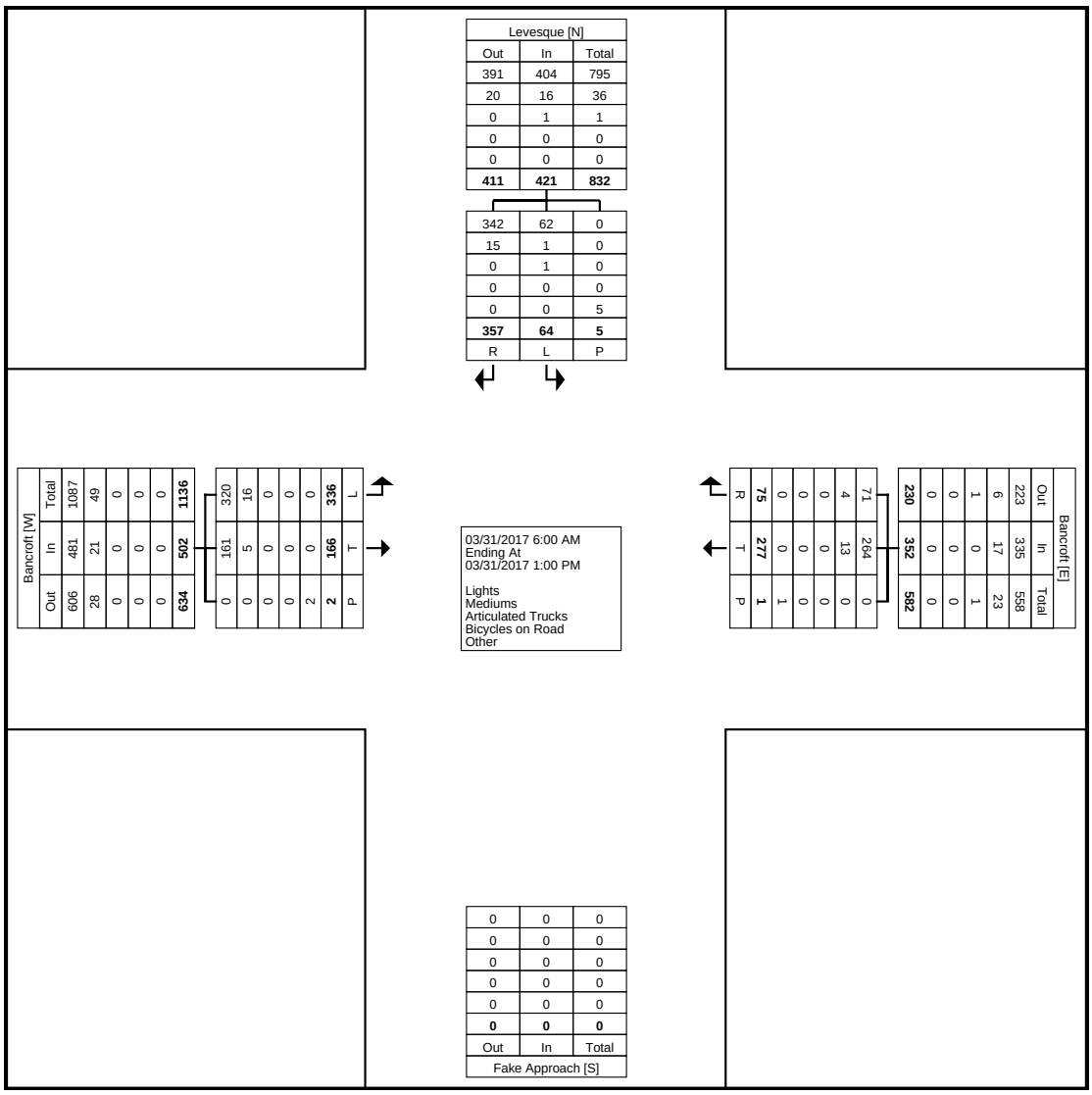
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft @ Levesque
Site Code: 00855103
Start Date: 03/31/2017


Turning Movement Data Plot

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft @ Levesque
Site Code: 00855103
Start Date: 03/31/2017


# Turning Movement Peak Hour Data (7:30 AM)

| Start Time | Levesque Southbound | | | | Bancroft Westbound | | | | Bancroft Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Left | Peds | App. Total | Right | Thru | Peds | App. Total | Thru | Left | Peds | App. Total | Int. Total |
| 7:30 AM | 26 | 3 | 0 | 29 | 6 | 21 | 0 | 27 | 7 | 28 | 0 | 35 | 91 |
| 7:45 AM | 25 | 7 | 1 | 32 | 6 | 12 | 0 | 18 | 9 | 21 | 0 | 30 | 80 |
| 8:00 AM | 22 | 3 | 0 | 25 | 6 | 22 | 0 | 28 | 7 | 12 | 0 | 19 | 72 |
| 8:15 AM | 29 | 4 | 0 | 33 | 3 | 23 | 0 | 26 | 4 | 21 | 0 | 25 | 84 |
| Total | 102 | 17 | 1 | 119 | 21 | 78 | 0 | 99 | 27 | 82 | 0 | 109 | 327 |
| Approach % | 85.7 | 14.3 | - | - | 21.2 | 78.8 | - | - | 24.8 | 75.2 | - | - | - |
| Total % | 31.2 | 5.2 | - | 36.4 | 6.4 | 23.9 | - | 30.3 | 8.3 | 25.1 | - | 33.3 | - |
| PHF | 0.879 | 0.607 | - | 0.902 | 0.875 | 0.848 | - | 0.884 | 0.750 | 0.732 | - | 0.779 | 0.898 |
| Lights | 98 | 17 | - | 115 | 21 | 73 | - | 94 | 24 | 77 | - | 101 | 310 |
| % Lights | 96.1 | 100.0 | - | 96.6 | 100.0 | 93.6 | - | 94.9 | 88.9 | 93.9 | - | 92.7 | 94.8 |
| Mediums | 4 | 0 | - | 4 | 0 | 5 | - | 5 | 3 | 5 | - | 8 | 17 |
| % Mediums | 3.9 | 0.0 | - | 3.4 | 0.0 | 6.4 | - | 5.1 | 11.1 | 6.1 | - | 7.3 | 5.2 |
| Articulated Trucks | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | 1 | - | - | - | 0 | - | - | - | 0 | - | - |
| % Pedestrians | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
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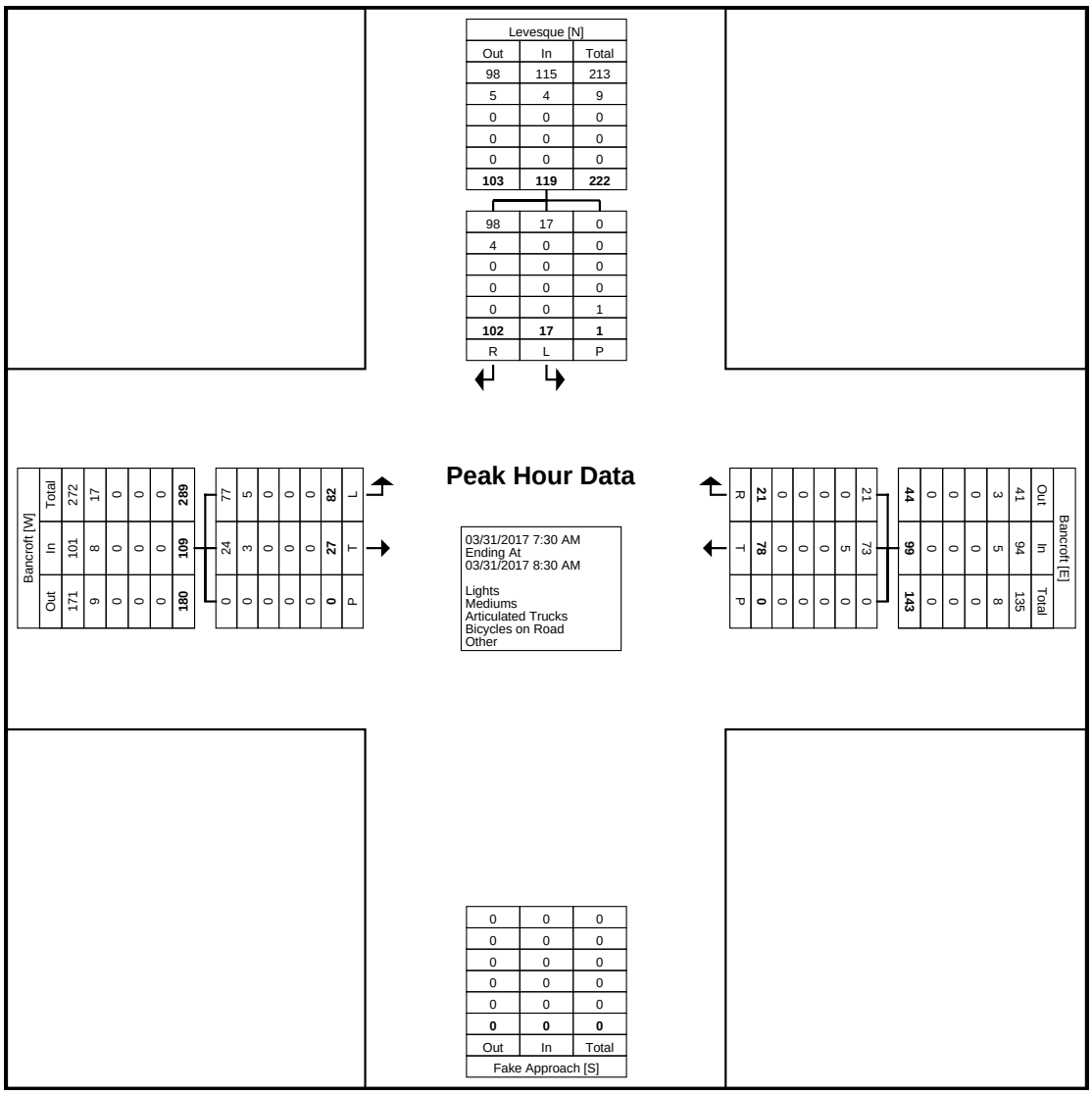
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft @ Levesque
Site Code: 00855103
Start Date: 03/31/2017


Turning Movement Peak Hour Data Plot (7:30 AM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft @ Levesque
Site Code: 00855103
Start Date: 03/31/2017


# Turning Movement Peak Hour Data (11:00 AM)

| Start Time | Levesque Southbound | | | | Bancroft Westbound | | | | Bancroft Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Left | Peds | App. Total | Right | Thru | Peds | App. Total | Thru | Left | Peds | App. Total | Int. Total |
| 11:00 AM | 10 | 4 | 0 | 14 | 3 | 8 | 0 | 11 | 13 | 14 | 0 | 27 | 52 |
| 11:15 AM | 17 | 2 | 0 | 19 | 5 | 13 | 0 | 18 | 17 | 16 | 0 | 33 | 70 |
| 11:30 AM | 13 | 3 | 0 | 16 | 3 | 11 | 0 | 14 | 9 | 17 | 0 | 26 | 56 |
| 11:45 AM | 16 | 2 | 0 | 18 | 4 | 12 | 1 | 16 | 13 | 15 | 1 | 28 | 62 |
| Total | 56 | 11 | 0 | 67 | 15 | 44 | 1 | 59 | 52 | 62 | 1 | 114 | 240 |
| Approach % | 83.6 | 16.4 | - | - | 25.4 | 74.6 | - | - | 45.6 | 54.4 | - | - | - |
| Total % | 23.3 | 4.6 | - | 27.9 | 6.3 | 18.3 | - | 24.6 | 21.7 | 25.8 | - | 47.5 | - |
| PHF | 0.824 | 0.688 | - | 0.882 | 0.750 | 0.846 | - | 0.819 | 0.765 | 0.912 | - | 0.864 | 0.857 |
| Lights | 55 | 10 | - | 65 | 13 | 43 | - | 56 | 51 | 60 | - | 111 | 232 |
| % Lights | 98.2 | 90.9 | - | 97.0 | 86.7 | 97.7 | - | 94.9 | 98.1 | 96.8 | - | 97.4 | 96.7 |
| Mediums | 1 | 0 | - | 1 | 2 | 1 | - | 3 | 1 | 2 | - | 3 | 7 |
| % Mediums | 1.8 | 0.0 | - | 1.5 | 13.3 | 2.3 | - | 5.1 | 1.9 | 3.2 | - | 2.6 | 2.9 |
| Articulated Trucks | 0 | 1 | - | 1 | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 1 |
| % Articulated Trucks | 0.0 | 9.1 | - | 1.5 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.4 |
| Bicycles on Road | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | 0.0 | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | 0 | - | - | - | 1 | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | - | - | 100.0 | - | - | - | 100.0 | - | - |

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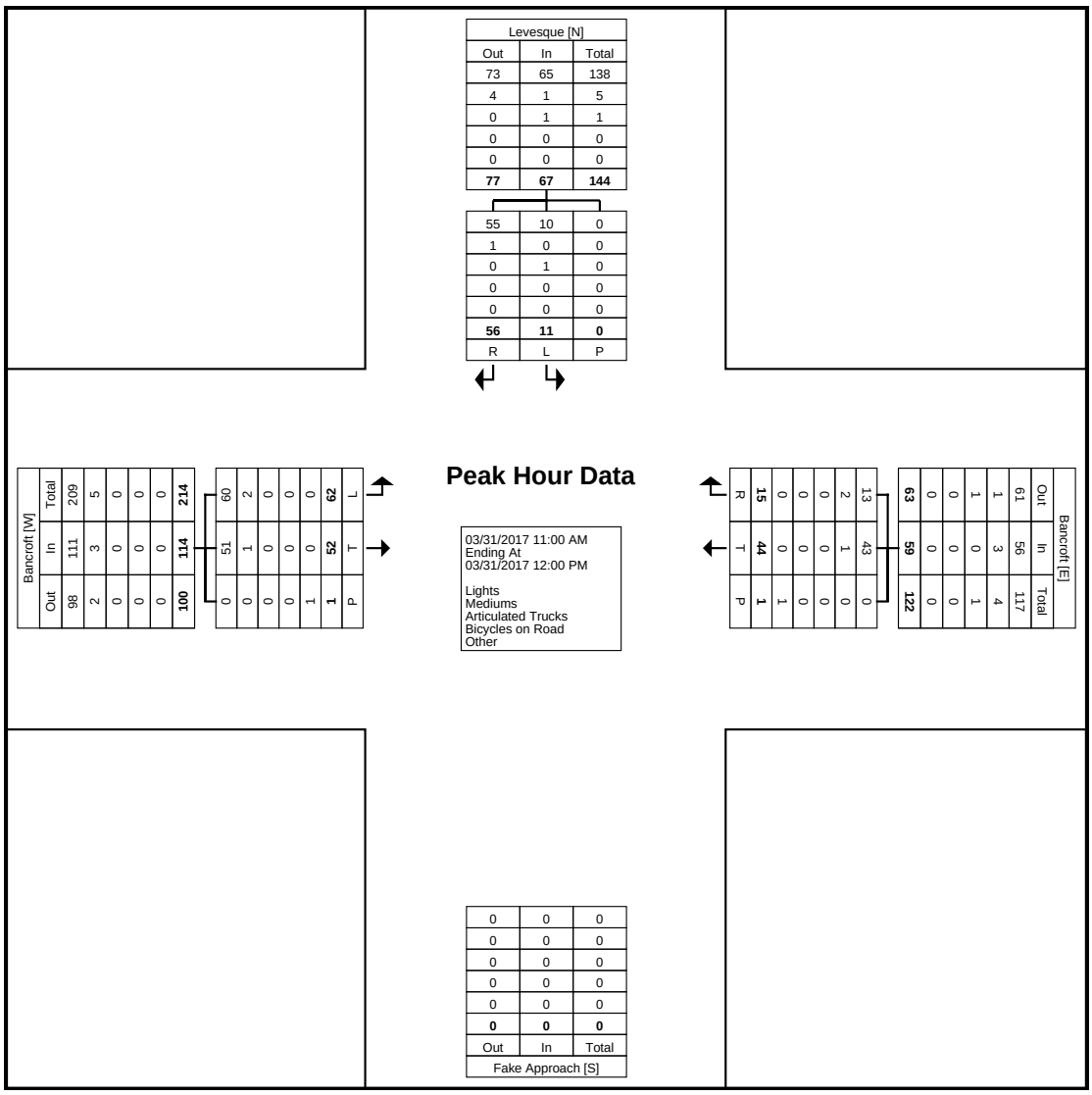
705-674-4455

Count Name: Bancroft @ Levesque
Site Code: 00855103
Start Date: 03/31/2017


Turning Movement Peak Hour Data Plot (11:00 AM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft @ Levesque
Site Code: 00855103
Start Date: 03/31/2017


# Turning Movement Peak Hour Data (12:00 PM)

| Start Time | Levesque Southbound | | | | Bancroft Westbound | | | | Bancroft Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Left | Peds | App. Total | Right | Thru | Peds | App. Total | Thru | Left | Peds | App. Total | Int. Total |
| 12:00 PM | 18 | 2 | 0 | 20 | 0 | 6 | 0 | 6 | 10 | 15 | 0 | 25 | 51 |
| 12:15 PM | 15 | 3 | 0 | 18 | 2 | 10 | 0 | 12 | 7 | 14 | 1 | 21 | 51 |
| 12:30 PM | 16 | 2 | 0 | 18 | 2 | 12 | 0 | 14 | 10 | 18 | 0 | 28 | 60 |
| 12:45 PM | 20 | 6 | 0 | 26 | 5 | 11 | 0 | 16 | 16 | 16 | 0 | 32 | 74 |
| Total | 69 | 13 | 0 | 82 | 9 | 39 | 0 | 48 | 43 | 63 | 1 | 106 | 236 |
| Approach % | 84.1 | 15.9 | - | - | 18.8 | 81.3 | - | - | 40.6 | 59.4 | - | - | - |
| Total % | 29.2 | 5.5 | - | 34.7 | 3.8 | 16.5 | - | 20.3 | 18.2 | 26.7 | - | 44.9 | - |
| PHF | 0.863 | 0.542 | - | 0.788 | 0.450 | 0.813 | - | 0.750 | 0.672 | 0.875 | - | 0.828 | 0.797 |
| Lights | 68 | 12 | - | 80 | 8 | 36 | - | 44 | 43 | 62 | - | 105 | 229 |
| % Lights | 98.6 | 92.3 | - | 97.6 | 88.9 | 92.3 | - | 91.7 | 100.0 | 98.4 | - | 99.1 | 97.0 |
| Mediums | 1 | 1 | - | 2 | 1 | 3 | - | 4 | 0 | 1 | - | 1 | 7 |
| % Mediums | 1.4 | 7.7 | - | 2.4 | 11.1 | 7.7 | - | 8.3 | 0.0 | 1.6 | - | 0.9 | 3.0 |
| Articulated Trucks | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | 0 | - | - | - | 0 | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | 0 | - | - | - | 0 | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
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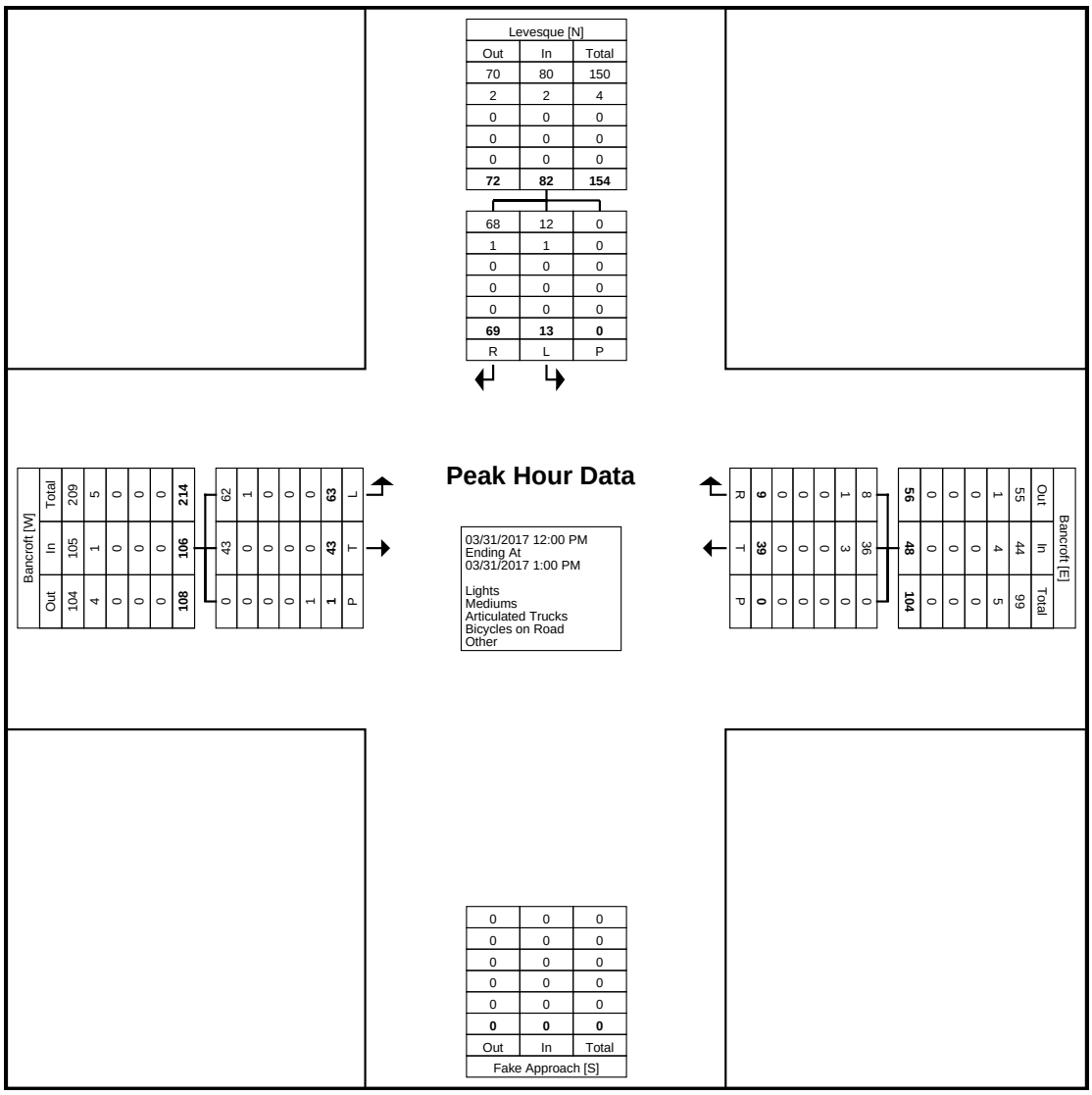
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft @ Levesque
Site Code: 00855103
Start Date: 03/31/2017


Turning Movement Peak Hour Data Plot (12:00 PM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
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705-674-4455

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1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft Drive @ Moonlight Ave.
Site Code:
Start Date: 04/12/2017


# Turning Movement Data

| Start Time | Moonlight Ave. Southbound | | | | | Bancroft Drive Westbound | | | | | Moonlight Beach Road Northbound | | | | | Bancroft Drive Eastbound | | | | | Int. Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | |
| 3:00 PM | 4 | 1 | 1 | 0 | 6 | 2 | 6 | 0 | 0 | 8 | 0 | 1 | 3 | 0 | 4 | 3 | 11 | 3 | 0 | 17 | 35 |
| 3:15 PM | 2 | 1 | 2 | 0 | 5 | 4 | 4 | 0 | 0 | 8 | 0 | 0 | 2 | 0 | 2 | 1 | 12 | 7 | 0 | 20 | 35 |
| 3:30 PM | 1 | 2 | 2 | 0 | 5 | 6 | 7 | 0 | 0 | 13 | 0 | 0 | 1 | 0 | 1 | 0 | 8 | 10 | 0 | 18 | 37 |
| 3:45 PM | 3 | 1 | 3 | 0 | 7 | 4 | 4 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 14 | 9 | 0 | 26 | 41 |
| Hourly Total | 10 | 5 | 8 | 0 | 23 | 16 | 21 | 0 | 0 | 37 | 0 | 1 | 6 | 0 | 7 | 7 | 45 | 29 | 0 | 81 | 148 |
| 4:00 PM | 3 | 2 | 6 | 0 | 11 | 5 | 9 | 0 | 0 | 14 | 1 | 2 | 0 | 0 | 3 | 3 | 9 | 7 | 0 | 19 | 47 |
| 4:15 PM | 6 | 2 | 6 | 0 | 14 | 0 | 6 | 1 | 0 | 7 | 1 | 2 | 4 | 0 | 7 | 1 | 14 | 12 | 0 | 27 | 55 |
| 4:30 PM | 8 | 0 | 11 | 0 | 19 | 4 | 11 | 2 | 0 | 17 | 1 | 0 | 1 | 0 | 2 | 0 | 12 | 11 | 0 | 23 | 61 |
| 4:45 PM | 10 | 0 | 3 | 0 | 13 | 0 | 10 | 0 | 0 | 10 | 1 | 3 | 1 | 0 | 5 | 1 | 14 | 11 | 0 | 26 | 54 |
| Hourly Total | 27 | 4 | 26 | 0 | 57 | 9 | 36 | 3 | 0 | 48 | 4 | 7 | 6 | 0 | 17 | 5 | 49 | 41 | 0 | 95 | 217 |
| 5:00 PM | 5 | 1 | 12 | 0 | 18 | 4 | 11 | 0 | 0 | 15 | 0 | 0 | 1 | 0 | 1 | 0 | 20 | 16 | 0 | 36 | 70 |
| 5:15 PM | 9 | 0 | 7 | 0 | 16 | 3 | 7 | 0 | 0 | 10 | 1 | 1 | 1 | 0 | 3 | 3 | 17 | 6 | 0 | 26 | 55 |
| 5:30 PM | 2 | 1 | 2 | 0 | 5 | 1 | 11 | 1 | 0 | 13 | 1 | 0 | 2 | 0 | 3 | 2 | 16 | 13 | 0 | 31 | 52 |
| 5:45 PM | 1 | 0 | 10 | 0 | 11 | 2 | 3 | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 1 | 4 | 19 | 6 | 0 | 29 | 46 |
| Hourly Total | 17 | 2 | 31 | 0 | 50 | 10 | 32 | 1 | 0 | 43 | 2 | 1 | 5 | 0 | 8 | 9 | 72 | 41 | 0 | 122 | 223 |
| 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:00 AM | 1 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 6:15 AM | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 3 | 0 | 4 | 10 |
| 6:30 AM | 2 | 0 | 1 | 0 | 3 | 4 | 8 | 0 | 0 | 12 | 0 | 0 | 1 | 0 | 1 | 0 | 5 | 0 | 0 | 5 | 21 |
| 6:45 AM | 2 | 0 | 4 | 0 | 6 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 2 | 0 | 7 | 23 |
| Hourly Total | 5 | 0 | 6 | 0 | 11 | 5 | 23 | 0 | 0 | 28 | 0 | 0 | 3 | 0 | 3 | 1 | 10 | 5 | 0 | 16 | 58 |
| 7:00 AM | 5 | 1 | 0 | 1 | 6 | 2 | 15 | 0 | 0 | 17 | 0 | 0 | 1 | 0 | 1 | 0 | 5 | 1 | 1 | 6 | 30 |
| 7:15 AM | 4 | 0 | 1 | 0 | 5 | 4 | 15 | 0 | 0 | 19 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 0 | 4 | 29 |
| 7:30 AM | 7 | 0 | 2 | 0 | 9 | 5 | 17 | 0 | 0 | 22 | 0 | 0 | 1 | 0 | 1 | 0 | 6 | 1 | 0 | 7 | 39 |
| 7:45 AM | 4 | 0 | 7 | 0 | 11 | 8 | 12 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 5 | 0 | 14 | 45 |
| Hourly Total | 20 | 1 | 10 | 1 | 31 | 19 | 59 | 0 | 0 | 78 | 0 | 1 | 2 | 0 | 3 | 1 | 22 | 8 | 1 | 31 | 143 |
| 8:00 AM | 7 | 0 | 3 | 0 | 10 | 3 | 19 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 2 | 0 | 8 | 40 |
| 8:15 AM | 5 | 1 | 1 | 0 | 7 | 4 | 5 | 0 | 0 | 9 | 0 | 0 | 3 | 0 | 3 | 1 | 5 | 7 | 0 | 13 | 32 |
| 8:30 AM | 7 | 1 | 3 | 0 | 11 | 4 | 7 | 0 | 0 | 11 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 4 | 0 | 7 | 30 |
| 8:45 AM | 3 | 1 | 3 | 0 | 7 | 1 | 8 | 0 | 0 | 9 | 0 | 2 | 4 | 0 | 6 | 3 | 5 | 7 | 0 | 15 | 37 |
| Hourly Total | 22 | 3 | 10 | 0 | 35 | 12 | 39 | 0 | 0 | 51 | 0 | 3 | 7 | 0 | 10 | 7 | 16 | 20 | 0 | 43 | 139 |
| 9:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *** BREAK *** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hourly Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11:00 AM | 4 | 0 | 1 | 0 | 5 | 2 | 6 | 0 | 0 | 8 | 0 | 2 | 0 | 0 | 2 | 1 | 4 | 4 | 1 | 9 | 24 |
| 11:15 AM | 1 | 2 | 1 | 0 | 4 | 0 | 6 | 2 | 0 | 8 | 1 | 0 | 0 | 0 | 1 | 1 | 10 | 4 | 0 | 15 | 28 |
| 11:30 AM | 4 | 0 | 2 | 0 | 6 | 5 | 8 | 0 | 0 | 13 | 0 | 1 | 2 | 0 | 3 | 1 | 1 | 7 | 0 | 9 | 31 |
| 11:45 AM | 4 | 0 | 2 | 0 | 6 | 0 | 8 | 2 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | 3 | 0 | 11 | 27 |
| Hourly Total | 13 | 2 | 6 | 0 | 21 | 7 | 28 | 4 | 0 | 39 | 1 | 3 | 2 | 0 | 6 | 4 | 22 | 18 | 1 | 44 | 110 |
| 12:00 PM | 7 | 1 | 8 | 0 | 16 | 2 | 5 | 0 | 0 | 7 | 0 | 0 | 2 | 0 | 2 | 3 | 10 | 8 | 1 | 21 | 46 |
| 12:15 PM | 5 | 1 | 2 | 0 | 8 | 2 | 6 | 0 | 0 | 8 | 0 | 1 | 1 | 0 | 2 | 2 | 11 | 3 | 0 | 16 | 34 |
| 12:30 PM | 6 | 2 | 4 | 0 | 12 | 5 | 9 | 0 | 0 | 14 | 0 | 2 | 3 | 0 | 5 | 4 | 10 | 5 | 0 | 19 | 50 |
| 12:45 PM | 10 | 1 | 4 | 1 | 15 | 5 | 4 | 1 | 0 | 10 | 0 | 3 | 3 | 0 | 6 | 1 | 6 | 10 | 0 | 17 | 48 |
| Hourly Total | 28 | 5 | 18 | 1 | 51 | 14 | 24 | 1 | 0 | 39 | 0 | 6 | 9 | 0 | 15 | 10 | 37 | 26 | 1 | 73 | 178 |
| 1:00 PM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Grand Total | 142 | 22 | 116 | 2 | 280 | 92 | 262 | 9 | 0 | 363 | 7 | 22 | 40 | 0 | 69 | 44 | 273 | 188 | 3 | 505 | 1217 |
| Approach % | 50.7 | 7.9 | 41.4 | - | - | 25.3 | 72.2 | 2.5 | - | - | 10.1 | 31.9 | 58.0 | - | - | 8.7 | 54.1 | 37.2 | - | - | - |
| Total % | 11.7 | 1.8 | 9.5 | - | 23.0 | 7.6 | 21.5 | 0.7 | - | 29.8 | 0.6 | 1.8 | 3.3 | - | 5.7 | 3.6 | 22.4 | 15.4 | - | 41.5 | - |
| Lights | 121 | 21 | 105 | - | 247 | 87 | 253 | 9 | - | 349 | 7 | 21 | 40 | - | 68 | 44 | 269 | 182 | - | 495 | 1159 |
| % Lights | 85.2 | 95.5 | 90.5 | - | 88.2 | 94.6 | 96.6 | 100.0 | - | 96.1 | 100.0 | 95.5 | 100.0 | - | 98.6 | 100.0 | 98.5 | 96.8 | - | 98.0 | 95.2 |
| Mediums | 21 | 1 | 11 | - | 33 | 4 | 7 | 0 | - | 11 | 0 | 1 | 0 | - | 1 | 0 | 4 | 6 | - | 10 | 55 |
| % Mediums | 14.8 | 4.5 | 9.5 | - | 11.8 | 4.3 | 2.7 | 0.0 | - | 3.0 | 0.0 | 4.5 | 0.0 | - | 1.4 | 0.0 | 1.5 | 3.2 | - | 2.0 | 4.5 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 1 | 2 | 0 | - | 3 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 3 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | 0.0 | 1.1 | 0.8 | 0.0 | - | 0.8 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.2 |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | 2 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 3 | - | - |
| % Pedestrians | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

Traffic and Transportation Engineering Services
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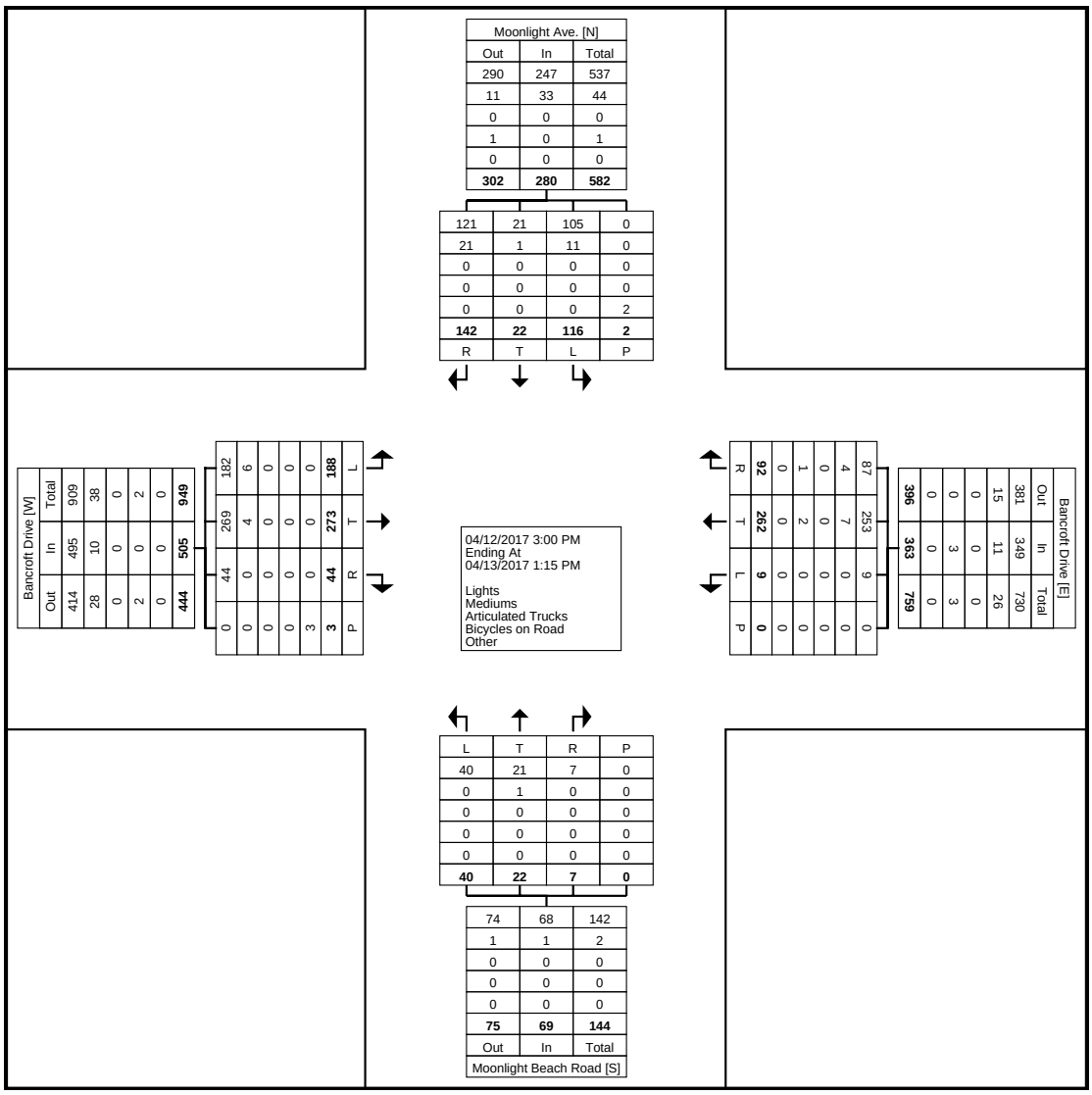
705-674-4455

Count Name: Bancroft Drive @ Moonlight Ave.
Site Code:
Start Date: 04/12/2017


Turning Movement Data Plot

Traffic and Transportation Engineering Services
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Sudbury, Ontario, Canada P3A 5P3
705-674-4455

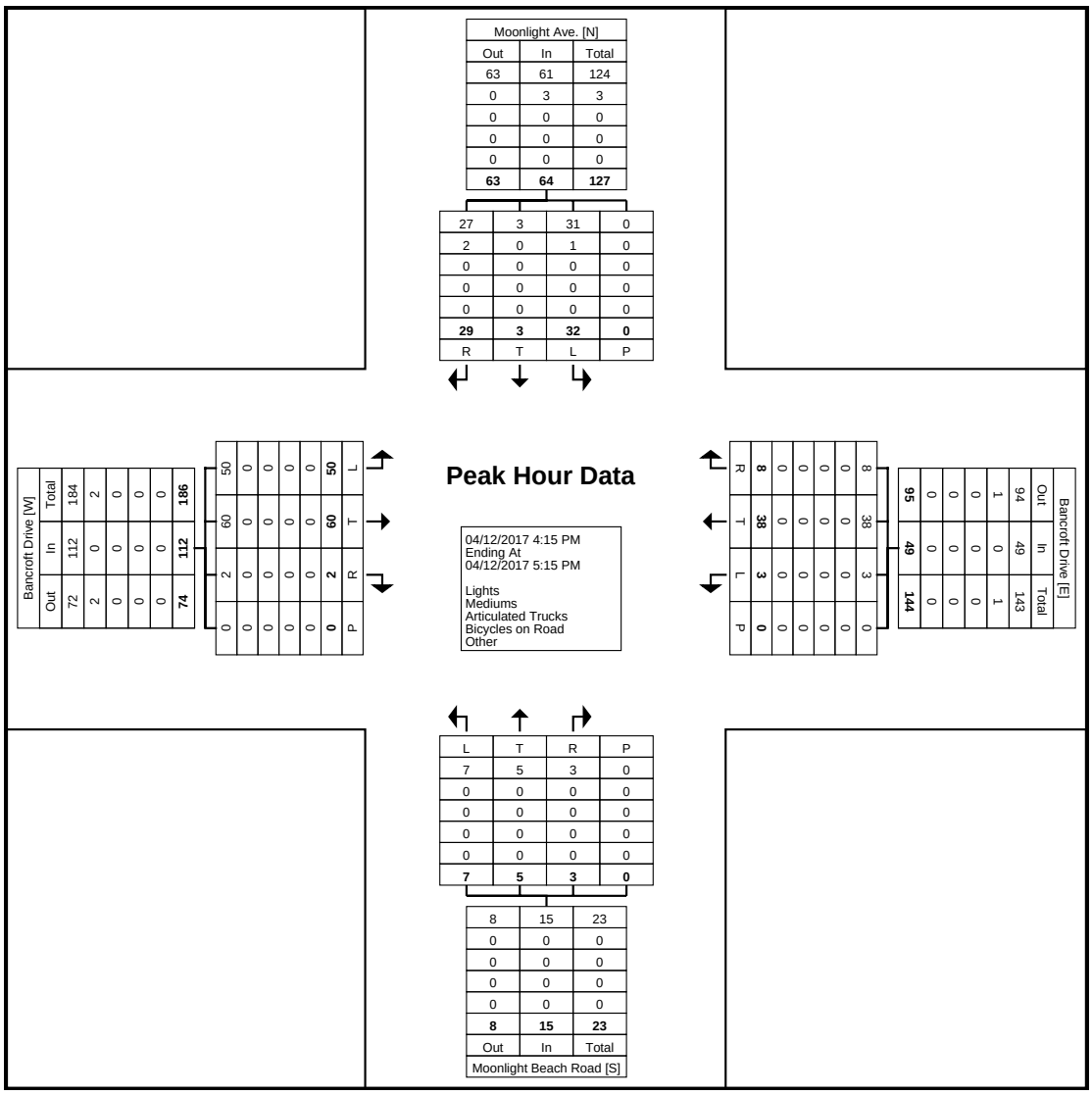
Count Name: Bancroft Drive @ Moonlight Ave.
Site Code:
Start Date: 04/12/2017


# Turning Movement Peak Hour Data (4:15 PM)

| Start Time | Moonlight Ave. Southbound | | | | | Bancroft Drive Westbound | | | | | Moonlight Beach Road Northbound | | | | | Bancroft Drive Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 4:15 PM | 6 | 2 | 6 | 0 | 14 | 0 | 6 | 1 | 0 | 7 | 1 | 2 | 4 | 0 | 7 | 1 | 14 | 12 | 0 | 27 | 55 |
| 4:30 PM | 8 | 0 | 11 | 0 | 19 | 4 | 11 | 2 | 0 | 17 | 1 | 0 | 1 | 0 | 2 | 0 | 12 | 11 | 0 | 23 | 61 |
| 4:45 PM | 10 | 0 | 3 | 0 | 13 | 0 | 10 | 0 | 0 | 10 | 1 | 3 | 1 | 0 | 5 | 1 | 14 | 11 | 0 | 26 | 54 |
| 5:00 PM | 5 | 1 | 12 | 0 | 18 | 4 | 11 | 0 | 0 | 15 | 0 | 0 | 1 | 0 | 1 | 0 | 20 | 16 | 0 | 36 | 70 |
| Total | 29 | 3 | 32 | 0 | 64 | 8 | 38 | 3 | 0 | 49 | 3 | 5 | 7 | 0 | 15 | 2 | 60 | 50 | 0 | 112 | 240 |
| Approach % | 45.3 | 4.7 | 50.0 | - | - | 16.3 | 77.6 | 6.1 | - | - | 20.0 | 33.3 | 46.7 | - | - | 1.8 | 53.6 | 44.6 | - | - | - |
| Total % | 12.1 | 1.3 | 13.3 | - | 26.7 | 3.3 | 15.8 | 1.3 | - | 20.4 | 1.3 | 2.1 | 2.9 | - | 6.3 | 0.8 | 25.0 | 20.8 | - | 46.7 | - |
| PHF | 0.725 | 0.375 | 0.667 | - | 0.842 | 0.500 | 0.864 | 0.375 | - | 0.721 | 0.750 | 0.417 | 0.438 | - | 0.536 | 0.500 | 0.750 | 0.781 | - | 0.778 | 0.857 |
| Lights | 27 | 3 | 31 | - | 61 | 8 | 38 | 3 | - | 49 | 3 | 5 | 7 | - | 15 | 2 | 60 | 50 | - | 112 | 237 |
| % Lights | 93.1 | 100.0 | 96.9 | - | 95.3 | 100.0 | 100.0 | 100.0 | - | 100.0 | 100.0 | 100.0 | 100.0 | - | 100.0 | 100.0 | 100.0 | 100.0 | - | 100.0 | 98.8 |
| Mediums | 2 | 0 | 1 | - | 3 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 3 |
| % Mediums | 6.9 | 0.0 | 3.1 | - | 4.7 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 1.3 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft Drive @ Moonlight Ave.
Site Code:
Start Date: 04/12/2017


Turning Movement Peak Hour Data Plot (4:15 PM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

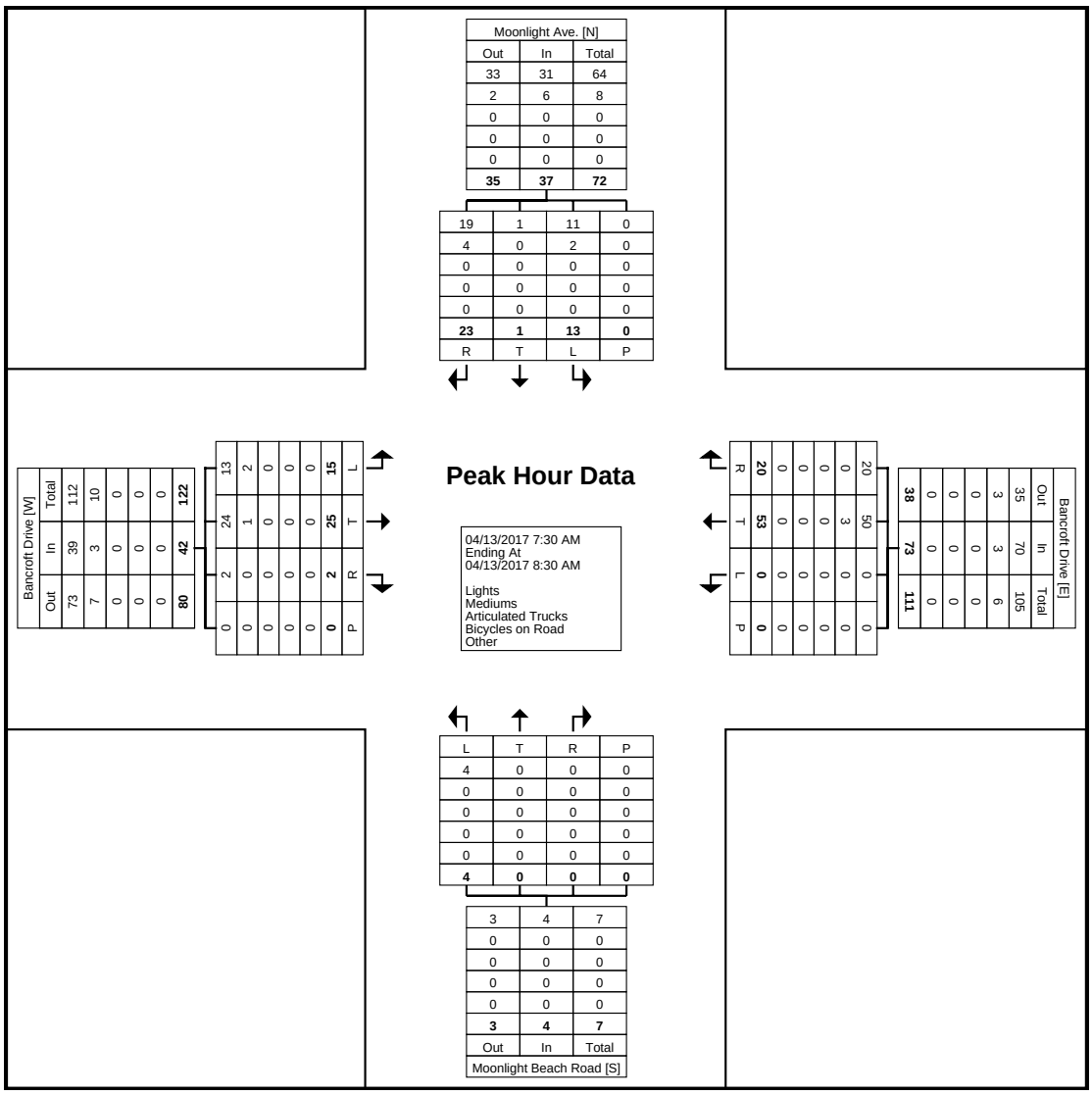
Count Name: Bancroft Drive @ Moonlight Ave.
Site Code:
Start Date: 04/12/2017


# Turning Movement Peak Hour Data (7:30 AM)

| Start Time | Moonlight Ave. Southbound | | | | | Bancroft Drive Westbound | | | | | Moonlight Beach Road Northbound | | | | | Bancroft Drive Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 7:30 AM | 7 | 0 | 2 | 0 | 9 | 5 | 17 | 0 | 0 | 22 | 0 | 0 | 1 | 0 | 1 | 0 | 6 | 1 | 0 | 7 | 39 |
| 7:45 AM | 4 | 0 | 7 | 0 | 11 | 8 | 12 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 5 | 0 | 14 | 45 |
| 8:00 AM | 7 | 0 | 3 | 0 | 10 | 3 | 19 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 2 | 0 | 8 | 40 |
| 8:15 AM | 5 | 1 | 1 | 0 | 7 | 4 | 5 | 0 | 0 | 9 | 0 | 0 | 3 | 0 | 3 | 1 | 5 | 7 | 0 | 13 | 32 |
| Total | 23 | 1 | 13 | 0 | 37 | 20 | 53 | 0 | 0 | 73 | 0 | 0 | 4 | 0 | 4 | 2 | 25 | 15 | 0 | 42 | 156 |
| Approach % | 62.2 | 2.7 | 35.1 | - | - | 27.4 | 72.6 | 0.0 | - | - | 0.0 | 0.0 | 100.0 | - | - | 4.8 | 59.5 | 35.7 | - | - | - |
| Total % | 14.7 | 0.6 | 8.3 | - | 23.7 | 12.8 | 34.0 | 0.0 | - | 46.8 | 0.0 | 0.0 | 2.6 | - | 2.6 | 1.3 | 16.0 | 9.6 | - | 26.9 | - |
| PHF | 0.821 | 0.250 | 0.464 | - | 0.841 | 0.625 | 0.697 | 0.000 | - | 0.830 | 0.000 | 0.000 | 0.333 | - | 0.333 | 0.500 | 0.694 | 0.536 | - | 0.750 | 0.867 |
| Lights | 19 | 1 | 11 | - | 31 | 20 | 50 | 0 | - | 70 | 0 | 0 | 4 | - | 4 | 2 | 24 | 13 | - | 39 | 144 |
| % Lights | 82.6 | 100.0 | 84.6 | - | 83.8 | 100.0 | 94.3 | - | - | 95.9 | - | - | 100.0 | - | 100.0 | 100.0 | 96.0 | 86.7 | - | 92.9 | 92.3 |
| Mediums | 4 | 0 | 2 | - | 6 | 0 | 3 | 0 | - | 3 | 0 | 0 | 0 | - | 0 | 0 | 1 | 2 | - | 3 | 12 |
| % Mediums | 17.4 | 0.0 | 15.4 | - | 16.2 | 0.0 | 5.7 | - | - | 4.1 | - | - | 0.0 | - | 0.0 | 0.0 | 4.0 | 13.3 | - | 7.1 | 7.7 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | - | - | 0.0 | - | - | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft Drive @ Moonlight Ave.
Site Code:
Start Date: 04/12/2017


Turning Movement Peak Hour Data Plot (7:30 AM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft Drive @ Moonlight Ave.
Site Code:
Start Date: 04/12/2017


# Turning Movement Peak Hour Data (11:00 AM)

| Start Time | Moonlight Ave. Southbound | | | | | Bancroft Drive Westbound | | | | | Moonlight Beach Road Northbound | | | | | Bancroft Drive Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 11:00 AM | 4 | 0 | 1 | 0 | 5 | 2 | 6 | 0 | 0 | 8 | 0 | 2 | 0 | 0 | 2 | 1 | 4 | 4 | 1 | 9 | 24 |
| 11:15 AM | 1 | 2 | 1 | 0 | 4 | 0 | 6 | 2 | 0 | 8 | 1 | 0 | 0 | 0 | 1 | 1 | 10 | 4 | 0 | 15 | 28 |
| 11:30 AM | 4 | 0 | 2 | 0 | 6 | 5 | 8 | 0 | 0 | 13 | 0 | 1 | 2 | 0 | 3 | 1 | 1 | 7 | 0 | 9 | 31 |
| 11:45 AM | 4 | 0 | 2 | 0 | 6 | 0 | 8 | 2 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | 3 | 0 | 11 | 27 |
| Total | 13 | 2 | 6 | 0 | 21 | 7 | 28 | 4 | 0 | 39 | 1 | 3 | 2 | 0 | 6 | 4 | 22 | 18 | 1 | 44 | 110 |
| Approach % | 61.9 | 9.5 | 28.6 | - | - | 17.9 | 71.8 | 10.3 | - | - | 16.7 | 50.0 | 33.3 | - | - | 9.1 | 50.0 | 40.9 | - | - | - |
| Total % | 11.8 | 1.8 | 5.5 | - | 19.1 | 6.4 | 25.5 | 3.6 | - | 35.5 | 0.9 | 2.7 | 1.8 | - | 5.5 | 3.6 | 20.0 | 16.4 | - | 40.0 | - |
| PHF | 0.813 | 0.250 | 0.750 | - | 0.875 | 0.350 | 0.875 | 0.500 | - | 0.750 | 0.250 | 0.375 | 0.250 | - | 0.500 | 1.000 | 0.550 | 0.643 | - | 0.733 | 0.887 |
| Lights | 11 | 2 | 6 | - | 19 | 7 | 27 | 4 | - | 38 | 1 | 3 | 2 | - | 6 | 4 | 22 | 17 | - | 43 | 106 |
| % Lights | 84.6 | 100.0 | 100.0 | - | 90.5 | 100.0 | 96.4 | 100.0 | - | 97.4 | 100.0 | 100.0 | 100.0 | - | 100.0 | 100.0 | 100.0 | 94.4 | - | 97.7 | 96.4 |
| Mediums | 2 | 0 | 0 | - | 2 | 0 | 1 | 0 | - | 1 | 0 | 0 | 0 | - | 0 | 0 | 0 | 1 | - | 1 | 4 |
| % Mediums | 15.4 | 0.0 | 0.0 | - | 9.5 | 0.0 | 3.6 | 0.0 | - | 2.6 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 5.6 | - | 2.3 | 3.6 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

Traffic and Transportation Engineering Services
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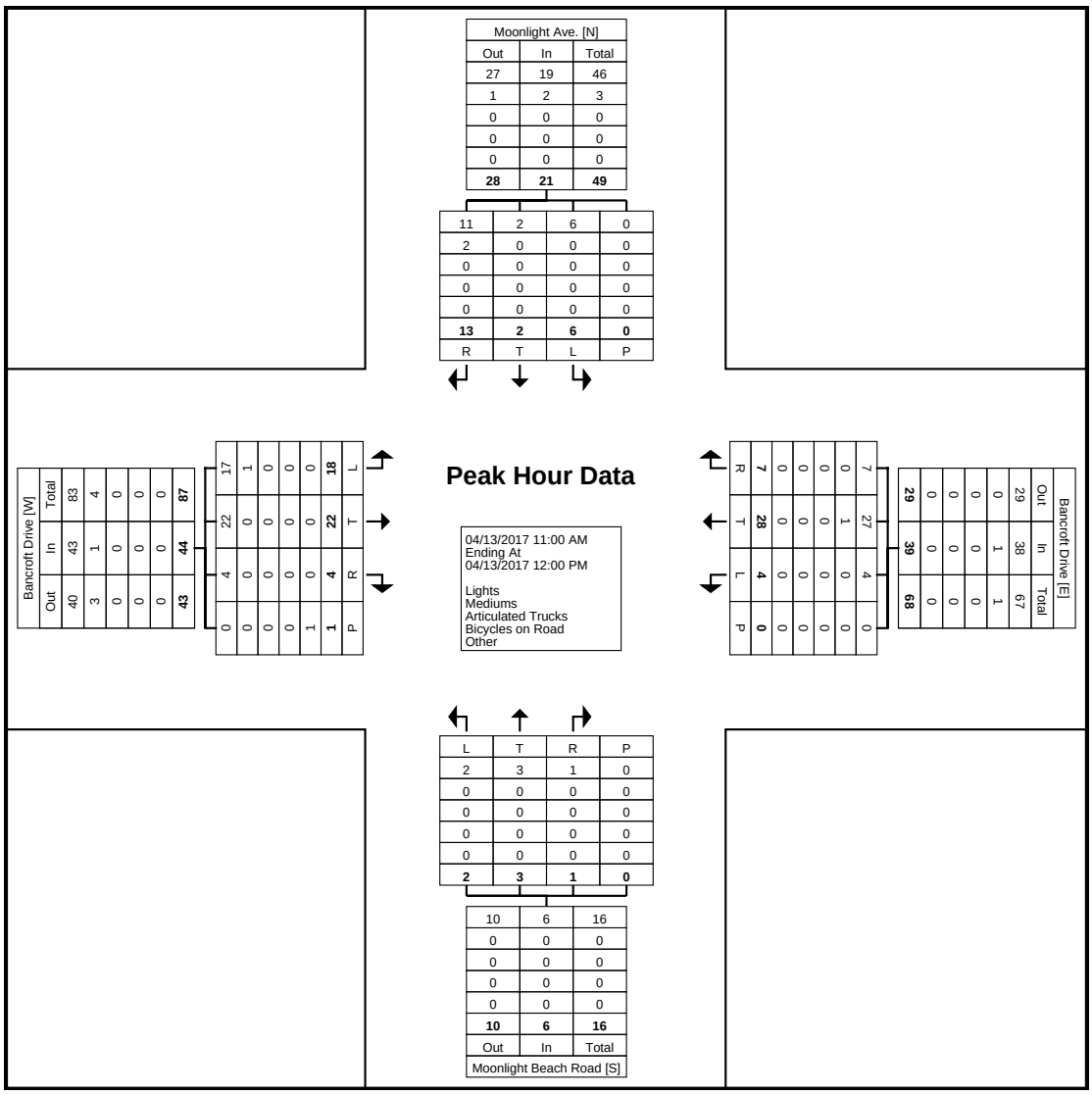
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft Drive @ Moonlight Ave.
Site Code:
Start Date: 04/12/2017


Turning Movement Peak Hour Data Plot (11:00 AM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada P3A 5P3
705-674-4455

Count Name: Bancroft Drive @ Moonlight Ave.
Site Code:
Start Date: 04/12/2017


# Turning Movement Peak Hour Data (12:00 PM)

| Start Time | Moonlight Ave. Southbound | | | | | Bancroft Drive Westbound | | | | | Moonlight Beach Road Northbound | | | | | Bancroft Drive Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 12:00 PM | 7 | 1 | 8 | 0 | 16 | 2 | 5 | 0 | 0 | 7 | 0 | 0 | 2 | 0 | 2 | 3 | 10 | 8 | 1 | 21 | 46 |
| 12:15 PM | 5 | 1 | 2 | 0 | 8 | 2 | 6 | 0 | 0 | 8 | 0 | 1 | 1 | 0 | 2 | 2 | 11 | 3 | 0 | 16 | 34 |
| 12:30 PM | 6 | 2 | 4 | 0 | 12 | 5 | 9 | 0 | 0 | 14 | 0 | 2 | 3 | 0 | 5 | 4 | 10 | 5 | 0 | 19 | 50 |
| 12:45 PM | 10 | 1 | 4 | 1 | 15 | 5 | 4 | 1 | 0 | 10 | 0 | 3 | 3 | 0 | 6 | 1 | 6 | 10 | 0 | 17 | 48 |
| Total | 28 | 5 | 18 | 1 | 51 | 14 | 24 | 1 | 0 | 39 | 0 | 6 | 9 | 0 | 15 | 10 | 37 | 26 | 1 | 73 | 178 |
| Approach % | 54.9 | 9.8 | 35.3 | - | - | 35.9 | 61.5 | 2.6 | - | - | 0.0 | 40.0 | 60.0 | - | - | 13.7 | 50.7 | 35.6 | - | - | - |
| Total % | 15.7 | 2.8 | 10.1 | - | 28.7 | 7.9 | 13.5 | 0.6 | - | 21.9 | 0.0 | 3.4 | 5.1 | - | 8.4 | 5.6 | 20.8 | 14.6 | - | 41.0 | - |
| PHF | 0.700 | 0.625 | 0.563 | - | 0.797 | 0.700 | 0.667 | 0.250 | - | 0.696 | 0.000 | 0.500 | 0.750 | - | 0.625 | 0.625 | 0.841 | 0.650 | - | 0.869 | 0.890 |
| Lights | 26 | 5 | 15 | - | 46 | 12 | 23 | 1 | - | 36 | 0 | 6 | 9 | - | 15 | 10 | 37 | 26 | - | 73 | 170 |
| % Lights | 92.9 | 100.0 | 83.3 | - | 90.2 | 85.7 | 95.8 | 100.0 | - | 92.3 | - | 100.0 | 100.0 | - | 100.0 | 100.0 | 100.0 | 100.0 | - | 100.0 | 95.5 |
| Mediums | 2 | 0 | 3 | - | 5 | 1 | 1 | 0 | - | 2 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 7 |
| % Mediums | 7.1 | 0.0 | 16.7 | - | 9.8 | 7.1 | 4.2 | 0.0 | - | 5.1 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 3.9 |
| Articulated Trucks | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 |
| % Articulated Trucks | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.0 |
| Bicycles on Road | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | - | 1 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 1 |
| % Bicycles on Road | 0.0 | 0.0 | 0.0 | - | 0.0 | 7.1 | 0.0 | 0.0 | - | 2.6 | - | 0.0 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.0 | - | 0.0 | 0.6 |
| Bicycles on Crosswalk | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - |
| % Bicycles on Crosswalk | - | - | - | 0.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - |
| Pedestrians | - | - | - | 1 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 1 | - | - |
| % Pedestrians | - | - | - | 100.0 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100.0 | - | - |

Traffic and Transportation Engineering Services
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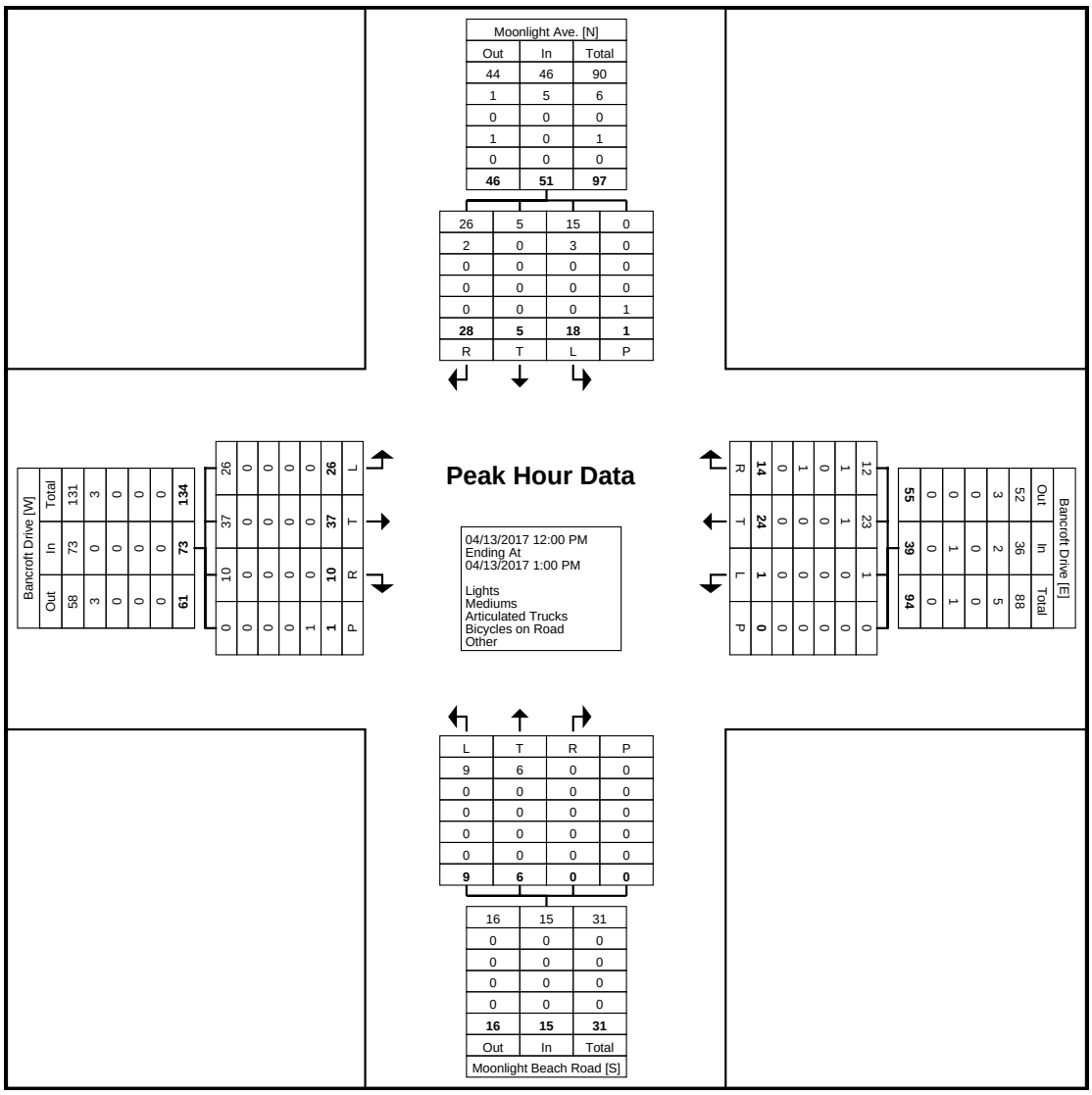
Count Name: Bancroft Drive @ Moonlight Ave.
Site Code:
Start Date: 04/12/2017


Turning Movement Peak Hour Data Plot (12:00 PM)

Traffic and Transportation Engineering Services
1800 Frobisher Street
PO Box 5000, STN A
Sudbury, Ontario, Canada  P3A 5P3
705-674-4455

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Project #20-191 - JD Engineering Inc

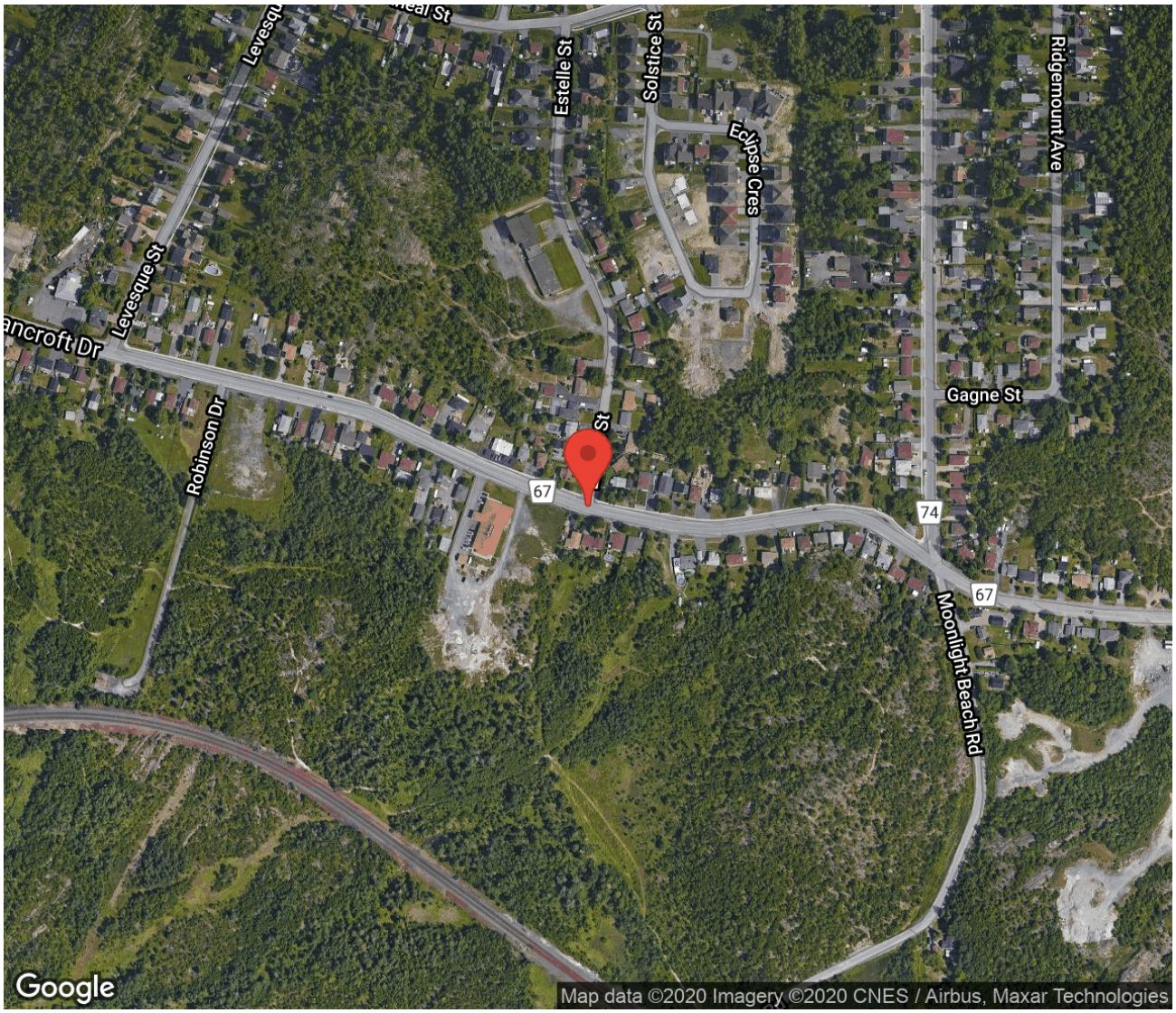
## Intersection Count Report

| | |
|---|---|
| **Intersection:** | Bancroft Dr & Estelle St |
| **Municipality:** | Sudbury |
| **Count Date:** | Nov 18, 2020 |
| **Site Code:** | 2019100001 |
| **Count Categories:** | Cars, Trucks, Bicycles, Pedestrians |
| **Count Period:** | 07:00-09:00, 16:00-19:00 |
| **Weather:** | Clear |

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Traffic Count Map

| | |
|---|---|
| Intersection: | Bancroft Dr & Estelle St |
| Municipality: | Sudbury |
| Count Date: | Nov 18, 2020 |



Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Traffic Count Summary

Intersection: Bancroft Dr & Estelle St
Municipality: Sudbury
Count Date: Nov 18, 2020

## Estelle St - Traffic Summary

| Hour | North Approach Totals | | | | | | South Approach Totals | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | 1 | 0 | 4 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 - 09:00 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BREAK | | | | | | | | | | | | |
| 16:00 - 17:00 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 - 18:00 | 2 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:00 - 19:00 | 1 | 0 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **GRAND TOTAL** | **5** | **0** | **9** | **0** | **14** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Traffic Count Summary

Intersection: Bancroft Dr & Estelle St
Municipality: Sudbury
Count Date: Nov 18, 2020

## Bancroft Dr - Traffic Summary

| | East Approach Totals | | | | | | West Approach Totals | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Includes Cars, Trucks, Bicycles | | | | | | Includes Cars, Trucks, Bicycles | | | | | |
| Hour | Left | Thru | Right | U-Turn | Total | Peds | Left | Thru | Right | U-Turn | Total | Peds |
| 07:00 - 08:00 | 0 | 71 | 4 | 0 | 75 | 0 | 2 | 35 | 0 | 0 | 37 | 2 |
| 08:00 - 09:00 | 0 | 65 | 4 | 0 | 69 | 0 | 1 | 42 | 0 | 0 | 43 | 0 |
| BREAK | | | | | | | | | | | | |
| 16:00 - 17:00 | 0 | 58 | 4 | 0 | 62 | 0 | 5 | 112 | 0 | 0 | 117 | 0 |
| 17:00 - 18:00 | 0 | 41 | 3 | 0 | 44 | 1 | 8 | 65 | 0 | 0 | 73 | 0 |
| 18:00 - 19:00 | 0 | 27 | 1 | 0 | 28 | 0 | 1 | 36 | 0 | 0 | 37 | 0 |
| **GRAND TOTAL** | **0** | **262** | **16** | **0** | **278** | **1** | **17** | **290** | **0** | **0** | **307** | **2** |

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Traffic Count Data

Intersection: Bancroft Dr & Estelle St
Municipality: Sudbury
Count Date: Nov 18, 2020

## North Approach - Estelle St

| 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 |
| 07:15 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 0 | 0 | 1 | 0 | 1 | 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 |
| 08:15 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 0 | 0 | 5 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Traffic Count Data

Intersection: Bancroft Dr & Estelle St
Municipality: Sudbury
Count Date: Nov 18, 2020

## North Approach - Estelle St

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ↰ | ↑ | ↱ | ↻ | Total | ↰ | ↑ | ↱ | ↻ | Total | ↰ | ↑ | ↱ | ↻ | Total | |
| 16:00 | 1 | 0 | 0 | 0 | 1 | 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 |
| 16:30 | 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 |
| 17:00 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 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 |
| 18:00 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:15 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:45 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 4 | 0 | 3 | 0 | 7 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| GRAND TOTAL | 4 | 0 | 8 | 0 | 12 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Traffic Count Data

Intersection: Bancroft Dr & Estelle St
Municipality: Sudbury
Count Date: Nov 18, 2020

## East Approach - Bancroft Dr

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ↰ | ↑ | ↱ | ↷ | Total | ↰ | ↑ | ↱ | ↷ | Total | ↰ | ↑ | ↱ | ↷ | Total | |
| 07:00 | 0 | 13 | 0 | 0 | 13 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 0 | 17 | 0 | 0 | 17 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 | 0 | 19 | 0 | 0 | 19 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 0 | 17 | 2 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 0 | 19 | 0 | 0 | 19 | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 0 | 11 | 0 | 0 | 11 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 0 | 18 | 2 | 0 | 20 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 0 | 12 | 1 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 0 | 126 | 5 | 0 | 131 | 0 | 10 | 3 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 |

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Traffic Count Data

Intersection: Bancroft Dr & Estelle St
Municipality: Sudbury
Count Date: Nov 18, 2020

## East Approach - Bancroft Dr

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ↰ | ↑ | ↱ | ↶ | Total | ↰ | ↑ | ↱ | ↶ | Total | ↰ | ↑ | ↱ | ↶ | Total | |
| 16:00 | 0 | 15 | 0 | 0 | 15 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 0 | 13 | 1 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 0 | 21 | 1 | 0 | 22 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 0 | 6 | 2 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 0 | 12 | 1 | 0 | 13 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 0 | 7 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 0 | 10 | 1 | 0 | 11 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 18:00 | 0 | 5 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:15 | 0 | 7 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:30 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:45 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 0 | 119 | 8 | 0 | 127 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 |
| GRAND TOTAL | 0 | 245 | 13 | 0 | 258 | 0 | 17 | 3 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 1 |

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Traffic Count Data

Intersection: Bancroft Dr & Estelle St
Municipality: Sudbury
Count Date: Nov 18, 2020

## West Approach - Bancroft Dr

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ↰ | ↑ | ↱ | ↻ | Total | ↰ | ↑ | ↱ | ↻ | Total | ↰ | ↑ | ↱ | ↻ | Total | |
| 07:00 | 0 | 7 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 | 0 | 9 | 0 | 0 | 9 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| 07:30 | 2 | 4 | 0 | 0 | 6 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 | 0 | 10 | 0 | 0 | 10 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:00 | 0 | 10 | 0 | 0 | 10 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 | 0 | 10 | 0 | 0 | 10 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:30 | 1 | 8 | 0 | 0 | 9 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 3 | 68 | 0 | 0 | 71 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 2 |

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Traffic Count Data

Intersection: Bancroft Dr & Estelle St
Municipality: Sudbury
Count Date: Nov 18, 2020

## West Approach - Bancroft Dr

| Start Time | Cars | | | | | Trucks | | | | | Bicycles | | | | | Total Peds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ↰ | ↑ | ↱ | ↻ | Total | ↰ | ↑ | ↱ | ↻ | Total | ↰ | ↑ | ↱ | ↻ | Total | |
| 16:00 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:15 | 1 | 32 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:30 | 2 | 23 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16:45 | 2 | 31 | 0 | 0 | 33 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:00 | 2 | 18 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:15 | 3 | 16 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:30 | 3 | 17 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17:45 | 0 | 14 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:00 | 0 | 13 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 18:15 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:30 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18:45 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SUBTOTAL | 13 | 212 | 0 | 0 | 225 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| GRAND TOTAL | 16 | 280 | 0 | 0 | 296 | 0 | 10 | 0 | 0 | 10 | 1 | 0 | 0 | 0 | 1 | 2 |

# Peak Hour Diagram

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

| Specified Period | | One Hour Peak | |
|---|---|---|---|
| From: | 07:00:00 | From: | 07:15:00 |
| To: | 09:00:00 | To: | 08:15:00 |

**Intersection:** Bancroft Dr & Estelle St
**Site ID:** 2019100001
**Count Date:** Nov 18, 2020

**Weather conditions:**

**** Unsignalized Intersection ****

**Major Road:** Estelle St runs N/S

## North Approach

| | Out | In | Total |
|---|---|---|---|
| Cars | 4 | 4 | 8 |
| Trucks | 1 | 3 | 4 |
| Bicycles | 0 | 0 | 0 |
| | **5** | **7** | **12** |

## Estelle St

| | | | |
|---|---|---|---|
| Bicycles | 0 | 0 | 0 |
| Trucks | 0 | 1 | 0 |
| Cars | 4 | 0 | 0 |
| **Totals** | **4** | **1** | **0** |

## East Approach

| | Out | In | Total |
|---|---|---|---|
| Cars | 74 | 33 | 107 |
| Trucks | 8 | 6 | 14 |
| Bicycles | 0 | 0 | 0 |
| | **82** | **39** | **121** |

Peds: 0

## Bancroft Dr

| Bicycles | Trucks | Cars | Totals |
|---|---|---|---|
| 0 | 0 | 0 | **0** |
| 0 | 0 | 2 | **2** |
| 0 | 5 | 33 | **38** |

Peds: 2


Peds: 0

## Bancroft Dr

| Totals | Cars | Trucks | Bicycles |
|---|---|---|---|
| **0** | 0 | 0 | 0 |
| **5** | 2 | 3 | 0 |
| **77** | 72 | 5 | 0 |

Peds: 0

## West Approach

| | Out | In | Total |
|---|---|---|---|
| Cars | 35 | 76 | 111 |
| Trucks | 5 | 5 | 10 |
| Bicycles | 0 | 0 | 0 |
| | **40** | **81** | **121** |

- Cars  - Trucks  - Bicycles

## Comments

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Peak Hour Summary

Intersection: Bancroft Dr & Estelle St
Count Date: Nov 18, 2020
Period: 07:00 - 09:00

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

| Start Time | North Approach Estelle St | | | | | | South Approach | | | | | | East Approach Bancroft Dr | | | | | | West Approach Bancroft Dr | | | | | | Total Vehicles |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ↰ | ↑ | ↱ | ↶ | Peds | Total | ↰ | ↑ | ↱ | ↶ | Peds | Total | ↰ | ↑ | ↱ | ↶ | Peds | Total | ↰ | ↑ | ↱ | ↶ | Peds | Total | |
| 07:15 | 0 | | 2 | 0 | 0 | 2 | | | | | 0 | | | 17 | 2 | 0 | 0 | 19 | 0 | 10 | | 0 | 2 | 10 | 31 |
| 07:30 | 1 | | 1 | 0 | 0 | 2 | | | | | 0 | | | 21 | 0 | 0 | 0 | 21 | 2 | 5 | | 0 | 0 | 7 | 30 |
| 07:45 | 0 | | 1 | 0 | 0 | 1 | | | | | 0 | | | 17 | 2 | 0 | 0 | 19 | 0 | 12 | | 0 | 0 | 12 | 32 |
| 08:00 | 0 | | 0 | 0 | 0 | 0 | | | | | 0 | | | 22 | 1 | 0 | 0 | 23 | 0 | 11 | | 0 | 0 | 11 | 34 |
| **Grand Total** | **1** | | **4** | **0** | **0** | **5** | | | | | **0** | **0** | | **77** | **5** | **0** | **0** | **82** | **2** | **38** | | **0** | **2** | **40** | **127** |
| **Approach %** | 20 | | 80 | 0 | | - | | | | | | - | | 93.9 | 6.1 | 0 | | - | 5 | 95 | | 0 | | - | |
| **Totals %** | 0.8 | | 3.1 | 0 | | 3.9 | | | | | | 0 | | 60.6 | 3.9 | 0 | | 64.6 | 1.6 | 29.9 | | 0 | | 31.5 | |
| **PHF** | **0.25** | | **0.5** | **0** | | **0.63** | | | | | | **0** | | **0.88** | **0.63** | **0** | | **0.89** | **0.25** | **0.79** | | **0** | | **0.83** | **0.93** |
| **Cars** | 0 | | 4 | 0 | | 4 | | | | | | 0 | | 72 | 2 | 0 | | 74 | 2 | 33 | | 0 | | 35 | 113 |
| **% Cars** | 0 | | 100 | 0 | | 80 | | | | | | 0 | | 93.5 | 40 | 0 | | 90.2 | 100 | 86.8 | | 0 | | 87.5 | 89 |
| **Trucks** | 1 | | 0 | 0 | | 1 | | | | | | 0 | | 5 | 3 | 0 | | 8 | 0 | 5 | | 0 | | 5 | 14 |
| **% Trucks** | 100 | | 0 | 0 | | 20 | | | | | | 0 | | 6.5 | 60 | 0 | | 9.8 | 0 | 13.2 | | 0 | | 12.5 | 11 |
| **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 | - | | | | | 2 | - | 2 |
| **% Peds** | | | | | 0 | - | | | | | 0 | - | | | | | 0 | - | | | | | 100 | - | |

# Peak Hour Diagram

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

| Specified Period | | One Hour Peak | |
|---|---|---|---|
| From: | 16:00:00 | From: | 16:00:00 |
| To: | 19:00:00 | To: | 17:00:00 |

**Intersection:** Bancroft Dr & Estelle St
**Site ID:** 2019100001
**Count Date:** Nov 18, 2020

**Weather conditions:**

**** Unsignalized Intersection ****

**Major Road:** Estelle St runs N/S

## North Approach

| | Out | In | Total |
|---|---|---|---|
| Cars | 1 | 9 | 10 |
| Trucks | 0 | 0 | 0 |
| Bicycles | 0 | 0 | 0 |
| | **1** | **9** | **10** |

## Estelle St

| | | | |
|---|---|---|---|
| Bicycles | 0 | 0 | 0 |
| Trucks | 0 | 0 | 0 |
| Cars | 0 | 1 | 0 |
| **Totals** | **0** | **1** | **0** |

## East Approach

| | Out | In | Total |
|---|---|---|---|
| Cars | 59 | 112 | 171 |
| Trucks | 3 | 1 | 4 |
| Bicycles | 0 | 0 | 0 |
| | **62** | **113** | **175** |

Peds: 0

## Bancroft Dr

| Bicycles | Trucks | Cars | Totals | |
|---|---|---|---|---|
| 0 | 0 | 0 | **0** | |
| 0 | 0 | 5 | **5** | |
| 0 | 1 | 111 | **112** | |

Peds: 0


Peds: 0

## Bancroft Dr

| | Totals | Cars | Trucks | Bicycles |
|---|---|---|---|---|
| | **0** | 0 | 0 | 0 |
| | **4** | 4 | 0 | 0 |
| | **58** | 55 | 3 | 0 |

Peds: 0

## West Approach

| | Out | In | Total |
|---|---|---|---|
| Cars | 116 | 55 | 171 |
| Trucks | 1 | 3 | 4 |
| Bicycles | 0 | 0 | 0 |
| | **117** | **58** | **175** |

- Cars  - Trucks  - Bicycles

## Comments

Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

# Peak Hour Summary

Intersection: Bancroft Dr & Estelle St
Count Date: Nov 18, 2020
Period: 16:00 - 19:00

## Peak Hour Data (16:00 - 17:00)

| Start Time | North Approach Estelle St | | | | | | South Approach | | | | | | East Approach Bancroft Dr | | | | | | West Approach Bancroft Dr | | | | | | Total Vehicles |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Peds | Total | | | | | Peds | Total | | | | | Peds | Total | | | | | Peds | Total | |
| 16:00 | 1 | | 0 | 0 | 0 | 1 | | | | 0 | | | | 17 | 0 | 0 | 0 | 17 | 0 | 25 | | 0 | 0 | 25 | 43 |
| 16:15 | 0 | | 0 | 0 | 0 | 0 | | | | 0 | | | | 13 | 1 | 0 | 0 | 14 | 1 | 32 | | 0 | 0 | 33 | 47 |
| 16:30 | 0 | | 0 | 0 | 0 | 0 | | | | 0 | | | | 22 | 1 | 0 | 0 | 23 | 2 | 23 | | 0 | 0 | 25 | 48 |
| 16:45 | 0 | | 0 | 0 | 0 | 0 | | | | 0 | | | | 6 | 2 | 0 | 0 | 8 | 2 | 32 | | 0 | 0 | 34 | 42 |
| **Grand Total** | **1** | | **0** | **0** | **0** | **1** | | | | **0** | **0** | | | **58** | **4** | **0** | **0** | **62** | **5** | **112** | | **0** | **0** | **117** | **180** |
| **Approach %** | 100 | | 0 | 0 | | - | | | | | - | | | 93.5 | 6.5 | 0 | | - | 4.3 | 95.7 | | 0 | | - | |
| **Totals %** | 0.6 | | 0 | 0 | | 0.6 | | | | | 0 | | | 32.2 | 2.2 | 0 | | 34.4 | 2.8 | 62.2 | | 0 | | 65 | |
| **PHF** | **0.25** | | **0** | **0** | | **0.25** | | | | | **0** | | | **0.66** | **0.5** | **0** | | **0.67** | **0.63** | **0.88** | | **0** | | **0.86** | **0.94** |
| **Cars** | 1 | | 0 | 0 | | 1 | | | | | 0 | | | 55 | 4 | 0 | | 59 | 5 | 111 | | 0 | | 116 | 176 |
| **% Cars** | 100 | | 0 | 0 | | 100 | | | | | 0 | | | 94.8 | 100 | 0 | | 95.2 | 100 | 99.1 | | 0 | | 99.1 | 97.8 |
| **Trucks** | 0 | | 0 | 0 | | 0 | | | | | 0 | | | 3 | 0 | 0 | | 3 | 0 | 1 | | 0 | | 1 | 4 |
| **% Trucks** | 0 | | 0 | 0 | | 0 | | | | | 0 | | | 5.2 | 0 | 0 | | 4.8 | 0 | 0.9 | | 0 | | 0.9 | 2.2 |
| **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 | - | |

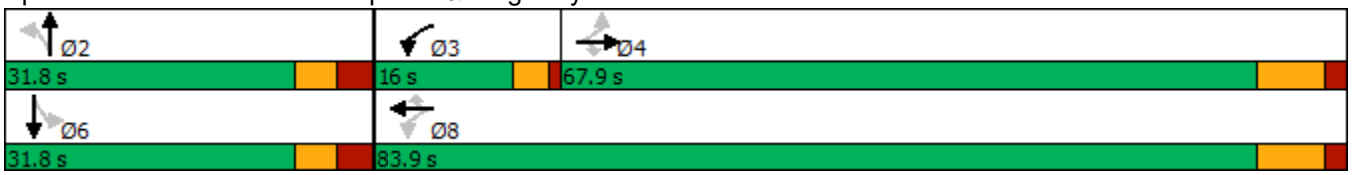
# Appendix D –
# Synchro Analysis Output –
# Existing Traffic Volumes

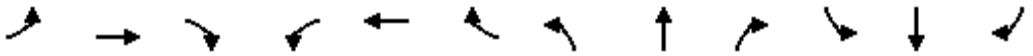
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 1 | 867 | 201 | 82 | 653 | 1 | 80 | 0 | 0 |
| Future Volume (vph) | 1 | 867 | 201 | 82 | 653 | 1 | 80 | 0 | 0 |
| Lane Group Flow (vph) | 1 | 922 | 214 | 87 | 695 | 1 | 85 | 132 | 1 |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | NA |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | 6 |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | |
| Detector Phase | 4 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 30.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 37.9 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 67.9 | 67.9 | 67.9 | 16.0 | 83.9 | 83.9 | 31.8 | 31.8 | 31.8 |
| Total Split (%) | 58.7% | 58.7% | 58.7% | 13.8% | 72.5% | 72.5% | 27.5% | 27.5% | 27.5% |
| Yellow Time (s) | 5.9 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lag | Lag | Lag | Lead | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | |
| Recall Mode | Max | Max | Max | None | Max | Max | None | None | None |
| v/c Ratio | 0.00 | 0.39 | 0.19 | 0.19 | 0.27 | 0.00 | 0.53 | 0.32 | 0.00 |
| Control Delay | 8.0 | 9.5 | 1.7 | 3.9 | 4.7 | 0.0 | 55.3 | 2.0 | 0.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 8.0 | 9.5 | 1.7 | 3.9 | 4.7 | 0.0 | 55.3 | 2.0 | 0.0 |
| Queue Length 50th (m) | 0.1 | 44.5 | 0.0 | 3.3 | 20.3 | 0.0 | 17.0 | 0.0 | 0.0 |
| Queue Length 95th (m) | 0.8 | 68.5 | 9.3 | 8.2 | 33.3 | 0.0 | 33.0 | 0.0 | 0.0 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | 303.0 |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 13.0 | | |
| Base Capacity (vph) | 488 | 2349 | 1122 | 529 | 2575 | 1218 | 341 | 576 | 601 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.00 | 0.39 | 0.19 | 0.16 | 0.27 | 0.00 | 0.25 | 0.23 | 0.00 |

**Intersection Summary**

Cycle Length: 115.7
Actuated Cycle Length: 105.4
Natural Cycle: 75
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Levesque St & Kingsway





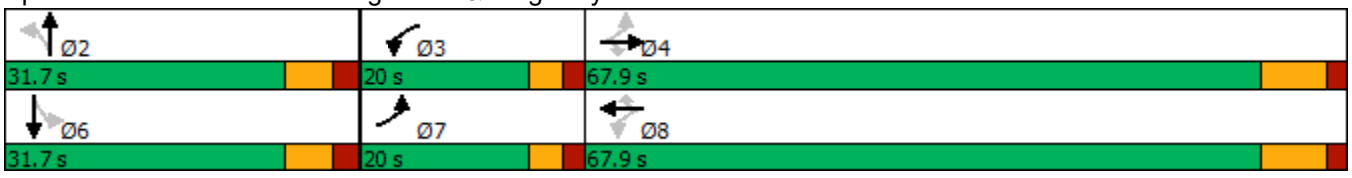
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 1 | 867 | 201 | 82 | 653 | 1 | 80 | 0 | 124 | 0 | 0 | 1 |
| Future Volume (vph) | 1 | 867 | 201 | 82 | 653 | 1 | 80 | 0 | 124 | 0 | 0 | 1 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | | 6.8 | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 | | | 0.86 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | 1805 | 3539 | 1583 | 1736 | 3438 | 1615 | 1805 | 1568 | | | 1644 | |
| Flt Permitted | 0.39 | 1.00 | 1.00 | 0.27 | 1.00 | 1.00 | 0.76 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | 736 | 3539 | 1583 | 494 | 3438 | 1615 | 1439 | 1568 | | | 1644 | |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 1 | 922 | 214 | 87 | 695 | 1 | 85 | 0 | 132 | 0 | 0 | 1 |
| RTOR Reduction (vph) | 0 | 0 | 73 | 0 | 0 | 0 | 0 | 117 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 1 | 922 | 141 | 87 | 695 | 1 | 85 | 15 | 0 | 0 | 0 | 0 |
| Heavy Vehicles (%) | 0% | 2% | 2% | 4% | 5% | 0% | 0% | 0% | 3% | 0% | 0% | 0% |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 70.0 | 70.0 | 70.0 | 79.7 | 79.7 | 79.7 | 11.7 | 11.7 | | | 11.7 | |
| Effective Green, g (s) | 70.0 | 70.0 | 70.0 | 79.7 | 79.7 | 79.7 | 11.7 | 11.7 | | | 11.7 | |
| Actuated g/C Ratio | 0.66 | 0.66 | 0.66 | 0.75 | 0.75 | 0.75 | 0.11 | 0.11 | | | 0.11 | |
| Clearance Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | | 6.8 | |
| 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) | 485 | 2334 | 1044 | 437 | 2582 | 1213 | 158 | 172 | | | 181 | |
| v/s Ratio Prot | | c0.26 | | 0.01 | c0.20 | | | 0.01 | | | 0.00 | |
| v/s Ratio Perm | 0.00 | | 0.09 | 0.14 | | 0.00 | c0.06 | | | | | |
| v/c Ratio | 0.00 | 0.40 | 0.14 | 0.20 | 0.27 | 0.00 | 0.54 | 0.08 | | | 0.00 | |
| Uniform Delay, d1 | 6.1 | 8.3 | 6.7 | 4.0 | 4.1 | 3.3 | 44.6 | 42.4 | | | 42.0 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | 1.00 | |
| Incremental Delay, d2 | 0.0 | 0.5 | 0.3 | 0.2 | 0.3 | 0.0 | 3.5 | 0.2 | | | 0.0 | |
| Delay (s) | 6.2 | 8.8 | 7.0 | 4.2 | 4.4 | 3.3 | 48.1 | 42.6 | | | 42.0 | |
| Level of Service | A | A | A | A | A | A | D | D | | | D | |
| Approach Delay (s) | | 8.5 | | | 4.4 | | | 44.8 | | | 42.0 | |
| Approach LOS | | A | | | A | | | D | | | D | |

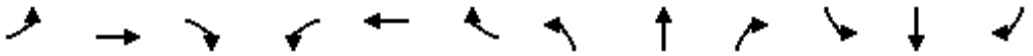
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.41 | | |
| Actuated Cycle Length (s) | 106.1 | Sum of lost time (s) | 18.7 |
| Intersection Capacity Utilization | 79.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 969 | 69 | 27 | 781 | 11 | 35 | 6 | 11 | 4 |
| Future Volume (vph) | 15 | 969 | 69 | 27 | 781 | 11 | 35 | 6 | 11 | 4 |
| Lane Group Flow (vph) | 16 | 1065 | 76 | 30 | 858 | 12 | 38 | 43 | 12 | 36 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | 6 |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.0 | 37.9 | 37.9 | 10.0 | 37.9 | 37.9 | 30.7 | 30.7 | 30.7 | 30.7 |
| Total Split (s) | 20.0 | 67.9 | 67.9 | 20.0 | 67.9 | 67.9 | 31.7 | 31.7 | 31.7 | 31.7 |
| Total Split (%) | 16.7% | 56.8% | 56.8% | 16.7% | 56.8% | 56.8% | 26.5% | 26.5% | 26.5% | 26.5% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 4.1 | 4.1 | 4.1 | 4.1 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.6 | 2.6 | 2.6 | 2.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | 6.7 | 6.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None |
| v/c Ratio | 0.03 | 0.42 | 0.06 | 0.07 | 0.33 | 0.01 | 0.29 | 0.23 | 0.11 | 0.21 |
| Control Delay | 2.7 | 7.8 | 1.8 | 2.9 | 6.2 | 0.0 | 46.0 | 19.2 | 41.5 | 18.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.7 | 7.8 | 1.8 | 2.9 | 6.2 | 0.0 | 46.0 | 19.2 | 41.5 | 18.9 |
| Queue Length 50th (m) | 0.5 | 49.2 | 0.0 | 0.9 | 22.2 | 0.0 | 6.9 | 1.2 | 2.1 | 0.7 |
| Queue Length 95th (m) | 1.9 | 71.0 | 4.9 | 3.0 | 53.2 | 0.0 | 17.1 | 11.5 | 7.8 | 10.0 |
| Internal Link Dist (m) | | 440.7 | | | 446.3 | | | 949.6 | | 204.9 |
| Turn Bay Length (m) | 40.0 | | 22.0 | 42.0 | | 51.0 | 20.0 | | 14.0 | |
| Base Capacity (vph) | 652 | 2543 | 1181 | 567 | 2602 | 1241 | 375 | 473 | 316 | 431 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.02 | 0.42 | 0.06 | 0.05 | 0.33 | 0.01 | 0.10 | 0.09 | 0.04 | 0.08 |

| Intersection Summary |
|---|
| Cycle Length: 119.6 |
| Actuated Cycle Length: 93.1 |
| Natural Cycle: 80 |
| Control Type: Semi Act-Uncoord |

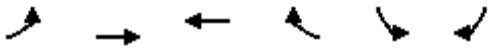
Splits and Phases: 2: Moonlight Ave & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 969 | 69 | 27 | 781 | 11 | 35 | 6 | 33 | 11 | 4 | 29 |
| Future Volume (vph) | 15 | 969 | 69 | 27 | 781 | 11 | 35 | 6 | 33 | 11 | 4 | 29 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 0.87 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1687 | 3471 | 1583 | 1736 | 3438 | 1615 | 1805 | 1661 | | 1530 | 1512 | |
| Flt Permitted | 0.33 | 1.00 | 1.00 | 0.24 | 1.00 | 1.00 | 0.73 | 1.00 | | 0.73 | 1.00 | |
| Satd. Flow (perm) | 582 | 3471 | 1583 | 440 | 3438 | 1615 | 1394 | 1661 | | 1174 | 1512 | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 16 | 1065 | 76 | 30 | 858 | 12 | 38 | 7 | 36 | 12 | 4 | 32 |
| RTOR Reduction (vph) | 0 | 0 | 24 | 0 | 0 | 4 | 0 | 33 | 0 | 0 | 30 | 0 |
| Lane Group Flow (vph) | 16 | 1065 | 52 | 30 | 858 | 8 | 38 | 10 | 0 | 12 | 6 | 0 |
| Heavy Vehicles (%) | 7% | 4% | 2% | 4% | 5% | 0% | 0% | 0% | 0% | 18% | 0% | 10% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 69.7 | 67.4 | 67.4 | 72.3 | 68.7 | 68.7 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Effective Green, g (s) | 69.7 | 67.4 | 67.4 | 72.3 | 68.7 | 68.7 | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Actuated g/C Ratio | 0.71 | 0.69 | 0.69 | 0.74 | 0.70 | 0.70 | 0.07 | 0.07 | | 0.07 | 0.07 | |
| Clearance Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 441 | 2396 | 1093 | 373 | 2419 | 1136 | 99 | 119 | | 84 | 108 | |
| v/s Ratio Prot | 0.00 | c0.31 | | c0.00 | 0.25 | | | 0.01 | | | 0.00 | |
| v/s Ratio Perm | 0.03 | | 0.03 | 0.06 | | 0.01 | c0.03 | | | 0.01 | | |
| v/c Ratio | 0.04 | 0.44 | 0.05 | 0.08 | 0.35 | 0.01 | 0.38 | 0.08 | | 0.14 | 0.06 | |
| Uniform Delay, d1 | 4.0 | 6.7 | 4.8 | 3.6 | 5.7 | 4.3 | 43.2 | 42.3 | | 42.5 | 42.2 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.0 | 0.6 | 0.1 | 0.1 | 0.4 | 0.0 | 2.5 | 0.3 | | 0.8 | 0.2 | |
| Delay (s) | 4.1 | 7.3 | 4.9 | 3.7 | 6.1 | 4.3 | 45.7 | 42.6 | | 43.3 | 42.5 | |
| Level of Service | A | A | A | A | A | A | D | D | | D | D | |
| Approach Delay (s) | | 7.1 | | | 6.0 | | | 44.1 | | | 42.7 | |
| Approach LOS | | A | | | A | | | D | | | D | |

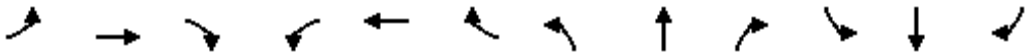
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.42 | | |
| Actuated Cycle Length (s) | 97.6 | Sum of lost time (s) | 19.6 |
| Intersection Capacity Utilization | 52.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 90 | 113 | 56 | 13 | 19 | 99 |
| Future Volume (Veh/h) | 90 | 113 | 56 | 13 | 19 | 99 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Hourly flow rate (vph) | 113 | 141 | 70 | 16 | 24 | 124 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 86 | | | | 445 | 78 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 86 | | | | 445 | 78 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 93 | | | | 95 | 87 |
| cM capacity (veh/h) | 1523 | | | | 518 | 985 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 254 | 86 | 148 |
| Volume Left | 113 | 0 | 24 |
| Volume Right | 0 | 16 | 124 |
| cSH | 1523 | 1700 | 860 |
| Volume to Capacity | 0.07 | 0.05 | 0.17 |
| Queue Length 95th (m) | 1.9 | 0.0 | 5.0 |
| Control Delay (s) | 3.7 | 0.0 | 10.1 |
| Lane LOS | A | | B |
| Approach Delay (s) | 3.7 | 0.0 | 10.1 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.0 | | |
| Intersection Capacity Utilization | 31.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 53 | 64 | 2 | 3 | 40 | 8 | 7 | 5 | 3 | 34 | 3 | 31 |
| Future Volume (vph) | 53 | 64 | 2 | 3 | 40 | 8 | 7 | 5 | 3 | 34 | 3 | 31 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph) | 62 | 74 | 2 | 3 | 47 | 9 | 8 | 6 | 3 | 40 | 3 | 36 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 138 | 59 | 17 | 79 |
| Volume Left (vph) | 62 | 3 | 8 | 40 |
| Volume Right (vph) | 2 | 9 | 3 | 36 |
| Hadj (s) | 0.08 | -0.08 | -0.01 | -0.09 |
| Departure Headway (s) | 4.3 | 4.2 | 4.4 | 4.3 |
| Degree Utilization, x | 0.16 | 0.07 | 0.02 | 0.09 |
| Capacity (veh/h) | 823 | 833 | 768 | 805 |
| Control Delay (s) | 8.1 | 7.5 | 7.5 | 7.7 |
| Approach Delay (s) | 8.1 | 7.5 | 7.5 | 7.7 |
| Approach LOS | A | A | A | A |

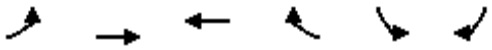
| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.8 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 24.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.8 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 53 | 64 | 2 | 3 | 40 | 8 | 7 | 5 | 3 | 34 | 3 | 31 |
| Future Vol, veh/h | 53 | 64 | 2 | 3 | 40 | 8 | 7 | 5 | 3 | 34 | 3 | 31 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 7 |
| Mvmt Flow | 62 | 74 | 2 | 3 | 47 | 9 | 8 | 6 | 3 | 40 | 3 | 36 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 8.1 | 7.5 | 7.5 | 7.7 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 47% | 45% | 6% | 50% |
| Vol Thru, % | 33% | 54% | 78% | 4% |
| Vol Right, % | 20% | 2% | 16% | 46% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 15 | 119 | 51 | 68 |
| LT Vol | 7 | 53 | 3 | 34 |
| Through Vol | 5 | 64 | 40 | 3 |
| RT Vol | 3 | 2 | 8 | 31 |
| Lane Flow Rate | 17 | 138 | 59 | 79 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.021 | 0.161 | 0.067 | 0.093 |
| Departure Headway (Hd) | 4.398 | 4.193 | 4.092 | 4.236 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 818 | 847 | 862 | 851 |
| Service Time | 2.4 | 2.261 | 2.182 | 2.236 |
| HCM Lane V/C Ratio | 0.021 | 0.163 | 0.068 | 0.093 |
| HCM Control Delay | 7.5 | 8.1 | 7.5 | 7.7 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.6 | 0.2 | 0.3 |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 6 | 126 | 65 | 4 | 1 | 0 |
| Future Volume (Veh/h) | 6 | 126 | 65 | 4 | 1 | 0 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 6 | 134 | 69 | 4 | 1 | 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 | 73 | | | | 217 | 71 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 73 | | | | 217 | 71 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 100 |
| cM capacity (veh/h) | 1540 | | | | 773 | 997 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 140 | 73 | 1 |
| Volume Left | 6 | 0 | 1 |
| Volume Right | 0 | 4 | 0 |
| cSH | 1540 | 1700 | 773 |
| Volume to Capacity | 0.00 | 0.04 | 0.00 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 0.3 | 0.0 | 9.7 |
| Lane LOS | A | | A |
| Approach Delay (s) | 0.3 | 0.0 | 9.7 |
| Approach LOS | | | A |

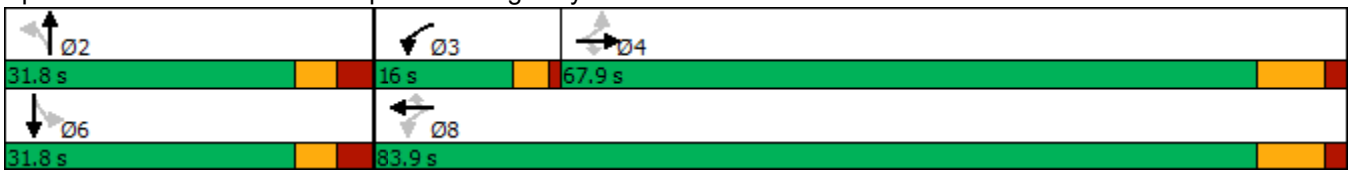
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 21.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

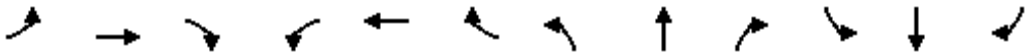
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBT | Ø6 |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 350 | 81 | 115 | 751 | 192 | 0 | |
| Future Volume (vph) | 350 | 81 | 115 | 751 | 192 | 0 | |
| Lane Group Flow (vph) | 389 | 90 | 128 | 834 | 213 | 122 | |
| Turn Type | NA | Perm | pm+pt | NA | Perm | NA | |
| Protected Phases | 4 | | 3 | 8 | | 2 | 6 |
| Permitted Phases | | 4 | 8 | | 2 | | |
| Detector Phase | 4 | 4 | 3 | 8 | 2 | 2 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 30.0 | 30.0 | 5.0 | 30.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 37.9 | 37.9 | 9.0 | 37.9 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 67.9 | 67.9 | 16.0 | 83.9 | 31.8 | 31.8 | 31.8 |
| Total Split (%) | 58.7% | 58.7% | 13.8% | 72.5% | 27.5% | 27.5% | 27% |
| Yellow Time (s) | 5.9 | 5.9 | 3.0 | 5.9 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 2.0 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 7.9 | 7.9 | 4.0 | 7.9 | 6.8 | 6.8 | |
| Lead/Lag | Lag | Lag | Lead | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | | |
| Recall Mode | Max | Max | None | Max | None | None | None |
| v/c Ratio | 0.20 | 0.09 | 0.17 | 0.36 | 0.81 | 0.17 | |
| Control Delay | 12.5 | 3.0 | 6.0 | 8.4 | 66.9 | 0.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 12.5 | 3.0 | 6.0 | 8.4 | 66.9 | 0.5 | |
| Queue Length 50th (m) | 22.0 | 0.0 | 8.2 | 39.9 | 47.1 | 0.0 | |
| Queue Length 95th (m) | 33.9 | 7.7 | 15.6 | 55.1 | #76.6 | 0.0 | |
| Internal Link Dist (m) | 516.5 | | | 440.7 | | 737.0 | |
| Turn Bay Length (m) | | 94.0 | 30.0 | | 13.0 | | |
| Base Capacity (vph) | 1904 | 967 | 763 | 2304 | 319 | 757 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.20 | 0.09 | 0.17 | 0.36 | 0.67 | 0.16 | |

Intersection Summary

Cycle Length: 115.7
Actuated Cycle Length: 111.5
Natural Cycle: 75
Control Type: Semi Act-Uncoord
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Levesque St & Kingsway





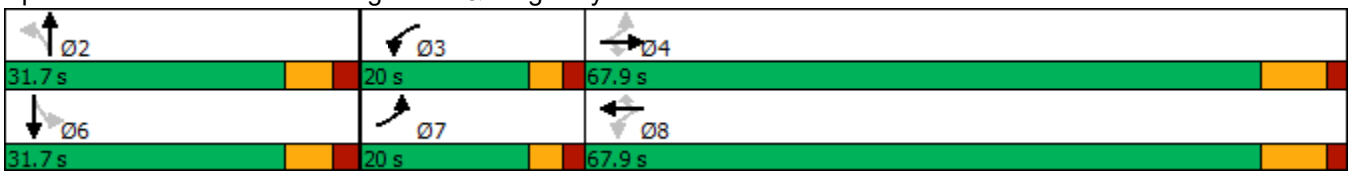
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 350 | 81 | 115 | 751 | 0 | 192 | 0 | 110 | 0 | 0 | 0 |
| Future Volume (vph) | 0 | 350 | 81 | 115 | 751 | 0 | 192 | 0 | 110 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 7.9 | 7.9 | 4.0 | 7.9 | | 6.8 | 6.8 | | | | |
| Lane Util. Factor | | 0.95 | 1.00 | 1.00 | 0.95 | | 1.00 | 1.00 | | | | |
| Frt | | 1.00 | 0.85 | 1.00 | 1.00 | | 1.00 | 0.85 | | | | |
| Flt Protected | | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | | | |
| Satd. Flow (prot) | | 3312 | 1615 | 1805 | 3374 | | 1787 | 1553 | | | | |
| Flt Permitted | | 1.00 | 1.00 | 0.49 | 1.00 | | 0.76 | 1.00 | | | | |
| Satd. Flow (perm) | | 3312 | 1615 | 933 | 3374 | | 1424 | 1553 | | | | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0 | 389 | 90 | 128 | 834 | 0 | 213 | 0 | 122 | 0 | 0 | 0 |
| RTOR Reduction (vph) | 0 | 0 | 38 | 0 | 0 | 0 | 0 | 99 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 389 | 52 | 128 | 834 | 0 | 213 | 23 | 0 | 0 | 0 | 0 |
| Heavy Vehicles (%) | 5% | 9% | 0% | 0% | 7% | 1% | 1% | 0% | 4% | 0% | 0% | 0% |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | | | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | | 64.1 | 64.1 | 76.1 | 76.1 | | 20.6 | 20.6 | | | | |
| Effective Green, g (s) | | 64.1 | 64.1 | 76.1 | 76.1 | | 20.6 | 20.6 | | | | |
| Actuated g/C Ratio | | 0.58 | 0.58 | 0.68 | 0.68 | | 0.18 | 0.18 | | | | |
| Clearance Time (s) | | 7.9 | 7.9 | 4.0 | 7.9 | | 6.8 | 6.8 | | | | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | | | |
| Lane Grp Cap (vph) | | 1905 | 929 | 699 | 2304 | | 263 | 287 | | | | |
| v/s Ratio Prot | | 0.12 | | 0.01 | c0.25 | | | 0.01 | | | | |
| v/s Ratio Perm | | | 0.03 | 0.11 | | | c0.15 | | | | | |
| v/c Ratio | | 0.20 | 0.06 | 0.18 | 0.36 | | 0.81 | 0.08 | | | | |
| Uniform Delay, d1 | | 11.4 | 10.4 | 6.1 | 7.4 | | 43.5 | 37.6 | | | | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | | | | |
| Incremental Delay, d2 | | 0.2 | 0.1 | 0.1 | 0.4 | | 16.6 | 0.1 | | | | |
| Delay (s) | | 11.6 | 10.5 | 6.2 | 7.9 | | 60.1 | 37.7 | | | | |
| Level of Service | | B | B | A | A | | E | D | | | | |
| Approach Delay (s) | | 11.4 | | | 7.7 | | | 51.9 | | | 0.0 | |
| Approach LOS | | B | | | A | | | D | | | A | |

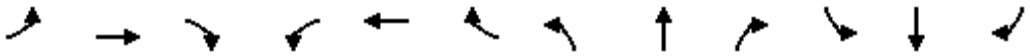
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 17.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.48 | | |
| Actuated Cycle Length (s) | 111.4 | Sum of lost time (s) | 18.7 |
| Intersection Capacity Utilization | 79.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 29 | 477 | 33 | 3 | 936 | 10 | 55 | 5 | 3 | 1 |
| Future Volume (vph) | 29 | 477 | 33 | 3 | 936 | 10 | 55 | 5 | 3 | 1 |
| Lane Group Flow (vph) | 34 | 555 | 38 | 3 | 1088 | 12 | 64 | 26 | 3 | 16 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | 6 |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.0 | 37.9 | 37.9 | 10.0 | 37.9 | 37.9 | 30.7 | 30.7 | 30.7 | 30.7 |
| Total Split (s) | 20.0 | 67.9 | 67.9 | 20.0 | 67.9 | 67.9 | 31.7 | 31.7 | 31.7 | 31.7 |
| Total Split (%) | 16.7% | 56.8% | 56.8% | 16.7% | 56.8% | 56.8% | 26.5% | 26.5% | 26.5% | 26.5% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 4.1 | 4.1 | 4.1 | 4.1 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.6 | 2.6 | 2.6 | 2.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | 6.7 | 6.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None |
| v/c Ratio | 0.11 | 0.22 | 0.04 | 0.00 | 0.44 | 0.01 | 0.43 | 0.13 | 0.03 | 0.11 |
| Control Delay | 3.7 | 5.1 | 0.3 | 3.3 | 9.0 | 0.0 | 49.8 | 21.0 | 39.0 | 20.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 3.7 | 5.1 | 0.3 | 3.3 | 9.0 | 0.0 | 49.8 | 21.0 | 39.0 | 20.7 |
| Queue Length 50th (m) | 1.2 | 14.2 | 0.0 | 0.1 | 55.1 | 0.0 | 11.9 | 1.1 | 0.5 | 0.2 |
| Queue Length 95th (m) | 3.6 | 33.0 | 0.5 | 0.8 | 76.2 | 0.0 | 24.2 | 8.3 | 3.1 | 5.9 |
| Internal Link Dist (m) | | 440.7 | | | 446.3 | | | 949.6 | | 204.9 |
| Turn Bay Length (m) | 40.0 | | 22.0 | 42.0 | | 51.0 | 20.0 | | 14.0 | |
| Base Capacity (vph) | 400 | 2555 | 1007 | 831 | 2477 | 992 | 367 | 459 | 222 | 326 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.09 | 0.22 | 0.04 | 0.00 | 0.44 | 0.01 | 0.17 | 0.06 | 0.01 | 0.05 |

| Intersection Summary |
|---|
| Cycle Length: 119.6 |
| Actuated Cycle Length: 95 |
| Natural Cycle: 80 |
| Control Type: Semi Act-Uncoord |

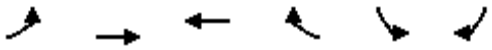
Splits and Phases: 2: Moonlight Ave & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 29 | 477 | 33 | 3 | 936 | 10 | 55 | 5 | 17 | 3 | 1 | 13 |
| Future Volume (vph) | 29 | 477 | 33 | 3 | 936 | 10 | 55 | 5 | 17 | 3 | 1 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.88 | | 1.00 | 0.86 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1280 | 3312 | 1282 | 1805 | 3438 | 1346 | 1770 | 1681 | | 1081 | 1196 | |
| Flt Permitted | 0.23 | 1.00 | 1.00 | 0.44 | 1.00 | 1.00 | 0.75 | 1.00 | | 0.74 | 1.00 | |
| Satd. Flow (perm) | 305 | 3312 | 1282 | 844 | 3438 | 1346 | 1392 | 1681 | | 842 | 1196 | |
| Peak-hour factor, PHF | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Adj. Flow (vph) | 34 | 555 | 38 | 3 | 1088 | 12 | 64 | 6 | 20 | 3 | 1 | 15 |
| RTOR Reduction (vph) | 0 | 0 | 11 | 0 | 0 | 4 | 0 | 18 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 34 | 555 | 27 | 3 | 1088 | 8 | 64 | 8 | 0 | 3 | 2 | 0 |
| Heavy Vehicles (%) | 41% | 9% | 26% | 0% | 5% | 20% | 2% | 0% | 0% | 67% | 0% | 39% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 75.4 | 71.5 | 71.5 | 69.8 | 68.7 | 68.7 | 8.4 | 8.4 | | 8.4 | 8.4 | |
| Effective Green, g (s) | 75.4 | 71.5 | 71.5 | 69.8 | 68.7 | 68.7 | 8.4 | 8.4 | | 8.4 | 8.4 | |
| Actuated g/C Ratio | 0.75 | 0.71 | 0.71 | 0.69 | 0.68 | 0.68 | 0.08 | 0.08 | | 0.08 | 0.08 | |
| Clearance Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 266 | 2353 | 911 | 596 | 2347 | 919 | 116 | 140 | | 70 | 99 | |
| v/s Ratio Prot | c0.00 | c0.17 | | 0.00 | c0.32 | | | 0.00 | | | 0.00 | |
| v/s Ratio Perm | 0.09 | | 0.02 | 0.00 | | 0.01 | c0.05 | | | 0.00 | | |
| v/c Ratio | 0.13 | 0.24 | 0.03 | 0.01 | 0.46 | 0.01 | 0.55 | 0.05 | | 0.04 | 0.02 | |
| Uniform Delay, d1 | 3.8 | 5.1 | 4.3 | 4.7 | 7.4 | 5.1 | 44.3 | 42.4 | | 42.4 | 42.3 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.2 | 0.2 | 0.1 | 0.0 | 0.7 | 0.0 | 5.6 | 0.2 | | 0.3 | 0.1 | |
| Delay (s) | 4.0 | 5.3 | 4.4 | 4.7 | 8.1 | 5.1 | 49.9 | 42.6 | | 42.7 | 42.4 | |
| Level of Service | A | A | A | A | A | A | D | D | | D | D | |
| Approach Delay (s) | | 5.2 | | | 8.0 | | | 47.8 | | | 42.5 | |
| Approach LOS | | A | | | A | | | D | | | D | |

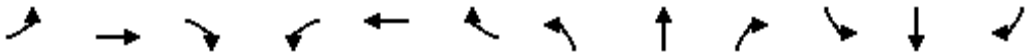
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.46 | | |
| Actuated Cycle Length (s) | 100.6 | Sum of lost time (s) | 19.6 |
| Intersection Capacity Utilization | 52.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 87 | 29 | 83 | 22 | 18 | 108 |
| Future Volume (Veh/h) | 87 | 29 | 83 | 22 | 18 | 108 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 97 | 32 | 92 | 24 | 20 | 120 |
| 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 | 116 | | | | 330 | 104 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 116 | | | | 330 | 104 |
| tC, single (s) | 4.2 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.3 | | | | 3.5 | 3.3 |
| p0 queue free % | 93 | | | | 97 | 87 |
| cM capacity (veh/h) | 1448 | | | | 624 | 945 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 129 | 116 | 140 |
| Volume Left | 97 | 0 | 20 |
| Volume Right | 0 | 24 | 120 |
| cSH | 1448 | 1700 | 880 |
| Volume to Capacity | 0.07 | 0.07 | 0.16 |
| Queue Length 95th (m) | 1.7 | 0.0 | 4.5 |
| Control Delay (s) | 5.9 | 0.0 | 9.9 |
| Lane LOS | A | | A |
| Approach Delay (s) | 5.9 | 0.0 | 9.9 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.6 | | |
| Intersection Capacity Utilization | 27.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 16 | 27 | 2 | 0 | 56 | 21 | 4 | 0 | 0 | 14 | 1 | 24 |
| Future Volume (vph) | 16 | 27 | 2 | 0 | 56 | 21 | 4 | 0 | 0 | 14 | 1 | 24 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 18 | 31 | 2 | 0 | 64 | 24 | 5 | 0 | 0 | 16 | 1 | 28 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 51 | 88 | 5 | 45 |
| Volume Left (vph) | 18 | 0 | 5 | 16 |
| Volume Right (vph) | 2 | 24 | 0 | 28 |
| Hadj (s) | 0.17 | -0.09 | 0.20 | -0.03 |
| Departure Headway (s) | 4.3 | 4.0 | 4.4 | 4.2 |
| Degree Utilization, x | 0.06 | 0.10 | 0.01 | 0.05 |
| Capacity (veh/h) | 827 | 889 | 774 | 832 |
| 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 |

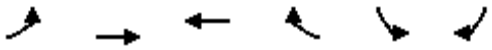
| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.4 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 19.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.5 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 16 | 27 | 2 | 0 | 56 | 21 | 4 | 0 | 0 | 14 | 1 | 24 |
| Future Vol, veh/h | 16 | 27 | 2 | 0 | 56 | 21 | 4 | 0 | 0 | 14 | 1 | 24 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 13 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 15 | 0 | 17 |
| Mvmt Flow | 18 | 31 | 2 | 0 | 64 | 24 | 5 | 0 | 0 | 16 | 1 | 28 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.6 | 7.4 | 7.5 | 7.4 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 100% | 36% | 0% | 36% |
| Vol Thru, % | 0% | 60% | 73% | 3% |
| Vol Right, % | 0% | 4% | 27% | 62% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 4 | 45 | 77 | 39 |
| LT Vol | 4 | 16 | 0 | 14 |
| Through Vol | 0 | 27 | 56 | 1 |
| RT Vol | 0 | 2 | 21 | 24 |
| Lane Flow Rate | 5 | 52 | 89 | 45 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.006 | 0.062 | 0.097 | 0.051 |
| Departure Headway (Hd) | 4.379 | 4.319 | 3.964 | 4.104 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 808 | 826 | 901 | 864 |
| Service Time | 2.454 | 2.361 | 2.003 | 2.17 |
| HCM Lane V/C Ratio | 0.006 | 0.063 | 0.099 | 0.052 |
| HCM Control Delay | 7.5 | 7.6 | 7.4 | 7.4 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.2 | 0.3 | 0.2 |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 48 | 97 | 6 | 1 | 5 |
| Future Volume (Veh/h) | 2 | 48 | 97 | 6 | 1 | 5 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 52 | 104 | 6 | 1 | 5 |
| 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 | 110 | | | | 163 | 107 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 110 | | | | 163 | 107 |
| tC, single (s) | 4.1 | | | | 6.9 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 4.0 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 99 |
| cM capacity (veh/h) | 1493 | | | | 727 | 953 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 54 | 110 | 6 |
| Volume Left | 2 | 0 | 1 |
| Volume Right | 0 | 6 | 5 |
| cSH | 1493 | 1700 | 906 |
| Volume to Capacity | 0.00 | 0.06 | 0.01 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.2 |
| Control Delay (s) | 0.3 | 0.0 | 9.0 |
| Lane LOS | A | | A |
| Approach Delay (s) | 0.3 | 0.0 | 9.0 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.4 | | |
| Intersection Capacity Utilization | 15.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

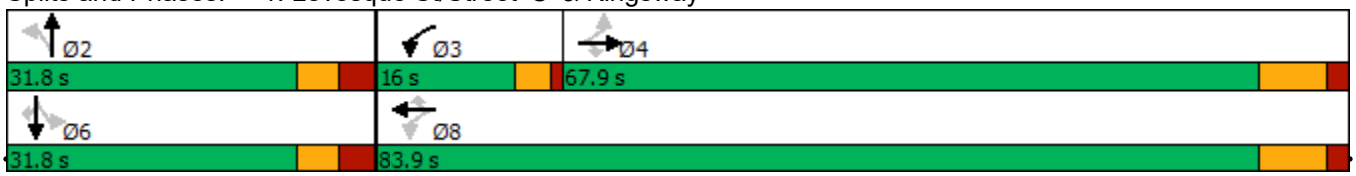
# Appendix E –
# Synchro Analysis Output –
# Background Traffic Volumes

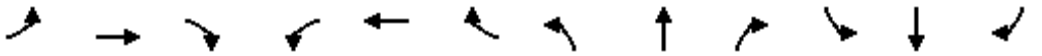
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 439 | 112 | 120 | 1078 | 163 | 321 | 111 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 439 | 112 | 120 | 1078 | 163 | 321 | 111 | 59 | 31 | 44 |
| Lane Group Flow (vph) | 206 | 488 | 124 | 133 | 1198 | 181 | 357 | 251 | 66 | 34 | 49 |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 30.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 37.9 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 27.8 | 27.8 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 67.9 | 67.9 | 67.9 | 16.0 | 83.9 | 83.9 | 31.8 | 31.8 | 31.8 | 31.8 | 31.8 |
| Total Split (%) | 58.7% | 58.7% | 58.7% | 13.8% | 72.5% | 72.5% | 27.5% | 27.5% | 27.5% | 27.5% | 27.5% |
| Yellow Time (s) | 5.9 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lag | Lag | Lag | Lead | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | | | |
| Recall Mode | Max | Max | Max | None | Max | Max | None | None | None | None | None |
| v/c Ratio | 0.90 | 0.27 | 0.13 | 0.21 | 0.54 | 0.17 | 1.20 | 0.62 | 0.39 | 0.08 | 0.12 |
| Control Delay | 64.6 | 14.4 | 2.7 | 6.8 | 11.7 | 6.5 | 157.0 | 41.8 | 46.9 | 37.0 | 2.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 64.6 | 14.4 | 2.7 | 6.8 | 11.7 | 6.5 | 157.0 | 41.8 | 46.9 | 37.0 | 2.8 |
| Queue Length 50th (m) | 41.6 | 30.7 | 0.0 | 9.5 | 73.2 | 12.0 | ~103.1 | 45.7 | 13.6 | 6.5 | 0.0 |
| Queue Length 95th (m) | #95.6 | 42.9 | 8.9 | 16.2 | 90.3 | 21.0 | #162.7 | 74.1 | 28.6 | 15.5 | 3.4 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | | 303.0 | |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 13.0 | | 75.0 | | |
| Base Capacity (vph) | 230 | 1822 | 944 | 678 | 2216 | 1062 | 298 | 404 | 169 | 410 | 414 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.90 | 0.27 | 0.13 | 0.20 | 0.54 | 0.17 | 1.20 | 0.62 | 0.39 | 0.08 | 0.12 |

Intersection Summary

Cycle Length: 115.7
Actuated Cycle Length: 115.7
Natural Cycle: 100
Control Type: Semi Act-Uncoord
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Levesque St/Street 'C' & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 439 | 112 | 120 | 1078 | 163 | 321 | 111 | 115 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 439 | 112 | 120 | 1078 | 163 | 321 | 111 | 115 | 59 | 31 | 44 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1719 | 3312 | 1615 | 1805 | 3374 | 1599 | 1787 | 1720 | | 1805 | 1900 | 1615 |
| Flt Permitted | 0.23 | 1.00 | 1.00 | 0.44 | 1.00 | 1.00 | 0.73 | 1.00 | | 0.41 | 1.00 | 1.00 |
| Satd. Flow (perm) | 418 | 3312 | 1615 | 838 | 3374 | 1599 | 1383 | 1720 | | 784 | 1900 | 1615 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 206 | 488 | 124 | 133 | 1198 | 181 | 357 | 123 | 128 | 66 | 34 | 49 |
| RTOR Reduction (vph) | 0 | 0 | 56 | 0 | 0 | 12 | 0 | 32 | 0 | 0 | 0 | 38 |
| Lane Group Flow (vph) | 206 | 488 | 68 | 133 | 1198 | 169 | 357 | 219 | 0 | 66 | 34 | 11 |
| Heavy Vehicles (%) | 5% | 9% | 0% | 0% | 7% | 1% | 1% | 0% | 4% | 0% | 0% | 0% |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 63.7 | 63.7 | 63.7 | 76.0 | 76.0 | 76.0 | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 |
| Effective Green, g (s) | 63.7 | 63.7 | 63.7 | 76.0 | 76.0 | 76.0 | 25.0 | 25.0 | | 25.0 | 25.0 | 25.0 |
| Actuated g/C Ratio | 0.55 | 0.55 | 0.55 | 0.66 | 0.66 | 0.66 | 0.22 | 0.22 | | 0.22 | 0.22 | 0.22 |
| Clearance Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| 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) | 230 | 1823 | 889 | 619 | 2216 | 1050 | 298 | 371 | | 169 | 410 | 348 |
| v/s Ratio Prot | | 0.15 | | 0.02 | c0.36 | | | 0.13 | | | 0.02 | |
| v/s Ratio Perm | c0.49 | | 0.04 | 0.13 | | 0.11 | c0.26 | | | 0.08 | | 0.01 |
| v/c Ratio | 0.90 | 0.27 | 0.08 | 0.21 | 0.54 | 0.16 | 1.20 | 0.59 | | 0.39 | 0.08 | 0.03 |
| Uniform Delay, d1 | 23.1 | 13.7 | 12.2 | 7.5 | 10.6 | 7.6 | 45.4 | 40.7 | | 38.8 | 36.2 | 35.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 37.4 | 0.4 | 0.2 | 0.2 | 1.0 | 0.3 | 116.9 | 2.4 | | 1.5 | 0.1 | 0.0 |
| Delay (s) | 60.4 | 14.1 | 12.4 | 7.6 | 11.5 | 7.9 | 162.3 | 43.1 | | 40.3 | 36.3 | 35.8 |
| Level of Service | E | B | B | A | B | A | F | D | | D | D | D |
| Approach Delay (s) | | 25.5 | | | 10.7 | | | 113.1 | | | 37.9 | |
| Approach LOS | | C | | | B | | | F | | | D | |

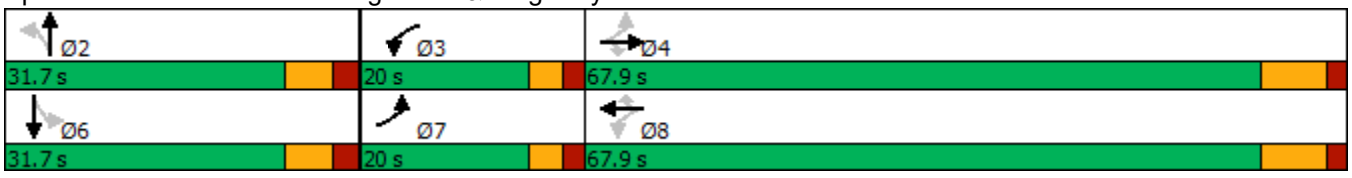
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 36.1 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.95 | | |
| Actuated Cycle Length (s) | 115.7 | Sum of lost time (s) | 18.7 |
| Intersection Capacity Utilization | 103.7% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 29 | 631 | 35 | 3 | 1435 | 10 | 58 | 5 | 3 | 1 |
| Future Volume (vph) | 29 | 631 | 35 | 3 | 1435 | 10 | 58 | 5 | 3 | 1 |
| Lane Group Flow (vph) | 34 | 734 | 41 | 3 | 1669 | 12 | 67 | 27 | 3 | 16 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | 6 |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.0 | 37.9 | 37.9 | 10.0 | 37.9 | 37.9 | 30.7 | 30.7 | 30.7 | 30.7 |
| Total Split (s) | 20.0 | 67.9 | 67.9 | 20.0 | 67.9 | 67.9 | 31.7 | 31.7 | 31.7 | 31.7 |
| Total Split (%) | 16.7% | 56.8% | 56.8% | 16.7% | 56.8% | 56.8% | 26.5% | 26.5% | 26.5% | 26.5% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 4.1 | 4.1 | 4.1 | 4.1 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.6 | 2.6 | 2.6 | 2.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | 6.7 | 6.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None |
| v/c Ratio | 0.19 | 0.29 | 0.04 | 0.00 | 0.68 | 0.01 | 0.44 | 0.13 | 0.03 | 0.11 |
| Control Delay | 5.5 | 5.5 | 0.5 | 3.3 | 13.1 | 0.0 | 50.2 | 20.9 | 39.0 | 20.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.5 | 5.5 | 0.5 | 3.3 | 13.1 | 0.0 | 50.2 | 20.9 | 39.0 | 20.6 |
| Queue Length 50th (m) | 1.2 | 20.3 | 0.0 | 0.1 | 113.5 | 0.0 | 12.5 | 1.1 | 0.6 | 0.2 |
| Queue Length 95th (m) | 3.7 | 45.6 | 0.8 | 0.8 | 151.6 | 0.0 | 24.9 | 8.5 | 3.1 | 5.9 |
| Internal Link Dist (m) | | 440.7 | | | 446.3 | | | 949.6 | | 204.9 |
| Turn Bay Length (m) | 40.0 | | 22.0 | 42.0 | | 51.0 | 20.0 | | 14.0 | |
| Base Capacity (vph) | 284 | 2550 | 1005 | 742 | 2472 | 990 | 366 | 458 | 222 | 326 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.12 | 0.29 | 0.04 | 0.00 | 0.68 | 0.01 | 0.18 | 0.06 | 0.01 | 0.05 |

**Intersection Summary**

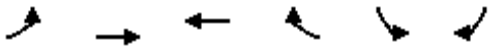
Cycle Length: 119.6
Actuated Cycle Length: 95.2
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Moonlight Ave & Kingsway



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 29 | 631 | 35 | 3 | 1435 | 10 | 58 | 5 | 18 | 3 | 1 | 13 |
| Future Volume (vph) | 29 | 631 | 35 | 3 | 1435 | 10 | 58 | 5 | 18 | 3 | 1 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.88 | | 1.00 | 0.86 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1280 | 3312 | 1282 | 1805 | 3438 | 1346 | 1770 | 1678 | | 1081 | 1196 | |
| Flt Permitted | 0.09 | 1.00 | 1.00 | 0.37 | 1.00 | 1.00 | 0.75 | 1.00 | | 0.74 | 1.00 | |
| Satd. Flow (perm) | 126 | 3312 | 1282 | 708 | 3438 | 1346 | 1392 | 1678 | | 841 | 1196 | |
| Peak-hour factor, PHF | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Adj. Flow (vph) | 34 | 734 | 41 | 3 | 1669 | 12 | 67 | 6 | 21 | 3 | 1 | 15 |
| RTOR Reduction (vph) | 0 | 0 | 12 | 0 | 0 | 4 | 0 | 19 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 34 | 734 | 29 | 3 | 1669 | 8 | 67 | 8 | 0 | 3 | 2 | 0 |
| Heavy Vehicles (%) | 41% | 9% | 26% | 0% | 5% | 20% | 2% | 0% | 0% | 67% | 0% | 39% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 75.5 | 71.5 | 71.5 | 69.7 | 68.6 | 68.6 | 8.5 | 8.5 | | 8.5 | 8.5 | |
| Effective Green, g (s) | 75.5 | 71.5 | 71.5 | 69.7 | 68.6 | 68.6 | 8.5 | 8.5 | | 8.5 | 8.5 | |
| Actuated g/C Ratio | 0.75 | 0.71 | 0.71 | 0.69 | 0.68 | 0.68 | 0.08 | 0.08 | | 0.08 | 0.08 | |
| Clearance Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 140 | 2351 | 910 | 502 | 2342 | 916 | 117 | 141 | | 70 | 100 | |
| v/s Ratio Prot | c0.01 | c0.22 | | 0.00 | c0.49 | | | 0.00 | | | 0.00 | |
| v/s Ratio Perm | 0.17 | | 0.02 | 0.00 | | 0.01 | c0.05 | | | 0.00 | | |
| v/c Ratio | 0.24 | 0.31 | 0.03 | 0.01 | 0.71 | 0.01 | 0.57 | 0.06 | | 0.04 | 0.02 | |
| Uniform Delay, d1 | 7.2 | 5.4 | 4.3 | 4.8 | 9.9 | 5.1 | 44.4 | 42.4 | | 42.4 | 42.3 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.9 | 0.3 | 0.1 | 0.0 | 1.9 | 0.0 | 6.6 | 0.2 | | 0.3 | 0.1 | |
| Delay (s) | 8.1 | 5.8 | 4.4 | 4.8 | 11.8 | 5.2 | 51.0 | 42.6 | | 42.6 | 42.4 | |
| Level of Service | A | A | A | A | B | A | D | D | | D | D | |
| Approach Delay (s) | | 5.8 | | | 11.8 | | | 48.6 | | | 42.4 | |
| Approach LOS | | A | | | B | | | D | | | D | |

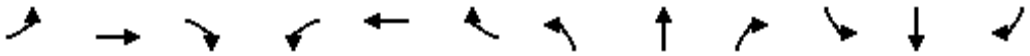
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 100.7 | Sum of lost time (s) | 19.6 |
| Intersection Capacity Utilization | 61.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 273 | 30 | 87 | 71 | 30 | 158 |
| Future Volume (Veh/h) | 273 | 30 | 87 | 71 | 30 | 158 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 303 | 33 | 97 | 79 | 33 | 176 |
| 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 | 176 | | | | 776 | 136 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 176 | | | | 776 | 136 |
| tC, single (s) | 4.2 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.3 | | | | 3.5 | 3.3 |
| p0 queue free % | 78 | | | | 89 | 81 |
| cM capacity (veh/h) | 1376 | | | | 288 | 907 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 336 | 176 | 209 |
| Volume Left | 303 | 0 | 33 |
| Volume Right | 0 | 79 | 176 |
| cSH | 1376 | 1700 | 677 |
| Volume to Capacity | 0.22 | 0.10 | 0.31 |
| Queue Length 95th (m) | 6.7 | 0.0 | 10.5 |
| Control Delay (s) | 7.7 | 0.0 | 12.7 |
| Lane LOS | A | | B |
| Approach Delay (s) | 7.7 | 0.0 | 12.7 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.3 | | |
| Intersection Capacity Utilization | 47.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 17 | 39 | 2 | 0 | 107 | 22 | 4 | 0 | 0 | 15 | 1 | 25 |
| Future Volume (vph) | 17 | 39 | 2 | 0 | 107 | 22 | 4 | 0 | 0 | 15 | 1 | 25 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 20 | 45 | 2 | 0 | 123 | 25 | 5 | 0 | 0 | 17 | 1 | 29 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 67 | 148 | 5 | 47 |
| Volume Left (vph) | 20 | 0 | 5 | 17 |
| Volume Right (vph) | 2 | 25 | 0 | 29 |
| Hadj (s) | 0.15 | -0.02 | 0.20 | -0.03 |
| Departure Headway (s) | 4.3 | 4.1 | 4.6 | 4.3 |
| Degree Utilization, x | 0.08 | 0.17 | 0.01 | 0.06 |
| Capacity (veh/h) | 814 | 868 | 733 | 786 |
| Control Delay (s) | 7.7 | 7.9 | 7.7 | 7.6 |
| Approach Delay (s) | 7.7 | 7.9 | 7.7 | 7.6 |
| Approach LOS | A | A | A | A |

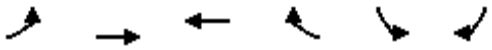
| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.8 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 23.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.8 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 17 | 39 | 2 | 0 | 107 | 22 | 4 | 0 | 0 | 15 | 1 | 25 |
| Future Vol, veh/h | 17 | 39 | 2 | 0 | 107 | 22 | 4 | 0 | 0 | 15 | 1 | 25 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 13 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 15 | 0 | 17 |
| Mvmt Flow | 20 | 45 | 2 | 0 | 123 | 25 | 5 | 0 | 0 | 17 | 1 | 29 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.8 | 7.9 | 7.7 | 7.6 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 100% | 29% | 0% | 37% |
| Vol Thru, % | 0% | 67% | 83% | 2% |
| Vol Right, % | 0% | 3% | 17% | 61% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 4 | 58 | 129 | 41 |
| LT Vol | 4 | 17 | 0 | 15 |
| Through Vol | 0 | 39 | 107 | 1 |
| RT Vol | 0 | 2 | 22 | 25 |
| Lane Flow Rate | 5 | 67 | 148 | 47 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.006 | 0.081 | 0.166 | 0.057 |
| Departure Headway (Hd) | 4.628 | 4.362 | 4.04 | 4.343 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 778 | 815 | 882 | 829 |
| Service Time | 2.63 | 2.426 | 2.093 | 2.343 |
| HCM Lane V/C Ratio | 0.006 | 0.082 | 0.168 | 0.057 |
| HCM Control Delay | 7.7 | 7.8 | 7.9 | 7.6 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.3 | 0.6 | 0.2 |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 61 | 149 | 6 | 1 | 5 |
| Future Volume (Veh/h) | 2 | 61 | 149 | 6 | 1 | 5 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 66 | 160 | 6 | 1 | 5 |
| 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 | | | | 233 | 163 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 166 | | | | 233 | 163 |
| tC, single (s) | 4.1 | | | | 6.9 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 4.0 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 99 |
| cM capacity (veh/h) | 1424 | | | | 660 | 887 |

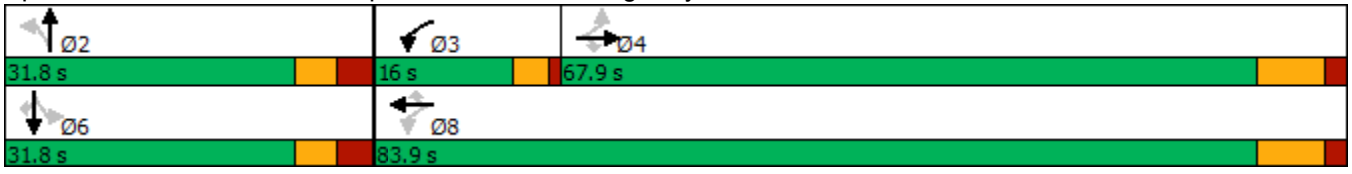
| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 68 | 166 | 6 |
| Volume Left | 2 | 0 | 1 |
| Volume Right | 0 | 6 | 5 |
| cSH | 1424 | 1700 | 839 |
| Volume to Capacity | 0.00 | 0.10 | 0.01 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.2 |
| Control Delay (s) | 0.2 | 0.0 | 9.3 |
| Lane LOS | A | | A |
| Approach Delay (s) | 0.2 | 0.0 | 9.3 |
| Approach LOS | | | A |

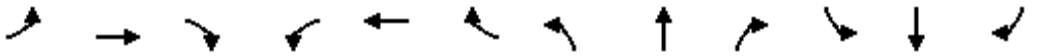
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 18.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 1207 | 265 | 86 | 833 | 41 | 109 | 25 | 135 | 95 | 286 |
| Future Volume (vph) | 86 | 1207 | 265 | 86 | 833 | 41 | 109 | 25 | 135 | 95 | 286 |
| Lane Group Flow (vph) | 91 | 1284 | 282 | 91 | 886 | 44 | 116 | 165 | 144 | 101 | 304 |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 30.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 37.9 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 27.8 | 27.8 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 67.9 | 67.9 | 67.9 | 16.0 | 83.9 | 83.9 | 31.8 | 31.8 | 31.8 | 31.8 | 31.8 |
| Total Split (%) | 58.7% | 58.7% | 58.7% | 13.8% | 72.5% | 72.5% | 27.5% | 27.5% | 27.5% | 27.5% | 27.5% |
| Yellow Time (s) | 5.9 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lag | Lag | Lag | Lead | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | | | |
| Recall Mode | Max | Max | Max | None | Max | Max | None | None | None | None | None |
| v/c Ratio | 0.24 | 0.59 | 0.26 | 0.31 | 0.37 | 0.04 | 0.52 | 0.43 | 0.80 | 0.32 | 0.71 |
| Control Delay | 14.4 | 15.9 | 2.1 | 7.7 | 7.9 | 2.8 | 49.9 | 13.3 | 73.3 | 41.9 | 26.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 14.4 | 15.9 | 2.1 | 7.7 | 7.9 | 2.8 | 49.9 | 13.3 | 73.3 | 41.9 | 26.1 |
| Queue Length 50th (m) | 9.3 | 92.0 | 0.0 | 5.1 | 39.0 | 0.5 | 24.0 | 5.2 | 31.3 | 20.1 | 24.3 |
| Queue Length 95th (m) | 22.8 | 134.9 | 12.3 | 11.8 | 59.0 | 4.6 | 42.8 | 24.0 | 54.8 | 36.1 | 55.5 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | | 303.0 | |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 13.0 | | 75.0 | | |
| Base Capacity (vph) | 374 | 2170 | 1079 | 360 | 2394 | 1135 | 301 | 478 | 246 | 435 | 513 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.24 | 0.59 | 0.26 | 0.25 | 0.37 | 0.04 | 0.39 | 0.35 | 0.59 | 0.23 | 0.59 |

| Intersection Summary |
|---|
| Cycle Length: 115.7 |
| Actuated Cycle Length: 109.4 |
| Natural Cycle: 75 |
| Control Type: Semi Act-Uncoord |

Splits and Phases: 1: Levesque St/Street 'C' & Kingsway





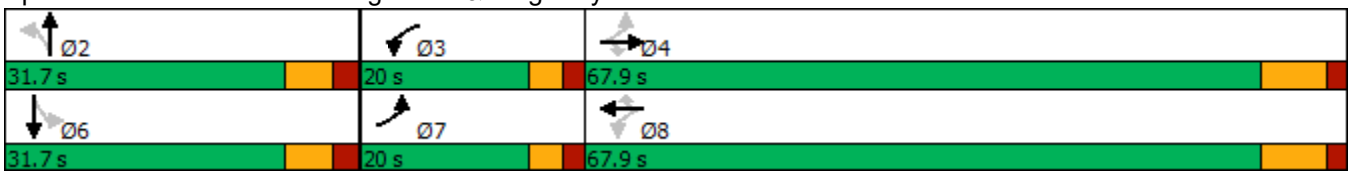
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 1207 | 265 | 86 | 833 | 41 | 109 | 25 | 130 | 135 | 95 | 286 |
| Future Volume (vph) | 86 | 1207 | 265 | 86 | 833 | 41 | 109 | 25 | 130 | 135 | 95 | 286 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1805 | 3539 | 1583 | 1736 | 3438 | 1615 | 1805 | 1621 | | 1805 | 1900 | 1615 |
| Flt Permitted | 0.32 | 1.00 | 1.00 | 0.15 | 1.00 | 1.00 | 0.69 | 1.00 | | 0.57 | 1.00 | 1.00 |
| Satd. Flow (perm) | 610 | 3539 | 1583 | 272 | 3438 | 1615 | 1314 | 1621 | | 1074 | 1900 | 1615 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 91 | 1284 | 282 | 91 | 886 | 44 | 116 | 27 | 138 | 144 | 101 | 304 |
| RTOR Reduction (vph) | 0 | 0 | 110 | 0 | 0 | 11 | 0 | 115 | 0 | 0 | 0 | 155 |
| Lane Group Flow (vph) | 91 | 1284 | 172 | 91 | 886 | 33 | 116 | 50 | 0 | 144 | 101 | 149 |
| Heavy Vehicles (%) | 0% | 2% | 2% | 4% | 5% | 0% | 0% | 0% | 3% | 0% | 0% | 0% |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 67.1 | 67.1 | 67.1 | 77.1 | 77.1 | 77.1 | 18.4 | 18.4 | | 18.4 | 18.4 | 18.4 |
| Effective Green, g (s) | 67.1 | 67.1 | 67.1 | 77.1 | 77.1 | 77.1 | 18.4 | 18.4 | | 18.4 | 18.4 | 18.4 |
| Actuated g/C Ratio | 0.61 | 0.61 | 0.61 | 0.70 | 0.70 | 0.70 | 0.17 | 0.17 | | 0.17 | 0.17 | 0.17 |
| Clearance Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| 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) | 371 | 2154 | 963 | 270 | 2405 | 1129 | 219 | 270 | | 179 | 317 | 269 |
| v/s Ratio Prot | | c0.36 | | 0.02 | c0.26 | | | 0.03 | | | 0.05 | |
| v/s Ratio Perm | 0.15 | | 0.11 | 0.22 | | 0.02 | 0.09 | | | c0.13 | | 0.09 |
| v/c Ratio | 0.25 | 0.60 | 0.18 | 0.34 | 0.37 | 0.03 | 0.53 | 0.19 | | 0.80 | 0.32 | 0.55 |
| Uniform Delay, d1 | 9.9 | 13.2 | 9.5 | 8.1 | 6.7 | 5.1 | 41.9 | 39.5 | | 44.2 | 40.4 | 42.1 |
| 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 | 1.6 | 1.2 | 0.4 | 0.7 | 0.4 | 0.0 | 2.3 | 0.3 | | 22.4 | 0.6 | 2.5 |
| Delay (s) | 11.5 | 14.5 | 9.9 | 8.8 | 7.1 | 5.1 | 44.3 | 39.8 | | 66.6 | 41.0 | 44.6 |
| Level of Service | B | B | A | A | A | A | D | D | | E | D | D |
| Approach Delay (s) | | 13.5 | | | 7.2 | | | 41.6 | | | 49.7 | |
| Approach LOS | | B | | | A | | | D | | | D | |

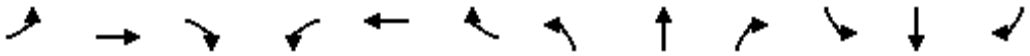
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 19.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 110.2 | Sum of lost time (s) | 18.7 |
| Intersection Capacity Utilization | 91.3% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 1448 | 72 | 28 | 1007 | 11 | 37 | 6 | 11 | 4 |
| Future Volume (vph) | 15 | 1448 | 72 | 28 | 1007 | 11 | 37 | 6 | 11 | 4 |
| Lane Group Flow (vph) | 16 | 1591 | 79 | 31 | 1107 | 12 | 41 | 45 | 12 | 36 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | 6 |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.0 | 37.9 | 37.9 | 10.0 | 37.9 | 37.9 | 30.7 | 30.7 | 30.7 | 30.7 |
| Total Split (s) | 20.0 | 67.9 | 67.9 | 20.0 | 67.9 | 67.9 | 31.7 | 31.7 | 31.7 | 31.7 |
| Total Split (%) | 16.7% | 56.8% | 56.8% | 16.7% | 56.8% | 56.8% | 26.5% | 26.5% | 26.5% | 26.5% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 4.1 | 4.1 | 4.1 | 4.1 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.6 | 2.6 | 2.6 | 2.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | 6.7 | 6.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None |
| v/c Ratio | 0.04 | 0.63 | 0.07 | 0.12 | 0.43 | 0.01 | 0.31 | 0.23 | 0.11 | 0.21 |
| Control Delay | 2.9 | 10.8 | 1.9 | 3.6 | 7.0 | 0.0 | 46.5 | 18.9 | 41.3 | 18.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.9 | 10.8 | 1.9 | 3.6 | 7.0 | 0.0 | 46.5 | 18.9 | 41.3 | 18.7 |
| Queue Length 50th (m) | 0.5 | 94.6 | 0.0 | 1.0 | 31.8 | 0.0 | 7.5 | 1.2 | 2.1 | 0.7 |
| Queue Length 95th (m) | 2.0 | 135.6 | 5.3 | 3.1 | 75.4 | 0.0 | 18.1 | 11.6 | 7.8 | 10.0 |
| Internal Link Dist (m) | | 440.7 | | | 446.3 | | | 949.6 | | 204.9 |
| Turn Bay Length (m) | 40.0 | | 22.0 | 42.0 | | 51.0 | 20.0 | | 14.0 | |
| Base Capacity (vph) | 550 | 2540 | 1179 | 414 | 2598 | 1240 | 375 | 474 | 315 | 430 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.03 | 0.63 | 0.07 | 0.07 | 0.43 | 0.01 | 0.11 | 0.09 | 0.04 | 0.08 |

| Intersection Summary |
|---|
| Cycle Length: 119.6 |
| Actuated Cycle Length: 93.2 |
| Natural Cycle: 90 |
| Control Type: Semi Act-Uncoord |

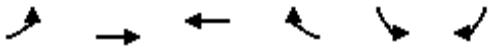
Splits and Phases: 2: Moonlight Ave & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 1448 | 72 | 28 | 1007 | 11 | 37 | 6 | 35 | 11 | 4 | 29 |
| Future Volume (vph) | 15 | 1448 | 72 | 28 | 1007 | 11 | 37 | 6 | 35 | 11 | 4 | 29 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 0.87 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1687 | 3471 | 1583 | 1736 | 3438 | 1615 | 1805 | 1659 | | 1530 | 1512 | |
| Flt Permitted | 0.24 | 1.00 | 1.00 | 0.11 | 1.00 | 1.00 | 0.73 | 1.00 | | 0.73 | 1.00 | |
| Satd. Flow (perm) | 426 | 3471 | 1583 | 206 | 3438 | 1615 | 1394 | 1659 | | 1172 | 1512 | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 16 | 1591 | 79 | 31 | 1107 | 12 | 41 | 7 | 38 | 12 | 4 | 32 |
| RTOR Reduction (vph) | 0 | 0 | 25 | 0 | 0 | 4 | 0 | 35 | 0 | 0 | 30 | 0 |
| Lane Group Flow (vph) | 16 | 1591 | 54 | 31 | 1107 | 8 | 41 | 10 | 0 | 12 | 6 | 0 |
| Heavy Vehicles (%) | 7% | 4% | 2% | 4% | 5% | 0% | 0% | 0% | 0% | 18% | 0% | 10% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 69.7 | 67.4 | 67.4 | 72.3 | 68.7 | 68.7 | 7.1 | 7.1 | | 7.1 | 7.1 | |
| Effective Green, g (s) | 69.7 | 67.4 | 67.4 | 72.3 | 68.7 | 68.7 | 7.1 | 7.1 | | 7.1 | 7.1 | |
| Actuated g/C Ratio | 0.71 | 0.69 | 0.69 | 0.74 | 0.70 | 0.70 | 0.07 | 0.07 | | 0.07 | 0.07 | |
| Clearance Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 333 | 2394 | 1092 | 208 | 2417 | 1135 | 101 | 120 | | 85 | 109 | |
| v/s Ratio Prot | 0.00 | c0.46 | | c0.01 | 0.32 | | | 0.01 | | | 0.00 | |
| v/s Ratio Perm | 0.03 | | 0.03 | 0.10 | | 0.01 | c0.03 | | | 0.01 | | |
| v/c Ratio | 0.05 | 0.66 | 0.05 | 0.15 | 0.46 | 0.01 | 0.41 | 0.08 | | 0.14 | 0.06 | |
| Uniform Delay, d1 | 4.2 | 8.7 | 4.9 | 5.6 | 6.3 | 4.3 | 43.3 | 42.3 | | 42.4 | 42.2 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 1.5 | 0.1 | 0.3 | 0.6 | 0.0 | 2.7 | 0.3 | | 0.8 | 0.2 | |
| Delay (s) | 4.2 | 10.2 | 5.0 | 5.9 | 7.0 | 4.3 | 45.9 | 42.5 | | 43.2 | 42.4 | |
| Level of Service | A | B | A | A | A | A | D | D | | D | D | |
| Approach Delay (s) | | 9.9 | | | 6.9 | | | 44.2 | | | 42.6 | |
| Approach LOS | | A | | | A | | | D | | | D | |

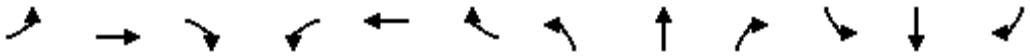
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 97.7 | Sum of lost time (s) | 19.6 |
| Intersection Capacity Utilization | 60.9% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 139 | 118 | 59 | 24 | 60 | 214 |
| Future Volume (Veh/h) | 139 | 118 | 59 | 24 | 60 | 214 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Hourly flow rate (vph) | 174 | 148 | 74 | 30 | 75 | 268 |
| 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 | 104 | | | | 585 | 89 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 104 | | | | 585 | 89 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 88 | | | | 82 | 72 |
| cM capacity (veh/h) | 1500 | | | | 410 | 972 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 322 | 104 | 343 |
| Volume Left | 174 | 0 | 75 |
| Volume Right | 0 | 30 | 268 |
| cSH | 1500 | 1700 | 748 |
| Volume to Capacity | 0.12 | 0.06 | 0.46 |
| Queue Length 95th (m) | 3.1 | 0.0 | 19.4 |
| Control Delay (s) | 4.6 | 0.0 | 13.8 |
| Lane LOS | A | | B |
| Approach Delay (s) | 4.6 | 0.0 | 13.8 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 8.1 | | |
| Intersection Capacity Utilization | 43.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 55 | 107 | 2 | 3 | 52 | 8 | 7 | 5 | 3 | 36 | 3 | 32 |
| Future Volume (vph) | 55 | 107 | 2 | 3 | 52 | 8 | 7 | 5 | 3 | 36 | 3 | 32 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph) | 64 | 124 | 2 | 3 | 60 | 9 | 8 | 6 | 3 | 42 | 3 | 37 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 190 | 72 | 17 | 82 |
| Volume Left (vph) | 64 | 3 | 8 | 42 |
| Volume Right (vph) | 2 | 9 | 3 | 37 |
| Hadj (s) | 0.06 | -0.07 | -0.01 | -0.09 |
| Departure Headway (s) | 4.3 | 4.3 | 4.6 | 4.4 |
| Degree Utilization, x | 0.23 | 0.09 | 0.02 | 0.10 |
| Capacity (veh/h) | 822 | 814 | 732 | 760 |
| Control Delay (s) | 8.5 | 7.7 | 7.7 | 7.9 |
| Approach Delay (s) | 8.5 | 7.7 | 7.7 | 7.9 |
| Approach LOS | A | A | A | A |

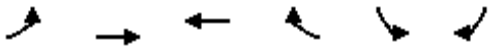
| Intersection Summary | | | |
|---|---|---|---|
| Delay | 8.2 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 27.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 55 | 107 | 2 | 3 | 52 | 8 | 7 | 5 | 3 | 36 | 3 | 32 |
| Future Vol, veh/h | 55 | 107 | 2 | 3 | 52 | 8 | 7 | 5 | 3 | 36 | 3 | 32 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 7 |
| Mvmt Flow | 64 | 124 | 2 | 3 | 60 | 9 | 8 | 6 | 3 | 42 | 3 | 37 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 8.5 | 7.7 | 7.7 | 7.9 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 47% | 34% | 5% | 51% |
| Vol Thru, % | 33% | 65% | 83% | 4% |
| Vol Right, % | 20% | 1% | 13% | 45% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 15 | 164 | 63 | 71 |
| LT Vol | 7 | 55 | 3 | 36 |
| Through Vol | 5 | 107 | 52 | 3 |
| RT Vol | 3 | 2 | 8 | 32 |
| Lane Flow Rate | 17 | 191 | 73 | 83 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.022 | 0.222 | 0.087 | 0.101 |
| Departure Headway (Hd) | 4.557 | 4.19 | 4.26 | 4.391 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 789 | 845 | 844 | 821 |
| Service Time | 2.565 | 2.277 | 2.27 | 2.395 |
| HCM Lane V/C Ratio | 0.022 | 0.226 | 0.086 | 0.101 |
| HCM Control Delay | 7.7 | 8.5 | 7.7 | 7.9 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.8 | 0.3 | 0.3 |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 6 | 172 | 78 | 4 | 1 | 0 |
| Future Volume (Veh/h) | 6 | 172 | 78 | 4 | 1 | 0 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 6 | 183 | 83 | 4 | 1 | 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 | 87 | | | | 280 | 85 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 87 | | | | 280 | 85 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 100 |
| cM capacity (veh/h) | 1522 | | | | 711 | 980 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 189 | 87 | 1 |
| Volume Left | 6 | 0 | 1 |
| Volume Right | 0 | 4 | 0 |
| cSH | 1522 | 1700 | 711 |
| Volume to Capacity | 0.00 | 0.05 | 0.00 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 0.3 | 0.0 | 10.1 |
| Lane LOS | A | | B |
| Approach Delay (s) | 0.3 | 0.0 | 10.1 |
| Approach LOS | | | B |

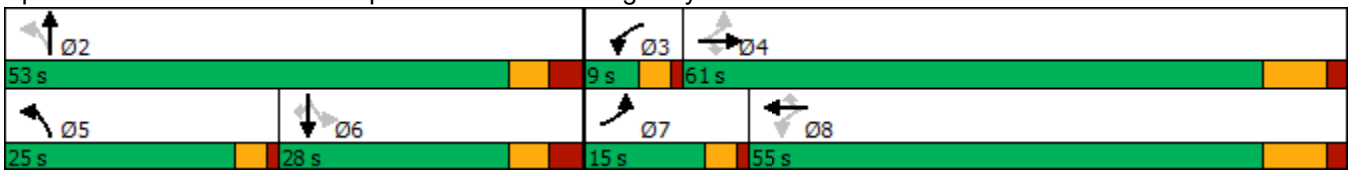
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 23.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

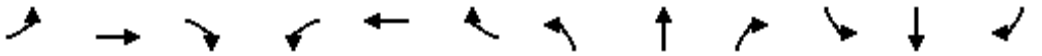
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 439 | 112 | 120 | 1078 | 163 | 321 | 111 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 439 | 112 | 120 | 1078 | 163 | 321 | 111 | 59 | 31 | 44 |
| Lane Group Flow (vph) | 206 | 488 | 124 | 133 | 1198 | 181 | 357 | 251 | 66 | 34 | 49 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 4.5 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 4.5 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.0 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 9.0 | 27.8 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 15.0 | 61.0 | 61.0 | 9.0 | 55.0 | 55.0 | 25.0 | 53.0 | 28.0 | 28.0 | 28.0 |
| Total Split (%) | 12.2% | 49.6% | 49.6% | 7.3% | 44.7% | 44.7% | 20.3% | 43.1% | 22.8% | 22.8% | 22.8% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.0 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 3.2 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None | None |
| v/c Ratio | 0.80 | 0.30 | 0.15 | 0.26 | 0.82 | 0.24 | 0.77 | 0.46 | 0.52 | 0.16 | 0.16 |
| Control Delay | 43.5 | 19.2 | 3.8 | 13.9 | 35.2 | 7.3 | 42.9 | 27.0 | 63.3 | 47.4 | 1.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 43.5 | 19.2 | 3.8 | 13.9 | 35.2 | 7.3 | 42.9 | 27.0 | 63.3 | 47.4 | 1.1 |
| Queue Length 50th (m) | 26.4 | 36.5 | 0.0 | 13.3 | 131.5 | 5.7 | 67.4 | 36.5 | 14.9 | 7.4 | 0.0 |
| Queue Length 95th (m) | #74.0 | 53.7 | 11.0 | 25.6 | #188.2 | 21.3 | 97.5 | 59.9 | 29.9 | 17.3 | 0.0 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | | 303.0 | |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 100.0 | | 75.0 | | |
| Base Capacity (vph) | 259 | 1611 | 849 | 503 | 1455 | 769 | 482 | 756 | 222 | 369 | 434 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 0.30 | 0.15 | 0.26 | 0.82 | 0.24 | 0.74 | 0.33 | 0.30 | 0.09 | 0.11 |

Intersection Summary

Cycle Length: 123
Actuated Cycle Length: 110.2
Natural Cycle: 85
Control Type: Semi Act-Uncoord
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Levesque St/Street 'C' & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 439 | 112 | 120 | 1078 | 163 | 321 | 111 | 115 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 439 | 112 | 120 | 1078 | 163 | 321 | 111 | 115 | 59 | 31 | 44 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | | 6.8 | 6.8 | 6.8 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1719 | 3312 | 1615 | 1805 | 3374 | 1599 | 1787 | 1720 | | 1805 | 1900 | 1615 |
| Flt Permitted | 0.10 | 1.00 | 1.00 | 0.47 | 1.00 | 1.00 | 0.53 | 1.00 | | 0.60 | 1.00 | 1.00 |
| Satd. Flow (perm) | 173 | 3312 | 1615 | 901 | 3374 | 1599 | 993 | 1720 | | 1147 | 1900 | 1615 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 206 | 488 | 124 | 133 | 1198 | 181 | 357 | 123 | 128 | 66 | 34 | 49 |
| RTOR Reduction (vph) | 0 | 0 | 64 | 0 | 0 | 80 | 0 | 34 | 0 | 0 | 0 | 45 |
| Lane Group Flow (vph) | 206 | 488 | 60 | 133 | 1198 | 101 | 357 | 217 | 0 | 66 | 34 | 4 |
| Heavy Vehicles (%) | 5% | 9% | 0% | 0% | 7% | 1% | 1% | 0% | 4% | 0% | 0% | 0% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 62.7 | 53.7 | 53.7 | 52.6 | 47.6 | 47.6 | 34.3 | 34.3 | | 10.2 | 10.2 | 10.2 |
| Effective Green, g (s) | 62.7 | 53.7 | 53.7 | 52.6 | 47.6 | 47.6 | 34.3 | 34.3 | | 10.2 | 10.2 | 10.2 |
| Actuated g/C Ratio | 0.56 | 0.48 | 0.48 | 0.47 | 0.43 | 0.43 | 0.31 | 0.31 | | 0.09 | 0.09 | 0.09 |
| Clearance Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | | 6.8 | 6.8 | 6.8 |
| 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) | 250 | 1592 | 776 | 464 | 1437 | 681 | 447 | 528 | | 104 | 173 | 147 |
| v/s Ratio Prot | c0.08 | 0.15 | | 0.01 | 0.36 | | c0.14 | 0.13 | | | 0.02 | |
| v/s Ratio Perm | c0.38 | | 0.04 | 0.12 | | 0.06 | c0.10 | | | 0.06 | | 0.00 |
| v/c Ratio | 0.82 | 0.31 | 0.08 | 0.29 | 0.83 | 0.15 | 0.80 | 0.41 | | 0.63 | 0.20 | 0.03 |
| Uniform Delay, d1 | 24.3 | 17.7 | 15.6 | 16.9 | 28.5 | 19.6 | 33.6 | 30.7 | | 49.0 | 47.0 | 46.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 19.3 | 0.5 | 0.2 | 0.3 | 5.8 | 0.5 | 9.6 | 0.5 | | 12.0 | 0.6 | 0.1 |
| Delay (s) | 43.6 | 18.2 | 15.8 | 17.2 | 34.4 | 20.1 | 43.2 | 31.2 | | 60.9 | 47.5 | 46.3 |
| Level of Service | D | B | B | B | C | C | D | C | | E | D | D |
| Approach Delay (s) | | 24.2 | | | 31.1 | | | 38.3 | | | 53.1 | |
| Approach LOS | | C | | | C | | | D | | | D | |

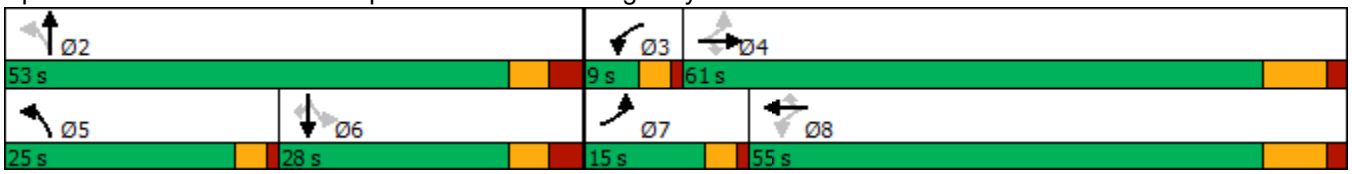
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 31.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.87 | | |
| Actuated Cycle Length (s) | 111.7 | Sum of lost time (s) | 22.7 |
| Intersection Capacity Utilization | 83.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

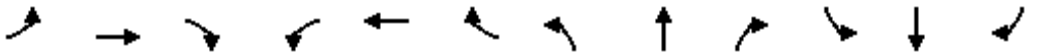
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 467 | 118 | 130 | 1139 | 163 | 336 | 111 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 467 | 118 | 130 | 1139 | 163 | 336 | 111 | 59 | 31 | 44 |
| Lane Group Flow (vph) | 206 | 519 | 131 | 144 | 1266 | 181 | 373 | 261 | 66 | 34 | 49 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 4.5 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 4.5 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.0 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 9.0 | 27.8 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 15.0 | 61.0 | 61.0 | 9.0 | 55.0 | 55.0 | 25.0 | 53.0 | 28.0 | 28.0 | 28.0 |
| Total Split (%) | 12.2% | 49.6% | 49.6% | 7.3% | 44.7% | 44.7% | 20.3% | 43.1% | 22.8% | 22.8% | 22.8% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.0 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 3.2 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None | None |
| v/c Ratio | 0.85 | 0.32 | 0.15 | 0.29 | 0.87 | 0.24 | 0.80 | 0.48 | 0.53 | 0.16 | 0.16 |
| Control Delay | 55.5 | 19.6 | 3.7 | 14.5 | 38.3 | 7.3 | 45.0 | 27.0 | 63.6 | 47.4 | 1.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 55.5 | 19.6 | 3.7 | 14.5 | 38.3 | 7.3 | 45.0 | 27.0 | 63.6 | 47.4 | 1.1 |
| Queue Length 50th (m) | 30.7 | 39.3 | 0.0 | 14.5 | 143.5 | 5.7 | 71.3 | 37.8 | 14.9 | 7.4 | 0.0 |
| Queue Length 95th (m) | #81.7 | 57.6 | 11.4 | 27.6 | #207.2 | 21.4 | 102.6 | 61.8 | 29.9 | 17.3 | 0.0 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | | 303.0 | |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 100.0 | | 75.0 | | |
| Base Capacity (vph) | 243 | 1606 | 851 | 489 | 1451 | 767 | 482 | 753 | 220 | 368 | 433 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.85 | 0.32 | 0.15 | 0.29 | 0.87 | 0.24 | 0.77 | 0.35 | 0.30 | 0.09 | 0.11 |

Intersection Summary

Cycle Length: 123
Actuated Cycle Length: 110.5
Natural Cycle: 85
Control Type: Semi Act-Uncoord
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Levesque St/Street 'C' & Kingsway





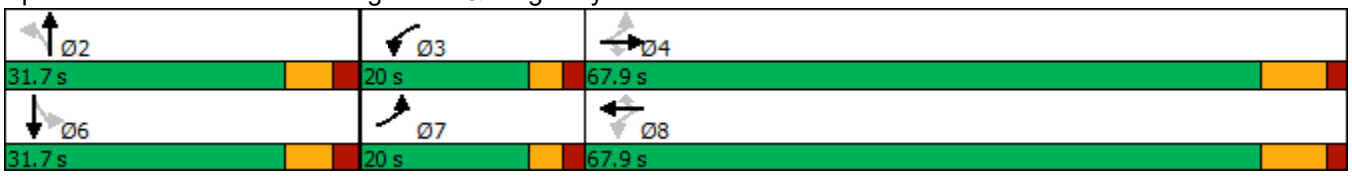
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 467 | 118 | 130 | 1139 | 163 | 336 | 111 | 124 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 467 | 118 | 130 | 1139 | 163 | 336 | 111 | 124 | 59 | 31 | 44 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | | 6.8 | 6.8 | 6.8 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1719 | 3312 | 1615 | 1805 | 3374 | 1599 | 1787 | 1713 | | 1805 | 1900 | 1615 |
| Flt Permitted | 0.08 | 1.00 | 1.00 | 0.46 | 1.00 | 1.00 | 0.53 | 1.00 | | 0.60 | 1.00 | 1.00 |
| Satd. Flow (perm) | 141 | 3312 | 1615 | 874 | 3374 | 1599 | 996 | 1713 | | 1136 | 1900 | 1615 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 206 | 519 | 131 | 144 | 1266 | 181 | 373 | 123 | 138 | 66 | 34 | 49 |
| RTOR Reduction (vph) | 0 | 0 | 68 | 0 | 0 | 81 | 0 | 37 | 0 | 0 | 0 | 44 |
| Lane Group Flow (vph) | 206 | 519 | 63 | 144 | 1266 | 100 | 373 | 224 | 0 | 66 | 34 | 5 |
| Heavy Vehicles (%) | 5% | 9% | 0% | 0% | 7% | 1% | 1% | 0% | 4% | 0% | 0% | 0% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 62.6 | 53.6 | 53.6 | 52.5 | 47.5 | 47.5 | 34.6 | 34.6 | | 10.3 | 10.3 | 10.3 |
| Effective Green, g (s) | 62.6 | 53.6 | 53.6 | 52.5 | 47.5 | 47.5 | 34.6 | 34.6 | | 10.3 | 10.3 | 10.3 |
| Actuated g/C Ratio | 0.56 | 0.48 | 0.48 | 0.47 | 0.42 | 0.42 | 0.31 | 0.31 | | 0.09 | 0.09 | 0.09 |
| Clearance Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | | 6.8 | 6.8 | 6.8 |
| 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) | 235 | 1586 | 773 | 451 | 1432 | 678 | 451 | 529 | | 104 | 174 | 148 |
| v/s Ratio Prot | c0.09 | 0.16 | | 0.01 | 0.38 | | c0.15 | 0.13 | | | 0.02 | |
| v/s Ratio Perm | c0.40 | | 0.04 | 0.14 | | 0.06 | c0.11 | | | 0.06 | | 0.00 |
| v/c Ratio | 0.88 | 0.33 | 0.08 | 0.32 | 0.88 | 0.15 | 0.83 | 0.42 | | 0.63 | 0.20 | 0.03 |
| Uniform Delay, d1 | 29.8 | 18.0 | 15.8 | 17.1 | 29.7 | 19.8 | 33.9 | 30.7 | | 49.0 | 47.0 | 46.3 |
| 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 | 28.5 | 0.6 | 0.2 | 0.4 | 8.3 | 0.5 | 11.8 | 0.6 | | 12.0 | 0.6 | 0.1 |
| Delay (s) | 58.3 | 18.6 | 16.0 | 17.5 | 37.9 | 20.2 | 45.7 | 31.3 | | 61.0 | 47.5 | 46.3 |
| Level of Service | E | B | B | B | D | C | D | C | | E | D | D |
| Approach Delay (s) | | 27.7 | | | 34.1 | | | 39.7 | | | 53.1 | |
| Approach LOS | | C | | | C | | | D | | | D | |

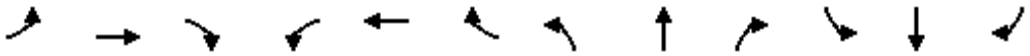
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 34.4 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.91 | | |
| Actuated Cycle Length (s) | 111.9 | Sum of lost time (s) | 22.7 |
| Intersection Capacity Utilization | 85.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 29 | 669 | 37 | 3 | 1510 | 10 | 62 | 5 | 3 | 1 |
| Future Volume (vph) | 29 | 669 | 37 | 3 | 1510 | 10 | 62 | 5 | 3 | 1 |
| Lane Group Flow (vph) | 34 | 778 | 43 | 3 | 1756 | 12 | 72 | 28 | 3 | 16 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | 6 |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.0 | 37.9 | 37.9 | 10.0 | 37.9 | 37.9 | 30.7 | 30.7 | 30.7 | 30.7 |
| Total Split (s) | 20.0 | 67.9 | 67.9 | 20.0 | 67.9 | 67.9 | 31.7 | 31.7 | 31.7 | 31.7 |
| Total Split (%) | 16.7% | 56.8% | 56.8% | 16.7% | 56.8% | 56.8% | 26.5% | 26.5% | 26.5% | 26.5% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 4.1 | 4.1 | 4.1 | 4.1 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.6 | 2.6 | 2.6 | 2.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | 6.7 | 6.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None |
| v/c Ratio | 0.21 | 0.31 | 0.04 | 0.01 | 0.71 | 0.01 | 0.46 | 0.14 | 0.03 | 0.11 |
| Control Delay | 6.1 | 5.8 | 0.6 | 3.3 | 14.3 | 0.0 | 50.7 | 20.2 | 38.7 | 20.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 6.1 | 5.8 | 0.6 | 3.3 | 14.3 | 0.0 | 50.7 | 20.2 | 38.7 | 20.4 |
| Queue Length 50th (m) | 1.3 | 22.5 | 0.0 | 0.1 | 127.2 | 0.0 | 13.5 | 1.1 | 0.6 | 0.2 |
| Queue Length 95th (m) | 3.8 | 49.6 | 1.0 | 0.8 | 170.0 | 0.0 | 26.4 | 8.7 | 3.1 | 5.9 |
| Internal Link Dist (m) | | 440.7 | | | 446.3 | | | 949.6 | | 204.9 |
| Turn Bay Length (m) | 40.0 | | 22.0 | 42.0 | | 51.0 | 20.0 | | 14.0 | |
| Base Capacity (vph) | 270 | 2543 | 1002 | 720 | 2465 | 987 | 365 | 456 | 221 | 325 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.31 | 0.04 | 0.00 | 0.71 | 0.01 | 0.20 | 0.06 | 0.01 | 0.05 |

| Intersection Summary |
|---|
| Cycle Length: 119.6 |
| Actuated Cycle Length: 95.5 |
| Natural Cycle: 100 |
| Control Type: Semi Act-Uncoord |

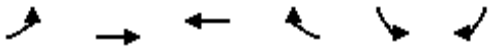
Splits and Phases: 2: Moonlight Ave & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 29 | 669 | 37 | 3 | 1510 | 10 | 62 | 5 | 19 | 3 | 1 | 13 |
| Future Volume (vph) | 29 | 669 | 37 | 3 | 1510 | 10 | 62 | 5 | 19 | 3 | 1 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.88 | | 1.00 | 0.86 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1280 | 3312 | 1282 | 1805 | 3438 | 1346 | 1770 | 1676 | | 1081 | 1196 | |
| Flt Permitted | 0.08 | 1.00 | 1.00 | 0.36 | 1.00 | 1.00 | 0.75 | 1.00 | | 0.74 | 1.00 | |
| Satd. Flow (perm) | 107 | 3312 | 1282 | 678 | 3438 | 1346 | 1392 | 1676 | | 841 | 1196 | |
| Peak-hour factor, PHF | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Adj. Flow (vph) | 34 | 778 | 43 | 3 | 1756 | 12 | 72 | 6 | 22 | 3 | 1 | 15 |
| RTOR Reduction (vph) | 0 | 0 | 13 | 0 | 0 | 4 | 0 | 20 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 34 | 778 | 30 | 3 | 1756 | 8 | 72 | 8 | 0 | 3 | 2 | 0 |
| Heavy Vehicles (%) | 41% | 9% | 26% | 0% | 5% | 20% | 2% | 0% | 0% | 67% | 0% | 39% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 75.6 | 71.6 | 71.6 | 69.8 | 68.7 | 68.7 | 8.8 | 8.8 | | 8.8 | 8.8 | |
| Effective Green, g (s) | 75.6 | 71.6 | 71.6 | 69.8 | 68.7 | 68.7 | 8.8 | 8.8 | | 8.8 | 8.8 | |
| Actuated g/C Ratio | 0.75 | 0.71 | 0.71 | 0.69 | 0.68 | 0.68 | 0.09 | 0.09 | | 0.09 | 0.09 | |
| Clearance Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 126 | 2345 | 907 | 480 | 2336 | 914 | 121 | 145 | | 73 | 104 | |
| v/s Ratio Prot | c0.01 | c0.23 | | 0.00 | c0.51 | | | 0.00 | | | 0.00 | |
| v/s Ratio Perm | 0.19 | | 0.02 | 0.00 | | 0.01 | c0.05 | | | 0.00 | | |
| v/c Ratio | 0.27 | 0.33 | 0.03 | 0.01 | 0.75 | 0.01 | 0.60 | 0.05 | | 0.04 | 0.02 | |
| Uniform Delay, d1 | 8.5 | 5.6 | 4.4 | 4.9 | 10.6 | 5.2 | 44.4 | 42.3 | | 42.3 | 42.2 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.2 | 0.4 | 0.1 | 0.0 | 2.3 | 0.0 | 7.6 | 0.2 | | 0.2 | 0.1 | |
| Delay (s) | 9.7 | 6.0 | 4.5 | 4.9 | 12.9 | 5.2 | 52.1 | 42.5 | | 42.5 | 42.3 | |
| Level of Service | A | A | A | A | B | A | D | D | | D | D | |
| Approach Delay (s) | | 6.1 | | | 12.8 | | | 49.4 | | | 42.3 | |
| Approach LOS | | A | | | B | | | D | | | D | |

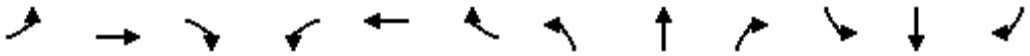
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.71 | | |
| Actuated Cycle Length (s) | 101.1 | Sum of lost time (s) | 19.6 |
| Intersection Capacity Utilization | 64.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 280 | 33 | 93 | 73 | 31 | 167 |
| Future Volume (Veh/h) | 280 | 33 | 93 | 73 | 31 | 167 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 311 | 37 | 103 | 81 | 34 | 186 |
| 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 | 184 | | | | 802 | 144 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 184 | | | | 802 | 144 |
| tC, single (s) | 4.2 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.3 | | | | 3.5 | 3.3 |
| p0 queue free % | 77 | | | | 88 | 79 |
| cM capacity (veh/h) | 1367 | | | | 275 | 899 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 348 | 184 | 220 |
| Volume Left | 311 | 0 | 34 |
| Volume Right | 0 | 81 | 186 |
| cSH | 1367 | 1700 | 665 |
| Volume to Capacity | 0.23 | 0.11 | 0.33 |
| Queue Length 95th (m) | 7.0 | 0.0 | 11.6 |
| Control Delay (s) | 7.7 | 0.0 | 13.1 |
| Lane LOS | A | | B |
| Approach Delay (s) | 7.7 | 0.0 | 13.1 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.4 | | |
| Intersection Capacity Utilization | 48.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 18 | 41 | 2 | 0 | 111 | 24 | 5 | 0 | 0 | 16 | 1 | 27 |
| Future Volume (vph) | 18 | 41 | 2 | 0 | 111 | 24 | 5 | 0 | 0 | 16 | 1 | 27 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 21 | 47 | 2 | 0 | 128 | 28 | 6 | 0 | 0 | 18 | 1 | 31 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 70 | 156 | 6 | 50 |
| Volume Left (vph) | 21 | 0 | 6 | 18 |
| Volume Right (vph) | 2 | 28 | 0 | 31 |
| Hadj (s) | 0.15 | -0.02 | 0.20 | -0.03 |
| Departure Headway (s) | 4.3 | 4.1 | 4.7 | 4.4 |
| Degree Utilization, x | 0.08 | 0.18 | 0.01 | 0.06 |
| Capacity (veh/h) | 810 | 866 | 727 | 771 |
| Control Delay (s) | 7.7 | 8.0 | 7.7 | 7.7 |
| Approach Delay (s) | 7.7 | 8.0 | 7.7 | 7.7 |
| Approach LOS | A | A | A | A |

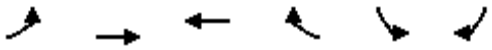
| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.8 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 24.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.9 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 18 | 41 | 2 | 0 | 111 | 24 | 5 | 0 | 0 | 16 | 1 | 27 |
| Future Vol, veh/h | 18 | 41 | 2 | 0 | 111 | 24 | 5 | 0 | 0 | 16 | 1 | 27 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 13 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 15 | 0 | 17 |
| Mvmt Flow | 21 | 47 | 2 | 0 | 128 | 28 | 6 | 0 | 0 | 18 | 1 | 31 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.9 | 8 | 7.7 | 7.6 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 100% | 30% | 0% | 36% |
| Vol Thru, % | 0% | 67% | 82% | 2% |
| Vol Right, % | 0% | 3% | 18% | 61% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 5 | 61 | 135 | 44 |
| LT Vol | 5 | 18 | 0 | 16 |
| Through Vol | 0 | 41 | 111 | 1 |
| RT Vol | 0 | 2 | 24 | 27 |
| Lane Flow Rate | 6 | 70 | 155 | 51 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.007 | 0.085 | 0.174 | 0.061 |
| Departure Headway (Hd) | 4.656 | 4.377 | 4.046 | 4.363 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 773 | 811 | 880 | 826 |
| Service Time | 2.657 | 2.444 | 2.102 | 2.363 |
| HCM Lane V/C Ratio | 0.008 | 0.086 | 0.176 | 0.062 |
| HCM Control Delay | 7.7 | 7.9 | 8 | 7.6 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.3 | 0.6 | 0.2 |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 65 | 157 | 6 | 1 | 5 |
| Future Volume (Veh/h) | 2 | 65 | 157 | 6 | 1 | 5 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 70 | 169 | 6 | 1 | 5 |
| 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 | | | | 246 | 172 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 175 | | | | 246 | 172 |
| tC, single (s) | 4.1 | | | | 6.9 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 4.0 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 99 |
| cM capacity (veh/h) | 1414 | | | | 648 | 877 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 72 | 175 | 6 |
| Volume Left | 2 | 0 | 1 |
| Volume Right | 0 | 6 | 5 |
| cSH | 1414 | 1700 | 828 |
| Volume to Capacity | 0.00 | 0.10 | 0.01 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.2 |
| Control Delay (s) | 0.2 | 0.0 | 9.4 |
| Lane LOS | A | | A |
| Approach Delay (s) | 0.2 | 0.0 | 9.4 |
| Approach LOS | | | A |

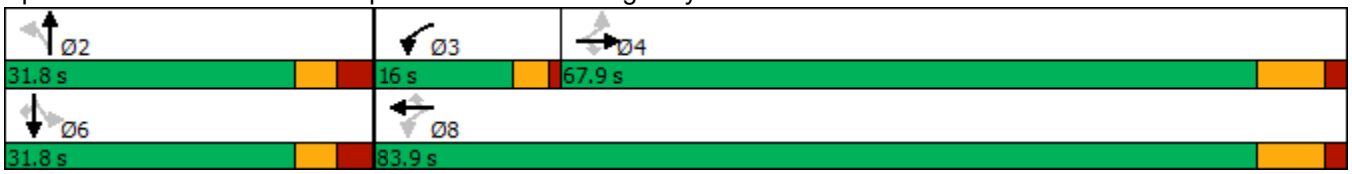
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 18.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

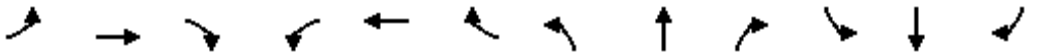
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 1277 | 281 | 92 | 886 | 41 | 115 | 25 | 135 | 95 | 286 |
| Future Volume (vph) | 86 | 1277 | 281 | 92 | 886 | 41 | 115 | 25 | 135 | 95 | 286 |
| Lane Group Flow (vph) | 91 | 1359 | 299 | 98 | 943 | 44 | 122 | 176 | 144 | 101 | 304 |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 30.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 37.9 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 27.8 | 27.8 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 67.9 | 67.9 | 67.9 | 16.0 | 83.9 | 83.9 | 31.8 | 31.8 | 31.8 | 31.8 | 31.8 |
| Total Split (%) | 58.7% | 58.7% | 58.7% | 13.8% | 72.5% | 72.5% | 27.5% | 27.5% | 27.5% | 27.5% | 27.5% |
| Yellow Time (s) | 5.9 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lag | Lag | Lag | Lead | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | | | |
| Recall Mode | Max | Max | Max | None | Max | Max | None | None | None | None | None |
| v/c Ratio | 0.27 | 0.65 | 0.28 | 0.37 | 0.40 | 0.04 | 0.54 | 0.44 | 0.82 | 0.31 | 0.73 |
| Control Delay | 15.4 | 17.9 | 2.2 | 9.0 | 8.2 | 2.8 | 50.3 | 12.9 | 76.6 | 41.7 | 30.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 15.4 | 17.9 | 2.2 | 9.0 | 8.2 | 2.8 | 50.3 | 12.9 | 76.6 | 41.7 | 30.1 |
| Queue Length 50th (m) | 9.6 | 102.7 | 0.0 | 5.7 | 43.4 | 0.5 | 25.3 | 5.2 | 31.5 | 20.1 | 29.5 |
| Queue Length 95th (m) | 23.4 | 147.7 | 12.7 | 12.5 | 64.0 | 4.6 | 44.7 | 24.4 | #58.5 | 36.1 | 61.3 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | | 303.0 | |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 100.0 | | 75.0 | | |
| Base Capacity (vph) | 340 | 2088 | 1056 | 331 | 2385 | 1131 | 300 | 484 | 235 | 433 | 496 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.27 | 0.65 | 0.28 | 0.30 | 0.40 | 0.04 | 0.41 | 0.36 | 0.61 | 0.23 | 0.61 |

Intersection Summary

Cycle Length: 115.7
Actuated Cycle Length: 109.8
Natural Cycle: 75
Control Type: Semi Act-Uncoord
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Levesque St/Street 'C' & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 1277 | 281 | 92 | 886 | 41 | 115 | 25 | 140 | 135 | 95 | 286 |
| Future Volume (vph) | 86 | 1277 | 281 | 92 | 886 | 41 | 115 | 25 | 140 | 135 | 95 | 286 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1805 | 3539 | 1583 | 1736 | 3438 | 1615 | 1805 | 1618 | | 1805 | 1900 | 1615 |
| Flt Permitted | 0.30 | 1.00 | 1.00 | 0.13 | 1.00 | 1.00 | 0.69 | 1.00 | | 0.54 | 1.00 | 1.00 |
| Satd. Flow (perm) | 576 | 3539 | 1583 | 229 | 3438 | 1615 | 1314 | 1618 | | 1029 | 1900 | 1615 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 91 | 1359 | 299 | 98 | 943 | 44 | 122 | 27 | 149 | 144 | 101 | 304 |
| RTOR Reduction (vph) | 0 | 0 | 123 | 0 | 0 | 11 | 0 | 123 | 0 | 0 | 0 | 137 |
| Lane Group Flow (vph) | 91 | 1359 | 176 | 98 | 943 | 33 | 122 | 53 | 0 | 144 | 101 | 167 |
| Heavy Vehicles (%) | 0% | 2% | 2% | 4% | 5% | 0% | 0% | 0% | 3% | 0% | 0% | 0% |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 64.8 | 64.8 | 64.8 | 76.2 | 76.2 | 76.2 | 18.9 | 18.9 | | 18.9 | 18.9 | 18.9 |
| Effective Green, g (s) | 64.8 | 64.8 | 64.8 | 76.2 | 76.2 | 76.2 | 18.9 | 18.9 | | 18.9 | 18.9 | 18.9 |
| Actuated g/C Ratio | 0.59 | 0.59 | 0.59 | 0.69 | 0.69 | 0.69 | 0.17 | 0.17 | | 0.17 | 0.17 | 0.17 |
| Clearance Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| 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) | 339 | 2088 | 934 | 260 | 2385 | 1120 | 226 | 278 | | 177 | 327 | 277 |
| v/s Ratio Prot | | c0.38 | | 0.03 | c0.27 | | | 0.03 | | | 0.05 | |
| v/s Ratio Perm | 0.16 | | 0.11 | 0.24 | | 0.02 | 0.09 | | | c0.14 | | 0.10 |
| v/c Ratio | 0.27 | 0.65 | 0.19 | 0.38 | 0.40 | 0.03 | 0.54 | 0.19 | | 0.81 | 0.31 | 0.60 |
| Uniform Delay, d1 | 11.0 | 15.0 | 10.4 | 9.6 | 7.1 | 5.2 | 41.5 | 38.9 | | 43.8 | 39.7 | 42.0 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.9 | 1.6 | 0.4 | 0.9 | 0.5 | 0.0 | 2.5 | 0.3 | | 24.0 | 0.5 | 3.7 |
| Delay (s) | 12.9 | 16.6 | 10.8 | 10.5 | 7.6 | 5.3 | 44.0 | 39.2 | | 67.8 | 40.3 | 45.7 |
| Level of Service | B | B | B | B | A | A | D | D | | E | D | D |
| Approach Delay (s) | | 15.4 | | | 7.7 | | | 41.2 | | | 50.5 | |
| Approach LOS | | B | | | A | | | D | | | D | |

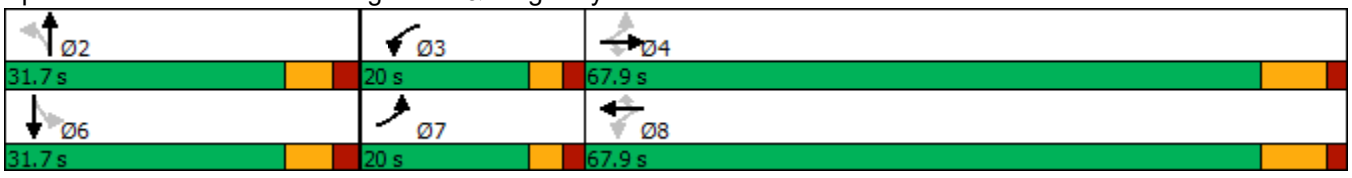
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 109.8 | Sum of lost time (s) | 18.7 |
| Intersection Capacity Utilization | 91.9% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

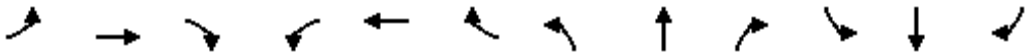
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 1527 | 78 | 30 | 1070 | 11 | 39 | 6 | 11 | 4 |
| Future Volume (vph) | 15 | 1527 | 78 | 30 | 1070 | 11 | 39 | 6 | 11 | 4 |
| Lane Group Flow (vph) | 16 | 1678 | 86 | 33 | 1176 | 12 | 43 | 48 | 12 | 36 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | 6 |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.0 | 37.9 | 37.9 | 10.0 | 37.9 | 37.9 | 30.7 | 30.7 | 30.7 | 30.7 |
| Total Split (s) | 20.0 | 67.9 | 67.9 | 20.0 | 67.9 | 67.9 | 31.7 | 31.7 | 31.7 | 31.7 |
| Total Split (%) | 16.7% | 56.8% | 56.8% | 16.7% | 56.8% | 56.8% | 26.5% | 26.5% | 26.5% | 26.5% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 4.1 | 4.1 | 4.1 | 4.1 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.6 | 2.6 | 2.6 | 2.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | 6.7 | 6.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None |
| v/c Ratio | 0.04 | 0.66 | 0.07 | 0.14 | 0.45 | 0.01 | 0.32 | 0.24 | 0.11 | 0.21 |
| Control Delay | 2.9 | 11.6 | 2.2 | 3.9 | 7.4 | 0.0 | 46.7 | 18.4 | 41.2 | 18.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.9 | 11.6 | 2.2 | 3.9 | 7.4 | 0.0 | 46.7 | 18.4 | 41.2 | 18.7 |
| Queue Length 50th (m) | 0.5 | 105.1 | 0.5 | 1.1 | 35.1 | 0.0 | 7.8 | 1.2 | 2.1 | 0.7 |
| Queue Length 95th (m) | 2.0 | 151.4 | 6.1 | 3.3 | 82.7 | 0.0 | 18.8 | 11.9 | 7.8 | 10.0 |
| Internal Link Dist (m) | | 440.7 | | | 446.3 | | | 949.6 | | 204.9 |
| Turn Bay Length (m) | 40.0 | | 22.0 | 42.0 | | 51.0 | 20.0 | | 14.0 | |
| Base Capacity (vph) | 525 | 2534 | 1177 | 395 | 2595 | 1238 | 375 | 475 | 314 | 430 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.03 | 0.66 | 0.07 | 0.08 | 0.45 | 0.01 | 0.11 | 0.10 | 0.04 | 0.08 |

**Intersection Summary**

Cycle Length: 119.6
Actuated Cycle Length: 93.2
Natural Cycle: 90
Control Type: Semi Act-Uncoord

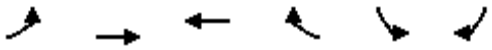
Splits and Phases: 2: Moonlight Ave & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 1527 | 78 | 30 | 1070 | 11 | 39 | 6 | 37 | 11 | 4 | 29 |
| Future Volume (vph) | 15 | 1527 | 78 | 30 | 1070 | 11 | 39 | 6 | 37 | 11 | 4 | 29 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 0.87 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1687 | 3471 | 1583 | 1736 | 3438 | 1615 | 1805 | 1657 | | 1530 | 1512 | |
| Flt Permitted | 0.22 | 1.00 | 1.00 | 0.10 | 1.00 | 1.00 | 0.73 | 1.00 | | 0.73 | 1.00 | |
| Satd. Flow (perm) | 388 | 3471 | 1583 | 176 | 3438 | 1615 | 1394 | 1657 | | 1169 | 1512 | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 16 | 1678 | 86 | 33 | 1176 | 12 | 43 | 7 | 41 | 12 | 4 | 32 |
| RTOR Reduction (vph) | 0 | 0 | 25 | 0 | 0 | 4 | 0 | 38 | 0 | 0 | 30 | 0 |
| Lane Group Flow (vph) | 16 | 1678 | 61 | 33 | 1176 | 8 | 43 | 10 | 0 | 12 | 6 | 0 |
| Heavy Vehicles (%) | 7% | 4% | 2% | 4% | 5% | 0% | 0% | 0% | 0% | 18% | 0% | 10% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 69.6 | 67.3 | 67.3 | 72.2 | 68.6 | 68.6 | 7.3 | 7.3 | | 7.3 | 7.3 | |
| Effective Green, g (s) | 69.6 | 67.3 | 67.3 | 72.2 | 68.6 | 68.6 | 7.3 | 7.3 | | 7.3 | 7.3 | |
| Actuated g/C Ratio | 0.71 | 0.69 | 0.69 | 0.74 | 0.70 | 0.70 | 0.07 | 0.07 | | 0.07 | 0.07 | |
| Clearance Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 306 | 2388 | 1089 | 187 | 2411 | 1132 | 104 | 123 | | 87 | 112 | |
| v/s Ratio Prot | 0.00 | c0.48 | | c0.01 | 0.34 | | | 0.01 | | | 0.00 | |
| v/s Ratio Perm | 0.04 | | 0.04 | 0.12 | | 0.01 | c0.03 | | | 0.01 | | |
| v/c Ratio | 0.05 | 0.70 | 0.06 | 0.18 | 0.49 | 0.01 | 0.41 | 0.08 | | 0.14 | 0.06 | |
| Uniform Delay, d1 | 4.3 | 9.2 | 4.9 | 6.4 | 6.6 | 4.4 | 43.2 | 42.1 | | 42.3 | 42.1 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 1.8 | 0.1 | 0.5 | 0.7 | 0.0 | 2.7 | 0.3 | | 0.7 | 0.2 | |
| Delay (s) | 4.4 | 11.0 | 5.0 | 6.9 | 7.3 | 4.4 | 45.9 | 42.4 | | 43.0 | 42.3 | |
| Level of Service | A | B | A | A | A | A | D | D | | D | D | |
| Approach Delay (s) | | 10.6 | | | 7.3 | | | 44.0 | | | 42.5 | |
| Approach LOS | | B | | | A | | | D | | | D | |

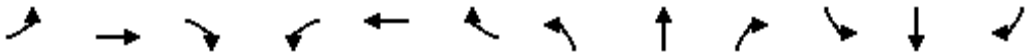
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 10.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 97.8 | Sum of lost time (s) | 19.6 |
| Intersection Capacity Utilization | 63.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 146 | 127 | 63 | 25 | 61 | 222 |
| Future Volume (Veh/h) | 146 | 127 | 63 | 25 | 61 | 222 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Hourly flow rate (vph) | 183 | 159 | 79 | 31 | 76 | 278 |
| 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 | 110 | | | | 620 | 94 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 110 | | | | 620 | 94 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 88 | | | | 80 | 71 |
| cM capacity (veh/h) | 1493 | | | | 388 | 965 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 342 | 110 | 354 |
| Volume Left | 183 | 0 | 76 |
| Volume Right | 0 | 31 | 278 |
| cSH | 1493 | 1700 | 732 |
| Volume to Capacity | 0.12 | 0.06 | 0.48 |
| Queue Length 95th (m) | 3.3 | 0.0 | 21.3 |
| Control Delay (s) | 4.6 | 0.0 | 14.4 |
| Lane LOS | A | | B |
| Approach Delay (s) | 4.6 | 0.0 | 14.4 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 8.3 | | |
| Intersection Capacity Utilization | 45.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 60 | 112 | 2 | 3 | 55 | 9 | 8 | 6 | 3 | 38 | 3 | 35 |
| Future Volume (vph) | 60 | 112 | 2 | 3 | 55 | 9 | 8 | 6 | 3 | 38 | 3 | 35 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph) | 70 | 130 | 2 | 3 | 64 | 10 | 9 | 7 | 3 | 44 | 3 | 41 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 202 | 77 | 19 | 88 |
| Volume Left (vph) | 70 | 3 | 9 | 44 |
| Volume Right (vph) | 2 | 10 | 3 | 41 |
| Hadj (s) | 0.06 | -0.07 | 0.00 | -0.10 |
| Departure Headway (s) | 4.3 | 4.3 | 4.6 | 4.5 |
| Degree Utilization, x | 0.24 | 0.09 | 0.02 | 0.11 |
| Capacity (veh/h) | 815 | 797 | 720 | 752 |
| Control Delay (s) | 8.7 | 7.7 | 7.8 | 8.0 |
| Approach Delay (s) | 8.7 | 7.7 | 7.8 | 8.0 |
| Approach LOS | A | A | A | A |

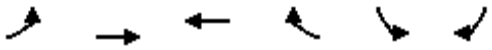
| Intersection Summary | | | |
|---|---|---|---|
| Delay | 8.3 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 28.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 60 | 112 | 2 | 3 | 55 | 9 | 8 | 6 | 3 | 38 | 3 | 35 |
| Future Vol, veh/h | 60 | 112 | 2 | 3 | 55 | 9 | 8 | 6 | 3 | 38 | 3 | 35 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 7 |
| Mvmt Flow | 70 | 130 | 2 | 3 | 64 | 10 | 9 | 7 | 3 | 44 | 3 | 41 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 8.6 | 7.7 | 7.7 | 8 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 47% | 34% | 4% | 50% |
| Vol Thru, % | 35% | 64% | 82% | 4% |
| Vol Right, % | 18% | 1% | 13% | 46% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 17 | 174 | 67 | 76 |
| LT Vol | 8 | 60 | 3 | 38 |
| Through Vol | 6 | 112 | 55 | 3 |
| RT Vol | 3 | 2 | 9 | 35 |
| Lane Flow Rate | 20 | 202 | 78 | 88 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.025 | 0.237 | 0.093 | 0.109 |
| Departure Headway (Hd) | 4.619 | 4.212 | 4.29 | 4.424 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 778 | 840 | 838 | 814 |
| Service Time | 2.628 | 2.306 | 2.301 | 2.43 |
| HCM Lane V/C Ratio | 0.026 | 0.24 | 0.093 | 0.108 |
| HCM Control Delay | 7.7 | 8.6 | 7.7 | 8 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.9 | 0.3 | 0.4 |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 6 | 182 | 83 | 4 | 1 | 0 |
| Future Volume (Veh/h) | 6 | 182 | 83 | 4 | 1 | 0 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 6 | 194 | 88 | 4 | 1 | 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 | 92 | | | | 296 | 90 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 92 | | | | 296 | 90 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 100 |
| cM capacity (veh/h) | 1515 | | | | 697 | 973 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 200 | 92 | 1 |
| Volume Left | 6 | 0 | 1 |
| Volume Right | 0 | 4 | 0 |
| cSH | 1515 | 1700 | 697 |
| Volume to Capacity | 0.00 | 0.05 | 0.00 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 0.3 | 0.0 | 10.2 |
| Lane LOS | A | | B |
| Approach Delay (s) | 0.3 | 0.0 | 10.2 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 24.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

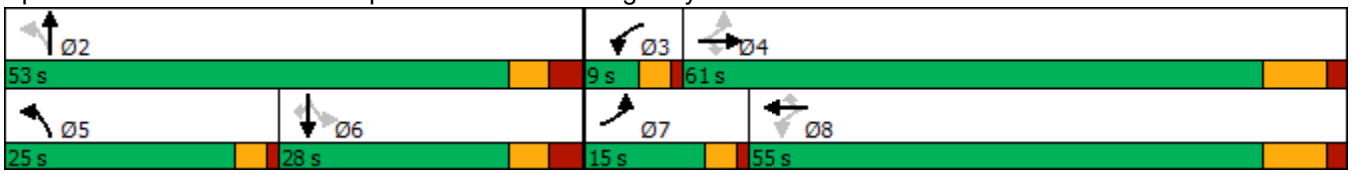
# Appendix F –
# Synchro Analysis Output –
# Total Traffic Volumes

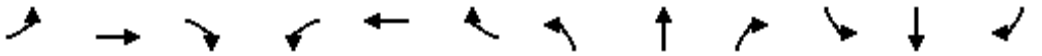
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 439 | 117 | 120 | 1078 | 163 | 352 | 111 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 439 | 117 | 120 | 1078 | 163 | 352 | 111 | 59 | 31 | 44 |
| Lane Group Flow (vph) | 206 | 488 | 130 | 133 | 1198 | 181 | 391 | 251 | 66 | 34 | 49 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 4.5 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 4.5 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.0 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 9.0 | 27.8 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 15.0 | 61.0 | 61.0 | 9.0 | 55.0 | 55.0 | 25.0 | 53.0 | 28.0 | 28.0 | 28.0 |
| Total Split (%) | 12.2% | 49.6% | 49.6% | 7.3% | 44.7% | 44.7% | 20.3% | 43.1% | 22.8% | 22.8% | 22.8% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.0 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 3.2 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None | None |
| v/c Ratio | 0.80 | 0.30 | 0.15 | 0.27 | 0.83 | 0.24 | 0.83 | 0.46 | 0.53 | 0.16 | 0.16 |
| Control Delay | 44.6 | 19.3 | 3.7 | 13.9 | 35.5 | 7.3 | 48.1 | 26.9 | 63.4 | 47.4 | 1.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 44.6 | 19.3 | 3.7 | 13.9 | 35.5 | 7.3 | 48.1 | 26.9 | 63.4 | 47.4 | 1.1 |
| Queue Length 50th (m) | 26.6 | 36.5 | 0.0 | 13.3 | 131.5 | 5.7 | 75.6 | 36.5 | 14.9 | 7.4 | 0.0 |
| Queue Length 95th (m) | #74.4 | 53.7 | 11.3 | 25.6 | #188.2 | 21.3 | 108.5 | 59.9 | 29.9 | 17.3 | 0.0 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | | 303.0 | |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 100.0 | | 75.0 | | |
| Base Capacity (vph) | 257 | 1604 | 849 | 501 | 1449 | 767 | 480 | 753 | 221 | 367 | 433 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 0.30 | 0.15 | 0.27 | 0.83 | 0.24 | 0.81 | 0.33 | 0.30 | 0.09 | 0.11 |

Intersection Summary

Cycle Length: 123
Actuated Cycle Length: 110.5
Natural Cycle: 85
Control Type: Semi Act-Uncoord
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Levesque St/Street 'C' & Kingsway





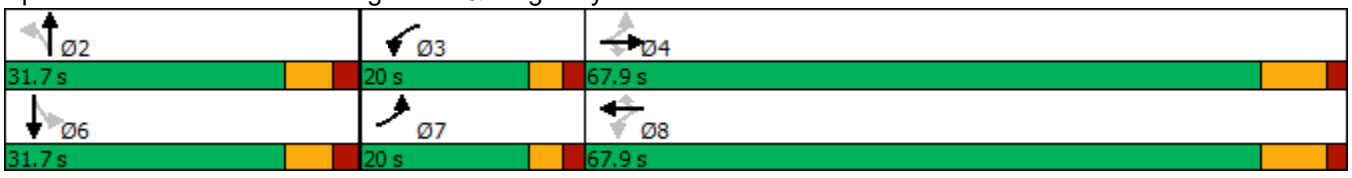
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 439 | 117 | 120 | 1078 | 163 | 352 | 111 | 115 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 439 | 117 | 120 | 1078 | 163 | 352 | 111 | 115 | 59 | 31 | 44 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | | 6.8 | 6.8 | 6.8 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1719 | 3312 | 1615 | 1805 | 3374 | 1599 | 1787 | 1720 | | 1805 | 1900 | 1615 |
| Flt Permitted | 0.09 | 1.00 | 1.00 | 0.47 | 1.00 | 1.00 | 0.53 | 1.00 | | 0.60 | 1.00 | 1.00 |
| Satd. Flow (perm) | 170 | 3312 | 1615 | 901 | 3374 | 1599 | 993 | 1720 | | 1147 | 1900 | 1615 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 206 | 488 | 130 | 133 | 1198 | 181 | 391 | 123 | 128 | 66 | 34 | 49 |
| RTOR Reduction (vph) | 0 | 0 | 68 | 0 | 0 | 81 | 0 | 34 | 0 | 0 | 0 | 45 |
| Lane Group Flow (vph) | 206 | 488 | 62 | 133 | 1198 | 100 | 391 | 217 | 0 | 66 | 34 | 4 |
| Heavy Vehicles (%) | 5% | 9% | 0% | 0% | 7% | 1% | 1% | 0% | 4% | 0% | 0% | 0% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 62.6 | 53.6 | 53.6 | 52.5 | 47.5 | 47.5 | 34.7 | 34.7 | | 10.2 | 10.2 | 10.2 |
| Effective Green, g (s) | 62.6 | 53.6 | 53.6 | 52.5 | 47.5 | 47.5 | 34.7 | 34.7 | | 10.2 | 10.2 | 10.2 |
| Actuated g/C Ratio | 0.56 | 0.48 | 0.48 | 0.47 | 0.42 | 0.42 | 0.31 | 0.31 | | 0.09 | 0.09 | 0.09 |
| Clearance Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | | 6.8 | 6.8 | 6.8 |
| 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) | 248 | 1585 | 772 | 462 | 1430 | 678 | 452 | 532 | | 104 | 173 | 147 |
| v/s Ratio Prot | c0.08 | 0.15 | | 0.01 | 0.36 | | c0.16 | 0.13 | | | 0.02 | |
| v/s Ratio Perm | c0.38 | | 0.04 | 0.12 | | 0.06 | c0.11 | | | 0.06 | | 0.00 |
| v/c Ratio | 0.83 | 0.31 | 0.08 | 0.29 | 0.84 | 0.15 | 0.87 | 0.41 | | 0.63 | 0.20 | 0.03 |
| Uniform Delay, d1 | 24.8 | 17.9 | 15.8 | 17.1 | 28.8 | 19.8 | 34.5 | 30.5 | | 49.1 | 47.1 | 46.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 20.4 | 0.5 | 0.2 | 0.3 | 6.0 | 0.5 | 15.7 | 0.5 | | 12.0 | 0.6 | 0.1 |
| Delay (s) | 45.2 | 18.4 | 16.0 | 17.4 | 34.8 | 20.3 | 50.2 | 31.1 | | 61.1 | 47.7 | 46.5 |
| Level of Service | D | B | B | B | C | C | D | C | | E | D | D |
| Approach Delay (s) | | 24.7 | | | 31.5 | | | 42.7 | | | 53.2 | |
| Approach LOS | | C | | | C | | | D | | | D | |

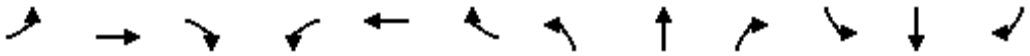
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 33.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 112.0 | Sum of lost time (s) | 22.7 |
| Intersection Capacity Utilization | 85.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 29 | 631 | 35 | 14 | 1435 | 10 | 58 | 5 | 3 | 1 |
| Future Volume (vph) | 29 | 631 | 35 | 14 | 1435 | 10 | 58 | 5 | 3 | 1 |
| Lane Group Flow (vph) | 34 | 734 | 41 | 16 | 1669 | 12 | 67 | 46 | 3 | 16 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | 6 |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.0 | 37.9 | 37.9 | 10.0 | 37.9 | 37.9 | 30.7 | 30.7 | 30.7 | 30.7 |
| Total Split (s) | 20.0 | 67.9 | 67.9 | 20.0 | 67.9 | 67.9 | 31.7 | 31.7 | 31.7 | 31.7 |
| Total Split (%) | 16.7% | 56.8% | 56.8% | 16.7% | 56.8% | 56.8% | 26.5% | 26.5% | 26.5% | 26.5% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 4.1 | 4.1 | 4.1 | 4.1 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.6 | 2.6 | 2.6 | 2.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | 6.7 | 6.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None |
| v/c Ratio | 0.19 | 0.30 | 0.04 | 0.03 | 0.68 | 0.01 | 0.44 | 0.21 | 0.03 | 0.11 |
| Control Delay | 5.6 | 6.7 | 0.5 | 3.3 | 13.0 | 0.0 | 50.0 | 17.3 | 39.0 | 20.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.6 | 6.7 | 0.5 | 3.3 | 13.0 | 0.0 | 50.0 | 17.3 | 39.0 | 20.5 |
| Queue Length 50th (m) | 1.2 | 20.3 | 0.0 | 0.6 | 113.5 | 0.0 | 12.5 | 1.1 | 0.6 | 0.2 |
| Queue Length 95th (m) | 3.7 | 46.2 | 0.8 | 2.2 | 151.6 | 0.0 | 24.9 | 10.6 | 3.1 | 5.9 |
| Internal Link Dist (m) | | 440.7 | | | 446.3 | | | 949.6 | | 204.9 |
| Turn Bay Length (m) | 40.0 | | 22.0 | 42.0 | | 51.0 | 20.0 | | 14.0 | |
| Base Capacity (vph) | 285 | 2472 | 977 | 742 | 2472 | 990 | 367 | 466 | 218 | 327 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.12 | 0.30 | 0.04 | 0.02 | 0.68 | 0.01 | 0.18 | 0.10 | 0.01 | 0.05 |

| Intersection Summary |
|---|
| Cycle Length: 119.6 |
| Actuated Cycle Length: 94.9 |
| Natural Cycle: 90 |
| Control Type: Semi Act-Uncoord |

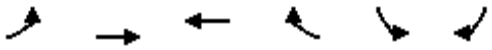
Splits and Phases: 2: Moonlight Ave & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 29 | 631 | 35 | 14 | 1435 | 10 | 58 | 5 | 34 | 3 | 1 | 13 |
| Future Volume (vph) | 29 | 631 | 35 | 14 | 1435 | 10 | 58 | 5 | 34 | 3 | 1 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 0.86 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1280 | 3312 | 1282 | 1805 | 3438 | 1346 | 1770 | 1652 | | 1081 | 1196 | |
| Flt Permitted | 0.09 | 1.00 | 1.00 | 0.37 | 1.00 | 1.00 | 0.75 | 1.00 | | 0.73 | 1.00 | |
| Satd. Flow (perm) | 128 | 3312 | 1282 | 708 | 3438 | 1346 | 1392 | 1652 | | 827 | 1196 | |
| Peak-hour factor, PHF | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Adj. Flow (vph) | 34 | 734 | 41 | 16 | 1669 | 12 | 67 | 6 | 40 | 3 | 1 | 15 |
| RTOR Reduction (vph) | 0 | 0 | 13 | 0 | 0 | 4 | 0 | 37 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 34 | 734 | 28 | 16 | 1669 | 8 | 67 | 9 | 0 | 3 | 2 | 0 |
| Heavy Vehicles (%) | 41% | 9% | 26% | 0% | 5% | 20% | 2% | 0% | 0% | 67% | 0% | 39% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 72.9 | 69.0 | 69.0 | 69.7 | 67.4 | 67.4 | 8.5 | 8.5 | | 8.5 | 8.5 | |
| Effective Green, g (s) | 72.9 | 69.0 | 69.0 | 69.7 | 67.4 | 67.4 | 8.5 | 8.5 | | 8.5 | 8.5 | |
| Actuated g/C Ratio | 0.73 | 0.69 | 0.69 | 0.70 | 0.68 | 0.68 | 0.09 | 0.09 | | 0.09 | 0.09 | |
| Clearance Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 139 | 2299 | 889 | 521 | 2331 | 912 | 119 | 141 | | 70 | 102 | |
| v/s Ratio Prot | c0.01 | 0.22 | | 0.00 | c0.49 | | | 0.01 | | | 0.00 | |
| v/s Ratio Perm | 0.17 | | 0.02 | 0.02 | | 0.01 | c0.05 | | | 0.00 | | |
| v/c Ratio | 0.24 | 0.32 | 0.03 | 0.03 | 0.72 | 0.01 | 0.56 | 0.07 | | 0.04 | 0.02 | |
| Uniform Delay, d1 | 7.2 | 6.0 | 4.8 | 4.5 | 10.0 | 5.2 | 43.7 | 41.8 | | 41.7 | 41.6 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.9 | 0.4 | 0.1 | 0.0 | 1.9 | 0.0 | 6.0 | 0.2 | | 0.3 | 0.1 | |
| Delay (s) | 8.1 | 6.3 | 4.8 | 4.5 | 11.9 | 5.2 | 49.6 | 42.0 | | 42.0 | 41.7 | |
| Level of Service | A | A | A | A | B | A | D | D | | D | D | |
| Approach Delay (s) | | 6.3 | | | 11.8 | | | 46.5 | | | 41.8 | |
| Approach LOS | | A | | | B | | | D | | | D | |

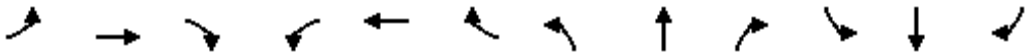
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 99.4 | Sum of lost time (s) | 19.6 |
| Intersection Capacity Utilization | 61.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 273 | 31 | 94 | 71 | 30 | 158 |
| Future Volume (Veh/h) | 273 | 31 | 94 | 71 | 30 | 158 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 303 | 34 | 104 | 79 | 33 | 176 |
| 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 | 183 | | | | 784 | 144 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 183 | | | | 784 | 144 |
| tC, single (s) | 4.2 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.3 | | | | 3.5 | 3.3 |
| p0 queue free % | 78 | | | | 88 | 80 |
| cM capacity (veh/h) | 1368 | | | | 284 | 899 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 337 | 183 | 209 |
| Volume Left | 303 | 0 | 33 |
| Volume Right | 0 | 79 | 176 |
| cSH | 1368 | 1700 | 670 |
| Volume to Capacity | 0.22 | 0.11 | 0.31 |
| Queue Length 95th (m) | 6.8 | 0.0 | 10.6 |
| Control Delay (s) | 7.7 | 0.0 | 12.8 |
| Lane LOS | A | | B |
| Approach Delay (s) | 7.7 | 0.0 | 12.8 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.2 | | |
| Intersection Capacity Utilization | 47.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 17 | 40 | 2 | 0 | 108 | 22 | 4 | 0 | 0 | 15 | 1 | 25 |
| Future Volume (vph) | 17 | 40 | 2 | 0 | 108 | 22 | 4 | 0 | 0 | 15 | 1 | 25 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 20 | 46 | 2 | 0 | 124 | 25 | 5 | 0 | 0 | 17 | 1 | 29 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 68 | 149 | 5 | 47 |
| Volume Left (vph) | 20 | 0 | 5 | 17 |
| Volume Right (vph) | 2 | 25 | 0 | 29 |
| Hadj (s) | 0.15 | -0.02 | 0.20 | -0.03 |
| Departure Headway (s) | 4.3 | 4.1 | 4.6 | 4.4 |
| Degree Utilization, x | 0.08 | 0.17 | 0.01 | 0.06 |
| Capacity (veh/h) | 814 | 868 | 732 | 785 |
| Control Delay (s) | 7.7 | 7.9 | 7.7 | 7.6 |
| Approach Delay (s) | 7.7 | 7.9 | 7.7 | 7.6 |
| Approach LOS | A | A | A | A |

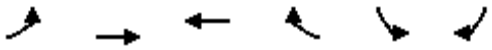
| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.8 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 23.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.8 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 17 | 40 | 2 | 0 | 108 | 22 | 4 | 0 | 0 | 15 | 1 | 25 |
| Future Vol, veh/h | 17 | 40 | 2 | 0 | 108 | 22 | 4 | 0 | 0 | 15 | 1 | 25 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 13 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 15 | 0 | 17 |
| Mvmt Flow | 20 | 46 | 2 | 0 | 124 | 25 | 5 | 0 | 0 | 17 | 1 | 29 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.8 | 7.9 | 7.7 | 7.6 |
| HCM LOS | A | A | A | A |

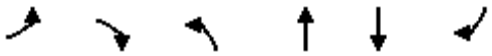
| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 100% | 29% | 0% | 37% |
| Vol Thru, % | 0% | 68% | 83% | 2% |
| Vol Right, % | 0% | 3% | 17% | 61% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 4 | 59 | 130 | 41 |
| LT Vol | 4 | 17 | 0 | 15 |
| Through Vol | 0 | 40 | 108 | 1 |
| RT Vol | 0 | 2 | 22 | 25 |
| Lane Flow Rate | 5 | 68 | 149 | 47 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.006 | 0.082 | 0.168 | 0.057 |
| Departure Headway (Hd) | 4.634 | 4.362 | 4.042 | 4.348 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 777 | 814 | 882 | 828 |
| Service Time | 2.636 | 2.427 | 2.094 | 2.348 |
| HCM Lane V/C Ratio | 0.006 | 0.084 | 0.169 | 0.057 |
| HCM Control Delay | 7.7 | 7.8 | 7.9 | 7.6 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.3 | 0.6 | 0.2 |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 3 | 61 | 149 | 7 | 2 | 12 |
| Future Volume (Veh/h) | 3 | 61 | 149 | 7 | 2 | 12 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 3 | 66 | 160 | 8 | 2 | 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 | 168 | | | | 236 | 164 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 168 | | | | 236 | 164 |
| tC, single (s) | 4.1 | | | | 6.9 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 4.0 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 99 |
| cM capacity (veh/h) | 1422 | | | | 657 | 886 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 69 | 168 | 15 |
| Volume Left | 3 | 0 | 2 |
| Volume Right | 0 | 8 | 13 |
| cSH | 1422 | 1700 | 846 |
| Volume to Capacity | 0.00 | 0.10 | 0.02 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.4 |
| Control Delay (s) | 0.3 | 0.0 | 9.3 |
| Lane LOS | A | | A |
| Approach Delay (s) | 0.3 | 0.0 | 9.3 |
| Approach LOS | | | A |

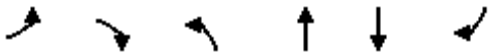
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.6 | | |
| Intersection Capacity Utilization | 18.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 9 | 2 | 1 | 9 | 12 | 3 |
| Future Volume (Veh/h) | 9 | 2 | 1 | 9 | 12 | 3 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 10 | 2 | 1 | 10 | 13 | 3 |
| 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 | 26 | 14 | 16 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 26 | 14 | 16 | | | |
| 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 | 100 | 100 | | | |
| cM capacity (veh/h) | 993 | 1071 | 1615 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 12 | 11 | 16 |
| Volume Left | 10 | 1 | 0 |
| Volume Right | 2 | 0 | 3 |
| cSH | 1005 | 1615 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.01 |
| Queue Length 95th (m) | 0.3 | 0.0 | 0.0 |
| Control Delay (s) | 8.6 | 0.7 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 8.6 | 0.7 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.8 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 38 | 6 | 1 | 17 | 9 | 13 |
| Future Volume (Veh/h) | 38 | 6 | 1 | 17 | 9 | 13 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 41 | 7 | 1 | 18 | 10 | 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 | 37 | 17 | 24 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 37 | 17 | 24 | | | |
| 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 | 100 | | | |
| cM capacity (veh/h) | 980 | 1068 | 1604 | | | |

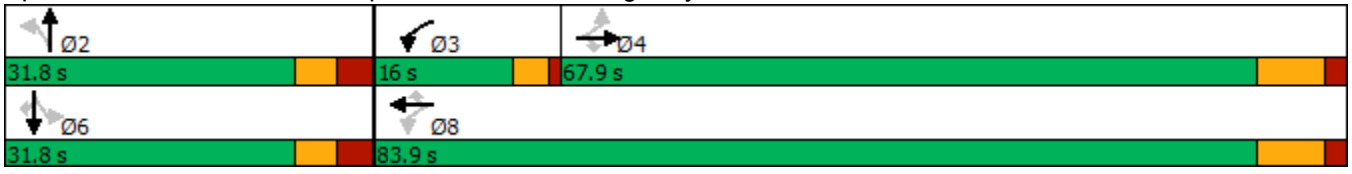
| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 48 | 19 | 24 |
| Volume Left | 41 | 1 | 0 |
| Volume Right | 7 | 0 | 14 |
| cSH | 992 | 1604 | 1700 |
| Volume to Capacity | 0.05 | 0.00 | 0.01 |
| Queue Length 95th (m) | 1.2 | 0.0 | 0.0 |
| Control Delay (s) | 8.8 | 0.4 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 8.8 | 0.4 | 0.0 |
| Approach LOS | A | | |

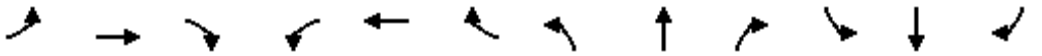
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.7 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 1207 | 292 | 86 | 833 | 41 | 122 | 25 | 135 | 95 | 286 |
| Future Volume (vph) | 86 | 1207 | 292 | 86 | 833 | 41 | 122 | 25 | 135 | 95 | 286 |
| Lane Group Flow (vph) | 91 | 1284 | 311 | 91 | 886 | 44 | 130 | 165 | 144 | 101 | 304 |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 30.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 37.9 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 27.8 | 27.8 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 67.9 | 67.9 | 67.9 | 16.0 | 83.9 | 83.9 | 31.8 | 31.8 | 31.8 | 31.8 | 31.8 |
| Total Split (%) | 58.7% | 58.7% | 58.7% | 13.8% | 72.5% | 72.5% | 27.5% | 27.5% | 27.5% | 27.5% | 27.5% |
| Yellow Time (s) | 5.9 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lag | Lag | Lag | Lead | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | | | |
| Recall Mode | Max | Max | Max | None | Max | Max | None | None | None | None | None |
| v/c Ratio | 0.24 | 0.59 | 0.29 | 0.31 | 0.37 | 0.04 | 0.59 | 0.43 | 0.80 | 0.32 | 0.71 |
| Control Delay | 14.4 | 15.9 | 2.1 | 7.7 | 7.9 | 2.8 | 52.8 | 13.3 | 73.3 | 41.9 | 26.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 14.4 | 15.9 | 2.1 | 7.7 | 7.9 | 2.8 | 52.8 | 13.3 | 73.3 | 41.9 | 26.1 |
| Queue Length 50th (m) | 9.3 | 92.0 | 0.0 | 5.1 | 39.0 | 0.5 | 27.2 | 5.2 | 31.3 | 20.1 | 24.3 |
| Queue Length 95th (m) | 22.8 | 134.9 | 12.9 | 11.8 | 59.0 | 4.6 | 47.6 | 24.0 | 54.8 | 36.1 | 55.5 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | | 303.0 | |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 100.0 | | 75.0 | | |
| Base Capacity (vph) | 374 | 2170 | 1091 | 360 | 2394 | 1135 | 301 | 478 | 246 | 435 | 513 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.24 | 0.59 | 0.29 | 0.25 | 0.37 | 0.04 | 0.43 | 0.35 | 0.59 | 0.23 | 0.59 |

| Intersection Summary |
|---|
| Cycle Length: 115.7 |
| Actuated Cycle Length: 109.4 |
| Natural Cycle: 75 |
| Control Type: Semi Act-Uncoord |

Splits and Phases: 1: Levesque St/Street 'C' & Kingsway





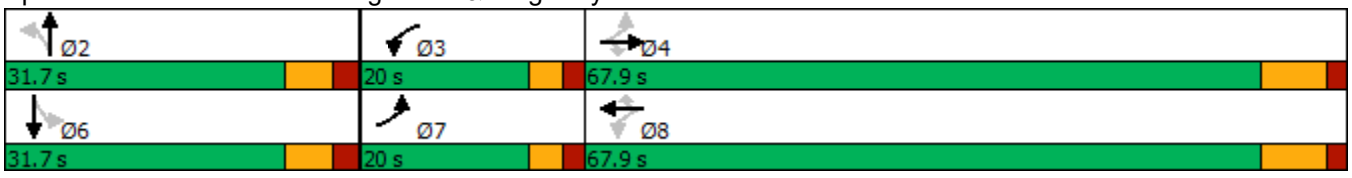
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 1207 | 292 | 86 | 833 | 41 | 122 | 25 | 130 | 135 | 95 | 286 |
| Future Volume (vph) | 86 | 1207 | 292 | 86 | 833 | 41 | 122 | 25 | 130 | 135 | 95 | 286 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1805 | 3539 | 1583 | 1736 | 3438 | 1615 | 1805 | 1621 | | 1805 | 1900 | 1615 |
| Flt Permitted | 0.32 | 1.00 | 1.00 | 0.15 | 1.00 | 1.00 | 0.69 | 1.00 | | 0.57 | 1.00 | 1.00 |
| Satd. Flow (perm) | 610 | 3539 | 1583 | 272 | 3438 | 1615 | 1314 | 1621 | | 1074 | 1900 | 1615 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 91 | 1284 | 311 | 91 | 886 | 44 | 130 | 27 | 138 | 144 | 101 | 304 |
| RTOR Reduction (vph) | 0 | 0 | 122 | 0 | 0 | 11 | 0 | 115 | 0 | 0 | 0 | 155 |
| Lane Group Flow (vph) | 91 | 1284 | 189 | 91 | 886 | 33 | 130 | 50 | 0 | 144 | 101 | 149 |
| Heavy Vehicles (%) | 0% | 2% | 2% | 4% | 5% | 0% | 0% | 0% | 3% | 0% | 0% | 0% |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 67.1 | 67.1 | 67.1 | 77.1 | 77.1 | 77.1 | 18.4 | 18.4 | | 18.4 | 18.4 | 18.4 |
| Effective Green, g (s) | 67.1 | 67.1 | 67.1 | 77.1 | 77.1 | 77.1 | 18.4 | 18.4 | | 18.4 | 18.4 | 18.4 |
| Actuated g/C Ratio | 0.61 | 0.61 | 0.61 | 0.70 | 0.70 | 0.70 | 0.17 | 0.17 | | 0.17 | 0.17 | 0.17 |
| Clearance Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| 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) | 371 | 2154 | 963 | 270 | 2405 | 1129 | 219 | 270 | | 179 | 317 | 269 |
| v/s Ratio Prot | | c0.36 | | 0.02 | c0.26 | | | 0.03 | | | 0.05 | |
| v/s Ratio Perm | 0.15 | | 0.12 | 0.22 | | 0.02 | 0.10 | | | c0.13 | | 0.09 |
| v/c Ratio | 0.25 | 0.60 | 0.20 | 0.34 | 0.37 | 0.03 | 0.59 | 0.19 | | 0.80 | 0.32 | 0.55 |
| Uniform Delay, d1 | 9.9 | 13.2 | 9.6 | 8.1 | 6.7 | 5.1 | 42.4 | 39.5 | | 44.2 | 40.4 | 42.1 |
| 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 | 1.6 | 1.2 | 0.5 | 0.7 | 0.4 | 0.0 | 4.3 | 0.3 | | 22.4 | 0.6 | 2.5 |
| Delay (s) | 11.5 | 14.5 | 10.0 | 8.8 | 7.1 | 5.1 | 46.7 | 39.8 | | 66.6 | 41.0 | 44.6 |
| Level of Service | B | B | B | A | A | A | D | D | | E | D | D |
| Approach Delay (s) | | 13.5 | | | 7.2 | | | 42.8 | | | 49.7 | |
| Approach LOS | | B | | | A | | | D | | | D | |

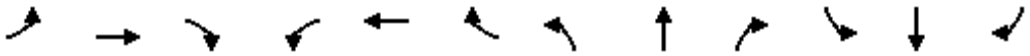
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 19.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 110.2 | Sum of lost time (s) | 18.7 |
| Intersection Capacity Utilization | 91.3% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 1448 | 72 | 49 | 1007 | 11 | 37 | 6 | 11 | 4 |
| Future Volume (vph) | 15 | 1448 | 72 | 49 | 1007 | 11 | 37 | 6 | 11 | 4 |
| Lane Group Flow (vph) | 16 | 1591 | 79 | 54 | 1107 | 12 | 41 | 65 | 12 | 36 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | 6 |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.0 | 37.9 | 37.9 | 10.0 | 37.9 | 37.9 | 30.7 | 30.7 | 30.7 | 30.7 |
| Total Split (s) | 20.0 | 67.9 | 67.9 | 20.0 | 67.9 | 67.9 | 31.7 | 31.7 | 31.7 | 31.7 |
| Total Split (%) | 16.7% | 56.8% | 56.8% | 16.7% | 56.8% | 56.8% | 26.5% | 26.5% | 26.5% | 26.5% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 4.1 | 4.1 | 4.1 | 4.1 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.6 | 2.6 | 2.6 | 2.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | 6.7 | 6.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None |
| v/c Ratio | 0.04 | 0.65 | 0.07 | 0.21 | 0.43 | 0.01 | 0.31 | 0.31 | 0.11 | 0.21 |
| Control Delay | 2.9 | 12.2 | 2.0 | 4.5 | 7.1 | 0.0 | 46.4 | 17.3 | 41.5 | 18.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.9 | 12.2 | 2.0 | 4.5 | 7.1 | 0.0 | 46.4 | 17.3 | 41.5 | 18.9 |
| Queue Length 50th (m) | 0.5 | 95.7 | 0.0 | 1.7 | 31.8 | 0.0 | 7.5 | 1.3 | 2.2 | 0.7 |
| Queue Length 95th (m) | 2.0 | 137.6 | 5.3 | 4.6 | 75.3 | 0.0 | 18.3 | 13.7 | 7.8 | 10.0 |
| Internal Link Dist (m) | | 440.7 | | | 446.3 | | | 949.6 | | 204.9 |
| Turn Bay Length (m) | 40.0 | | 22.0 | 42.0 | | 51.0 | 20.0 | | 14.0 | |
| Base Capacity (vph) | 555 | 2446 | 1139 | 407 | 2594 | 1238 | 377 | 487 | 311 | 432 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.03 | 0.65 | 0.07 | 0.13 | 0.43 | 0.01 | 0.11 | 0.13 | 0.04 | 0.08 |

| Intersection Summary |
|---|
| Cycle Length: 119.6 |
| Actuated Cycle Length: 92.7 |
| Natural Cycle: 90 |
| Control Type: Semi Act-Uncoord |

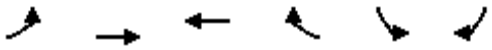
Splits and Phases: 2: Moonlight Ave & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 1448 | 72 | 49 | 1007 | 11 | 37 | 6 | 53 | 11 | 4 | 29 |
| Future Volume (vph) | 15 | 1448 | 72 | 49 | 1007 | 11 | 37 | 6 | 53 | 11 | 4 | 29 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 0.87 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1687 | 3471 | 1583 | 1736 | 3438 | 1615 | 1805 | 1646 | | 1530 | 1512 | |
| Flt Permitted | 0.24 | 1.00 | 1.00 | 0.11 | 1.00 | 1.00 | 0.73 | 1.00 | | 0.71 | 1.00 | |
| Satd. Flow (perm) | 434 | 3471 | 1583 | 194 | 3438 | 1615 | 1394 | 1646 | | 1151 | 1512 | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 16 | 1591 | 79 | 54 | 1107 | 12 | 41 | 7 | 58 | 12 | 4 | 32 |
| RTOR Reduction (vph) | 0 | 0 | 26 | 0 | 0 | 4 | 0 | 54 | 0 | 0 | 30 | 0 |
| Lane Group Flow (vph) | 16 | 1591 | 53 | 54 | 1107 | 8 | 41 | 11 | 0 | 12 | 6 | 0 |
| Heavy Vehicles (%) | 7% | 4% | 2% | 4% | 5% | 0% | 0% | 0% | 0% | 18% | 0% | 10% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 67.9 | 65.6 | 65.6 | 73.1 | 68.2 | 68.2 | 7.2 | 7.2 | | 7.2 | 7.2 | |
| Effective Green, g (s) | 67.9 | 65.6 | 65.6 | 73.1 | 68.2 | 68.2 | 7.2 | 7.2 | | 7.2 | 7.2 | |
| Actuated g/C Ratio | 0.70 | 0.67 | 0.67 | 0.75 | 0.70 | 0.70 | 0.07 | 0.07 | | 0.07 | 0.07 | |
| Clearance Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 332 | 2340 | 1067 | 223 | 2409 | 1131 | 103 | 121 | | 85 | 111 | |
| v/s Ratio Prot | 0.00 | c0.46 | | c0.01 | c0.32 | | | 0.01 | | | 0.00 | |
| v/s Ratio Perm | 0.03 | | 0.03 | 0.17 | | 0.01 | c0.03 | | | 0.01 | | |
| v/c Ratio | 0.05 | 0.68 | 0.05 | 0.24 | 0.46 | 0.01 | 0.40 | 0.09 | | 0.14 | 0.06 | |
| Uniform Delay, d1 | 4.5 | 9.5 | 5.3 | 6.2 | 6.4 | 4.4 | 43.0 | 42.0 | | 42.2 | 41.9 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 1.6 | 0.1 | 0.6 | 0.6 | 0.0 | 2.5 | 0.3 | | 0.8 | 0.2 | |
| Delay (s) | 4.6 | 11.2 | 5.4 | 6.8 | 7.1 | 4.4 | 45.5 | 42.3 | | 42.9 | 42.1 | |
| Level of Service | A | B | A | A | A | A | D | D | | D | D | |
| Approach Delay (s) | | 10.8 | | | 7.0 | | | 43.6 | | | 42.3 | |
| Approach LOS | | B | | | A | | | D | | | D | |

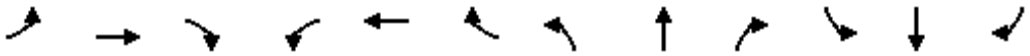
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 97.3 | Sum of lost time (s) | 19.6 |
| Intersection Capacity Utilization | 61.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 139 | 124 | 61 | 24 | 60 | 214 |
| Future Volume (Veh/h) | 139 | 124 | 61 | 24 | 60 | 214 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Hourly flow rate (vph) | 174 | 155 | 76 | 30 | 75 | 268 |
| 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 | 106 | | | | 594 | 91 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 106 | | | | 594 | 91 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 88 | | | | 81 | 72 |
| cM capacity (veh/h) | 1498 | | | | 405 | 969 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 329 | 106 | 343 |
| Volume Left | 174 | 0 | 75 |
| Volume Right | 0 | 30 | 268 |
| cSH | 1498 | 1700 | 743 |
| Volume to Capacity | 0.12 | 0.06 | 0.46 |
| Queue Length 95th (m) | 3.1 | 0.0 | 19.6 |
| Control Delay (s) | 4.5 | 0.0 | 13.9 |
| Lane LOS | A | | B |
| Approach Delay (s) | 4.5 | 0.0 | 13.9 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 8.1 | | |
| Intersection Capacity Utilization | 44.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 55 | 109 | 2 | 3 | 53 | 8 | 7 | 5 | 3 | 36 | 3 | 32 |
| Future Volume (vph) | 55 | 109 | 2 | 3 | 53 | 8 | 7 | 5 | 3 | 36 | 3 | 32 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph) | 64 | 127 | 2 | 3 | 62 | 9 | 8 | 6 | 3 | 42 | 3 | 37 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 193 | 74 | 17 | 82 |
| Volume Left (vph) | 64 | 3 | 8 | 42 |
| Volume Right (vph) | 2 | 9 | 3 | 37 |
| Hadj (s) | 0.06 | -0.06 | -0.01 | -0.09 |
| Departure Headway (s) | 4.3 | 4.3 | 4.6 | 4.4 |
| Degree Utilization, x | 0.23 | 0.09 | 0.02 | 0.10 |
| Capacity (veh/h) | 821 | 803 | 730 | 757 |
| Control Delay (s) | 8.5 | 7.7 | 7.7 | 7.9 |
| Approach Delay (s) | 8.5 | 7.7 | 7.7 | 7.9 |
| Approach LOS | A | A | A | A |

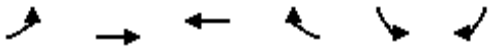
| Intersection Summary | | | |
|---|---|---|---|
| Delay | 8.2 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 27.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 55 | 109 | 2 | 3 | 53 | 8 | 7 | 5 | 3 | 36 | 3 | 32 |
| Future Vol, veh/h | 55 | 109 | 2 | 3 | 53 | 8 | 7 | 5 | 3 | 36 | 3 | 32 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 7 |
| Mvmt Flow | 64 | 127 | 2 | 3 | 62 | 9 | 8 | 6 | 3 | 42 | 3 | 37 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 8.5 | 7.7 | 7.7 | 7.9 |
| HCM LOS | A | A | A | A |

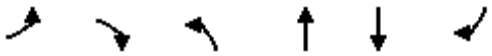
| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 47% | 33% | 5% | 51% |
| Vol Thru, % | 33% | 66% | 83% | 4% |
| Vol Right, % | 20% | 1% | 12% | 45% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 15 | 166 | 64 | 71 |
| LT Vol | 7 | 55 | 3 | 36 |
| Through Vol | 5 | 109 | 53 | 3 |
| RT Vol | 3 | 2 | 8 | 32 |
| Lane Flow Rate | 17 | 193 | 74 | 83 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.022 | 0.225 | 0.088 | 0.101 |
| Departure Headway (Hd) | 4.566 | 4.19 | 4.265 | 4.398 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 787 | 845 | 844 | 819 |
| Service Time | 2.573 | 2.277 | 2.273 | 2.403 |
| HCM Lane V/C Ratio | 0.022 | 0.228 | 0.088 | 0.101 |
| HCM Control Delay | 7.7 | 8.5 | 7.7 | 7.9 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.9 | 0.3 | 0.3 |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 12 | 172 | 78 | 5 | 3 | 2 |
| Future Volume (Veh/h) | 12 | 172 | 78 | 5 | 3 | 2 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 13 | 183 | 83 | 5 | 3 | 2 |
| 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 | 88 | | | | 294 | 86 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 88 | | | | 294 | 86 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 99 | | | | 100 | 100 |
| cM capacity (veh/h) | 1520 | | | | 695 | 979 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 196 | 88 | 5 |
| Volume Left | 13 | 0 | 3 |
| Volume Right | 0 | 5 | 2 |
| cSH | 1520 | 1700 | 786 |
| Volume to Capacity | 0.01 | 0.05 | 0.01 |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.2 |
| Control Delay (s) | 0.6 | 0.0 | 9.6 |
| Lane LOS | A | | A |
| Approach Delay (s) | 0.6 | 0.0 | 9.6 |
| Approach LOS | | | A |

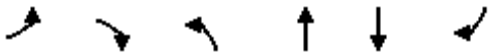
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 26.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 7 | 1 | 2 | 15 | 4 | 10 |
| Future Volume (Veh/h) | 7 | 1 | 2 | 15 | 4 | 10 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 8 | 1 | 2 | 16 | 4 | 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 | 30 | 10 | 15 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 30 | 10 | 15 | | | |
| 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 | 100 | 100 | | | |
| cM capacity (veh/h) | 989 | 1078 | 1616 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 9 | 18 | 15 |
| Volume Left | 8 | 2 | 0 |
| Volume Right | 1 | 0 | 11 |
| cSH | 998 | 1616 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.01 |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.0 |
| Control Delay (s) | 8.6 | 0.8 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 8.6 | 0.8 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.2 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 24 | 3 | 5 | 17 | 11 | 38 |
| Future Volume (Veh/h) | 24 | 3 | 5 | 17 | 11 | 38 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 26 | 3 | 5 | 18 | 12 | 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 | 60 | 32 | 53 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 60 | 32 | 53 | | | |
| 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) | 948 | 1047 | 1566 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 29 | 23 | 53 |
| Volume Left | 26 | 5 | 0 |
| Volume Right | 3 | 0 | 41 |
| cSH | 957 | 1566 | 1700 |
| Volume to Capacity | 0.03 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.7 | 0.1 | 0.0 |
| Control Delay (s) | 8.9 | 1.6 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 8.9 | 1.6 | 0.0 |
| Approach LOS | A | | |

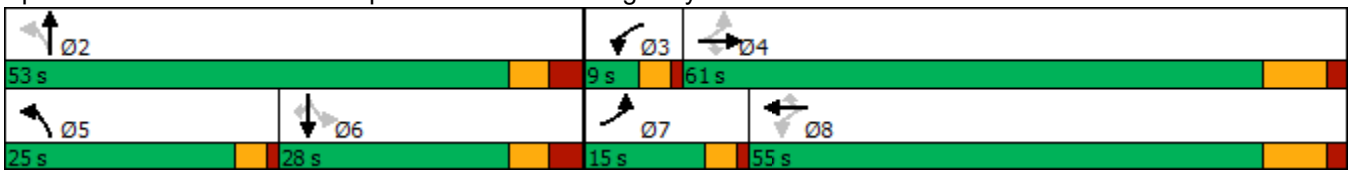
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.8 | | |
| Intersection Capacity Utilization | 15.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

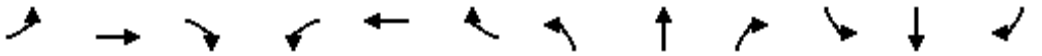
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 467 | 123 | 130 | 1139 | 163 | 367 | 111 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 467 | 123 | 130 | 1139 | 163 | 367 | 111 | 59 | 31 | 44 |
| Lane Group Flow (vph) | 206 | 519 | 137 | 144 | 1266 | 181 | 408 | 261 | 66 | 34 | 49 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 4.5 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 4.5 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.0 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 9.0 | 27.8 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 15.0 | 61.0 | 61.0 | 9.0 | 55.0 | 55.0 | 25.0 | 53.0 | 28.0 | 28.0 | 28.0 |
| Total Split (%) | 12.2% | 49.6% | 49.6% | 7.3% | 44.7% | 44.7% | 20.3% | 43.1% | 22.8% | 22.8% | 22.8% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.0 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 3.2 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None | None |
| v/c Ratio | 0.85 | 0.32 | 0.16 | 0.30 | 0.88 | 0.24 | 0.86 | 0.47 | 0.53 | 0.16 | 0.16 |
| Control Delay | 56.0 | 19.6 | 3.7 | 14.5 | 38.7 | 7.3 | 51.3 | 26.9 | 63.7 | 47.4 | 1.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 56.0 | 19.6 | 3.7 | 14.5 | 38.7 | 7.3 | 51.3 | 26.9 | 63.7 | 47.4 | 1.1 |
| Queue Length 50th (m) | 30.7 | 39.3 | 0.0 | 14.5 | 143.5 | 5.7 | 79.9 | 37.8 | 14.9 | 7.4 | 0.0 |
| Queue Length 95th (m) | #81.7 | 57.6 | 11.7 | 27.6 | #207.2 | 21.4 | #118.4 | 61.8 | 29.9 | 17.3 | 0.0 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | | 303.0 | |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 100.0 | | 75.0 | | |
| Base Capacity (vph) | 242 | 1600 | 851 | 487 | 1445 | 765 | 480 | 751 | 219 | 366 | 432 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.85 | 0.32 | 0.16 | 0.30 | 0.88 | 0.24 | 0.85 | 0.35 | 0.30 | 0.09 | 0.11 |

Intersection Summary

Cycle Length: 123
Actuated Cycle Length: 110.8
Natural Cycle: 85
Control Type: Semi Act-Uncoord
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Levesque St/Street 'C' & Kingsway





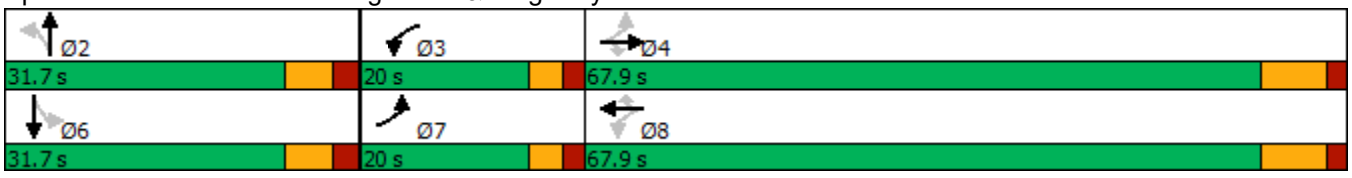
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 467 | 123 | 130 | 1139 | 163 | 367 | 111 | 124 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 467 | 123 | 130 | 1139 | 163 | 367 | 111 | 124 | 59 | 31 | 44 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | | 6.8 | 6.8 | 6.8 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1719 | 3312 | 1615 | 1805 | 3374 | 1599 | 1787 | 1713 | | 1805 | 1900 | 1615 |
| Flt Permitted | 0.08 | 1.00 | 1.00 | 0.46 | 1.00 | 1.00 | 0.53 | 1.00 | | 0.60 | 1.00 | 1.00 |
| Satd. Flow (perm) | 141 | 3312 | 1615 | 874 | 3374 | 1599 | 996 | 1713 | | 1136 | 1900 | 1615 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 206 | 519 | 137 | 144 | 1266 | 181 | 408 | 123 | 138 | 66 | 34 | 49 |
| RTOR Reduction (vph) | 0 | 0 | 72 | 0 | 0 | 81 | 0 | 36 | 0 | 0 | 0 | 45 |
| Lane Group Flow (vph) | 206 | 519 | 65 | 144 | 1266 | 100 | 408 | 225 | 0 | 66 | 34 | 4 |
| Heavy Vehicles (%) | 5% | 9% | 0% | 0% | 7% | 1% | 1% | 0% | 4% | 0% | 0% | 0% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 62.6 | 53.6 | 53.6 | 52.5 | 47.5 | 47.5 | 35.0 | 35.0 | | 10.3 | 10.3 | 10.3 |
| Effective Green, g (s) | 62.6 | 53.6 | 53.6 | 52.5 | 47.5 | 47.5 | 35.0 | 35.0 | | 10.3 | 10.3 | 10.3 |
| Actuated g/C Ratio | 0.56 | 0.48 | 0.48 | 0.47 | 0.42 | 0.42 | 0.31 | 0.31 | | 0.09 | 0.09 | 0.09 |
| Clearance Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | | 6.8 | 6.8 | 6.8 |
| 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) | 234 | 1580 | 770 | 450 | 1427 | 676 | 456 | 533 | | 104 | 174 | 148 |
| v/s Ratio Prot | c0.09 | 0.16 | | 0.01 | 0.38 | | c0.16 | 0.13 | | | 0.02 | |
| v/s Ratio Perm | c0.40 | | 0.04 | 0.14 | | 0.06 | c0.11 | | | 0.06 | | 0.00 |
| v/c Ratio | 0.88 | 0.33 | 0.08 | 0.32 | 0.89 | 0.15 | 0.89 | 0.42 | | 0.63 | 0.20 | 0.03 |
| Uniform Delay, d1 | 30.0 | 18.2 | 16.0 | 17.3 | 29.9 | 19.9 | 35.0 | 30.6 | | 49.2 | 47.2 | 46.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 29.5 | 0.6 | 0.2 | 0.4 | 8.5 | 0.5 | 19.6 | 0.5 | | 12.0 | 0.6 | 0.1 |
| Delay (s) | 59.5 | 18.8 | 16.2 | 17.7 | 38.4 | 20.4 | 54.5 | 31.2 | | 61.2 | 47.7 | 46.5 |
| Level of Service | E | B | B | B | D | C | D | C | | E | D | D |
| Approach Delay (s) | | 28.1 | | | 34.5 | | | 45.4 | | | 53.3 | |
| Approach LOS | | C | | | C | | | D | | | D | |

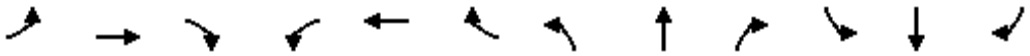
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 35.9 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.94 | | |
| Actuated Cycle Length (s) | 112.3 | Sum of lost time (s) | 22.7 |
| Intersection Capacity Utilization | 87.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 29 | 669 | 37 | 14 | 1510 | 10 | 62 | 5 | 3 | 1 |
| Future Volume (vph) | 29 | 669 | 37 | 14 | 1510 | 10 | 62 | 5 | 3 | 1 |
| Lane Group Flow (vph) | 34 | 778 | 43 | 16 | 1756 | 12 | 72 | 47 | 3 | 16 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | 6 |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.0 | 37.9 | 37.9 | 10.0 | 37.9 | 37.9 | 30.7 | 30.7 | 30.7 | 30.7 |
| Total Split (s) | 20.0 | 67.9 | 67.9 | 20.0 | 67.9 | 67.9 | 31.7 | 31.7 | 31.7 | 31.7 |
| Total Split (%) | 16.7% | 56.8% | 56.8% | 16.7% | 56.8% | 56.8% | 26.5% | 26.5% | 26.5% | 26.5% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 4.1 | 4.1 | 4.1 | 4.1 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.6 | 2.6 | 2.6 | 2.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | 6.7 | 6.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None |
| v/c Ratio | 0.21 | 0.32 | 0.04 | 0.03 | 0.71 | 0.01 | 0.46 | 0.21 | 0.03 | 0.11 |
| Control Delay | 6.2 | 6.9 | 0.6 | 3.4 | 14.3 | 0.0 | 50.4 | 16.9 | 38.7 | 20.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 6.2 | 6.9 | 0.6 | 3.4 | 14.3 | 0.0 | 50.4 | 16.9 | 38.7 | 20.4 |
| Queue Length 50th (m) | 1.3 | 22.5 | 0.0 | 0.6 | 127.2 | 0.0 | 13.5 | 1.1 | 0.6 | 0.2 |
| Queue Length 95th (m) | 3.8 | 50.2 | 1.0 | 2.2 | 169.6 | 0.0 | 26.4 | 10.6 | 3.1 | 5.9 |
| Internal Link Dist (m) | | 440.7 | | | 446.3 | | | 949.6 | | 204.9 |
| Turn Bay Length (m) | 40.0 | | 22.0 | 42.0 | | 51.0 | 20.0 | | 14.0 | |
| Base Capacity (vph) | 272 | 2463 | 973 | 720 | 2463 | 986 | 368 | 467 | 218 | 327 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.32 | 0.04 | 0.02 | 0.71 | 0.01 | 0.20 | 0.10 | 0.01 | 0.05 |

| Intersection Summary |
|---|
| Cycle Length: 119.6 |
| Actuated Cycle Length: 94.9 |
| Natural Cycle: 100 |
| Control Type: Semi Act-Uncoord |

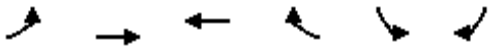
Splits and Phases: 2: Moonlight Ave & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 29 | 669 | 37 | 14 | 1510 | 10 | 62 | 5 | 35 | 3 | 1 | 13 |
| Future Volume (vph) | 29 | 669 | 37 | 14 | 1510 | 10 | 62 | 5 | 35 | 3 | 1 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 0.86 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1280 | 3312 | 1282 | 1805 | 3438 | 1346 | 1770 | 1651 | | 1081 | 1196 | |
| Flt Permitted | 0.08 | 1.00 | 1.00 | 0.36 | 1.00 | 1.00 | 0.75 | 1.00 | | 0.73 | 1.00 | |
| Satd. Flow (perm) | 107 | 3312 | 1282 | 678 | 3438 | 1346 | 1392 | 1651 | | 826 | 1196 | |
| Peak-hour factor, PHF | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Adj. Flow (vph) | 34 | 778 | 43 | 16 | 1756 | 12 | 72 | 6 | 41 | 3 | 1 | 15 |
| RTOR Reduction (vph) | 0 | 0 | 13 | 0 | 0 | 4 | 0 | 37 | 0 | 0 | 14 | 0 |
| Lane Group Flow (vph) | 34 | 778 | 30 | 16 | 1756 | 8 | 72 | 10 | 0 | 3 | 2 | 0 |
| Heavy Vehicles (%) | 41% | 9% | 26% | 0% | 5% | 20% | 2% | 0% | 0% | 67% | 0% | 39% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 72.6 | 68.7 | 68.7 | 69.4 | 67.1 | 67.1 | 8.8 | 8.8 | | 8.8 | 8.8 | |
| Effective Green, g (s) | 72.6 | 68.7 | 68.7 | 69.4 | 67.1 | 67.1 | 8.8 | 8.8 | | 8.8 | 8.8 | |
| Actuated g/C Ratio | 0.73 | 0.69 | 0.69 | 0.70 | 0.68 | 0.68 | 0.09 | 0.09 | | 0.09 | 0.09 | |
| Clearance Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 124 | 2289 | 886 | 499 | 2320 | 908 | 123 | 146 | | 73 | 105 | |
| v/s Ratio Prot | c0.01 | 0.23 | | 0.00 | c0.51 | | | 0.01 | | | 0.00 | |
| v/s Ratio Perm | 0.19 | | 0.02 | 0.02 | | 0.01 | c0.05 | | | 0.00 | | |
| v/c Ratio | 0.27 | 0.34 | 0.03 | 0.03 | 0.76 | 0.01 | 0.59 | 0.07 | | 0.04 | 0.02 | |
| Uniform Delay, d1 | 8.5 | 6.2 | 4.9 | 4.6 | 10.7 | 5.3 | 43.5 | 41.5 | | 41.4 | 41.4 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.2 | 0.4 | 0.1 | 0.0 | 2.4 | 0.0 | 6.9 | 0.2 | | 0.2 | 0.1 | |
| Delay (s) | 9.7 | 6.6 | 4.9 | 4.6 | 13.1 | 5.3 | 50.5 | 41.7 | | 41.7 | 41.5 | |
| Level of Service | A | A | A | A | B | A | D | D | | D | D | |
| Approach Delay (s) | | 6.6 | | | 13.0 | | | 47.0 | | | 41.5 | |
| Approach LOS | | A | | | B | | | D | | | D | |

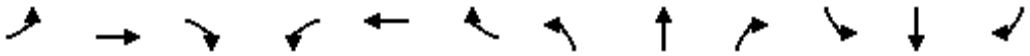
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.71 | | |
| Actuated Cycle Length (s) | 99.4 | Sum of lost time (s) | 19.6 |
| Intersection Capacity Utilization | 64.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 280 | 34 | 100 | 73 | 31 | 167 |
| Future Volume (Veh/h) | 280 | 34 | 100 | 73 | 31 | 167 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 311 | 38 | 111 | 81 | 34 | 186 |
| 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 | | | | 812 | 152 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 192 | | | | 812 | 152 |
| tC, single (s) | 4.2 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.3 | | | | 3.5 | 3.3 |
| p0 queue free % | 77 | | | | 87 | 79 |
| cM capacity (veh/h) | 1358 | | | | 271 | 890 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 349 | 192 | 220 |
| Volume Left | 311 | 0 | 34 |
| Volume Right | 0 | 81 | 186 |
| cSH | 1358 | 1700 | 658 |
| Volume to Capacity | 0.23 | 0.11 | 0.33 |
| Queue Length 95th (m) | 7.1 | 0.0 | 11.8 |
| Control Delay (s) | 7.7 | 0.0 | 13.2 |
| Lane LOS | A | | B |
| Approach Delay (s) | 7.7 | 0.0 | 13.2 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.4 | | |
| Intersection Capacity Utilization | 49.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 18 | 42 | 2 | 0 | 112 | 24 | 5 | 0 | 0 | 16 | 1 | 27 |
| Future Volume (vph) | 18 | 42 | 2 | 0 | 112 | 24 | 5 | 0 | 0 | 16 | 1 | 27 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 21 | 48 | 2 | 0 | 129 | 28 | 6 | 0 | 0 | 18 | 1 | 31 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 71 | 157 | 6 | 50 |
| Volume Left (vph) | 21 | 0 | 6 | 18 |
| Volume Right (vph) | 2 | 28 | 0 | 31 |
| Hadj (s) | 0.15 | -0.02 | 0.20 | -0.03 |
| Departure Headway (s) | 4.3 | 4.1 | 4.7 | 4.4 |
| Degree Utilization, x | 0.09 | 0.18 | 0.01 | 0.06 |
| Capacity (veh/h) | 810 | 866 | 726 | 770 |
| Control Delay (s) | 7.7 | 8.0 | 7.7 | 7.7 |
| Approach Delay (s) | 7.7 | 8.0 | 7.7 | 7.7 |
| Approach LOS | A | A | A | A |

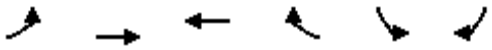
| Intersection Summary | | | |
|---|---|---|---|
| Delay | 7.9 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 24.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.9 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 18 | 42 | 2 | 0 | 112 | 24 | 5 | 0 | 0 | 16 | 1 | 27 |
| Future Vol, veh/h | 18 | 42 | 2 | 0 | 112 | 24 | 5 | 0 | 0 | 16 | 1 | 27 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 13 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 15 | 0 | 17 |
| Mvmt Flow | 21 | 48 | 2 | 0 | 129 | 28 | 6 | 0 | 0 | 18 | 1 | 31 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 7.9 | 8 | 7.7 | 7.7 |
| HCM LOS | A | A | A | A |

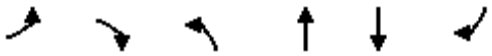
| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 100% | 29% | 0% | 36% |
| Vol Thru, % | 0% | 68% | 82% | 2% |
| Vol Right, % | 0% | 3% | 18% | 61% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 5 | 62 | 136 | 44 |
| LT Vol | 5 | 18 | 0 | 16 |
| Through Vol | 0 | 42 | 112 | 1 |
| RT Vol | 0 | 2 | 24 | 27 |
| Lane Flow Rate | 6 | 71 | 156 | 51 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.007 | 0.087 | 0.176 | 0.061 |
| Departure Headway (Hd) | 4.664 | 4.377 | 4.048 | 4.371 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 772 | 811 | 880 | 824 |
| Service Time | 2.665 | 2.445 | 2.104 | 2.371 |
| HCM Lane V/C Ratio | 0.008 | 0.088 | 0.177 | 0.062 |
| HCM Control Delay | 7.7 | 7.9 | 8 | 7.7 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0 | 0.3 | 0.6 | 0.2 |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 3 | 65 | 157 | 7 | 2 | 12 |
| Future Volume (Veh/h) | 3 | 65 | 157 | 7 | 2 | 12 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 3 | 70 | 169 | 8 | 2 | 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 | 177 | | | | 249 | 173 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 177 | | | | 249 | 173 |
| tC, single (s) | 4.1 | | | | 6.9 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 4.0 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 99 |
| cM capacity (veh/h) | 1411 | | | | 645 | 876 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 73 | 177 | 15 |
| Volume Left | 3 | 0 | 2 |
| Volume Right | 0 | 8 | 13 |
| cSH | 1411 | 1700 | 836 |
| Volume to Capacity | 0.00 | 0.10 | 0.02 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.4 |
| Control Delay (s) | 0.3 | 0.0 | 9.4 |
| Lane LOS | A | | A |
| Approach Delay (s) | 0.3 | 0.0 | 9.4 |
| Approach LOS | | | A |

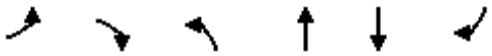
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.6 | | |
| Intersection Capacity Utilization | 18.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 9 | 2 | 1 | 9 | 12 | 3 |
| Future Volume (Veh/h) | 9 | 2 | 1 | 9 | 12 | 3 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 10 | 2 | 1 | 10 | 13 | 3 |
| 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 | 26 | 14 | 16 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 26 | 14 | 16 | | | |
| 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 | 100 | 100 | | | |
| cM capacity (veh/h) | 993 | 1071 | 1615 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 12 | 11 | 16 |
| Volume Left | 10 | 1 | 0 |
| Volume Right | 2 | 0 | 3 |
| cSH | 1005 | 1615 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.01 |
| Queue Length 95th (m) | 0.3 | 0.0 | 0.0 |
| Control Delay (s) | 8.6 | 0.7 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 8.6 | 0.7 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.8 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 38 | 6 | 1 | 17 | 9 | 13 |
| Future Volume (Veh/h) | 38 | 6 | 1 | 17 | 9 | 13 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 41 | 7 | 1 | 18 | 10 | 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 | 37 | 17 | 24 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 37 | 17 | 24 | | | |
| 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 | 100 | | | |
| cM capacity (veh/h) | 980 | 1068 | 1604 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 48 | 19 | 24 |
| Volume Left | 41 | 1 | 0 |
| Volume Right | 7 | 0 | 14 |
| cSH | 992 | 1604 | 1700 |
| Volume to Capacity | 0.05 | 0.00 | 0.01 |
| Queue Length 95th (m) | 1.2 | 0.0 | 0.0 |
| Control Delay (s) | 8.8 | 0.4 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 8.8 | 0.4 | 0.0 |
| Approach LOS | A | | |

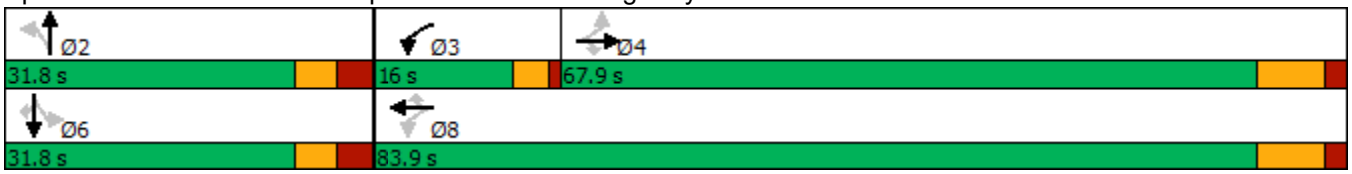
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.7 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

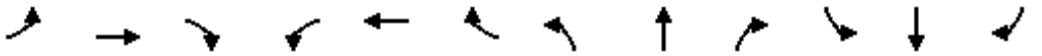
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 1277 | 308 | 92 | 886 | 41 | 128 | 25 | 135 | 95 | 286 |
| Future Volume (vph) | 86 | 1277 | 308 | 92 | 886 | 41 | 128 | 25 | 135 | 95 | 286 |
| Lane Group Flow (vph) | 91 | 1359 | 328 | 98 | 943 | 44 | 136 | 176 | 144 | 101 | 304 |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 30.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 37.9 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 27.8 | 27.8 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 67.9 | 67.9 | 67.9 | 16.0 | 83.9 | 83.9 | 31.8 | 31.8 | 31.8 | 31.8 | 31.8 |
| Total Split (%) | 58.7% | 58.7% | 58.7% | 13.8% | 72.5% | 72.5% | 27.5% | 27.5% | 27.5% | 27.5% | 27.5% |
| Yellow Time (s) | 5.9 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lag | Lag | Lag | Lead | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | | | |
| Recall Mode | Max | Max | Max | None | Max | Max | None | None | None | None | None |
| v/c Ratio | 0.27 | 0.65 | 0.31 | 0.37 | 0.40 | 0.04 | 0.60 | 0.44 | 0.82 | 0.31 | 0.73 |
| Control Delay | 15.4 | 17.9 | 2.2 | 9.0 | 8.2 | 2.8 | 53.2 | 12.9 | 76.6 | 41.7 | 30.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 15.4 | 17.9 | 2.2 | 9.0 | 8.2 | 2.8 | 53.2 | 12.9 | 76.6 | 41.7 | 30.1 |
| Queue Length 50th (m) | 9.6 | 102.7 | 0.0 | 5.7 | 43.4 | 0.5 | 28.6 | 5.2 | 31.5 | 20.1 | 29.5 |
| Queue Length 95th (m) | 23.4 | 147.7 | 13.2 | 12.5 | 64.0 | 4.6 | 49.5 | 24.4 | #58.5 | 36.1 | 61.3 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | | 303.0 | |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 100.0 | | 75.0 | | |
| Base Capacity (vph) | 340 | 2088 | 1068 | 331 | 2385 | 1131 | 300 | 484 | 235 | 433 | 496 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.27 | 0.65 | 0.31 | 0.30 | 0.40 | 0.04 | 0.45 | 0.36 | 0.61 | 0.23 | 0.61 |

Intersection Summary

Cycle Length: 115.7
Actuated Cycle Length: 109.8
Natural Cycle: 75
Control Type: Semi Act-Uncoord
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Levesque St/Street 'C' & Kingsway





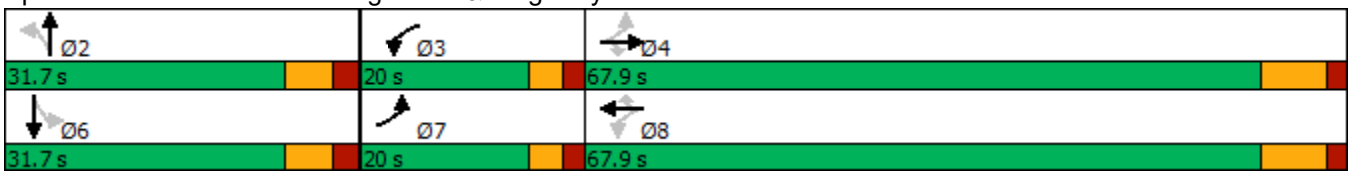
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 1277 | 308 | 92 | 886 | 41 | 128 | 25 | 140 | 135 | 95 | 286 |
| Future Volume (vph) | 86 | 1277 | 308 | 92 | 886 | 41 | 128 | 25 | 140 | 135 | 95 | 286 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1805 | 3539 | 1583 | 1736 | 3438 | 1615 | 1805 | 1618 | | 1805 | 1900 | 1615 |
| Flt Permitted | 0.30 | 1.00 | 1.00 | 0.13 | 1.00 | 1.00 | 0.69 | 1.00 | | 0.54 | 1.00 | 1.00 |
| Satd. Flow (perm) | 576 | 3539 | 1583 | 229 | 3438 | 1615 | 1314 | 1618 | | 1029 | 1900 | 1615 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 91 | 1359 | 328 | 98 | 943 | 44 | 136 | 27 | 149 | 144 | 101 | 304 |
| RTOR Reduction (vph) | 0 | 0 | 134 | 0 | 0 | 11 | 0 | 123 | 0 | 0 | 0 | 137 |
| Lane Group Flow (vph) | 91 | 1359 | 194 | 98 | 943 | 33 | 136 | 53 | 0 | 144 | 101 | 167 |
| Heavy Vehicles (%) | 0% | 2% | 2% | 4% | 5% | 0% | 0% | 0% | 3% | 0% | 0% | 0% |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | Perm |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 64.8 | 64.8 | 64.8 | 76.2 | 76.2 | 76.2 | 18.9 | 18.9 | | 18.9 | 18.9 | 18.9 |
| Effective Green, g (s) | 64.8 | 64.8 | 64.8 | 76.2 | 76.2 | 76.2 | 18.9 | 18.9 | | 18.9 | 18.9 | 18.9 |
| Actuated g/C Ratio | 0.59 | 0.59 | 0.59 | 0.69 | 0.69 | 0.69 | 0.17 | 0.17 | | 0.17 | 0.17 | 0.17 |
| Clearance Time (s) | 7.9 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| 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) | 339 | 2088 | 934 | 260 | 2385 | 1120 | 226 | 278 | | 177 | 327 | 277 |
| v/s Ratio Prot | | c0.38 | | 0.03 | c0.27 | | | 0.03 | | | 0.05 | |
| v/s Ratio Perm | 0.16 | | 0.12 | 0.24 | | 0.02 | 0.10 | | | c0.14 | | 0.10 |
| v/c Ratio | 0.27 | 0.65 | 0.21 | 0.38 | 0.40 | 0.03 | 0.60 | 0.19 | | 0.81 | 0.31 | 0.60 |
| Uniform Delay, d1 | 11.0 | 15.0 | 10.5 | 9.6 | 7.1 | 5.2 | 42.0 | 38.9 | | 43.8 | 39.7 | 42.0 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.9 | 1.6 | 0.5 | 0.9 | 0.5 | 0.0 | 4.5 | 0.3 | | 24.0 | 0.5 | 3.7 |
| Delay (s) | 12.9 | 16.6 | 11.0 | 10.5 | 7.6 | 5.3 | 46.4 | 39.2 | | 67.8 | 40.3 | 45.7 |
| Level of Service | B | B | B | B | A | A | D | D | | E | D | D |
| Approach Delay (s) | | 15.4 | | | 7.7 | | | 42.4 | | | 50.5 | |
| Approach LOS | | B | | | A | | | D | | | D | |

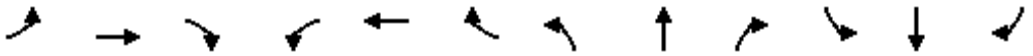
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 109.8 | Sum of lost time (s) | 18.7 |
| Intersection Capacity Utilization | 91.9% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 1527 | 78 | 51 | 1070 | 11 | 39 | 6 | 11 | 4 |
| Future Volume (vph) | 15 | 1527 | 78 | 51 | 1070 | 11 | 39 | 6 | 11 | 4 |
| Lane Group Flow (vph) | 16 | 1678 | 86 | 56 | 1176 | 12 | 43 | 67 | 12 | 36 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | 6 |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 6 | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.0 | 37.9 | 37.9 | 10.0 | 37.9 | 37.9 | 30.7 | 30.7 | 30.7 | 30.7 |
| Total Split (s) | 20.0 | 67.9 | 67.9 | 20.0 | 67.9 | 67.9 | 31.7 | 31.7 | 31.7 | 31.7 |
| Total Split (%) | 16.7% | 56.8% | 56.8% | 16.7% | 56.8% | 56.8% | 26.5% | 26.5% | 26.5% | 26.5% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 4.1 | 4.1 | 4.1 | 4.1 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.6 | 2.6 | 2.6 | 2.6 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | 6.7 | 6.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None |
| v/c Ratio | 0.04 | 0.69 | 0.08 | 0.24 | 0.45 | 0.01 | 0.32 | 0.31 | 0.11 | 0.20 |
| Control Delay | 2.9 | 13.2 | 2.3 | 5.1 | 7.4 | 0.0 | 46.6 | 17.1 | 41.5 | 18.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.9 | 13.2 | 2.3 | 5.1 | 7.4 | 0.0 | 46.6 | 17.1 | 41.5 | 18.8 |
| Queue Length 50th (m) | 0.5 | 106.6 | 0.5 | 1.8 | 35.4 | 0.0 | 7.9 | 1.3 | 2.2 | 0.7 |
| Queue Length 95th (m) | 2.0 | 154.0 | 6.1 | 4.9 | 83.0 | 0.0 | 18.7 | 13.9 | 7.8 | 10.0 |
| Internal Link Dist (m) | | 440.7 | | | 446.3 | | | 949.6 | | 204.9 |
| Turn Bay Length (m) | 40.0 | | 22.0 | 42.0 | | 51.0 | 20.0 | | 14.0 | |
| Base Capacity (vph) | 530 | 2442 | 1137 | 389 | 2591 | 1236 | 377 | 488 | 310 | 432 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.03 | 0.69 | 0.08 | 0.14 | 0.45 | 0.01 | 0.11 | 0.14 | 0.04 | 0.08 |

| Intersection Summary |
|---|
| Cycle Length: 119.6 |
| Actuated Cycle Length: 92.8 |
| Natural Cycle: 90 |
| Control Type: Semi Act-Uncoord |

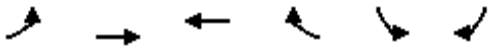
Splits and Phases: 2: Moonlight Ave & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 1527 | 78 | 51 | 1070 | 11 | 39 | 6 | 55 | 11 | 4 | 29 |
| Future Volume (vph) | 15 | 1527 | 78 | 51 | 1070 | 11 | 39 | 6 | 55 | 11 | 4 | 29 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 0.87 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1687 | 3471 | 1583 | 1736 | 3438 | 1615 | 1805 | 1645 | | 1530 | 1512 | |
| Flt Permitted | 0.22 | 1.00 | 1.00 | 0.09 | 1.00 | 1.00 | 0.73 | 1.00 | | 0.71 | 1.00 | |
| Satd. Flow (perm) | 396 | 3471 | 1583 | 166 | 3438 | 1615 | 1394 | 1645 | | 1149 | 1512 | |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 16 | 1678 | 86 | 56 | 1176 | 12 | 43 | 7 | 60 | 12 | 4 | 32 |
| RTOR Reduction (vph) | 0 | 0 | 26 | 0 | 0 | 4 | 0 | 56 | 0 | 0 | 30 | 0 |
| Lane Group Flow (vph) | 16 | 1678 | 60 | 56 | 1176 | 8 | 43 | 11 | 0 | 12 | 6 | 0 |
| Heavy Vehicles (%) | 7% | 4% | 2% | 4% | 5% | 0% | 0% | 0% | 0% | 18% | 0% | 10% |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | 67.9 | 65.6 | 65.6 | 73.1 | 68.2 | 68.2 | 7.3 | 7.3 | | 7.3 | 7.3 | |
| Effective Green, g (s) | 67.9 | 65.6 | 65.6 | 73.1 | 68.2 | 68.2 | 7.3 | 7.3 | | 7.3 | 7.3 | |
| Actuated g/C Ratio | 0.70 | 0.67 | 0.67 | 0.75 | 0.70 | 0.70 | 0.07 | 0.07 | | 0.07 | 0.07 | |
| Clearance Time (s) | 5.0 | 7.9 | 7.9 | 5.0 | 7.9 | 7.9 | 6.7 | 6.7 | | 6.7 | 6.7 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 306 | 2337 | 1066 | 203 | 2407 | 1130 | 104 | 123 | | 86 | 113 | |
| v/s Ratio Prot | 0.00 | c0.48 | | c0.01 | c0.34 | | | 0.01 | | | 0.00 | |
| v/s Ratio Perm | 0.04 | | 0.04 | 0.19 | | 0.01 | c0.03 | | | 0.01 | | |
| v/c Ratio | 0.05 | 0.72 | 0.06 | 0.28 | 0.49 | 0.01 | 0.41 | 0.09 | | 0.14 | 0.06 | |
| Uniform Delay, d1 | 4.6 | 10.1 | 5.4 | 7.3 | 6.7 | 4.4 | 43.0 | 42.0 | | 42.1 | 41.9 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 1.9 | 0.1 | 0.7 | 0.7 | 0.0 | 2.7 | 0.3 | | 0.7 | 0.2 | |
| Delay (s) | 4.7 | 12.0 | 5.5 | 8.1 | 7.4 | 4.4 | 45.7 | 42.3 | | 42.9 | 42.1 | |
| Level of Service | A | B | A | A | A | A | D | D | | D | D | |
| Approach Delay (s) | | 11.6 | | | 7.4 | | | 43.6 | | | 42.3 | |
| Approach LOS | | B | | | A | | | D | | | D | |

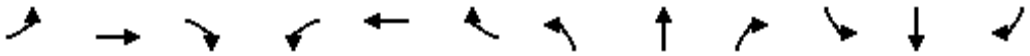
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 97.4 | Sum of lost time (s) | 19.6 |
| Intersection Capacity Utilization | 63.4% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 146 | 133 | 65 | 25 | 61 | 222 |
| Future Volume (Veh/h) | 146 | 133 | 65 | 25 | 61 | 222 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Hourly flow rate (vph) | 183 | 166 | 81 | 31 | 76 | 278 |
| 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 | 112 | | | | 628 | 96 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 112 | | | | 628 | 96 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 88 | | | | 80 | 71 |
| cM capacity (veh/h) | 1490 | | | | 383 | 963 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 349 | 112 | 354 |
| Volume Left | 183 | 0 | 76 |
| Volume Right | 0 | 31 | 278 |
| cSH | 1490 | 1700 | 727 |
| Volume to Capacity | 0.12 | 0.07 | 0.49 |
| Queue Length 95th (m) | 3.4 | 0.0 | 21.5 |
| Control Delay (s) | 4.6 | 0.0 | 14.6 |
| Lane LOS | A | | B |
| Approach Delay (s) | 4.6 | 0.0 | 14.6 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 8.3 | | |
| Intersection Capacity Utilization | 45.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Traffic Volume (vph) | 60 | 114 | 2 | 3 | 56 | 9 | 8 | 6 | 3 | 38 | 3 | 35 |
| Future Volume (vph) | 60 | 114 | 2 | 3 | 56 | 9 | 8 | 6 | 3 | 38 | 3 | 35 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Hourly flow rate (vph) | 70 | 133 | 2 | 3 | 65 | 10 | 9 | 7 | 3 | 44 | 3 | 41 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 205 | 78 | 19 | 88 |
| Volume Left (vph) | 70 | 3 | 9 | 44 |
| Volume Right (vph) | 2 | 10 | 3 | 41 |
| Hadj (s) | 0.06 | -0.07 | 0.00 | -0.10 |
| Departure Headway (s) | 4.3 | 4.3 | 4.6 | 4.5 |
| Degree Utilization, x | 0.24 | 0.09 | 0.02 | 0.11 |
| Capacity (veh/h) | 815 | 796 | 718 | 750 |
| Control Delay (s) | 8.7 | 7.7 | 7.8 | 8.0 |
| Approach Delay (s) | 8.7 | 7.7 | 7.8 | 8.0 |
| Approach LOS | A | A | A | A |

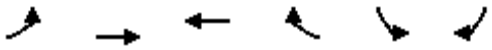
| Intersection Summary | | | |
|---|---|---|---|
| Delay | 8.3 | | |
| Level of Service | A | | |
| Intersection Capacity Utilization | 28.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.3 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 60 | 114 | 2 | 3 | 56 | 9 | 8 | 6 | 3 | 38 | 3 | 35 |
| Future Vol, veh/h | 60 | 114 | 2 | 3 | 56 | 9 | 8 | 6 | 3 | 38 | 3 | 35 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 7 |
| Mvmt Flow | 70 | 133 | 2 | 3 | 65 | 10 | 9 | 7 | 3 | 44 | 3 | 41 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 8.7 | 7.7 | 7.8 | 8 |
| HCM LOS | A | A | A | A |

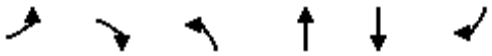
| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 47% | 34% | 4% | 50% |
| Vol Thru, % | 35% | 65% | 82% | 4% |
| Vol Right, % | 18% | 1% | 13% | 46% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 17 | 176 | 68 | 76 |
| LT Vol | 8 | 60 | 3 | 38 |
| Through Vol | 6 | 114 | 56 | 3 |
| RT Vol | 3 | 2 | 9 | 35 |
| Lane Flow Rate | 20 | 205 | 79 | 88 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.025 | 0.239 | 0.094 | 0.109 |
| Departure Headway (Hd) | 4.627 | 4.212 | 4.293 | 4.431 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 777 | 839 | 838 | 813 |
| Service Time | 2.634 | 2.306 | 2.303 | 2.436 |
| HCM Lane V/C Ratio | 0.026 | 0.244 | 0.094 | 0.108 |
| HCM Control Delay | 7.8 | 8.7 | 7.7 | 8 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.1 | 0.9 | 0.3 | 0.4 |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 12 | 182 | 83 | 5 | 3 | 2 |
| Future Volume (Veh/h) | 12 | 182 | 83 | 5 | 3 | 2 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 13 | 194 | 88 | 5 | 3 | 2 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 93 | | | | 310 | 90 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 93 | | | | 310 | 90 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 99 | | | | 100 | 100 |
| cM capacity (veh/h) | 1514 | | | | 680 | 973 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 207 | 93 | 5 |
| Volume Left | 13 | 0 | 3 |
| Volume Right | 0 | 5 | 2 |
| cSH | 1514 | 1700 | 773 |
| Volume to Capacity | 0.01 | 0.05 | 0.01 |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.2 |
| Control Delay (s) | 0.5 | 0.0 | 9.7 |
| Lane LOS | A | | A |
| Approach Delay (s) | 0.5 | 0.0 | 9.7 |
| Approach LOS | | | A |

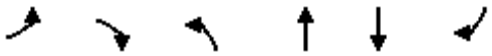
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 26.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 7 | 1 | 2 | 15 | 4 | 10 |
| Future Volume (Veh/h) | 7 | 1 | 2 | 15 | 4 | 10 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 8 | 1 | 2 | 16 | 4 | 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 | 30 | 10 | 15 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 30 | 10 | 15 | | | |
| 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 | 100 | 100 | | | |
| cM capacity (veh/h) | 989 | 1078 | 1616 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 9 | 18 | 15 |
| Volume Left | 8 | 2 | 0 |
| Volume Right | 1 | 0 | 11 |
| cSH | 998 | 1616 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.01 |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.0 |
| Control Delay (s) | 8.6 | 0.8 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 8.6 | 0.8 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.2 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 24 | 3 | 5 | 17 | 11 | 38 |
| Future Volume (Veh/h) | 24 | 3 | 5 | 17 | 11 | 38 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 26 | 3 | 5 | 18 | 12 | 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 | 60 | 32 | 53 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 60 | 32 | 53 | | | |
| 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) | 948 | 1047 | 1566 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 29 | 23 | 53 |
| Volume Left | 26 | 5 | 0 |
| Volume Right | 3 | 0 | 41 |
| cSH | 957 | 1566 | 1700 |
| Volume to Capacity | 0.03 | 0.00 | 0.03 |
| Queue Length 95th (m) | 0.7 | 0.1 | 0.0 |
| Control Delay (s) | 8.9 | 1.6 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 8.9 | 1.6 | 0.0 |
| Approach LOS | A | | |

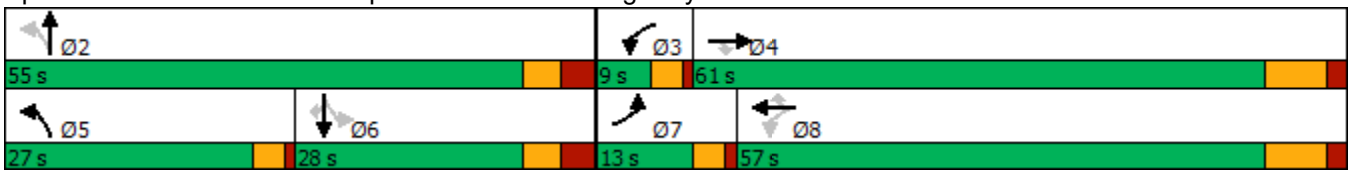
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.8 | | |
| Intersection Capacity Utilization | 15.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

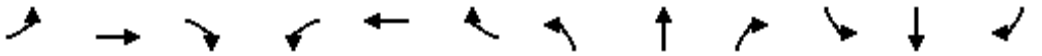
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 467 | 123 | 130 | 1139 | 163 | 367 | 111 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 467 | 123 | 130 | 1139 | 163 | 367 | 111 | 59 | 31 | 44 |
| Lane Group Flow (vph) | 206 | 519 | 137 | 144 | 1266 | 181 | 408 | 261 | 66 | 34 | 49 |
| Turn Type | Prot | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 6 | |
| Permitted Phases | | | 4 | 8 | | 8 | 2 | | 6 | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 4.5 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 4.5 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.0 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 9.0 | 27.8 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 13.0 | 61.0 | 61.0 | 9.0 | 57.0 | 57.0 | 27.0 | 55.0 | 28.0 | 28.0 | 28.0 |
| Total Split (%) | 10.4% | 48.8% | 48.8% | 7.2% | 45.6% | 45.6% | 21.6% | 44.0% | 22.4% | 22.4% | 22.4% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.0 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 3.2 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None | None |
| v/c Ratio | 0.77 | 0.33 | 0.16 | 0.29 | 0.85 | 0.24 | 0.83 | 0.46 | 0.53 | 0.16 | 0.18 |
| Control Delay | 71.5 | 20.5 | 3.9 | 14.9 | 36.7 | 10.9 | 47.0 | 26.2 | 64.9 | 48.4 | 1.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 71.5 | 20.5 | 3.9 | 14.9 | 36.7 | 10.9 | 47.0 | 26.2 | 64.9 | 48.4 | 1.4 |
| Queue Length 50th (m) | 25.3 | 40.8 | 0.0 | 15.3 | 143.8 | 11.1 | 79.8 | 37.8 | 15.2 | 7.5 | 0.0 |
| Queue Length 95th (m) | #48.1 | 59.6 | 11.9 | 28.8 | #206.3 | 28.5 | 113.6 | 61.5 | 30.5 | 17.5 | 0.0 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | | 303.0 | |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 100.0 | | 75.0 | | |
| Base Capacity (vph) | 269 | 1577 | 841 | 496 | 1486 | 761 | 506 | 771 | 215 | 361 | 398 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.77 | 0.33 | 0.16 | 0.29 | 0.85 | 0.24 | 0.81 | 0.34 | 0.31 | 0.09 | 0.12 |

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 112.5
Natural Cycle: 85
Control Type: Semi Act-Uncoord
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Levesque St/Street 'C' & Kingsway





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 467 | 123 | 130 | 1139 | 163 | 367 | 111 | 124 | 59 | 31 | 44 |
| Future Volume (vph) | 185 | 467 | 123 | 130 | 1139 | 163 | 367 | 111 | 124 | 59 | 31 | 44 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | | 6.8 | 6.8 | 6.8 |
| Lane Util. Factor | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3335 | 3312 | 1615 | 1805 | 3374 | 1599 | 1787 | 1713 | | 1805 | 1900 | 1615 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.46 | 1.00 | 1.00 | 0.53 | 1.00 | | 0.60 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3335 | 3312 | 1615 | 874 | 3374 | 1599 | 999 | 1713 | | 1136 | 1900 | 1615 |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 206 | 519 | 137 | 144 | 1266 | 181 | 408 | 123 | 138 | 66 | 34 | 49 |
| RTOR Reduction (vph) | 0 | 0 | 72 | 0 | 0 | 58 | 0 | 36 | 0 | 0 | 0 | 45 |
| Lane Group Flow (vph) | 206 | 519 | 65 | 144 | 1266 | 123 | 408 | 225 | 0 | 66 | 34 | 4 |
| Heavy Vehicles (%) | 5% | 9% | 0% | 0% | 7% | 1% | 1% | 0% | 4% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | | | 4 | 8 | | 8 | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 9.1 | 53.7 | 53.7 | 54.6 | 49.6 | 49.6 | 36.6 | 36.6 | | 10.4 | 10.4 | 10.4 |
| Effective Green, g (s) | 9.1 | 53.7 | 53.7 | 54.6 | 49.6 | 49.6 | 36.6 | 36.6 | | 10.4 | 10.4 | 10.4 |
| Actuated g/C Ratio | 0.08 | 0.47 | 0.47 | 0.48 | 0.44 | 0.44 | 0.32 | 0.32 | | 0.09 | 0.09 | 0.09 |
| Clearance Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 4.0 | 6.8 | | 6.8 | 6.8 | 6.8 |
| 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) | 266 | 1560 | 760 | 459 | 1467 | 695 | 474 | 549 | | 103 | 173 | 147 |
| v/s Ratio Prot | c0.06 | 0.16 | | 0.01 | c0.38 | | c0.17 | 0.13 | | | 0.02 | |
| v/s Ratio Perm | | | 0.04 | 0.14 | | 0.08 | c0.11 | | | 0.06 | | 0.00 |
| v/c Ratio | 0.77 | 0.33 | 0.08 | 0.31 | 0.86 | 0.18 | 0.86 | 0.41 | | 0.64 | 0.20 | 0.03 |
| Uniform Delay, d1 | 51.4 | 18.9 | 16.6 | 16.8 | 29.1 | 19.7 | 34.3 | 30.3 | | 50.0 | 47.9 | 47.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 13.1 | 0.6 | 0.2 | 0.4 | 6.9 | 0.6 | 14.7 | 0.5 | | 12.8 | 0.6 | 0.1 |
| Delay (s) | 64.6 | 19.5 | 16.8 | 17.2 | 36.1 | 20.3 | 49.0 | 30.8 | | 62.8 | 48.5 | 47.3 |
| Level of Service | E | B | B | B | D | C | D | C | | E | D | D |
| Approach Delay (s) | | 29.8 | | | 32.6 | | | 41.9 | | | 54.4 | |
| Approach LOS | | C | | | C | | | D | | | D | |

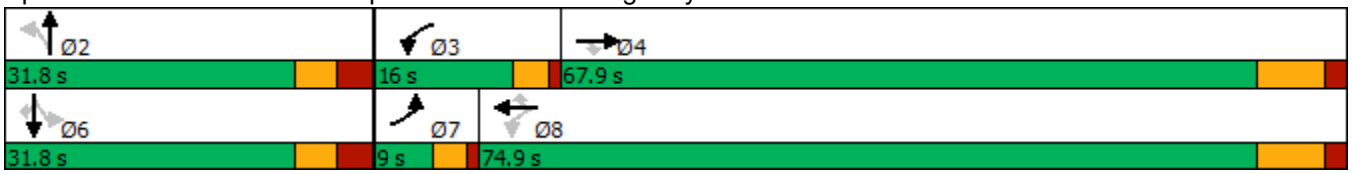
| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 34.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.88 | | |
| Actuated Cycle Length (s) | 114.0 | Sum of lost time (s) | 22.7 |
| Intersection Capacity Utilization | 82.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

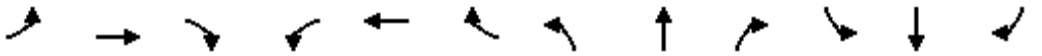
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 1277 | 308 | 92 | 886 | 41 | 128 | 25 | 135 | 95 | 286 |
| Future Volume (vph) | 86 | 1277 | 308 | 92 | 886 | 41 | 128 | 25 | 135 | 95 | 286 |
| Lane Group Flow (vph) | 91 | 1359 | 328 | 98 | 943 | 44 | 136 | 176 | 144 | 101 | 304 |
| Turn Type | Prot | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | 6 | |
| Permitted Phases | | | 4 | 8 | | 8 | 2 | | 6 | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 4.5 | 30.0 | 30.0 | 5.0 | 30.0 | 30.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 9.0 | 37.9 | 37.9 | 9.0 | 37.9 | 37.9 | 27.8 | 27.8 | 27.8 | 27.8 | 27.8 |
| Total Split (s) | 9.0 | 67.9 | 67.9 | 16.0 | 74.9 | 74.9 | 31.8 | 31.8 | 31.8 | 31.8 | 31.8 |
| Total Split (%) | 7.8% | 58.7% | 58.7% | 13.8% | 64.7% | 64.7% | 27.5% | 27.5% | 27.5% | 27.5% | 27.5% |
| Yellow Time (s) | 3.0 | 5.9 | 5.9 | 3.0 | 5.9 | 5.9 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | | |
| Recall Mode | None | Max | Max | None | Max | Max | None | None | None | None | None |
| v/c Ratio | 0.56 | 0.66 | 0.31 | 0.37 | 0.44 | 0.04 | 0.60 | 0.44 | 0.81 | 0.31 | 0.69 |
| Control Delay | 66.5 | 18.0 | 2.2 | 9.0 | 12.4 | 0.9 | 52.7 | 12.9 | 75.3 | 41.5 | 23.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 66.5 | 18.0 | 2.2 | 9.0 | 12.4 | 0.9 | 52.7 | 12.9 | 75.3 | 41.5 | 23.3 |
| Queue Length 50th (m) | 10.6 | 102.7 | 0.0 | 5.7 | 57.1 | 0.0 | 28.6 | 5.2 | 31.5 | 20.1 | 21.4 |
| Queue Length 95th (m) | #21.8 | 147.7 | 13.2 | 12.5 | 81.2 | 2.0 | 49.5 | 24.4 | #58.5 | 36.1 | 52.3 |
| Internal Link Dist (m) | | 516.5 | | | 440.7 | | | 737.0 | | 303.0 | |
| Turn Bay Length (m) | 59.0 | | 94.0 | 30.0 | | 1.0 | 100.0 | | 75.0 | | |
| Base Capacity (vph) | 162 | 2072 | 1062 | 334 | 2152 | 1039 | 304 | 489 | 238 | 439 | 526 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.56 | 0.66 | 0.31 | 0.29 | 0.44 | 0.04 | 0.45 | 0.36 | 0.61 | 0.23 | 0.58 |

Intersection Summary

Cycle Length: 115.7
Actuated Cycle Length: 108.5
Natural Cycle: 75
Control Type: Semi Act-Uncoord
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Levesque St/Street 'C' & Kingsway



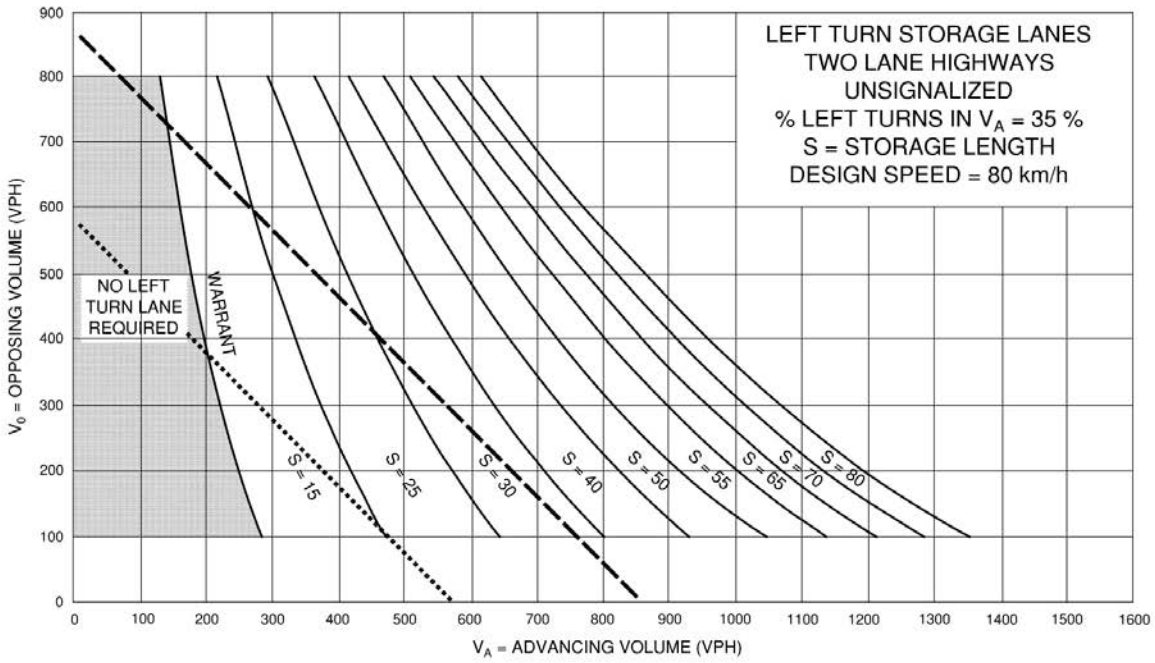


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 86 | 1277 | 308 | 92 | 886 | 41 | 128 | 25 | 140 | 135 | 95 | 286 |
| Future Volume (vph) | 86 | 1277 | 308 | 92 | 886 | 41 | 128 | 25 | 140 | 135 | 95 | 286 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| Lane Util. Factor | 0.97 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 3502 | 3539 | 1583 | 1736 | 3438 | 1615 | 1805 | 1618 | | 1805 | 1900 | 1615 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.13 | 1.00 | 1.00 | 0.69 | 1.00 | | 0.54 | 1.00 | 1.00 |
| Satd. Flow (perm) | 3502 | 3539 | 1583 | 230 | 3438 | 1615 | 1314 | 1618 | | 1031 | 1900 | 1615 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 91 | 1359 | 328 | 98 | 943 | 44 | 136 | 27 | 149 | 144 | 101 | 304 |
| RTOR Reduction (vph) | 0 | 0 | 135 | 0 | 0 | 17 | 0 | 123 | 0 | 0 | 0 | 164 |
| Lane Group Flow (vph) | 91 | 1359 | 193 | 98 | 943 | 27 | 136 | 53 | 0 | 144 | 101 | 140 |
| Heavy Vehicles (%) | 0% | 2% | 2% | 4% | 5% | 0% | 0% | 0% | 3% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | 4 | 8 | | 8 | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 3.9 | 64.5 | 64.5 | 75.4 | 68.0 | 68.0 | 18.8 | 18.8 | | 18.8 | 18.8 | 18.8 |
| Effective Green, g (s) | 3.9 | 64.5 | 64.5 | 75.4 | 68.0 | 68.0 | 18.8 | 18.8 | | 18.8 | 18.8 | 18.8 |
| Actuated g/C Ratio | 0.04 | 0.59 | 0.59 | 0.69 | 0.62 | 0.62 | 0.17 | 0.17 | | 0.17 | 0.17 | 0.17 |
| Clearance Time (s) | 4.0 | 7.9 | 7.9 | 4.0 | 7.9 | 7.9 | 6.8 | 6.8 | | 6.8 | 6.8 | 6.8 |
| 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) | 124 | 2086 | 933 | 260 | 2136 | 1003 | 225 | 278 | | 177 | 326 | 277 |
| v/s Ratio Prot | c0.03 | c0.38 | | c0.03 | 0.27 | | | 0.03 | | | 0.05 | |
| v/s Ratio Perm | | | 0.12 | 0.23 | | 0.02 | 0.10 | | | c0.14 | | 0.09 |
| v/c Ratio | 0.73 | 0.65 | 0.21 | 0.38 | 0.44 | 0.03 | 0.60 | 0.19 | | 0.81 | 0.31 | 0.51 |
| Uniform Delay, d1 | 52.2 | 15.0 | 10.5 | 9.6 | 10.8 | 8.0 | 41.9 | 38.8 | | 43.6 | 39.6 | 41.1 |
| 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 | 20.0 | 1.6 | 0.5 | 0.9 | 0.7 | 0.1 | 4.5 | 0.3 | | 24.0 | 0.5 | 1.5 |
| Delay (s) | 72.2 | 16.6 | 11.0 | 10.5 | 11.5 | 8.0 | 46.4 | 39.1 | | 67.6 | 40.2 | 42.5 |
| Level of Service | E | B | B | B | B | A | D | D | | E | D | D |
| Approach Delay (s) | | 18.4 | | | 11.2 | | | 42.3 | | | 48.7 | |
| Approach LOS | | B | | | B | | | D | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 22.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 109.4 | Sum of lost time (s) | 18.7 |
| Intersection Capacity Utilization | 79.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

# Appendix G –
# MTO Left Turn Analysis

**Exhibit 9A-17**




**Levesque Street / Bancroft Drive**
2024 Background - Eastbound
Critical Case - AM Peak Hour

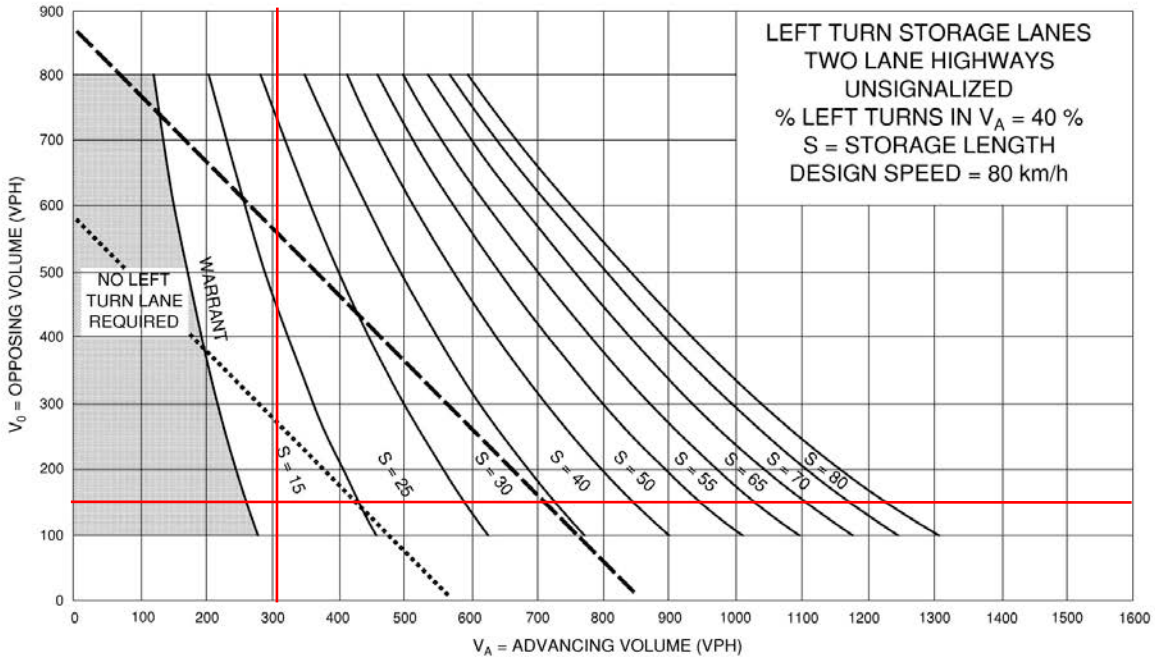
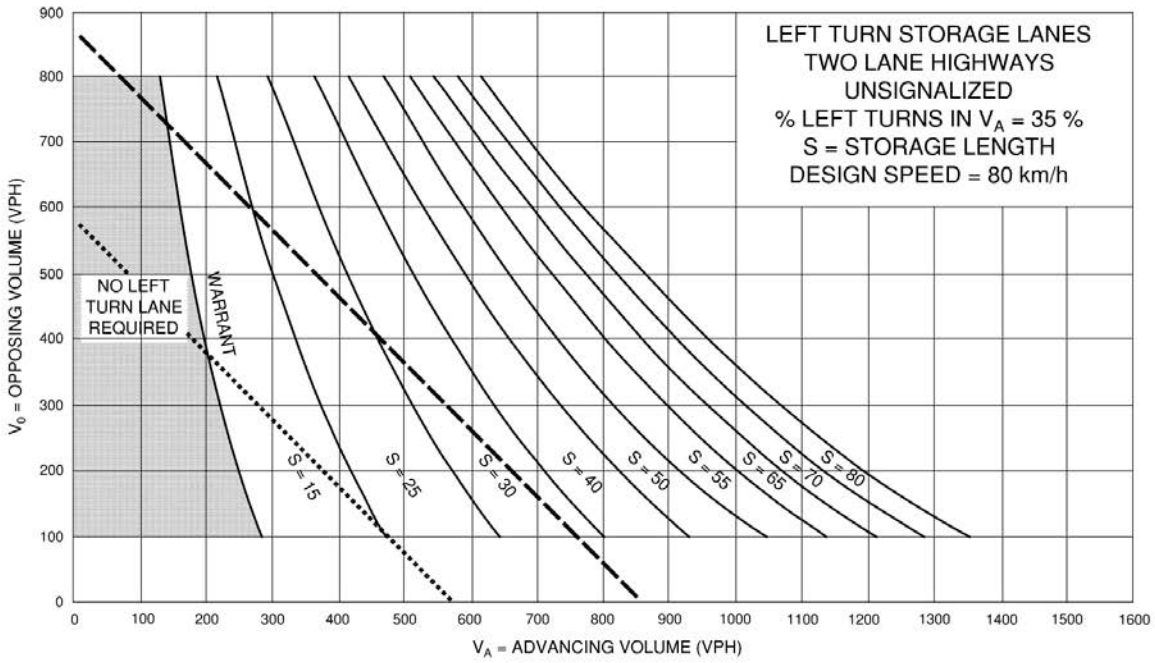


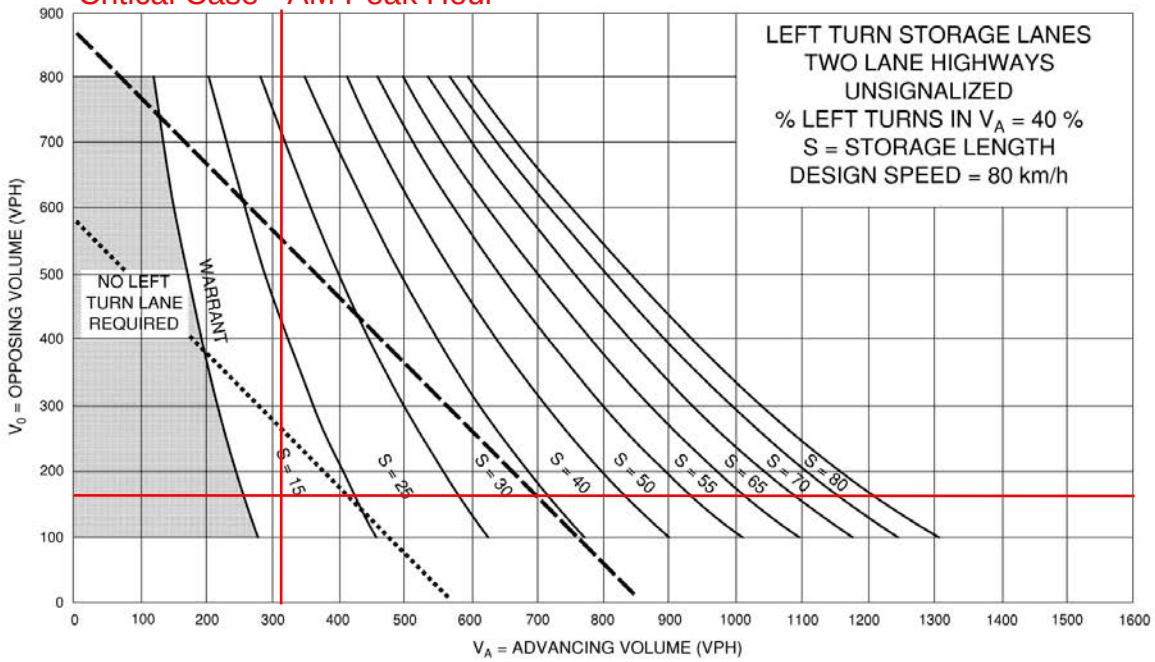
**Exhibit 9A-17**



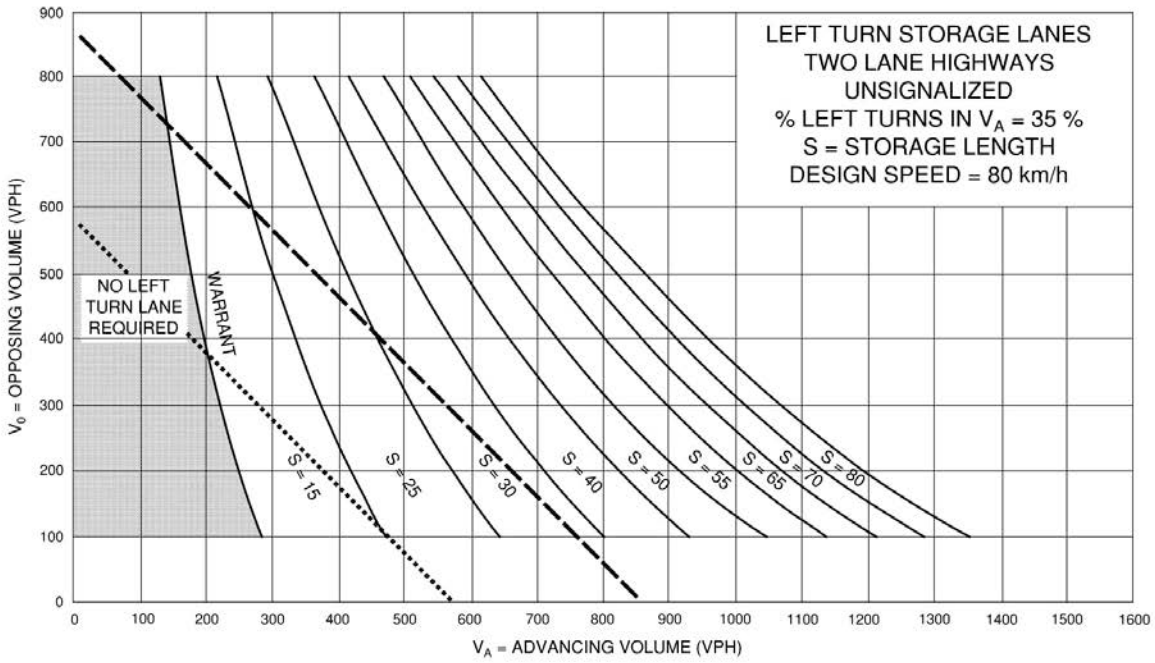

TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

**Levesque Street / Bancroft Drive**
2029 Background - Eastbound
Critical Case - AM Peak Hour



## Exhibit 9A-17




**Levesque Street / Bancroft Drive**
2024 Total - Eastbound
Critical Case - AM Peak Hour

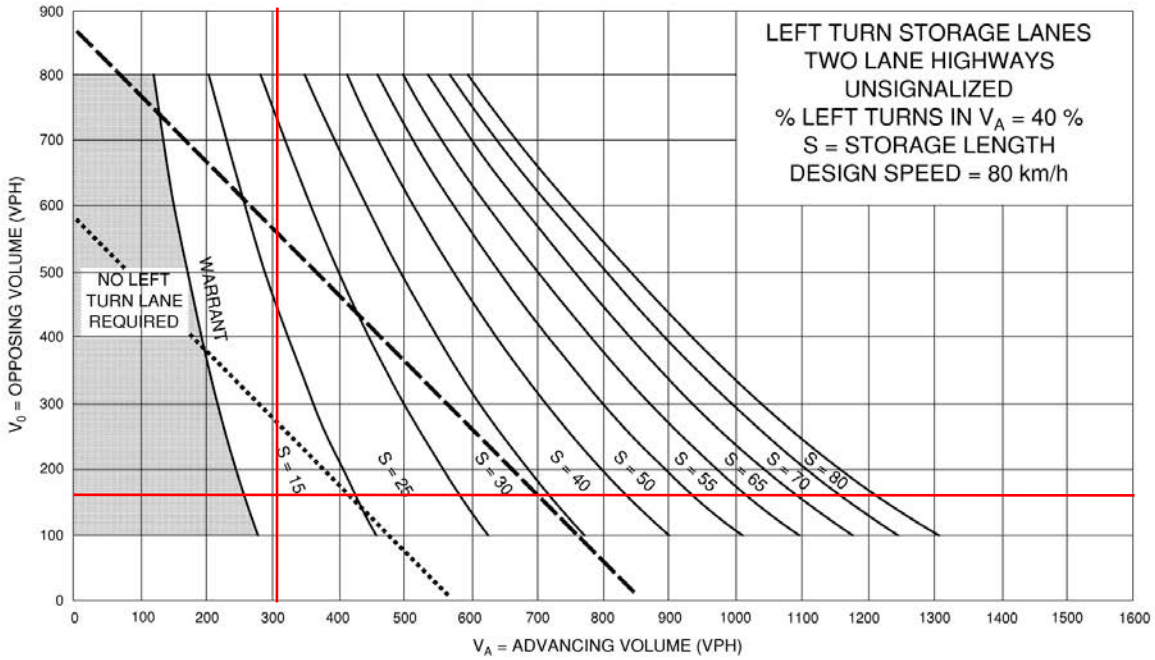
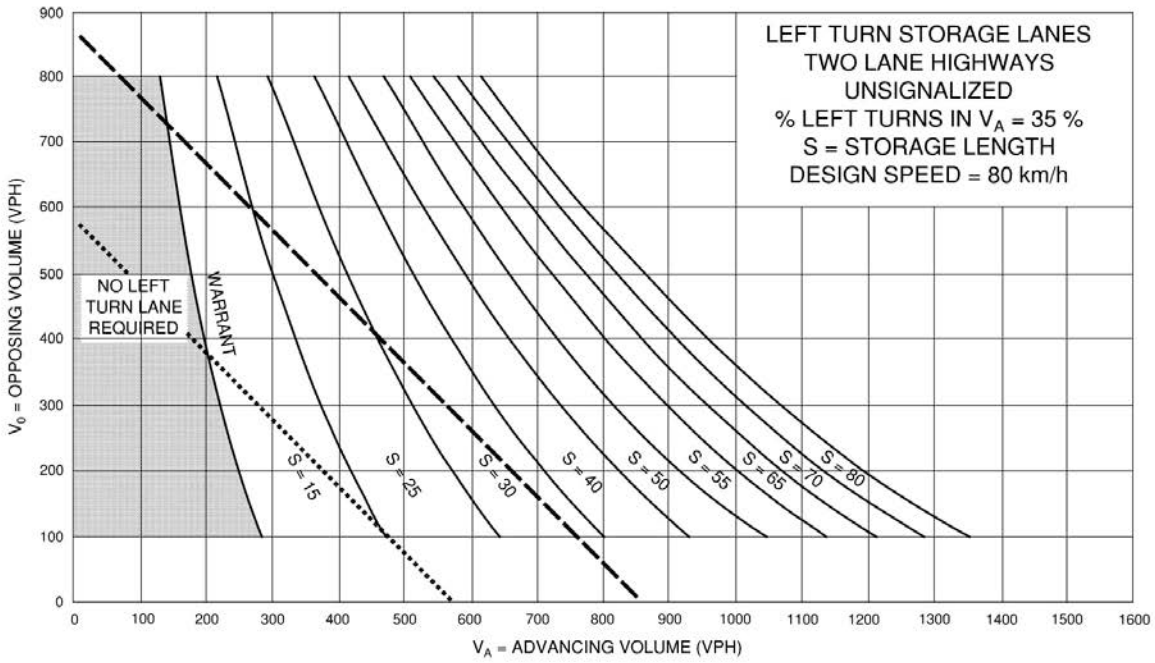


**Exhibit 9A-17**




**Levesque Street / Bancroft Drive**
2029 Total - Eastbound
Critical Case - AM Peak Hour

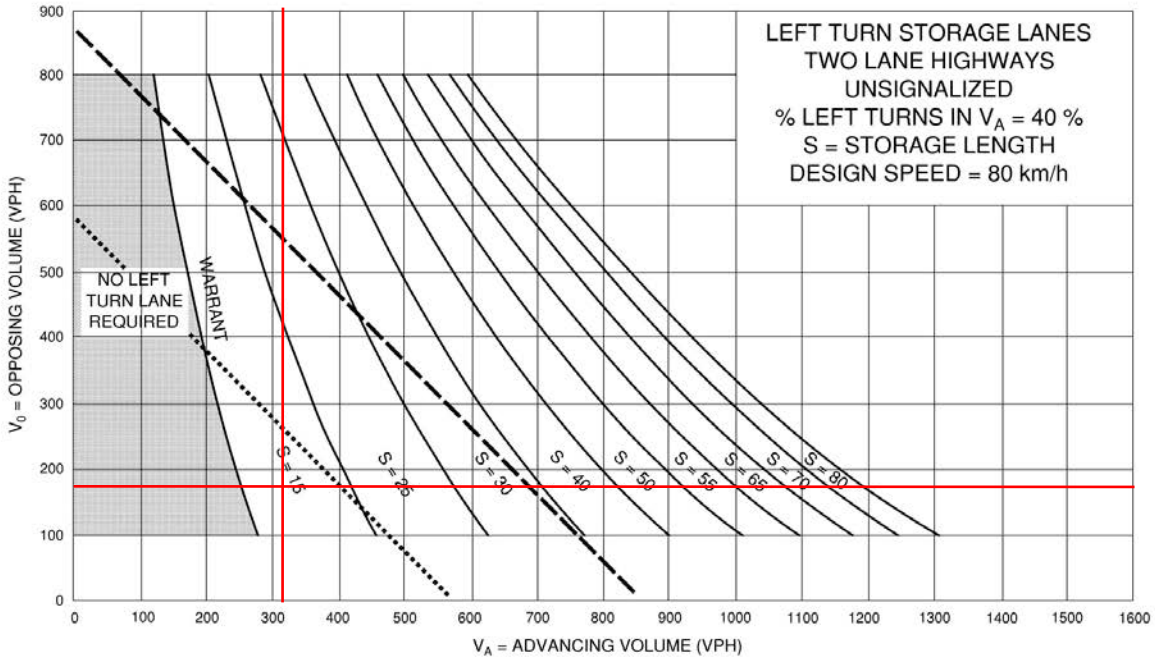
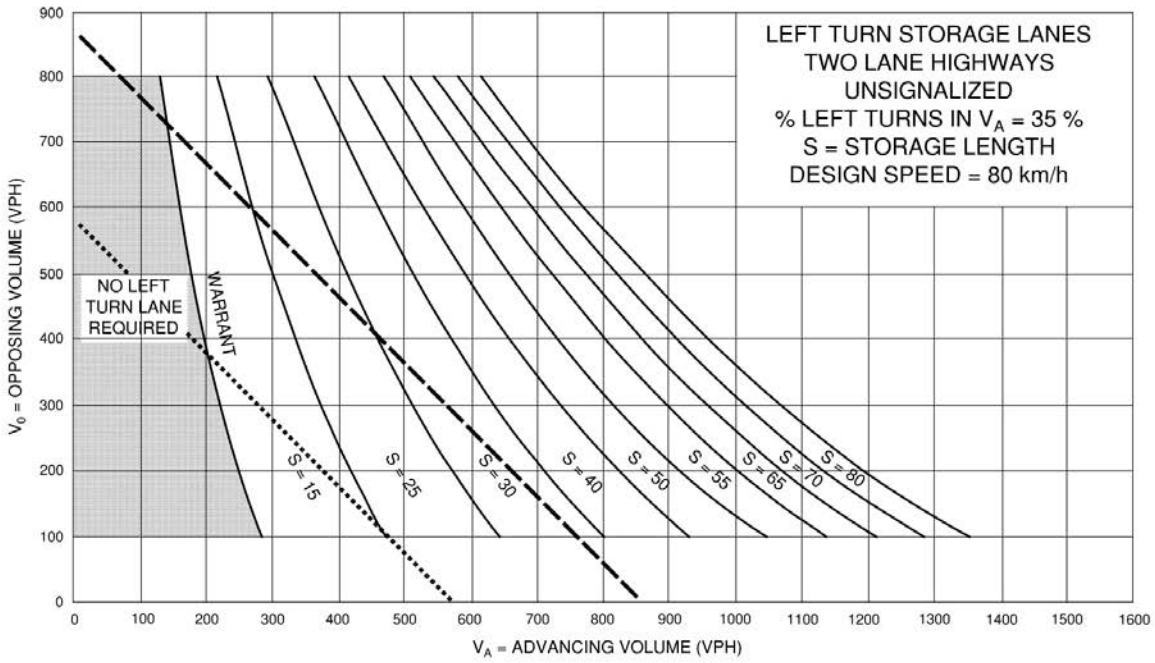


**Exhibit 9A-17**




TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

**Levesque Street / Bancroft Drive**
2029 Total - Eastbound
PM Peak Hour

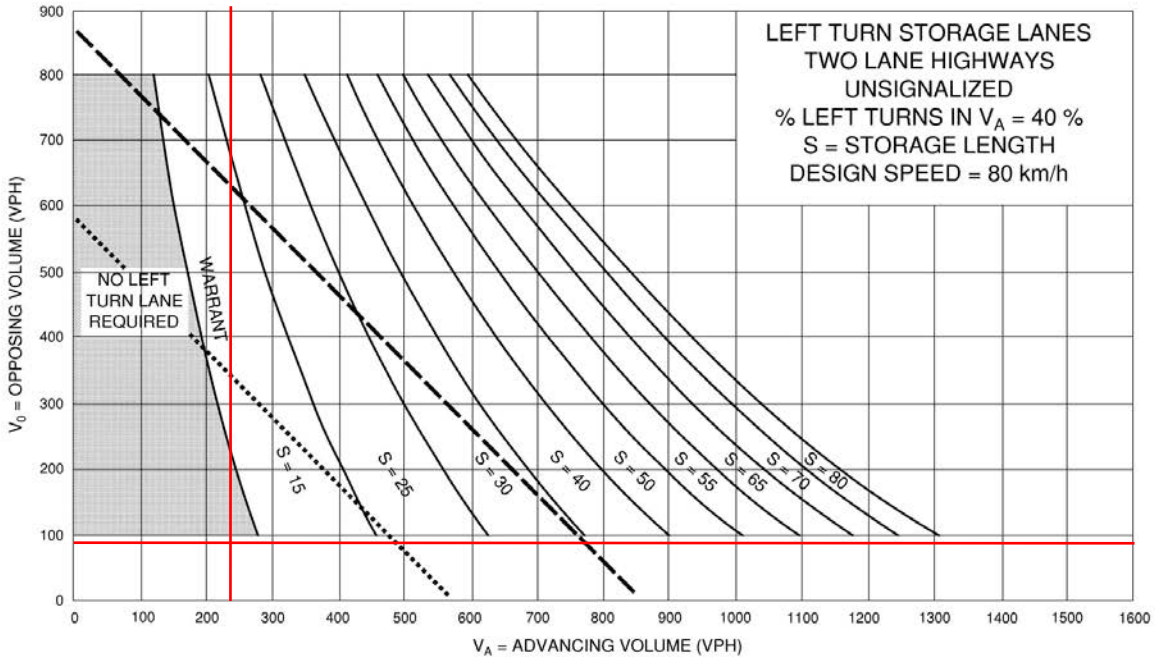
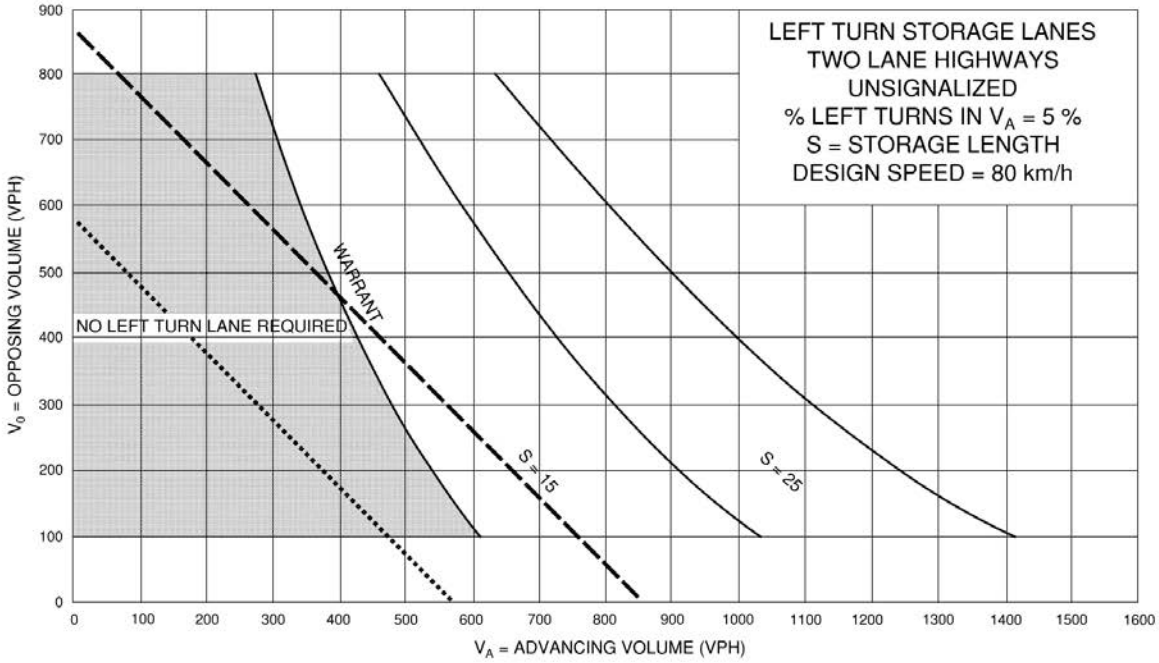
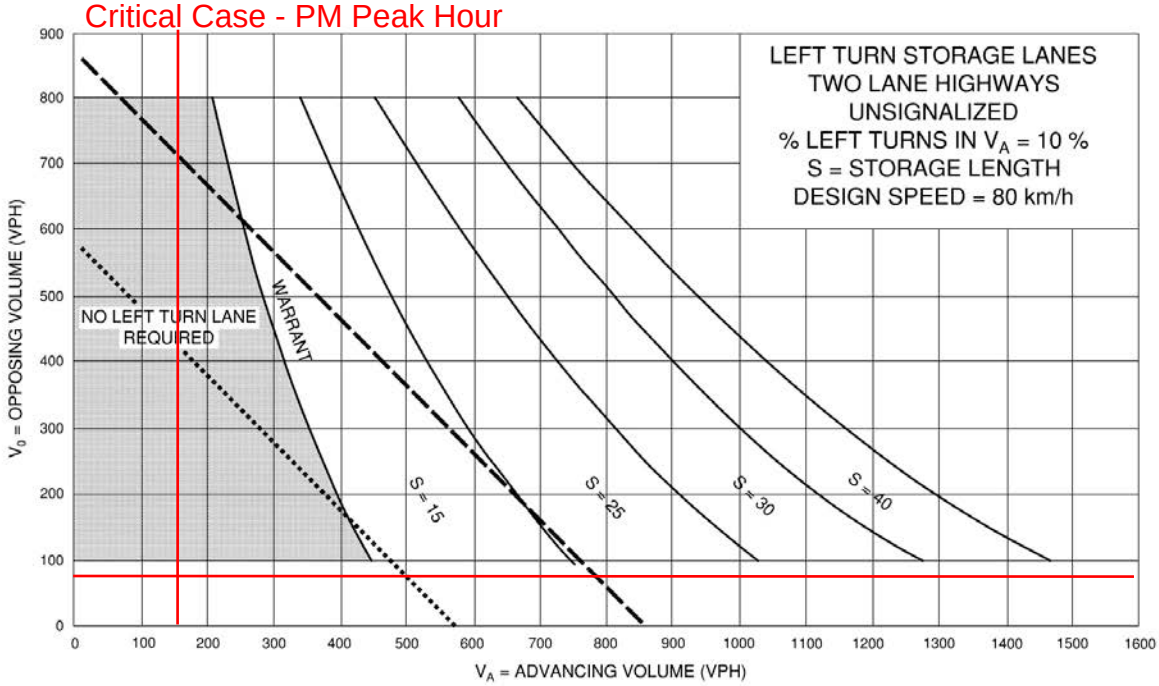


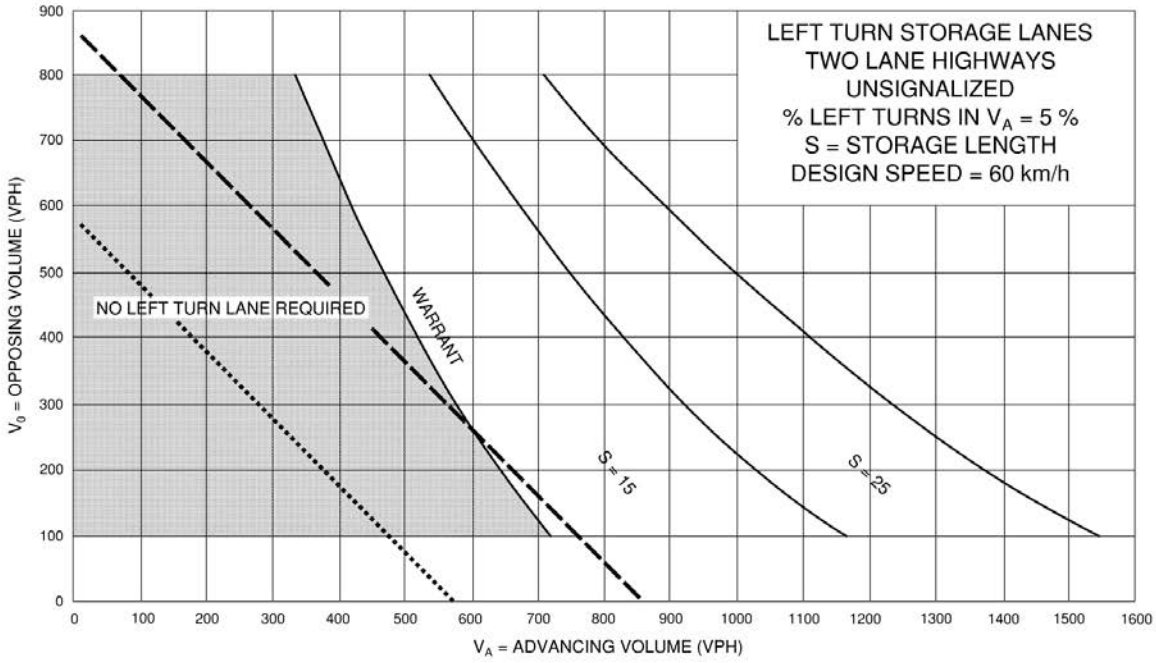
**Exhibit 9A-14**



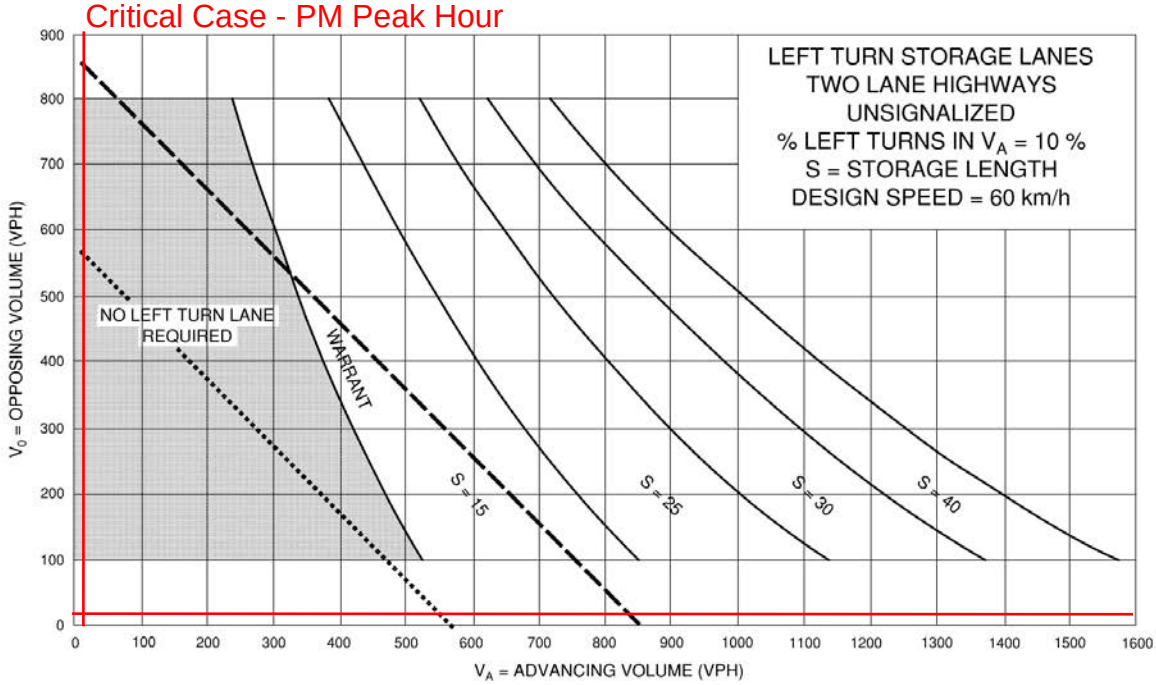

**Estelle Street / Bancroft Drive**
2029 Total - Eastbound
Critical Case - PM Peak Hour



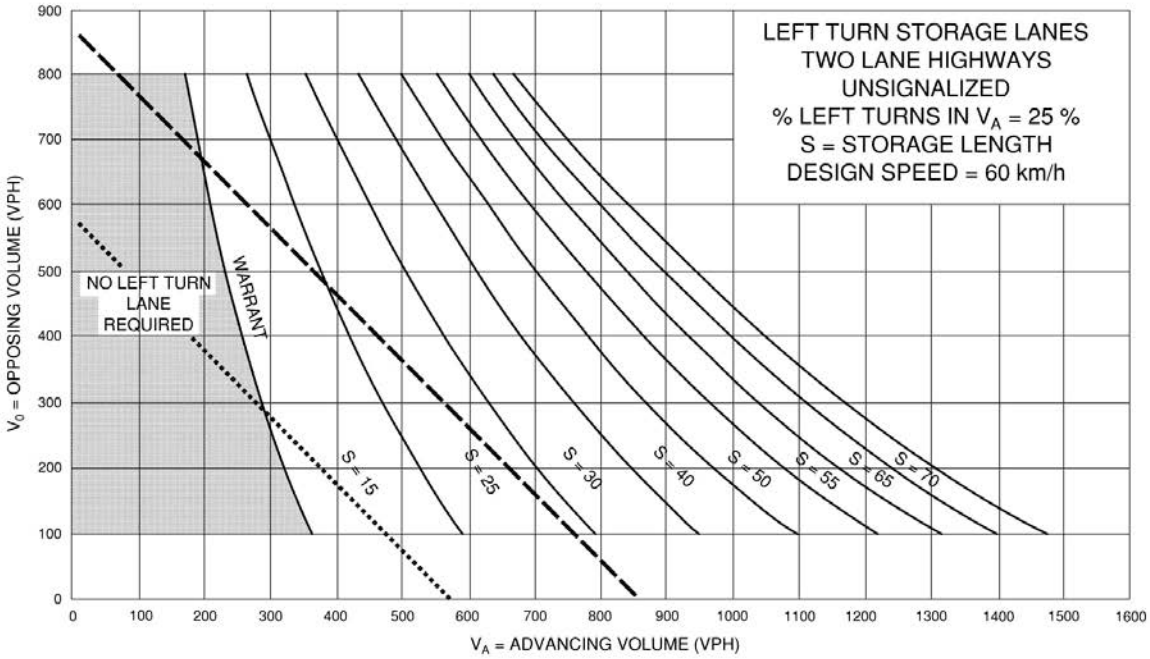
## Exhibit 9A-6



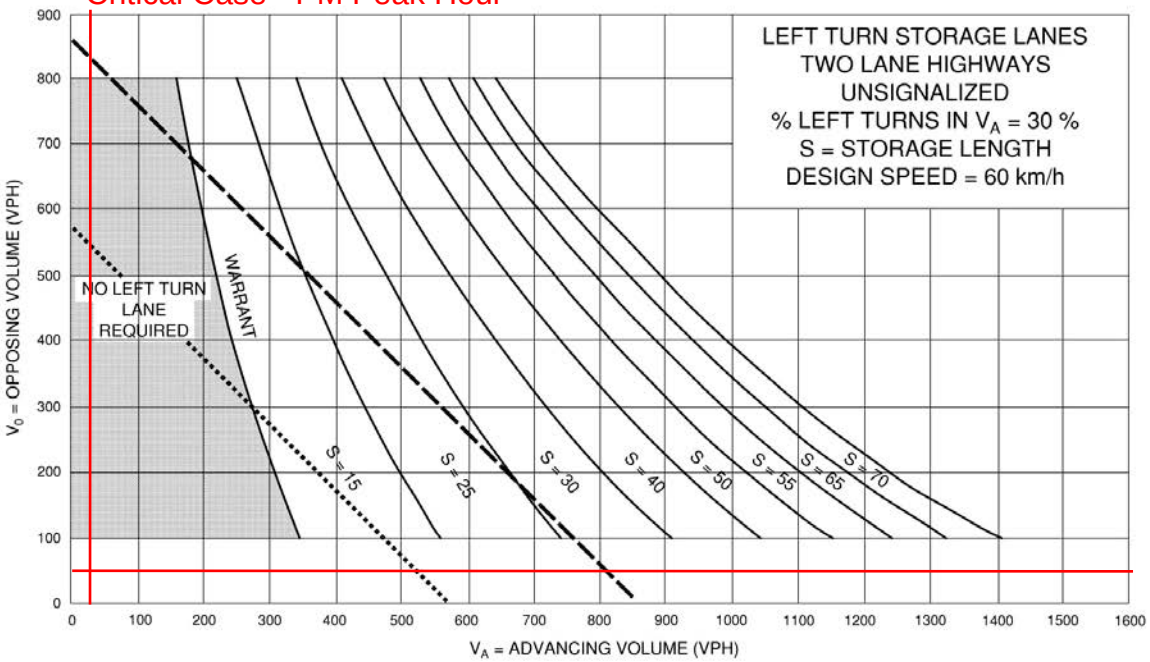

**South Access / Estelle Street**
2029 Total - Northbound
Critical Case - PM Peak Hour



## Exhibit 9A-8




**North Access / Estelle Street**
2029 Total - Northbound
Critical Case - PM Peak Hour



# Appendix H –
# OTM Signal Justification Sheets

**Justification No. 7 - 2029 Total Traffic (Critical Case)**

Levesque Street / Bancroft Drive

| Justification | Description | | Compliance | | | Signal Warrant | Underground Provisions Warrant |
|---|---|---|---|---|---|---|---|
| | | | Sectional | | Entire % | | |
| | | Rest. Flow | Numerical | % | | | |
| 1. Minimum Vehicluar Volume | A. Vehicle volume, all aproaches (average hour) | 720 | 334 | 46% | 39% | NO | NO |
| | B. Vehicle volume, along minor streets (average hour) | 255 | 120 | 47% | | NO | NO |
| 2. Delay to cross traffic | A. Vehicle volume, major street (average hour) | 720 | 190 | 26% | 22% | NO | NO |
| | B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour) | 75 | 23 | 31% | | NO | NO |

**Justification No. 7 - 2029 Total Traffic (Critical Case)**

Moonlight Avenue & Moonlight Beach Road / Bancroft Drive

| Justification | Description | | Compliance | | | Signal Warrant | Underground Provisions Warrant |
|---|---|---|---|---|---|---|---|
| | | | Sectional | | Entire % | | |
| | | Rest. Flow | Numerical | % | | | |
| 1. Minimum Vehicluar Volume | A. Vehicle volume, all aproaches (average hour) | 720 | 146 | 20% | 17% | NO | NO |
| | B. Vehicle volume, along minor streets (average hour) | 170 | 35 | 21% | | NO | NO |
| 2. Delay to cross traffic | A. Vehicle volume, major street (average hour) | 720 | 101 | 14% | 12% | NO | NO |
| | B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour) | 75 | 18 | 24% | | NO | NO |

**Justification No. 7 - 2029 Total Traffic (Critical Case)**

Estelle Street / Bancroft Drive

| Justification | Description | | Compliance | | | Signal Warrant | Underground Provisions Warrant |
|---|---|---|---|---|---|---|---|
| | | | Sectional | | Entire % | | |
| | | Rest. Flow | Numerical | % | | | |
| 1. Minimum Vehicluar Volume | A. Vehicle volume, all aproaches (average hour) | 720 | 133 | 19% | 2% | NO | NO |
| | B. Vehicle volume, along minor streets (average hour) | 255 | 5 | 2% | | NO | NO |
| 2. Delay to cross traffic | A. Vehicle volume, major street (average hour) | 720 | 126 | 17% | 1% | NO | NO |
| | B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour) | 75 | 1 | 2% | | NO | NO |

**Justification No. 7 - 2029 Total Traffic (Critical Case)**

Estelle Street / North Access

| Justification | Description | | Compliance | | | Signal Warrant | Underground Provisions Warrant |
|---|---|---|---|---|---|---|---|
| | | | Sectional | | Entire % | | |
| | | Rest. Flow | Numerical | % | | | |
| 1. Minimum Vehicluar Volume | A. Vehicle volume, all aproaches (average hour) | 720 | 46 | 6% | 4% | NO | NO |
| | B. Vehicle volume, along minor streets (average hour) | 255 | 18 | 7% | | NO | NO |
| 2. Delay to cross traffic | A. Vehicle volume, major street (average hour) | 720 | 15 | 2% | 1% | NO | NO |
| | B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour) | 75 | 16 | 21% | | NO | NO |

**Justification No. 7 - 2029 Total Traffic (Critical Case)**

Estelle Street / South Access

| Justification | Description | | Compliance | | | Signal Warrant | Underground Provisions Warrant |
|---|---|---|---|---|---|---|---|
| | | | Sectional | | Entire % | | |
| | | Rest. Flow | Numerical | % | | | |
| 1. Minimum Vehicluar Volume | A. Vehicle volume, all aproaches (average hour) | 720 | 19 | 3% | 1% | NO | NO |
| | B. Vehicle volume, along minor streets (average hour) | 255 | 5 | 2% | | NO | NO |
| 2. Delay to cross traffic | A. Vehicle volume, major street (average hour) | 720 | 11 | 1% | 1% | NO | NO |
| | B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour) | 75 | 4 | 5% | | NO | NO |

# Appendix I –
# Parking Survey Data

# PARKING COUNTS- GREENBRIAR APARTMENTS

**Date:** Friday November 20th, 2020

**Time:** 17:00-21:00

| Time | # Passenger Vehicles | Visitor Parking (Passenger Vehicles) | # Commercial Vehicles | Total |
|---|---|---|---|---|
| 17:00 (5:00pm) | 85 | 7 | 0 | **92** |
| 17:30 (5:30pm) | 79 | 7 | 0 | **86** |
| 18:00 (6:00pm) | 79 | 8 | 0 | **87** |
| 18:30 (6:30pm) | 82 | 9 | 0 | **91** |
| 19:00 (7:00pm) | 86 | 10 | 0 | **96** |
| 19:30 (7:30pm) | 86 | 8 | 0 | **94** |
| 20:00 (8:00pm) | 87 | 8 | 0<br>(one taxi came) | **95** |
| 20:30 (8:30pm) | 85 | 9 | 0 | **94** |
| 21:00 (9:00pm) | 84 | 8 | 0 | **92** |

**Date:** Saturday November 21st, 2020

**Time:** 11:00-21:00

| Time | # Passenger Vehicles | Visitor Parking (Passenger Vehicles) | # Commercial Vehicles | Total |
|---|---|---|---|---|
| 11:00 (11:00am) | 73 | 8 | 0 | **81** |
| 11:30 (11:30am) | 75 | 9 | 0 | **84** |
| 12:00 (12:00pm) | 81 | 8 | 0 | **89** |
| 12:30 (12:30pm) | 78 | 7 | 0 | **85** |
| 13:00 (1:00pm) | 73 | 6 | 0 | **79** |
| 13:30 (1:30pm) | 75 | 8 | 0 | **83** |
| 14:00 (2:00pm) | 77 | 7 | 0 | **84** |
| 14:30 (2:30pm) | 72 | 5 | 0 | **77** |
| 15:00 (3:00pm) | 76 | 10 | 0 | **86** |
| 15:30 (3:30pm) | 73 | 7 | 0<br>(1 taxi)<br>(1 handi transit)<br>(1 tow truck) | **80** |
| 16:00 (4:00pm) | 72 | 15 | 0 | **87** |
| 16:30 (4:30pm) | 81 | 13 | 0 | **94** |
| 17:00 (5:00pm) | 88 | 12 | 0 | **100** |
| 17:30 (5:30pm) | 88 | 14 | 0 | **102** |
| 18:00 (6:00pm) | 86 | 14 | 0 | **100** |
| 18:30 (6:30pm) | 82 | 11 | 0 | **93** |
| 19:00 (7:00pm) | 82 | 10 | 0 | **92** |
| 19:30 (7:30pm) | 89 | 10 | 0 | **99** |

| | | | | |
|---|---|---|---|---|
| 20:00 (8:00pm) | 89 | 10 | 0 | **99** |
| 20:30 (8:30pm) | 85 | 9 | 0 | **94** |
| 21:00 (9:00pm) | 81 | 6 | 0 | **87** |