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TIA Strategy Report

# Residential Building Development
# 1655 Carling Avenue

PARSONS

# Residential Building Development
## 1655 Carling Avenue

TIA Strategy Report

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# Strategy Report

Parsons has been retained by Surface Developments to prepare a TIA in support of a Zoning By-Law Amendment Application (ZBLA) for a proposed residential building development in Ward 15: Kitchissippi. The following report represents Step 4 – Strategy, of the TIA process.

## 1. SCREENING FORM

The Screening Form was submitted to the City of Ottawa for review and verification of the need to complete a Transportation Impact Assessment (TIA). The Trip Generation, Location and Safety triggers of the Screening Form were all met based on the checklist provided by the TIA Guidelines. As such, a TIA Report was deemed required. The Screening Form and responses to City comments are provided in **Appendix A.**

## 2. SCOPING REPORT

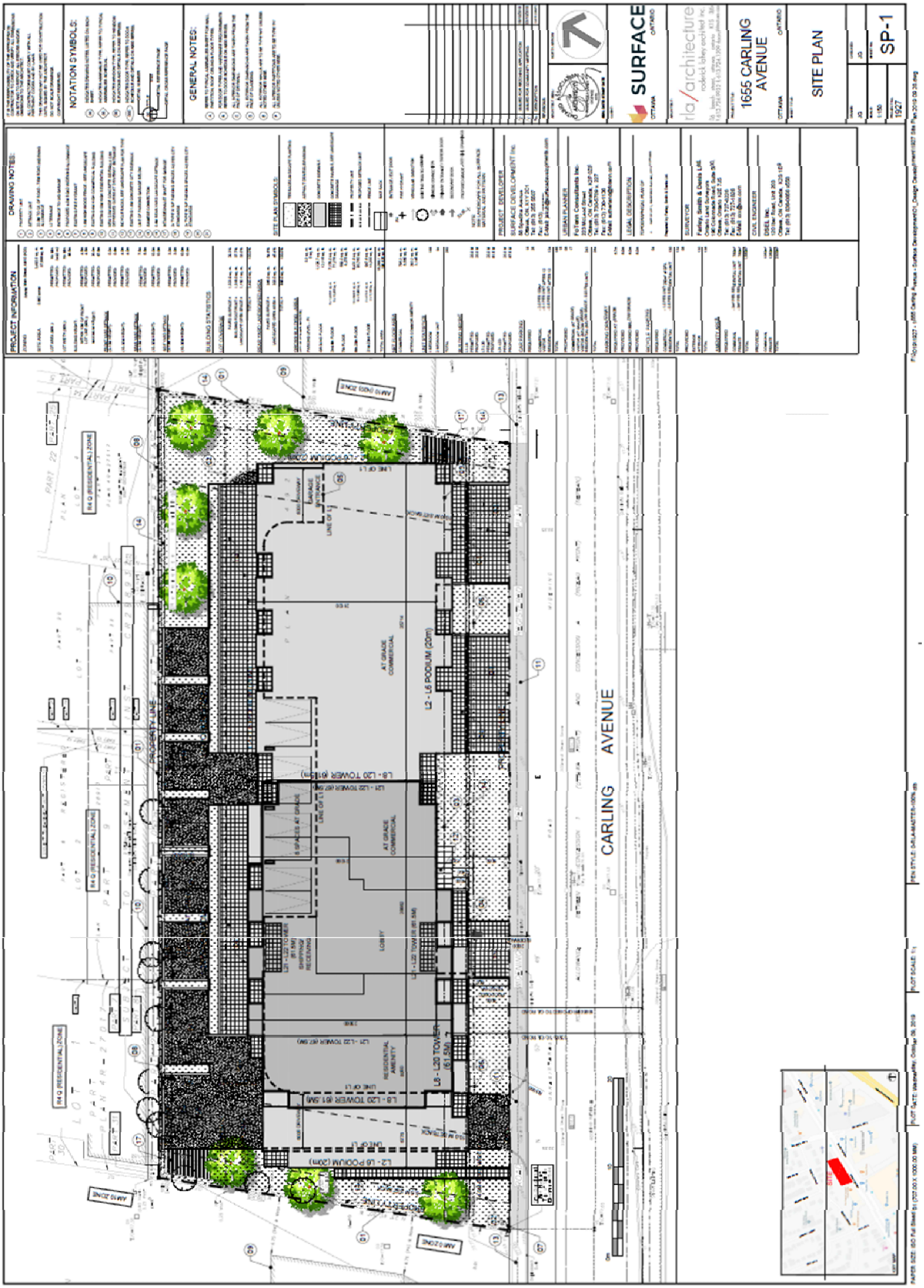
### 2.1. EXISTING AND PLANNED CONDITIONS

#### 2.1.1. PROPOSED DEVELOPMENT

The proposed development is located at 1655 Carling Ave and will consist of a total of 260 residential units within a 22-storey building. The site is currently occupied by an unpaved parking lot with an estimated maximum occupancy of 80 vehicles, which is being used by Carling Motors (1622 Carling Ave) and the Canadian Blood Services (1575 Carling Ave). The proposed residential development will be constructed in a single phase, with an anticipated full-buildout date of 2022. **Figure 1** below provides the local context of the development site, while **Figure 2** provides the current concept plan. The site is currently zoned as an Arterial Mainstreet (AM) zone.

Figure 1: Local Context

Figure 2: Concept Plan



As shown in **Figure 2**, one driveway access is proposed to serve the future development. The access will be located along the north side of Carling Ave, on the west end of the site, as a right-in/right-out driveway. In order to access the parking garage, residents will have to loop around the site to the east end of the building. Furthermore, the proposed development is anticipated to have 260 underground parking spaces and 24 surface parking spaces.

Given the centre median on Carling Ave along the site's frontage, vehicles destined to the site from the west would be expected to complete a U-turn at the Carling/Churchill and vehicles leaving to the site to the east would be required to complete a U-turn at the intersection Carling/Clyde/Cole intersection. Alternatively, there is a possibility that drivers elect to use Tillburry Avenue (local street situated north of the site) to avoid the U-turn manoeuvres on Carling Ave; however, this routing is considered more circuitous.

### 2.1.2. EXISTING CONDITIONS

#### Area Road Network

***Carling Ave*** is an east-west municipal arterial roadway within the City of Ottawa, that runs from Bronson Ave in the east to March Rd in the west. Within the study area, Carling Ave has a six-lane divided cross-section, with a posted speed limit of 60 km/h and auxiliary turn lanes at major intersections.

***Churchill Ave N*** is a north-south municipal roadway within the City of Ottawa, classified as a local roadway both south of Carling Ave and north of Lanark Ave, a major collector roadway between Carling Ave and Richmond Rd, an arterial roadway between Richmond Rd and Scott St and a collector roadway between Scott St and Lanark Ave. Churchill Ave N has a two-lane cross-section, with a posted speed limit of 50 km/h and auxiliary turn-lanes at major intersections.

***Cole Ave*** is a north-south municipal local roadway within the City of Ottawa, that extends from Dovercourt Ave in the north to connect to the north leg of Carling Ave in the south. Cole Ave has a two-lane cross-section and a posted speed limit of 40 km/h.

***Clyde Ave*** is a north-south municipal local roadway within the City of Ottawa, that extends from the south leg of Carling Ave and terminates at 951 Clyde Ave. The roadway then continues at Castle Hill Crescent intersection down to Merivale Rd/Lotta Ave. Within the study area, Clyde Ave, with an assumed speed limit of 50 km/h and auxiliary turn lanes at major intersections.

#### Existing Study Area Intersections

**Carling/Churchill**

The Carling/Churchill intersection is a four-legged full-movement signalized intersection. The east and west legs of the intersection consist of two exclusive through lanes, 1 shared through/right-turn lane and one auxiliary left-turn lane. While the north and south legs of the intersection consist of one shared through/right-turn lane and one auxiliary left-turn lane. There are no restricted movements at this intersection.

**Carling/Clyde/Cole**

The Carling/Clyde/Cole intersection is a four-legged full-movement signalized intersection. The east and west legs of the intersection consist of two exclusive through lanes, 1 shared through/right-turn lane and one auxiliary left-turn lane. The north leg of the intersection consists of one shared through/right-turn lane and one auxiliary left-turn lane. The south leg of the intersection consists of one exclusive through lane, one auxiliary left-turn lane and one auxiliary right-turn lane. There are no restricted movements at this intersection. However, trucks are not permitted to enter the north leg of the intersection.

## Existing Driveways to Adjacent Developments

The following driveways are currently on the north side of Carling Ave, within 200 m of the proposed development driveway at 1655 Carling Ave:

- Two accesses to Shell Gas Station, approximately 45 m east of the proposed development;
- One access to a small mixed-use commercial and office building, approximately 85 m west of the proposed development; and,
- One access to commercial and office units, approximately 160 m west of the proposed development.

## Pedestrian/Cycling Network

Pedestrian sidewalk facilities are provided throughout the study area, including both sides of Carling Ave, both sides of Churchill Ave, both sides of Cole Ave and the east side of Clyde Ave. With regards to cycling facilities, unidirectional cycle tracks are provided on both sides of Churchill Ave N, between Carling Ave and Byron Ave. There are no dedicated cycling facilities on Carling Ave, although it is identified as a spine route in the TMP.

## Transit Network

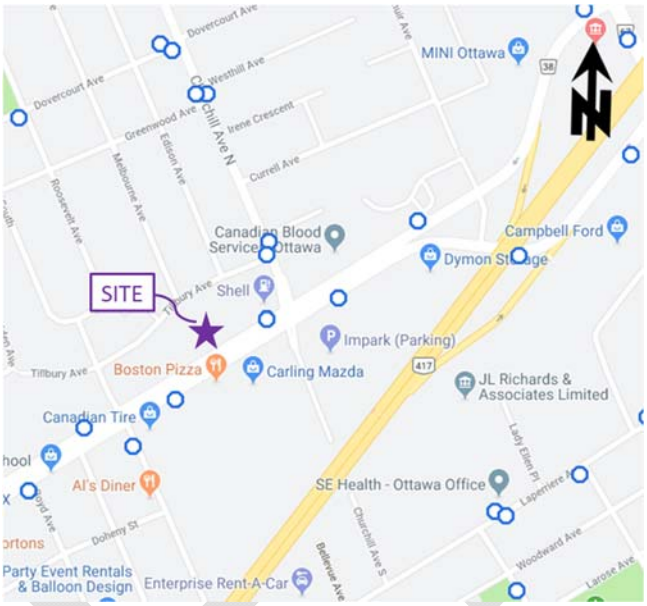
The following OC Transpo routes currently operate along Carling Ave, at the frontage of the site:

- **Route #50 (Tunney's Pasture <-> Lincoln Fields)**: identified by OC Transpo as a "Local Route", this route operates on customized routing and schedules, to serve local destinations. Route #50 operates at an average rate of every 30 minutes during weekdays. The nearest bus stops to the site are the Carling/Churchill stop, for the Lincoln Fields destination and the Carling/Clyde North stop, for the Tunney's Pasture destination.
- **Route #85 (Lees <-> Bayshore)**: identified by OC Transpo as a "Frequent Route", this route operates at a high frequency along Carling Ave. Route #85 operates 7 days a week, at an average rate of every 15 minutes or less during weekday peak hours. The nearest bus stops to the site are the Carling/Churchill stop, for the Bayshore destination and the Carling/Clyde North stop, for the Lees destination.

OC Transpo route maps for routes #50 and #85 have been provided in **Appendix B**. **Figure 3** below illustrates the area transit network surrounding the subject site, while **Figure 4** provides the nearest bus stop locations to the development site in the form of blue dots. The Carling/Churchill bus stop is approximately 40 m east of the site, while the Carling/Clyde North bus stop is within approximately a 300 m walking distance of the site.

Figure 3: Area Transit Network

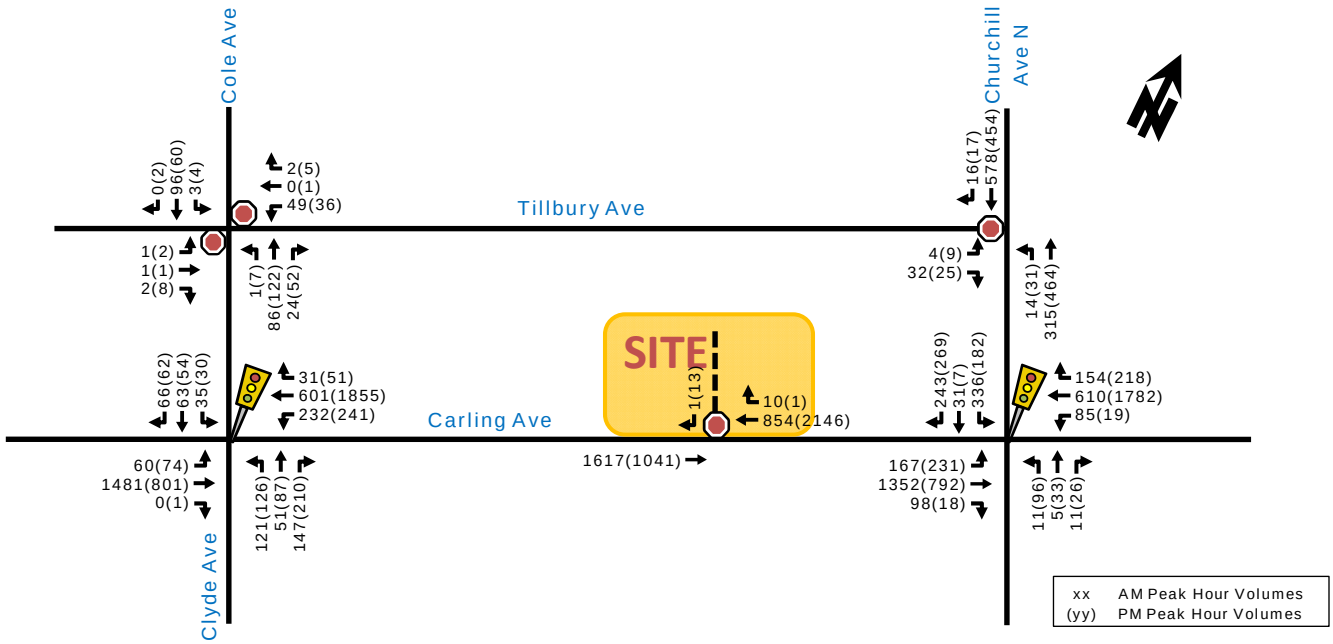

Figure 4: Bus Stop Locations




## Peak Hour Travel Demand

The existing peak hour traffic volumes, which were obtained from the City of Ottawa for the intersections of Carling/Churchill and Carling/Clyde/Cole, are illustrated in **Figure 5** below. Note that the east and west traffic volumes approaching to/from the Carling/Clyde/Cole intersection were balanced according to the traffic volumes at the Carling/Churchill intersection. Similarly, the SB traffic approaching from the Tillbury/Churchill intersection was balanced based on the SB traffic volumes at the Carling/Churchill intersection. With regards to the counts conducted at the existing site, the three existing accesses were combined to assume one large access. The raw traffic count data has been provided in **Appendix C**.

Figure 5: Existing Peak Hour Traffic Volumes



### Existing Road Safety Conditions

A five-year collision history data (2014-2018, inclusive) was requested and obtained from the City of Ottawa for all intersections and road segments within the study area. Upon analyzing the collision data, the total number of collisions observed within the study area was determined to be 84 collisions within the past five-years. The majority of the collisions (83%) resulted in property damage only, while the remaining collisions resulted in a non-fatal injury. Furthermore, the type of impacts that resulted in 84 collisions were broken down into the following: 32 turning movement, 24 rear end, 24 sideswipe and 4 angle.

A standard unit of measure for assessing collisions at an intersection is based on the number of collisions per million entering vehicles (MEV). At signalized intersections within the study area, reported collisions have historically taken place at a rate of:

- 0.31 Collisions/MEV at the intersection of Carling/Churchill. A total of 22 collisions took place at this intersection within the past five-years. However, breakdown of collision data shows that there are no particular collision patterns taking place at this intersection.
- 0.77 Collisions/MEV at the intersection of Carling/Clyde/Cole. A total of 50 collisions took place at this intersection within the past five-years. 29 collisions occurred as a result of turning movements, the majority of which were between the WB/EB left-turns and the opposing EB/WB through movements, respectively. The turning movement collisions along Carling Ave are assumed to be due to the following:
    - Left-turning vehicles must cross 4 lanes of traffic (3 through and 1 left-turn lanes) to complete their left-turn movement.
    - Left-turn types along Carling Ave are protected-permitted during peak hours. Hence, the collisions occur during the EB/WB through/permitted left-turns phase.
    - A high volume of traffic performs a WBLT during peak hours to access the Canadian Tire store.

As such, turning movement collisions at the Carling/Clyde/Cole intersection can be potentially reduced by allowing only a protected left-turn type for EB and WB movements, during the peak hours of travel demand.

Lastly, 6 collisions were observed along Carling Ave, between Churchill Ave and Clyde Ave/Cole Ave. However, no particular collision patterns were observed.

Collision data obtained from the City of Ottawa is provided in **Appendix D**, along with the analysis conducted by Parsons.

## 2.1.3. PLANNED CONDITIONS

### Planned Study Area Transportation Network Changes

Based on the City of Ottawa's TMP, the 2031 Affordable Network for Rapid Transit and Transit Priority illustrates Carling Ave as a Transit Priority Corridor (Continuous Measures) at the frontage of the site. There are no other anticipated changes to the road network surrounding the subject development's site.

### Other Area Developments

A summary of other area developments is provided below based on the latest available information from the City regarding adjacent site development applications.

***689 Churchill Ave***

A 3-storey low-rise apartment building is proposed at 689 Churchill Ave. The building will consist of 15 residential units, which are expected to generate minimal traffic. As such, traffic generated by this development will be accounted for in the background growth rate in the forecasting section of the report.

*701 Churchill Ave*

A 3-storey low-rise apartment building is proposed at 701 Churchill Ave. The building will consist of 12 residential units, which are expected to generate minimal traffic. As such, traffic generated by this development will be accounted for in the background growth rate in the forecasting section of the report.

*1705 Carling Ave*

A TIA was submitted by Novatech in May 2018 for a 9-storey mixed-use building development, containing 68 senior's apartments and 130 residential care units at 1705 Carling Ave. As the site is currently occupied by an 80-unit motel and a 3500 ft$^2$ restaurant, the number of trips forecasted for the future development are expected to be lower than the trips generated by the existing developments at this site. Thus, trips for this development will not be added to the background traffic volumes forecasted in this report.

## 2.2. STUDY AREA AND TIME PERIODS

Since the proposed development consists of a residential building, the peak time periods to be assessed are the weekday morning and afternoon peak hour periods. Furthermore, the horizon years to be analyzed are the year of full-buildout of the development (2022) and five years after full-buildout (2027), as per the requirements of the TIA Guidelines. The proposed study area is shown below in **Figure 6**.

Figure 6: Study Area


Study area intersections include:

- Carling Ave/Clyde Ave/Cole Ave
- Carling Ave/Churchill Ave N

A justification letter was provided to the City of Ottawa on August 28th, 2019, explaining the rationale for using a reduced study area limit instead of the 1 km radius recommended by the TIA Guidelines. The justification letter is provided in **Appendix E**.

## 2.3. EXEMPTION REVIEW

Based on the City's TIA guidelines and the subject site, the following modules/elements of the TIA process, summarized in **Table 1**, are recommended to be exempt in the subsequent steps of the TIA process:

Table 1: Exemptions Review Summary

| Module | Element | Exemption Consideration |
|---|---|---|
| 4.1 - 4.4 Design Review Component | All elements | Site design requirements are omitted in a Zoning By-Law Amendment Application. These elements will be explored in detail in the future Site Plan Application. |
| 4.8 Review of Network Concept | All elements | The site is not expected to generate 200 trips more than the established zoning. |

# 3. FORECASTING

## 3.1. DEVELOPMENT GENERATED TRAVEL DEMAND

### 3.1.1. TRIP GENERATION AND MODE SHARES

The proposed development will consist of a high-rise apartment building containing 260 residential units. Appropriate trip generation rates were obtained from the 2009 TRANS Trip Generation Residential Trip Rates report, Table 6.3, which have been summarized in **Table 2**.

Table 2: TRANS Trip Generation Residential Trip Rates

| Land Use | Data Source | Trip Rates | |
|---|---|---|---|
| | | AM Peak | PM Peak |
| High-Rise Apartments | TRANS | T = 0.24(du); | T = 0.27(du); |

*Notes: T = Average Vehicle Trip Ends*
*du = Dwelling unit*

Using the trip rates shown in **Table 2**, along with the planned number of residential units, the number of vehicles per hour were determined as shown in **Table 3** below.

Table 3: Apartment Units Vehicle Trip Generation

| Land Use | Dwelling Units | AM Peak (Vehicles/h) | | | PM Peak (Vehicles/h) | | |
|---|---|---|---|---|---|---|---|
| | | In | Out | Total | In | Out | Total |
| High-Rise Apartments | 260 | 14 | 48 | 62 | 43 | 27 | 70 |

The total vehicle trips shown in **Table 3** were then converted to total person trips using mode share percentages found in the 2009 TRANS Trip Generation Study Report. The total person trips were then used to determine person trips/h for each travel mode, based on their respective mode share percentages. **Table 4** summarizes the number of trips generated for each of the respective travel modes of the proposed development.

Table 4: Mode Shares for the Residential Buildings Development

| Travel Mode | Mode Share | AM Peak (Person Trips/h) | | | Mode Share | PM Peak (Person Trips/h) | | |
|---|---|---|---|---|---|---|---|---|
| | | In (24%) | Out (76%) | Total | | In (62%) | Out (38%) | Total |
| Auto Driver | 37% | 14 | 48 | 62 | 40% | 43 | 27 | 70 |
| Auto Passenger | 8% | 3 | 10 | 13 | 9% | 10 | 6 | 16 |
| Transit | 41% | 16 | 53 | 69 | 37% | 40 | 25 | 65 |
| Non-motorized | 14% | 5 | 19 | 24 | 14% | 14 | 10 | 24 |
| **Total Person Trips** | **100%** | **38** | **130** | **168** | **100%** | **107** | **68** | **175** |

As shown in **Table 4**, the resulting number of Total Person Trips expected to be generated by the proposed development are approximately 168 and 175 person trips/h in the morning and afternoon peak hours respectively.

Furthermore, the 2011 NCR Household Origin-Destination Survey provides mode share percentages based on the district where the proposed development site is located. As the site is located in the Ottawa West district, the respective mode share percentages were used in conjunction with the total person trips determined in **Table 4**, thereby providing new trip generation results as shown in **Table 5**.

Table 5: OD Survey Mode Shares – Ottawa West District

| Travel Mode | Mode Share | AM Peak (Person Trips/h) | | | PM Peak (Person Trips/h) | | |
|---|---|---|---|---|---|---|---|
| | | In (24%) | Out (76%) | Total | In (24%) | Out (76%) | Total |
| Auto Driver | 50% | 20 | 64 | 84 | 53 | 34 | 87 |
| Auto Passenger | 15% | 6 | 19 | 25 | 16 | 10 | 26 |
| Transit | 20% | 7 | 26 | 33 | 21 | 14 | 35 |
| Bike | 5% | 2 | 7 | 9 | 5 | 4 | 9 |
| Walk | 10% | 4 | 13 | 17 | 11 | 7 | 18 |
| **Total Person Trips** | **100%** | **39** | **129** | **168** | **106** | **69** | **175** |
| | **Total Auto Trips** | **20** | **64** | **84** | **53** | **34** | **87** |

The auto trips expected to be generated by the future residential development are 84 and 87 veh/h during the morning and afternoon peak hour periods, respectively. However, considering that proposed transit movements along Carling Ave (see **Section 3.2.1**), the mode shares were adjusted as shown in **Table 6** below to reflect a higher transit usage.

Table 6: OD Survey Mode Shares with Increased Transit

| Travel Mode | Mode Share | AM Peak (Person Trips/h) | | | PM Peak (Person Trips/h) | | |
|---|---|---|---|---|---|---|---|
| | | In (24%) | Out (76%) | Total | In (24%) | Out (76%) | Total |
| Auto Driver | 40% | 16 | 52 | 68 | 43 | 27 | 70 |
| Auto Passenger | 10% | 4 | 12 | 16 | 10 | 7 | 17 |
| Transit | 35% | 13 | 45 | 58 | 37 | 24 | 61 |
| Bike | 5% | 2 | 7 | 9 | 5 | 4 | 9 |
| Walk | 10% | 4 | 13 | 17 | 11 | 7 | 18 |
| **Total Person Trips** | **100%** | **39** | **129** | **168** | **106** | **69** | **175** |
| | **Total Auto Trips** | **16** | **52** | **68** | **43** | **27** | **70** |

As such, the proposed development is forecasted to generate approximately 70 veh/h during both the morning and afternoon peak hour periods. However, the proposed development site is currently occupied by an unpaved parking lot with an assumed maximum occupancy of 80 vehicles. Morning and afternoon peak hour traffic counts were conducted at the three access points of the existing parking lot. **Table 7** provides the vehicle trips to/from the existing parking lot (as shown in **Figure 5**).

Table 7: Vehicle Trips to/from the Existing Unpaved Parking Lot

| Land Use | Capacity | AM Peak (Vehicles/h) | | | PM Peak (Vehicles/h) | | |
|---|---|---|---|---|---|---|---|
| | | In | Out | Total | In | Out | Total |
| Existing Unpaved Parking Lot | 80 Vehicles | 10 | 1 | 11 | 1 | 13 | 14 |

Therefore, the net differences in vehicles between future and existing development conditions are provided in **Table 8**.

Table 8: Forecasted Net Change in Site Traffic

| Land Use | AM Peak (Vehicles/h) | | | PM Peak (Vehicles/h) | | |
|---|---|---|---|---|---|---|
| | In | Out | Total | In | Out | Total |
| *New Trips* High-Rise Apartments | 16 | 52 | 68 | 43 | 27 | 70 |
| *Minus Existing Trips* Unpaved Parking Lot | 10 | 1 | 11 | 1 | 13 | 14 |
| *Net Change* | ***6*** | ***51*** | ***57*** | ***42*** | ***14*** | ***56*** |

As shown in **Table 8**, the planned residential building development is expected to result in a net increase of approximately 55 veh/h within the study area, during both morning and afternoon peak hour periods.

### 3.1.2. TRIP DISTRIBUTION AND ASSIGNMENT

Based on the 2011 OD Survey (Ottawa West district) and the location of adjacent arterial roadways and neighbourhoods, the distribution of site-generated traffic volumes was estimated as follows:

- 20% to/from the north;
- 10% to/from the south;
- 65% to/from the east; and,
- 5% to/from the west.

The expected site-generated auto trips in **Table 5** were then assigned to the surrounding road network as shown in **Figure 7** below. Furthermore, traffic volumes generated by the existing parking lot (see **Table 7**) are shown in **Figure 8** and the net difference in traffic (see **Table 8**) is illustrated in **Figure 9**. With regards to inbound traffic, vehicles were assumed to approach as follows:

- 65% from east Carling Ave
- 20% from north Churchill Ave N, and
- 15% from west Carling Ave (2/3 of which complete the U-turn at Carling/Churchill and 1/3 use Tillburry Ave),

Outbound vehicles were assumed to leave the site as follows:

- 15% to west Carling Ave
- 20% to north Churchill Ave N through Tillbury Ave and
- 65% to east Carling Ave (3/4 of which complete the U-turn at Carling/Clyde/Cole and 1/4 use Tillbury Ave).

Figure 7: Planned Residential Development Site-Generated Traffic

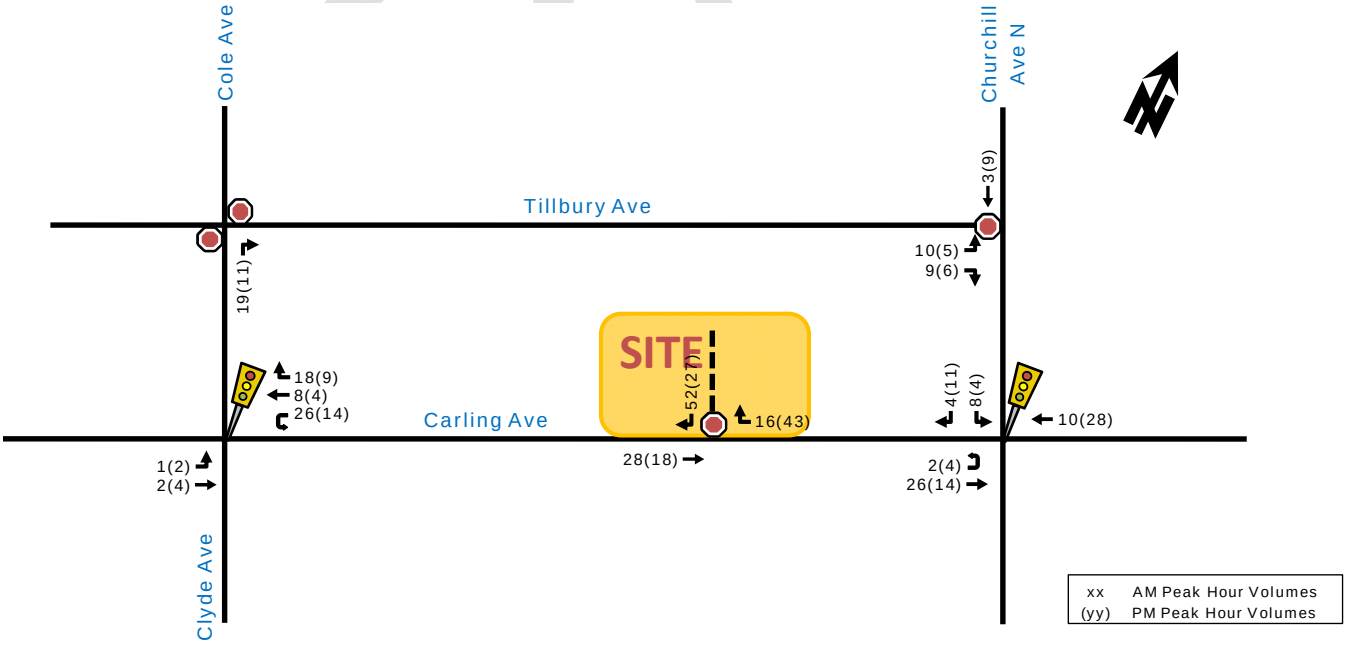


Figure 8: Existing Parking Lot Traffic Volumes

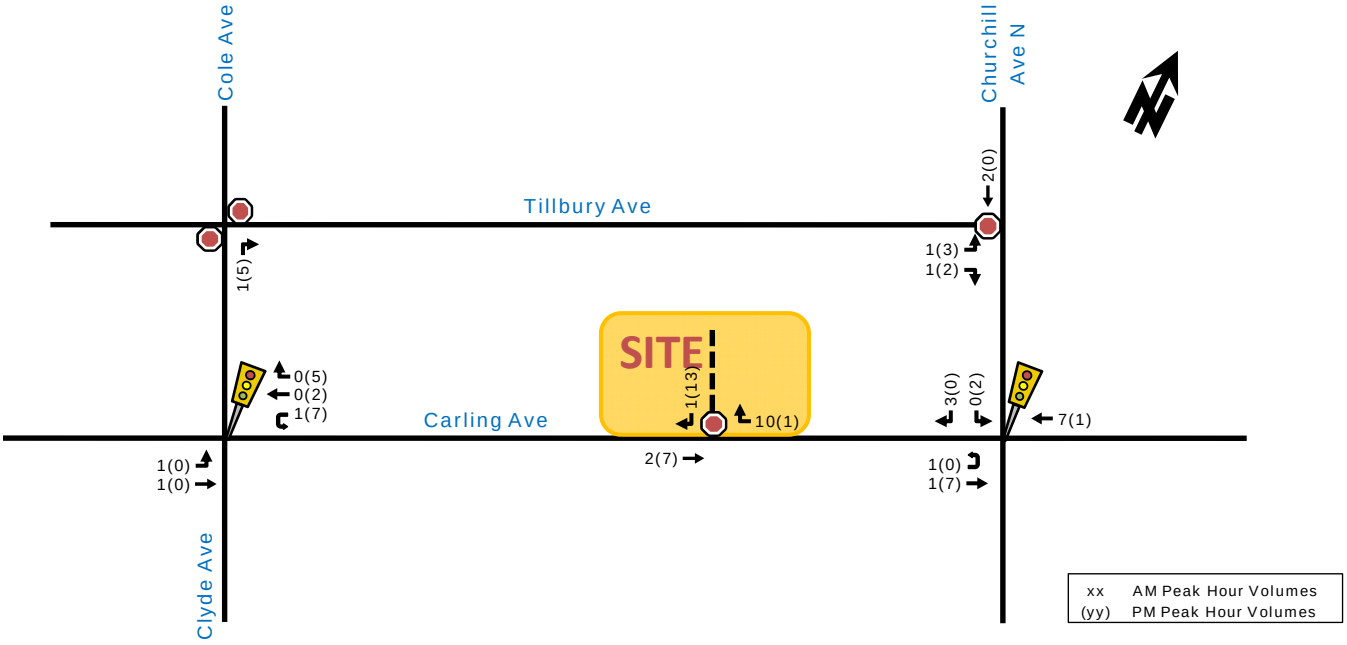
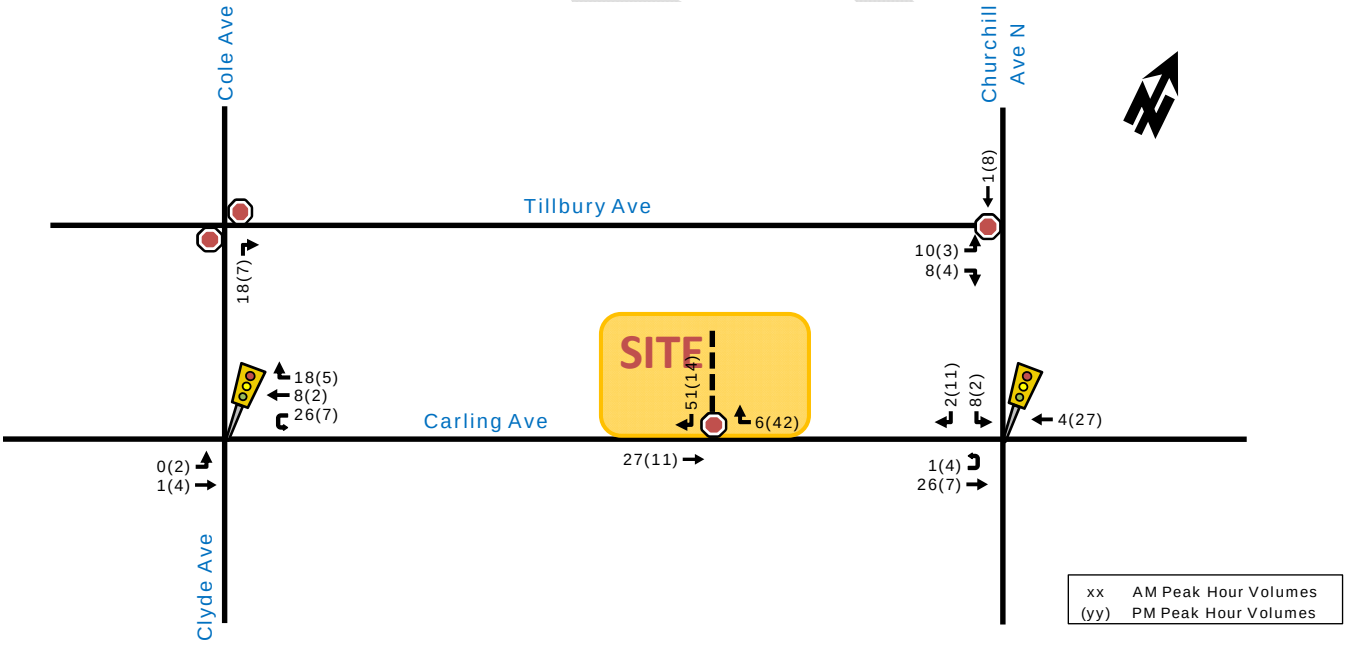



Figure 9: Net Traffic Difference




## 3.2. BACKGROUND NETWORK TRAFFIC

### 3.2.1. TRANSPORTATION NETWORK PLANS

Refer to **Section 2.1.3: Planned Study Area Transportation Network Changes.** A functional design project initiated by the City of Ottawa is currently underway to provide transit priority measures along Carling Ave, from Lincoln Fields to Bronson Ave. Between Lincoln Fields and Sherwood Dr, the plan is to provide a single designated bus lane for transit by reducing the three general purpose lanes to two general purpose lanes along both sides of Carling Ave. This plan is anticipated to

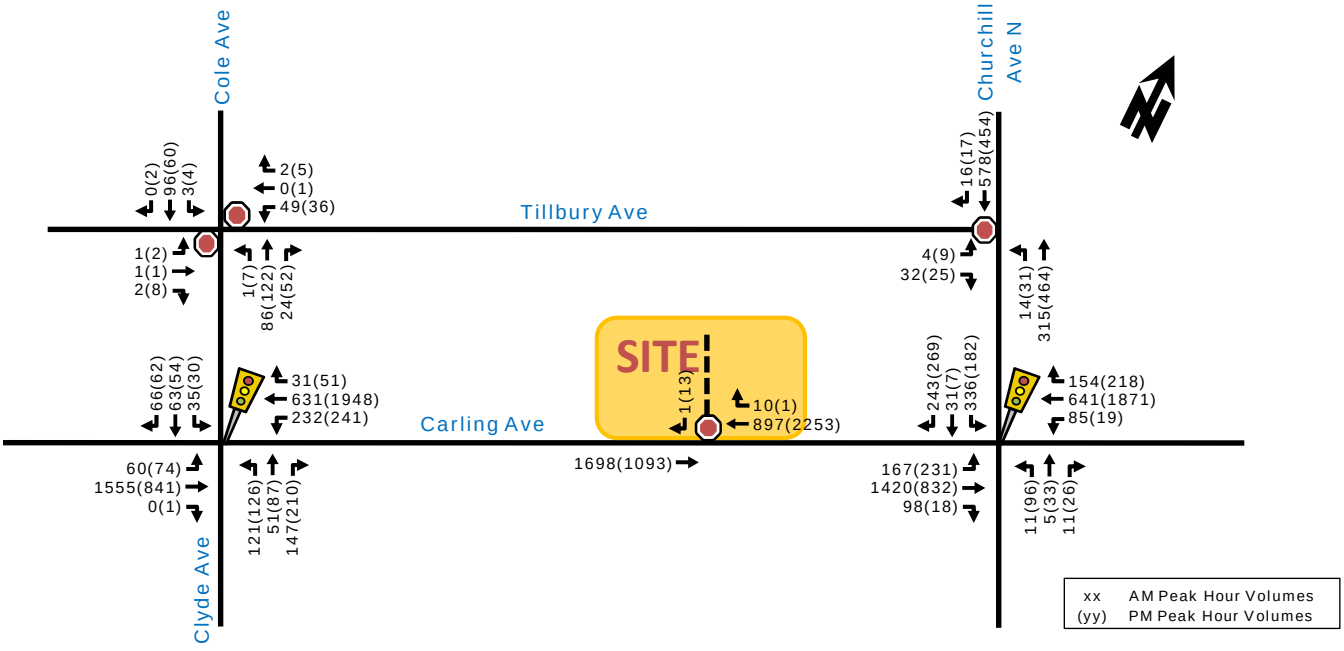
be implemented by 2020. **Figure 10** below shows the functional plan at the frontage of the site, where red lines represent the designated transit bus lanes.

Figure 10: Carling Ave Transit Priority Measure


### 3.2.2. BACKGROUND GROWTH

The introduction of designated transit bus lanes along Carling Ave is expected to help reduce future background traffic through increasing the reliability and performance of transit services. Furthermore, since the area is well developed and there are no major other area developments planned near the subject site, traffic along Carling Ave is not anticipated to increase significantly in the next few years. As such, traffic growth is assumed to be 0% per year for the future horizon year 2022 and 1% per year thereafter for future horizon year 2027. Traffic volumes anticipated for the future background horizon year 2027 is illustrated in **Figure 11**.

Figure 11: Future Background 2027 Traffic Volumes



### 3.2.3. OTHER DEVELOPMENTS

Description of other area developments taking place within the study area was provided in **Section 2.1.3 - Other Area Developments**. For the purposes of this report, there are no additional traffic volumes associated with adjacent area developments that will be included in the analysis.

## 3.3. DEMAND RATIONALIZATION

Given that the number of lanes along Carling Ave is anticipated to be reduced to two general-purpose lanes in each direction, capacity of the study area intersections in future horizon years will be significantly lower than the capacity of Carling Ave in existing conditions. However, based on the *Carling Avenue Transit Priority Measures and Functional Design Report (WSP, June 2017)*, east-west traffic along Carling Ave is forecasted to decrease by up to 20% due to the implementation of the continuous dedicated bus lanes. The resulting anticipated traffic volumes for future background horizon years 2022 and 2027 are illustrated in **Figure 12** and **Figure 13**. Note that, as per **Section 3.2.2**, a 1% per year background growth rate was applied to traffic volumes between horizon year 2022 and 2027.

Figure 12: Future Background 2022 Traffic Volumes, with 20% East-West Reduction

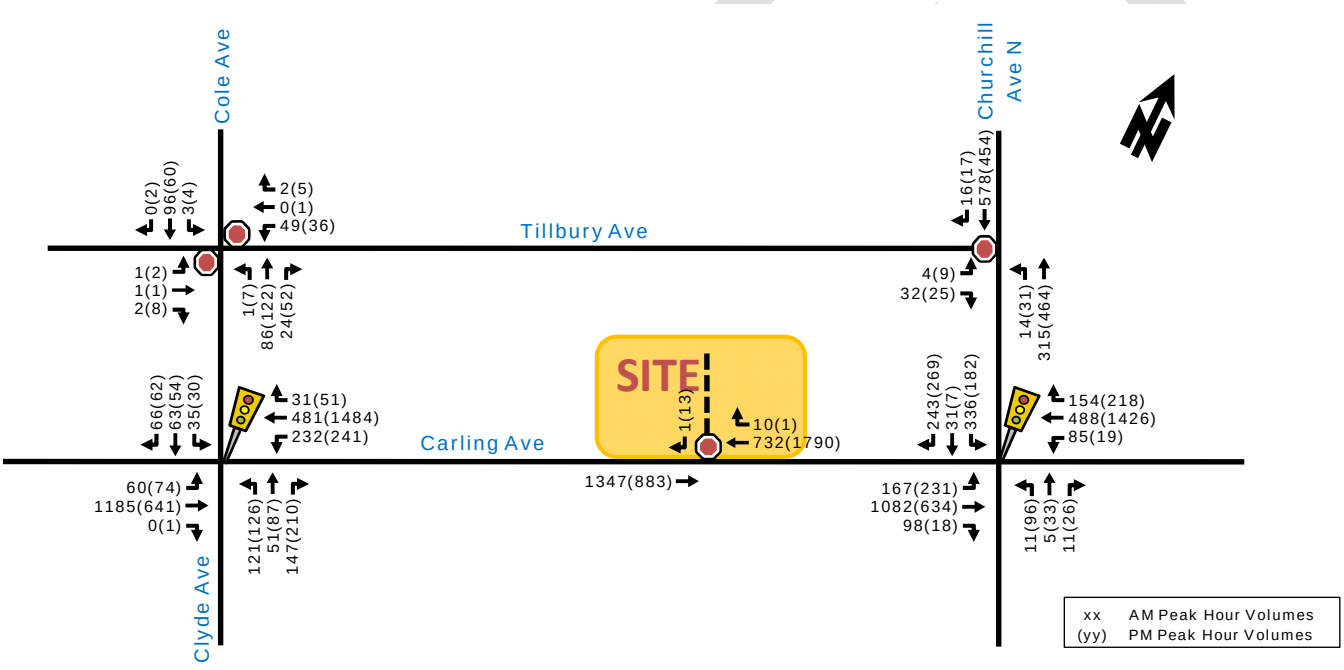
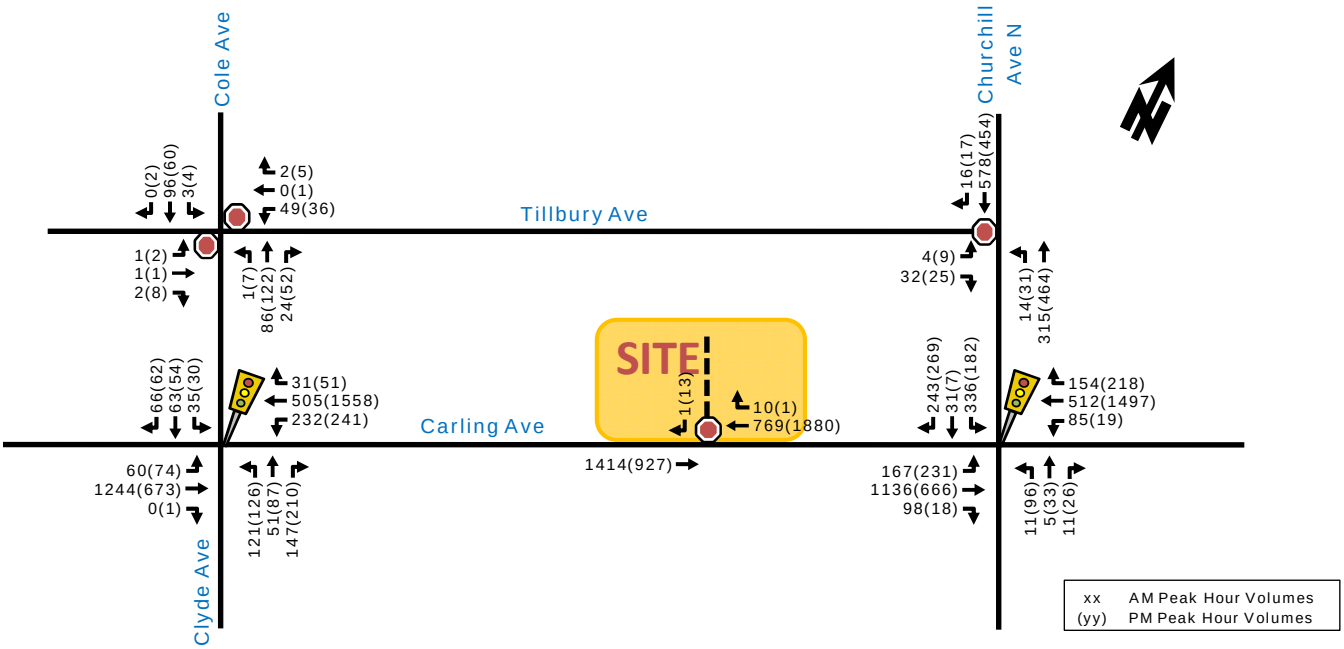


Figure 13: Future Background 2027 Traffic Volumes, with 20% East-West Reduction




# 4. ANALYSIS

## 4.1. DEVELOPMENT DESIGN

Exempt – see **Section 2.3**. Note that surface parking spaces are proposed to be located on the north end of the site, while access to the underground parking is proposed on the northeast end of the site. Indoor and outdoor bicycle parking will be provided, based on the parking provisions. Pedestrian sidewalk facilities will be provided throughout the site and bus stops are located near the site (see **Section 2.1.2**).

## 4.2. PARKING

Exempt – see **Section 2.3**. Based on the concept plan, a total of 284 (243 underground and 24 surface) parking spaces are proposed for the development. A total of 138 bicycle parking spaces are proposed as well.

## 4.3. BOUNDARY STREET DESIGN

Exempt – see **Section 2.3**. This element will be explored in detail in the future Site Plan Application.

## 4.4. ACCESS INTERSECTION DESIGN

Exempt – see **Section 2.3**. As mentioned previously, the access is located on the west end of the site and can be used to access the surface and underground parking entrance at the back end of the building. STOP control is determined to be sufficient for vehicles exiting the development site.

## 4.5. TRANSPORTATION DEMAND MANAGEMENT

The TDM checklist is attached in **Appendix F**.

## 4.6. NEIGHBOURHOOD TRAFFIC MANAGEMENT

Within the study area, some drivers may elect to use Cole Ave and Tillbury Ave (local roads) in combination with Churchill Ave N (major collector) as part of their route to/from the proposed development. Based on the City of Ottawa's TIA Guidelines, the threshold for future traffic volumes in the peak direction is 120 veh/h for local roads and 600 veh/h for major collector roads. Based on the projected future background 2027 traffic volumes (**Figure 13**) and the net site-generated traffic (**Figure 9**):

- Along Tillbury Ave, the maximum number of traffic anticipated in the peak direction is 59 veh/h in the afternoon eastbound direction, which does not exceed the 120 veh/h threshold.
- Along Cole Ave, traffic volumes between Carling Ave and Tillbury Ave exceed the 120 veh/h threshold in peak directions for both existing and future conditions. However, there are no anticipated operational issues along Cole Ave, under normal conditions.
- Along Churchill Ave N, the maximum number of traffic anticipated in the peak direction is 579 veh/h in the morning southbound direction, which does not exceed the 600 veh/h threshold.

Therefore, changes to the existing classification of the study area roadways is not required.

## 4.7. TRANSIT

As previously mentioned in **Section 3.2.1**, Carling Ave is planned to be a transit priority corridor (continuous measures). In order to account for the anticipated addition of a designated bus lane along Carling Ave, the number of general purpose lanes was reduced to two lanes for the future background and future projected conditions analyzed in **Section 4.9**.

## 4.8. REVIEW OF NETWORK CONCEPT

Exempt – see **Section 2.3**.

## 4.9. INTERSECTION DESIGN

### 4.9.1. INTERSECTION CONTROL

STOP control will be provided for the proposed development access, which will be sufficient given the low site-generated traffic volumes.

### 4.9.2. INTERSECTION DESIGN

The Synchro 10 Trafficware was used to analyze intersection performance of intersections within the study area. Critical movements at each of the intersections were assessed based on either the movement with the highest volume-to-capacity ratio (for signalized intersections), or the movement experiencing the highest average delay (for unsignalized intersections). It should be noted that, as per the TIA Guidelines, the Peak Hour Factor (PHF) used for analysis was 0.9 in existing conditions and 1.0 in all future scenario conditions. Furthermore, the number of lanes along Carling Ave were reduced to two general purpose lanes in all future background and total projected scenarios. All Synchro report outputs for existing and future conditions have been provided in **Appendix G**.

Existing Conditions

**Table 9** below summarizes the intersection performance of study area intersections, based on the existing conditions traffic volumes provided in **Figure 5.**

Table 9: Existing Conditions Intersection Performance

| Intersection | Weekday AM Peak (PM Peak) | | | | | |
|---|---|---|---|---|---|---|
| | Critical Movement | | | Intersection 'As a Whole' | | |
| | LOS | max. v/c or avg. delay (s) | Movement | Delay (s) | LOS | v/c |
| Churchill Ave N/Carling Ave (S) | D(F) | 0.88(1.17) | SBL(WBT) | 37.1(79.9) | B(F) | 0.61(1.05) |
| Clyde Ave/Cole Ave/Carling Ave (S) | C(C) | 0.78(0.75) | NBL(NBL) | 23.5(19.9) | B(B) | 0.64(0.66) |
| Carling Ave/Site Access (U) | A(B) | 8.7(10.5) | SB(SB) | 0.0(0.0) | - | - |
| Cole Ave/Tillbury Ave (U) | B(B) | 10.3(10.4) | WB(WB) | 2.2(2.1) | - | - |
| Tillbury Ave/Churchill Ave N (U) | B(B) | 14.2(14.8) | EB(EB) | 0.7(1.0) | - | - |

Note: Analysis of signalized intersections assumes a PHF of 0.90 and a saturation flow rate of 1800 veh/h/lane.
(S) – Signalized intersection.
(U) - Unsignalized intersection.

As shown in **Table 9**, the critical southbound left-turn movement at Churchill Ave N/Carling Ave operates at a LOS 'D' during the morning peak hour, while the critical westbound through movement operates at capacity with LOS 'F' during the afternoon peak hour. The critical northbound left-turn movement at Clyde Ave/Cole Ave/Carling Ave operates at a LOS 'C' during both morning and afternoon peak hour periods. Critical movements at the unsignalized intersections operate at a LOS 'B' or better during the morning and afternoon peak hour periods.

## Future Background 2022 Conditions

**Table 10** below summarizes the intersection performance of study area intersections, based on the future background 2022 conditions traffic volumes provided in **Figure 12.**

Table 10: Future Background 2022 Intersection Performance

| Intersection | Weekday AM Peak (PM Peak) | | | | | |
|---|---|---|---|---|---|---|
| | Critical Movement | | | Intersection 'As a Whole' | | |
| | LOS | max. v/c or avg. delay (s) | Movement | Delay (s) | LOS | v/c |
| Churchill Ave N/Carling Ave (S) | D(E) | 0.86(0.98) | SBL(WBT) | 33.8(40.8) | A(D) | 0.58(0.88) |
| Clyde Ave/Cole Ave/Carling Ave (S) | C(B) | 0.74(0.70) | NBL(NBL) | 20.6(18.5) | B(B) | 0.61(0.64) |
| Carling Ave/Site Access (U) | A(B) | 9.2(10.8) | SB(SB) | 0.0(0.1) | - | - |
| Cole Ave/Tillbury Ave (U) | B(B) | 10.1(10.2) | WB(WB) | 2.2(2.1) | - | - |
| Tillbury Ave/Churchill Ave N (U) | B(B) | 13.3(13.7) | EB(EB) | 0.7(0.9) | - | - |

Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.
(S) – Signalized intersection.
(U) - Unsignalized intersection.

As shown in **Table 10**, the critical SBL movement at Churchill Ave N/Carling Ave shows slight improvement in the morning and afternoon peak hour analysis compared to the existing conditions. Likewise, the critical movements at the Clyde Ave/Cole Ave/Carling Ave intersection show decrease in v/c ratios and operate at a LOS 'C' or better during morning and afternoon peak hour periods. Critical movements at the unsignalized intersections continue to operate at a LOS 'B' or better during the morning and afternoon peak hour periods.

## Future Background 2027 Conditions

**Table 11** below summarizes the intersection performance of study area intersections, based on the future background 2027 conditions traffic volumes provided in **Figure 13.**

Table 11: Future Background 2027 Intersection Performance

| Intersection | Weekday AM Peak (PM Peak) | | | | | |
|---|---|---|---|---|---|---|
| | Critical Movement | | | Intersection 'As a Whole' | | |
| | LOS | max. v/c or avg. delay (s) | Movement | Delay (s) | LOS | v/c |
| Churchill Ave N/Carling Ave (S) | D(F) | 0.86(1.03) | SBL(WBT) | 34.2(46.2) | A(E) | 0.58(0.92) |
| Clyde Ave/Cole Ave/Carling Ave (S) | C(B) | 0.74(0.70) | NBL(WBT) | 21.5(19.0) | B(B) | 0.63(0.67) |
| Carling Ave/Site Access (U) | A(B) | 9.3(10.9) | SB(SB) | 0.0(0.1) | - | - |
| Cole Ave/Tillbury Ave (U) | B(B) | 10.1(10.2) | WB(WB) | 2.2(2.1) | - | - |
| Tillbury Ave/Churchill Ave N (U) | B(B) | 13.3(13.7) | EB(EB) | 0.7(0.9) | - | - |

Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.
(S) – Signalized intersection.
(U) - Unsignalized intersection.

As shown in **Table 11**, the analysis results show slight increase in v/c ratios and intersection delays compared to the future background 2022 conditions. However, the WBT movement at the intersection of Churchill Ave N/Carling Ave is projected to operate at capacity during the afternoon peak hour.

## Total Projected 2022 Conditions – Full Build-Out

The total projected 2022 traffic volumes were derived by superimposing the net site-generated traffic (**Figure 9**) onto future background 2022 traffic volumes (**Figure 12**). The resulting total projected 2022 traffic volumes are illustrated in **Figure 14**.

Figure 14: Total Projected 2022 Traffic Volumes

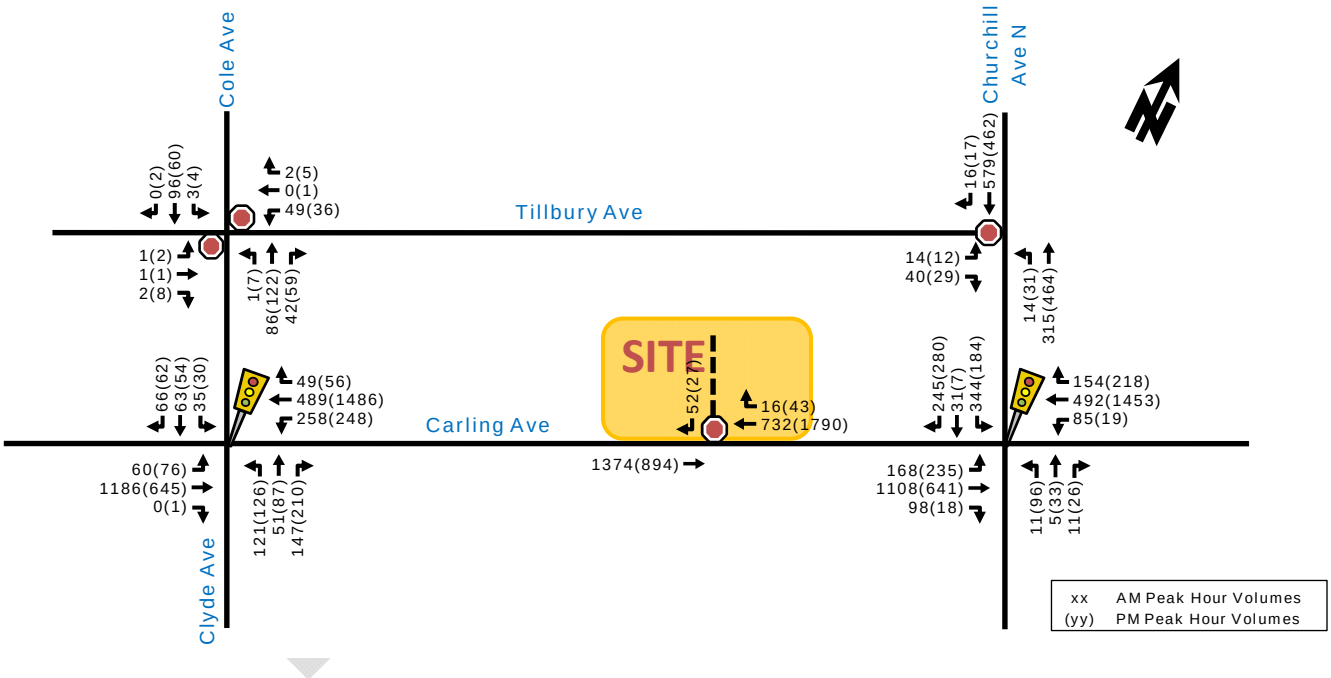



**Table 12** below summarizes the intersection performance of study area intersections, based on the total projected 2022 conditions.

Table 12: Total Projected 2022 Performance at Study Area Intersections

| Intersection | Weekday AM Peak (PM Peak) | | | | | |
|---|---|---|---|---|---|---|
| | Critical Movement | | | Intersection 'As a Whole' | | |
| | LOS | max. v/c or avg. delay (s) | Movement | Delay (s) | LOS | v/c |
| Churchill Ave N/Carling Ave (S) | D(F) | 0.86(1.02) | SBL(NBL) | 34.4(45.4) | A(D) | 0.58(0.90) |
| Clyde Ave/Cole Ave/Carling Ave (S) | C(B) | 0.74(0.70) | NBL(NBL) | 21.4(18.6) | B(B) | 0.62(0.64) |
| Carling Ave/Proposed Access (U) | A(B) | 9.5(11.0) | SB(SB) | 0.2(0.1) | - | - |
| Cole Ave/Tillbury Ave (U) | B(B) | 10.2(10.2) | WB(WB) | 2.1(2.0) | - | - |
| Tillbury Ave/Churchill Ave N (U) | B(B) | 14.8(14.1) | EB(EB) | 1.0(1.0) | - | - |

Note: Analysis of signalized intersections assumes a PHF of 1.0 and a saturation flow rate of 1800 veh/h/lane.
(S) – Signalized intersection.
(U) – Unsignalized intersection.

Note that U-turn movements are analyzed in Synchro as left-turn movements. As such, U-turn traffic volumes generated by the future development were added to the left-turn traffic volumes in both the Synchro model and its corresponding traffic volumes figure (**Figure 14**). Overall, the analysis results in **Table 12** show slight increase in v/c ratios and intersection delays compared to the future background 2022 conditions. The WBT movement at the intersection of Churchill Ave N/Carling Ave is projected to operate at capacity during the afternoon peak hour.

## Total Projected 2027 Conditions – Build-Out Plus Five Years

The total projected 2027 traffic volumes, shown in **Figure 15**, were derived by superimposing the net site-generated traffic (**Figure 9**) onto future background 2027 traffic volumes (**Figure 13**).

Figure 15: Total Projected 2027 Traffic Volumes

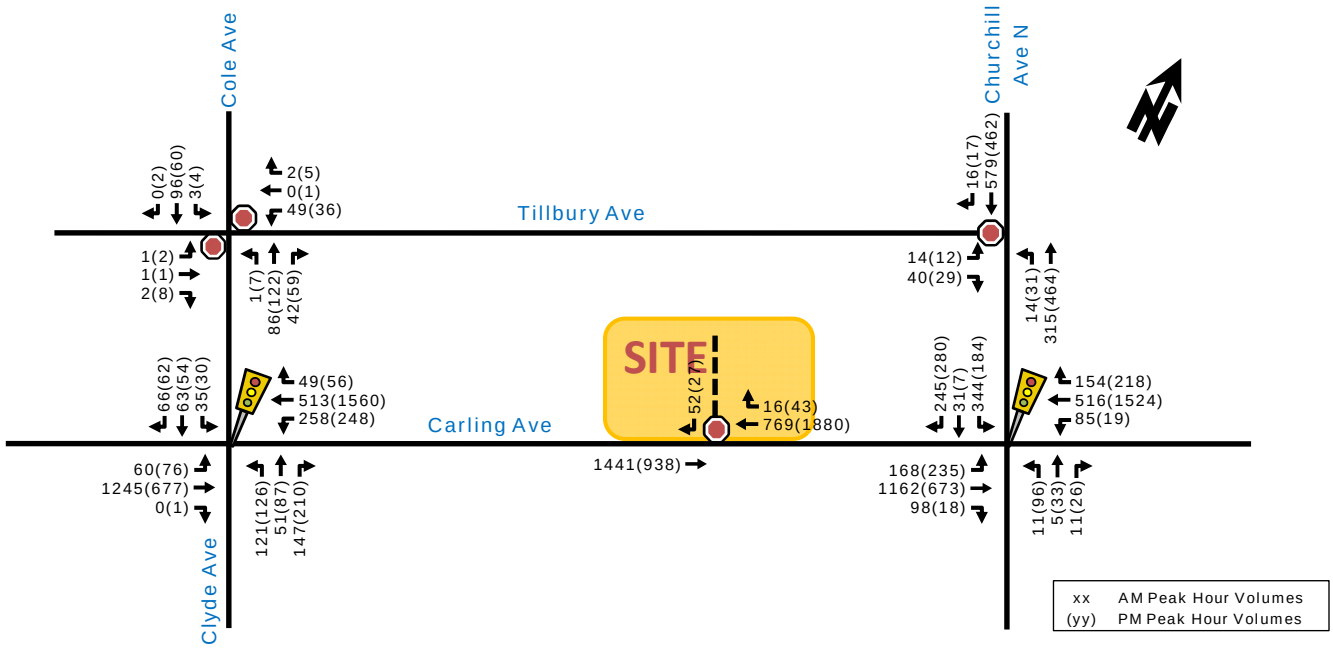



**Table 13** below summarizes the intersection performance of study area intersections, based on the total projected 2027 conditions.

Table 13: Total Projected 2027 Performance at Study Area Intersections

| Intersection | Weekday AM Peak (PM Peak) | | | | | |
|---|---|---|---|---|---|---|
| | Critical Movement | | | Intersection 'As a Whole' | | |
| | LOS | max. v/c or avg. delay (s) | Movement | Delay (s) | LOS | v/c |
| Churchill Ave N/Carling Ave (S) | D(F) | 0.86(1.06) | SBL(WBT) | 34.9(52.2) | A(E) | 0.59(0.94) |
| Clyde Ave/Cole Ave/Carling Ave (S) | C(B) | 0.74(0.70) | NBL(WBT) | 22.4(19.0) | B(B) | 0.65(0.67) |
| Carling Ave/Proposed Access (U) | A(B) | 9.6(11.0) | SB(SB) | 0.2(0.1) | - | - |
| Cole Ave/Tillbury Ave (U) | B(B) | 10.2(10.2) | WB(WB) | 2.1(2.0) | - | - |
| Tillbury Ave/Churchill Ave N (U) | B(B) | 14.8(14.1) | EB(EB) | 1.0(1.0) | - | - |

Note: Analysis of signalized intersections assumes a PHF of 1.00 and a saturation flow rate of 1800 veh/h/lane.
(S) – Signalized intersection.
(U) – Unsignalized intersection.

As shown in **Table 13**, there is a slight increase in v/c ratios compared to future background 2027 conditions. The WBT movement at the Churchill Ave N/Carling Ave intersection continues to operate at capacity during the afternoon peak hour period. However, note that the v/c ratio only slightly exceed the 1.00 threshold. As such, a simple potential mitigation measure to reduce the v/c ratio to an acceptable level is to adjust the phase timings of the intersection of Churchill Ave N/Carling Ave.

### MMLOS Analysis

All required MMLOS analysis for signalized intersections and road segments within the study area will be provided in accordance to the TIA Guidelines requirements in the future Site Plan Application.

# 5. FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Based on the results summarized herein the following transportation related conclusions are offered:

### Proposed Development

- The proposed single-phase development will consist of approximately 260 residential units within a 22-storey high-rise apartment building and is expected to reach full build-out by 2022.
- A total of 260 underground parking spaces and 24 surface parking spaces are anticipated to be provided.
- A right-in/right-out access is proposed along the west side of the property, on the north side of Carling Ave.
- The proposed development is anticipated to generate approximately 75 vehicles/hour during both the morning and afternoon peak hour periods. However, due to the existing vehicle trips generated by the unpaved parking lot, the proposed development vehicle trips result in a net increase of approximately 55 veh/h during the morning and afternoon peak hour periods.

### Existing and Background Conditions

- In existing conditions, the SBL operates at a LOS 'D', while the WBT operates at capacity at the intersection of Churchill Ave N/Carling Ave, during the morning and afternoon peak hour periods, respectively. The NBL at the intersection of Clyde Ave/Cole Ave/Carling Ave operates at a LOS 'C' during both morning and afternoon peak hour periods. Critical movements at unsignalized intersections operate at a LOS 'B' or better during both morning and afternoon peak hours.
- Due to the absence of major other area developments near the subject site, traffic is not anticipated to grow significantly within the study area. Nonetheless, a 1% per year background growth rate was applied along Carling Ave, between horizon years 2022 and 2027.

- A designated bus lane is anticipated to be implemented along Carling Ave by year 2020, which will reduce the vehicle capacity significantly along Carling Ave, since a general-purpose lane in each travel direction will be replaced with a transit lane. However, the *Carling Avenue Transit Priority Measures and Functional Design Report* indicates that vehicle traffic along Carling Ave is expected to reduced by up to 20% once the transit lanes are implemented. These changes are reflected in the Synchro analysis conducted for all future scenarios.
- The Synchro operational analysis of Future Background 2022 and 2027 conditions indicated the following:
    - The SBL movement at the intersection of Churchill Ave N/Carling Ave operates at a LOS 'D' during the morning peak hour. While the WBT movement operates at a LOS 'E' for future background 2022 conditions and LOS 'F' for future background 2027 conditions during the afternoon peak hour.
    - The critical movements at the intersection of Clyde Ave/Cole Ave/Carling Ave operate at a LOS 'C' or better during the morning and afternoon peak hour periods.
    - Critical movements at all unsignalized intersections operate at a LOS 'B' or better during morning and afternoon peak hour periods.

### Projected Conditions

- Analysis of Total Projected 2022 and 2027 conditions indicated results similar to Future Background 2022 and 2027 conditions, with slight increase in v/c ratios and intersection delays.
- Although critical movements at the intersection of Churchill Ave N/Carling Ave operate at capacity during the afternoon peak hour, the volume-to-capacity ratio exceeds the threshold only slightly. As such, the v/c ratios may be reduced to acceptable levels by adjusting the intersection's phase timings.
- Since site-generated traffic may use local roads (Cole Ave and Tillbury Ave) and a major collector road (Churchill Ave N) as part of their access route to/from the future development, anticipated future traffic volumes along these roadways was compared against the thresholds set by the TIA Guidelines. It was determined that changes to the existing classification of the existing study area roadways was not required given the very modest volume increases of 18 veh/h.
- MMLOS analysis for signalized intersections and road segments within the study area will be provided in the future Site Plan Application.

Based on the foregoing, the proposed residential development causes a slight variation to the adjacent transportation network and is recommended to proceed from a transportation perspective.

# Appendix A

Screening Form and City Comments

PARSONS

1223 Michael Street, Suite 100, Ottawa, Ontario, K1J 7T2
P: +1 613.738.4160 | F: +1 613.739.7105 | www.parsons.com

City of Ottawa 2017 TIA Guidelines

# TIA Screening Form

| | |
|---|---|
| Date | 27-Aug-19 |
| Project | 1655 Carling Avenue |
| Project Number | 477272 - 01000 |

| Results of Screening | Yes/No |
|---|---|
| Development Satisfies the Trip Generation Trigger | Yes |
| Development Satisfies the Location Trigger | Yes |
| Development Satisfies the Safety Trigger | Yes |

| Module 1.1 - Description of Proposed Development | |
|---|---|
| Municipal Address | 1655 Carling Avenue (Ottawa, ON) |
| Description of location | To replace the unpaved parking lot west of Hakim Optical |
| Land Use | Residential apartments tower |
| Development Size | 260 residential units |
| Number of Accesses and Locations | 1 Existing Access, 65 m west of Carling/Churchill intersection |
| Development Phasing | 1 Phase |
| Buildout Year | 2021 |
| Sketch Plan / Site Plan | See attached |

| Module 1.2 - Trip Generation Trigger | | |
|---|---|---|
| Land Use Type | Townhomes or Apartments | |
| Development Size | 260 | Units |
| Trip Generation Trigger Met? | Yes | |

| Module 1.3 - Location Triggers | | |
|---|---|---|
| Development Proposes a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks (See Sheet 3) | No | Development to continue using existing driveway |
| Development is in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone. (See Sheet 3) | Yes | Carling Avenue is designated as an Arterial Mainstreet |
| Location Trigger Met? | Yes | |

| Module 1.4 - Safety Triggers | | |
|---|---|---|
| Posted Speed Limit on any boundary road | <80 | km/h |
| Horizontal / Vertical Curvature on a boundary street limits sight lines at a proposed driveway | No | |
| A proposed driveway is within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions) or within auxiliary lanes of an intersection; | Yes | Within 150 m of the Carling Ave/Chuchill Ave N signalized intersection |
| A proposed driveway makes use of an existing median break that serves an existing site | No | |
| There is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development | No | |
| The development includes a drive-thru facility | No | |
| Safety Trigger Met? | Yes | |

## Ansari, Basel

**Subject:** 1655 Carling Ave - Strategy Report

## Responses to City comments are shown in red below.

**From:** Dubyk, Wally <Wally.Dubyk@ottawa.ca>
**Sent:** Friday, September 27, 2019 8:35 AM
**To:** Ansari, Basel <Basel.Ansari@parsons.com>
**Cc:** Deiaco, Simon <Simon.Deiaco@ottawa.ca>
**Subject:** [EXTERNAL] 1655 Carling Ave - Forecasting response

Basel,

Please review the following Forecasting response;

**1655 Carling Avenue**
**TIA Forecasting Report, Received September 12, 2019**

Comments

General (Site Plan related)

Carling Avenue is designated as an Arterial road within the City's Official Plan with a ROW protection limit of 44.5 metres. The ROW protection limit and the offset distance (22.25 metres) are to be dimensioned from the existing centerline of pavement and shown on the drawings.

ROW interpretation – Land for a road widening will be taken equally from both sides of a road, measured from the centreline in existence at the time of the widening if required by the City. The centreline is a line running down the middle of a road surface, equidistant from both edges of the pavement. In determining the centreline, paved shoulders, bus lay-bys, auxiliary lanes, turning lanes and other special circumstances are not included in the road surface.

All underground and above ground building footprints and permanent walls need to be shown on the plan to confirm that any permanent structure does not extend either above or below into the future road widening protection limits.

The concrete sidewalks should be 2.0 metres in width and be continuous and depressed through the proposed accesses (please refer to the City's sidewalk and curb standard drawing SC7.1 for unsignalized entrance).

The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.

Noted. Architect has been made aware of these comments. Updated concept plan has been provided in the report.

**Transportation Engineering**

Include the Cole Avenue/Tillbury Avenue and Tillbury Avenue/Churchill Avenue N intersections in the analysis given that they are a possible option for those traveling eastbound on Carling Avenue to access the development. Account for this possibility in Figures 7-9.
The Cole Avenue/Tillbury Avenue and Tillbury Avenue/Churchill Avenue intersections have been included in the report.

Adjust the target modal shares in Table 5. The existing mode shares in Table 5 are lower than what is reflected in the 2011 OD Survey for the non-motorized mode and too high for auto driver. Secondly, given the proposed transit improvements to Carling Avenue described in the report, consider a future higher transit mode share target for this development.
Target mode shares have been adjusted.

Display the walking and cycling modes separately in Tables 4 and 5.
Walking and cycling modes are now displayed in Table 5 as provided by the 2011 OD Survey. Table 4 provides a combined percentage as the 2009 TRANS Report does not provide separated walking and cycling mode shares.

To account for net change in development trips to this location as discussed in section 3.1.1, an assumption of existing trips is not accepted. Conduct a traffic count to reduce the net total vehicle trips.
Traffic counts have been conducted at the existing parking lot. Report analysis has been updated to include these volumes.

Correct the addition errors in Table 7 and reflect these changes in Figures 8 and 9.
Corrections made.

Provide justification for the trip distribution shown in Section 3.1.2.
The trip distribution was obtained from the 2011 OD Survey. Nonetheless, justification for the distribution of the site-generated traffic volumes has been provided in Section 3.1.2.

Demand rationalization will be required in the buildout year as well as the ultimate horizon assuming a 1% background growth rate and the elimination of one travel lane on Carling Avenue.
Demand rationalization has been provided in Section 3.3 of the report.

Modules 4.1 – 4.4 are required, however, the review will be focused on the ability of the site to accommodate the use. Reference the TIA Guidelines Structure of a TIA Study. Module 4.6 is also required as part of this application.
Modules 4.1 to 4.4 will be explored in more detail in the site plan application. However, brief reviews of what is expected of the site have been provided. A discussion has been provided for module 4.6.

Exemption of Module 4.8 is accepted if the site plan application is submitted with the rezoning application. Otherwise, a review of the maximum possible trips that would be possible with the proposed rezoning must be included.
As shown by the Forecasting Section of the report, the development is not anticipated to generate more than 200 person-trips during peak hours. Therefore, review of network concept is not required.

**Traffic Signal Operations**

Provide accurate vehicular activity at the existing parking lot.
Traffic counts have been conducted for the existing parking lot and included in the analysis.

Ensure that transit priority measures along Carling Avenue are taken into account when completing the traffic impact analysis.
The transit mode share has been increased in order to account for the transit priority measures.

Left turn lane storage analysis is required.
There are no left-turns at the access. The access allows right-in/right-out movements only.

Provide a more detailed review of the Carling Avenue/Clyde Avenue intersection collision date and provide recommended mitigation measures.
A more detailed review of the collisions at Carling Avenue/Clyde Avenue has been provided in the report.

Thank you,

Wally Dubyk
Project Manager - Transportation Approvals
Development Review, Central & South Branches
613-580-2424 x13783

'



'

# Appendix B

Transit Route Maps

FORMER / ANCIEN 150

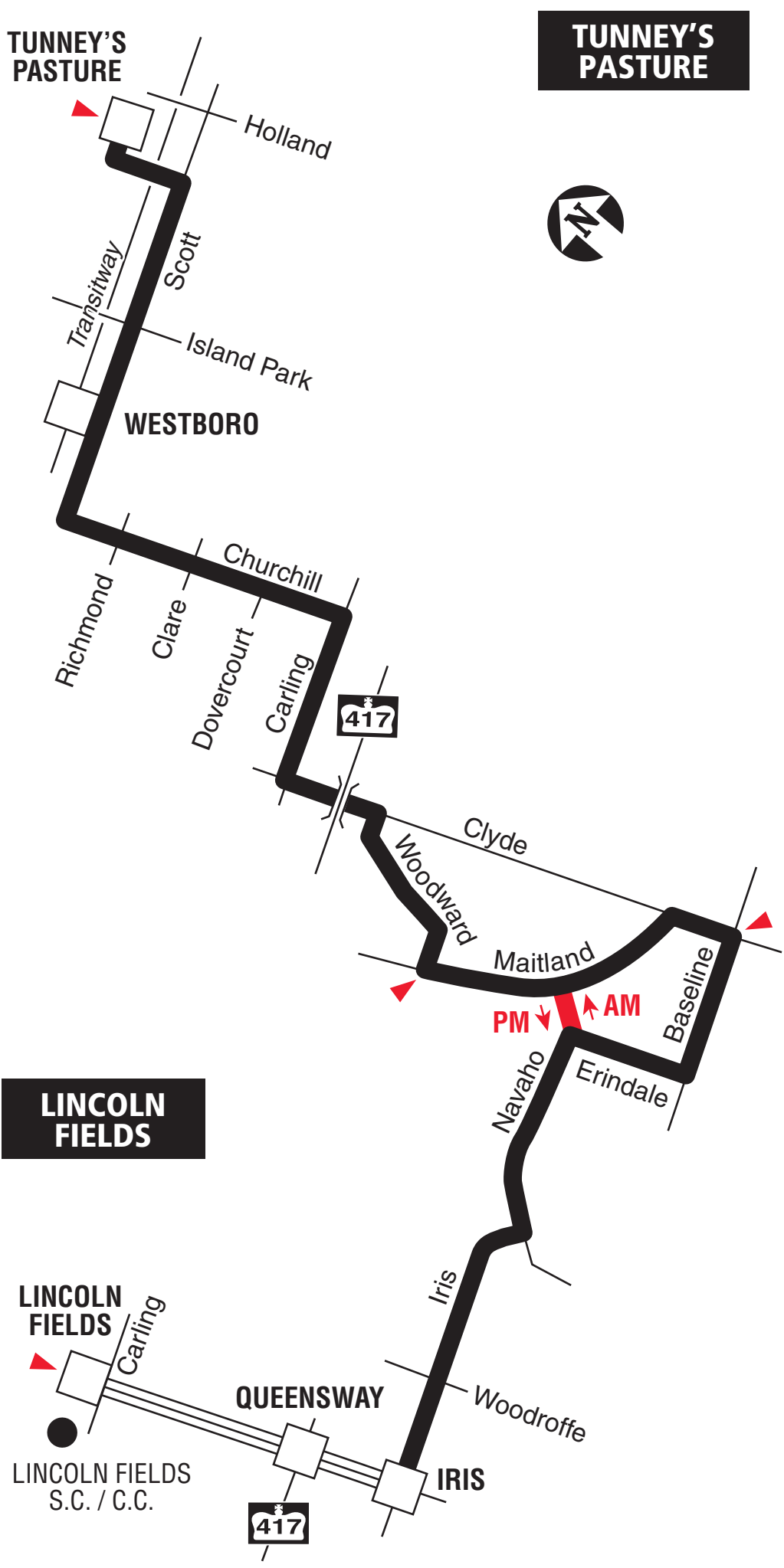
# 50

## TUNNEY'S PASTURE
## LINCOLN FIELDS

*Local*

**Monday to Saturday / Lundi au samedi**

No service Sat. eve. or all day Sunday / Aucun service le soir le sam. ou toute la journée dimanche




Legend • *Légende*

- Transitway & Station
- Peak Periods only / *Périodes de pointe seulement*
- Timepoint / *Heures de passage*

2017.04

**Schedule / Horaire.....613-560-1000**
**Text / Texto .....560560**

*plus* your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres

Customer Relations
Service à la clientèle ..... **613-842-3600**

Lost and Found / Objets perdus..... **613-563-4011**

Security / Sécurité ..... **613-741-2478**

**Effective April 24, 2017**
**En vigueur 24 avril 2017**

OC Transpo

**INFO 613-741-4390**
**octranspo.com**

Transpo

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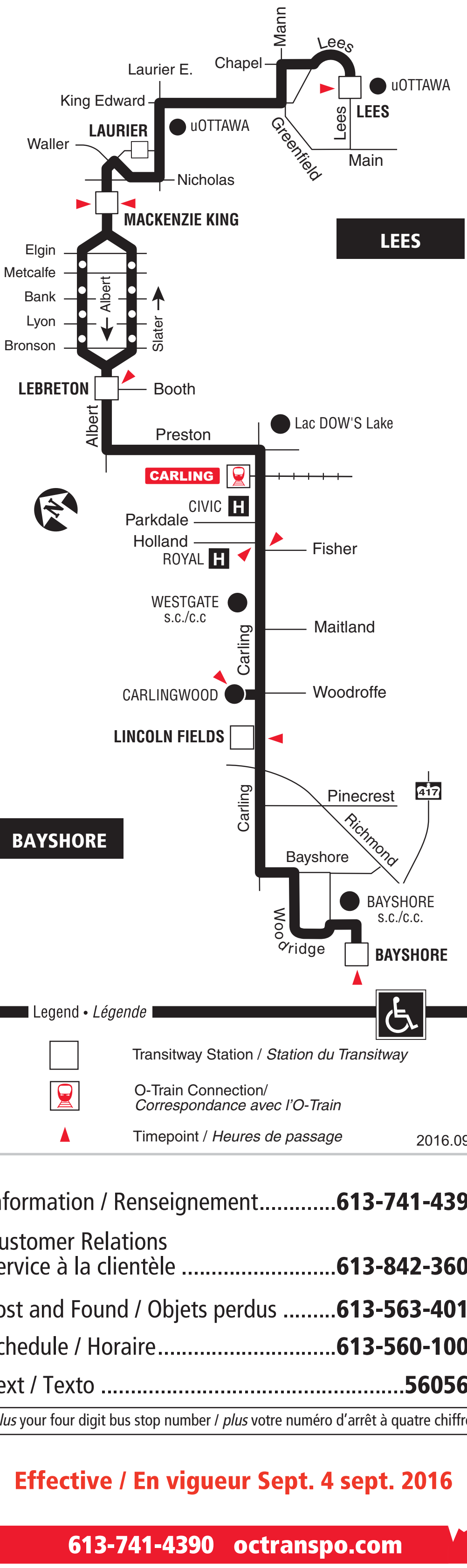
All day service
Service toute la journée




Information / Renseignement.....**613-741-4390**

Customer Relations
Service à la clientèle .....**613-842-3600**

Lost and Found / Objets perdus .....**613-563-4011**

Schedule / Horaire.....**613-560-1000**

Text / Texto .....**560560**

*plus* your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres

**Effective / En vigueur Sept. 4 sept. 2016**

**613-741-4390 octranspo.com**

# Appendix C

Traffic Data

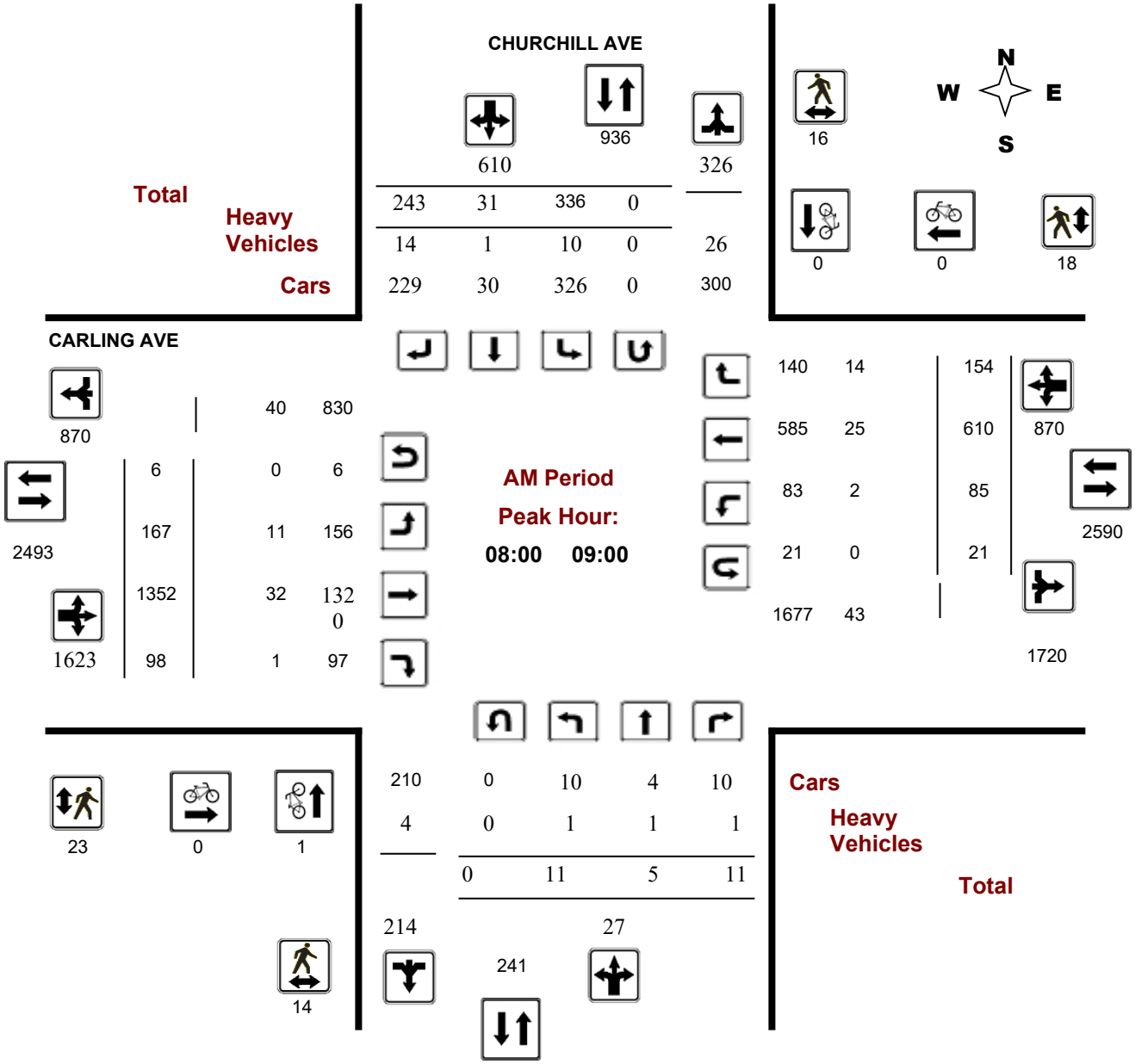
# Transportation Services - Traffic Services

## Turning Movement Count - Full Study Peak Hour Diagram

## CARLING AVE @ CHURCHILL AVE

**Survey Date:** Tuesday, April 25, 2017
**Start Time:** 07:00

**WO No:** 36955
**Device:** Miovision




**Comments**

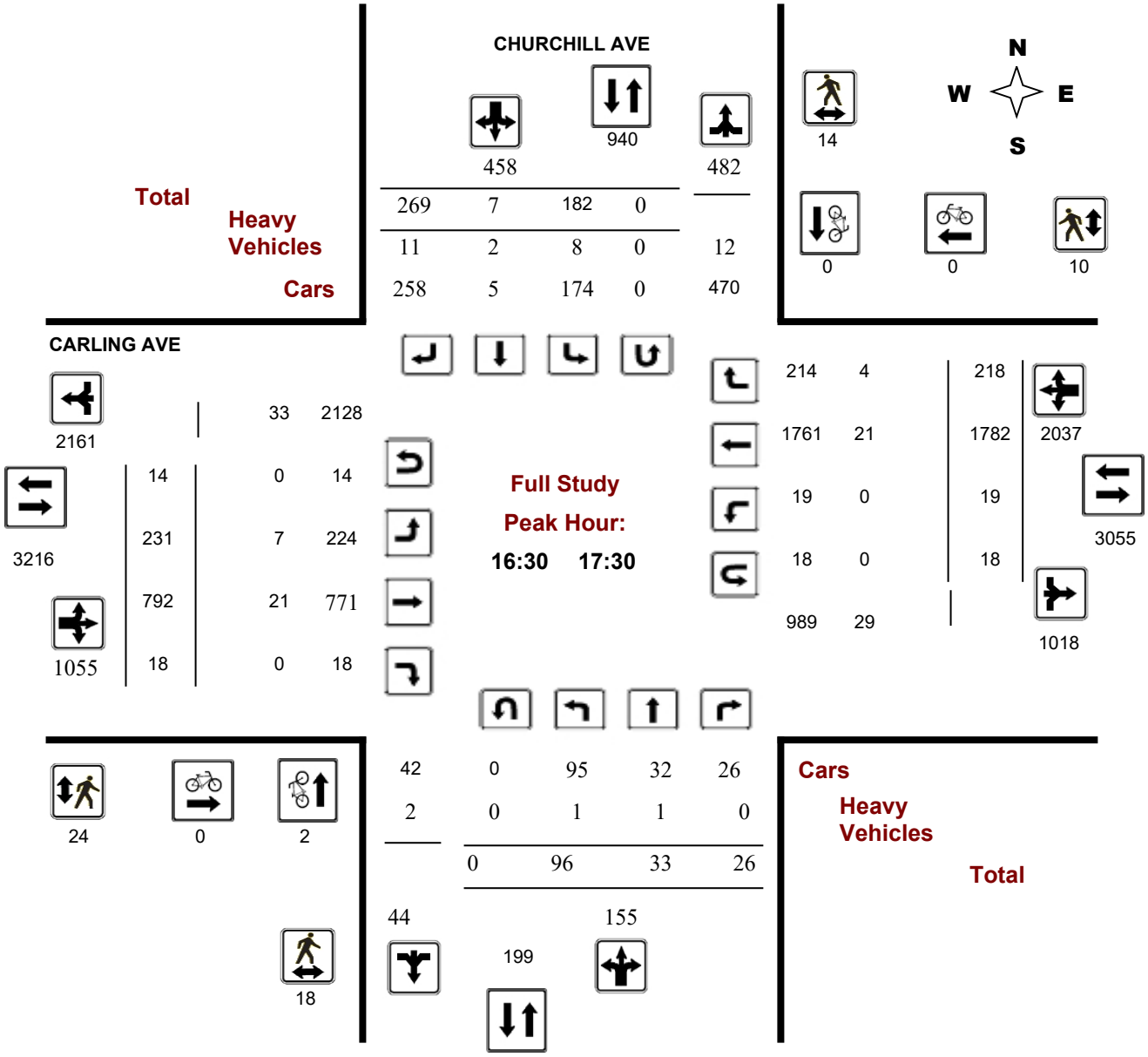
# Transportation Services - Traffic Services

## Turning Movement Count - Full Study Peak Hour Diagram

## CARLING AVE @ CHURCHILL AVE

**Survey Date:** Tuesday, April 25, 2017 **WO No:** 36955

**Start Time:** 07:00 **Device:** Miovision




**Comments**

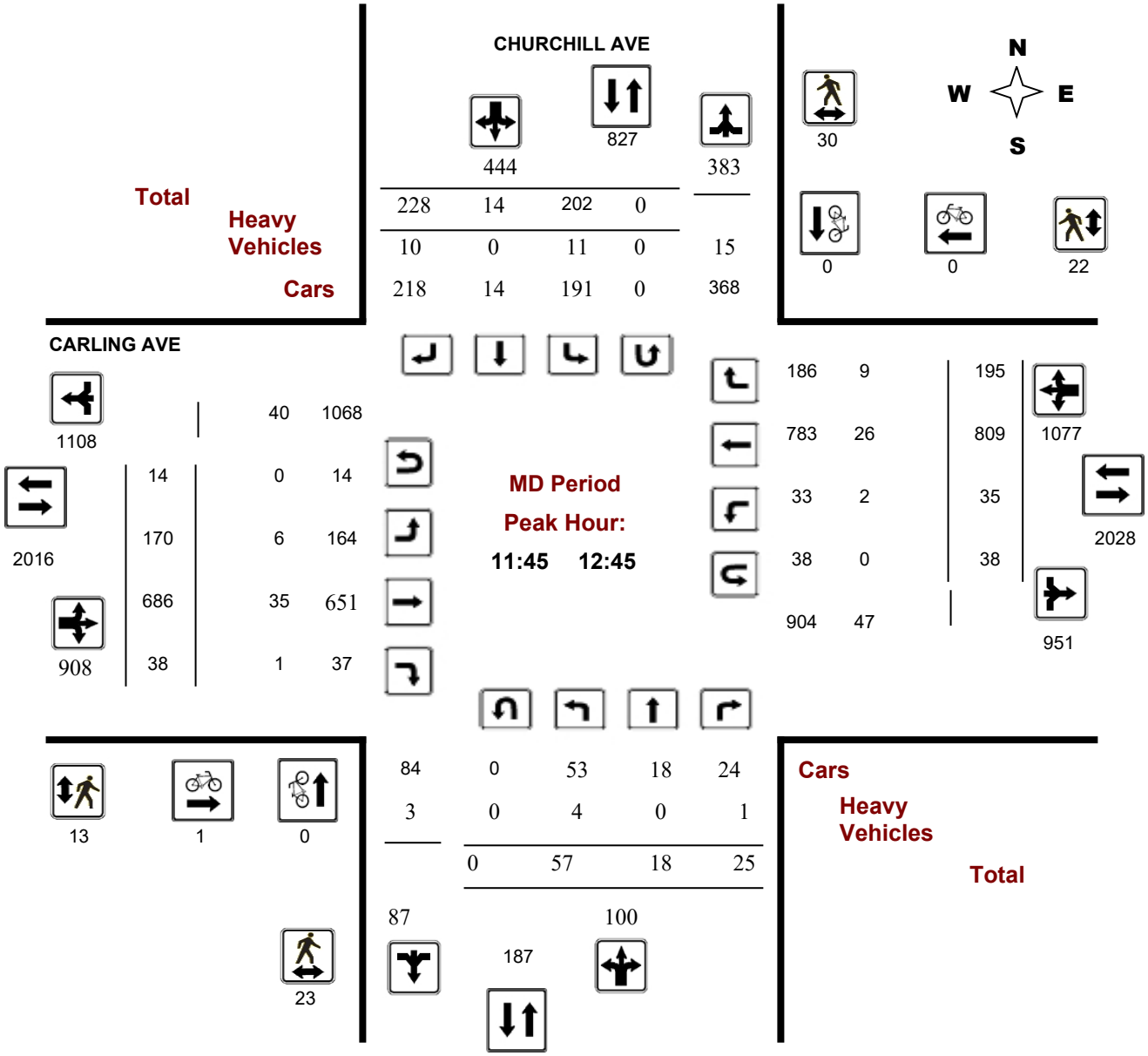
# Transportation Services - Traffic Services

## Turning Movement Count - Full Study Peak Hour Diagram

## CARLING AVE @ CHURCHILL AVE

**Survey Date:** Tuesday, April 25, 2017 **WO No:** 36955

**Start Time:** 07:00 **Device:** Miovision




**Comments**

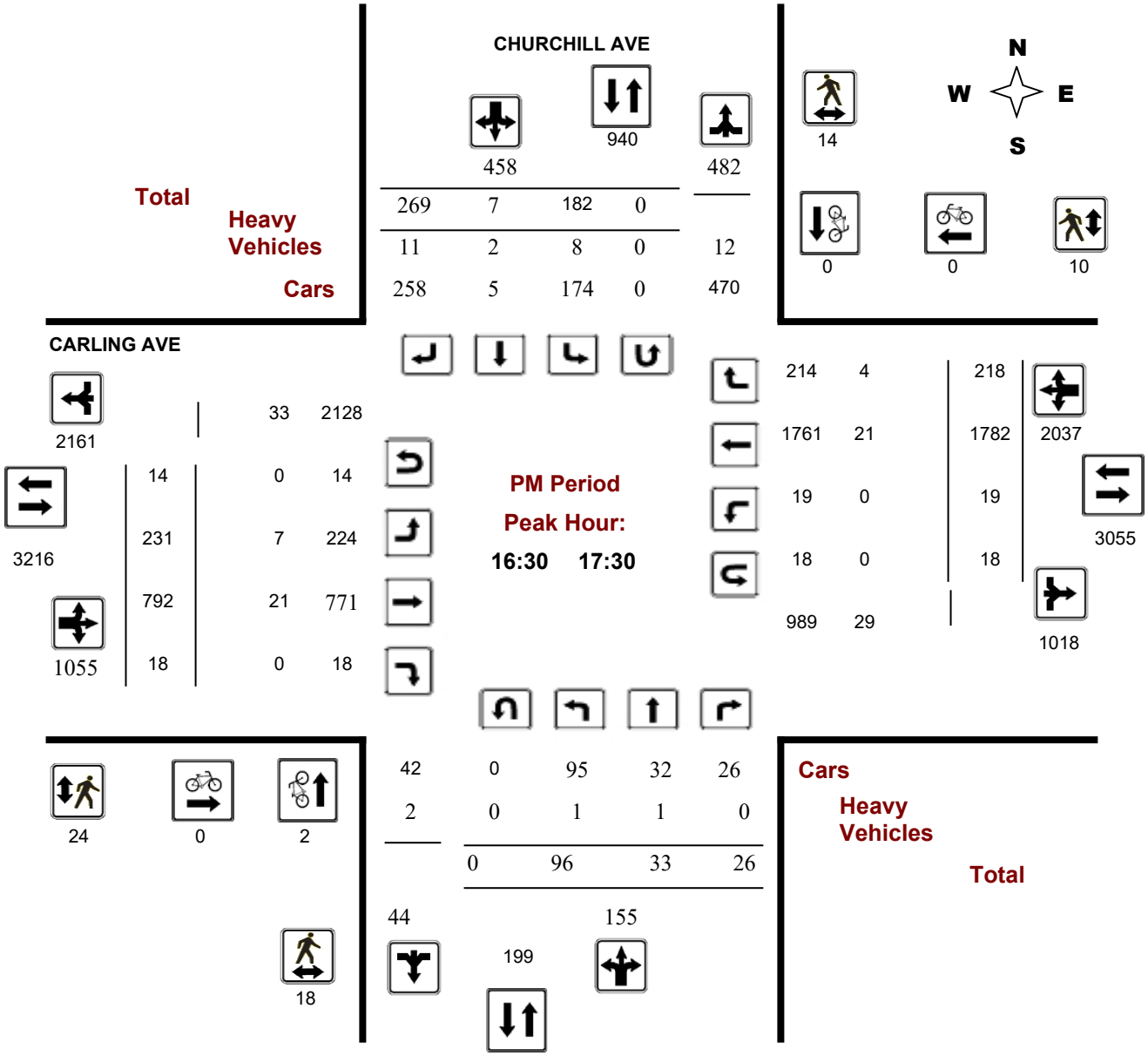
# Transportation Services - Traffic Services

## Turning Movement Count - Full Study Peak Hour Diagram

## CARLING AVE @ CHURCHILL AVE

**Survey Date:** Tuesday, April 25, 2017 **WO No:** 36955

**Start Time:** 07:00 **Device:** Miovision




**Comments**

# Transportation Services - Traffic Services

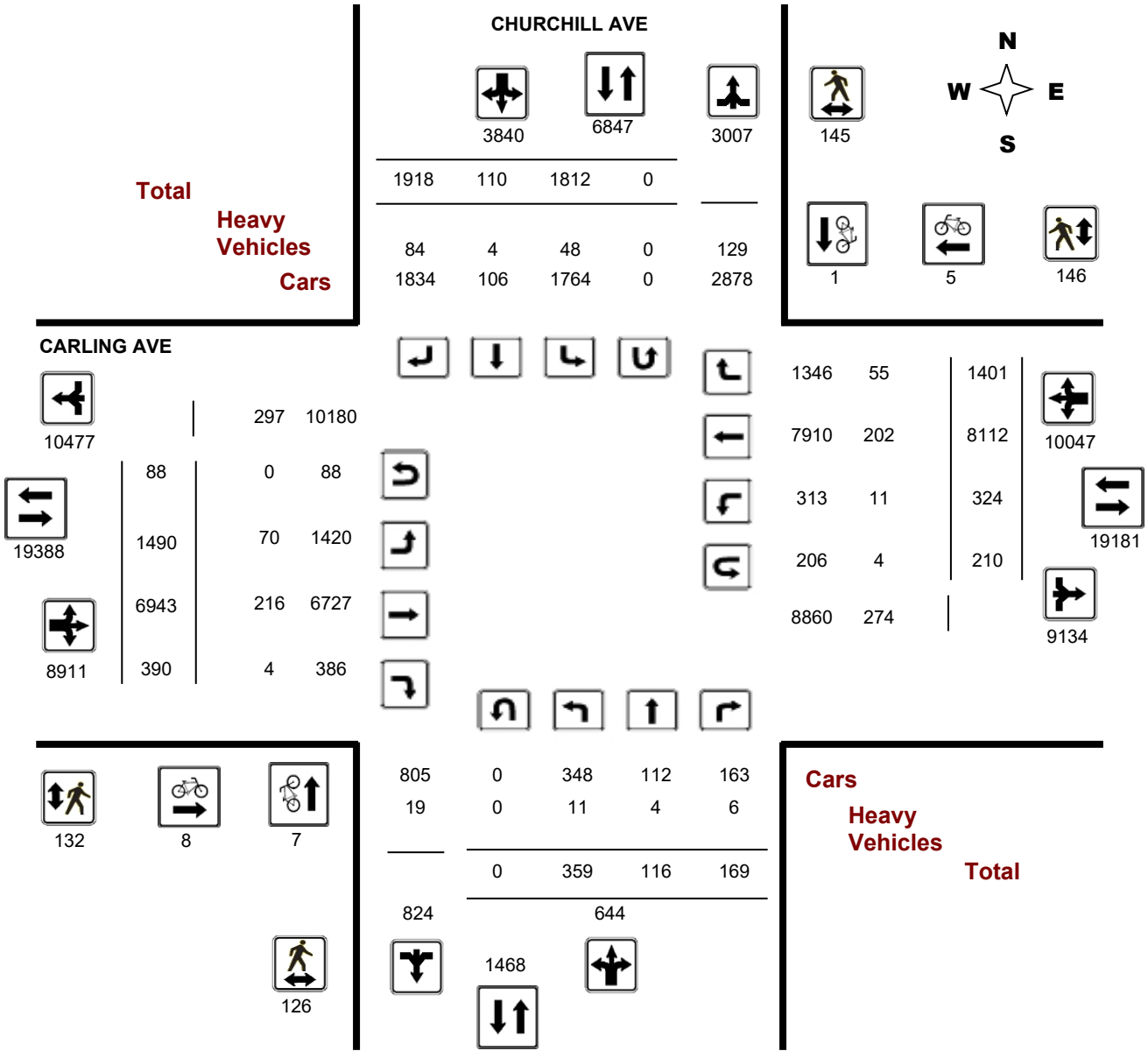
## Turning Movement Count - Full Study Diagram

## CARLING AVE @ CHURCHILL AVE

**Survey Date:** Tuesday, April 25, 2017

**WO#:** 36955

**Device:** Miovision




**Comments**

# Transportation Services - Traffic Services

**Work Order** 36955

## Turning Movement Count - Full Study Summary Report

## CARLING AVE @ CHURCHILL AVE

**Survey Date:** Tuesday, April 25, 2017

**Total Observed U-Turns**

Northbound: 0 Southbound: 0

Eastbound: 88 Westbound: 210

**AADT Factor** .90

### Full Study

| | CHURCHILL AVE | | | | | | | | | CARLING AVE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Northbound | | | | Southbound | | | | | Eastbound | | | | Westbound | | | | | |
| Period | LT | ST | RT | **NB TOT** | LT | ST | RT | **SB TOT** | **STR TOT** | LT | ST | RT | **EB TOT** | LT | ST | RT | **WB TOT** | **STR TOT** | **Grand Total** |
| 07:00 08:00 | 14 | 6 | 9 | **29** | 252 | 11 | 180 | **443** | **472** | 144 | 1213 | 76 | **1433** | 55 | 416 | 118 | **589** | **2022** | **2494** |
| 08:00 09:00 | 11 | 5 | 11 | **27** | 336 | 31 | 243 | **610** | **637** | 167 | 1352 | 98 | **1617** | 85 | 610 | 154 | **849** | **2466** | **3103** |
| 09:00 10:00 | 24 | 5 | 25 | **54** | 224 | 19 | 212 | **455** | **509** | 171 | 790 | 77 | **1038** | 47 | 618 | 151 | **816** | **1854** | **2363** |
| 11:30 12:30 | 54 | 16 | 23 | **93** | 204 | 10 | 237 | **451** | **544** | 164 | 637 | 34 | **835** | 35 | 823 | 188 | **1046** | **1881** | **2425** |
| 12:30 13:30 | 46 | 11 | 30 | **87** | 188 | 13 | 241 | **442** | **529** | 192 | 749 | 51 | **992** | 45 | 713 | 185 | **943** | **1935** | **2464** |
| 15:00 16:00 | 38 | 18 | 21 | **77** | 220 | 12 | 259 | **491** | **568** | 203 | 709 | 22 | **934** | 24 | 1403 | 174 | **1601** | **2535** | **3103** |
| 16:00 17:00 | 87 | 24 | 31 | **142** | 175 | 11 | 276 | **462** | **604** | 239 | 740 | 17 | **996** | 22 | 1762 | 208 | **1992** | **2988** | **3592** |
| 17:00 18:00 | 85 | 31 | 19 | **135** | 213 | 3 | 270 | **486** | **621** | 210 | 753 | 15 | **978** | 11 | 1767 | 223 | **2001** | **2979** | **3600** |
| **Sub Total** | 359 | 116 | 169 | **644** | 1812 | 110 | 1918 | **3840** | **4484** | 1490 | 6943 | 390 | **8823** | 324 | 8112 | 1401 | **9837** | **18660** | **23144** |
| **U Turns** | | | | **0** | | | | **0** | **0** | | | | **88** | | | | **210** | **298** | **298** |
| **Total** | 359 | 116 | 169 | **644** | 1812 | 110 | 1918 | **3840** | **4484** | 1490 | 6943 | 390 | **8911** | 324 | 8112 | 1401 | **10047** | **18958** | **23442** |
| **EQ 12Hr** | 499 | 161 | 235 | **895** | 2519 | 153 | 2666 | **5338** | **6233** | 2071 | 9651 | 542 | **12386** | 450 | 11276 | 1947 | **13965** | **26351** | **32584** |
| Note: These values are calculated by multiplying the totals by the appropriate expansion factor. | | | | | | | | | | | | | **1.39** | | | | | | |
| **AVG 12Hr** | 449 | 145 | 211 | **806** | 2267 | 138 | 2399 | **4804** | **5610** | 1864 | 8686 | 488 | **11148** | 405 | 10148 | 1753 | **12569** | **23717** | **29327** |
| Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. | | | | | | | | | | | | | **.90** | | | | | | |
| **AVG 24Hr** | 588 | 190 | 277 | **1055** | 2970 | 180 | 3143 | **6293** | **7348** | 2442 | 11378 | 639 | **14603** | 531 | 13294 | 2296 | **16465** | **31068** | **38416** |
| Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. | | | | | | | | | | | | | **1.31** | | | | | | |

**Comments:**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

# Transportation Services - Traffic Services

W.O. 36955

## Turning Movement Count - 15 Minute Summary Report

## CARLING AVE @ CHURCHILL AVE

**Survey Date:** Tuesday, April 25, 2017

**Total Observed U-Turns**

Northbound: 0 Southbound: 0

Eastbound: 88 Westbound: 210

**CHURCHILL AVE** **CARLING AVE**

| Time Period | | Northbound | | | | Southbound | | | | | Eastbound | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LT | ST | RT | N TOT | LT | ST | RT | S TOT | STR TOT | LT | ST | RT | E TOT | LT | ST | RT | W TOT | STR TOT | Grand Total |
| 07:00 | 07:15 | 3 | 2 | 2 | **7** | 48 | 2 | 36 | **86** | **93** | 23 | 227 | 16 | **267** | 14 | 81 | 25 | **123** | **390** | **483** |
| 07:15 | 07:30 | 1 | 0 | 1 | **2** | 43 | 1 | 40 | **84** | **86** | 26 | 295 | 14 | **337** | 12 | 94 | 32 | **140** | **477** | **563** |
| 07:30 | 07:45 | 6 | 1 | 3 | **10** | 76 | 4 | 54 | **134** | **144** | 39 | 328 | 15 | **383** | 15 | 99 | 25 | **148** | **531** | **675** |
| 07:45 | 08:00 | 4 | 3 | 3 | **10** | 85 | 4 | 50 | **139** | **149** | 56 | 363 | 31 | **451** | 14 | 142 | 36 | **197** | **648** | **797** |
| 08:00 | 08:15 | 4 | 0 | 5 | **9** | 85 | 7 | 67 | **159** | **168** | 29 | 370 | 26 | **426** | 11 | 108 | 35 | **158** | **584** | **752** |
| 08:15 | 08:30 | 1 | 1 | 2 | **4** | 73 | 5 | 53 | **131** | **135** | 36 | 330 | 27 | **395** | 24 | 162 | 42 | **235** | **630** | **765** |
| 08:30 | 08:45 | 1 | 2 | 2 | **5** | 95 | 9 | 71 | **175** | **180** | 50 | 322 | 18 | **392** | 24 | 165 | 38 | **234** | **626** | **806** |
| 08:45 | 09:00 | 5 | 2 | 2 | **9** | 83 | 10 | 52 | **145** | **154** | 52 | 330 | 27 | **410** | 26 | 175 | 39 | **243** | **653** | **807** |
| 09:00 | 09:15 | 4 | 2 | 8 | **14** | 86 | 8 | 51 | **145** | **159** | 46 | 211 | 26 | **285** | 9 | 146 | 32 | **196** | **481** | **640** |
| 09:15 | 09:30 | 5 | 1 | 3 | **9** | 34 | 4 | 43 | **81** | **90** | 39 | 213 | 26 | **280** | 12 | 147 | 40 | **205** | **485** | **575** |
| 09:30 | 09:45 | 6 | 1 | 9 | **16** | 59 | 5 | 58 | **122** | **138** | 44 | 203 | 12 | **263** | 16 | 146 | 42 | **211** | **474** | **612** |
| 09:45 | 10:00 | 9 | 1 | 5 | **15** | 45 | 2 | 60 | **107** | **122** | 42 | 163 | 13 | **221** | 10 | 179 | 37 | **236** | **457** | **579** |
| 11:30 | 11:45 | 9 | 1 | 7 | **17** | 47 | 0 | 60 | **107** | **124** | 44 | 149 | 7 | **201** | 8 | 196 | 47 | **264** | **465** | **589** |
| 11:45 | 12:00 | 15 | 3 | 5 | **23** | 63 | 3 | 58 | **124** | **147** | 41 | 165 | 6 | **217** | 8 | 195 | 45 | **263** | **480** | **627** |
| 12:00 | 12:15 | 17 | 6 | 9 | **32** | 54 | 2 | 63 | **119** | **151** | 37 | 146 | 12 | **199** | 12 | 229 | 48 | **296** | **495** | **646** |
| 12:15 | 12:30 | 13 | 6 | 2 | **21** | 40 | 5 | 56 | **101** | **122** | 42 | 177 | 9 | **232** | 7 | 203 | 48 | **267** | **499** | **621** |
| 12:30 | 12:45 | 12 | 3 | 9 | **24** | 45 | 4 | 51 | **100** | **124** | 50 | 198 | 11 | **260** | 8 | 182 | 54 | **251** | **511** | **635** |
| 12:45 | 13:00 | 17 | 3 | 10 | **30** | 46 | 2 | 69 | **117** | **147** | 44 | 164 | 12 | **224** | 18 | 176 | 42 | **243** | **467** | **614** |
| 13:00 | 13:15 | 9 | 4 | 6 | **19** | 47 | 5 | 62 | **114** | **133** | 51 | 173 | 14 | **240** | 7 | 197 | 46 | **259** | **499** | **632** |
| 13:15 | 13:30 | 8 | 1 | 5 | **14** | 50 | 2 | 59 | **111** | **125** | 47 | 214 | 14 | **278** | 12 | 158 | 43 | **227** | **505** | **630** |
| 15:00 | 15:15 | 10 | 3 | 6 | **19** | 53 | 3 | 61 | **117** | **136** | 44 | 186 | 6 | **240** | 9 | 286 | 32 | **334** | **574** | **710** |
| 15:15 | 15:30 | 11 | 4 | 5 | **20** | 51 | 7 | 69 | **127** | **147** | 47 | 172 | 5 | **229** | 5 | 317 | 38 | **367** | **596** | **743** |
| 15:30 | 15:45 | 6 | 9 | 4 | **19** | 63 | 0 | 70 | **133** | **152** | 68 | 175 | 7 | **254** | 5 | 354 | 48 | **414** | **668** | **820** |
| 15:45 | 16:00 | 11 | 2 | 6 | **19** | 53 | 2 | 59 | **114** | **133** | 44 | 176 | 4 | **227** | 5 | 446 | 56 | **510** | **737** | **870** |
| 16:00 | 16:15 | 25 | 4 | 9 | **38** | 47 | 2 | 79 | **128** | **166** | 63 | 175 | 4 | **245** | 7 | 394 | 45 | **449** | **694** | **860** |
| 16:15 | 16:30 | 26 | 4 | 9 | **39** | 54 | 4 | 63 | **121** | **160** | 57 | 182 | 3 | **243** | 4 | 476 | 50 | **533** | **776** | **936** |
| 16:30 | 16:45 | 16 | 6 | 9 | **31** | 45 | 2 | 55 | **102** | **133** | 59 | 194 | 2 | **262** | 6 | 408 | 59 | **481** | **743** | **876** |
| 16:45 | 17:00 | 20 | 10 | 4 | **34** | 29 | 3 | 79 | **111** | **145** | 60 | 189 | 8 | **259** | 5 | 484 | 54 | **547** | **806** | **951** |
| 17:00 | 17:15 | 38 | 10 | 11 | **59** | 43 | 1 | 68 | **112** | **171** | 67 | 205 | 4 | **278** | 3 | 422 | 54 | **482** | **760** | **931** |
| 17:15 | 17:30 | 22 | 7 | 2 | **31** | 65 | 1 | 67 | **133** | **164** | 45 | 204 | 4 | **256** | 5 | 468 | 51 | **527** | **783** | **947** |
| 17:30 | 17:45 | 13 | 6 | 1 | **20** | 48 | 0 | 62 | **110** | **130** | 58 | 161 | 3 | **228** | 2 | 440 | 49 | **493** | **721** | **851** |
| 17:45 | 18:00 | 12 | 8 | 5 | **25** | 57 | 1 | 73 | **131** | **156** | 40 | 183 | 4 | **229** | 1 | 437 | 69 | **514** | **743** | **899** |
| TOTAL: | | 359 | 116 | 169 | **644** | 1812 | 110 | 1918 | **3840** | **4484** | 1490 | 6943 | 390 | **8911** | 324 | 8112 | 1401 | **10047** | **18958** | **23442** |

Note: U-Turns are included in Totals.

**Comment:**

# Transportation Services - Traffic Services

## Turning Movement Count - Cyclist Volume Report

**Work Order**
**36955**

## CARLING AVE @ CHURCHILL AVE

**Count Date:** Tuesday, April 25, 2017 **Start Time:** 07:00

| | CHURCHILL AVE | | | CARLING AVE | | | |
|---|---|---|---|---|---|---|---|
| Time Period | Northbound | Southbound | **Street Total** | Eastbound | Westbound | **Street Total** | **Grand Total** |
| 07:00 08:00 | 0 | 0 | **0** | 2 | 1 | **3** | **3** |
| 08:00 09:00 | 1 | 0 | **1** | 0 | 0 | **0** | **1** |
| 09:00 10:00 | 2 | 1 | **3** | 2 | 0 | **2** | **5** |
| 11:30 12:30 | 0 | 0 | **0** | 0 | 1 | **1** | **1** |
| 12:30 13:30 | 0 | 0 | **0** | 3 | 1 | **4** | **4** |
| 15:00 16:00 | 2 | 0 | **2** | 1 | 1 | **2** | **4** |
| 16:00 17:00 | 0 | 0 | **0** | 0 | 1 | **1** | **1** |
| 17:00 18:00 | 2 | 0 | **2** | 0 | 0 | **0** | **2** |
| Total ..... | 7 | 1 | **8** | 8 | 5 | **13** | **21** |

**Comment:**

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

# Transportation Services - Traffic Services

**W.O.** 36955

## Turning Movement Count - Heavy Vehicle Report

## CARLING AVE @ CHURCHILL AVE

**Survey Date:** Tuesday, April 25, 2017

| | | CHURCHILL AVE | | | | | | | | | CARLING AVE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Northbound | | | | Southbound | | | | | Eastbound | | | | Westbound | | | | | |
| Time Period | | LT | ST | RT | N TOT | LT | ST | RT | S TOT | STR TOT | LT | ST | RT | E TOT | LT | ST | RT | W TOT | STR TOT | Grand Total |
| 07:00 | 08:00 | 0 | 0 | 0 | **0** | 6 | 0 | 8 | **14** | **14** | 16 | 22 | 0 | **38** | 1 | 22 | 9 | **33** | **71** | **85** |
| 08:00 | 09:00 | 1 | 1 | 1 | **3** | 10 | 1 | 14 | **25** | **28** | 11 | 32 | 1 | **44** | 2 | 25 | 14 | **41** | **85** | **113** |
| 09:00 | 10:00 | 2 | 1 | 3 | **6** | 7 | 0 | 9 | **16** | **22** | 9 | 34 | 2 | **45** | 6 | 25 | 5 | **38** | **83** | **105** |
| 11:30 | 12:30 | 5 | 0 | 0 | **5** | 10 | 0 | 10 | **20** | **25** | 10 | 29 | 1 | **40** | 2 | 34 | 13 | **49** | **89** | **114** |
| 12:30 | 13:30 | 1 | 0 | 1 | **2** | 2 | 0 | 13 | **15** | **17** | 6 | 35 | 0 | **41** | 0 | 31 | 3 | **35** | **76** | **93** |
| 15:00 | 16:00 | 0 | 1 | 1 | **2** | 4 | 0 | 11 | **15** | **17** | 7 | 24 | 0 | **31** | 0 | 26 | 5 | **31** | **62** | **79** |
| 16:00 | 17:00 | 1 | 0 | 0 | **1** | 2 | 3 | 9 | **14** | **15** | 7 | 23 | 0 | **30** | 0 | 23 | 3 | **26** | **56** | **71** |
| 17:00 | 18:00 | 1 | 1 | 0 | **2** | 7 | 0 | 10 | **17** | **19** | 4 | 17 | 0 | **21** | 0 | 16 | 3 | **19** | **40** | **59** |
| **Sub Total** | | 11 | 4 | 6 | **21** | 48 | 4 | 84 | **136** | **157** | 70 | 216 | 4 | **290** | 11 | 202 | 55 | **272** | **562** | **719** |
| **U-Turns (Heavy Vehicles)** | | | | | **0** | | | | **0** | **0** | | | | **0** | | | | **4** | **4** | **4** |
| **Total** | | 11 | 4 | 6 | **0** | 48 | 4 | 84 | **136** | **157** | 70 | 216 | 4 | **290** | 11 | 202 | 55 | **276** | **566** | **723** |

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

# Transportation Services - Traffic Services

**Work Order**
**36955**

## Turning Movement Count - Pedestrian Volume Report

### CARLING AVE @ CHURCHILL AVE

**Count Date:** Tuesday, April 25, 2017 **Start Time:** 07:00

| Time Period | NB Approach (E or W Crossing) | SB Approach (E or W Crossing) | Total | EB Approach (N or S Crossing) | WB Approach (N or S Crossing) | Total | Grand Total |
|---|---|---|---|---|---|---|---|
| 07:00 07:15 | 3 | 3 | **6** | 1 | 4 | **5** | **11** |
| 07:15 07:30 | 3 | 5 | **8** | 6 | 7 | **13** | **21** |
| 07:30 07:45 | 4 | 2 | **6** | 2 | 5 | **7** | **13** |
| 07:45 08:00 | 1 | 2 | **3** | 5 | 5 | **10** | **13** |
| 07:00 08:00 | 11 | 12 | **23** | 14 | 21 | **35** | **58** |
| 08:00 08:15 | 1 | 2 | **3** | 5 | 3 | **8** | **11** |
| 08:15 08:30 | 5 | 3 | **8** | 6 | 4 | **10** | **18** |
| 08:30 08:45 | 4 | 3 | **7** | 8 | 4 | **12** | **19** |
| 08:45 09:00 | 4 | 8 | **12** | 4 | 7 | **11** | **23** |
| 08:00 09:00 | 14 | 16 | **30** | 23 | 18 | **41** | **71** |
| 09:00 09:15 | 3 | 4 | **7** | 7 | 2 | **9** | **16** |
| 09:15 09:30 | 1 | 5 | **6** | 2 | 7 | **9** | **15** |
| 09:30 09:45 | 5 | 5 | **10** | 3 | 7 | **10** | **20** |
| 09:45 10:00 | 1 | 3 | **4** | 0 | 3 | **3** | **7** |
| 09:00 10:00 | 10 | 17 | **27** | 12 | 19 | **31** | **58** |
| 11:30 11:45 | 4 | 5 | **9** | 5 | 6 | **11** | **20** |
| 11:45 12:00 | 2 | 9 | **11** | 1 | 5 | **6** | **17** |
| 12:00 12:15 | 4 | 7 | **11** | 2 | 6 | **8** | **19** |
| 12:15 12:30 | 9 | 9 | **18** | 5 | 2 | **7** | **25** |
| 11:30 12:30 | 19 | 30 | **49** | 13 | 19 | **32** | **81** |
| 12:30 12:45 | 8 | 5 | **13** | 5 | 9 | **14** | **27** |
| 12:45 13:00 | 8 | 6 | **14** | 6 | 9 | **15** | **29** |
| 13:00 13:15 | 9 | 3 | **12** | 6 | 6 | **12** | **24** |
| 13:15 13:30 | 3 | 4 | **7** | 2 | 6 | **8** | **15** |
| 12:30 13:30 | 28 | 18 | **46** | 19 | 30 | **49** | **95** |
| 15:00 15:15 | 2 | 5 | **7** | 2 | 4 | **6** | **13** |
| 15:15 15:30 | 5 | 6 | **11** | 8 | 4 | **12** | **23** |
| 15:30 15:45 | 10 | 2 | **12** | 3 | 4 | **7** | **19** |
| 15:45 16:00 | 1 | 3 | **4** | 3 | 2 | **5** | **9** |
| 15:00 16:00 | 18 | 16 | **34** | 16 | 14 | **30** | **64** |
| 16:00 16:15 | 2 | 4 | **6** | 3 | 3 | **6** | **12** |
| 16:15 16:30 | 5 | 6 | **11** | 3 | 6 | **9** | **20** |
| 16:30 16:45 | 1 | 7 | **8** | 5 | 3 | **8** | **16** |
| 16:45 17:00 | 3 | 1 | **4** | 3 | 1 | **4** | **8** |
| 16:00 17:00 | 11 | 18 | **29** | 14 | 13 | **27** | **56** |
| 17:00 17:15 | 6 | 4 | **10** | 9 | 4 | **13** | **23** |
| 17:15 17:30 | 8 | 2 | **10** | 7 | 2 | **9** | **19** |
| 17:30 17:45 | 1 | 7 | **8** | 4 | 4 | **8** | **16** |
| 17:45 18:00 | 0 | 5 | **5** | 1 | 2 | **3** | **8** |
| 17:00 18:00 | 15 | 18 | **33** | 21 | 12 | **33** | **66** |
| Total ..... | 126 | 145 | **271** | 132 | 146 | **278** | **549** |

**Comment:**

# Transportation Services - Traffic Services

**Work Order**
36955

## Turning Movement Count - 15 Min U-Turn Total Report

## CARLING AVE @ CHURCHILL AVE

**Survey Date:** Tuesday, April 25, 2017

| Time Period | | Northbound U-Turn Total | Southbound U-Turn Total | Eastbound U-Turn Total | Westbound U-Turn Total | Total |
|---|---|---|---|---|---|---|
| 07:00 | 07:15 | 0 | 0 | 1 | 3 | 4 |
| 07:15 | 07:30 | 0 | 0 | 2 | 2 | 4 |
| 07:30 | 07:45 | 0 | 0 | 1 | 9 | 10 |
| 07:45 | 08:00 | 0 | 0 | 1 | 5 | 6 |
| 08:00 | 08:15 | 0 | 0 | 1 | 4 | 5 |
| 08:15 | 08:30 | 0 | 0 | 2 | 7 | 9 |
| 08:30 | 08:45 | 0 | 0 | 2 | 7 | 9 |
| 08:45 | 09:00 | 0 | 0 | 1 | 3 | 4 |
| 09:00 | 09:15 | 0 | 0 | 2 | 9 | 11 |
| 09:15 | 09:30 | 0 | 0 | 2 | 6 | 8 |
| 09:30 | 09:45 | 0 | 0 | 4 | 7 | 11 |
| 09:45 | 10:00 | 0 | 0 | 3 | 10 | 13 |
| 11:30 | 11:45 | 0 | 0 | 1 | 13 | 14 |
| 11:45 | 12:00 | 0 | 0 | 5 | 15 | 20 |
| 12:00 | 12:15 | 0 | 0 | 4 | 7 | 11 |
| 12:15 | 12:30 | 0 | 0 | 4 | 9 | 13 |
| 12:30 | 12:45 | 0 | 0 | 1 | 7 | 8 |
| 12:45 | 13:00 | 0 | 0 | 4 | 7 | 11 |
| 13:00 | 13:15 | 0 | 0 | 2 | 9 | 11 |
| 13:15 | 13:30 | 0 | 0 | 3 | 14 | 17 |
| 15:00 | 15:15 | 0 | 0 | 4 | 7 | 11 |
| 15:15 | 15:30 | 0 | 0 | 5 | 7 | 12 |
| 15:30 | 15:45 | 0 | 0 | 4 | 7 | 11 |
| 15:45 | 16:00 | 0 | 0 | 3 | 3 | 6 |
| 16:00 | 16:15 | 0 | 0 | 3 | 3 | 6 |
| 16:15 | 16:30 | 0 | 0 | 1 | 3 | 4 |
| 16:30 | 16:45 | 0 | 0 | 7 | 8 | 15 |
| 16:45 | 17:00 | 0 | 0 | 2 | 4 | 6 |
| 17:00 | 17:15 | 0 | 0 | 2 | 3 | 5 |
| 17:15 | 17:30 | 0 | 0 | 3 | 3 | 6 |
| 17:30 | 17:45 | 0 | 0 | 6 | 2 | 8 |
| 17:45 | 18:00 | 0 | 0 | 2 | 7 | 9 |
| Total | | 0 | 0 | 88 | 210 | 298 |

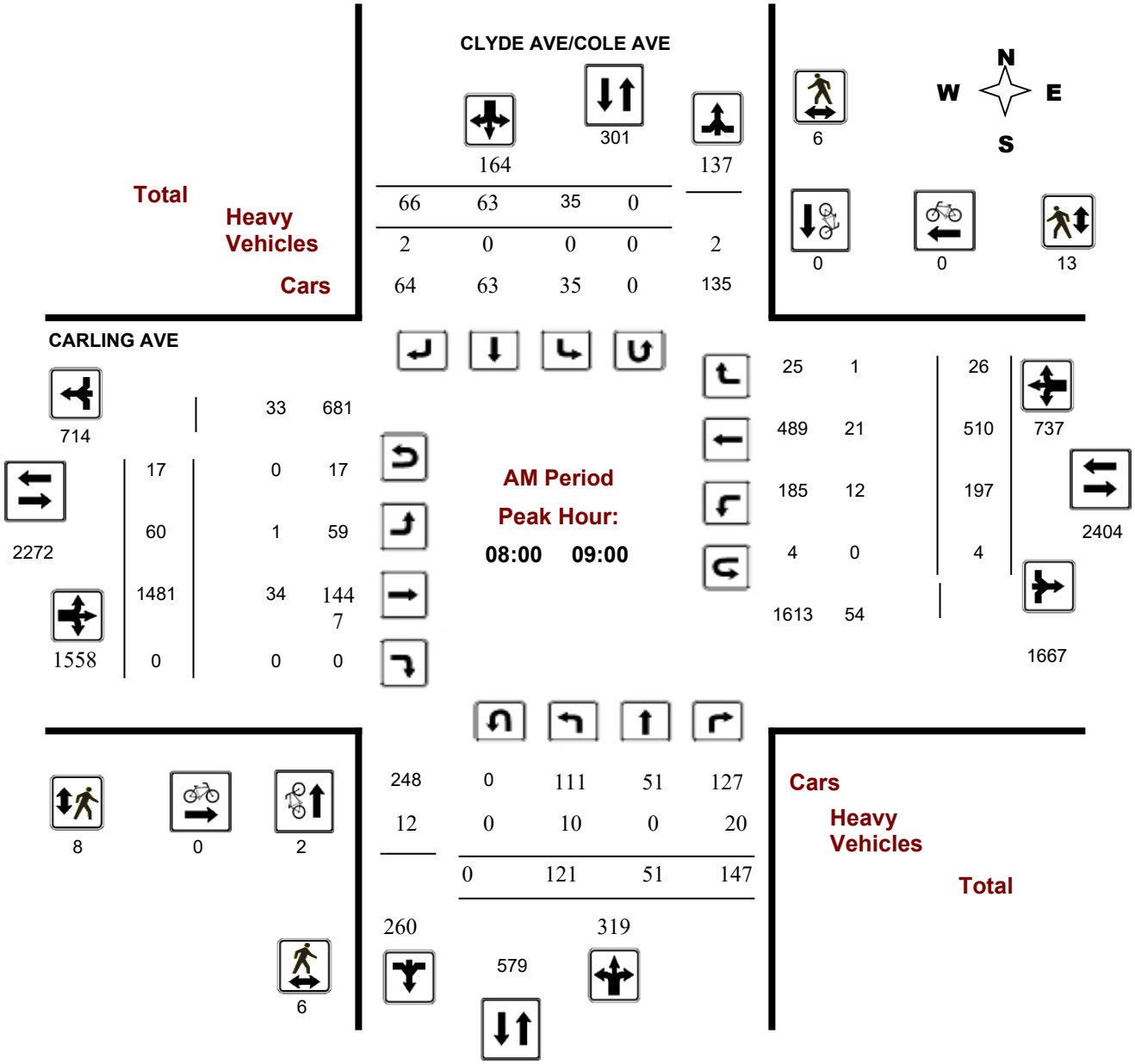
# Transportation Services - Traffic Services

## Turning Movement Count - Full Study Peak Hour Diagram

## CARLING AVE @ CLYDE AVE/COLE AVE

**Survey Date:** Wednesday, January 27, 2016 **WO No:** 35669

**Start Time:** 07:00 **Device:** Miovision




**Comments**

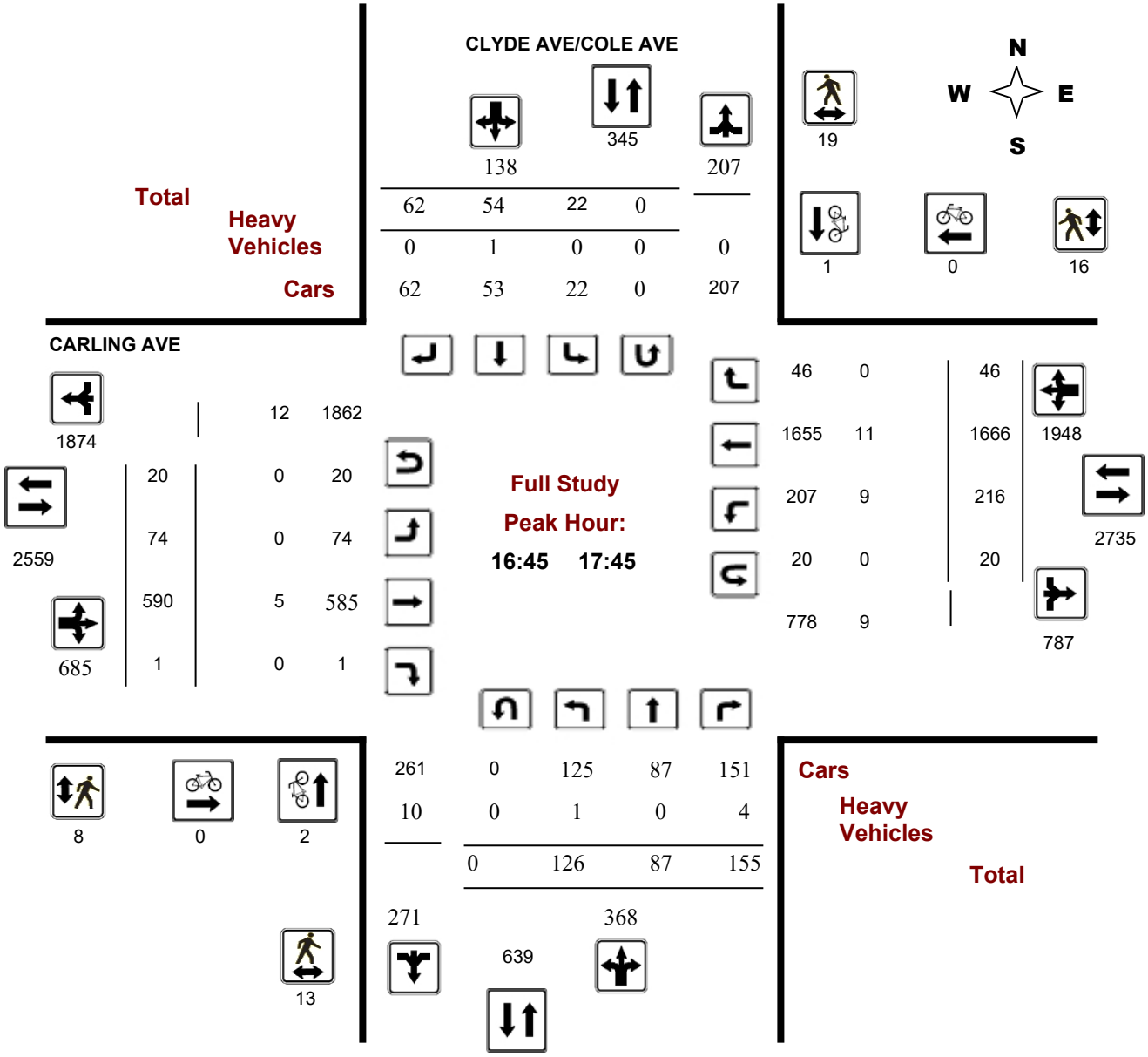
# Transportation Services - Traffic Services

## Turning Movement Count - Full Study Peak Hour Diagram

## CARLING AVE @ CLYDE AVE/COLE AVE

**Survey Date:** Wednesday, January 27, 2016 **WO No:** 35669

**Start Time:** 07:00 **Device:** Miovision




**Comments**

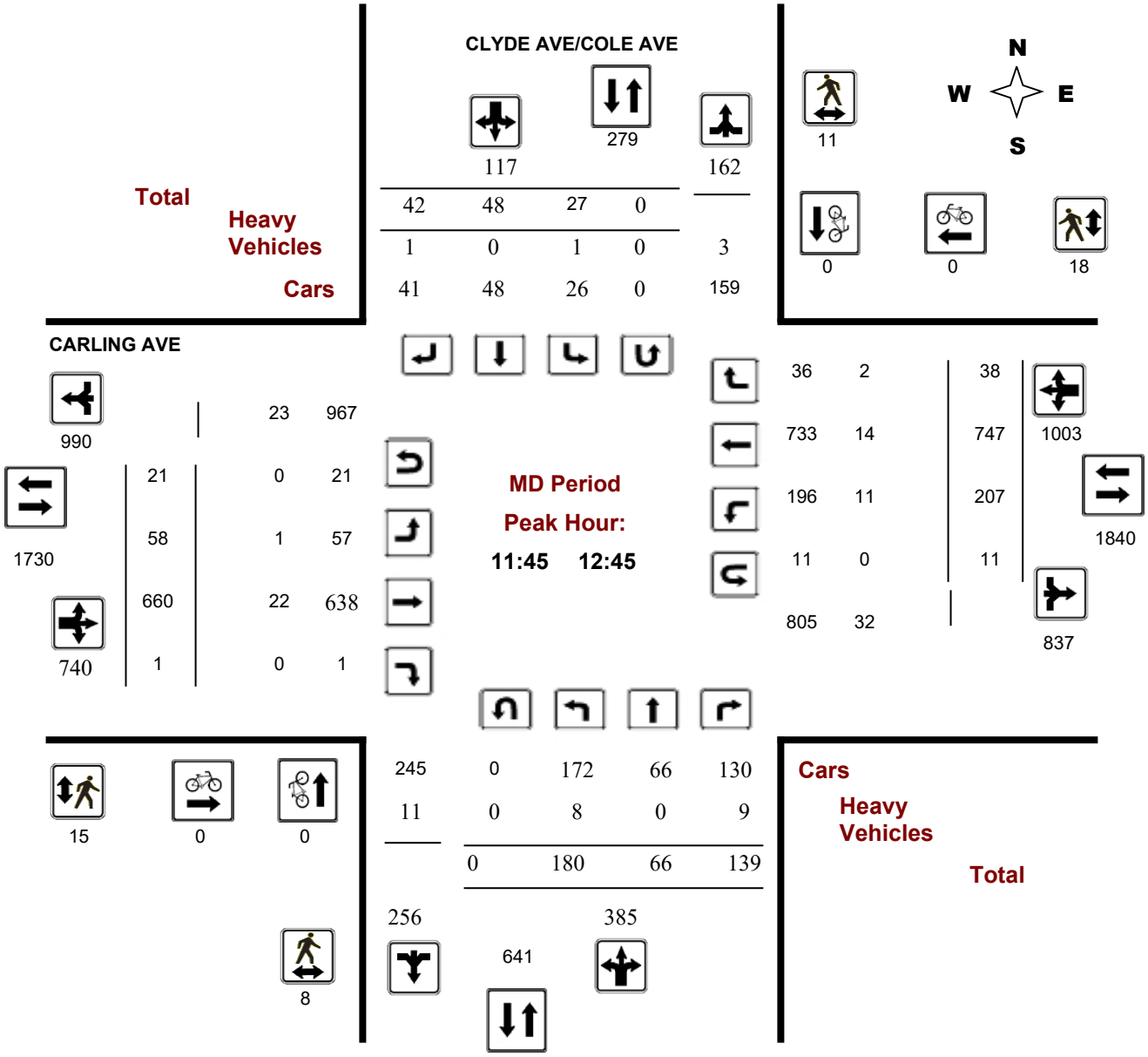
# Transportation Services - Traffic Services

## Turning Movement Count - Full Study Peak Hour Diagram

## CARLING AVE @ CLYDE AVE/COLE AVE

**Survey Date:** Wednesday, January 27, 2016 **WO No:** 35669

**Start Time:** 07:00 **Device:** Miovision




**Comments**

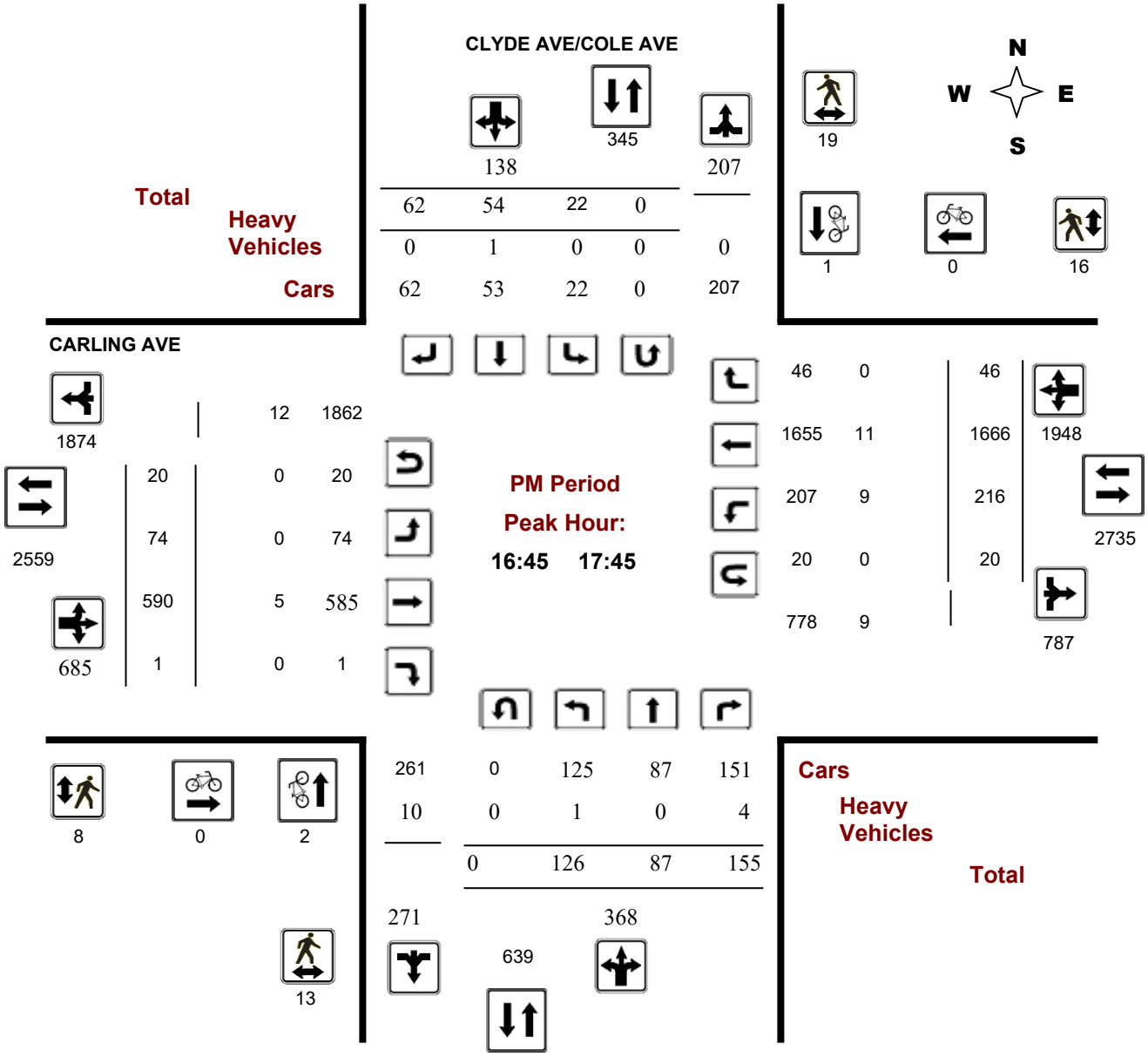
# Transportation Services - Traffic Services

## Turning Movement Count - Full Study Peak Hour Diagram

## CARLING AVE @ CLYDE AVE/COLE AVE

**Survey Date:** Wednesday, January 27, 2016 **WO No:** 35669

**Start Time:** 07:00 **Device:** Miovision




**Comments**

# Transportation Services - Traffic Services

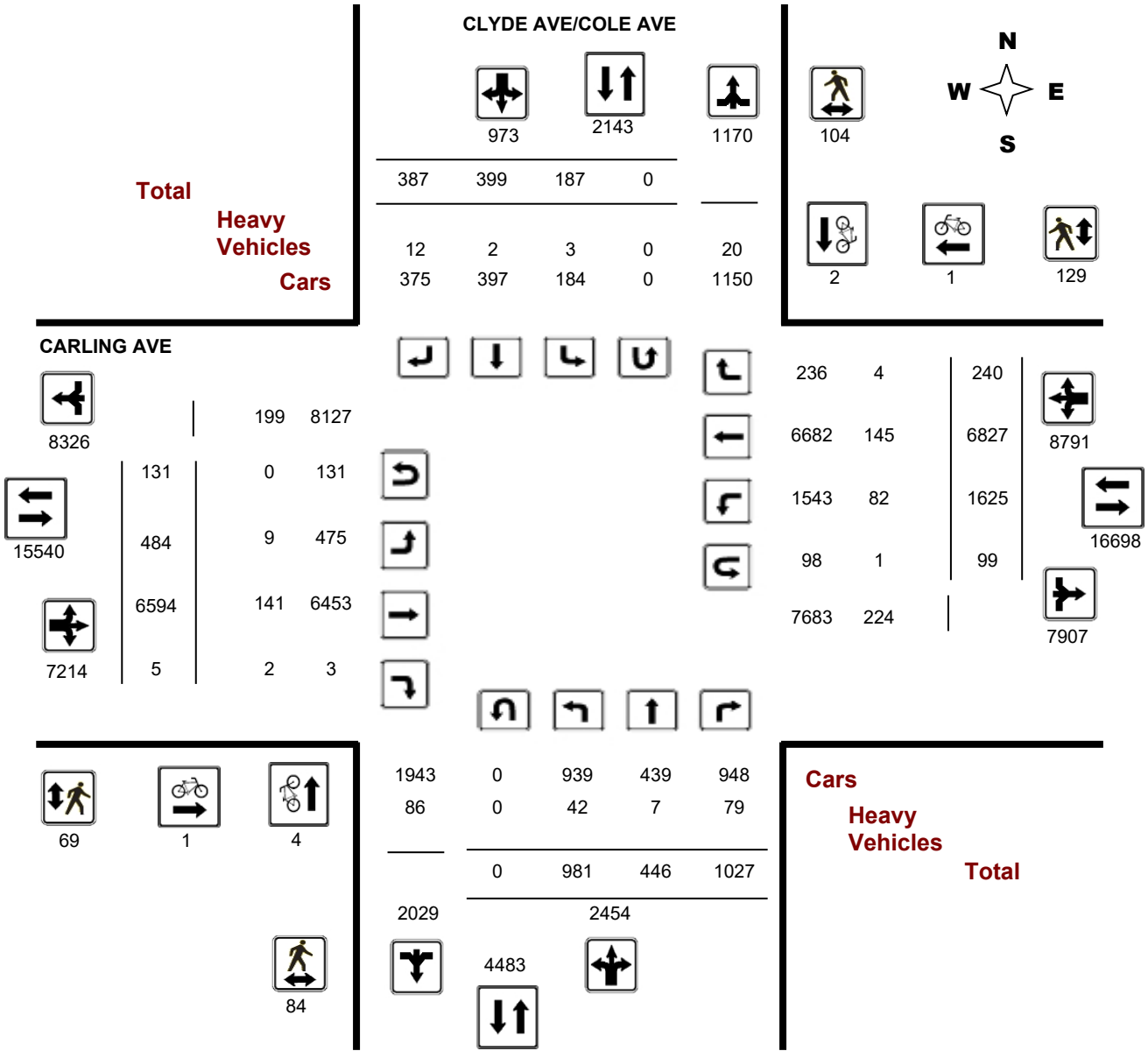
## Turning Movement Count - Full Study Diagram

## CARLING AVE @ CLYDE AVE/COLE AVE

**Survey Date:** Wednesday, January 27, 2016

**WO#:** 35669

**Device:** Miovision




**Comments**

# Transportation Services - Traffic Services

**Work Order**
35669

## Turning Movement Count - Full Study Summary Report

## CARLING AVE @ CLYDE AVE/COLE AVE

**Survey Date:** Wednesday, January 27, 201

**Total Observed U-Turns**

Northbound: 0 Southbound: 0

Eastbound: 131 Westbound: 99

**AADT Factor**
1.00

### Full Study

| | CLYDE AVE/COLE AVE | | | | | | | | | CARLING AVE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Northbound | | | | Southbound | | | | | Eastbound | | | | Westbound | | | | | |
| Period | LT | ST | RT | **NB TOT** | LT | ST | RT | **SB TOT** | **STR TOT** | LT | ST | RT | **EB TOT** | LT | ST | RT | **WB TOT** | **STR TOT** | **Grand Total** |
| 07:00 08:00 | 47 | 19 | 80 | **146** | 23 | 27 | 31 | **81** | **227** | 38 | 1209 | 0 | **1247** | 180 | 319 | 13 | **512** | **1759** | **1986** |
| 08:00 09:00 | 121 | 51 | 147 | **319** | 35 | 63 | 66 | **164** | **483** | 60 | 1481 | 0 | **1541** | 197 | 510 | 26 | **733** | **2274** | **2757** |
| 09:00 10:00 | 108 | 31 | 97 | **236** | 16 | 40 | 39 | **95** | **331** | 61 | 784 | 0 | **845** | 191 | 540 | 12 | **743** | **1588** | **1919** |
| 11:30 12:30 | 159 | 69 | 137 | **365** | 22 | 50 | 47 | **119** | **484** | 54 | 642 | 2 | **698** | 214 | 743 | 33 | **990** | **1688** | **2172** |
| 12:30 13:30 | 129 | 52 | 133 | **314** | 29 | 47 | 50 | **126** | **440** | 77 | 689 | 0 | **766** | 187 | 672 | 27 | **886** | **1652** | **2092** |
| 15:00 16:00 | 165 | 56 | 139 | **360** | 16 | 43 | 44 | **103** | **463** | 41 | 657 | 2 | **700** | 221 | 1117 | 34 | **1372** | **2072** | **2535** |
| 16:00 17:00 | 120 | 68 | 147 | **335** | 20 | 73 | 41 | **134** | **469** | 75 | 540 | 0 | **615** | 228 | 1381 | 51 | **1660** | **2275** | **2744** |
| 17:00 18:00 | 132 | 100 | 147 | **379** | 26 | 56 | 69 | **151** | **530** | 78 | 592 | 1 | **671** | 207 | 1545 | 44 | **1796** | **2467** | **2997** |
| **Sub Total** | 981 | 446 | 1027 | **2454** | 187 | 399 | 387 | **973** | **3427** | 484 | 6594 | 5 | **7083** | 1625 | 6827 | 240 | **8692** | **15775** | **19202** |
| **U Turns** | | | | **0** | | | | **0** | **0** | | | | **131** | | | | **99** | **230** | **230** |
| **Total** | 981 | 446 | 1027 | **2454** | 187 | 399 | 387 | **973** | **3427** | 484 | 6594 | 5 | **7214** | 1625 | 6827 | 240 | **8791** | **16005** | **19432** |
| **EQ 12Hr** | 1364 | 620 | 1428 | **3411** | 260 | 555 | 538 | **1352** | **4763** | 673 | 9166 | 7 | **10027** | 2259 | 9490 | 334 | **12219** | **22246** | **27009** |
| Note: These values are calculated by multiplying the totals by the appropriate expansion factor. | | | | | | | | | | | | | **1.39** | | | | | | |
| **AVG 12Hr** | 1364 | 620 | 1428 | **3411** | 260 | 555 | 538 | **1352** | **4763** | 673 | 9166 | 7 | **10027** | 2259 | 9490 | 334 | **12219** | **22246** | **27009** |
| Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. | | | | | | | | | | | | | **1.00** | | | | | | |
| **AVG 24Hr** | 1786 | 812 | 1870 | **4468** | 341 | 727 | 705 | **1772** | **6240** | 881 | 12007 | 9 | **13136** | 2959 | 12431 | 437 | **16008** | **29144** | **35384** |
| Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. | | | | | | | | | | | | | **1.31** | | | | | | |

**Comments:**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

# Transportation Services - Traffic Services

W.O. 35669

## Turning Movement Count - 15 Minute Summary Report

## CARLING AVE @ CLYDE AVE/COLE AVE

**Survey Date:** Wednesday, January 27, 2016

**Total Observed U-Turns**

Northbound: 0 Southbound: 0

Eastbound: 131 Westbound: 99

| | | CLYDE AVE/COLE AVE | | | | | | | | | CARLING AVE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Northbound | | | | Southbound | | | | | Eastbound | | | | Westbound | | | | | |
| Time Period | | LT | ST | RT | N TOT | LT | ST | RT | S TOT | STR TOT | LT | ST | RT | E TOT | LT | ST | RT | W TOT | STR TOT | Grand Total |
| 07:00 | 07:15 | 6 | 2 | 13 | **21** | 3 | 1 | 3 | **7** | **28** | 8 | 221 | 0 | **229** | 37 | 46 | 4 | **89** | **318** | **346** |
| 07:15 | 07:30 | 10 | 5 | 10 | **25** | 5 | 7 | 9 | **21** | **46** | 10 | 281 | 0 | **294** | 50 | 77 | 4 | **133** | **427** | **473** |
| 07:30 | 07:45 | 13 | 4 | 21 | **38** | 8 | 6 | 8 | **22** | **60** | 9 | 344 | 0 | **357** | 50 | 86 | 1 | **141** | **498** | **558** |
| 07:45 | 08:00 | 18 | 8 | 36 | **62** | 7 | 13 | 11 | **31** | **93** | 11 | 363 | 0 | **378** | 43 | 110 | 4 | **158** | **536** | **629** |
| 08:00 | 08:15 | 34 | 6 | 29 | **69** | 6 | 12 | 17 | **35** | **104** | 15 | 393 | 0 | **409** | 41 | 112 | 5 | **159** | **568** | **672** |
| 08:15 | 08:30 | 33 | 16 | 39 | **88** | 13 | 10 | 21 | **44** | **132** | 12 | 383 | 0 | **398** | 48 | 116 | 2 | **166** | **564** | **696** |
| 08:30 | 08:45 | 23 | 14 | 49 | **86** | 12 | 19 | 16 | **47** | **133** | 16 | 399 | 0 | **421** | 43 | 146 | 7 | **198** | **619** | **752** |
| 08:45 | 09:00 | 31 | 15 | 30 | **76** | 4 | 22 | 12 | **38** | **114** | 17 | 306 | 0 | **330** | 65 | 136 | 12 | **214** | **544** | **658** |
| 09:00 | 09:15 | 25 | 6 | 18 | **49** | 8 | 13 | 13 | **34** | **83** | 17 | 269 | 0 | **290** | 64 | 138 | 3 | **206** | **496** | **579** |
| 09:15 | 09:30 | 30 | 7 | 28 | **65** | 4 | 16 | 8 | **28** | **93** | 19 | 208 | 0 | **229** | 55 | 117 | 4 | **178** | **407** | **500** |
| 09:30 | 09:45 | 24 | 9 | 30 | **63** | 1 | 9 | 8 | **18** | **81** | 14 | 152 | 0 | **172** | 37 | 130 | 3 | **171** | **343** | **424** |
| 09:45 | 10:00 | 29 | 9 | 21 | **59** | 3 | 2 | 10 | **15** | **74** | 11 | 155 | 0 | **170** | 35 | 155 | 2 | **194** | **364** | **438** |
| 11:30 | 11:45 | 18 | 16 | 30 | **64** | 4 | 18 | 12 | **34** | **98** | 12 | 169 | 1 | **189** | 50 | 155 | 4 | **212** | **401** | **499** |
| 11:45 | 12:00 | 63 | 14 | 33 | **110** | 4 | 6 | 15 | **25** | **135** | 15 | 149 | 1 | **172** | 55 | 195 | 9 | **261** | **433** | **568** |
| 12:00 | 12:15 | 39 | 20 | 40 | **99** | 7 | 11 | 12 | **30** | **129** | 13 | 148 | 0 | **168** | 57 | 204 | 9 | **274** | **442** | **571** |
| 12:15 | 12:30 | 39 | 19 | 34 | **92** | 7 | 15 | 8 | **30** | **122** | 14 | 176 | 0 | **192** | 52 | 189 | 11 | **254** | **446** | **568** |
| 12:30 | 12:45 | 39 | 13 | 32 | **84** | 9 | 16 | 7 | **32** | **116** | 16 | 187 | 0 | **208** | 43 | 159 | 9 | **214** | **422** | **538** |
| 12:45 | 13:00 | 30 | 11 | 41 | **82** | 8 | 12 | 16 | **36** | **118** | 19 | 162 | 0 | **187** | 36 | 188 | 6 | **236** | **423** | **541** |
| 13:00 | 13:15 | 29 | 16 | 31 | **76** | 5 | 7 | 9 | **21** | **97** | 24 | 172 | 0 | **198** | 57 | 151 | 8 | **220** | **418** | **515** |
| 13:15 | 13:30 | 31 | 12 | 29 | **72** | 7 | 12 | 18 | **37** | **109** | 18 | 168 | 0 | **191** | 51 | 174 | 4 | **231** | **422** | **531** |
| 15:00 | 15:15 | 38 | 6 | 35 | **79** | 4 | 10 | 13 | **27** | **106** | 9 | 181 | 1 | **195** | 52 | 224 | 6 | **285** | **480** | **586** |
| 15:15 | 15:30 | 46 | 15 | 39 | **100** | 2 | 13 | 10 | **25** | **125** | 11 | 145 | 0 | **161** | 60 | 262 | 9 | **335** | **496** | **621** |
| 15:30 | 15:45 | 29 | 15 | 33 | **77** | 4 | 10 | 9 | **23** | **100** | 6 | 181 | 0 | **190** | 61 | 303 | 13 | **382** | **572** | **672** |
| 15:45 | 16:00 | 52 | 20 | 32 | **104** | 6 | 10 | 12 | **28** | **132** | 15 | 150 | 1 | **171** | 48 | 328 | 6 | **386** | **557** | **689** |
| 16:00 | 16:15 | 33 | 15 | 33 | **81** | 3 | 16 | 10 | **29** | **110** | 16 | 150 | 0 | **169** | 58 | 387 | 10 | **460** | **629** | **739** |
| 16:15 | 16:30 | 29 | 23 | 36 | **88** | 10 | 28 | 9 | **47** | **135** | 26 | 130 | 0 | **157** | 43 | 261 | 13 | **321** | **478** | **613** |
| 16:30 | 16:45 | 32 | 19 | 38 | **89** | 5 | 17 | 7 | **29** | **118** | 21 | 138 | 0 | **162** | 72 | 309 | 18 | **402** | **564** | **682** |
| 16:45 | 17:00 | 26 | 11 | 40 | **77** | 2 | 12 | 15 | **29** | **106** | 12 | 122 | 0 | **137** | 55 | 424 | 10 | **489** | **626** | **732** |
| 17:00 | 17:15 | 38 | 35 | 50 | **123** | 4 | 12 | 18 | **34** | **157** | 19 | 171 | 0 | **201** | 52 | 461 | 9 | **527** | **728** | **885** |
| 17:15 | 17:30 | 39 | 15 | 35 | **89** | 8 | 12 | 17 | **37** | **126** | 18 | 150 | 0 | **169** | 58 | 414 | 12 | **488** | **657** | **783** |
| 17:30 | 17:45 | 23 | 26 | 30 | **79** | 8 | 18 | 12 | **38** | **117** | 25 | 147 | 1 | **178** | 51 | 367 | 15 | **444** | **622** | **739** |
| 17:45 | 18:00 | 32 | 24 | 32 | **88** | 6 | 14 | 22 | **42** | **130** | 16 | 124 | 0 | **142** | 46 | 303 | 8 | **363** | **505** | **635** |
| TOTAL: | | 981 | 446 | 1027 | **2454** | 187 | 399 | 387 | **973** | **3427** | 484 | 6594 | 5 | **7214** | 1625 | 6827 | 240 | **8791** | **16005** | **19432** |

Note: U-Turns are included in Totals.

**Comment:**

# Transportation Services - Traffic Services

## Turning Movement Count - Cyclist Volume Report

**Work Order**
**35669**

## CARLING AVE @ CLYDE AVE/COLE AVE

**Count Date:** Wednesday, January 27, 2016 **Start Time:** 07:00

| | CLYDE AVE/COLE AVE | | | CARLING AVE | | | |
|---|---|---|---|---|---|---|---|
| Time Period | Northbound | Southbound | **Street Total** | Eastbound | Westbound | **Street Total** | **Grand Total** |
| 07:00 08:00 | 0 | 1 | **1** | 0 | 0 | **0** | **1** |
| 08:00 09:00 | 2 | 0 | **2** | 0 | 0 | **0** | **2** |
| 09:00 10:00 | 0 | 0 | **0** | 0 | 0 | **0** | **0** |
| 11:30 12:30 | 0 | 0 | **0** | 0 | 0 | **0** | **0** |
| 12:30 13:30 | 0 | 0 | **0** | 1 | 1 | **2** | **2** |
| 15:00 16:00 | 0 | 0 | **0** | 0 | 0 | **0** | **0** |
| 16:00 17:00 | 1 | 0 | **1** | 0 | 0 | **0** | **1** |
| 17:00 18:00 | 1 | 1 | **2** | 0 | 0 | **0** | **2** |
| Total ..... | 4 | 2 | **6** | 1 | 1 | **2** | **8** |

**Comment:**

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

# Transportation Services - Traffic Services

**W.O.** 35669

## Turning Movement Count - Heavy Vehicle Report

## CARLING AVE @ CLYDE AVE/COLE AVE

**Survey Date:** Wednesday, January 27, 2016

| | | CLYDE AVE/COLE AVE | | | | | | | | | CARLING AVE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Northbound | | | | Southbound | | | | | Eastbound | | | | Westbound | | | | | |
| Time Period | | LT | ST | RT | **N TOT** | LT | ST | RT | **S TOT** | **STR TOT** | LT | ST | RT | **E TOT** | LT | ST | RT | **W TOT** | **STR TOT** | **Grand Total** |
| 07:00 | 08:00 | 6 | 1 | 13 | **20** | 0 | 0 | 4 | **4** | **24** | 3 | 12 | 0 | **15** | 6 | 14 | 0 | **20** | **35** | **59** |
| 08:00 | 09:00 | 10 | 0 | 20 | **30** | 0 | 0 | 2 | **2** | **32** | 1 | 34 | 0 | **35** | 12 | 21 | 1 | **34** | **69** | **101** |
| 09:00 | 10:00 | 6 | 1 | 14 | **21** | 1 | 0 | 1 | **2** | **23** | 1 | 27 | 0 | **28** | 12 | 26 | 0 | **38** | **66** | **89** |
| 11:30 | 12:30 | 6 | 0 | 10 | **16** | 1 | 0 | 0 | **1** | **17** | 1 | 25 | 0 | **26** | 15 | 18 | 2 | **35** | **61** | **78** |
| 12:30 | 13:30 | 5 | 3 | 9 | **17** | 0 | 1 | 2 | **3** | **20** | 0 | 16 | 0 | **16** | 12 | 15 | 0 | **28** | **44** | **64** |
| 15:00 | 16:00 | 5 | 2 | 6 | **13** | 0 | 0 | 3 | **3** | **16** | 1 | 13 | 2 | **16** | 7 | 21 | 1 | **29** | **45** | **61** |
| 16:00 | 17:00 | 4 | 0 | 2 | **6** | 1 | 1 | 0 | **2** | **8** | 2 | 8 | 0 | **10** | 8 | 17 | 0 | **25** | **35** | **43** |
| 17:00 | 18:00 | 0 | 0 | 5 | **5** | 0 | 0 | 0 | **0** | **5** | 0 | 6 | 0 | **6** | 10 | 13 | 0 | **23** | **29** | **34** |
| **Sub Total** | | 42 | 7 | 79 | **128** | 3 | 2 | 12 | **17** | **145** | 9 | 141 | 2 | **152** | 82 | 145 | 4 | **232** | **384** | **529** |
| **U-Turns (Heavy Vehicles)** | | | | | **0** | | | | **0** | **0** | | | | **0** | | | | **1** | **1** | **1** |
| **Total** | | 42 | 7 | 79 | **0** | 3 | 2 | 12 | **17** | **145** | 9 | 141 | 2 | **152** | 82 | 145 | 4 | **233** | **385** | **530** |

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

# Transportation Services - Traffic Services

**Work Order**
**35669**

## Turning Movement Count - Pedestrian Volume Report

### CARLING AVE @ CLYDE AVE/COLE AVE

**Count Date:** Wednesday, January 27, 2016 **Start Time:** 07:00

| Time Period | NB Approach (E or W Crossing) | SB Approach (E or W Crossing) | Total | EB Approach (N or S Crossing) | WB Approach (N or S Crossing) | Total | Grand Total |
|---|---|---|---|---|---|---|---|
| 07:00 07:15 | 1 | 4 | **5** | 2 | 1 | **3** | **8** |
| 07:15 07:30 | 1 | 2 | **3** | 1 | 4 | **5** | **8** |
| 07:30 07:45 | 2 | 4 | **6** | 0 | 2 | **2** | **8** |
| 07:45 08:00 | 7 | 3 | **10** | 2 | 10 | **12** | **22** |
| 07:00 08:00 | 11 | 13 | **24** | 5 | 17 | **22** | **46** |
| 08:00 08:15 | 1 | 2 | **3** | 2 | 5 | **7** | **10** |
| 08:15 08:30 | 2 | 1 | **3** | 4 | 4 | **8** | **11** |
| 08:30 08:45 | 2 | 2 | **4** | 2 | 4 | **6** | **10** |
| 08:45 09:00 | 1 | 1 | **2** | 0 | 0 | **0** | **2** |
| 08:00 09:00 | 6 | 6 | **12** | 8 | 13 | **21** | **33** |
| 09:00 09:15 | 5 | 6 | **11** | 1 | 3 | **4** | **15** |
| 09:15 09:30 | 1 | 2 | **3** | 1 | 2 | **3** | **6** |
| 09:30 09:45 | 0 | 0 | **0** | 1 | 1 | **2** | **2** |
| 09:45 10:00 | 2 | 2 | **4** | 4 | 3 | **7** | **11** |
| 09:00 10:00 | 8 | 10 | **18** | 7 | 9 | **16** | **34** |
| 11:30 11:45 | 2 | 7 | **9** | 1 | 6 | **7** | **16** |
| 11:45 12:00 | 3 | 2 | **5** | 3 | 1 | **4** | **9** |
| 12:00 12:15 | 0 | 4 | **4** | 5 | 8 | **13** | **17** |
| 12:15 12:30 | 1 | 2 | **3** | 2 | 0 | **2** | **5** |
| 11:30 12:30 | 6 | 15 | **21** | 11 | 15 | **26** | **47** |
| 12:30 12:45 | 4 | 3 | **7** | 5 | 9 | **14** | **21** |
| 12:45 13:00 | 3 | 1 | **4** | 1 | 6 | **7** | **11** |
| 13:00 13:15 | 5 | 6 | **11** | 5 | 8 | **13** | **24** |
| 13:15 13:30 | 2 | 2 | **4** | 2 | 0 | **2** | **6** |
| 12:30 13:30 | 14 | 12 | **26** | 13 | 23 | **36** | **62** |
| 15:00 15:15 | 3 | 4 | **7** | 1 | 6 | **7** | **14** |
| 15:15 15:30 | 2 | 10 | **12** | 2 | 5 | **7** | **19** |
| 15:30 15:45 | 1 | 1 | **2** | 4 | 3 | **7** | **9** |
| 15:45 16:00 | 5 | 3 | **8** | 0 | 4 | **4** | **12** |
| 15:00 16:00 | 11 | 18 | **29** | 7 | 18 | **25** | **54** |
| 16:00 16:15 | 7 | 2 | **9** | 4 | 3 | **7** | **16** |
| 16:15 16:30 | 1 | 3 | **4** | 1 | 6 | **7** | **11** |
| 16:30 16:45 | 5 | 5 | **10** | 4 | 5 | **9** | **19** |
| 16:45 17:00 | 3 | 3 | **6** | 0 | 6 | **6** | **12** |
| 16:00 17:00 | 16 | 13 | **29** | 9 | 20 | **29** | **58** |
| 17:00 17:15 | 1 | 3 | **4** | 1 | 5 | **6** | **10** |
| 17:15 17:30 | 5 | 5 | **10** | 2 | 2 | **4** | **14** |
| 17:30 17:45 | 4 | 8 | **12** | 5 | 3 | **8** | **20** |
| 17:45 18:00 | 2 | 1 | **3** | 1 | 4 | **5** | **8** |
| 17:00 18:00 | 12 | 17 | **29** | 9 | 14 | **23** | **52** |
| Total ..... | 84 | 104 | **188** | 69 | 129 | **198** | **386** |

**Comment:**

# Transportation Services - Traffic Services

**Work Order**
35669

## Turning Movement Count - 15 Min U-Turn Total Report

## CARLING AVE @ CLYDE AVE/COLE AVE

**Survey Date:** Wednesday, January 27, 2016

| Time Period | | Northbound U-Turn Total | Southbound U-Turn Total | Eastbound U-Turn Total | Westbound U-Turn Total | Total |
|---|---|---|---|---|---|---|
| 07:00 | 07:15 | 0 | 0 | 0 | 2 | 2 |
| 07:15 | 07:30 | 0 | 0 | 3 | 2 | 5 |
| 07:30 | 07:45 | 0 | 0 | 4 | 4 | 8 |
| 07:45 | 08:00 | 0 | 0 | 4 | 1 | 5 |
| 08:00 | 08:15 | 0 | 0 | 1 | 1 | 2 |
| 08:15 | 08:30 | 0 | 0 | 3 | 0 | 3 |
| 08:30 | 08:45 | 0 | 0 | 6 | 2 | 8 |
| 08:45 | 09:00 | 0 | 0 | 7 | 1 | 8 |
| 09:00 | 09:15 | 0 | 0 | 4 | 1 | 5 |
| 09:15 | 09:30 | 0 | 0 | 2 | 2 | 4 |
| 09:30 | 09:45 | 0 | 0 | 6 | 1 | 7 |
| 09:45 | 10:00 | 0 | 0 | 4 | 2 | 6 |
| 11:30 | 11:45 | 0 | 0 | 7 | 3 | 10 |
| 11:45 | 12:00 | 0 | 0 | 7 | 2 | 9 |
| 12:00 | 12:15 | 0 | 0 | 7 | 4 | 11 |
| 12:15 | 12:30 | 0 | 0 | 2 | 2 | 4 |
| 12:30 | 12:45 | 0 | 0 | 5 | 3 | 8 |
| 12:45 | 13:00 | 0 | 0 | 6 | 6 | 12 |
| 13:00 | 13:15 | 0 | 0 | 2 | 4 | 6 |
| 13:15 | 13:30 | 0 | 0 | 5 | 2 | 7 |
| 15:00 | 15:15 | 0 | 0 | 4 | 3 | 7 |
| 15:15 | 15:30 | 0 | 0 | 5 | 4 | 9 |
| 15:30 | 15:45 | 0 | 0 | 3 | 5 | 8 |
| 15:45 | 16:00 | 0 | 0 | 5 | 4 | 9 |
| 16:00 | 16:15 | 0 | 0 | 3 | 5 | 8 |
| 16:15 | 16:30 | 0 | 0 | 1 | 4 | 5 |
| 16:30 | 16:45 | 0 | 0 | 3 | 3 | 6 |
| 16:45 | 17:00 | 0 | 0 | 3 | 0 | 3 |
| 17:00 | 17:15 | 0 | 0 | 11 | 5 | 16 |
| 17:15 | 17:30 | 0 | 0 | 1 | 4 | 5 |
| 17:30 | 17:45 | 0 | 0 | 5 | 11 | 16 |
| 17:45 | 18:00 | 0 | 0 | 2 | 6 | 8 |
| Total | | 0 | 0 | 131 | 99 | 230 |

# Appendix D

City of Ottawa Collision Data

**Total Area**

| Classification of Accident | Rear End | Turning Movement | Sideswipe | Angle | Approaching | Single Vehicle (other) | Single vehicle (Unattended vehicle) | Other | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| P.D. only | 19 | 24 | 20 | 2 | 0 | 0 | 0 | 0 | 65 | 83% |
| Non-fatal injury | 3 | 7 | 1 | 2 | 0 | 0 | 0 | 0 | 13 | 17% |
| Non reportable | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0% |
| Total | **22** | **31** | **21** | **4** | **0** | **0** | **0** | **0** | **78** | 100% |
| | #2 or 28% | #1 or 40% | #3 or 27% | #4 or 5% | #5 or 0% | #5 or 0% | #5 or 0% | #5 or 0% | | |

**Carling Ave / Churchill Ave**

| Years | Total # Collisions | 24 Hr AADT Veh Volume | Days | Collisions/MEV |
|---|---|---|---|---|
| 2014-2018 | 22 | 38,416 | 1825 | **0.31** |

| Classification of Accident | Rear End | Turning Movement | Sideswipe | Angle | Approaching | Single Vehicle (other) | Single vehicle (Unattended vehicle) | Other | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| P.D. only | 11 | 1 | 6 | 1 | 0 | 0 | 0 | 0 | 19 | 86% |
| Non-fatal injury | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 14% |
| Non reportable | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0% |
| Total | **13** | **1** | **7** | **1** | **0** | **0** | **0** | **0** | **22** | 100% |
| | 59% | 5% | 32% | 5% | 0% | 0% | 0% | 0% | | |

**Carling Ave / Clyde Ave / Cole Ave**

| Years | Total # Collisions | 24 Hr AADT Veh Volume | Days | Collisions/MEV |
|---|---|---|---|---|
| 2014-2018 | 50 | 35,384 | 1825 | **0.77** |

| Classification of Accident | Rear End | Turning Movement | Sideswipe | Angle | Approaching | Single Vehicle (other) | Single vehicle (Unattended vehicle) | Other | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| P.D. only | 6 | 22 | 11 | 1 | 0 | 0 | 0 | 0 | 40 | 80% |
| Non-fatal injury | 1 | 7 | 0 | 2 | 0 | 0 | 0 | 0 | 10 | 20% |
| Non reportable | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0% |
| Total | **7** | **29** | **11** | **3** | **0** | **0** | **0** | **0** | **50** | 100% |
| | 14% | 58% | 22% | 6% | 0% | 0% | 0% | 0% | | |

**Carling Ave EB, Clyde Ave to Churchill Ave N**

| Years | Total # Collisions | 24 Hr AADT Veh Volume | Days | Collisions/MEV |
|---|---|---|---|---|
| 2014-2018 | 1 | n/a | 1825 | **n/a** |

| Classification of Accident | Rear End | Turning Movement | Sideswipe | Angle | Approaching | Single Vehicle (other) | Single vehicle (Unattended vehicle) | Other | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| P.D. only | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 100% |
| Non-fatal injury | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0% |
| Non reportable | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0% |
| Total | **0** | **0** | **1** | **0** | **0** | **0** | **0** | **0** | **1** | 100% |
| | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | | |

**Carling Ave WB, Cole Ave to Churchill Ave N**

| Years | Total # Collisions | 24 Hr AADT Veh Volume | Days | Collisions/MEV |
|---|---|---|---|---|
| 2014-2018 | 5 | n/a | 1825 | **n/a** |

| Classification of Accident | Rear End | Turning Movement | Sideswipe | Angle | Approaching | Single Vehicle (other) | Single vehicle (Unattended vehicle) | Other | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| P.D. only | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 5 | 100% |
| Non-fatal injury | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0% |
| Non reportable | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0% |
| Total | **2** | **1** | **2** | **0** | **0** | **0** | **0** | **0** | **5** | 100% |
| | 40% | 20% | 40% | 0% | 0% | 0% | 0% | 0% | | |

# City Operations - Transportation Services

## Collision Details Report - Public Version

**From:** January 1, 2014 **To:** December 31, 2018

**Location:** CARLING AVE @ CHURCHILL AVE

**Traffic Control:** Traffic signal

**Total Collisions:** 23

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2014-Mar-04, Tue,14:04 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Truck and trailer | Other motor vehicle | |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2014-Jun-09, Mon,08:55 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2014-Sep-15, Mon,16:25 | Clear | Sideswipe | Non-fatal injury | Dry | East | Changing lanes | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Going ahead | Pick-up truck | Other motor vehicle | |
| 2015-Mar-28, Sat,13:18 | Clear | Rear end | P.D. only | Dry | East | Turning left | Municipal transit bus | Other motor vehicle | |
| | | | | | East | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2015-May-01, Fri,13:22 | Clear | Rear end | P.D. only | Dry | South | Turning right | Pick-up truck | Other motor vehicle | |
| | | | | | South | Turning right | Pick-up truck | Other motor vehicle | |
| 2015-Nov-04, Wed,16:04 | Clear | Rear end | P.D. only | Dry | West | Slowing or stopping | Pick-up truck | Other motor vehicle | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle |
| 2015-Jul-08, Wed,13:40 | Clear | Sideswipe | P.D. only | Dry | West | Changing lanes | Pick-up truck | Other motor vehicle |
| | | | | | West | Turning left | Automobile, station wagon | Other motor vehicle |
| 2016-May-19, Thu,13:41 | Clear | Rear end | P.D. only | Dry | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle |
| 2016-Mar-04, Fri,11:19 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Automobile, station wagon | Other motor vehicle |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle |
| 2016-Jul-08, Fri,14:38 | Clear | Sideswipe | P.D. only | Dry | East | Turning right | Truck - open | Other motor vehicle |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle |
| 2017-Aug-16, Wed,15:00 | Clear | Turning movement | P.D. only | Dry | East | Going ahead | Delivery van | Other motor vehicle |
| | | | | | East | Turning right | Automobile, station wagon | Other motor vehicle |
| 2017-Feb-10, Fri,09:52 | Clear | Rear end | P.D. only | Dry | East | Slowing or stopping | Pick-up truck | Other motor vehicle |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle |
| 2017-Jul-19, Wed,16:45 | Clear | Angle | P.D. only | Dry | East | Going ahead | Automobile, station wagon | Other motor vehicle |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | North | Turning left | Automobile, station wagon | Other motor vehicle |
| 2017-Sep-20, Wed,19:20 | Clear | Sideswipe | P.D. only | Dry | West | Changing lanes | Automobile, station wagon | Other motor vehicle |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2018-Jan-16, Tue,18:18 | Clear | Rear end | P.D. only | Slush | South | Going ahead | Automobile, station wagon | Other motor vehicle |
| | | | | | South | Stopped | Automobile, station wagon | Other motor vehicle |
| 2018-Feb-27, Tue,11:26 | Clear | Sideswipe | P.D. only | Dry | East | Changing lanes | Truck - closed | Other motor vehicle |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2018-Mar-27, Tue,10:50 | Clear | SMV other | Non-fatal injury | Dry | South | Turning left | Automobile, station wagon | Curb |
| 2018-Oct-12, Fri,10:20 | Clear | Rear end | P.D. only | Dry | East | Turning left | Truck - dump | Other motor vehicle |
| | | | | | East | Turning left | Delivery van | Other motor vehicle |
| 2018-Sep-05, Wed,08:46 | Clear | Rear end | P.D. only | Dry | East | Changing lanes | Automobile, station wagon | Other motor vehicle |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle |
| 2018-Sep-04, Tue,08:30 | Clear | Sideswipe | P.D. only | Dry | West | Changing lanes | Truck - dump | Other motor vehicle |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2018-Jul-23, Mon,18:59 | Clear | Rear end | Non-fatal injury | Dry | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2018-Dec-25, Tue,12:19 | Clear | Rear end | Non-fatal injury | Dry | South | Turning left | Automobile, station wagon | Other motor vehicle | |
| | | | | | South | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2018-Aug-27, Mon,12:02 | Clear | Sideswipe | P.D. only | Dry | West | Changing lanes | Pick-up truck | Other motor vehicle | |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle | |

**Location:** CARLING AVE @ CLYDE AVE/COLE AVE

**Traffic Control:** Traffic signal **Total Collisions:** 55

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2014-Jan-29, Wed,15:37 | Clear | Turning movement | P.D. only | Slush | North | Turning left | Automobile, station wagon | Other motor vehicle | |
| | | | | | South | Going ahead | Delivery van | Other motor vehicle | |
| 2014-Mar-12, Wed,17:04 | Drifting Snow | Turning movement | P.D. only | Packed snow | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2014-Apr-16, Wed,10:05 | Clear | Sideswipe | P.D. only | Dry | North | Changing lanes | Delivery van | Other motor vehicle | |
| | | | | | North | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2014-Mar-25, Tue,15:40 | Clear | Turning movement | P.D. only | Dry | East | Turning left | Pick-up truck | Other motor vehicle | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2014-Jan-30, Thu,13:05 | Clear | SMV other | Non-fatal injury | Dry | North | Turning left | Automobile, station wagon | Pedestrian | 1 |
| 2014-Jul-19, Sat,12:01 | Clear | Turning movement | P.D. only | Dry | East | Making "U" turn | Automobile, station wagon | Other motor vehicle | |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2014-Dec-05, Fri,14:15 | Clear | Turning movement | Non-fatal injury | Dry | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Going ahead | Passenger van | Other motor vehicle | |
| 2014-Nov-14, Fri,16:14 | Snow | Turning movement | P.D. only | Wet | East | Making "U" turn | Automobile, station wagon | Other motor vehicle | |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2014-Nov-06, Thu,11:59 | Clear | Sideswipe | P.D. only | Dry | East | Turning left | Truck - dump | Other motor vehicle | |
| | | | | | East | Stopped | Truck - dump | Other motor vehicle | |
| 2015-Feb-10, Tue,17:34 | Clear | Turning movement | P.D. only | Dry | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| | | | | | West | Making "U" turn | Pick-up truck | Other motor vehicle | |
| 2014-Sep-25, Thu,12:15 | Clear | Sideswipe | P.D. only | Dry | West | Unknown | Unknown | Other motor vehicle | |
| | | | | | West | Turning right | Automobile, station wagon | Other motor vehicle | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2014-Oct-29, Wed,15:31 | Clear | Turning movement | P.D. only | Dry | West | Turning left | Unknown | Other motor vehicle |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2014-Dec-11, Thu,03:15 | Snow | SMV other | P.D. only | Loose snow | East | Going ahead | Automobile, station wagon | Curb |
| 2014-Sep-04, Thu,08:20 | Clear | Angle | P.D. only | Dry | East | Making "U" turn | Passenger van | Other motor vehicle |
| | | | | | North | Turning left | Automobile, station wagon | Other motor vehicle |
| 2014-Nov-27, Thu,11:34 | Clear | Turning movement | P.D. only | Dry | North | Turning left | Automobile, station wagon | Other motor vehicle |
| | | | | | South | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2015-Jan-05, Mon,17:51 | Clear | Sideswipe | P.D. only | Wet | West | Changing lanes | Passenger van | Other motor vehicle |
| | | | | | West | Going ahead | Pick-up truck | Other motor vehicle |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2015-Feb-19, Thu,16:10 | Snow | Rear end | P.D. only | Loose snow | West | Going ahead | Unknown | Other motor vehicle |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle |
| 2015-Mar-27, Fri,08:15 | Snow | Rear end | P.D. only | Wet | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | West | Stopped | Pick-up truck | Other motor vehicle |
| 2015-Sep-15, Tue,14:46 | Clear | Turning movement | Non-fatal injury | Dry | East | Turning left | Automobile, station wagon | Other motor vehicle |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2016-Feb-12, Fri,09:41 | Clear | Turning movement | Non-fatal injury | Wet | West | Turning left | Pick-up truck | Other motor vehicle |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2016-Aug-02, Tue,10:00 | Clear | Turning movement | Non-fatal injury | Dry | East | Turning left | Passenger van | Other motor vehicle |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2015-Aug-05, Wed,18:30 | Clear | Turning movement | P.D. only | Dry | South | Turning left | Passenger van | Other motor vehicle |
| | | | | | North | Going ahead | Passenger van | Other motor vehicle |
| 2015-Jul-23, Thu,19:14 | Clear | Turning movement | P.D. only | Dry | South | Turning right | Pick-up truck | Other motor vehicle |
| | | | | | South | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2015-Dec-08, Tue,09:09 | Clear | Turning movement | P.D. only | Dry | East | Making "U" turn | Automobile, station wagon | Other motor vehicle |
| | | | | | West | Going ahead | Municipal transit bus | Other motor vehicle |
| 2016-Oct-08, Sat,15:20 | Clear | SMV other | P.D. only | Dry | East | Turning right | Truck and trailer | Pole (utility, power) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2017-Jun-28, Wed,17:55 | Clear | Sideswipe | P.D. only | Dry | East | Unknown | Unknown | Other motor vehicle | |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2016-Nov-28, Mon,08:41 | Clear | SMV other | Non-fatal injury | Dry | North | Turning right | Automobile, station wagon | Pedestrian | 1 |
| 2017-May-18, Thu,08:36 | Clear | Turning movement | Non-fatal injury | Dry | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2017-Jun-27, Tue,14:30 | Clear | Turning movement | P.D. only | Dry | West | Turning left | Unknown | Other motor vehicle | |
| | | | | | East | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2017-Jul-07, Fri,15:43 | Clear | Rear end | P.D. only | Dry | South | Slowing or stopping | Motorcycle | Other motor vehicle | |
| | | | | | South | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2017-Nov-30, Thu,14:31 | Clear | Rear end | P.D. only | Wet | North | Turning right | Automobile, station wagon | Other motor vehicle | |
| | | | | | North | Turning right | Pick-up truck | Other motor vehicle | |
| 2017-Jul-26, Wed,08:34 | Clear | Turning movement | Non-fatal injury | Dry | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2017-Jul-20, Thu,15:48 | Clear | Angle | Non-fatal injury | Dry | East | Going ahead | Passenger van | Other motor vehicle | |
| | | | | | South | Turning left | Municipal transit bus | Other motor vehicle | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2017-Oct-14, Sat,13:15 | Clear | Turning movement | P.D. only | Dry | North | Turning right | Delivery van | Other motor vehicle |
| | | | | | South | Turning left | Automobile, station wagon | Other motor vehicle |
| 2017-Sep-22, Fri,15:43 | Clear | Sideswipe | P.D. only | Dry | East | Changing lanes | Truck - dump | Other motor vehicle |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2017-Oct-26, Thu,16:59 | Clear | Turning movement | P.D. only | Dry | North | Turning left | Automobile, station wagon | Other motor vehicle |
| | | | | | South | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2017-Sep-21, Thu,16:00 | Clear | Rear end | Non-fatal injury | Dry | East | Going ahead | Automobile, station wagon | Other motor vehicle |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle |
| 2018-Jan-13, Sat,10:12 | Drifting Snow | Sideswipe | P.D. only | Ice | West | Slowing or stopping | Automobile, station wagon | Skidding/sliding |
| | | | | | West | Turning left | Automobile, station wagon | Other motor vehicle |
| 2018-Jan-09, Tue,21:41 | Clear | Sideswipe | P.D. only | Slush | South | Unknown | Unknown | Other motor vehicle |
| | | | | | South | Stopped | Automobile, station wagon | Other motor vehicle |
| 2018-Jan-10, Wed,21:16 | Clear | Turning movement | P.D. only | Wet | West | Going ahead | Automobile, station wagon | Other motor vehicle |
| | | | | | East | Turning left | Automobile, station wagon | Other motor vehicle |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2018-Feb-09, Fri,12:58 | Clear | Rear end | P.D. only | Wet | West | Slowing or stopping | Truck - dump | Other motor vehicle |
| | | | | | West | Turning right | Automobile, station wagon | Other motor vehicle |
| 2018-Feb-06, Tue,18:13 | Clear | Turning movement | P.D. only | Wet | West | Going ahead | Automobile, station wagon | Other motor vehicle |
| | | | | | East | Turning left | Pick-up truck | Other motor vehicle |
| 2018-Feb-01, Thu,07:07 | Snow | Sideswipe | P.D. only | Loose snow | West | Turning left | School bus | Other motor vehicle |
| | | | | | West | Changing lanes | Pick-up truck | Other motor vehicle |
| 2018-May-31, Thu,08:11 | Clear | Turning movement | Non-fatal injury | Dry | East | Turning left | Automobile, station wagon | Other motor vehicle |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2018-May-18, Fri,11:37 | Clear | Sideswipe | P.D. only | Dry | East | Changing lanes | Truck - closed | Other motor vehicle |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2018-May-12, Sat,14:30 | Clear | Turning movement | P.D. only | Dry | West | Turning left | Automobile, station wagon | Other motor vehicle |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle |
| 2018-Jun-29, Fri,15:48 | Clear | Rear end | P.D. only | Dry | East | Slowing or stopping | Automobile, station wagon | Other motor vehicle |
| | | | | | East | Slowing or stopping | Automobile, station wagon | Other motor vehicle |
| 2018-Oct-19, Fri,09:19 | Clear | Turning movement | P.D. only | Dry | West | Turning left | Pick-up truck | Other motor vehicle |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Nov-23, Fri,13:08 | Clear | SMV other | Non-fatal injury | Dry | North | Turning left | Automobile, station wagon | Pedestrian | 1 |
| 2018-Oct-24, Wed,12:43 | Clear | Turning movement | P.D. only | Dry | East | Turning left | Automobile, station wagon | Other motor vehicle | |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Aug-13, Mon,16:20 | Clear | Turning movement | P.D. only | Dry | East | Turning left | Pick-up truck | Other motor vehicle | |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Aug-11, Sat,12:51 | Clear | Turning movement | P.D. only | Dry | East | Turning left | Automobile, station wagon | Other motor vehicle | |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Oct-27, Sat,22:36 | Snow | Sideswipe | P.D. only | Wet | East | Changing lanes | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Aug-17, Fri,10:38 | Clear | Turning movement | P.D. only | Wet | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Going ahead | Truck - closed | Other motor vehicle | |
| 2018-Nov-16, Fri,07:23 | Snow | Angle | Non-fatal injury | Loose snow | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| | | | | | North | Going ahead | Automobile, station wagon | Other motor vehicle | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | South | Going ahead | Pick-up truck | Other motor vehicle | |

**Location:** CARLING AVE EB btwn CLYDE AVE & CHURCHILL AVE N

**Traffic Control:** No control

**Total Collisions:** 1

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2017-Mar-27, Mon,15:30 | Clear | Sideswipe | P.D. only | Wet | East | Changing lanes | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Going ahead | Passenger van | Other motor vehicle | |

**Location:** CARLING AVE WB btwn COLE AVE & CHURCHILL AVE N

**Traffic Control:** No control

**Total Collisions:** 5

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2014-Feb-15, Sat,20:28 | Clear | Rear end | P.D. only | Dry | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| | | | | | West | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2015-Mar-31, Tue,10:04 | Clear | Sideswipe | P.D. only | Dry | West | Changing lanes | Truck and trailer | Other motor vehicle | |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2016-Oct-07, Fri,14:55 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2017-May-04, Thu,16:47 | Clear | Sideswipe | P.D. only | Dry | West | Changing lanes | Automobile, station wagon | Other motor vehicle | |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2018-Aug-02, Thu,17:43 | Clear | Turning movement | P.D. only | Dry | West | Going ahead | Automobile, station wagon | Other motor vehicle |
| | | | | | West | Turning right | Automobile, station wagon | Other motor vehicle |

# Appendix E

Study Area Justification

PARSONS

1223 Michael Street, Suite 100 | Ottawa, Ontario K1J7T2
P: +1 613.738.4160 | www.parsons.com

# Technical Memo

To: Wally Dubyk (City of Ottawa)
Copy: Mark Baker, P.Eng.
From: Basel Ansari, EIT

Date: 28 August 2019
Project: 477272 – 01000

## Re: TIA 1655 Carling Avenue - Proposed Study Area

This letter is prepared with the purpose of providing justification for using a smaller study area than the 1km radius noted in the City's current TIA Guidelines for a suburban context.

The proposed development is located at 1655 Carling Avenue and is anticipated to consist of a 22-storey building containing 260 residential units, which is forecasted to generate person trips as summarized in Table 1 below. The number of vehicle trips forecasted in in the order of approximately 90 vehicles/hr during each of the morning and afternoon peak hour periods.

*Table 1: Forecasted Trips*

| Travel Mode | AM Mode Share | AM Peak (persons/h) | | | PM Mode Share | PM Peak (persons/h) | | |
|---|---|---|---|---|---|---|---|---|
| | | In | Out | Total | | In | Out | Total |
| Auto Driver | 50% | 20 | 64 | 84 | 50% | 53 | 34 | 87 |
| Auto Passenger | 15% | 6 | 19 | 25 | 15% | 16 | 10 | 26 |
| Transit | 20% | 7 | 26 | 33 | 20% | 21 | 14 | 35 |
| Non-motorized | 15% | 6 | 20 | 26 | 15% | 16 | 11 | 27 |
| **Total People Trips** | **100%** | **39** | **129** | **168** | **100%** | **106** | **69** | **175** |
| **Total 'New' Residential Apartment Building Auto Trips** | | **20** | **64** | **84** | | **53** | **34** | **87** |

The subject site currently consists of an unpaved parking lot with an estimated maximum occupancy of 80 vehicles. Although a driveway count has not been conducted, it is estimated that half of the parking lot's capacity is generated during the commuter peak hour. On this basis, the existing parking lot generates in the order of 40 vehicles during each peak hour, thereby resulting in a net potential increase in vehicle trips of approximately 50 veh/h two-way associated with the proposed residential development.

Parsons is recommending that the TIA limit the study area for analysis to the adjacent two signalized intersections on Carling Avenue located within approximately 400m of the site, namely Carling/Clyde (to the west) and Carling/Churchill (to the east). This is consistent with an urban context according to the TIA Guidelines. **Figure 1** below provides an illustration of the site location, with a 1 km radius from the site shown. Red circles within the radius indicate major intersections near the subject site that are proposed as part of the reduced study area, whereas the orange circles and rectangles represent intersections and highway ramps that would need to be included in the analysis based on the 1 km radius noted in the TIA Guidelines for a suburban context.

Given the relatively low volume of net forecasted site-generated traffic, an appropriate study area is considered to be the two signalized intersections on either side of the subject site. An evaluation of all eight signalized intersections and two highway ramps within a 1km radius is not considered of benefit to the approvals process.

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*Figure 1: Study Area*

# Appendix F

TDM Checklist

# TDM-Supportive Development Design and Infrastructure Checklist:
*Residential Developments (multi-family or condominium)*

***Legend***

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

| | | TDM-supportive design & infrastructure measures: *Residential developments* | Check if completed & add descriptions, explanations or plan/drawing references |
|---|---|---|---|
| | **1.** | **WALKING & CYCLING: ROUTES** | |
| | **1.1** | **Building location & access points** | |
| BASIC | 1.1.1 | Locate building close to the street, and do not locate parking areas between the street and building entrances | ☑ |
| BASIC | 1.1.2 | Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations | ☐ |
| BASIC | 1.1.3 | Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort | ☐ |
| | **1.2** | **Facilities for walking & cycling** | |
| REQUIRED | 1.2.1 | Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)* | ☐ *No rapid transit routes within 600 meters.* |
| REQUIRED | 1.2.2 | Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)* | ☑ |

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

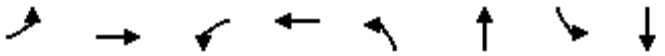
| | | TDM-supportive design & infrastructure measures: *Residential developments* | Check if completed & add descriptions, explanations or plan/drawing references |
|---|---|---|---|
| | **2.** | **WALKING & CYCLING: END-OF-TRIP FACILITIES** | |
| | **2.1** | **Bicycle parking** | |
| REQUIRED | 2.1.1 | Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)* | ☑ |
| REQUIRED | 2.1.2 | Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)* | ☑ |
| REQUIRED | 2.1.3 | Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)* | ☑ |
| BASIC | 2.1.4 | Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists | ☐ |
| | **2.2** | **Secure bicycle parking** | |
| REQUIRED | 2.2.1 | Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)* | ☑ |
| BETTER | 2.2.2 | Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments | ☐ |
| | **2.3** | **Bicycle repair station** | |
| BETTER | 2.3.1 | Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided) | ☐ |
| | **3.** | **TRANSIT** | |
| | **3.1** | **Customer amenities** | |
| BASIC | 3.1.1 | Provide shelters, lighting and benches at any on-site transit stops | ☐ |
| BASIC | 3.1.2 | Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter | ☐ |
| BETTER | 3.1.3 | Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building | ☐ |

| | | TDM-supportive design & infrastructure measures: *Residential developments* | Check if completed & add descriptions, explanations or plan/drawing references |
|---|---|---|---|
| | **4.** | **RIDESHARING** | |
| | **4.1** | **Pick-up & drop-off facilities** | |
| BASIC | 4.1.1 | Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones | ☐ |
| | **5.** | **CARSHARING & BIKESHARING** | |
| | **5.1** | **Carshare parking spaces** | |
| BETTER | 5.1.1 | Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)* | ☐ |
| | **5.2** | **Bikeshare station location** | |
| BETTER | 5.2.1 | Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection | ☐ |
| | **6.** | **PARKING** | |
| | **6.1** | **Number of parking spaces** | |
| REQUIRED | 6.1.1 | Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for | ☑ |
| BASIC | 6.1.2 | Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking | ☐ |
| BASIC | 6.1.3 | Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)* | ☐ |
| BETTER | 6.1.4 | Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)* | ☐ |
| | **6.2** | **Separate long-term & short-term parking areas** | |
| BETTER | 6.2.1 | Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa) | ☐ |

# Appendix G

Synchro Analysis Reports

# Existing Conditions

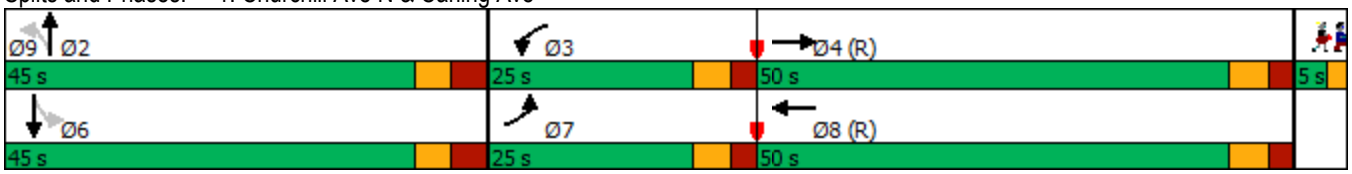


| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | Ø9 |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 167 | 1352 | 85 | 610 | 11 | 5 | 336 | 31 | |
| Future Volume (vph) | 167 | 1352 | 85 | 610 | 11 | 5 | 336 | 31 | |
| Lane Group Flow (vph) | 186 | 1611 | 94 | 849 | 12 | 18 | 373 | 304 | |
| Turn Type | Prot | NA | Prot | NA | Perm | NA | Perm | NA | |
| Protected Phases | 7 | 4 | 3 | 8 | | 2 | | 6 | 9 |
| Permitted Phases | | | | | 2 | | 6 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 1.0 |
| Minimum Split (s) | 11.1 | 34.1 | 11.1 | 34.1 | 44.8 | 44.8 | 44.8 | 44.8 | 5.0 |
| Total Split (s) | 25.0 | 50.0 | 25.0 | 50.0 | 45.0 | 45.0 | 45.0 | 45.0 | 5.0 |
| Total Split (%) | 20.0% | 40.0% | 20.0% | 40.0% | 36.0% | 36.0% | 36.0% | 36.0% | 4% |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 2.0 |
| All-Red Time (s) | 2.4 | 2.4 | 2.4 | 2.4 | 3.5 | 3.5 | 3.5 | 3.5 | 0.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.1 | 6.1 | 6.1 | 6.1 | 6.8 | 6.8 | 6.8 | 6.8 | |
| Lead/Lag | Lead | Lag | Lead | Lag | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | |
| Recall Mode | None | C-Max | None | C-Max | None | None | None | None | None |
| Act Effct Green (s) | 17.2 | 53.0 | 12.2 | 48.1 | 40.8 | 40.8 | 40.8 | 40.8 | |
| Actuated g/C Ratio | 0.14 | 0.42 | 0.10 | 0.38 | 0.33 | 0.33 | 0.33 | 0.33 | |
| v/c Ratio | 0.80 | 0.79 | 0.57 | 0.46 | 0.05 | 0.03 | 0.88 | 0.45 | |
| Control Delay | 76.6 | 35.6 | 66.4 | 28.7 | 28.2 | 16.0 | 61.4 | 7.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 76.6 | 35.6 | 66.4 | 28.7 | 28.2 | 16.0 | 61.4 | 7.5 | |
| LOS | E | D | E | C | C | B | E | A | |
| Approach Delay | | 39.8 | | 32.5 | | 20.9 | | 37.2 | |
| Approach LOS | | D | | C | | C | | D | |
| Queue Length 50th (m) | 44.2 | 127.3 | 22.5 | 56.1 | 2.0 | 1.0 | 83.5 | 5.6 | |
| Queue Length 95th (m) | #75.1 | #158.6 | 38.6 | 69.1 | 6.6 | 6.2 | #134.4 | 26.7 | |
| Internal Link Dist (m) | | 99.0 | | 113.3 | | 62.0 | | 67.5 | |
| Turn Bay Length (m) | 65.0 | | 60.0 | | 20.0 | | 20.0 | | |
| Base Capacity (vph) | 256 | 2043 | 256 | 1830 | 252 | 533 | 436 | 680 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.73 | 0.79 | 0.37 | 0.46 | 0.05 | 0.03 | 0.86 | 0.45 | |

| Intersection Summary | |
|---|---|
| Cycle Length: 125 | |
| Actuated Cycle Length: 125 | |
| Offset: 101 (81%), Referenced to phase 4:EBT and 8:WBT, Start of Green | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.88 | |
| Intersection Signal Delay: 37.1 | Intersection LOS: D |
| Intersection Capacity Utilization 80.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

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

Splits and Phases: 1: Churchill Ave N & Carling Ave

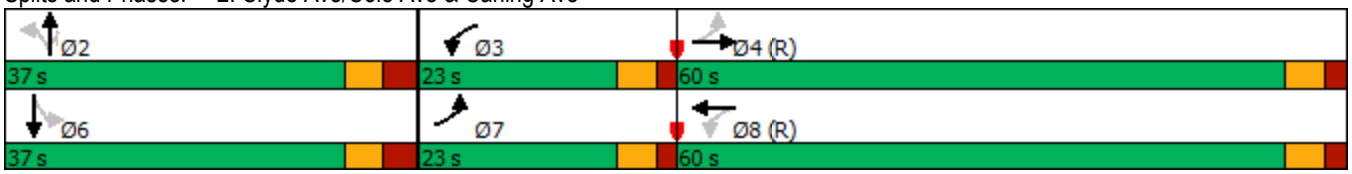


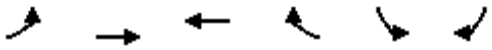
| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 60 | 1481 | 232 | 601 | 121 | 51 | 147 | 35 | 63 |
| Future Volume (vph) | 60 | 1481 | 232 | 601 | 121 | 51 | 147 | 35 | 63 |
| Lane Group Flow (vph) | 67 | 1646 | 258 | 702 | 134 | 57 | 163 | 39 | 143 |
| Turn Type | pm+pt | NA | pm+pt | NA | Perm | NA | Perm | Perm | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 2 | | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 2 | 6 | |
| Detector Phase | 7 | 4 | 3 | 8 | 2 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 10.4 | 35.5 | 10.4 | 35.5 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 |
| Total Split (s) | 23.0 | 60.0 | 23.0 | 60.0 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 |
| Total Split (%) | 19.2% | 50.0% | 19.2% | 50.0% | 30.8% | 30.8% | 30.8% | 30.8% | 30.8% |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |
| All-Red Time (s) | 1.7 | 2.1 | 1.7 | 2.1 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |
| 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) | 5.4 | 5.8 | 5.4 | 5.8 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | | | | |
| Recall Mode | None | C-Max | None | C-Max | None | None | None | None | None |
| Act Effct Green (s) | 71.4 | 64.1 | 88.4 | 77.9 | 19.6 | 19.6 | 19.6 | 19.6 | 19.6 |
| Actuated g/C Ratio | 0.60 | 0.53 | 0.74 | 0.65 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| v/c Ratio | 0.15 | 0.63 | 0.74 | 0.22 | 0.78 | 0.20 | 0.43 | 0.19 | 0.48 |
| Control Delay | 7.8 | 22.6 | 37.3 | 10.1 | 75.9 | 42.3 | 9.6 | 42.5 | 35.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 7.8 | 22.6 | 37.3 | 10.1 | 75.9 | 42.3 | 9.6 | 42.5 | 35.6 |
| LOS | A | C | D | B | E | D | A | D | D |
| Approach Delay | | 22.0 | | 17.4 | | 39.9 | | | 37.1 |
| Approach LOS | | C | | B | | D | | | D |
| Queue Length 50th (m) | 3.8 | 99.2 | 35.1 | 23.8 | 30.6 | 11.8 | 0.0 | 8.0 | 21.5 |
| Queue Length 95th (m) | 10.0 | 133.4 | #73.6 | 38.3 | 48.5 | 21.8 | 16.7 | 16.7 | 38.0 |
| Internal Link Dist (m) | | 94.2 | | 153.1 | | 79.0 | | | 73.1 |
| Turn Bay Length (m) | 20.0 | | 120.0 | | | | 5.0 | 20.0 | |
| Base Capacity (vph) | 604 | 2601 | 361 | 3138 | 267 | 451 | 495 | 320 | 444 |
| 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 | 0.11 | 0.63 | 0.71 | 0.22 | 0.50 | 0.13 | 0.33 | 0.12 | 0.32 |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 84 (70%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green | |
| Natural Cycle: 85 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay: 23.5 | Intersection LOS: C |
| Intersection Capacity Utilization 86.6% | ICU Level of Service E |
| Analysis Period (min) 15 | |

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

Splits and Phases: 2: Clyde Ave/Cole Ave & Carling Ave

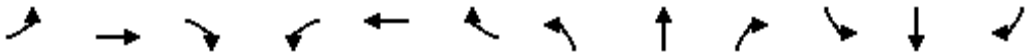




| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 1617 | 854 | 10 | 0 | 1 |
| Future Volume (Veh/h) | 0 | 1617 | 854 | 10 | 0 | 1 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 0 | 1797 | 949 | 11 | 0 | 1 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | 177 | 123 | | | |
| pX, platoon unblocked | 0.89 | | | | 0.82 | 0.89 |
| vC, conflicting volume | 960 | | | | 1554 | 322 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 518 | | | | 10 | 0 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 100 |
| cM capacity (veh/h) | 928 | | | | 830 | 964 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | SB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 599 | 599 | 599 | 380 | 380 | 201 | 1 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 0 | 11 | 1 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 964 |
| Volume to Capacity | 0.35 | 0.35 | 0.35 | 0.22 | 0.22 | 0.12 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.7 |
| Lane LOS | | | | | | | A |
| Approach Delay (s) | 0.0 | | | 0.0 | | | 8.7 |
| Approach LOS | | | | | | | A |

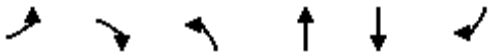
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 36.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 24 | 3 | 96 | 0 |
| Future Volume (Veh/h) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 24 | 3 | 96 | 0 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 1 | 1 | 2 | 54 | 0 | 2 | 1 | 96 | 27 | 3 | 107 | 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) | | | | | | | | 97 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 226 | 238 | 107 | 227 | 224 | 110 | 107 | | | 123 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 226 | 238 | 107 | 227 | 224 | 110 | 107 | | | 123 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 100 | 100 | 100 | 93 | 100 | 100 | 100 | | | 100 | | |
| cM capacity (veh/h) | 726 | 661 | 947 | 724 | 673 | 944 | 1484 | | | 1464 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 4 | 56 | 124 | 110 |
| Volume Left | 1 | 54 | 1 | 3 |
| Volume Right | 2 | 2 | 27 | 0 |
| cSH | 800 | 730 | 1484 | 1464 |
| Volume to Capacity | 0.01 | 0.08 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.1 | 1.9 | 0.0 | 0.0 |
| Control Delay (s) | 9.5 | 10.3 | 0.1 | 0.2 |
| Lane LOS | A | B | A | A |
| Approach Delay (s) | 9.5 | 10.3 | 0.1 | 0.2 |
| Approach LOS | A | B | | |

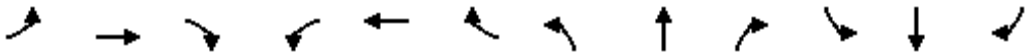
| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.2 | | | |
| Intersection Capacity Utilization | 23.2% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 4 | 32 | 14 | 315 | 578 | 16 |
| Future Volume (Veh/h) | 4 | 32 | 14 | 315 | 578 | 16 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 4 | 36 | 16 | 350 | 642 | 18 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 91 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1033 | 651 | 660 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1033 | 651 | 660 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 92 | 98 | | | |
| cM capacity (veh/h) | 253 | 469 | 928 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 40 | 366 | 660 |
| Volume Left | 4 | 16 | 0 |
| Volume Right | 36 | 0 | 18 |
| cSH | 432 | 928 | 1700 |
| Volume to Capacity | 0.09 | 0.02 | 0.39 |
| Queue Length 95th (m) | 2.3 | 0.4 | 0.0 |
| Control Delay (s) | 14.2 | 0.6 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 14.2 | 0.6 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.7 | | |
| Intersection Capacity Utilization | 43.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 231 | 792 | 18 | 19 | 1782 | 218 | 96 | 33 | 26 | 182 | 7 | 269 |
| Future Volume (vph) | 231 | 792 | 18 | 19 | 1782 | 218 | 96 | 33 | 26 | 182 | 7 | 269 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 65.0 | | 0.0 | 60.0 | | 0.0 | 20.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 25.0 | | | 15.0 | | | 20.0 | | | 25.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 50 | |
| Link Distance (m) | | 108.4 | | | 137.3 | | | 86.0 | | | 87.9 | |
| Travel Time (s) | | 6.5 | | | 8.2 | | | 6.2 | | | 6.3 | |
| Lane Group Flow (vph) | 257 | 900 | 0 | 21 | 2222 | 0 | 107 | 66 | 0 | 202 | 307 | 0 |
| Turn Type | Prot | NA | | Prot | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 11.1 | 34.1 | | 11.1 | 34.1 | | 44.8 | 44.8 | | 44.8 | 44.8 | |
| Total Split (s) | 20.0 | 55.0 | | 20.0 | 55.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 16.0% | 44.0% | | 16.0% | 44.0% | | 36.0% | 36.0% | | 36.0% | 36.0% | |
| Yellow Time (s) | 3.7 | 3.7 | | 3.7 | 3.7 | | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.4 | 2.4 | | 2.4 | 2.4 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.1 | 6.1 | | 6.1 | 6.1 | | 6.8 | 6.8 | | 6.8 | 6.8 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | | | | | | | |
| Recall Mode | None | C-Max | | None | C-Max | | None | None | | None | None | |
| Act Effct Green (s) | 30.7 | 77.6 | | 7.1 | 49.3 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Actuated g/C Ratio | 0.25 | 0.62 | | 0.06 | 0.39 | | 0.21 | 0.21 | | 0.21 | 0.21 | |
| v/c Ratio | 0.62 | 0.30 | | 0.22 | 1.17 | | 1.07 | 0.18 | | 0.77 | 0.58 | |
| Control Delay | 51.2 | 13.4 | | 60.9 | 119.2 | | 157.6 | 23.6 | | 65.0 | 10.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 51.2 | 13.4 | | 60.9 | 119.2 | | 157.6 | 23.6 | | 65.0 | 10.6 | |
| LOS | D | B | | E | F | | F | C | | E | B | |
| Approach Delay | | 21.8 | | | 118.6 | | | 106.5 | | | 32.2 | |
| Approach LOS | | C | | | F | | | F | | | C | |
| Queue Length 50th (m) | 56.5 | 39.3 | | 5.0 | ~239.8 | | ~28.8 | 7.4 | | 47.1 | 5.2 | |
| Queue Length 95th (m) | #111.1 | 60.4 | | 13.2 | #269.0 | | #55.3 | 17.6 | | 67.0 | 28.0 | |
| Internal Link Dist (m) | | 84.4 | | | 113.3 | | | 62.0 | | | 63.9 | |
| Turn Bay Length (m) | 65.0 | | | 60.0 | | | 20.0 | | | 20.0 | | |
| Base Capacity (vph) | 416 | 3013 | | 188 | 1892 | | 147 | 524 | | 385 | 644 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.62 | 0.30 | | 0.11 | 1.17 | | 0.73 | 0.13 | | 0.52 | 0.48 | |

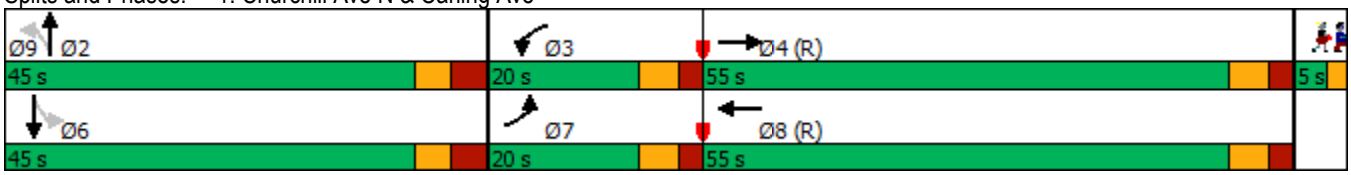
| Intersection Summary | |
|---|---|
| Area Type: | Other |

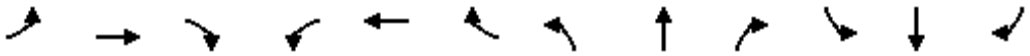
| Lane Group | Ø9 |
|---|---|
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (m) | |
| Storage Lanes | |
| Taper Length (m) | |
| Right Turn on Red | |
| Link Speed (k/h) | |
| Link Distance (m) | |
| Travel Time (s) | |
| Lane Group Flow (vph) | |
| Turn Type | |
| Protected Phases | 9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 1.0 |
| Minimum Split (s) | 5.0 |
| Total Split (s) | 5.0 |
| Total Split (%) | 4% |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 0.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Queue Length 50th (m) | |
| Queue Length 95th (m) | |
| Internal Link Dist (m) | |
| Turn Bay Length (m) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |
| Reduced v/c Ratio | |

| Intersection Summary |
|---|

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 92 (74%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 79.9 Intersection LOS: E
Intersection Capacity Utilization 111.5% ICU Level of Service H
Analysis Period (min) 15
~ 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: Churchill Ave N & Carling Ave



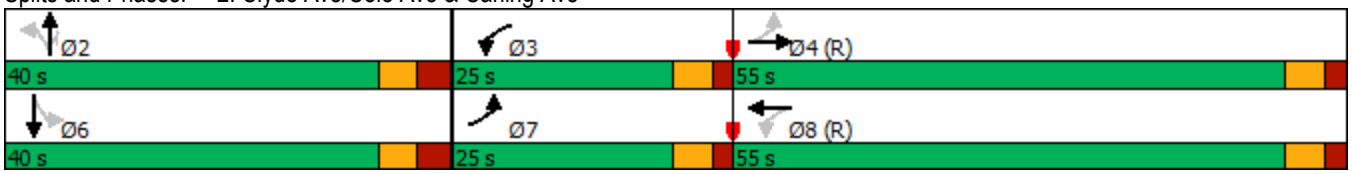


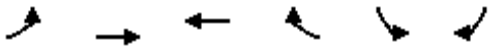
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 74 | 801 | 1 | 241 | 1855 | 51 | 126 | 87 | 210 | 30 | 54 | 62 |
| Future Volume (vph) | 74 | 801 | 1 | 241 | 1855 | 51 | 126 | 87 | 210 | 30 | 54 | 62 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 20.0 | | 0.0 | 120.0 | | 0.0 | 0.0 | | 5.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 1 | 1 | | 0 |
| Taper Length (m) | 20.0 | | | 30.0 | | | 7.6 | | | 20.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 40 | |
| Link Distance (m) | | 118.2 | | | 191.8 | | | 103.0 | | | 96.3 | |
| Travel Time (s) | | 7.1 | | | 11.5 | | | 7.4 | | | 8.7 | |
| Lane Group Flow (vph) | 82 | 891 | 0 | 268 | 2118 | 0 | 140 | 97 | 233 | 33 | 129 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | Perm | NA | Perm | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Detector Phase | 7 | 4 | | 3 | 8 | | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | |
| Minimum Split (s) | 10.4 | 35.5 | | 10.4 | 35.5 | | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (s) | 25.0 | 55.0 | | 25.0 | 55.0 | | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 20.8% | 45.8% | | 20.8% | 45.8% | | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | |
| Yellow Time (s) | 3.7 | 3.7 | | 3.7 | 3.7 | | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 1.7 | 2.1 | | 1.7 | 2.1 | | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| 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) | 5.4 | 5.8 | | 5.4 | 5.8 | | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | | | | | | | |
| Recall Mode | None | C-Max | | None | C-Max | | None | None | None | None | None | |
| Act Effct Green (s) | 77.8 | 69.8 | | 87.4 | 76.9 | | 19.9 | 19.9 | 19.9 | 19.9 | 19.9 | |
| Actuated g/C Ratio | 0.65 | 0.58 | | 0.73 | 0.64 | | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | |
| v/c Ratio | 0.49 | 0.31 | | 0.57 | 0.68 | | 0.75 | 0.33 | 0.61 | 0.16 | 0.42 | |
| Control Delay | 27.6 | 14.8 | | 11.1 | 17.4 | | 70.5 | 45.1 | 20.5 | 41.5 | 30.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 27.6 | 14.8 | | 11.1 | 17.4 | | 70.5 | 45.1 | 20.5 | 41.5 | 30.1 | |
| LOS | C | B | | B | B | | E | D | C | D | C | |
| Approach Delay | | 15.9 | | | 16.7 | | | 40.5 | | | 32.4 | |
| Approach LOS | | B | | | B | | | D | | | C | |
| Queue Length 50th (m) | 4.7 | 36.0 | | 17.2 | 111.6 | | 31.9 | 20.5 | 14.0 | 6.8 | 17.0 | |
| Queue Length 95th (m) | 22.5 | 61.8 | | 35.6 | 172.7 | | 49.5 | 33.0 | 36.3 | 14.7 | 32.2 | |
| Internal Link Dist (m) | | 94.2 | | | 167.8 | | | 79.0 | | | 72.3 | |
| Turn Bay Length (m) | 20.0 | | | 120.0 | | | | | 5.0 | 20.0 | | |
| Base Capacity (vph) | 334 | 2831 | | 543 | 3105 | | 313 | 496 | 528 | 339 | 486 | |
| 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 | 0.25 | 0.31 | | 0.49 | 0.68 | | 0.45 | 0.20 | 0.44 | 0.10 | 0.27 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 93 (78%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 19.9 Intersection LOS: B
Intersection Capacity Utilization 76.8% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Clyde Ave/Cole Ave & Carling Ave

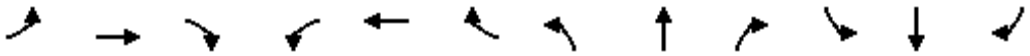




| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 1041 | 2146 | 1 | 0 | 13 |
| Future Volume (Veh/h) | 0 | 1041 | 2146 | 1 | 0 | 13 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 0 | 1157 | 2384 | 1 | 0 | 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) | | 192 | 109 | | | |
| pX, platoon unblocked | 0.61 | | | | 0.66 | 0.61 |
| vC, conflicting volume | 2385 | | | | 2770 | 795 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1059 | | | | 1011 | 0 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 98 |
| cM capacity (veh/h) | 402 | | | | 155 | 667 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | SB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 386 | 386 | 386 | 954 | 954 | 478 | 14 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 0 | 1 | 14 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 667 |
| Volume to Capacity | 0.23 | 0.23 | 0.23 | 0.56 | 0.56 | 0.28 | 0.02 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.5 |
| Lane LOS | | | | | | | B |
| Approach Delay (s) | 0.0 | | | 0.0 | | | 10.5 |
| Approach LOS | | | | | | | B |

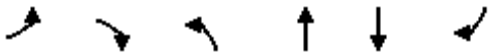
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 53.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 52 | 4 | 60 | 2 |
| Future Volume (Veh/h) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 52 | 4 | 60 | 2 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 2 | 1 | 9 | 40 | 1 | 6 | 8 | 136 | 58 | 4 | 67 | 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) | | | | | | | | 96 | | | | |
| pX, platoon unblocked | 0.97 | 0.97 | | 0.97 | 0.97 | 0.97 | | | | 0.97 | | |
| vC, conflicting volume | 264 | 286 | 68 | 266 | 258 | 165 | 69 | | | 194 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 227 | 250 | 68 | 230 | 221 | 125 | 69 | | | 155 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 100 | 100 | 99 | 94 | 100 | 99 | 99 | | | 100 | | |
| cM capacity (veh/h) | 698 | 629 | 995 | 693 | 653 | 899 | 1532 | | | 1384 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 12 | 47 | 202 | 73 |
| Volume Left | 2 | 40 | 8 | 4 |
| Volume Right | 9 | 6 | 58 | 2 |
| cSH | 889 | 713 | 1532 | 1384 |
| Volume to Capacity | 0.01 | 0.07 | 0.01 | 0.00 |
| Queue Length 95th (m) | 0.3 | 1.6 | 0.1 | 0.1 |
| Control Delay (s) | 9.1 | 10.4 | 0.3 | 0.4 |
| Lane LOS | A | B | A | A |
| Approach Delay (s) | 9.1 | 10.4 | 0.3 | 0.4 |
| Approach LOS | A | B | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.1 | | | |
| Intersection Capacity Utilization | 27.8% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

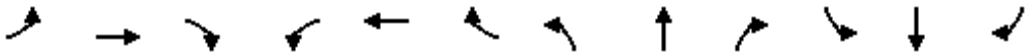


| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 9 | 25 | 31 | 464 | 454 | 17 |
| Future Volume (Veh/h) | 9 | 25 | 31 | 464 | 454 | 17 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 10 | 28 | 34 | 516 | 504 | 19 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 88 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1098 | 514 | 523 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1098 | 514 | 523 | | | |
| 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 | 95 | 97 | | | |
| cM capacity (veh/h) | 228 | 561 | 1043 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 38 | 550 | 523 |
| Volume Left | 10 | 34 | 0 |
| Volume Right | 28 | 0 | 19 |
| cSH | 405 | 1043 | 1700 |
| Volume to Capacity | 0.09 | 0.03 | 0.31 |
| Queue Length 95th (m) | 2.3 | 0.8 | 0.0 |
| Control Delay (s) | 14.8 | 0.9 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 14.8 | 0.9 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 62.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

# Future Background 2022



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 167 | 1082 | 98 | 85 | 488 | 154 | 11 | 5 | 11 | 336 | 31 | 243 |
| Future Volume (vph) | 167 | 1082 | 98 | 85 | 488 | 154 | 11 | 5 | 11 | 336 | 31 | 243 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 25.0 | | | 15.0 | | | 20.0 | | | 25.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 50 | |
| Link Distance (m) | | 111.5 | | | 137.3 | | | 86.0 | | | 94.3 | |
| Travel Time (s) | | 6.7 | | | 8.2 | | | 6.2 | | | 6.8 | |
| Lane Group Flow (vph) | 167 | 1082 | 98 | 85 | 488 | 154 | 11 | 16 | 0 | 336 | 274 | 0 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | 4 | | | 8 | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 11.1 | 34.1 | 34.1 | 11.1 | 34.1 | 34.1 | 44.8 | 44.8 | | 44.8 | 44.8 | |
| Total Split (s) | 25.0 | 50.0 | 50.0 | 25.0 | 50.0 | 50.0 | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 20.0% | 40.0% | 40.0% | 20.0% | 40.0% | 40.0% | 36.0% | 36.0% | | 36.0% | 36.0% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| 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) | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 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 | C-Max | C-Max | None | C-Max | C-Max | None | None | | None | None | |
| Act Effct Green (s) | 16.3 | 57.0 | 57.0 | 11.6 | 52.3 | 52.3 | 37.4 | 37.4 | | 37.4 | 37.4 | |
| Actuated g/C Ratio | 0.13 | 0.46 | 0.46 | 0.09 | 0.42 | 0.42 | 0.30 | 0.30 | | 0.30 | 0.30 | |
| v/c Ratio | 0.76 | 0.70 | 0.14 | 0.54 | 0.34 | 0.23 | 0.05 | 0.03 | | 0.86 | 0.44 | |
| Control Delay | 73.7 | 32.1 | 4.7 | 66.2 | 27.3 | 11.0 | 28.6 | 16.2 | | 61.9 | 7.8 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 73.7 | 32.1 | 4.7 | 66.2 | 27.3 | 11.0 | 28.6 | 16.2 | | 61.9 | 7.8 | |
| LOS | E | C | A | E | C | B | C | B | | E | A | |
| Approach Delay | | 35.3 | | | 28.4 | | | 21.3 | | | 37.6 | |
| Approach LOS | | D | | | C | | | C | | | D | |
| Queue Length 50th (m) | 39.7 | 112.3 | 0.0 | 20.3 | 44.0 | 7.6 | 1.9 | 0.9 | | 76.3 | 5.4 | |
| Queue Length 95th (m) | 62.9 | 156.1 | 10.1 | 35.5 | 62.6 | 23.9 | 6.0 | 5.7 | | 109.0 | 24.8 | |
| Internal Link Dist (m) | | 87.5 | | | 113.3 | | | 62.0 | | | 70.3 | |
| Turn Bay Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | | 20.0 | | |
| Base Capacity (vph) | 256 | 1546 | 713 | 256 | 1419 | 660 | 255 | 513 | | 422 | 649 | |
| 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 | 0.65 | 0.70 | 0.14 | 0.33 | 0.34 | 0.23 | 0.04 | 0.03 | | 0.80 | 0.42 | |

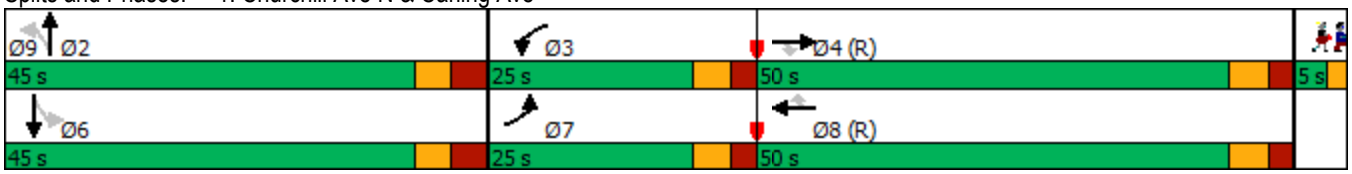
| Intersection Summary | |
|---|---|
| Area Type: | Other |

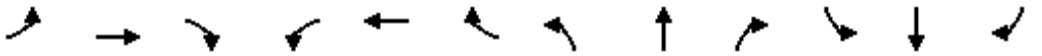
| Lane Group | Ø9 |
|---|---|
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (m) | |
| Storage Lanes | |
| Taper Length (m) | |
| Right Turn on Red | |
| Link Speed (k/h) | |
| Link Distance (m) | |
| Travel Time (s) | |
| Lane Group Flow (vph) | |
| Turn Type | |
| Protected Phases | 9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 3.0 |
| Minimum Split (s) | 5.0 |
| Total Split (s) | 5.0 |
| Total Split (%) | 4% |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 0.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Queue Length 50th (m) | |
| Queue Length 95th (m) | |
| Internal Link Dist (m) | |
| Turn Bay Length (m) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |
| Reduced v/c Ratio | |

| Intersection Summary |
|---|

| | |
|---|---|
| Cycle Length: 125 | |
| Actuated Cycle Length: 125 | |
| Offset: 101 (81%), Referenced to phase 4:EBT and 8:WBT, Start of Green | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay: 33.8 | Intersection LOS: C |
| Intersection Capacity Utilization 81.6% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Churchill Ave N & Carling Ave



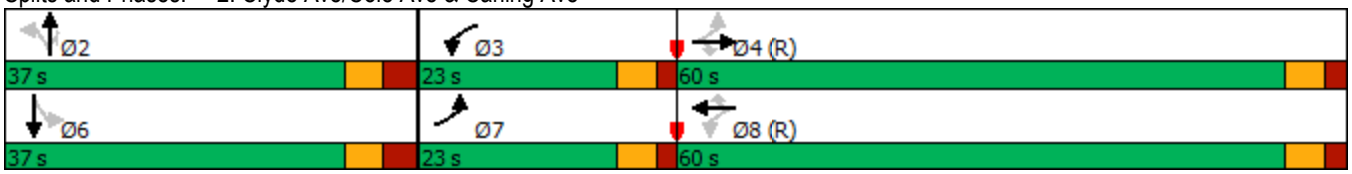


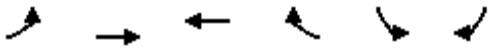
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 1185 | 0 | 232 | 481 | 31 | 121 | 51 | 147 | 35 | 63 | 66 |
| Future Volume (vph) | 60 | 1185 | 0 | 232 | 481 | 31 | 121 | 51 | 147 | 35 | 63 | 66 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | 0.0 | | 5.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 0 |
| Taper Length (m) | 20.0 | | | 30.0 | | | 7.6 | | | 20.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 40 | |
| Link Distance (m) | | 118.2 | | | 188.6 | | | 103.0 | | | 97.3 | |
| Travel Time (s) | | 7.1 | | | 11.3 | | | 7.4 | | | 8.8 | |
| Lane Group Flow (vph) | 60 | 1185 | 0 | 232 | 481 | 31 | 121 | 51 | 147 | 35 | 129 | 0 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | |
| Minimum Split (s) | 10.4 | 35.5 | 35.5 | 10.4 | 35.5 | 35.5 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (s) | 23.0 | 60.0 | 60.0 | 23.0 | 60.0 | 60.0 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (%) | 19.2% | 50.0% | 50.0% | 19.2% | 50.0% | 50.0% | 30.8% | 30.8% | 30.8% | 30.8% | 30.8% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 1.7 | 2.1 | 2.1 | 1.7 | 2.1 | 2.1 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| 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) | 5.4 | 5.8 | 5.8 | 5.4 | 5.8 | 5.8 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | None | None | None | None | |
| Act Effct Green (s) | 76.4 | 69.3 | | 90.2 | 79.9 | 79.9 | 17.8 | 17.8 | 17.8 | 17.8 | 17.8 | |
| Actuated g/C Ratio | 0.64 | 0.58 | | 0.75 | 0.67 | 0.67 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | |
| v/c Ratio | 0.10 | 0.61 | | 0.60 | 0.21 | 0.03 | 0.74 | 0.19 | 0.43 | 0.19 | 0.47 | |
| Control Delay | 6.5 | 20.3 | | 14.1 | 9.5 | 0.1 | 73.5 | 43.8 | 10.4 | 44.2 | 35.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 6.5 | 20.3 | | 14.1 | 9.5 | 0.1 | 73.5 | 43.8 | 10.4 | 44.2 | 35.2 | |
| LOS | A | C | | B | A | A | E | D | B | D | D | |
| Approach Delay | | 19.6 | | | 10.5 | | | 39.7 | | | 37.2 | |
| Approach LOS | | B | | | B | | | D | | | D | |
| Queue Length 50th (m) | 3.1 | 90.5 | | 13.4 | 22.3 | 0.0 | 27.7 | 10.7 | 0.0 | 7.3 | 18.7 | |
| Queue Length 95th (m) | 8.5 | 148.4 | | 37.0 | 38.2 | 0.0 | 44.8 | 20.5 | 16.3 | 15.6 | 34.7 | |
| Internal Link Dist (m) | | 94.2 | | | 164.6 | | | 79.0 | | | 73.3 | |
| Turn Bay Length (m) | 20.0 | | | 120.0 | | 20.0 | | | 5.0 | 20.0 | | |
| Base Capacity (vph) | 733 | 1958 | | 426 | 2257 | 1003 | 280 | 451 | 483 | 322 | 444 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.08 | 0.61 | | 0.54 | 0.21 | 0.03 | 0.43 | 0.11 | 0.30 | 0.11 | 0.29 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 84 (70%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 20.6 Intersection LOS: C
Intersection Capacity Utilization 91.0% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: Clyde Ave/Cole Ave & Carling Ave

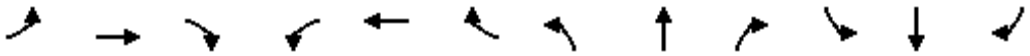




| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 1347 | 732 | 10 | 0 | 1 |
| Future Volume (Veh/h) | 0 | 1347 | 732 | 10 | 0 | 1 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 1347 | 732 | 10 | 0 | 1 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | 189 | 112 | | | |
| pX, platoon unblocked | 0.91 | | | | 0.82 | 0.91 |
| vC, conflicting volume | 742 | | | | 1410 | 371 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 509 | | | | 544 | 100 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 100 |
| cM capacity (veh/h) | 954 | | | | 384 | 849 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 674 | 674 | 488 | 254 | 1 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 10 | 1 |
| cSH | 1700 | 1700 | 1700 | 1700 | 849 |
| Volume to Capacity | 0.40 | 0.40 | 0.29 | 0.15 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 9.2 |
| Lane LOS | | | | | A |
| Approach Delay (s) | 0.0 | | 0.0 | | 9.2 |
| Approach LOS | | | | | A |

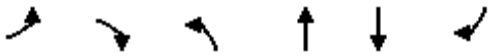
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 42.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 24 | 3 | 96 | 0 |
| Future Volume (Veh/h) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 24 | 3 | 96 | 0 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 24 | 3 | 96 | 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) | | | | | | | | 97 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 204 | 214 | 96 | 204 | 202 | 98 | 96 | | | 110 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 204 | 214 | 96 | 204 | 202 | 98 | 96 | | | 110 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 100 | 100 | 100 | 93 | 100 | 100 | 100 | | | 100 | | |
| cM capacity (veh/h) | 751 | 682 | 960 | 749 | 692 | 958 | 1498 | | | 1480 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 4 | 51 | 111 | 99 |
| Volume Left | 1 | 49 | 1 | 3 |
| Volume Right | 2 | 2 | 24 | 0 |
| cSH | 819 | 756 | 1498 | 1480 |
| Volume to Capacity | 0.00 | 0.07 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.1 | 1.6 | 0.0 | 0.0 |
| Control Delay (s) | 9.4 | 10.1 | 0.1 | 0.2 |
| Lane LOS | A | B | A | A |
| Approach Delay (s) | 9.4 | 10.1 | 0.1 | 0.2 |
| Approach LOS | A | B | | |

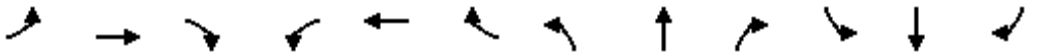
| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.2 | | | |
| Intersection Capacity Utilization | 23.2% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 4 | 32 | 14 | 315 | 578 | 16 |
| Future Volume (Veh/h) | 4 | 32 | 14 | 315 | 578 | 16 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 4 | 32 | 14 | 315 | 578 | 16 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 94 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 929 | 586 | 594 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 929 | 586 | 594 | | | |
| 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 | 94 | 99 | | | |
| cM capacity (veh/h) | 293 | 510 | 982 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 36 | 329 | 594 |
| Volume Left | 4 | 14 | 0 |
| Volume Right | 32 | 0 | 16 |
| cSH | 471 | 982 | 1700 |
| Volume to Capacity | 0.08 | 0.01 | 0.35 |
| Queue Length 95th (m) | 1.9 | 0.3 | 0.0 |
| Control Delay (s) | 13.3 | 0.5 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 13.3 | 0.5 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.7 | | |
| Intersection Capacity Utilization | 43.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 231 | 634 | 18 | 19 | 1426 | 218 | 96 | 33 | 26 | 182 | 7 | 269 |
| Future Volume (vph) | 231 | 634 | 18 | 19 | 1426 | 218 | 96 | 33 | 26 | 182 | 7 | 269 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 25.0 | | | 15.0 | | | 20.0 | | | 25.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 50 | |
| Link Distance (m) | | 112.3 | | | 137.3 | | | 86.0 | | | 93.3 | |
| Travel Time (s) | | 6.7 | | | 8.2 | | | 6.2 | | | 6.7 | |
| Lane Group Flow (vph) | 231 | 634 | 18 | 19 | 1426 | 218 | 96 | 59 | 0 | 182 | 276 | 0 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | 4 | | | 8 | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 11.1 | 34.1 | 34.1 | 11.1 | 34.1 | 34.1 | 44.8 | 44.8 | | 44.8 | 44.8 | |
| Total Split (s) | 20.0 | 55.0 | 55.0 | 20.0 | 55.0 | 55.0 | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 16.0% | 44.0% | 44.0% | 16.0% | 44.0% | 44.0% | 36.0% | 36.0% | | 36.0% | 36.0% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| 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) | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 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 | C-Max | C-Max | None | C-Max | C-Max | None | None | | None | None | |
| Act Effct Green (s) | 28.4 | 82.6 | 82.6 | 7.0 | 53.9 | 53.9 | 23.7 | 23.7 | | 23.7 | 23.7 | |
| Actuated g/C Ratio | 0.23 | 0.66 | 0.66 | 0.06 | 0.43 | 0.43 | 0.19 | 0.19 | | 0.19 | 0.19 | |
| v/c Ratio | 0.60 | 0.28 | 0.02 | 0.20 | 0.98 | 0.32 | 0.96 | 0.18 | | 0.76 | 0.56 | |
| Control Delay | 51.9 | 11.4 | 0.1 | 60.6 | 54.0 | 14.0 | 128.3 | 25.1 | | 66.2 | 9.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 51.9 | 11.4 | 0.1 | 60.6 | 54.0 | 14.0 | 128.3 | 25.1 | | 66.2 | 9.4 | |
| LOS | D | B | A | E | D | B | F | C | | E | A | |
| Approach Delay | | 21.8 | | | 48.9 | | | 89.0 | | | 32.0 | |
| Approach LOS | | C | | | D | | | F | | | C | |
| Queue Length 50th (m) | 51.7 | 26.1 | 0.0 | 4.6 | 174.5 | 16.7 | 23.7 | 6.8 | | 42.9 | 1.4 | |
| Queue Length 95th (m) | #87.4 | 61.7 | 0.0 | 12.2 | #247.4 | 37.9 | #47.1 | 16.7 | | 62.0 | 22.6 | |
| Internal Link Dist (m) | | 88.3 | | | 113.3 | | | 62.0 | | | 69.3 | |
| Turn Bay Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | | 20.0 | | |
| Base Capacity (vph) | 384 | 2239 | 978 | 188 | 1460 | 679 | 162 | 522 | | 388 | 636 | |
| 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 | 0.60 | 0.28 | 0.02 | 0.10 | 0.98 | 0.32 | 0.59 | 0.11 | | 0.47 | 0.43 | |

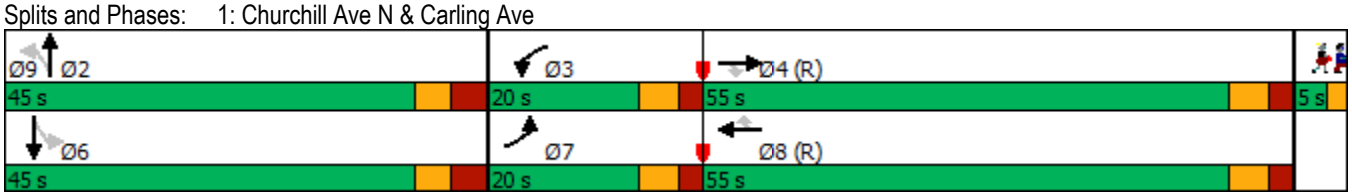
| Intersection Summary | |
|---|---|
| Area Type: | Other |

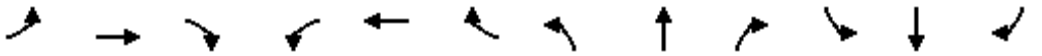
| Lane Group | Ø9 |
|---|---|
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (m) | |
| Storage Lanes | |
| Taper Length (m) | |
| Right Turn on Red | |
| Link Speed (k/h) | |
| Link Distance (m) | |
| Travel Time (s) | |
| Lane Group Flow (vph) | |
| Turn Type | |
| Protected Phases | 9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 3.0 |
| Minimum Split (s) | 5.0 |
| Total Split (s) | 5.0 |
| Total Split (%) | 4% |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 0.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Queue Length 50th (m) | |
| Queue Length 95th (m) | |
| Internal Link Dist (m) | |
| Turn Bay Length (m) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |
| Reduced v/c Ratio | |

| Intersection Summary |
|---|

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 92 (74%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 40.8 Intersection LOS: D
Intersection Capacity Utilization 111.4% ICU Level of Service H
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Churchill Ave N & Carling Ave



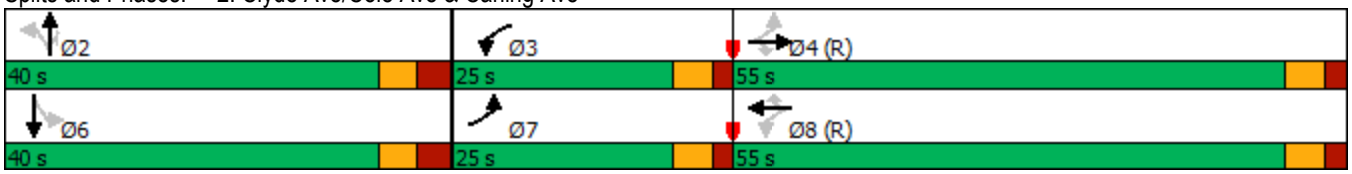


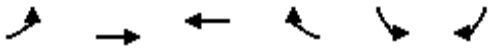
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 74 | 641 | 1 | 241 | 1484 | 51 | 126 | 87 | 210 | 30 | 54 | 62 |
| Future Volume (vph) | 74 | 641 | 1 | 241 | 1484 | 51 | 126 | 87 | 210 | 30 | 54 | 62 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | 0.0 | | 5.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 0 |
| Taper Length (m) | 20.0 | | | 30.0 | | | 7.6 | | | 20.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 40 | |
| Link Distance (m) | | 118.2 | | | 187.7 | | | 103.0 | | | 97.5 | |
| Travel Time (s) | | 7.1 | | | 11.3 | | | 7.4 | | | 8.8 | |
| Lane Group Flow (vph) | 74 | 641 | 1 | 241 | 1484 | 51 | 126 | 87 | 210 | 30 | 116 | 0 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | |
| Minimum Split (s) | 10.4 | 35.5 | 35.5 | 10.4 | 35.5 | 35.5 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (s) | 25.0 | 55.0 | 55.0 | 25.0 | 55.0 | 55.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 20.8% | 45.8% | 45.8% | 20.8% | 45.8% | 45.8% | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 1.7 | 2.1 | 2.1 | 1.7 | 2.1 | 2.1 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| 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) | 5.4 | 5.8 | 5.8 | 5.4 | 5.8 | 5.8 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | None | None | None | None | |
| Act Effct Green (s) | 80.5 | 72.9 | 72.9 | 88.6 | 78.9 | 78.9 | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 | |
| Actuated g/C Ratio | 0.67 | 0.61 | 0.61 | 0.74 | 0.66 | 0.66 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | |
| v/c Ratio | 0.31 | 0.31 | 0.00 | 0.43 | 0.67 | 0.05 | 0.70 | 0.32 | 0.58 | 0.16 | 0.40 | |
| Control Delay | 9.5 | 13.3 | 0.0 | 7.8 | 16.6 | 1.0 | 67.0 | 46.3 | 17.6 | 42.8 | 29.6 | |
| 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 | 9.5 | 13.3 | 0.0 | 7.8 | 16.6 | 1.0 | 67.0 | 46.3 | 17.6 | 42.8 | 29.6 | |
| LOS | A | B | A | A | B | A | E | D | B | D | C | |
| Approach Delay | | 12.9 | | | 15.0 | | | 38.2 | | | 32.3 | |
| Approach LOS | | B | | | B | | | D | | | C | |
| Queue Length 50th (m) | 3.9 | 35.2 | 0.0 | 14.2 | 106.9 | 0.0 | 28.6 | 18.6 | 9.2 | 6.2 | 14.4 | |
| Queue Length 95th (m) | 10.5 | 61.8 | 0.0 | 30.2 | 173.6 | 2.3 | 45.2 | 30.9 | 30.0 | 13.8 | 29.2 | |
| Internal Link Dist (m) | | 94.2 | | | 163.7 | | | 79.0 | | | 73.5 | |
| Turn Bay Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | | | 5.0 | 20.0 | | |
| Base Capacity (vph) | 405 | 2060 | 907 | 644 | 2228 | 960 | 328 | 496 | 528 | 342 | 486 | |
| 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 | 0.18 | 0.31 | 0.00 | 0.37 | 0.67 | 0.05 | 0.38 | 0.18 | 0.40 | 0.09 | 0.24 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |

| | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 93 (78%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.70 | |
| Intersection Signal Delay: 18.5 | Intersection LOS: B |
| Intersection Capacity Utilization 81.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Clyde Ave/Cole Ave & Carling Ave

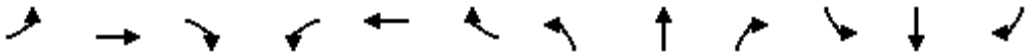




| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 883 | 1790 | 1 | 0 | 13 |
| Future Volume (Veh/h) | 0 | 883 | 1790 | 1 | 0 | 13 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 883 | 1790 | 1 | 0 | 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) | | 188 | 112 | | | |
| pX, platoon unblocked | 0.58 | | | | 0.63 | 0.58 |
| vC, conflicting volume | 1791 | | | | 2232 | 896 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 928 | | | | 1163 | 0 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 98 |
| cM capacity (veh/h) | 427 | | | | 118 | 633 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 442 | 442 | 1193 | 598 | 13 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 1 | 13 |
| cSH | 1700 | 1700 | 1700 | 1700 | 633 |
| Volume to Capacity | 0.26 | 0.26 | 0.70 | 0.35 | 0.02 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 10.8 |
| Lane LOS | | | | | B |
| Approach Delay (s) | 0.0 | | 0.0 | | 10.8 |
| Approach LOS | | | | | B |

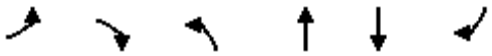
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 62.3% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 52 | 4 | 60 | 2 |
| Future Volume (Veh/h) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 52 | 4 | 60 | 2 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 52 | 4 | 60 | 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) | | | | | | | | 98 | | | | |
| pX, platoon unblocked | 0.98 | 0.98 | | 0.98 | 0.98 | 0.98 | | | | 0.98 | | |
| vC, conflicting volume | 236 | 257 | 61 | 240 | 232 | 148 | 62 | | | 174 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 207 | 228 | 61 | 210 | 202 | 116 | 62 | | | 143 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 100 | 100 | 99 | 95 | 100 | 99 | 100 | | | 100 | | |
| cM capacity (veh/h) | 725 | 651 | 1004 | 719 | 673 | 914 | 1541 | | | 1407 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 11 | 42 | 181 | 66 |
| Volume Left | 2 | 36 | 7 | 4 |
| Volume Right | 8 | 5 | 52 | 2 |
| cSH | 897 | 737 | 1541 | 1407 |
| Volume to Capacity | 0.01 | 0.06 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.3 | 1.4 | 0.1 | 0.1 |
| Control Delay (s) | 9.1 | 10.2 | 0.3 | 0.5 |
| Lane LOS | A | B | A | A |
| Approach Delay (s) | 9.1 | 10.2 | 0.3 | 0.5 |
| Approach LOS | A | B | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.1 | | | |
| Intersection Capacity Utilization | 27.8% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

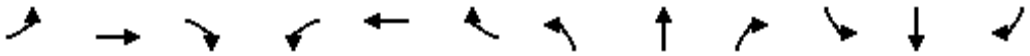


| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 9 | 25 | 31 | 464 | 454 | 17 |
| Future Volume (Veh/h) | 9 | 25 | 31 | 464 | 454 | 17 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 9 | 25 | 31 | 464 | 454 | 17 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 93 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 988 | 462 | 471 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 988 | 462 | 471 | | | |
| 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 | 96 | 97 | | | |
| cM capacity (veh/h) | 266 | 599 | 1091 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 34 | 495 | 471 |
| Volume Left | 9 | 31 | 0 |
| Volume Right | 25 | 0 | 17 |
| cSH | 450 | 1091 | 1700 |
| Volume to Capacity | 0.08 | 0.03 | 0.28 |
| Queue Length 95th (m) | 1.9 | 0.7 | 0.0 |
| Control Delay (s) | 13.7 | 0.8 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 13.7 | 0.8 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.9 | | |
| Intersection Capacity Utilization | 62.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

# Future Background 2027



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 167 | 1136 | 98 | 85 | 512 | 154 | 11 | 5 | 11 | 336 | 31 | 243 |
| Future Volume (vph) | 167 | 1136 | 98 | 85 | 512 | 154 | 11 | 5 | 11 | 336 | 31 | 243 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 25.0 | | | 15.0 | | | 20.0 | | | 25.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 50 | |
| Link Distance (m) | | 113.4 | | | 137.3 | | | 90.4 | | | 92.0 | |
| Travel Time (s) | | 6.8 | | | 8.2 | | | 6.5 | | | 6.6 | |
| Lane Group Flow (vph) | 167 | 1136 | 98 | 85 | 512 | 154 | 11 | 16 | 0 | 336 | 274 | 0 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | 4 | | | 8 | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 11.1 | 34.1 | 34.1 | 11.1 | 34.1 | 34.1 | 44.8 | 44.8 | | 44.8 | 44.8 | |
| Total Split (s) | 25.0 | 50.0 | 50.0 | 25.0 | 50.0 | 50.0 | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 20.0% | 40.0% | 40.0% | 20.0% | 40.0% | 40.0% | 36.0% | 36.0% | | 36.0% | 36.0% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| 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) | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 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 | C-Max | C-Max | None | C-Max | C-Max | None | None | | None | None | |
| Act Effct Green (s) | 16.3 | 57.0 | 57.0 | 11.6 | 52.3 | 52.3 | 37.4 | 37.4 | | 37.4 | 37.4 | |
| Actuated g/C Ratio | 0.13 | 0.46 | 0.46 | 0.09 | 0.42 | 0.42 | 0.30 | 0.30 | | 0.30 | 0.30 | |
| v/c Ratio | 0.76 | 0.73 | 0.14 | 0.54 | 0.36 | 0.23 | 0.05 | 0.03 | | 0.86 | 0.44 | |
| Control Delay | 73.7 | 33.2 | 4.7 | 66.2 | 27.6 | 11.0 | 28.6 | 16.2 | | 61.9 | 7.8 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 73.7 | 33.2 | 4.7 | 66.2 | 27.6 | 11.0 | 28.6 | 16.2 | | 61.9 | 7.8 | |
| LOS | E | C | A | E | C | B | C | B | | E | A | |
| Approach Delay | | 36.1 | | | 28.5 | | | 21.3 | | | 37.6 | |
| Approach LOS | | D | | | C | | | C | | | D | |
| Queue Length 50th (m) | 39.7 | 120.7 | 0.0 | 20.3 | 46.5 | 7.6 | 1.9 | 0.9 | | 76.3 | 5.4 | |
| Queue Length 95th (m) | 62.9 | #176.9 | 10.1 | 35.5 | 66.0 | 23.9 | 6.0 | 5.7 | | 109.0 | 24.8 | |
| Internal Link Dist (m) | | 89.4 | | | 113.3 | | | 66.4 | | | 68.0 | |
| Turn Bay Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | | 20.0 | | |
| Base Capacity (vph) | 256 | 1546 | 713 | 256 | 1419 | 660 | 255 | 513 | | 422 | 649 | |
| 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 | 0.65 | 0.73 | 0.14 | 0.33 | 0.36 | 0.23 | 0.04 | 0.03 | | 0.80 | 0.42 | |

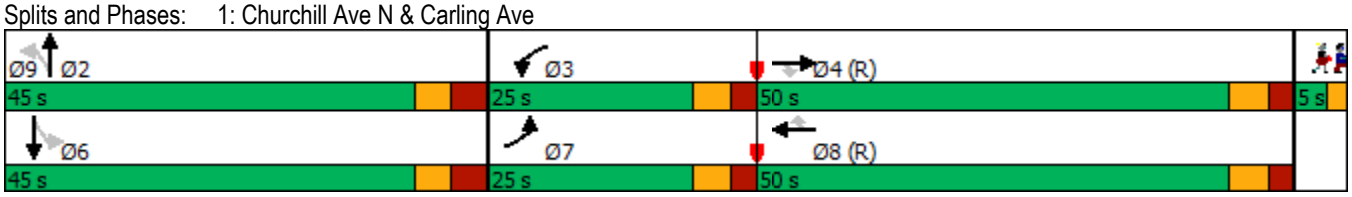
| Intersection Summary | |
|---|---|
| Area Type: | Other |

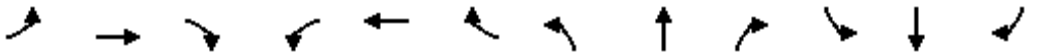
| Lane Group | Ø9 |
|---|---|
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (m) | |
| Storage Lanes | |
| Taper Length (m) | |
| Right Turn on Red | |
| Link Speed (k/h) | |
| Link Distance (m) | |
| Travel Time (s) | |
| Lane Group Flow (vph) | |
| Turn Type | |
| Protected Phases | 9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 3.0 |
| Minimum Split (s) | 5.0 |
| Total Split (s) | 5.0 |
| Total Split (%) | 4% |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 0.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Queue Length 50th (m) | |
| Queue Length 95th (m) | |
| Internal Link Dist (m) | |
| Turn Bay Length (m) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |
| Reduced v/c Ratio | |

| Intersection Summary |
|---|

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 101 (81%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 34.2 Intersection LOS: C
Intersection Capacity Utilization 83.1% ICU Level of Service E
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Churchill Ave N & Carling Ave



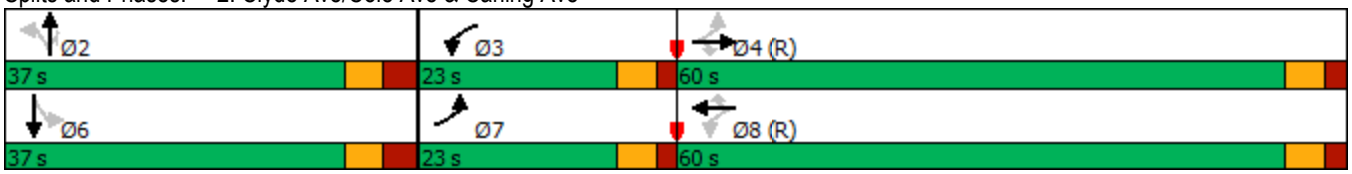


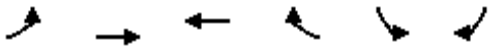
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 1244 | 0 | 232 | 505 | 31 | 121 | 51 | 147 | 35 | 63 | 66 |
| Future Volume (vph) | 60 | 1244 | 0 | 232 | 505 | 31 | 121 | 51 | 147 | 35 | 63 | 66 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | 0.0 | | 5.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 0 |
| Taper Length (m) | 20.0 | | | 30.0 | | | 7.6 | | | 20.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 40 | |
| Link Distance (m) | | 118.2 | | | 186.6 | | | 103.0 | | | 94.6 | |
| Travel Time (s) | | 7.1 | | | 11.2 | | | 7.4 | | | 8.5 | |
| Lane Group Flow (vph) | 60 | 1244 | 0 | 232 | 505 | 31 | 121 | 51 | 147 | 35 | 129 | 0 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | |
| Minimum Split (s) | 10.4 | 35.5 | 35.5 | 10.4 | 35.5 | 35.5 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (s) | 23.0 | 60.0 | 60.0 | 23.0 | 60.0 | 60.0 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (%) | 19.2% | 50.0% | 50.0% | 19.2% | 50.0% | 50.0% | 30.8% | 30.8% | 30.8% | 30.8% | 30.8% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 1.7 | 2.1 | 2.1 | 1.7 | 2.1 | 2.1 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| 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) | 5.4 | 5.8 | 5.8 | 5.4 | 5.8 | 5.8 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | None | None | None | None | |
| Act Effct Green (s) | 75.5 | 68.4 | | 90.2 | 79.9 | 79.9 | 17.8 | 17.8 | 17.8 | 17.8 | 17.8 | |
| Actuated g/C Ratio | 0.63 | 0.57 | | 0.75 | 0.67 | 0.67 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | |
| v/c Ratio | 0.11 | 0.64 | | 0.62 | 0.22 | 0.03 | 0.74 | 0.19 | 0.43 | 0.19 | 0.47 | |
| Control Delay | 6.7 | 21.6 | | 17.0 | 9.5 | 0.1 | 73.5 | 43.8 | 10.4 | 44.2 | 35.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 6.7 | 21.6 | | 17.0 | 9.5 | 0.1 | 73.5 | 43.8 | 10.4 | 44.2 | 35.2 | |
| LOS | A | C | | B | A | A | E | D | B | D | D | |
| Approach Delay | | 20.9 | | | 11.4 | | | 39.7 | | | 37.2 | |
| Approach LOS | | C | | | B | | | D | | | D | |
| Queue Length 50th (m) | 3.1 | 100.1 | | 13.4 | 23.7 | 0.0 | 27.7 | 10.7 | 0.0 | 7.3 | 18.7 | |
| Queue Length 95th (m) | 8.5 | 159.7 | | 42.0 | 40.1 | 0.0 | 44.8 | 20.5 | 16.3 | 15.6 | 34.7 | |
| Internal Link Dist (m) | | 94.2 | | | 162.6 | | | 79.0 | | | 70.6 | |
| Turn Bay Length (m) | 20.0 | | | 120.0 | | 20.0 | | | 5.0 | 20.0 | | |
| Base Capacity (vph) | 717 | 1931 | | 410 | 2257 | 1003 | 280 | 451 | 483 | 322 | 444 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.08 | 0.64 | | 0.57 | 0.22 | 0.03 | 0.43 | 0.11 | 0.30 | 0.11 | 0.29 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 84 (70%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 21.5 Intersection LOS: C
Intersection Capacity Utilization 92.7% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: Clyde Ave/Cole Ave & Carling Ave

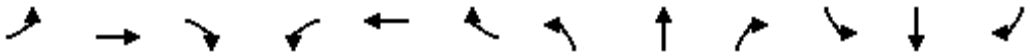




| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 1414 | 769 | 10 | 0 | 1 |
| Future Volume (Veh/h) | 0 | 1414 | 769 | 10 | 0 | 1 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 1414 | 769 | 10 | 0 | 1 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | 187 | 113 | | | |
| pX, platoon unblocked | 0.90 | | | | 0.80 | 0.90 |
| vC, conflicting volume | 779 | | | | 1481 | 390 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 534 | | | | 534 | 102 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 100 |
| cM capacity (veh/h) | 927 | | | | 379 | 841 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 707 | 707 | 513 | 266 | 1 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 10 | 1 |
| cSH | 1700 | 1700 | 1700 | 1700 | 841 |
| Volume to Capacity | 0.42 | 0.42 | 0.30 | 0.16 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 9.3 |
| Lane LOS | | | | | A |
| Approach Delay (s) | 0.0 | | 0.0 | | 9.3 |
| Approach LOS | | | | | A |

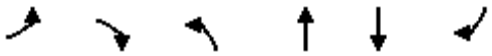
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 44.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 24 | 3 | 96 | 0 |
| Future Volume (Veh/h) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 24 | 3 | 96 | 0 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 24 | 3 | 96 | 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) | | | | | | | | 94 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 204 | 214 | 96 | 204 | 202 | 98 | 96 | | | 110 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 204 | 214 | 96 | 204 | 202 | 98 | 96 | | | 110 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 100 | 100 | 100 | 93 | 100 | 100 | 100 | | | 100 | | |
| cM capacity (veh/h) | 751 | 682 | 960 | 749 | 692 | 958 | 1498 | | | 1480 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 4 | 51 | 111 | 99 |
| Volume Left | 1 | 49 | 1 | 3 |
| Volume Right | 2 | 2 | 24 | 0 |
| cSH | 819 | 756 | 1498 | 1480 |
| Volume to Capacity | 0.00 | 0.07 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.1 | 1.6 | 0.0 | 0.0 |
| Control Delay (s) | 9.4 | 10.1 | 0.1 | 0.2 |
| Lane LOS | A | B | A | A |
| Approach Delay (s) | 9.4 | 10.1 | 0.1 | 0.2 |
| Approach LOS | A | B | | |

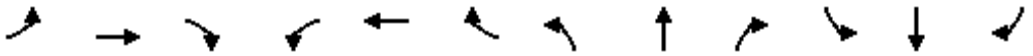
| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.2 | | | |
| Intersection Capacity Utilization | 23.2% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 4 | 32 | 14 | 315 | 578 | 16 |
| Future Volume (Veh/h) | 4 | 32 | 14 | 315 | 578 | 16 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 4 | 32 | 14 | 315 | 578 | 16 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 92 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 929 | 586 | 594 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 929 | 586 | 594 | | | |
| 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 | 94 | 99 | | | |
| cM capacity (veh/h) | 293 | 510 | 982 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 36 | 329 | 594 |
| Volume Left | 4 | 14 | 0 |
| Volume Right | 32 | 0 | 16 |
| cSH | 471 | 982 | 1700 |
| Volume to Capacity | 0.08 | 0.01 | 0.35 |
| Queue Length 95th (m) | 1.9 | 0.3 | 0.0 |
| Control Delay (s) | 13.3 | 0.5 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 13.3 | 0.5 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.7 | | |
| Intersection Capacity Utilization | 43.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 231 | 666 | 18 | 19 | 1497 | 218 | 96 | 33 | 26 | 182 | 7 | 269 |
| Future Volume (vph) | 231 | 666 | 18 | 19 | 1497 | 218 | 96 | 33 | 26 | 182 | 7 | 269 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 25.0 | | | 15.0 | | | 20.0 | | | 25.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 50 | |
| Link Distance (m) | | 111.2 | | | 137.3 | | | 86.0 | | | 92.6 | |
| Travel Time (s) | | 6.7 | | | 8.2 | | | 6.2 | | | 6.7 | |
| Lane Group Flow (vph) | 231 | 666 | 18 | 19 | 1497 | 218 | 96 | 59 | 0 | 182 | 276 | 0 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | 4 | | | 8 | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 11.1 | 34.1 | 34.1 | 11.1 | 34.1 | 34.1 | 44.8 | 44.8 | | 44.8 | 44.8 | |
| Total Split (s) | 20.0 | 55.0 | 55.0 | 20.0 | 55.0 | 55.0 | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 16.0% | 44.0% | 44.0% | 16.0% | 44.0% | 44.0% | 36.0% | 36.0% | | 36.0% | 36.0% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| 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) | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 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 | C-Max | C-Max | None | C-Max | C-Max | None | None | | None | None | |
| Act Effct Green (s) | 28.4 | 82.6 | 82.6 | 7.0 | 53.9 | 53.9 | 23.7 | 23.7 | | 23.7 | 23.7 | |
| Actuated g/C Ratio | 0.23 | 0.66 | 0.66 | 0.06 | 0.43 | 0.43 | 0.19 | 0.19 | | 0.19 | 0.19 | |
| v/c Ratio | 0.60 | 0.30 | 0.02 | 0.20 | 1.03 | 0.32 | 0.96 | 0.18 | | 0.76 | 0.56 | |
| Control Delay | 51.9 | 11.6 | 0.1 | 60.6 | 65.7 | 14.0 | 128.3 | 25.1 | | 66.2 | 9.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 51.9 | 11.6 | 0.1 | 60.6 | 65.7 | 14.0 | 128.3 | 25.1 | | 66.2 | 9.4 | |
| LOS | D | B | A | E | E | B | F | C | | E | A | |
| Approach Delay | | 21.5 | | | 59.1 | | | 89.0 | | | 32.0 | |
| Approach LOS | | C | | | E | | | F | | | C | |
| Queue Length 50th (m) | 51.7 | 27.8 | 0.0 | 4.6 | 190.0 | 16.7 | 23.7 | 6.8 | | 42.9 | 1.4 | |
| Queue Length 95th (m) | #87.4 | 65.5 | 0.0 | 12.2 | #266.8 | 37.9 | #47.1 | 16.7 | | 62.0 | 22.6 | |
| Internal Link Dist (m) | | 87.2 | | | 113.3 | | | 62.0 | | | 68.6 | |
| Turn Bay Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | | 20.0 | | |
| Base Capacity (vph) | 384 | 2239 | 978 | 188 | 1460 | 679 | 162 | 522 | | 388 | 636 | |
| 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 | 0.60 | 0.30 | 0.02 | 0.10 | 1.03 | 0.32 | 0.59 | 0.11 | | 0.47 | 0.43 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |

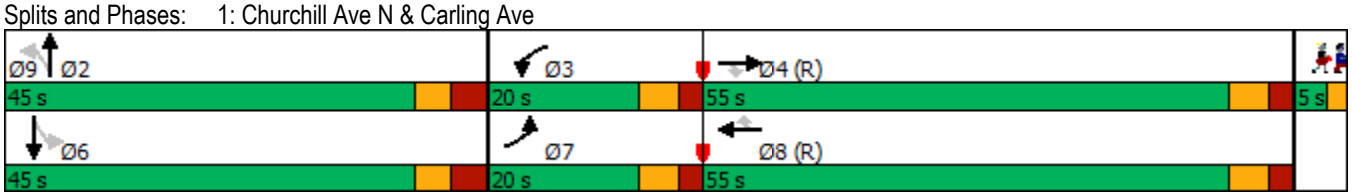
| Lane Group | Ø9 |
|---|---|
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (m) | |
| Storage Lanes | |
| Taper Length (m) | |
| Right Turn on Red | |
| Link Speed (k/h) | |
| Link Distance (m) | |
| Travel Time (s) | |
| Lane Group Flow (vph) | |
| Turn Type | |
| Protected Phases | 9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 3.0 |
| Minimum Split (s) | 5.0 |
| Total Split (s) | 5.0 |
| Total Split (%) | 4% |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 0.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Queue Length 50th (m) | |
| Queue Length 95th (m) | |
| Internal Link Dist (m) | |
| Turn Bay Length (m) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |
| Reduced v/c Ratio | |

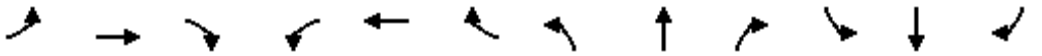
| Intersection Summary |
|---|

| | |
|---|---|
| Cycle Length: 125 | |
| Actuated Cycle Length: 125 | |
| Offset: 92 (74%), Referenced to phase 4:EBT and 8:WBT, Start of Green | |
| Natural Cycle: 145 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.03 | |
| Intersection Signal Delay: 46.2 | Intersection LOS: D |
| Intersection Capacity Utilization 113.5% | ICU Level of Service H |
| Analysis Period (min) 15 | |

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

Splits and Phases: 1: Churchill Ave N & Carling Ave



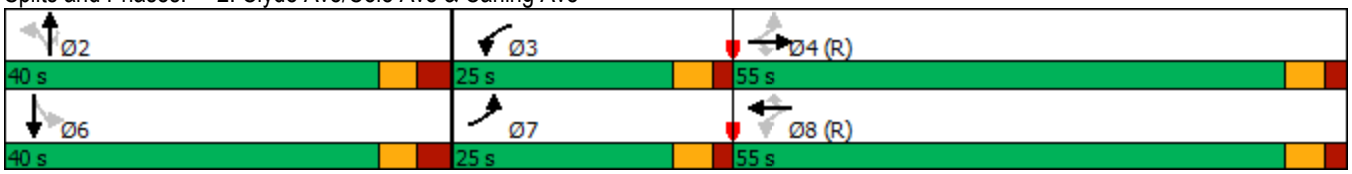


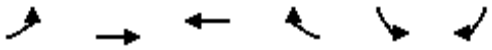
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 74 | 673 | 1 | 241 | 1558 | 51 | 126 | 87 | 210 | 30 | 54 | 62 |
| Future Volume (vph) | 74 | 673 | 1 | 241 | 1558 | 51 | 126 | 87 | 210 | 30 | 54 | 62 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | 0.0 | | 5.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 0 |
| Taper Length (m) | 20.0 | | | 30.0 | | | 7.6 | | | 20.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 40 | |
| Link Distance (m) | | 118.2 | | | 188.8 | | | 103.0 | | | 93.9 | |
| Travel Time (s) | | 7.1 | | | 11.3 | | | 7.4 | | | 8.5 | |
| Lane Group Flow (vph) | 74 | 673 | 1 | 241 | 1558 | 51 | 126 | 87 | 210 | 30 | 116 | 0 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | |
| Minimum Split (s) | 10.4 | 35.5 | 35.5 | 10.4 | 35.5 | 35.5 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (s) | 25.0 | 55.0 | 55.0 | 25.0 | 55.0 | 55.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 20.8% | 45.8% | 45.8% | 20.8% | 45.8% | 45.8% | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 1.7 | 2.1 | 2.1 | 1.7 | 2.1 | 2.1 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| 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) | 5.4 | 5.8 | 5.8 | 5.4 | 5.8 | 5.8 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | None | None | None | None | |
| Act Effct Green (s) | 80.5 | 72.9 | 72.9 | 88.6 | 78.9 | 78.9 | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 | |
| Actuated g/C Ratio | 0.67 | 0.61 | 0.61 | 0.74 | 0.66 | 0.66 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | |
| v/c Ratio | 0.34 | 0.33 | 0.00 | 0.44 | 0.70 | 0.05 | 0.70 | 0.32 | 0.58 | 0.16 | 0.40 | |
| Control Delay | 10.4 | 13.5 | 0.0 | 8.0 | 17.6 | 1.0 | 67.0 | 46.3 | 17.6 | 42.8 | 29.6 | |
| 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 | 10.4 | 13.5 | 0.0 | 8.0 | 17.6 | 1.0 | 67.0 | 46.3 | 17.6 | 42.8 | 29.6 | |
| LOS | B | B | A | A | B | A | E | D | B | D | C | |
| Approach Delay | | 13.2 | | | 15.8 | | | 38.2 | | | 32.3 | |
| Approach LOS | | B | | | B | | | D | | | C | |
| Queue Length 50th (m) | 3.9 | 37.4 | 0.0 | 14.2 | 116.9 | 0.0 | 28.6 | 18.6 | 9.2 | 6.2 | 14.4 | |
| Queue Length 95th (m) | 10.5 | 65.4 | 0.0 | 30.2 | 189.8 | 2.3 | 45.2 | 30.9 | 30.0 | 13.8 | 29.2 | |
| Internal Link Dist (m) | | 94.2 | | | 164.8 | | | 79.0 | | | 69.9 | |
| Turn Bay Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | | | 5.0 | 20.0 | | |
| Base Capacity (vph) | 388 | 2060 | 907 | 629 | 2228 | 960 | 328 | 496 | 528 | 342 | 486 | |
| 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 | 0.19 | 0.33 | 0.00 | 0.38 | 0.70 | 0.05 | 0.38 | 0.18 | 0.40 | 0.09 | 0.24 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 93 (78%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 19.0 Intersection LOS: B
Intersection Capacity Utilization 83.2% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Clyde Ave/Cole Ave & Carling Ave

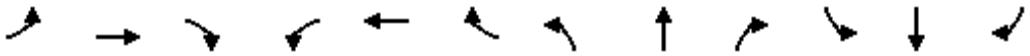




| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 927 | 1880 | 1 | 0 | 13 |
| Future Volume (Veh/h) | 0 | 927 | 1880 | 1 | 0 | 13 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 927 | 1880 | 1 | 0 | 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) | | 189 | 111 | | | |
| pX, platoon unblocked | 0.58 | | | | 0.62 | 0.58 |
| vC, conflicting volume | 1881 | | | | 2344 | 940 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1055 | | | | 1283 | 0 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 98 |
| cM capacity (veh/h) | 377 | | | | 97 | 624 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 464 | 464 | 1253 | 628 | 13 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 1 | 13 |
| cSH | 1700 | 1700 | 1700 | 1700 | 624 |
| Volume to Capacity | 0.27 | 0.27 | 0.74 | 0.37 | 0.02 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 10.9 |
| Lane LOS | | | | | B |
| Approach Delay (s) | 0.0 | | 0.0 | | 10.9 |
| Approach LOS | | | | | B |

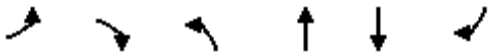
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 64.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 52 | 4 | 60 | 2 |
| Future Volume (Veh/h) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 52 | 4 | 60 | 2 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 52 | 4 | 60 | 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) | | | | | | | | 94 | | | | |
| pX, platoon unblocked | 0.98 | 0.98 | | 0.98 | 0.98 | 0.98 | | | | 0.98 | | |
| vC, conflicting volume | 236 | 257 | 61 | 240 | 232 | 148 | 62 | | | 174 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 206 | 227 | 61 | 209 | 201 | 115 | 62 | | | 142 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 100 | 100 | 99 | 95 | 100 | 99 | 100 | | | 100 | | |
| cM capacity (veh/h) | 725 | 652 | 1004 | 720 | 673 | 915 | 1541 | | | 1407 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 11 | 42 | 181 | 66 |
| Volume Left | 2 | 36 | 7 | 4 |
| Volume Right | 8 | 5 | 52 | 2 |
| cSH | 897 | 738 | 1541 | 1407 |
| Volume to Capacity | 0.01 | 0.06 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.3 | 1.4 | 0.1 | 0.1 |
| Control Delay (s) | 9.1 | 10.2 | 0.3 | 0.5 |
| Lane LOS | A | B | A | A |
| Approach Delay (s) | 9.1 | 10.2 | 0.3 | 0.5 |
| Approach LOS | A | B | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.1 | | | |
| Intersection Capacity Utilization | 27.8% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

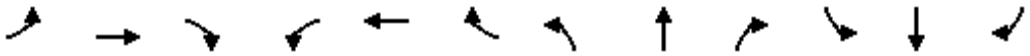


| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 9 | 25 | 31 | 464 | 454 | 17 |
| Future Volume (Veh/h) | 9 | 25 | 31 | 464 | 454 | 17 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 9 | 25 | 31 | 464 | 454 | 17 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 93 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 988 | 462 | 471 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 988 | 462 | 471 | | | |
| 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 | 96 | 97 | | | |
| cM capacity (veh/h) | 266 | 599 | 1091 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 34 | 495 | 471 |
| Volume Left | 9 | 31 | 0 |
| Volume Right | 25 | 0 | 17 |
| cSH | 450 | 1091 | 1700 |
| Volume to Capacity | 0.08 | 0.03 | 0.28 |
| Queue Length 95th (m) | 1.9 | 0.7 | 0.0 |
| Control Delay (s) | 13.7 | 0.8 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 13.7 | 0.8 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.9 | | |
| Intersection Capacity Utilization | 62.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

# Total Projected 2022



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 168 | 1108 | 98 | 85 | 492 | 154 | 11 | 5 | 11 | 344 | 31 | 245 |
| Future Volume (vph) | 168 | 1108 | 98 | 85 | 492 | 154 | 11 | 5 | 11 | 344 | 31 | 245 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 25.0 | | | 15.0 | | | 20.0 | | | 25.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 50 | |
| Link Distance (m) | | 115.1 | | | 137.3 | | | 90.4 | | | 90.1 | |
| Travel Time (s) | | 6.9 | | | 8.2 | | | 6.5 | | | 6.5 | |
| Lane Group Flow (vph) | 168 | 1108 | 98 | 85 | 492 | 154 | 11 | 16 | 0 | 344 | 276 | 0 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | 4 | | | 8 | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 11.1 | 34.1 | 34.1 | 11.1 | 34.1 | 34.1 | 44.8 | 44.8 | | 44.8 | 44.8 | |
| Total Split (s) | 25.0 | 50.0 | 50.0 | 25.0 | 50.0 | 50.0 | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 20.0% | 40.0% | 40.0% | 20.0% | 40.0% | 40.0% | 36.0% | 36.0% | | 36.0% | 36.0% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| 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) | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 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 | C-Max | C-Max | None | C-Max | C-Max | None | None | | None | None | |
| Act Effct Green (s) | 16.3 | 56.3 | 56.3 | 11.6 | 51.6 | 51.6 | 38.1 | 38.1 | | 38.1 | 38.1 | |
| Actuated g/C Ratio | 0.13 | 0.45 | 0.45 | 0.09 | 0.41 | 0.41 | 0.30 | 0.30 | | 0.30 | 0.30 | |
| v/c Ratio | 0.76 | 0.73 | 0.14 | 0.54 | 0.35 | 0.24 | 0.05 | 0.03 | | 0.86 | 0.44 | |
| Control Delay | 73.9 | 33.2 | 4.7 | 66.2 | 27.8 | 11.1 | 28.5 | 16.2 | | 61.8 | 7.7 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 73.9 | 33.2 | 4.7 | 66.2 | 27.8 | 11.1 | 28.5 | 16.2 | | 61.8 | 7.7 | |
| LOS | E | C | A | E | C | B | C | B | | E | A | |
| Approach Delay | | 36.2 | | | 28.7 | | | 21.2 | | | 37.7 | |
| Approach LOS | | D | | | C | | | C | | | D | |
| Queue Length 50th (m) | 39.9 | 118.3 | 0.0 | 20.3 | 45.2 | 7.7 | 1.9 | 0.8 | | 77.8 | 5.3 | |
| Queue Length 95th (m) | 63.2 | 161.6 | 10.1 | 35.5 | 63.2 | 23.9 | 6.0 | 5.7 | | #114.0 | 25.1 | |
| Internal Link Dist (m) | | 91.1 | | | 113.3 | | | 66.4 | | | 66.1 | |
| Turn Bay Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | | 20.0 | | |
| Base Capacity (vph) | 256 | 1527 | 706 | 256 | 1399 | 652 | 257 | 516 | | 425 | 652 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.66 | 0.73 | 0.14 | 0.33 | 0.35 | 0.24 | 0.04 | 0.03 | | 0.81 | 0.42 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |

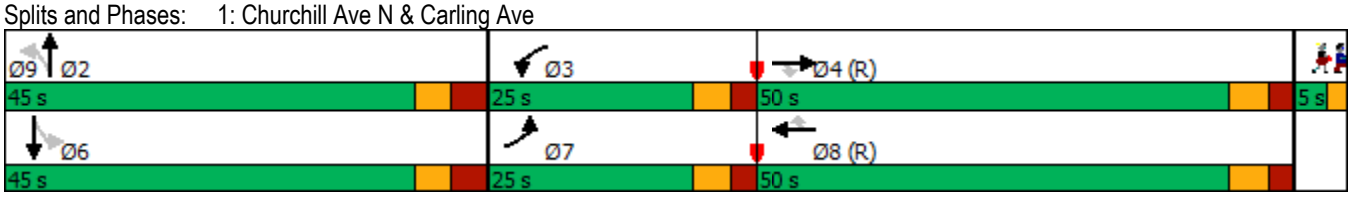
| Lane Group | Ø9 |
|---|---|
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (m) | |
| Storage Lanes | |
| Taper Length (m) | |
| Right Turn on Red | |
| Link Speed (k/h) | |
| Link Distance (m) | |
| Travel Time (s) | |
| Lane Group Flow (vph) | |
| Turn Type | |
| Protected Phases | 9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 3.0 |
| Minimum Split (s) | 5.0 |
| Total Split (s) | 5.0 |
| Total Split (%) | 4% |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 0.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Queue Length 50th (m) | |
| Queue Length 95th (m) | |
| Internal Link Dist (m) | |
| Turn Bay Length (m) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |
| Reduced v/c Ratio | |

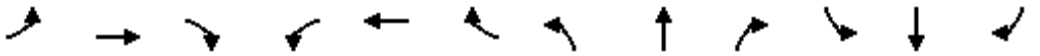
| Intersection Summary |
|---|

| | |
|---|---|
| Cycle Length: 125 | |
| Actuated Cycle Length: 125 | |
| Offset: 101 (81%), Referenced to phase 4:EBT and 8:WBT, Start of Green | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay: 34.4 | Intersection LOS: C |
| Intersection Capacity Utilization 82.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

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

Splits and Phases: 1: Churchill Ave N & Carling Ave



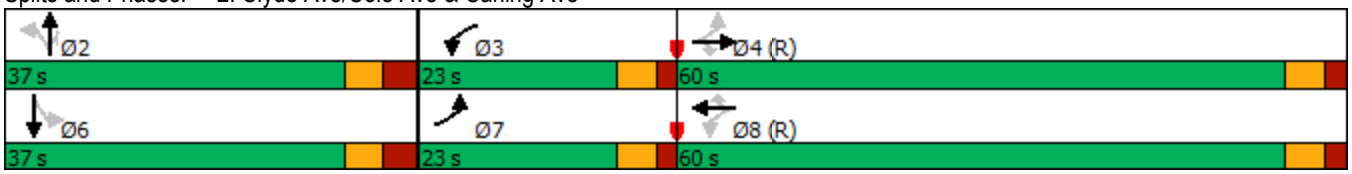


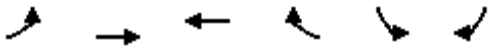
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 1186 | 0 | 260 | 489 | 51 | 121 | 51 | 147 | 35 | 63 | 66 |
| Future Volume (vph) | 60 | 1186 | 0 | 260 | 489 | 51 | 121 | 51 | 147 | 35 | 63 | 66 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | 0.0 | | 5.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 0 |
| Taper Length (m) | 20.0 | | | 30.0 | | | 7.6 | | | 20.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 40 | |
| Link Distance (m) | | 118.2 | | | 185.0 | | | 103.0 | | | 95.8 | |
| Travel Time (s) | | 7.1 | | | 11.1 | | | 7.4 | | | 8.6 | |
| Lane Group Flow (vph) | 60 | 1186 | 0 | 260 | 489 | 51 | 121 | 51 | 147 | 35 | 129 | 0 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | |
| Minimum Split (s) | 10.4 | 35.5 | 35.5 | 10.4 | 35.5 | 35.5 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (s) | 23.0 | 60.0 | 60.0 | 23.0 | 60.0 | 60.0 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (%) | 19.2% | 50.0% | 50.0% | 19.2% | 50.0% | 50.0% | 30.8% | 30.8% | 30.8% | 30.8% | 30.8% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 1.7 | 2.1 | 2.1 | 1.7 | 2.1 | 2.1 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| 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) | 5.4 | 5.8 | 5.8 | 5.4 | 5.8 | 5.8 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | None | None | None | None | |
| Act Effct Green (s) | 74.5 | 67.4 | | 90.2 | 79.9 | 79.9 | 17.8 | 17.8 | 17.8 | 17.8 | 17.8 | |
| Actuated g/C Ratio | 0.62 | 0.56 | | 0.75 | 0.67 | 0.67 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | |
| v/c Ratio | 0.11 | 0.62 | | 0.65 | 0.22 | 0.05 | 0.74 | 0.19 | 0.43 | 0.19 | 0.47 | |
| Control Delay | 6.8 | 21.6 | | 17.8 | 9.5 | 1.0 | 73.5 | 43.8 | 10.4 | 44.2 | 35.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 6.8 | 21.6 | | 17.8 | 9.5 | 1.0 | 73.5 | 43.8 | 10.4 | 44.2 | 35.2 | |
| LOS | A | C | | B | A | A | E | D | B | D | D | |
| Approach Delay | | 20.8 | | | 11.6 | | | 39.7 | | | 37.2 | |
| Approach LOS | | C | | | B | | | D | | | D | |
| Queue Length 50th (m) | 3.1 | 95.4 | | 15.3 | 22.7 | 0.0 | 27.7 | 10.7 | 0.0 | 7.3 | 18.7 | |
| Queue Length 95th (m) | 8.5 | 148.4 | | 47.9 | 38.8 | 2.2 | 44.8 | 20.5 | 16.3 | 15.6 | 34.7 | |
| Internal Link Dist (m) | | 94.2 | | | 161.0 | | | 79.0 | | | 71.8 | |
| Turn Bay Length (m) | 20.0 | | | 120.0 | | 20.0 | | | 5.0 | 20.0 | | |
| Base Capacity (vph) | 720 | 1904 | | 426 | 2257 | 1003 | 280 | 451 | 483 | 322 | 444 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.08 | 0.62 | | 0.61 | 0.22 | 0.05 | 0.43 | 0.11 | 0.30 | 0.11 | 0.29 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |

| | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 84 (70%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green | |
| Natural Cycle: 85 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.74 | |
| Intersection Signal Delay: 21.4 | Intersection LOS: C |
| Intersection Capacity Utilization 92.7% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Clyde Ave/Cole Ave & Carling Ave

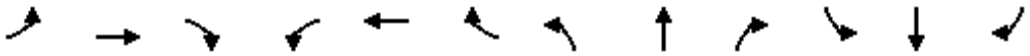




| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 1374 | 732 | 18 | 0 | 57 |
| Future Volume (Veh/h) | 0 | 1374 | 732 | 18 | 0 | 57 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 1374 | 732 | 18 | 0 | 57 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | 185 | 115 | | | |
| pX, platoon unblocked | 0.90 | | | | 0.81 | 0.90 |
| vC, conflicting volume | 750 | | | | 1428 | 375 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 513 | | | | 526 | 98 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 93 |
| cM capacity (veh/h) | 949 | | | | 389 | 849 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 687 | 687 | 488 | 262 | 57 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 18 | 57 |
| cSH | 1700 | 1700 | 1700 | 1700 | 849 |
| Volume to Capacity | 0.40 | 0.40 | 0.29 | 0.15 | 0.07 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 1.6 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 9.5 |
| Lane LOS | | | | | A |
| Approach Delay (s) | 0.0 | | 0.0 | | 9.5 |
| Approach LOS | | | | | A |

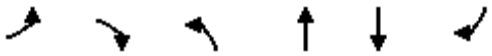
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 43.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 44 | 3 | 96 | 0 |
| Future Volume (Veh/h) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 44 | 3 | 96 | 0 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 44 | 3 | 96 | 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) | | | | | | | | 96 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 214 | 234 | 96 | 214 | 212 | 108 | 96 | | | 130 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 214 | 234 | 96 | 214 | 212 | 108 | 96 | | | 130 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 100 | 100 | 100 | 93 | 100 | 100 | 100 | | | 100 | | |
| cM capacity (veh/h) | 740 | 665 | 960 | 738 | 683 | 946 | 1498 | | | 1455 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 4 | 51 | 131 | 99 |
| Volume Left | 1 | 49 | 1 | 3 |
| Volume Right | 2 | 2 | 44 | 0 |
| cSH | 810 | 745 | 1498 | 1455 |
| Volume to Capacity | 0.00 | 0.07 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.1 | 1.7 | 0.0 | 0.0 |
| Control Delay (s) | 9.5 | 10.2 | 0.1 | 0.2 |
| Lane LOS | A | B | A | A |
| Approach Delay (s) | 9.5 | 10.2 | 0.1 | 0.2 |
| Approach LOS | A | B | | |

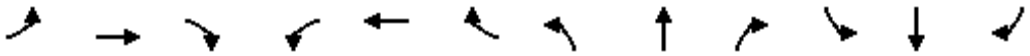
| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.1 | | | |
| Intersection Capacity Utilization | 23.9% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 15 | 40 | 14 | 315 | 580 | 16 |
| Future Volume (Veh/h) | 15 | 40 | 14 | 315 | 580 | 16 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 15 | 40 | 14 | 315 | 580 | 16 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 90 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 931 | 588 | 596 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 931 | 588 | 596 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 92 | 99 | | | |
| cM capacity (veh/h) | 292 | 509 | 980 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 55 | 329 | 596 |
| Volume Left | 15 | 14 | 0 |
| Volume Right | 40 | 0 | 16 |
| cSH | 423 | 980 | 1700 |
| Volume to Capacity | 0.13 | 0.01 | 0.35 |
| Queue Length 95th (m) | 3.4 | 0.3 | 0.0 |
| Control Delay (s) | 14.8 | 0.5 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 14.8 | 0.5 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 43.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 236 | 641 | 18 | 19 | 1453 | 218 | 96 | 33 | 26 | 185 | 7 | 281 |
| Future Volume (vph) | 236 | 641 | 18 | 19 | 1453 | 218 | 96 | 33 | 26 | 185 | 7 | 281 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 25.0 | | | 15.0 | | | 20.0 | | | 25.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 50 | |
| Link Distance (m) | | 106.9 | | | 137.3 | | | 86.0 | | | 92.7 | |
| Travel Time (s) | | 6.4 | | | 8.2 | | | 6.2 | | | 6.7 | |
| Lane Group Flow (vph) | 236 | 641 | 18 | 19 | 1453 | 218 | 96 | 59 | 0 | 185 | 288 | 0 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | 4 | | | 8 | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 11.1 | 34.1 | 34.1 | 11.1 | 34.1 | 34.1 | 44.8 | 44.8 | | 44.8 | 44.8 | |
| Total Split (s) | 20.0 | 55.0 | 55.0 | 20.0 | 55.0 | 55.0 | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 16.0% | 44.0% | 44.0% | 16.0% | 44.0% | 44.0% | 36.0% | 36.0% | | 36.0% | 36.0% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| 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) | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 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 | C-Max | C-Max | None | C-Max | C-Max | None | None | | None | None | |
| Act Effct Green (s) | 29.1 | 82.3 | 82.3 | 7.0 | 52.9 | 52.9 | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Actuated g/C Ratio | 0.23 | 0.66 | 0.66 | 0.06 | 0.42 | 0.42 | 0.19 | 0.19 | | 0.19 | 0.19 | |
| v/c Ratio | 0.60 | 0.29 | 0.02 | 0.20 | 1.01 | 0.33 | 1.02 | 0.17 | | 0.76 | 0.57 | |
| Control Delay | 51.4 | 11.6 | 0.1 | 60.6 | 63.1 | 14.2 | 146.1 | 24.9 | | 66.2 | 9.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 51.4 | 11.6 | 0.1 | 60.6 | 63.1 | 14.2 | 146.1 | 24.9 | | 66.2 | 9.4 | |
| LOS | D | B | A | E | E | B | F | C | | E | A | |
| Approach Delay | | 21.9 | | | 56.8 | | | 100.0 | | | 31.6 | |
| Approach LOS | | C | | | E | | | F | | | C | |
| Queue Length 50th (m) | 52.6 | 26.7 | 0.0 | 4.6 | 183.0 | 16.9 | ~25.3 | 6.8 | | 43.6 | 1.4 | |
| Queue Length 95th (m) | #91.5 | 63.0 | 0.0 | 12.2 | #255.0 | 37.9 | #49.4 | 16.7 | | 62.9 | 22.8 | |
| Internal Link Dist (m) | | 82.9 | | | 113.3 | | | 62.0 | | | 68.7 | |
| Turn Bay Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | | 20.0 | | |
| Base Capacity (vph) | 394 | 2232 | 974 | 188 | 1434 | 669 | 150 | 522 | | 388 | 644 | |
| 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 | 0.60 | 0.29 | 0.02 | 0.10 | 1.01 | 0.33 | 0.64 | 0.11 | | 0.48 | 0.45 | |

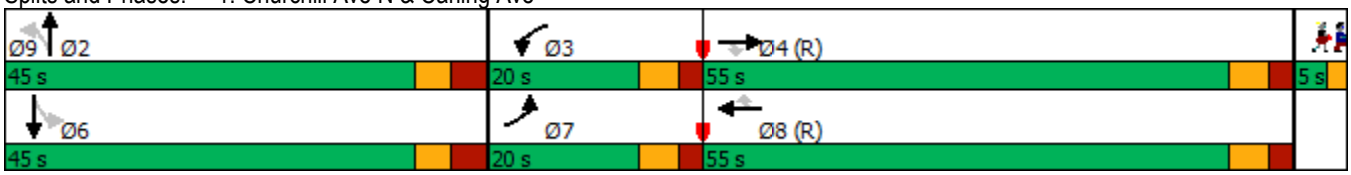
| Intersection Summary | |
|---|---|
| Area Type: | Other |

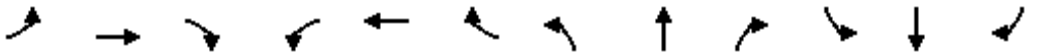
| Lane Group | Ø9 |
|---|---|
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (m) | |
| Storage Lanes | |
| Taper Length (m) | |
| Right Turn on Red | |
| Link Speed (k/h) | |
| Link Distance (m) | |
| Travel Time (s) | |
| Lane Group Flow (vph) | |
| Turn Type | |
| Protected Phases | 9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 3.0 |
| Minimum Split (s) | 5.0 |
| Total Split (s) | 5.0 |
| Total Split (%) | 4% |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 0.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Queue Length 50th (m) | |
| Queue Length 95th (m) | |
| Internal Link Dist (m) | |
| Turn Bay Length (m) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |
| Reduced v/c Ratio | |

| Intersection Summary |
|---|

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 92 (74%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 45.4 Intersection LOS: D
Intersection Capacity Utilization 112.9% ICU Level of Service H
Analysis Period (min) 15
~ 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: Churchill Ave N & Carling Ave



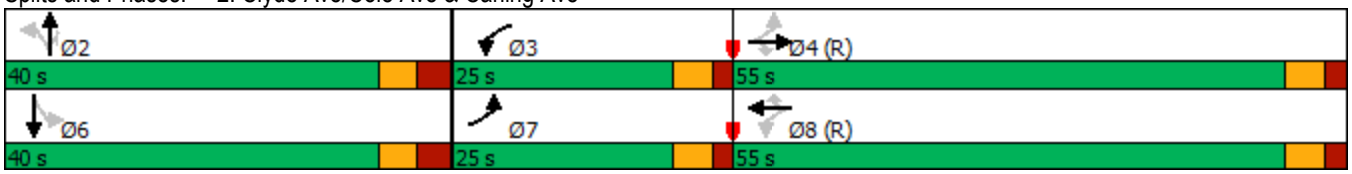


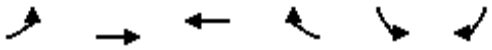
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 76 | 645 | 1 | 250 | 1486 | 57 | 126 | 87 | 210 | 30 | 54 | 62 |
| Future Volume (vph) | 76 | 645 | 1 | 250 | 1486 | 57 | 126 | 87 | 210 | 30 | 54 | 62 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | 0.0 | | 5.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 0 |
| Taper Length (m) | 20.0 | | | 30.0 | | | 7.6 | | | 20.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 40 | |
| Link Distance (m) | | 118.2 | | | 193.2 | | | 103.0 | | | 96.4 | |
| Travel Time (s) | | 7.1 | | | 11.6 | | | 7.4 | | | 8.7 | |
| Lane Group Flow (vph) | 76 | 645 | 1 | 250 | 1486 | 57 | 126 | 87 | 210 | 30 | 116 | 0 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | |
| Minimum Split (s) | 10.4 | 35.5 | 35.5 | 10.4 | 35.5 | 35.5 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (s) | 25.0 | 55.0 | 55.0 | 25.0 | 55.0 | 55.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 20.8% | 45.8% | 45.8% | 20.8% | 45.8% | 45.8% | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 1.7 | 2.1 | 2.1 | 1.7 | 2.1 | 2.1 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| 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) | 5.4 | 5.8 | 5.8 | 5.4 | 5.8 | 5.8 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | None | None | None | None | |
| Act Effct Green (s) | 80.3 | 72.7 | 72.7 | 88.7 | 78.8 | 78.8 | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 | |
| Actuated g/C Ratio | 0.67 | 0.61 | 0.61 | 0.74 | 0.66 | 0.66 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | |
| v/c Ratio | 0.32 | 0.31 | 0.00 | 0.45 | 0.67 | 0.06 | 0.70 | 0.32 | 0.58 | 0.16 | 0.40 | |
| Control Delay | 9.6 | 13.5 | 0.0 | 8.0 | 16.7 | 1.4 | 67.0 | 46.3 | 17.6 | 42.8 | 29.6 | |
| 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 | 9.6 | 13.5 | 0.0 | 8.0 | 16.7 | 1.4 | 67.0 | 46.3 | 17.6 | 42.8 | 29.6 | |
| LOS | A | B | A | A | B | A | E | D | B | D | C | |
| Approach Delay | | 13.1 | | | 15.0 | | | 38.2 | | | 32.3 | |
| Approach LOS | | B | | | B | | | D | | | C | |
| Queue Length 50th (m) | 4.0 | 35.6 | 0.0 | 14.8 | 107.5 | 0.0 | 28.6 | 18.6 | 9.2 | 6.2 | 14.4 | |
| Queue Length 95th (m) | 10.7 | 62.9 | 0.0 | 31.3 | 174.6 | 3.3 | 45.2 | 30.9 | 30.0 | 13.8 | 29.2 | |
| Internal Link Dist (m) | | 94.2 | | | 169.2 | | | 79.0 | | | 72.4 | |
| Turn Bay Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | | | 5.0 | 20.0 | | |
| Base Capacity (vph) | 405 | 2053 | 904 | 641 | 2226 | 959 | 328 | 496 | 528 | 342 | 486 | |
| 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 | 0.19 | 0.31 | 0.00 | 0.39 | 0.67 | 0.06 | 0.38 | 0.18 | 0.40 | 0.09 | 0.24 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 93 (78%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 18.6 Intersection LOS: B
Intersection Capacity Utilization 81.2% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Clyde Ave/Cole Ave & Carling Ave

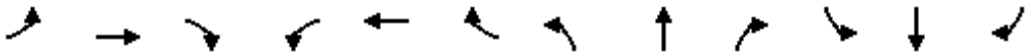




| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 894 | 1790 | 48 | 0 | 30 |
| Future Volume (Veh/h) | 0 | 894 | 1790 | 48 | 0 | 30 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 894 | 1790 | 48 | 0 | 30 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | 193 | 107 | | | |
| pX, platoon unblocked | 0.58 | | | | 0.63 | 0.58 |
| vC, conflicting volume | 1838 | | | | 2261 | 919 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1007 | | | | 1202 | 0 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 95 |
| cM capacity (veh/h) | 399 | | | | 111 | 632 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 447 | 447 | 1193 | 645 | 30 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 48 | 30 |
| cSH | 1700 | 1700 | 1700 | 1700 | 632 |
| Volume to Capacity | 0.26 | 0.26 | 0.70 | 0.38 | 0.05 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 11.0 |
| Lane LOS | | | | | B |
| Approach Delay (s) | 0.0 | | 0.0 | | 11.0 |
| Approach LOS | | | | | B |

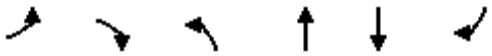
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 63.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 60 | 4 | 60 | 2 |
| Future Volume (Veh/h) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 60 | 4 | 60 | 2 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 60 | 4 | 60 | 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) | | | | | | | | 96 | | | | |
| pX, platoon unblocked | 0.98 | 0.98 | | 0.98 | 0.98 | 0.98 | | | | 0.98 | | |
| vC, conflicting volume | 240 | 265 | 61 | 244 | 236 | 152 | 62 | | | 182 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 210 | 235 | 61 | 213 | 205 | 119 | 62 | | | 150 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 100 | 100 | 99 | 95 | 100 | 99 | 100 | | | 100 | | |
| cM capacity (veh/h) | 721 | 645 | 1004 | 715 | 670 | 910 | 1541 | | | 1397 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 11 | 42 | 189 | 66 |
| Volume Left | 2 | 36 | 7 | 4 |
| Volume Right | 8 | 5 | 60 | 2 |
| cSH | 895 | 733 | 1541 | 1397 |
| Volume to Capacity | 0.01 | 0.06 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.3 | 1.4 | 0.1 | 0.1 |
| Control Delay (s) | 9.1 | 10.2 | 0.3 | 0.5 |
| Lane LOS | A | B | A | A |
| Approach Delay (s) | 9.1 | 10.2 | 0.3 | 0.5 |
| Approach LOS | A | B | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.0 | | | |
| Intersection Capacity Utilization | 28.4% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

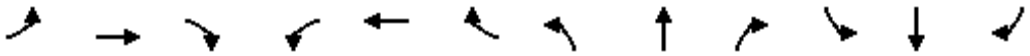


| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 12 | 30 | 31 | 464 | 463 | 17 |
| Future Volume (Veh/h) | 12 | 30 | 31 | 464 | 463 | 17 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 12 | 30 | 31 | 464 | 463 | 17 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 93 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 998 | 472 | 480 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 998 | 472 | 480 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 95 | 97 | | | |
| cM capacity (veh/h) | 263 | 592 | 1082 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 42 | 495 | 480 |
| Volume Left | 12 | 31 | 0 |
| Volume Right | 30 | 0 | 17 |
| cSH | 436 | 1082 | 1700 |
| Volume to Capacity | 0.10 | 0.03 | 0.28 |
| Queue Length 95th (m) | 2.4 | 0.7 | 0.0 |
| Control Delay (s) | 14.1 | 0.8 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 14.1 | 0.8 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 62.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

# Total Projected 2027



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 168 | 1162 | 98 | 85 | 516 | 154 | 11 | 5 | 11 | 344 | 31 | 245 |
| Future Volume (vph) | 168 | 1162 | 98 | 85 | 516 | 154 | 11 | 5 | 11 | 344 | 31 | 245 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 25.0 | | | 15.0 | | | 20.0 | | | 25.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 50 | |
| Link Distance (m) | | 112.5 | | | 137.3 | | | 90.4 | | | 92.6 | |
| Travel Time (s) | | 6.8 | | | 8.2 | | | 6.5 | | | 6.7 | |
| Lane Group Flow (vph) | 168 | 1162 | 98 | 85 | 516 | 154 | 11 | 16 | 0 | 344 | 276 | 0 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | 4 | | | 8 | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 11.1 | 34.1 | 34.1 | 11.1 | 34.1 | 34.1 | 44.8 | 44.8 | | 44.8 | 44.8 | |
| Total Split (s) | 25.0 | 50.0 | 50.0 | 25.0 | 50.0 | 50.0 | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 20.0% | 40.0% | 40.0% | 20.0% | 40.0% | 40.0% | 36.0% | 36.0% | | 36.0% | 36.0% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| 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) | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 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 | C-Max | C-Max | None | C-Max | C-Max | None | None | | None | None | |
| Act Effct Green (s) | 16.3 | 56.3 | 56.3 | 11.6 | 51.6 | 51.6 | 38.1 | 38.1 | | 38.1 | 38.1 | |
| Actuated g/C Ratio | 0.13 | 0.45 | 0.45 | 0.09 | 0.41 | 0.41 | 0.30 | 0.30 | | 0.30 | 0.30 | |
| v/c Ratio | 0.76 | 0.76 | 0.14 | 0.54 | 0.37 | 0.24 | 0.05 | 0.03 | | 0.86 | 0.44 | |
| Control Delay | 73.9 | 34.5 | 4.7 | 66.2 | 28.0 | 11.1 | 28.5 | 16.2 | | 61.8 | 7.7 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 73.9 | 34.5 | 4.7 | 66.2 | 28.0 | 11.1 | 28.5 | 16.2 | | 61.8 | 7.7 | |
| LOS | E | C | A | E | C | B | C | B | | E | A | |
| Approach Delay | | 37.1 | | | 28.9 | | | 21.2 | | | 37.7 | |
| Approach LOS | | D | | | C | | | C | | | D | |
| Queue Length 50th (m) | 39.9 | 127.1 | 0.0 | 20.3 | 47.7 | 7.7 | 1.9 | 0.8 | | 77.8 | 5.3 | |
| Queue Length 95th (m) | 63.2 | #183.9 | 10.1 | 35.5 | 66.4 | 23.9 | 6.0 | 5.7 | | #114.0 | 25.1 | |
| Internal Link Dist (m) | | 88.5 | | | 113.3 | | | 66.4 | | | 68.6 | |
| Turn Bay Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | | 20.0 | | |
| Base Capacity (vph) | 256 | 1527 | 706 | 256 | 1399 | 652 | 257 | 516 | | 425 | 652 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.66 | 0.76 | 0.14 | 0.33 | 0.37 | 0.24 | 0.04 | 0.03 | | 0.81 | 0.42 | |

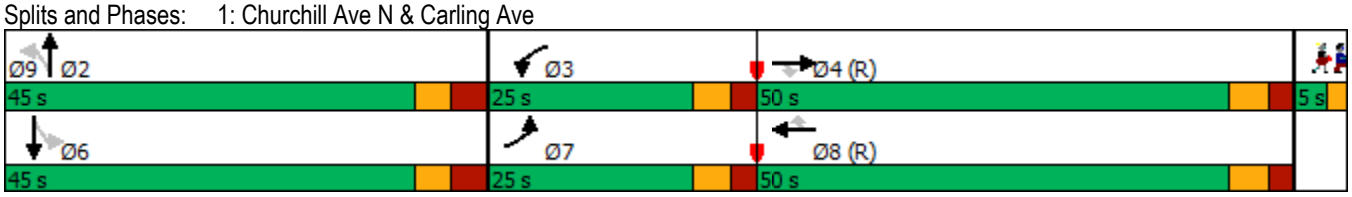
| Intersection Summary | |
|---|---|
| Area Type: | Other |

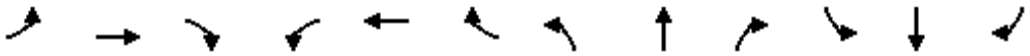
| Lane Group | Ø9 |
|---|---|
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (m) | |
| Storage Lanes | |
| Taper Length (m) | |
| Right Turn on Red | |
| Link Speed (k/h) | |
| Link Distance (m) | |
| Travel Time (s) | |
| Lane Group Flow (vph) | |
| Turn Type | |
| Protected Phases | 9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 3.0 |
| Minimum Split (s) | 5.0 |
| Total Split (s) | 5.0 |
| Total Split (%) | 4% |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 0.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Queue Length 50th (m) | |
| Queue Length 95th (m) | |
| Internal Link Dist (m) | |
| Turn Bay Length (m) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |
| Reduced v/c Ratio | |

| Intersection Summary |
|---|

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 101 (81%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 34.9 Intersection LOS: C
Intersection Capacity Utilization 84.1% ICU Level of Service E
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Churchill Ave N & Carling Ave



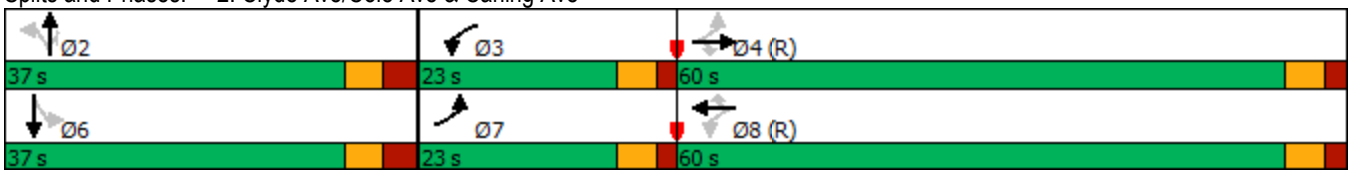


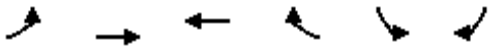
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 1245 | 0 | 260 | 513 | 51 | 121 | 51 | 147 | 35 | 63 | 66 |
| Future Volume (vph) | 60 | 1245 | 0 | 260 | 513 | 51 | 121 | 51 | 147 | 35 | 63 | 66 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | 0.0 | | 5.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 0 |
| Taper Length (m) | 20.0 | | | 30.0 | | | 7.6 | | | 20.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 40 | |
| Link Distance (m) | | 118.2 | | | 187.6 | | | 103.0 | | | 93.4 | |
| Travel Time (s) | | 7.1 | | | 11.3 | | | 7.4 | | | 8.4 | |
| Lane Group Flow (vph) | 60 | 1245 | 0 | 260 | 513 | 51 | 121 | 51 | 147 | 35 | 129 | 0 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | |
| Minimum Split (s) | 10.4 | 35.5 | 35.5 | 10.4 | 35.5 | 35.5 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (s) | 23.0 | 60.0 | 60.0 | 23.0 | 60.0 | 60.0 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (%) | 19.2% | 50.0% | 50.0% | 19.2% | 50.0% | 50.0% | 30.8% | 30.8% | 30.8% | 30.8% | 30.8% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 1.7 | 2.1 | 2.1 | 1.7 | 2.1 | 2.1 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| 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) | 5.4 | 5.8 | 5.8 | 5.4 | 5.8 | 5.8 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | None | None | None | None | |
| Act Effct Green (s) | 73.5 | 66.4 | | 90.2 | 79.9 | 79.9 | 17.8 | 17.8 | 17.8 | 17.8 | 17.8 | |
| Actuated g/C Ratio | 0.61 | 0.55 | | 0.75 | 0.67 | 0.67 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | |
| v/c Ratio | 0.11 | 0.66 | | 0.66 | 0.23 | 0.05 | 0.74 | 0.19 | 0.43 | 0.19 | 0.47 | |
| Control Delay | 6.9 | 23.1 | | 21.3 | 9.6 | 1.0 | 73.5 | 43.8 | 10.4 | 44.2 | 35.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 6.9 | 23.1 | | 21.3 | 9.6 | 1.0 | 73.5 | 43.8 | 10.4 | 44.2 | 35.2 | |
| LOS | A | C | | C | A | A | E | D | B | D | D | |
| Approach Delay | | 22.3 | | | 12.7 | | | 39.7 | | | 37.2 | |
| Approach LOS | | C | | | B | | | D | | | D | |
| Queue Length 50th (m) | 3.1 | 105.8 | | 20.3 | 24.1 | 0.0 | 27.7 | 10.7 | 0.0 | 7.3 | 18.7 | |
| Queue Length 95th (m) | 8.5 | 159.8 | | 53.0 | 40.7 | 2.2 | 44.8 | 20.5 | 16.3 | 15.6 | 34.7 | |
| Internal Link Dist (m) | | 94.2 | | | 163.6 | | | 79.0 | | | 69.4 | |
| Turn Bay Length (m) | 20.0 | | | 120.0 | | 20.0 | | | 5.0 | 20.0 | | |
| Base Capacity (vph) | 704 | 1876 | | 413 | 2257 | 1003 | 280 | 451 | 483 | 322 | 444 | |
| 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 | 0.66 | | 0.63 | 0.23 | 0.05 | 0.43 | 0.11 | 0.30 | 0.11 | 0.29 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 84 (70%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 22.4 Intersection LOS: C
Intersection Capacity Utilization 94.4% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: Clyde Ave/Cole Ave & Carling Ave

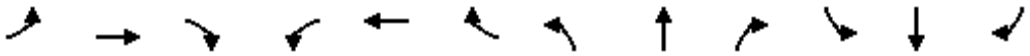




| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 1441 | 769 | 18 | 0 | 57 |
| Future Volume (Veh/h) | 0 | 1441 | 769 | 18 | 0 | 57 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 1441 | 769 | 18 | 0 | 57 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | 187 | 112 | | | |
| pX, platoon unblocked | 0.90 | | | | 0.79 | 0.90 |
| vC, conflicting volume | 787 | | | | 1498 | 394 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 538 | | | | 513 | 100 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 93 |
| cM capacity (veh/h) | 923 | | | | 386 | 842 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 720 | 720 | 513 | 274 | 57 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 18 | 57 |
| cSH | 1700 | 1700 | 1700 | 1700 | 842 |
| Volume to Capacity | 0.42 | 0.42 | 0.30 | 0.16 | 0.07 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 9.6 |
| Lane LOS | | | | | A |
| Approach Delay (s) | 0.0 | | 0.0 | | 9.6 |
| Approach LOS | | | | | A |

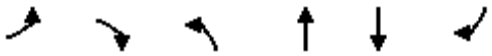
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 45.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 44 | 3 | 96 | 0 |
| Future Volume (Veh/h) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 44 | 3 | 96 | 0 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 1 | 1 | 2 | 49 | 0 | 2 | 1 | 86 | 44 | 3 | 96 | 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) | | | | | | | | 93 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 214 | 234 | 96 | 214 | 212 | 108 | 96 | | | 130 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 214 | 234 | 96 | 214 | 212 | 108 | 96 | | | 130 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 100 | 100 | 100 | 93 | 100 | 100 | 100 | | | 100 | | |
| cM capacity (veh/h) | 740 | 665 | 960 | 738 | 683 | 946 | 1498 | | | 1455 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 4 | 51 | 131 | 99 |
| Volume Left | 1 | 49 | 1 | 3 |
| Volume Right | 2 | 2 | 44 | 0 |
| cSH | 810 | 745 | 1498 | 1455 |
| Volume to Capacity | 0.00 | 0.07 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.1 | 1.7 | 0.0 | 0.0 |
| Control Delay (s) | 9.5 | 10.2 | 0.1 | 0.2 |
| Lane LOS | A | B | A | A |
| Approach Delay (s) | 9.5 | 10.2 | 0.1 | 0.2 |
| Approach LOS | A | B | | |

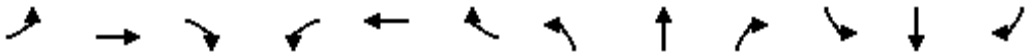
| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.1 | | | |
| Intersection Capacity Utilization | 23.9% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 15 | 40 | 14 | 315 | 580 | 16 |
| Future Volume (Veh/h) | 15 | 40 | 14 | 315 | 580 | 16 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 15 | 40 | 14 | 315 | 580 | 16 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 93 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 931 | 588 | 596 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 931 | 588 | 596 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 92 | 99 | | | |
| cM capacity (veh/h) | 292 | 509 | 980 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 55 | 329 | 596 |
| Volume Left | 15 | 14 | 0 |
| Volume Right | 40 | 0 | 16 |
| cSH | 423 | 980 | 1700 |
| Volume to Capacity | 0.13 | 0.01 | 0.35 |
| Queue Length 95th (m) | 3.4 | 0.3 | 0.0 |
| Control Delay (s) | 14.8 | 0.5 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 14.8 | 0.5 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 43.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 236 | 673 | 18 | 19 | 1524 | 218 | 96 | 33 | 26 | 185 | 7 | 281 |
| Future Volume (vph) | 236 | 673 | 18 | 19 | 1524 | 218 | 96 | 33 | 26 | 185 | 7 | 281 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | 0.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 25.0 | | | 15.0 | | | 20.0 | | | 25.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 50 | |
| Link Distance (m) | | 111.6 | | | 137.3 | | | 86.0 | | | 93.0 | |
| Travel Time (s) | | 6.7 | | | 8.2 | | | 6.2 | | | 6.7 | |
| Lane Group Flow (vph) | 236 | 673 | 18 | 19 | 1524 | 218 | 96 | 59 | 0 | 185 | 288 | 0 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | 4 | | | 8 | 2 | | | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 11.1 | 34.1 | 34.1 | 11.1 | 34.1 | 34.1 | 44.8 | 44.8 | | 44.8 | 44.8 | |
| Total Split (s) | 20.0 | 55.0 | 55.0 | 20.0 | 55.0 | 55.0 | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 16.0% | 44.0% | 44.0% | 16.0% | 44.0% | 44.0% | 36.0% | 36.0% | | 36.0% | 36.0% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | | 3.3 | 3.3 | |
| All-Red Time (s) | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 2.4 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| 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) | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 6.1 | 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 | C-Max | C-Max | None | C-Max | C-Max | None | None | | None | None | |
| Act Effct Green (s) | 29.1 | 82.3 | 82.3 | 7.0 | 52.9 | 52.9 | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Actuated g/C Ratio | 0.23 | 0.66 | 0.66 | 0.06 | 0.42 | 0.42 | 0.19 | 0.19 | | 0.19 | 0.19 | |
| v/c Ratio | 0.60 | 0.30 | 0.02 | 0.20 | 1.06 | 0.33 | 1.02 | 0.17 | | 0.76 | 0.57 | |
| Control Delay | 51.4 | 11.7 | 0.1 | 60.6 | 77.6 | 14.2 | 146.1 | 24.9 | | 66.2 | 9.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 51.4 | 11.7 | 0.1 | 60.6 | 77.6 | 14.2 | 146.1 | 24.9 | | 66.2 | 9.4 | |
| LOS | D | B | A | E | E | B | F | C | | E | A | |
| Approach Delay | | 21.6 | | | 69.6 | | | 100.0 | | | 31.6 | |
| Approach LOS | | C | | | E | | | F | | | C | |
| Queue Length 50th (m) | 52.6 | 28.4 | 0.0 | 4.6 | ~211.8 | 16.9 | ~25.3 | 6.8 | | 43.6 | 1.4 | |
| Queue Length 95th (m) | #91.5 | 66.5 | 0.0 | 12.2 | #274.1 | 37.9 | #49.4 | 16.7 | | 62.9 | 22.8 | |
| Internal Link Dist (m) | | 87.6 | | | 113.3 | | | 62.0 | | | 69.0 | |
| Turn Bay Length (m) | 65.0 | | 20.0 | 60.0 | | 20.0 | 20.0 | | | 20.0 | | |
| Base Capacity (vph) | 394 | 2232 | 974 | 188 | 1434 | 669 | 150 | 522 | | 388 | 644 | |
| 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 | 0.60 | 0.30 | 0.02 | 0.10 | 1.06 | 0.33 | 0.64 | 0.11 | | 0.48 | 0.45 | |

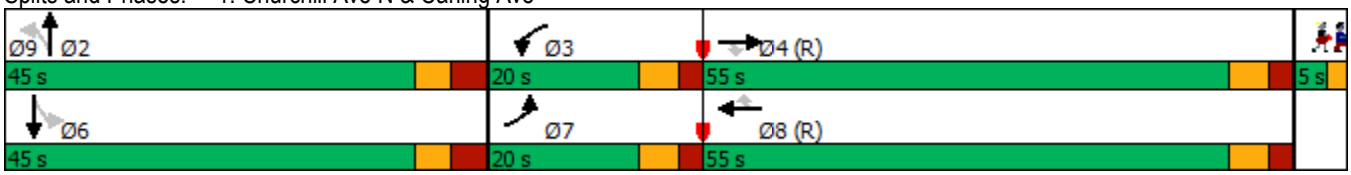
| Intersection Summary | |
|---|---|
| Area Type: | Other |

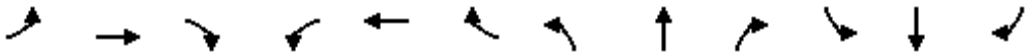
| Lane Group | Ø9 |
|---|---|
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (m) | |
| Storage Lanes | |
| Taper Length (m) | |
| Right Turn on Red | |
| Link Speed (k/h) | |
| Link Distance (m) | |
| Travel Time (s) | |
| Lane Group Flow (vph) | |
| Turn Type | |
| Protected Phases | 9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 3.0 |
| Minimum Split (s) | 5.0 |
| Total Split (s) | 5.0 |
| Total Split (%) | 4% |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 0.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Queue Length 50th (m) | |
| Queue Length 95th (m) | |
| Internal Link Dist (m) | |
| Turn Bay Length (m) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |
| Reduced v/c Ratio | |

| Intersection Summary |
|---|

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 92 (74%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 52.2 Intersection LOS: D
Intersection Capacity Utilization 115.0% ICU Level of Service H
Analysis Period (min) 15
~ 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: Churchill Ave N & Carling Ave



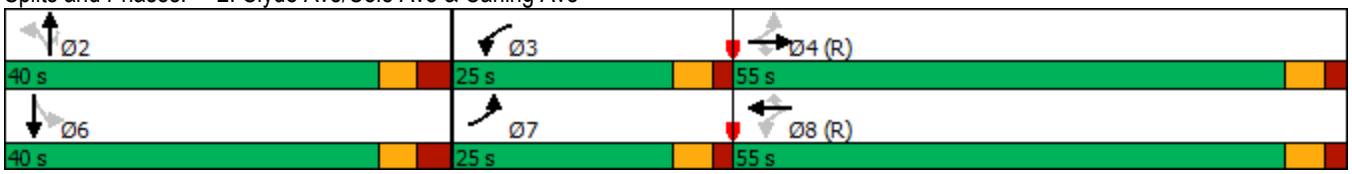


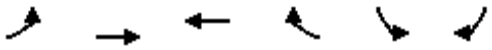
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 76 | 677 | 1 | 250 | 1560 | 57 | 126 | 87 | 210 | 30 | 54 | 62 |
| Future Volume (vph) | 76 | 677 | 1 | 250 | 1560 | 57 | 126 | 87 | 210 | 30 | 54 | 62 |
| Ideal Flow (vphpl) | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| Storage Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | 0.0 | | 5.0 | 20.0 | | 0.0 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 0 |
| Taper Length (m) | 20.0 | | | 30.0 | | | 7.6 | | | 20.0 | | |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Link Speed (k/h) | | 60 | | | 60 | | | 50 | | | 40 | |
| Link Distance (m) | | 118.2 | | | 188.5 | | | 103.0 | | | 96.0 | |
| Travel Time (s) | | 7.1 | | | 11.3 | | | 7.4 | | | 8.6 | |
| Lane Group Flow (vph) | 76 | 677 | 1 | 250 | 1560 | 57 | 126 | 87 | 210 | 30 | 116 | 0 |
| Turn Type | pm+pt | NA | Perm | pm+pt | NA | Perm | Perm | NA | Perm | Perm | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 2 | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | |
| Minimum Split (s) | 10.4 | 35.5 | 35.5 | 10.4 | 35.5 | 35.5 | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | |
| Total Split (s) | 25.0 | 55.0 | 55.0 | 25.0 | 55.0 | 55.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | |
| Total Split (%) | 20.8% | 45.8% | 45.8% | 20.8% | 45.8% | 45.8% | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | |
| Yellow Time (s) | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| All-Red Time (s) | 1.7 | 2.1 | 2.1 | 1.7 | 2.1 | 2.1 | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 | |
| 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) | 5.4 | 5.8 | 5.8 | 5.4 | 5.8 | 5.8 | 6.6 | 6.6 | 6.6 | 6.6 | 6.6 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | C-Max | None | None | None | None | None | |
| Act Effct Green (s) | 80.3 | 72.7 | 72.7 | 88.7 | 78.8 | 78.8 | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 | |
| Actuated g/C Ratio | 0.67 | 0.61 | 0.61 | 0.74 | 0.66 | 0.66 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | |
| v/c Ratio | 0.35 | 0.33 | 0.00 | 0.46 | 0.70 | 0.06 | 0.70 | 0.32 | 0.58 | 0.16 | 0.40 | |
| Control Delay | 10.6 | 13.7 | 0.0 | 8.2 | 17.7 | 1.4 | 67.0 | 46.3 | 17.6 | 42.8 | 29.6 | |
| 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 | 10.6 | 13.7 | 0.0 | 8.2 | 17.7 | 1.4 | 67.0 | 46.3 | 17.6 | 42.8 | 29.6 | |
| LOS | B | B | A | A | B | A | E | D | B | D | C | |
| Approach Delay | | 13.3 | | | 15.9 | | | 38.2 | | | 32.3 | |
| Approach LOS | | B | | | B | | | D | | | C | |
| Queue Length 50th (m) | 4.0 | 37.8 | 0.0 | 14.8 | 117.6 | 0.0 | 28.6 | 18.6 | 9.2 | 6.2 | 14.4 | |
| Queue Length 95th (m) | 10.7 | 66.3 | 0.0 | 31.3 | 190.8 | 3.3 | 45.2 | 30.9 | 30.0 | 13.8 | 29.2 | |
| Internal Link Dist (m) | | 94.2 | | | 164.5 | | | 79.0 | | | 72.0 | |
| Turn Bay Length (m) | 20.0 | | 20.0 | 120.0 | | 20.0 | | | 5.0 | 20.0 | | |
| Base Capacity (vph) | 388 | 2053 | 904 | 625 | 2226 | 959 | 328 | 496 | 528 | 342 | 486 | |
| 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 | 0.20 | 0.33 | 0.00 | 0.40 | 0.70 | 0.06 | 0.38 | 0.18 | 0.40 | 0.09 | 0.24 | |

| Intersection Summary | |
|---|---|
| Area Type: | Other |

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 93 (78%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 19.0 Intersection LOS: B
Intersection Capacity Utilization 83.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Clyde Ave/Cole Ave & Carling Ave

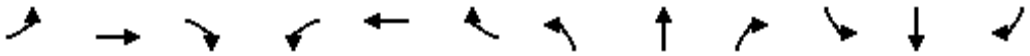




| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 938 | 1880 | 48 | 0 | 30 |
| Future Volume (Veh/h) | 0 | 938 | 1880 | 48 | 0 | 30 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 938 | 1880 | 48 | 0 | 30 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | 188 | 112 | | | |
| pX, platoon unblocked | 0.58 | | | | 0.63 | 0.58 |
| vC, conflicting volume | 1928 | | | | 2373 | 964 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1162 | | | | 1342 | 0 |
| tC, single (s) | 4.1 | | | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 95 |
| cM capacity (veh/h) | 348 | | | | 90 | 632 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 469 | 469 | 1253 | 675 | 30 |
| Volume Left | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 48 | 30 |
| cSH | 1700 | 1700 | 1700 | 1700 | 632 |
| Volume to Capacity | 0.28 | 0.28 | 0.74 | 0.40 | 0.05 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 11.0 |
| Lane LOS | | | | | B |
| Approach Delay (s) | 0.0 | | 0.0 | | 11.0 |
| Approach LOS | | | | | B |

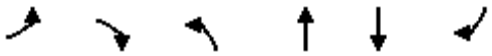
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 66.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 60 | 4 | 60 | 2 |
| Future Volume (Veh/h) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 60 | 4 | 60 | 2 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 2 | 1 | 8 | 36 | 1 | 5 | 7 | 122 | 60 | 4 | 60 | 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) | | | | | | | | 96 | | | | |
| pX, platoon unblocked | 0.98 | 0.98 | | 0.98 | 0.98 | 0.98 | | | | 0.98 | | |
| vC, conflicting volume | 240 | 265 | 61 | 244 | 236 | 152 | 62 | | | 182 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 210 | 235 | 61 | 213 | 205 | 119 | 62 | | | 150 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 100 | 100 | 99 | 95 | 100 | 99 | 100 | | | 100 | | |
| cM capacity (veh/h) | 721 | 645 | 1004 | 716 | 670 | 910 | 1541 | | | 1397 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 11 | 42 | 189 | 66 |
| Volume Left | 2 | 36 | 7 | 4 |
| Volume Right | 8 | 5 | 60 | 2 |
| cSH | 895 | 733 | 1541 | 1397 |
| Volume to Capacity | 0.01 | 0.06 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.3 | 1.4 | 0.1 | 0.1 |
| Control Delay (s) | 9.1 | 10.2 | 0.3 | 0.5 |
| Lane LOS | A | B | A | A |
| Approach Delay (s) | 9.1 | 10.2 | 0.3 | 0.5 |
| Approach LOS | A | B | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.0 | | | |
| Intersection Capacity Utilization | 28.4% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 12 | 30 | 31 | 464 | 463 | 17 |
| Future Volume (Veh/h) | 12 | 30 | 31 | 464 | 463 | 17 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 12 | 30 | 31 | 464 | 463 | 17 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | 93 | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 998 | 472 | 480 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 998 | 472 | 480 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 95 | 97 | | | |
| cM capacity (veh/h) | 263 | 592 | 1082 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 42 | 495 | 480 |
| Volume Left | 12 | 31 | 0 |
| Volume Right | 30 | 0 | 17 |
| cSH | 436 | 1082 | 1700 |
| Volume to Capacity | 0.10 | 0.03 | 0.28 |
| Queue Length 95th (m) | 2.4 | 0.7 | 0.0 |
| Control Delay (s) | 14.1 | 0.8 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 14.1 | 0.8 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 62.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |