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36 Years

# 2020 Walkley Road & 2935 Conroy Road

## Traffic Impact Assessment

Engineering excellence. Planning precision. Inspired landscapes.

# 2020 Walkley Road & 2935 Conroy Road

# Transportation Impact Assessment

Prepared By:

**NOVATECH**
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

March 2021

Novatech File: 119067
Ref: R-2020-124

March 16, 2021

City of Ottawa
Planning and Growth Management Department
110 Laurier Ave. W., 4th Floor,
Ottawa, Ontario K1P 1J1

**Attention:** **Mr. Mike Giampa, P.Eng.**
**Project Manager, Infrastructure Approvals**

Dear Mr. Giampa:

**Reference:** **2020 Walkley Road & 2935 Conroy Road**
**Transportation Impact Assessment**
**Novatech File No. 119067**

---

We are pleased to submit the following Transportation Impact Assessment in support of a ZBL and Site Plan Applications for the above address. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

If you have any questions or comments regarding this report, please feel free to contact Jennifer Luong, or the undersigned.

Yours truly,

**NOVATECH**

Patrick Hatton, P.Eng.
Transportation/Traffic



Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

# TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

**CERTIFICATION**

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering ☑ or transportation planning ☐.

[1,2] **License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.**

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Dated at Ottawa (City) this 16th day of March, 2021.

Name: Patrick Hatton, P.Eng.
(Please Print)

Professional Title: Project Manager, Transportation / Traffic

Signature of Individual certifier that s/he meets the above four criteria

| **Office Contact Information (Please Print)** | |
|---|---|
| Address: | 240 Michael Cowpland Drive, Suite 200 |
| City / Postal Code: | Ottawa, ON, K2M 1P6 |
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## EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared in support of ZBL and Site Plan Applications for 2020 Walkley Road / 2935 Conroy Road.

The subject site is designated as 'Urban Employment Area' on Schedule 'B' of the City of Ottawa's Official Plan. It is currently zoned Light Industrial Zone – IL[1477] S117-h2. A ZBL Amendment is required for the proposed warehouse use.

The existing site includes a 20,577 square foot gym in addition to 38,390 square feet of office at 2020 Walkley Road and a 48,540 square foot commercial building at 2935 Conroy Road. Access for the existing site is via one full movement driveway onto Walkley Road and one right-in, right-out driveway onto Conroy Road.

The proposed development is planned to consist of three single-storey warehouses totalling about 24,697 $m^2$ (265,836 $ft^2$) and the existing uses will be demolished. Access is planned via one access to Walkley Road (modified to RIRO with a closure to the median opening), two accesses to Conroy Road (one RIRO and one full movement), and one full access to St. Laurent Boulevard. Buildout is anticipated by 2023.

The study area intersections are:

- Walkley Road at Conroy Road;
- Conroy Road at St. Laurent Boulevard;
- Walkley Road at Harding Road; and,
- The site driveways.

The weekday AM and PM peak hours are considered to represent the "worst case" combination of site-generated traffic and peak traffic conditions of the adjacent roadways. Intersection capacity analysis has been completed for the weekday AM and PM peak hours. Analysis of potential transportation impacts has been completed for the 2023 buildout year and the 2028 horizon year. Weekday AM and PM traffic counts were collected by the City of Ottawa at the study area intersections.

A 1% background growth rate was applied to traffic along the study roadways. Trips generated by the nearby developments at 2500 St. Laurent Boulevard, 2190 Halifax Drive, and Timbercreek Heron Gate have been accounted for separately. Background traffic volumes for the 2023 buildout year were determined by applying the annual traffic growth rate to the peak hour traffic volumes and by adding the traffic generated by 2500 St. Laurent Boulevard and 2190 Halifax Drive. Background traffic volumes for the 2028 buildout year were determined by applying the annual traffic growth rate to the peak hour traffic volumes and by adding the traffic generated by 2500 St. Laurent Boulevard, 2190 Halifax Drive, and Timbercreek Heron Gate (2030 site generation). Traffic generated by both the proposed and existing development was estimated using *Trip Generation Manual*, *10th Edition* (Institute of Transportation Engineers, Washington 2017). Site traffic was distributed and assigned to the projected background traffic to determine future total traffic volumes.

The main conclusions and recommendations of this TIA are:

*Development Design and Parking*

- Pedestrian facilities will be provided between the main buildings and the parking lots. New pedestrian walkways will be constructed to connect to all three frontages.

- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- The proposed vehicular parking spaces at each phase meet the requirements of the ZBL.
- The proposed bicycle parking spaces meet the minimum requirements of the ZBL.
- The number of barrier-free spaces meet the AODA requirements.
- A minimum of one loading space is required for each proposed warehouse, each will have 20 or 22 loading bays.
- Each of the three buildings have exterior access doors within a 240m walking distance from an OC Transpo stop.

*Boundary Street Multi-Modal Level of Service (MMLOS)*

The results of the segment MMLOS analysis for Walkley Road, Conroy Road, and St. Laurent Boulevard can be summarized as follows:

- The PLOS along Walkley Road, Conroy Road, and St. Laurent Boulevard is currently failing. A 2m sidewalk and 2m boulevard are both required to achieve the target C on Walkley Road. Given the speed and traffic volume along St. Laurent Boulevard and Conroy Road, respectively, the target PLOS A is not achievable due to the speed and volume. PLOS D and PLOS C are achievable on Conroy Road and St. Laurent Boulevard, respectively, with a 2m sidewalk and a 2m boulevard;
- The Walkley and St. Laurent corridors miss the BLOS target C, achieving E and D, respectively. The target BLOS can be achieved on both Walkley and St. Laurent with 1.5m onstreet bike lanes;
- Walkley Road misses the TLOS target B, achieving a D. A bus lane is required to achieve LOS B; and,
- Each study road achieves TkLOS A or B, surpassing the targets, where applicable.

*Transit*

- The new development is anticipated to generate 13 transit trips (10 in and 3 out) during the weekday AM peak hour and 13 transit trips (4 in and 9 out) during the weekday PM peak hour. These transit trips are fewer than the transit trips generated by the existing site, estimated to be 33 transit trips (28 in and 5 out) during the weekday AM peak hour and 34 transit trips (9 in and 25 out) during the weekday PM peak hour.

*Access Design*

- Sufficient corner clearance, as applicable is provided at each driveway.
- The south driveway to Conroy Road is about 8.3m wide, measured at the property line, meeting the width requirements under the City's Private Approach by-law.
- The driveways to Conroy Road (north), Walkley Road, and St. Laurent Boulevard are 9.4m wide, 11.5m wide and 11.8m wide (measured at the right-of-way line), respectively, but the width is required to accommodate the heavy trucks.
- Adequate stopping sight distance for heavy vehicles is available at each driveway.
- A southbound left turn lane is warranted along Conroy Road at the north site driveway.
- The available clear throat at the St. Laurent Boulevard (15m) and Conroy Road (30m) are sufficient for the industrial development.
- The available clear throat at the Walkley Road driveway (20m) is sufficient to accommodate an accessory office use of <5,000m$^2$ for the site. Accessory office uses will be less than 5,000m$^2$. Since the Walkley driveway will be right-in, right-out only, heavy vehicles coming from the highway will not be able to use this entrance to the site. Queuing of entering and exiting traffic at this driveway is expected to be accommodated within the 20m storage.

*Intersection MMLOS Analysis*

- The Walkley at Conroy intersection does not meet the target Auto LOS.
    - The eastbound, approach at the **Walkley Road / Conroy Road** intersection does not meet the target Auto LOS D in the PM peak hour. By increasing the cycle length at the Walkley at Conroy intersection to 120 seconds (from 110 seconds) during the PM peak, the AutoLOS at the intersection can be improved to D.

Background Traffic:

- During the 2028 AM and PM peak hours without site development, all movements at the signalized study intersections are expected to operate with LOS D or better. The site driveway at Walkley Road will operate with LOS F with delays and queuing of about 2-3 vehicles.
- The delay at the Walkley site driveway is due to left turning traffic exiting the site. Converting this driveway to right-in, right-out only will improve the operations.

Total Traffic with Site Redevelopment:

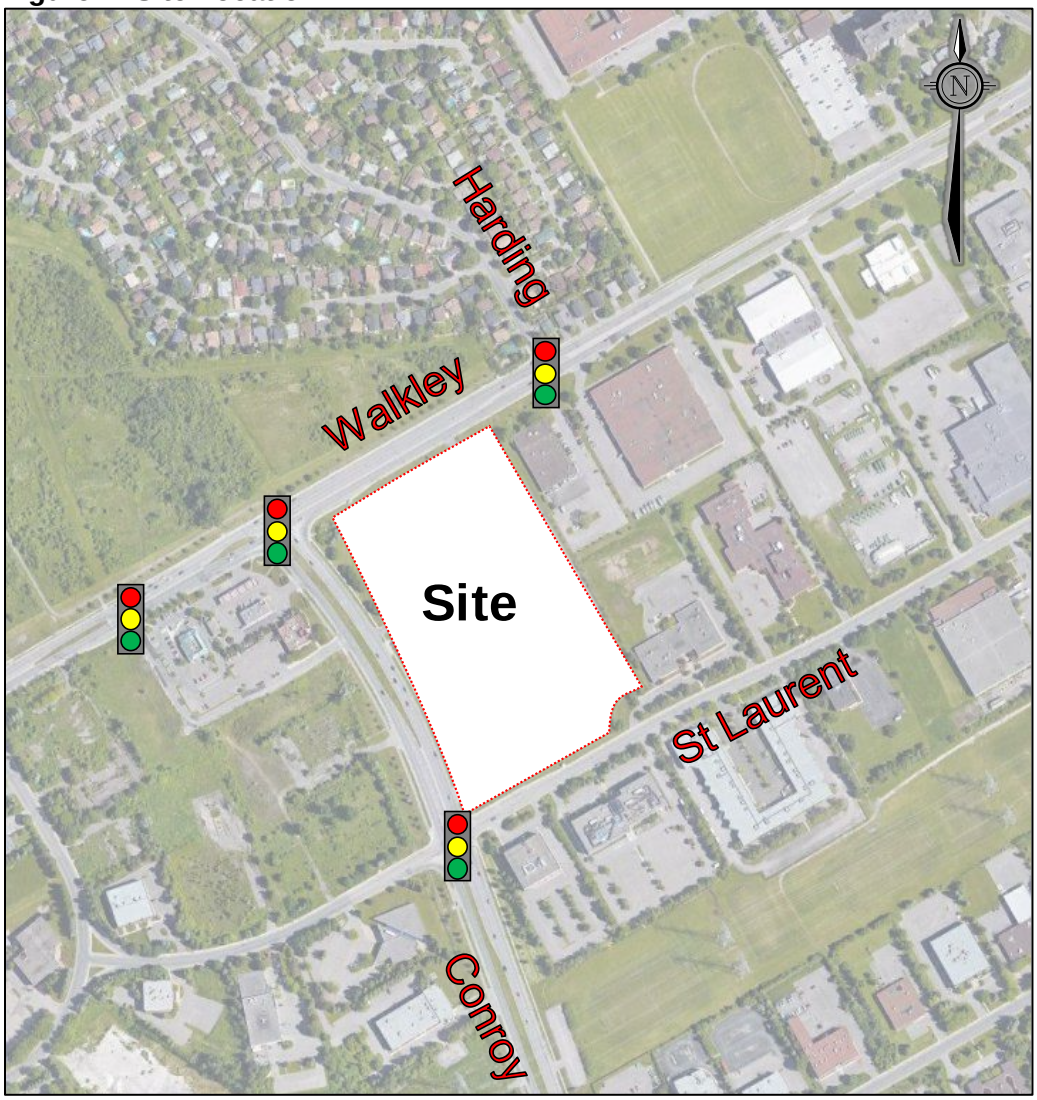
- With construction of a southbound left turn lane on Conroy Road at the North Site Driveway, all study intersections and site accesses are expected to operate with LOS D or better with site redevelopment.

## 1.0 INTRODUCTION

This Transportation Impact Assessment (TIA) report has been prepared in support of ZBL and Site Plan Applications for 2020 Walkley Road / 2935 Conroy Road. The site (See **Figure 1**) is occupied by commercial development and is surrounded by the following:

- Walkley Road, vacant land, and residential development to the north;
- Commercial development to the east;
- St. Laurent Boulevard and commercial development to the south; and,
- Conroy Road and vacant land / commercial development to the west.

**Figure 1: Site Location**




## 2.0 PROPOSED REDEVELOPMENT

The subject site is designated as 'Urban Employment Area' on Schedule 'B' of the City of Ottawa's Official Plan. It is currently zoned Light Industrial Zone – IL[1477] S117-h2. A ZBL Amendment is required for the proposed warehouse use.

The existing site includes a 20,577 square foot gym in addition to 38,390 square feet of office at 2020 Walkley Road and a 48,540 square foot commercial building at 2935 Conroy Road. Access for the existing site is via one full movement driveway onto Walkley Road and one right-in, right-out driveway onto Conroy Road.

The proposed redevelopment is planned to consist of three single-storey warehouses totalling about 24,697 $m^2$ (265,836 $ft^2$) and the existing uses will be demolished. Access is planned via one access to Walkley Road (modified to RIRO with a closure to the median opening, See **Appendix K**), two accesses to Conroy Road (one RIRO and one full movement), and one full access to St. Laurent Boulevard. Buildout is anticipated by 2023. It is expected that the redevelopment will be constructed in three phases with approval being sought for the full redevelopment. The phasing is planned to be:

- Phase 1 – South warehouse and the St Laurent access.
- Phase 2 – Midblock warehouse and the Conroy accesses.
- Phase 3 – North warehouse and the new Walkley access.

A Context Plan is included in **Figure 2**. The preliminary site plan is included in **Appendix A**.

## 3.0 SCREENING

The City's 2017 TIA Guidelines identifies three triggers for completing a TIA report, including trip generation, location, and safety. The criteria for each trigger are outlined in the City's TIA Screening Form (See **Appendix B**).

The trigger results are as follows:

- **Trip Generation Trigger** – The site is anticipated to generate over 60 person trips/peak hour; however, with consideration of the existing use there is a **net reduction** in traffic. A full TIA is being prepared due to the RMA required for the full movement access at Conroy and to modify the access at Walkley to right-in, right-out.
- **Location Triggers** – The site proposes driveways to Walkley Road and Conroy Road. Both are designated Spine Routes; further assessment **is required** based on this trigger.
- **Safety Triggers** – The driveway onto Walkley Road is within the area of influence of a signalized intersection; further assessment **is required** based on this trigger.

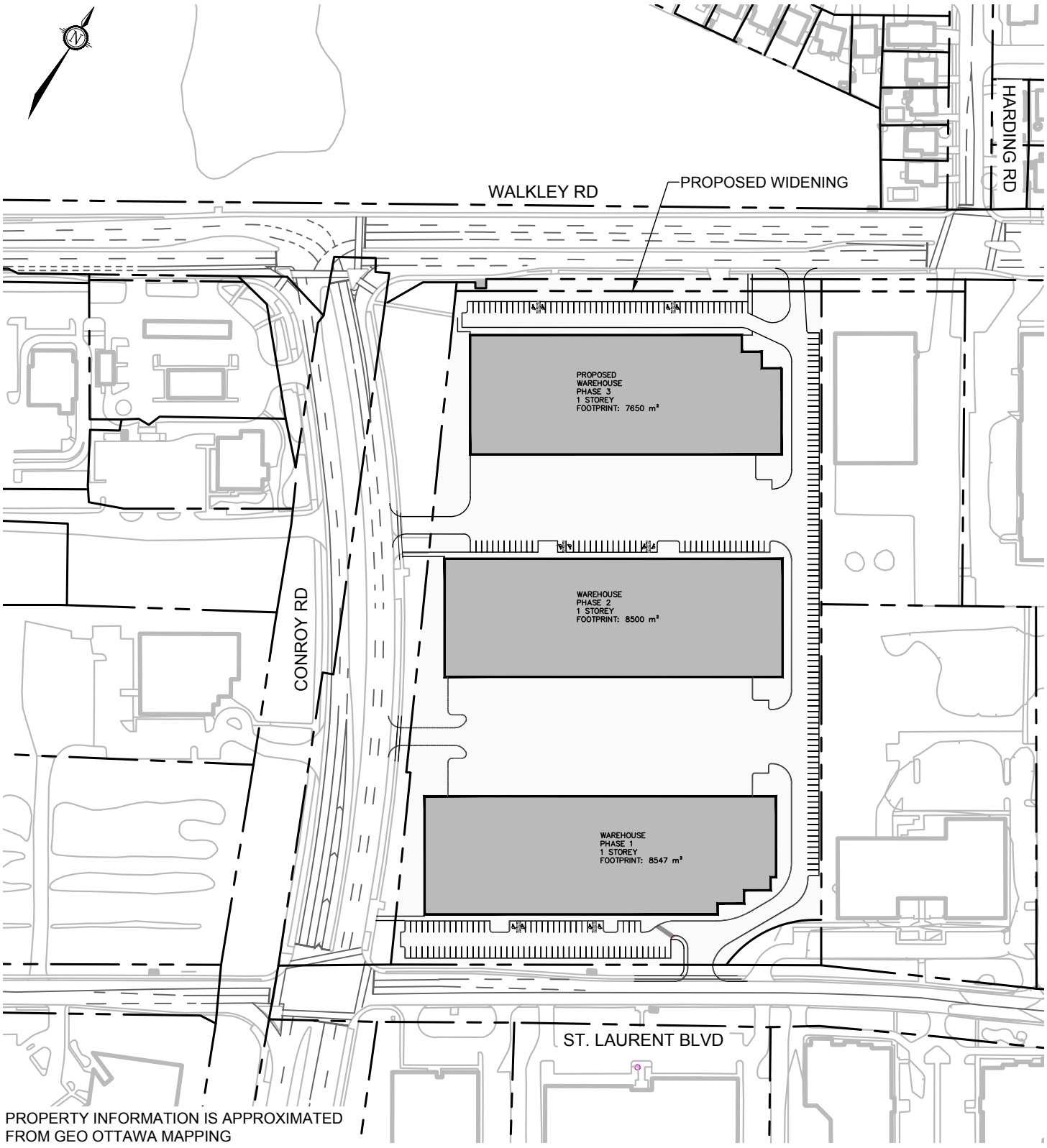
## 4.0 SCOPING

### 4.1 Existing Conditions

#### 4.1.1 Roadways

**Walkley Road** is a four-lane divided arterial roadway and is classified as a truck route, allowing full loads. It runs east-west and has a posted speed limit of 50km/h. Walkley Road between Heron and the Greenbelt Boundary has a right-of-way protection of 44.5m and a widening is required.

**Conroy Road** is a four-lane divided arterial roadway and is classified as a truck route, allowing full loads. It runs north-south and has a posted speed limit of 60km/h. Conroy Road between Walkley and the Greenbelt Boundary has a right-of-way protection of 44.5m and no widening is required.




PROPERTY INFORMATION IS APPROXIMATED FROM GEO OTTAWA MAPPING

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# 2020 WALKLEY ROAD

## CONTEXT PLAN

SCALE 1 : 2500 (0, 25, 50, 75, 100)

DATE MAR 2021 | JOB 119067 | FIGURE FIGURE 2

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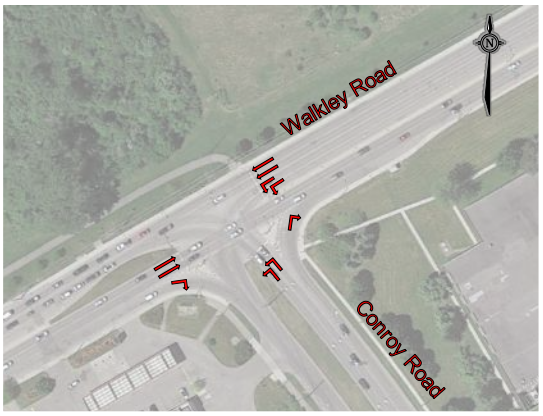
**St. Laurent Boulevard** is a two-lane undivided collector roadway. It runs east-west and has a posted speed limit of 50km/h.

**Harding Road** is a two-lane undivided local roadway. It runs north-south and has a regulatory speed limit of 50km/h. Harding Road has existing traffic calming with "Traffic Calmed Neighbourhood" signage, seasonal in-road centreline speed signs, and "SLOW" pavement markings.

### 4.1.2 Intersections

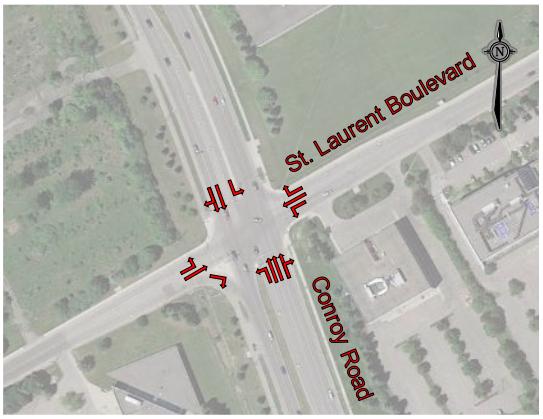
*Walkley Road at Conroy Road*

- Signalized three-legged intersection
- Northbound: two left turn lanes and one channelized right turn lane.
- Westbound: two left turn lanes, two through lanes
- Eastbound: two through lanes, one channelized right turn lane.
- Signalized crosswalks crossing the east and south approaches.



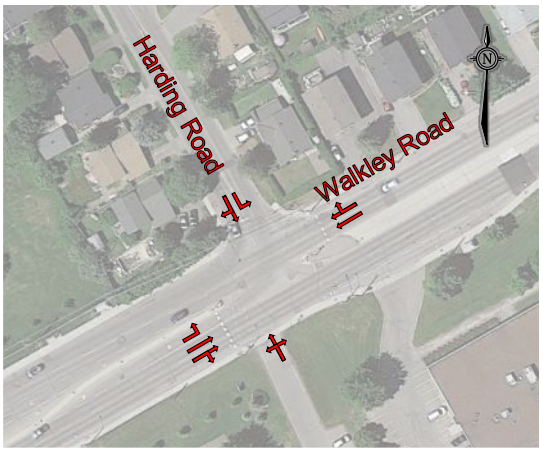

*Conroy Road at St. Laurent Boulevard*

- Signalized four-legged intersection
- Northbound: left turn lane, two through lanes, and one through/right shared lane.
- Southbound: left turn lane, one through lane, and one through / right shared lane.
- Westbound: one left turn lane, one through lane, and one right turn lane.
- Eastbound: one left turn lane, one through lane, and one channelized right turn lane.
- Signalized crosswalks crossing all four approaches.



*Walkley Road at Harding Road*

- Signalized four-legged intersection
- Northbound: single lane approach. Through movements are restricted during the AM peak period.
- Southbound: one left turn lane, one through / right shared lane.
- Eastbound: one left turn lane, one through lane and one through / right shared lane. Left turns are restricted during the AM peak period.
- Westbound: one through lane and one through / right shared lane. Left turn movements are restricted.




### 4.1.3 Driveways

In accordance with the City's 2017 TIA guidelines, a review of adjacent driveways along the boundary roads are provided as follows:

**Conroy Road, West Side:**

- One RIRO commercial driveway for 1970 Walkley Road.
- One RIRO commercial driveway for 2980 / 2990 Conroy Road.
- One RIRO commercial driveway for 3000 Conroy Road.

**Conroy Road, East Side:**

- One RIRO commercial driveway for 2935 Conroy Road (site).

**Walkley Road, North Side:**

- Five full movement residential driveways for 2077-2099 Walkley Road.

**Walkley Road, South Side:**

- One signalized full commercial driveway for 1950 Walkley Road.
- Two RIRO commercial driveways for 1970 Walkley Road.
- One full commercial driveway for 2020 Walkley Road (site).
- One commercial driveway (2060 Walkley Road) opposite Harding Road signals.
- Two full accesses to 2080 Walkley

**St. Laurent Boulevard, North Side:**

- Two commercial driveways for 2400 St. Laurent Boulevard
- Two commercial driveways for 2380 St. Laurent Boulevard

**St. Laurent Boulevard, South Side:**

- Two commercial driveways for 2465 St. Laurent Boulevard.
- Two one-way commercial driveways for 2445 St. Laurent Boulevard.
- Three commercial driveways for 2405 St. Laurent Boulevard.

### 4.1.4 Pedestrian and Cycling Facilities

Walkley Road and Conroy Road are identified as spine cycling routes in the City's Cycling Network with St. Laurent Boulevard identified as a local cycling route. Conroy Road and Walkley Road between Conroy Road and Heron Road are also cross-town bikeways. There are currently on-street bicycle lanes along Conroy Road between Walkley Road and Hunt Club Road.

Concrete sidewalks are provided along both sides of Walkley Road and the north (site) side of St. Laurent Boulevard in this area. There is concrete sidewalk along the east (site) side of Conroy Road and a multi-use pathway along the west side of Conroy Road. The MUP extends north of Walkley through the planned Alta Vista Corridor described in **Section 4.2**, to the Ottawa Health Sciences Centre, and is also a cross-town bikeway.

### 4.1.5 Transit

The nearest bus stops to the subject site are stops #7281, #7282, #8324, and #1899 along Walkley Road just to the north, stops #4311 and #4307 along St. Laurent Boulevard just to the south, and stops #1321, and #2344 to the south and west (See **Figure 3**). The Walkley stops serve routes #46, #644, and #649, the St. Laurent stops serve route #40, and the Conroy stops serve routes #40, #644, and #649.

**Figure 3: OC Transpo Bus Stop Locations**


OC Transpo Route #40 travels between the St. Laurent Shopping Centre and Hurdman Station on 30-minute headways with all-day service, 7-days per week.

OC Transpo Route #46 travels between Billings Bridge and Hurdman Station on 15-minute headways with all-day service, 7-days per week.

OC Transpo Route #644 is a school route and travels between Canterbury High School and Greenboro Station. OC Transpo Route #649 is a school route and travels between Hillcrest High School and Greenboro Station.

OC Transpo Route information is included in **Appendix C**.

### 4.1.6 Existing Area Traffic Management Measures

Currently, there are no completed or ongoing Area Traffic Management (ATM) studies within the study area.

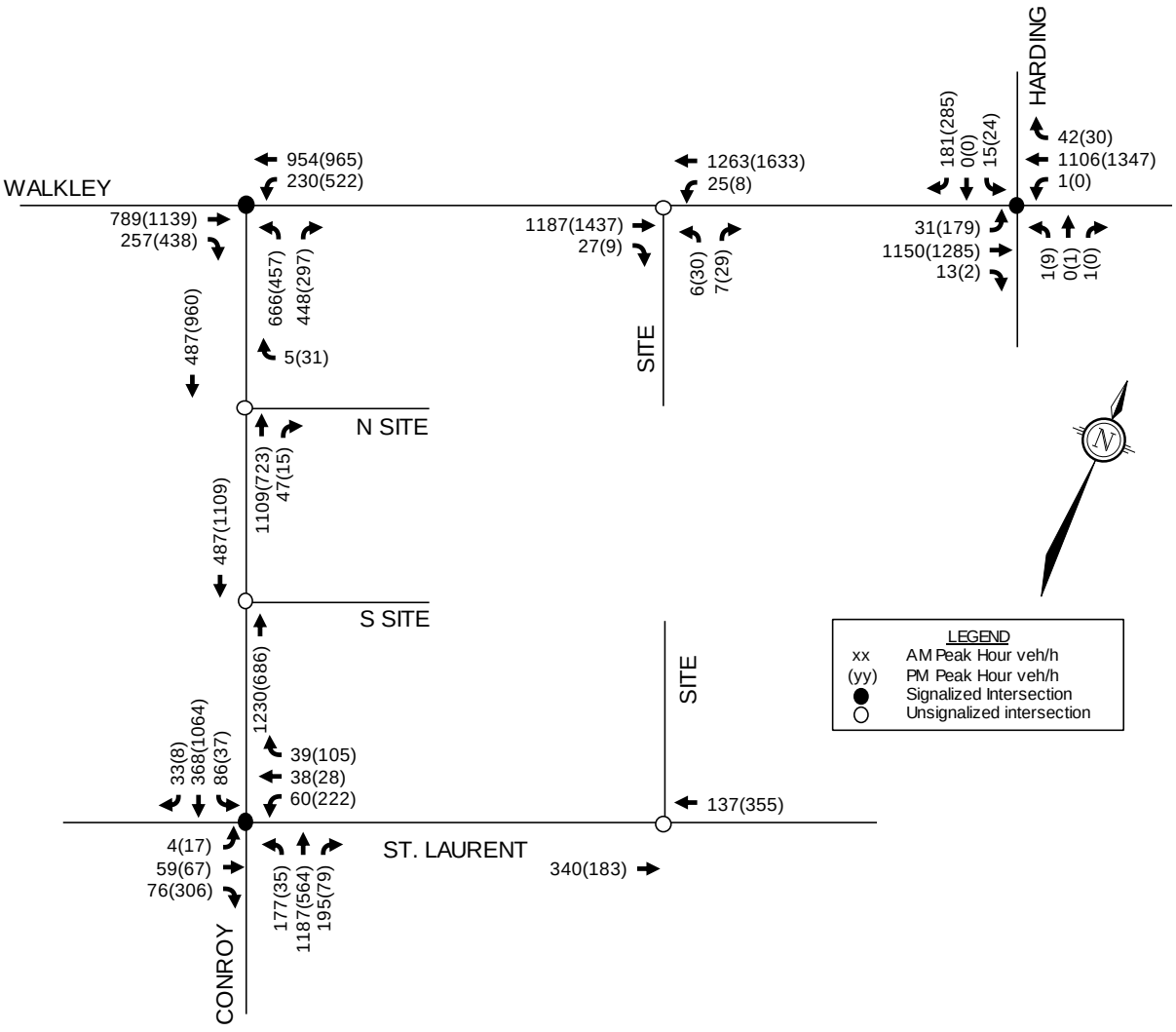
### 4.1.7 Existing Traffic Volumes

Weekday traffic counts were collected at the study area intersections to determine the existing pedestrian, cyclist and vehicular traffic volumes. The counts were completed by the City of Ottawa on the following dates:

- Walkley Road / Conroy Road — February 22, 2018
- Conroy Road / St. Laurent Boulevard — June 1, 2017
- Walkley Road / Harding Road — December 11, 2018

Observed weekday AM and PM peak hour traffic volumes at the study area intersections are shown in **Figure 4**. Peak hour summary sheets of the above traffic counts are included in **Appendix D**.

**Figure 4: Existing Traffic Volumes**



### 4.1.8 Collision Records

Historical collision data for the Walkley Road intersections with Conroy Road and Harding Road as well as the Conroy Road at St. Laurent Boulevard intersection from the last five years were obtained from the City's Public Works and Service Department. Copies of the collision summary reports are included in **Appendix E**.

The collision data have been evaluated to identify collision patterns. **Table 1** summarizes the number of collisions at each intersection from January 1, 2014 to December 31, 2018. During the five-year period there were no reported fatal collisions in the analyzed area.

**Table 1: Reported Collisions**

| Intersection | Number of Collisions | | | | | |
|---|---|---|---|---|---|---|
| | SMV[1]/ Other | Rear-End | Angle | Turning Mvmt | Side-swipe | Total |
| **Walkley Road at Conroy Road** | 3 | 49 | 4 | 5 | 11 | **72** |
| **Conroy Road at St. Laurent Boulevard** | 2 | 12 | 7 | 4 | 4 | **29** |
| **Walkley Road at Harding Road** | 2 | 11 | 6 | 12 | 2 | **33** |

1. SMV: Single Motor Vehicle

***Walkley Road at Conroy Road***

Twelve of the seventy-two collisions caused an injury. Sixty collisions occurred in clear conditions, three in rain conditions, and nine in snow conditions. None of the collisions involved pedestrians.

Of the **forty-nine rear-end** impacts at this intersection:

- Eight occurred in poor driving conditions;
- Sixteen occurred at the northbound approach;
- Twenty occurred at the eastbound approach; and,
- Thirteen occurred at the westbound approach.

High traffic volumes create the potential for more collisions of this type. There is some horizontal curvature on the northbound approach that may be contributing to these collisions. Eastbound rear ends could be the result of multiple accesses in proximity of the intersection.

Of the **eleven sideswipe** impacts at this intersection:

- Three occurred in poor driving conditions;
- Two occurred at the northbound approach;
- One occurred at the eastbound approach; and,
- Eight occurred at the westbound approach.

High traffic volumes and multiple lanes create the potential for more collisions of this type.

***Conroy Road at St. Laurent Boulevard***

Eight of the twenty-nine collisions caused an injury. Twenty-three collisions occurred in clear conditions, two in rain conditions, three in snow conditions, and one in fog conditions. None of the collisions involved pedestrians.

Of the **twelve rear-end** impacts at this intersection:

- Two occurred in poor driving conditions;
- Three occurred at the northbound approach;
- Two occurred at the eastbound approach;
- Three occurred at the southbound approach; and,

- Four occurred at the westbound approach.

Of the **seven angle** impacts at this intersection:

- Two occurred in poor driving conditions;
- Two involved a southbound vehicle and a westbound vehicle; and,
- Five involved a northbound vehicle and a westbound vehicle.

***Walkley Road at Harding Road***

Eight of the thirty-three collisions caused an injury. Twenty-seven collisions occurred in clear conditions, two in rain conditions, and four in snow conditions. None of the collisions involved pedestrians.

Of the **eleven rear-end** impacts at this intersection:

- Eight occurred in poor driving conditions;
- One occurred at the southbound approach;
- Four occurred at the eastbound approach; and,
- Six occurred at the westbound approach.

High traffic volumes create the potential for more collisions of this type. There are multiple full accesses in proximity of the intersection on the westbound approach.

Of the **twelve turning movement** impacts at this intersection:

- Two occurred in poor driving conditions;
- Eight were between an eastbound left vehicle and a westbound through vehicle; and,
- Four were between a westbound left vehicle and an eastbound through vehicle.

There may be insufficient green time for the EBL protected phase and insufficient gaps during the EBL permissive phase. The westbound left movement does not have a left turn lane and its restriction has been recently implemented.

## 4.2 Planned Conditions

The 2031 Rapid Transit and Transit Priority (RTTP) Network identifies a bus rapid transit (BRT) project within the study area. The Baseline/Heron/Walkley/St. Laurent BRT project will provide high-quality transit access to employment, commercial, and institutional land uses along the corridor. In the 2031 Affordable Network, at-grade BRT will connect from Baseline Station to Heron Station. In the 2031 Network Concept, at-grade BRT will connect from Bayshore Station to St. Laurent Station. The 2031 Network Concept will not be implemented until after 2031.

The Alta Vista Transportation Corridor (Network Concept) is a new four lane road (including two peak-period bus lanes) between the Ottawa Health Sciences Centre and Walkley Road. The roadway will include transit signal priority and queue jump lanes and will improve transit access to the Ottawa Hospital, CHEO, and the Canadian Forces Health Care Centre. The roadway addresses capacity deficiencies and the Environmental Assessment is complete. The corridor is part of the City's 2031 Network Concept and will not be implemented until after 2031.

Conroy Road is identified in the City's TMP for transit signal priority and queue jump lanes between Walkley Road and Hunt Club Road. The corridor is part of the City's 2031 Network Concept and will not be implemented until after 2031.

### 4.2.1 Other Study Area Developments

Other study area developments that are likely to occur within this study's horizon year include:

- 2500 St. Laurent Boulevard: A 2017 Transportation Brief was prepared (Stantec) for the 6,330m$^2$ (68,134 square foot) office development and estimated that Phase 1 (3,610m$^2$) of the development would generate 72 and 99 vehicle trips during the AM and PM peak hour, respectively.
- 2190 Halifax Drive: A 2019 TIA was prepared (Dillon) for 202 residential apartment units and estimated that the site would generate 48 and 54 vehicle trips during the AM and PM peak hours, respectively.
- Timbercreek Heron Gate: A 2020 TIA was prepared (CGH Transportation) for redevelopment of the Heron Gate site which will redevelop the existing townhouses with seven separate blocks that will include 118 low-rise, 2,047 mid-rise, and 2,874 high-rise units. The TIA estimates that the development will generate 587 and 614 vehicle trips during the AM and PM peak hours, respectively.
- 2375 St. Laurent Boulevard: A 2018 Screening form was prepared (D. J. Halpenny & Associates Ltd.) for the 930m$^2$ (10,000 square foot) warehouse and concluded that the development would not meet the triggers for a TIA.
- 1011 Thomas Spratt Place: A proposed 460.3m$^2$ (4,955 square foot) warehouse / office extension onto an existing two-storey building. No TIA was prepared, and the site is expected to generate minimal trips.

## 4.3 Study Area and Time Periods

A boundary street review will be conducted for Walkley Road, Conroy Road, and St. Laurent Boulevard. The study intersections are:

1. Walkley Road at Conroy Road;
2. Walkley Road at Harding Road;
3. Conroy Road at St. Laurent Boulevard; and,

4-7. The site driveways.

The weekday AM and PM peak hours are expected to represent the worst-case combination of site traffic and adjacent road traffic. Projection of site volumes will be completed for these peak hours.

### 4.3.1 Horizon Years

It is expected that the proposed redevelopment will be fully occupied by 2023 and approval is being sought for all three phases of construction. The analysis years for this study are therefore 2023 and 2028. Analysis of the interim phases has not been completed since most of the Phase 1 trips are expected to use the St. Laurent access throughout the development phases with little change to that access. The Conroy accesses are installed in Phase 2 and the impact of the existing City of Ottawa office and gym in Phase 2 is not expected to be significantly different than the impact of full buildout in Phase 3.

### 4.4 Exemptions Review

This module reviews possible exemptions from the final TIA, as outlined in the TIA Guidelines. The applicable exemptions for this site are shown in **Table 2**.

**Table 2: TIA Exemptions**

| Module | Element | Exemption Criteria | Exemption Applies |
|---|---|---|---|
| **Design Review Component** | | | |
| **4.1** Development Design | *4.1.2* Circulation and Access | • Only required for site plans | Not Exempt |
| | *4.1.3* New Street Networks | • Only required for plans of subdivision | Exempt |
| **4.2** Parking | *4.2.1* Parking Supply | • Only required for site plans | Not Exempt |
| | *4.2.2* Spillover Parking | • Only required for site plans where parking supply is 15% below unconstrained demand | Exempt |
| **Network Impact Component** | | | |
| **4.5** Transportation Demand Management | *All elements* | • Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time | Not Exempt |
| **4.6** Neighbourhood Traffic Management | *4.6.1* Adjacent Neighbourhoods | • Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds | Not Exempt |
| **4.8** Network Concept | *All elements* | • Only required when the proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by the established zoning | Exempt* |

* While a zoning amendment is required for the use, the development will generate fewer than 200 person trips during the peak hour.

## 5.0 FORECASTING

### 5.1 Development Generated Traffic

#### 5.1.1 Trip Generation

The proposed redevelopment is planned to consist of three single-storey warehouses totalling about 24,697 $m^2$ (265,836 $ft^2$). Trips generated by the proposed development were estimated using *Trip Generation*, *10th Edition* (Institute of Transportation Engineers, Washington, 2017). Person trips were estimated (See **Table 3**) using an ITE Trip to Person Trip conversion factor of 1.28, consistent with the City of Ottawa TIA Guidelines.

**Table 3: Person Trip Generation – Proposed Site**

| Land Use[1] | Units[2] | Person Trips Generated[3] | | | | | |
|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | | PM Peak Hour | | |
| | | In | Out | Total | In | Out | Total |
| Warehouse (ITE 150) | 265.8 | 56 | 17 | 73 | 21 | 55 | 76 |

Notes:
1. Trip Generation for the associated Land Use from *Trip Generation 10th Edition* (Institute of Transportation Engineers, Washington, 2017). Trips have been increased by 28% to account for 10% non-auto mode share and average vehicle occupancy of 1.15.
2. Units are 1,000 ft$^2$ of GFA.
3. Person trips per hour for peak hours.

The modal shares for the proposed development are anticipated to be generally consistent with the existing modal shares outlined in the *2011 TRANS O-D Survey Report*, specific to the Alta Vista region which indicates the modal share values for the trips to/from and within the district. The projected person trips by modal share are shown in **Table 4**.

The trips generation estimate for the warehouse site includes peak hour trips by heavy vehicles.

**Table 4: Person Trips by Modal Share – Proposed Site**

| Travel Mode | Existing Modal Share | Target Modal Share | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|---|
| | | | IN | OUT | TOT | IN | OUT | TOT |
| Person Trips | | | *56* | *17* | *73* | *21* | *55* | *76* |
| Vehicle Driver | 60% | **60%** | **33** | **10** | **43** | **12** | **33** | **45** |
| Auto Passenger | 13% | **13%** | 7 | 2 | 9 | 3 | 7 | 10 |
| Transit | 17% | **17%** | 10 | 3 | 13 | 4 | 9 | 13 |
| Active Trips | 10% | **10%** | 6 | 2 | 8 | 2 | 6 | 8 |

The proposed development is projected to generate 43 two-way vehicle trips during the AM peak hour and 45 two-way vehicle trips during the PM peak hour.

### 5.1.2 Trip Distribution / Assignment

The overall distribution of trips generated by the development has been estimated (see below) based on the observed volumes along the study area roadways as well as a review of the existing settlement patterns.

- 35% to/from the east;
- 30% to/from the west;
- 30% to/from the south; and,
- 5% to/from the north.

Anticipated Trip Assignment for each proposed driveway is summarized in **Table 5**.

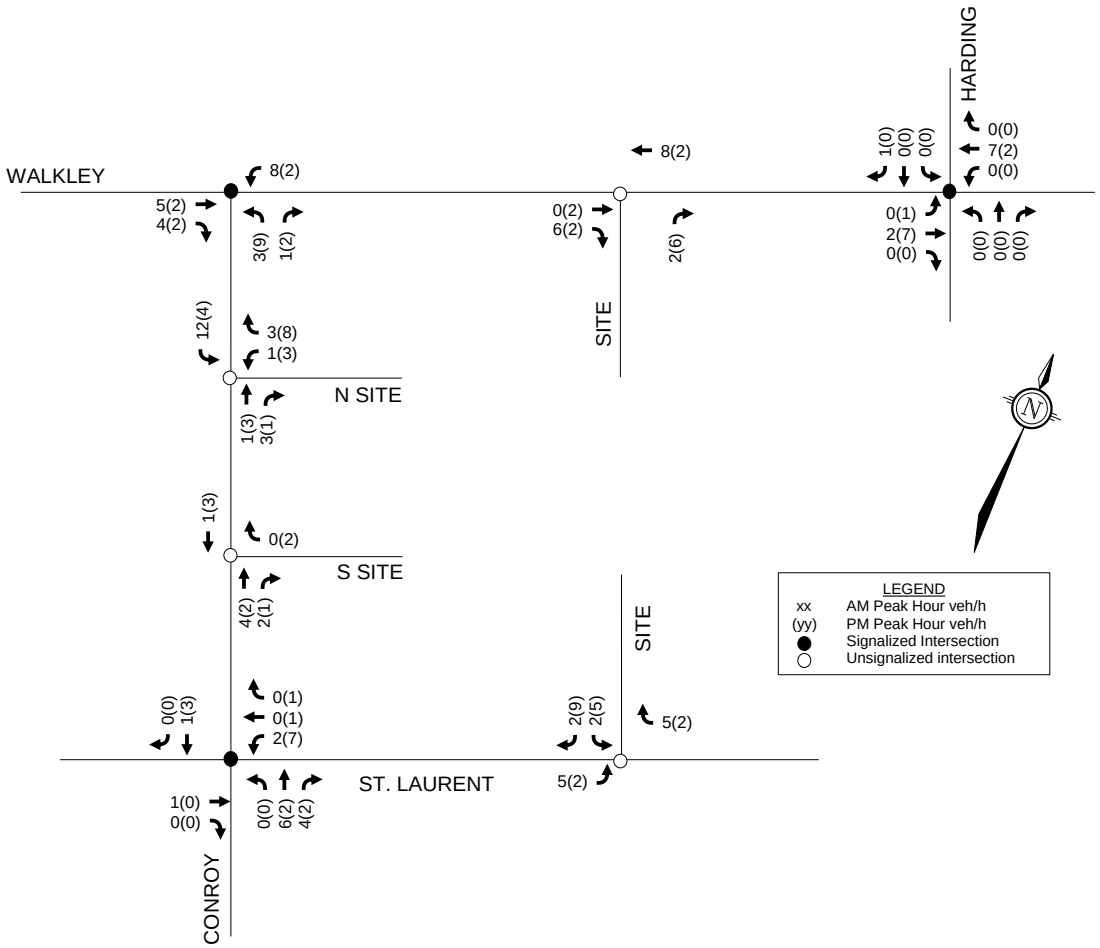
**Table 5: Trip Assignment by Driveway – Proposed Site**

| | | Driveway | | | |
|---|---|---|---|---|---|
| | | Walkley | Conroy North | Conroy South | St. Laurent |
| Trips In | From East | 0%[3] | 60% | 0% | 40%[1] |
| | From West | 50% | 40% | 0% | 10%[2] |
| | From South | 10% | 30% | 20% | 40% |
| | From North | 0% | 100% | 0% | 0% |
| Trips Out | To East | 40% | 10% | 10% | 40%[1] |
| | To West | 0% | 70% | 10% | 20%[2] |
| | To South | 0% | 30% | 0% | 70% |
| | To North | 75% | 25% | 0% | 0% |

1. 40% of trips from / to the east were assigned to route via St. Laurent Blvd. and the St. Laurent Blvd. driveway.
2. 10% of trips from / to the west were assigned to route via Don Reid Dr. and the St. Laurent Blvd. driveway.
3. No trips from the east have been assigned to the Walkley driveway due to the proposed restriction to the left turns.

Site generated traffic volumes have been assigned to the study area intersections and are shown in **Figure 5**.

**Figure 5: Assignment of Trips for the Proposed Site**



### 5.1.3 Existing Site Traffic

The existing site includes a 20,577 square foot gym in addition to 38,390 square feet of office at 2020 Walkley Road and a 48,540 square foot commercial building at 2935 Conroy Road (107,507 square feet total). Trips generated by the existing development were estimated using *Trip Generation*, *10th Edition* (Institute of Transportation Engineers, Washington, 2017). Trips were estimated using the Weekday AM and PM peak hours of generator for the business park since there are several more data points than for the peak hour of adjacent street. Person trips were estimated (See **Table 6**) using an ITE Trip to Person Trip conversion factor of 1.28, consistent with the City of Ottawa TIA Guidelines.

**Table 6: Person Trip Generation – Existing Site**

| Land Use[1] | Units[2] | Person Trips Generated[3] | | | | | |
|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | | PM Peak Hour | | |
| | | In | Out | Total | In | Out | Total |
| Business Park (ITE 770) | 107.5 | 166 | 29 | 195 | 53 | 149 | 202 |

Notes:
1. Trip Generation for the associated Land Use from *Trip Generation 10th Edition* (Institute of Transportation Engineers, Washington, 2017). Trips have been increased by 28% to account for 10% non-auto mode share and average vehicle occupancy of 1.15.
2. Units are 1,000 ft$^2$ of GFA.
3. Person trips per hour for peak hours.

The modal shares for the existing development are anticipated to be generally consistent with the existing modal shares outlined in the *2011 TRANS O-D Survey Report*, specific to the Alta Vista region which indicates the modal share values for the trips to/from and within the district. The projected person trips by modal share are shown in **Table 7**.

**Table 7: Person Trips by Modal Share – Existing Site**

| Travel Mode | Existing Modal Share | Target Modal Share | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|---|
| | | | IN | OUT | TOT | IN | OUT | TOT |
| Person Trips | | | *166* | *29* | *195* | *53* | *149* | *202* |
| Auto Driver | 60% | **60%** | **99** | **17** | **116** | **32** | **90** | **122** |
| Auto Passenger | 13% | **13%** | 22 | 4 | 26 | 7 | 19 | 26 |
| Transit | 17% | **17%** | 28 | 5 | 33 | 9 | 25 | 34 |
| Active Trips | 10% | **10%** | 17 | 3 | 20 | 5 | 15 | 20 |

The existing development is estimated to be generating 116 two-way vehicle trips during the AM peak hour and 122 two-way vehicle trips during the PM peak hour.

The overall distribution of trips generated by the existing site is estimated to be the same distribution as for the proposed site (See **Section 5.1.2**).

Anticipated Trip Assignment for each existing driveway is summarized in **Table 8**.

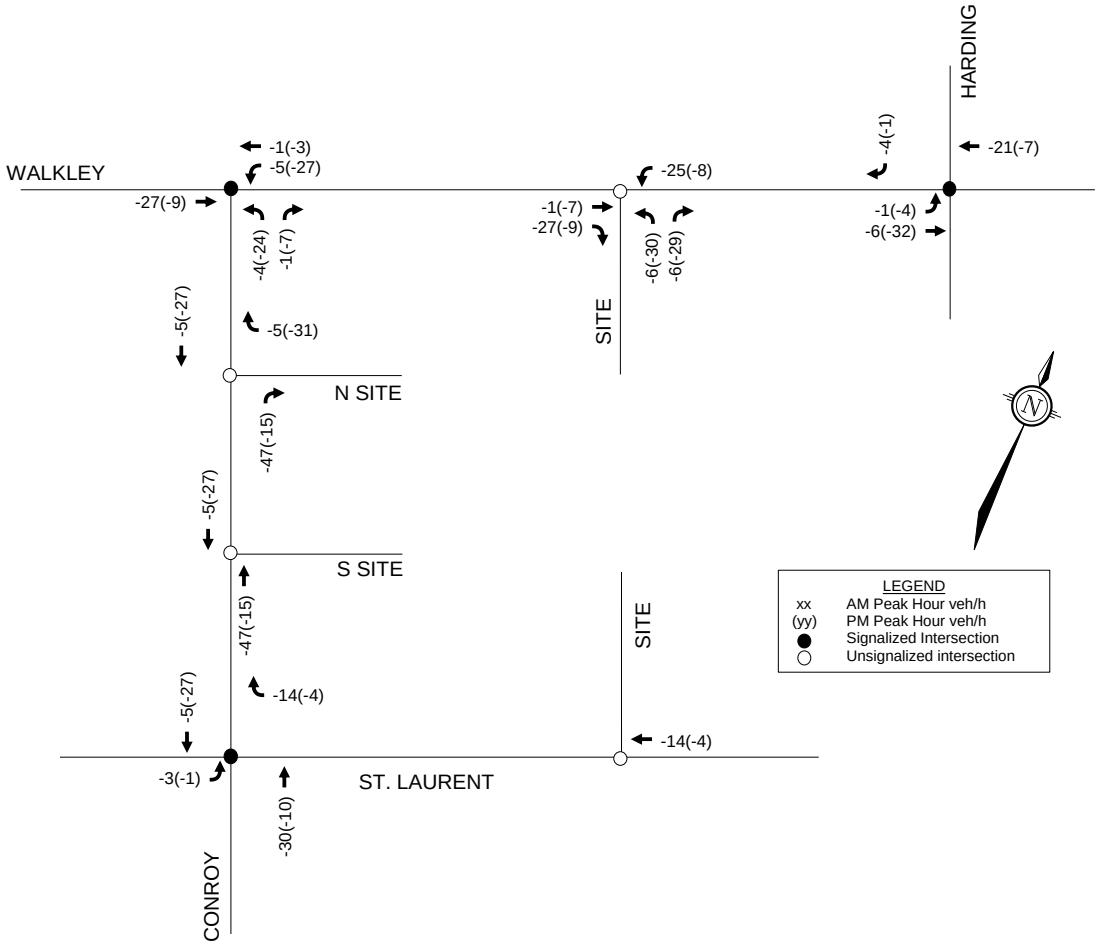
**Table 8: Trip Assignment by Driveway – Existing Site**

| | | Driveway | |
|---|---|---|---|
| | | **Walkley** | **Conroy** |
| Trips In | From East | 60% | 40%[1] |
| | From West | 90% | 10%[2] |
| | From South | 0% | 100% |
| | From North | 100% | 0% |
| Trips Out | To East | 80% | 20% |
| | To West | 10% | 90% |
| | To South | 100% | 0% |
| | To North | 80% | 20% |

1. 40% of trips from the east were assigned to route via St. Laurent Blvd. and the Conroy Rd. driveway.
2. 10% of trips from the west were assigned to route via Don Reid Dr. and the Conroy Rd. driveway.

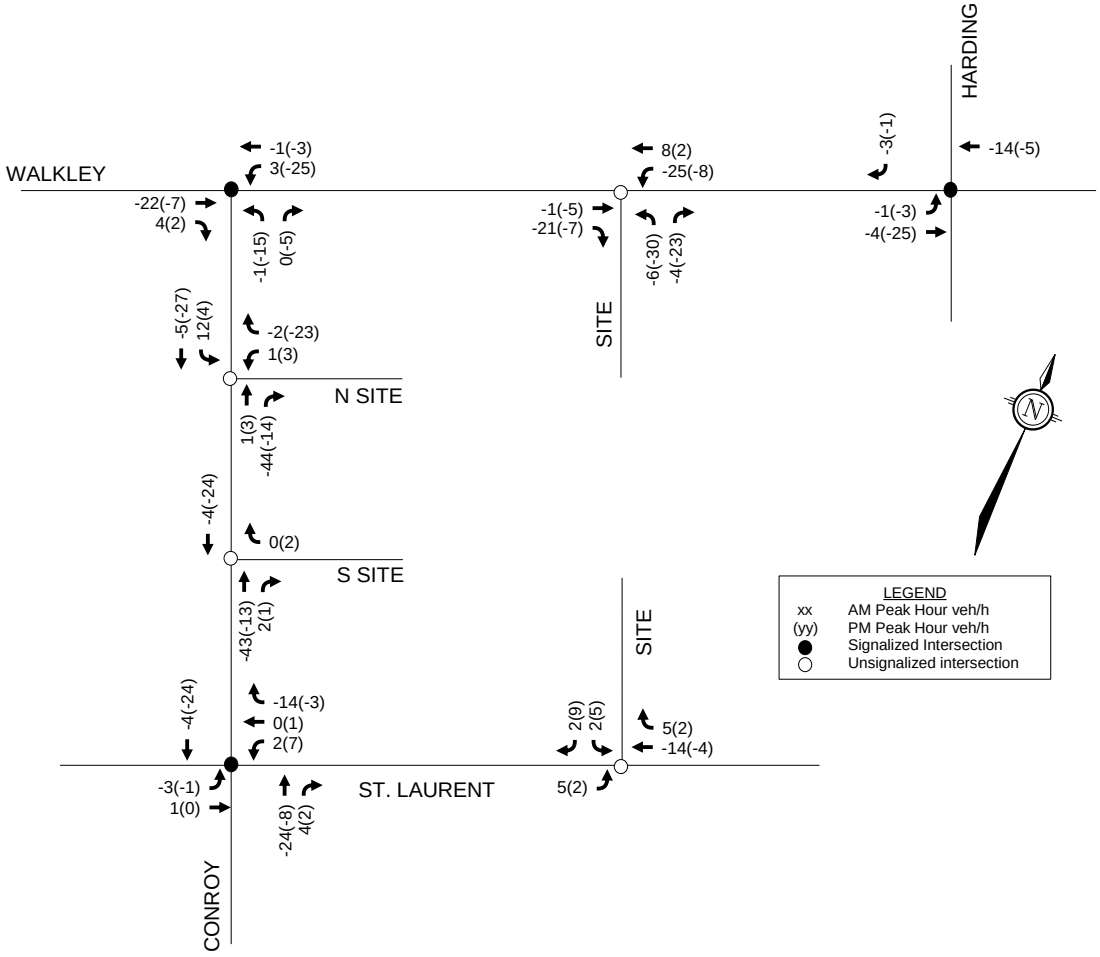
The reduction of assigned trips generated by the existing site (denoted as negative values) is shown in **Figure 6**.

**Figure 6: Reduction for Assignment of Existing Site Trips**



The net assignment of trips with site redevelopment (Proposed Site Generated Trips, **Figure 5** less Existing Site Generated Trips, **Figure 6**) is shown in **Figure 7**.

**Figure 7: Net Trip Assignment for Site Redevelopment**



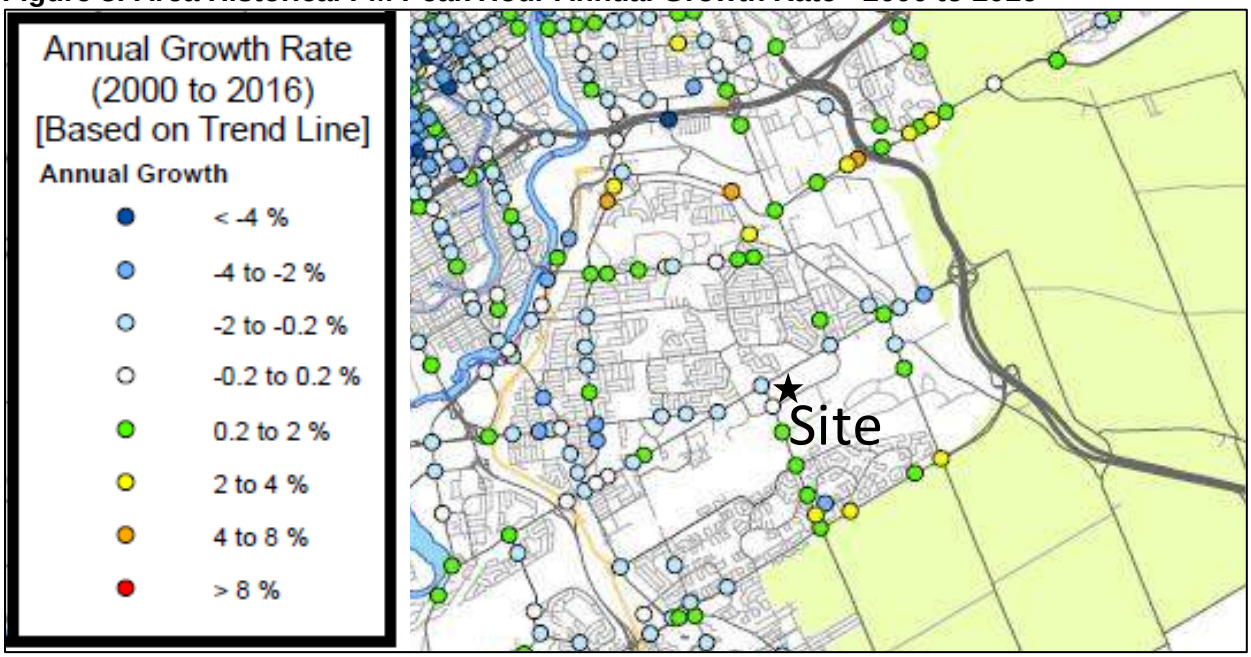

## 5.2 Background Traffic

### 5.2.1 Future Background Growth

For the 'Inner Suburbs' area of Ottawa, Exhibit 2.10 of the 2013 TMP projects population and employment growth rates of approximately 0.3% and 1.2% per annum, respectively. A 1% background growth rate has been applied to non-site traffic in this area.

This 1% background growth rate is in line with the annual historical (2000 to 2016) growth rate for this area (-2% to 2%) identified by the City of Ottawa (See **Figure 8**).

**Figure 8: Area Historical PM Peak Hour Annual Growth Rate - 2000 to 2016**




### 5.2.2 Other Area Development

Other study area developments are likely to occur within this study's horizon (See **Section 4.2.1**).

Trips generated by the 2500 St. Laurent, 2190 Halifax Drive, and Heron Gate sites have been assigned to the study area intersections based on the assignment outlined in each traffic study (See **Appendix F**). Full site development of 2500 St. Laurent and 2190 Halifax Drive have been applied for the 2023 buildout year. Full site development of 2500 St. Laurent and 2190 Halifax Drive as well as partial development of the Heron Gate site (2030 site generation and auto volume removed by 2030) have been applied for the 2028 horizon year. Remaining background developments are expected to be minimal with trips captured by the 1% background growth rate.

### 5.2.3 Projected Background and Total Traffic

Projected 2023 and 2028 background traffic volumes (with 1% background growth as well as the other study area developments) are shown in **Figure 9** and **Figure 10**, respectively. Total Traffic Volumes (**Figures 11** and **12**) have been projected for the Study Area intersections for the weekday AM and PM peak hours in 2023 and 2028 and include background traffic as well as net trips for site redevelopment (**Figure 7**).

**Figure 9: 2023 Future Background Traffic Volumes**

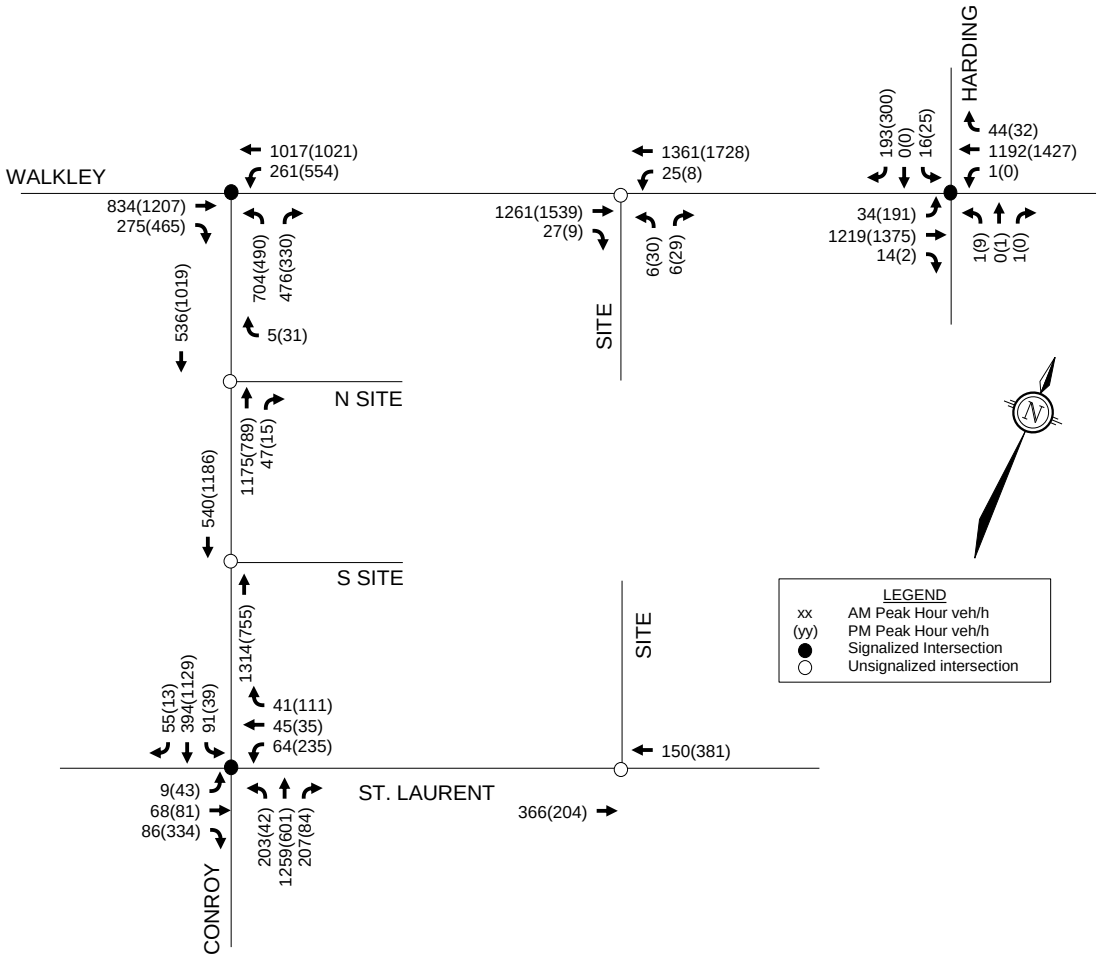


**Figure 10: 2028 Future Background Traffic Volumes**

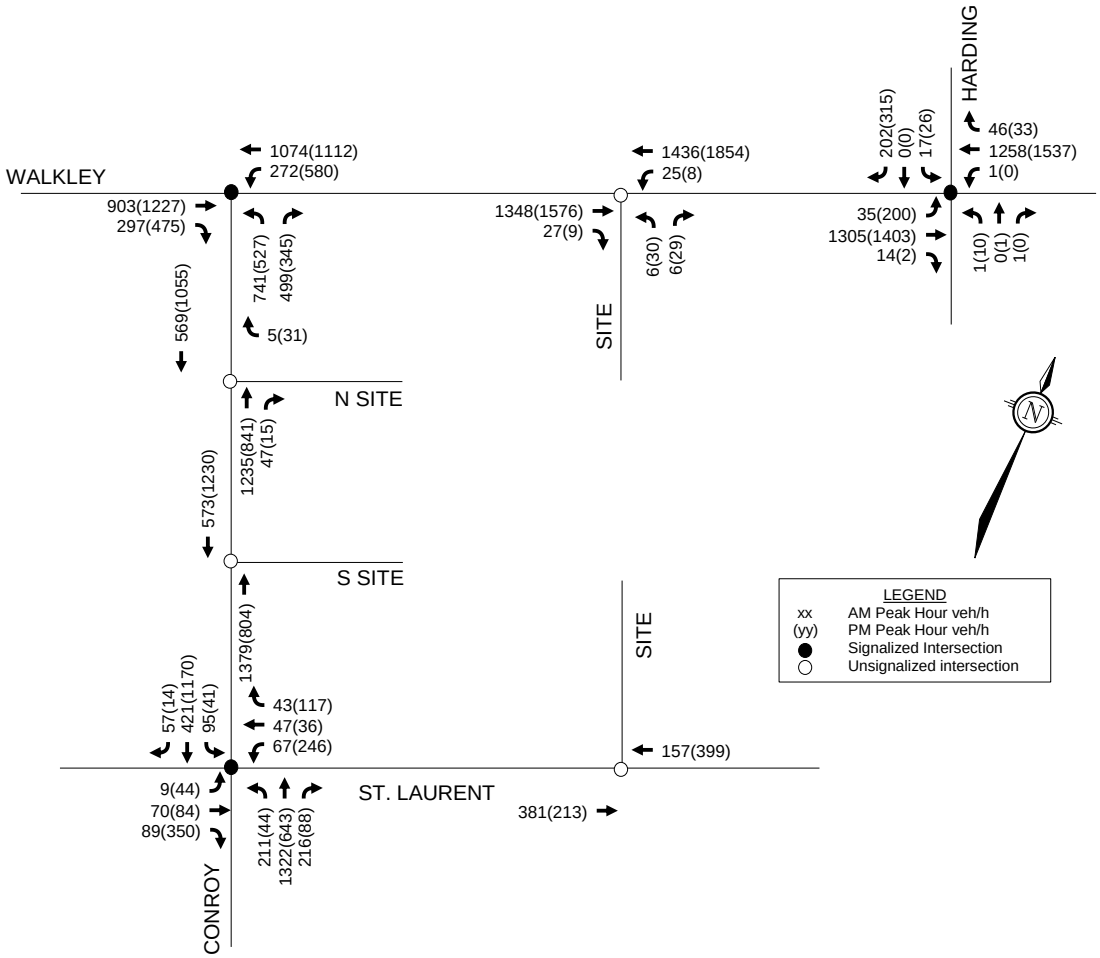


**Figure 11: 2023 Total Traffic Volumes with Site Redevelopment**

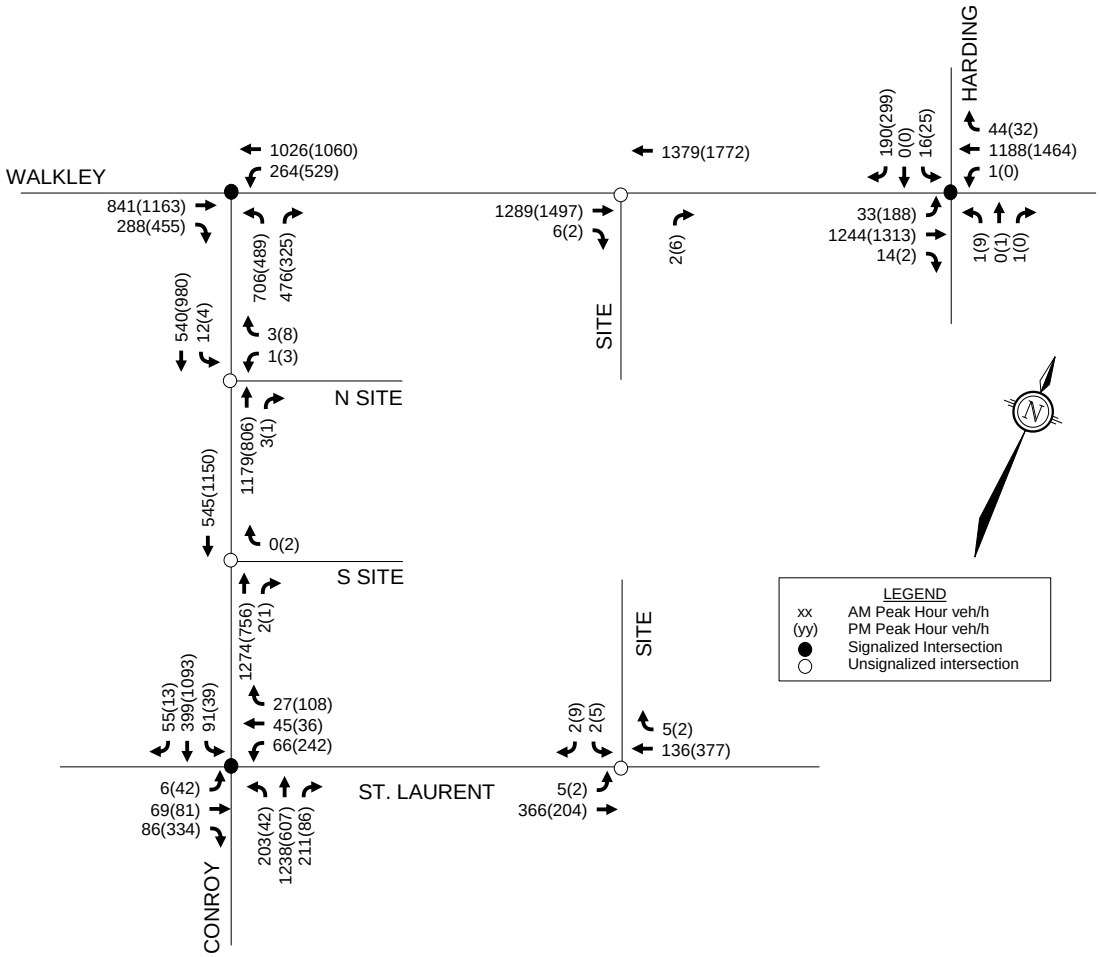
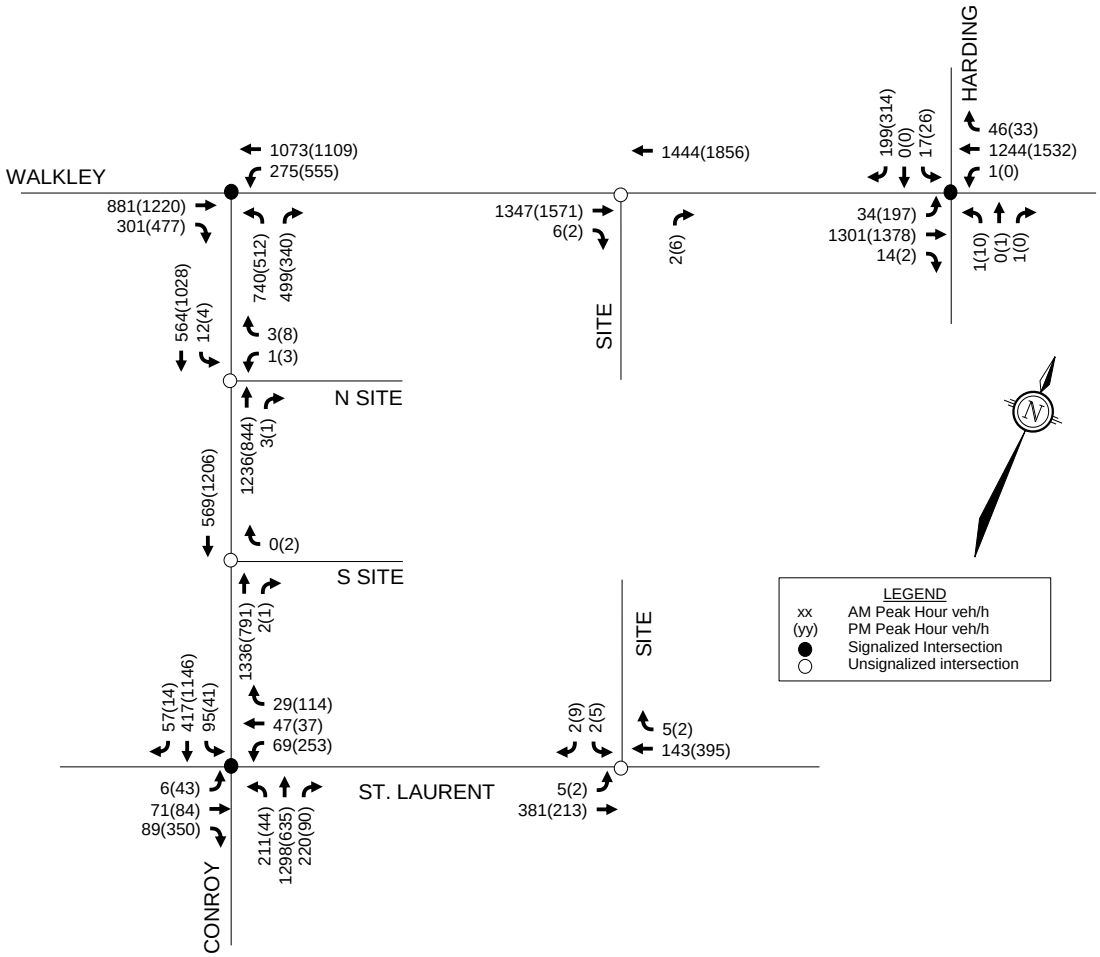


**Figure 12: 2028 Total Traffic Volumes with Site Redevelopment**




## 5.3 Demand Rationalization

Auto LOS (*Synchro 10*) analysis for the existing as well as the 2023 and 2028 peak periods without the addition of site generated trips are summarized in the following sections. Intersection parameters in the analysis are consistent with the City's TIA guidelines (saturation flow rate: 1800 vphpl, existing conditions PHF: 0.9, future conditions PHF: 1.0).

Existing signal timing plans obtained from the City of Ottawa are included in **Appendix G**. Detailed *Synchro 10* reports are included in **Appendix L**.

### 5.3.1 Existing Traffic – Intersection Operations

Intersection capacity analysis has been completed for the existing traffic volumes (See **Figure 3**) and summarized in **Table 9**. Approaches where long queuing is expected are shown with the associated 50$^{th}$ and 95$^{th}$ percentile queue lengths in **Table 10**.

**Table 9: Existing Traffic – Intersection Operations**

| Intersection | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|
| | Max V/C or Delay (sec) | LOS | Mvmt | Max V/C or Delay (sec) | LOS | Mvmt |
| Walkley at Conroy | 0.87 | D | NBL | **0.91** | **E** | **EBT** |
| Conroy at St. Laurent | 0.52 | A | SBL | 0.80 | C | EBR |
| Walkley at Harding | 0.72 | C | SB | 0.83 | D | SB |
| Walkley at Site Driveway[1] | 27 | D | NB | 66 | F | NB |
| Conroy at Site Driveway[1] | 9 | A | WB | 9 | A | WB |

1. Unsignalized intersection

**Table 10: Existing Traffic – Queuing**

| Intersection | Mvmt | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| | | v/c or Delay (sec) | 50th % Queue (m) | 95th % Queue (m) | v/c or Delay (sec) | 50th % Queue (m) | 95th % Queue (m) |
| Walkley at Conroy | EBT | 0.60 | 76 | 101 | 0.91 | 126 | #170 |
| | WBL | 0.66 | 29 | 42 | 0.89 | 61 | #86 |
| | WBT | 0.53 | 44 | 52 | 0.47 | 90 | 120 |
| | NBL | 0.87 | 77 | 99 | 0.79 | 49 | 64 |
| | NBR | 0.79 | 31 | 72 | 0.60 | 0 | 22 |
| Conroy at St. Laurent | EBL | 0.02 | 1 | 3 | 0.06 | 3 | 6 |
| | EBT | 0.23 | 11 | 16 | 0.18 | 10 | 16 |
| | EBR | 0.28 | 0 | 9 | 0.80 | 37 | 52 |
| | WBL | 0.39 | 12 | 17 | 0.54 | 29 | 33 |
| | WBT | 0.16 | 7 | 11 | 0.05 | 3 | 6 |
| | NBL | 0.31 | 10 | 41 | 0.38 | 4 | #20 |
| | NBTR | 0.44 | 30 | 85 | 0.33 | 25 | 45 |
| | SBL | 0.52 | 6 | #42 | 0.16 | 4 | 13 |
| | SBTR | 0.18 | 10 | 32 | 0.77 | 83 | #163 |
| Walkley at Harding | EBL | 0.14 | 1 | m3 | 0.65 | 21 | m33 |
| | EBTR | 0.51 | 31 | 52 | 0.57 | 7 | 18 |
| | WB | 0.54 | 42 | 90 | 0.76 | 108 | 162 |
| | SB | 0.72 | 18 | 38 | 0.80 | 19 | 44 |
| Walkley at Site Driveway[1] | NB | 27 | | 2 | 66 | | 18 |

1. Unsignalized intersection
#: volume for the 95th percentile cycle exceeds capacity
m: Volume for 95th percentile queue is metered by upstream signal

During the Existing AM peak hour, all movements at the study intersections operate with LOS D or better. During the Existing PM peak hour, the EBT movement on Walkley at Conroy operates with LOS E. The site driveway at Walkley Road will operate with LOS F with delays and queuing of about 2-3 vehicles. The remaining movements are expected to operate with LOS D or better.

The eastbound queue at Walkley / Conroy is 170m in the PM peak and queues through the adjacent signal at the commercial development (about 130m to the west). By increasing the cycle length at the Walkley at Conroy intersection to 120 seconds (from 110 seconds) during the PM peak, the intersection can be improved to LOS D (See **Appendix L).**

The high delay at the Walkley site driveway is due to left turning traffic exiting the site. Converting this driveway to right-in, right-out only will improve the operations.

### 5.3.2 2023 Background Traffic – Intersection Operations

Intersection capacity analysis has been completed for the projected 2023 background traffic volumes (See **Figure 8**) and summarized in **Table 11**. Approaches where long queuing is expected are shown with the associated 50$^{th}$ and 95$^{th}$ percentile queue lengths in **Table 12**.

**Table 11: 2023 Background Traffic – Intersection Operations**

| Intersection | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|
| | Max V/C or Delay (sec) | LOS | Mvmt | Max V/C or Delay (sec) | LOS | Mvmt |
| Walkley at Conroy | 0.85 | D | NBL | 0.87 | D | WBL |
| Conroy at St. Laurent | 0.45 | A | SBL | 0.79 | C | EBR |
| Walkley at Harding | 0.71 | C | SB | 0.80 | C | SB |
| Walkley at Site Driveway[1] | 25 | D | NB | 51 | F | NB |
| Conroy at Site Driveway[1] | 9 | A | WB | 9 | A | WB |

1. Unsignalized intersection

**Table 12: 2023 Background Traffic – Queuing**

| Intersection | Mvmt | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| | | v/c or Delay (sec) | 50th % Queue (m) | 95th % Queue (m) | v/c or Delay (sec) | 50th % Queue (m) | 95th % Queue (m) |
| Walkley at Conroy | EBT | 0.57 | 70 | 95 | 0.86 | 117 | #157 |
| | WBL | 0.67 | 31 | 42 | 0.87 | 57 | #83 |
| | WBT | 0.50 | 41 | 46 | 0.44 | 78 | 114 |
| | NBL | 0.85 | 73 | 93 | 0.77 | 47 | 62 |
| | NBR | 0.76 | 24 | 62 | 0.61 | 0 | 22 |
| Conroy at St. Laurent | EBL | 0.05 | 2 | 4 | 0.14 | 6 | 11 |
| | EBT | 0.24 | 11 | 16 | 0.20 | 11 | 17 |
| | EBR | 0.28 | 0 | 9 | 0.79 | 35 | 50 |
| | WBL | 0.37 | 11 | 16 | 0.52 | 28 | 31 |
| | WBT | 0.17 | 7 | 12 | 0.05 | 4 | 7 |
| | NBL | 0.32 | 10 | 42 | 0.35 | 4 | #20 |
| | NBTR | 0.42 | 27 | 79 | 0.31 | 23 | 43 |
| | SBL | 0.45 | 5 | #37 | 0.14 | 4 | 13 |
| | SBTR | 0.19 | 9 | 31 | 0.73 | 76 | #154 |
| Walkley at Harding | EBL | 0.14 | 1 | m3 | 0.65 | 21 | m33 |
| | EBTR | 0.51 | 29 | 48 | 0.57 | 7 | 18 |
| | WB | 0.54 | 47 | 86 | 0.76 | 108 | 162 |
| | SB | 0.71 | 15 | 35 | 0.80 | 19 | 44 |
| Walkley at Site Driveway[1] | NB | 25 | | 2 | 51 | | 14 |

1. Unsignalized intersection
#: volume for the 95th percentile cycle exceeds capacity
m: Volume for 95th percentile queue is metered by upstream signal

Based on the previous tables, the background traffic conditions appear to improve when compared to the existing traffic conditions. This can be attributed to differences in the Peak Hour Factor (set to 0.90 in existing conditions and 1.0 in future conditions, as per the 2017 TIA Guidelines).

During the 2023 AM and PM peak hours with no site redevelopment, all movements at the signalized study intersections are expected to operate with LOS D or better. The site driveway at Walkley Road will operate with LOS F with delays and queuing of about 2-3 vehicles. The eastbound queue at Walkley / Conroy is 157m in the PM peak and queues through the adjacent signal at the commercial development.

The high delay at the Walkley site driveway is due to left turning traffic exiting the site. Converting this driveway to right-in, right-out only will improve the operations.

### 5.3.3 2028 Background Traffic – Intersection Operations

Intersection capacity analysis has been completed for the projected 2028 background traffic volumes (See **Figure 9**) and summarized in **Table 13**. Approaches where long queuing is expected are shown with the associated 50th and 95th percentile queue lengths in **Table 14**.

**Table 13: 2028 Background Traffic – Intersection Operations**

| Intersection | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|
| | Max V/C or Delay (sec) | LOS | Mvmt | Max V/C or Delay (sec) | LOS | Mvmt |
| Walkley at Conroy | 0.87 | D | NBL | 0.90 | D | WBL |
| Conroy at St. Laurent | 0.51 | A | SBL | 0.81 | D | EBR |
| Walkley at Harding | 0.73 | C | SB | 0.84 | D | WBT |
| Walkley at Site Driveway[1] | 29 | D | NB | 61 | F | NB |
| Conroy at Site Driveway[1] | 9 | A | WB | 9 | A | WB |

1. Unsignalized intersection

**Table 14: 2028 Background Traffic – Queuing**

| Intersection | Mvmt | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| | | v/c or Delay (sec) | 50th % Queue (m) | 95th % Queue (m) | v/c or Delay (sec) | 50th % Queue (m) | 95th % Queue (m) |
| Walkley at Conroy | EBT | 0.63 | 80 | 105 | 0.89 | 120 | #161 |
| | WBL | 0.69 | 31 | 45 | 0.90 | 62 | #83 |
| | WBT | 0.54 | 45 | 53 | 0.48 | 94 | 125 |
| | NBL | 0.87 | 78 | 99 | 0.80 | 51 | 67 |
| | NBR | 0.79 | 32 | 74 | 0.61 | 0 | 22 |
| Conroy at St. Laurent | EBL | 0.05 | 2 | 4 | 0.14 | 6 | 11 |
| | EBT | 0.25 | 12 | 17 | 0.20 | 12 | 18 |
| | EBR | 0.29 | 0 | 9 | 0.81 | 39 | 54 |
| | WBL | 0.39 | 12 | 17 | 0.53 | 29 | 33 |
| | WBT | 0.18 | 8 | 12 | 0.05 | 4 | 7 |
| | NBL | 0.35 | 11 | 45 | 0.44 | 5 | #23 |
| | NBTR | 0.44 | 30 | 85 | 0.34 | 26 | 46 |
| | SBL | 0.51 | 6 | #41 | 0.16 | 4 | 13 |
| | SBTR | 0.20 | 10 | 34 | 0.77 | 83 | #162 |
| Walkley at Harding | EBL | 0.15 | 1 | m3 | 0.73 | 27 | m#44 |
| | EBTR | 0.53 | 32 | 52 | 0.59 | 8 | m19 |
| | WB | 0.55 | 44 | 94 | 0.84 | 133 | #200 |
| | SB | 0.73 | 20 | 39 | 0.83 | 24 | 49 |
| Walkley at Site Driveway[1] | NB | 29 | | 2 | 61 | | 16 |

1. Unsignalized intersection
#: volume for the 95th percentile cycle exceeds capacity
m: Volume for 95th percentile queue is metered by upstream signal

During the 2028 AM and PM peak hours, all movements at the signalized study intersections are expected to operate with LOS D or better. The site driveway at Walkley Road will operate with LOS F with delays and queuing of about 2-3 vehicles. The eastbound queue at Walkley / Conroy is 161m in the PM peak and queues through the adjacent signal at the commercial development.

The high delay at the Walkley site driveway is due to left turning traffic exiting the site. Converting this driveway to right-in, right-out only will improve the operations.

## 6.0 ANALYSIS

### 6.1 Development Design

The design overview is summarized below.

- Pedestrian facilities are shown (See **Appendix A**) between the buildings and the parking lots with new pedestrian walkways constructed to connect to all three frontages.
- OC Transpo's service design guideline for peak period service is to provide service within a five minute (400m) walk of the home, school and work location of 95% of urban residents. The existing bus stops near the subject sites are described in **Section 4.1.5**.
    - Each of the three buildings have exterior access doors within a 240m walking distance from an OC Transpo stop.
- The Fire Route (See **Appendix A**) for phase 1 is via the St Laurent Boulevard access. The Fire Route for phase 2 is via the Conroy Road north or St. Laurent Boulevard access with circulation between the two. The Fire Route for phase 3 is via the Walkley Road, Conroy Road north, or St. Laurent Boulevard access with circulation between each access.
- Garbage bins are shown (**Appendix A**). Each garbage bin is located within the truck loading area for each site where there is sufficient space for maneuvering.
- A review of the Transportation Demand Management (TDM) – *Supportive Development Design and Infrastructure Checklist* has been conducted. A copy of the TDM checklist is included in **Appendix I**. All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- Figures showing heavy vehicle turning paths are shown in **Appendix A**.

### 6.2 Parking

The subject site is within Area C on Schedule 1 and 1A of the City of Ottawa's ZBL. Minimum vehicular and bicycle parking as well as loading rates for the proposed uses are identified in the ZBL and are summarized in **Table 15** (Phase 1), **Table 16** (Phase 2), and **Table 17** (Phase 3). The proposed vehicular parking spaces, bicycle parking spaces, and loading meet or exceed the minimum requirements of the ZBL while the number of barrier-free parking spaces meet or exceed the AODA requirements.

**Table 15: Vehicular, Bicycle, Barrier Free Parking and Loading Requirements - Phase 1**

| Land Use | | Rate | GFA/Units | Requirement | Provided |
|---|---|---|---|---|---|
| *Vehicle Parking* | | | | | |
| Warehouse 1 | Office | 2.4 / 100 $m^2$of GFA | 855 $m^2$ | 21 | 110 |
| | Warehouse | 0.8 / 100 $m^2$of GFA<br>0.4 / 100 $m^2$of GFA above 5,000 $m^2$of GFA | 7,692 $m^2$ | 51 | |
| Existing | Office | 2.4 / 100 $m^2$of GFA | 2,850 $m^2$ | 68 | 304 |
| | Personal Service | 3.4 / 100 $m^2$of GFA | 1,520$m^2$ | 52 | |
| | Warehouse with office | 2.4 / 100 $m^2$of GFA (office)<br>0.8 / 100 $m^2$of GFA<br>0.4 / 100 $m^2$of GFA above 5,000 $m^2$of GFA | 1,070 $m^2$ (office)<br>1,760 $m^2$ (warehouse) | 26 (office)<br>14 (warehouse) | |
| | | | ***Total*** | ***232*** | ***414*** |
| *Bicycle Parking* | | | | | |
| Warehouse 1 | Office | 1 / 250$m^2$ of GFA | 855 $m^2$ | 3 | 7 |
| | Warehouse | 1 / 2,000$m^2$ of GFA | 7,692 $m^2$ | 4 | |
| | | | ***Total*** | ***7*** | ***7*** |
| *Barrier Free Parking* | | | | | |
| Warehouse 1 | | | 110 public spaces | 5 | 5 |
| | | | ***Total*** | ***5*** | ***5*** |
| *Vehicle Loading Spaces* | | | | | |
| Warehouse 1 | Office | 0 / 999$m^2$ of GFA | 855 $m^2$ | 0 | 0 |
| | Warehouse | 1 / 5,000-9,999$m^2$ of GFA | 7,692 $m^2$ | 1 | 22 |
| | | | ***Total*** | ***1*** | ***22*** |

**Table 16: Vehicular, Bicycle, Barrier Free Parking and Loading Requirements - Phase 2**

| Land Use | | Rate | GFA/Units | Requirement | Provided |
|---|---|---|---|---|---|
| *Vehicle Parking* | | | | | |
| Warehouse 1 | Office | 2.4 / 100 $m^2$of GFA | 855 $m^2$ | 21 | 169 |
| | Warehouse | 0.8 / 100 $m^2$of GFA<br>0.4 / 100 $m^2$of GFA above 5,000 $m^2$of GFA | 7,692 $m^2$ | 51 | |
| Warehouse 2 | Office | 2.4 / 100 $m^2$of GFA | 850 $m^2$ | 20 | |
| | Warehouse | 0.8 / 100 $m^2$of GFA<br>0.4 / 100 $m^2$of GFA above 5,000 $m^2$of GFA | 7,650 $m^2$ | 51 | |
| Existing | Office | 2.4 / 100 $m^2$of GFA | 2,850 $m^2$ | 68 | 120 |
| | Personal Service | 3.4 / 100 $m^2$of GFA | 1,520$m^2$ | 52 | |
| | | | ***Total*** | ***263*** | ***289*** |
| *Bicycle Parking* | | | | | |
| Warehouse 1 | Office | 1 / 250$m^2$ of GFA | 855 $m^2$ | 3 | 7 |
| | Warehouse | 1 / 2,000$m^2$ of GFA | 7,692 $m^2$ | 4 | |
| Warehouse 2 | Office | 1 / 250$m^2$ of GFA | 850 $m^2$ | 3 | 7 |
| | Warehouse | 1 / 2,000$m^2$ of GFA | 7,650 $m^2$ | 4 | |
| | | | ***Total*** | ***14*** | ***14*** |
| *Barrier Free Parking* | | | | | |
| Warehouses 1 & 2 | | | 169 public spaces | 7 | 9 |

| | | | | | |
|---|---|---|---|---|---|
| | | | ***Total*** | ***7*** | ***9*** |
| *Vehicle Loading Spaces* | | | | | |
| Warehouse 1 | Office | 0 / 999m$^2$ of GFA | 855 m$^2$ | 0 | 0 |
| | Warehouse | 1 / 5,000-9,999m$^2$ of GFA | 7,692 m$^2$ | 1 | 22 |
| Warehouse 2 | Office | 0 / 999m$^2$ of GFA | 850 m$^2$ | 0 | 0 |
| | Warehouse | 1 / 5,000-9,999m$^2$ of GFA | 7,650 m$^2$ | 1 | 22 |
| | | | ***Total*** | ***2*** | ***44*** |

**Table 17: Vehicular, Bicycle, Barrier Free Parking and Loading Requirements - Phase 3**

| Land Use | | Rate | GFA/Units | Requirement | Provided |
|---|---|---|---|---|---|
| *Vehicle Parking* | | | | | |
| Warehouse 1 | Office | 2.4 / 100 m$^2$of GFA | 855 m$^2$ | 21 | 291 |
| | Warehouse | 0.8 / 100 m$^2$of GFA<br>0.4 / 100 m$^2$of GFA above 5,000 m$^2$of GFA | 7,692 m$^2$ | 51 | |
| Warehouse 2 | Office | 2.4 / 100 m$^2$of GFA | 850 m$^2$ | 20 | |
| | Warehouse | 0.8 / 100 m$^2$of GFA<br>0.4 / 100 m$^2$of GFA above 5,000 m$^2$of GFA | 7,650 m$^2$ | 51 | |
| Warehouse 3 | Office | 2.4 / 100 m$^2$of GFA | 765 m$^2$ | 18 | |
| | Warehouse | 0.8 / 100 m$^2$of GFA<br>0.4 / 100 m$^2$of GFA above 5,000 m$^2$of GFA | 6,885 m$^2$ | 48 | |
| | | | ***Total*** | ***209*** | ***291*** |
| *Bicycle Parking* | | | | | |
| Warehouse 1 | Office | 1 / 250m$^2$ of GFA | 855 m$^2$ | 3 | 7 |
| | Warehouse | 1 / 2,000m$^2$ of GFA | 7,692 m$^2$ | 4 | |
| Warehouse 2 | Office | 1 / 250m$^2$ of GFA | 850 m$^2$ | 3 | 7 |
| | Warehouse | 1 / 2,000m$^2$ of GFA | 7,650 m$^2$ | 4 | |
| Warehouse 3 | Office | 1 / 250m$^2$ of GFA | 765 m$^2$ | 3 | 6 |
| | Warehouse | 1 / 2,000m$^2$ of GFA | 6,885 m$^2$ | 3 | |
| | | | ***Total*** | ***20*** | ***20*** |
| *Barrier Free Parking* | | | | | |
| Warehouses 1, 2, & 3 | | | 291 public spaces | 8 | 13 |
| | | | ***Total*** | ***8*** | ***13*** |
| *Vehicle Loading Spaces* | | | | | |
| Warehouse 1 | Office | 0 / 999m$^2$ of GFA | 855 m$^2$ | 0 | 0 |
| | Warehouse | 1 / 5,000-9,999m$^2$ of GFA | 7,692 m$^2$ | 1 | 22 |
| Warehouse 2 | Office | 0 / 999m$^2$ of GFA | 850 m$^2$ | 0 | 0 |
| | Warehouse | 1 / 5,000-9,999m$^2$ of GFA | 7,650 m$^2$ | 1 | 22 |
| Warehouse 3 | Office | 0 / 999m$^2$ of GFA | 765 m$^2$ | 0 | 0 |
| | Warehouse | 1 / 5,000-9,999m$^2$ of GFA | 6,885 m$^2$ | 1 | 20 |
| | | | | ***3*** | ***64*** |

## 6.3 Boundary Streets

Schedule ‘B’ of the City of Ottawa’s Official Plan indicates the site is in an Urban Employment Area. The site is also within 300m of Le Carrefour Adult school and Alternative High School.

Targets for pedestrian level of service (PLOS), bicycle level of service (BLOS), transit level of service (TLOS), and truck level of service (TkLOS) by street classification are outlined in an employment area (Walkley Road) and 300m of a school (Conroy Road and St. Laurent Boulevard) in Exhibit 22 of the MMLOS guidelines. The Segment PLOS, BLOS, TLOS, and TkLOS and associated targets for Walkley Road, Conroy Road, and St. Laurent Boulevard are summarized in **Table 18**. Details on the Segment MMLOS are included in **Appendix H**.

**Table 18: Segment MMLOS Summary**

| Intersection | PLOS | BLOS | TLOS | TkLOS |
|---|---|---|---|---|
| Walkley Road | E | F | D | A |
| **Target** | **C** | **C** | **B** | **B** |
| Conroy Road | E | A | D | A |
| **Target** | **A** | **A** | **D** | **D** |
| St. Laurent Boulevard | F | D | E | B |
| **Target** | **A** | **B** | **No Target** | **No Target** |

The PLOS along Walkley Road, Conroy Road, and St. Laurent Boulevard fronting the site is currently failing. With a posted speed limit of 50 km/h on Walkley Road, a 2m sidewalk and 2m boulevard are both required to achieve the target C. With posted speed limits of 50km/h and 60 km/h on St. Laurent Boulevard and Conroy Road, respectively, and more than 3,000 vehicles per day AADT, the target PLOS A is not achievable due to the speed and volume. PLOS D and PLOS C are achievable on Conroy Road and St. Laurent Boulevard, respectively, with a 2m sidewalk and a 2m boulevard.

With a multi-use path along the west side of Conroy Road, the street achieves BLOS A, meeting the target, while the Walkley and St. Laurent corridors miss the BLOS targets, achieving F and D, respectively. The target BLOS can be achieved on both Walkley and St. Laurent with 1.5m onstreet bike lanes.

Walkley Road (BRT with at-grade crossings) and Conroy Road (Isolated Measures) are designated future transit priority corridors. While Conroy Road achieves the target D, Walkley Road misses its target B, a bus lane is required to achieve TLOS B.

Each study road achieves TkLOS A or B, surpassing the targets, where applicable.

## 6.4 Access Intersections

The development will be served by one right-in, right-out connection to Walkley Road, one full connection and one right-in, right-out connection to Conroy Road, and one full connection to St. Laurent Boulevard.

The access configurations with respect to design guidelines and requirements of the City's Private Approach By-law are summarized below.

- Section 25 (m) of the *Private Approach By-Law* identifies spacing between driveways and streets for properties abutting arterial and major collector roads. For sites with 200-299 parking spaces, this spacing is 45m.

  - The site's connection to Walkley Road is about 185m from the signalized intersection at Conroy Road and about 60m from the signalized intersection at Harding Road, meeting the requirement.
  - The site's north connection to Conroy Road is 110m south of Walkley Road, meeting this requirement.
  - The distance between the two site connections to Conroy Road is 87m, meeting this requirement.
  - The site's south connection to Conroy Road is 100m north of St. Laurent Boulevard, meeting this requirement.
  - The site's connection to St. Laurent Boulevard is about 145m from the signalized intersection at Conroy Road, meeting this requirement.
- The Transportation Association of Canada Chapter 8, Figure 8.8.2 (TAC, June 2017) provides suggested corner clearances to accesses at major intersections. The corner clearances for this site are as follows:
  - The site's connection to Walkley Road is in advance of the EB left turn storage for the intersection with Harding Road, meeting the requirement.
  - The site's connection to St. Laurent Boulevard is about 145m from the signalized intersection at Conroy Road, meeting the requirement.
  - The northbound left lanes on Conroy at Walkley are continuous along the frontage and traffic analysis (**Section 6.7**) indicates the 95$^{th}$ percentile queue for the NBL is about 99m. The site's connections to Conroy Road are about 110m and 208m from the signalized intersection at Walkley Road, meeting the requirement for driveways to be outside the storage length of left turn lanes.
  - The site's connections to Conroy Road are about 105m and 200m from the signalized intersection at St. Laurent Boulevard, meeting the requirement.
- The south driveway to Conroy Road is about 8.3m wide, measured at the right-of-way line, meeting the width requirements under the City's Private Approach by-law.
- The north driveway to Conroy Road is 9.4m wide measured at the right-of-way line, but the width is required to accommodate the heavy trucks (See **Appendix A**).
- The driveway to Walkley Road is 11.5m wide measured at the right-of-way line, but the width is required to accommodate the heavy trucks (See **Appendix A**).
- The driveway to St. Laurent Boulevard is 11.8m wide measured at the right-of-way line, but the width is required to accommodate the heavy trucks (See **Appendix A**).
- The Transportation Association of Canada (TAC) outlines minimum clear throat lengths for driveways based on the land use, development size, and type of roadway. For a light industrial site, the clear throat requirement for a two-way driveway to an arterial is 30m, while the requirement to a collector is 15m. Approximately 15m of clear throat is provided at the St. Laurent Boulevard driveway and about 30m is provided at the Conroy Road driveways.
- The clear throat length at the Walkley driveway is about 20m, sufficient to accommodate an accessory office use of <5,000m$^2$ for the site. Accessory office uses will be less than 5,000m$^2$. Since the Walkley driveway will be right-in, right-out only, heavy vehicles coming from the highway will not be able to use this entrance to the site. Queuing of entering and exiting traffic at this driveway is expected to be accommodated within the 20m storage.
- The Stopping Sight Distance (SSD) along roadways with design speeds of 60km/h and 70km/h respectively, are 85m and 105m, respectively. Available SSD at each access is greater than 105m.

Traffic analysis of the driveway intersections is included in **Section 6.7**.

## 6.5 Transportation Demand Management

The buildings are expected to be multi-tenant with separate entrances for each tenant. There will be no central entrances for posting maps of active routes and transit schedules, etc and it will be difficult to implement TDM Measures.

## 6.6 Transit

Based on the modal share presented in **Table 4**, the new development is anticipated to generate 13 transit trips (10 in and 3 out) during the weekday AM peak hour and 13 transit trips (4 in and 9 out) during the weekday PM peak hour. These transit trips are fewer than the transit trips generated by the existing site (See **Table 7**), estimated to be 33 transit trips (28 in and 5 out) during the weekday AM peak hour and 34 transit trips (9 in and 25 out) during the weekday PM peak hour.

## 6.7 Intersection Analysis

### 6.7.1 Existing Intersection MMLOS

Identified and target PLOS, BLOS, TLOS, TkLOS and Auto LOS for the study area signalized intersections are summarized in **Table 19**. Existing traffic signal timings are included in **Appendix G** and detailed MMLOS calculations are included in **Appendix H**.

**Table 19: Intersection MMLOS Summary**

| Intersection | PLOS | BLOS | TLOS | TkLOS | Auto LOS |
|---|---|---|---|---|---|
| Walkley at Conroy | F | F | F | A | E |
| **Target** | **C** | **B** | **B** | **B** | **D** |
| Conroy at St. Laurent | F | F | E | E | C |
| **Target** | **A** | **A** | **D** | **D** | **E** |
| Walkley at Harding | F | F | D | E | D |
| **Target** | **C** | **C** | **B** | **B** | **D** |

*6.7.1.1 Walkley Road / Conroy Road*

Walkley Road/Conroy Road does not meet the target PLOS C, BLOS B, TLOS B, or Auto LOS D.

All approaches have a divided cross-section with a width equivalent to ten lanes crossed or more. There is limited opportunity in improving the PLOS at each approach without reducing the number of travel lanes or restricting turning movements. The level of comfort for pedestrians can be increased by implementing zebra-striped crosswalks. The east and south approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). There is also limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

None of the approaches meet the target BLOS B based on left and right turn characteristics. Given the high traffic volumes on both roadways, the existing right turn lanes and dual left turn

lanes are required. Cyclists would be better served to perform turns at a different intersection. Therefore, no recommendations have been made in improving the BLOS at this intersection.

None of the transit movements (EBT and WBT) meet the target TLOS B. The City's RTTP Network concept designates Walkley Road in this area as a BRT corridor with transit only lanes. This planned modification will improve the TLOS.

By increasing the cycle length at the Walkley at Conroy intersection to 120 seconds (from 110 seconds) during the PM peak, the AutoLOS at the intersection can be improved to D.

*6.7.1.2 Conroy Road / St. Laurent Boulevard*

Conroy Road / St. Laurent Boulevard does not meet the target PLOS A, BLOS A, TLOS D, or TkLOS D.

The north and south approaches both have a divided cross-section with widths equivalent to ten lanes crossed or more. The east and west approaches have auxiliary turn lanes with widths equivalent to 6 lanes crossed or more. The level of comfort for pedestrians can be increased by implementing zebra-striped crosswalks. The north and south approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). There is limited opportunity in improving the PLOS at each approach without reducing the number of lanes. Improving the delay scores for pedestrians crossing the north and south approaches would require reducing green time for the heavy northbound and southbound movements and is not desirable.

All approaches do not meet the target BLOS A based on left turn or both left and right turn characteristics. Given the travel speeds and traffic volumes along Conroy Road, there is limited opportunity for improving the BLOS along the north and south approaches.

During the AM peak hour, the WBL transit movement misses the target TLOS D achieving E. This transit movement is from St. Laurent Boulevard, which is not a transit priority corridor, and no modifications are required.

The north approach misses the target TkLOS D, achieving E. To achieve TkLOS D, a radius of more than 15m is required on St. Laurent Boulevard. This is identified for the City's consideration.

*6.7.1.3 Walkley Road / Harding Road*

Walkley Road / Harding Road does not meet the target PLOS C, BLOS C, TLOS B, or TkLOS B.

The east and west approaches both have a divided cross-section with widths equivalent to 6 or 7 lanes crossed. The level of comfort for pedestrians can be increased by implementing zebra-striped crosswalks. The east and west approaches meet the City's vehicle/pedestrian conflict threshold for zebra-striped crosswalks (greater than 400,000 vehicle/pedestrian conflicts over an eight-hour period). There is limited opportunity in improving the PLOS at each approach without reducing the number of lanes. Improving the delay scores for pedestrians crossing the east and west approaches would require reducing green time for the heavy eastbound and westbound movements and is not recommended.

The north and west approaches do not meet the target BLOS C based on left turn characteristics. Given the high traffic volumes along the east and west approaches, there is limited opportunity for improving the BLOS along the west approach. The two-lane approach (left and right turn lanes) on the north approach lead to BLOS D for both bicycle turning movements.

The WBT transit movement during the PM peak hour misses the target TLOS B, achieving D. The City's RTTP Network concept designates Walkley Road in this area as a BRT corridor with transit only lanes. This planned modification will improve the TLOS.

The east approach misses the target TkLOS B, achieving E. To achieve TkLOS B, a second receiving lane is required on Harding Road, this is not recommended.

### 6.7.2 2023 Total Traffic – Intersection Operations

Intersection capacity analysis has been completed for the projected 2023 AM and PM peak hours with the addition of site generated trips (See **Figure 11**). The results of the analysis are summarized in **Table 20** for the weekday AM and PM peak hours. Approaches where long queuing is expected are shown with the associated 50$^{th}$ and 95$^{th}$ percentile queue lengths in **Table 21**. Detailed *Synchro 10* reports are included in **Appendix L**.

**Table 20: 2023 Total Traffic – Intersection Operations**

| Intersection | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|
| | Max V/C or Delay (sec) | LOS | Mvmt | Max V/C or Delay (sec) | LOS | Mvmt |
| Walkley at Conroy | 0.85 | D | NBL | 0.85 | D | WBL |
| Conroy at St. Laurent | 0.50 | A | WBL | 0.82 | D | EBR |
| Walkley at Harding | 0.72 | C | SB | 0.81 | D | SB |
| Walkley at Site Driveway[1] | 10 | A | NB | 10 | A | NB |
| Conroy at North Site Driveway[1] | 12 | B | WB | 11 | B | WB |
| Conroy at South Site Driveway[1] | 0 | A | WB | 9 | A | WB |
| St. Laurent at Site Driveway[1] | 11 | B | SB | 11 | B | SB |

1. Unsignalized intersection

**Table 21: 2023 Total Traffic – Queuing**

| Intersection | Mvmt | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| | | v/c or Delay (sec) | 50th % Queue (m) | 95th % Queue (m) | v/c or Delay (sec) | 50th % Queue (m) | 95th % Queue (m) |
| Walkley at Conroy | EBT | 0.57 | 71 | 96 | 0.82 | 109 | #141 |
| | WBL | 0.67 | 29 | 44 | 0.85 | 55 | #77 |
| | WBT | 0.53 | 43 | 52 | 0.46 | 82 | 120 |
| | NBL | 0.85 | 74 | 93 | 0.77 | 47 | 62 |
| | NBR | 0.76 | 24 | 62 | 0.60 | 0 | 22 |
| Conroy at St. Laurent | EBL | 0.04 | 1 | 4 | 0.15 | 6 | 12 |
| | EBT | 0.32 | 12 | 22 | 0.21 | 11 | 19 |
| | EBR | 0.34 | 0 | 12 | 0.82 | 36 | 56 |
| | WBL | 0.50 | 11 | 22 | 0.55 | 29 | 37 |
| | WBT | 0.23 | 7 | 16 | 0.06 | 4 | 8 |
| | NBL | 0.31 | 10 | 24 | 0.31 | 4 | 16 |
| | NBTR | 0.40 | 27 | 44 | 0.31 | 24 | 39 |
| | SBL | 0.40 | 5 | 20 | 0.14 | 4 | 12 |
| | SBTR | 0.18 | 10 | 18 | 0.69 | 23 | #128 |
| Walkley at Harding | EBL | 0.12 | 1 | m2 | 0.65 | 22 | m35 |
| | EBTR | 0.49 | 27 | 40 | 0.54 | 7 | 16 |
| | WB | 0.51 | 35 | 67 | 0.78 | 112 | #174 |
| | SB | 0.72 | 14 | 35 | 0.81 | 19 | 45 |

#: volume for the 95th percentile cycle exceeds capacity
m: Volume for 95th percentile queue is metered by upstream signal

Left turn lane warrants have been prepared for the site accesses and indicate a southbound left turn lane is warranted (See **Appendix J**) on Conroy Road at the north site access with projected site traffic. The functional design is included in **Appendix K**. Due to the low turning volumes (about 1.0% which is less than the 5% for the lowest nomograph), a left turn lane is not warranted on St. Laurent Boulevard at the site access.

With construction of a left turn lane on Conroy Road at the North Site Driveway and conversion of the Walkley driveway to right-in, right-out (See **Appendix K**), all study intersections and site accesses are expected to operate with LOS D or better with the addition of site generated trips.

The NB queue on Conroy at Walkley is not expected to impact the northerly Conroy access, and the SB left queue at the northerly Conroy access will be accommodated by the proposed turn lane and will not impact Walkley/Conroy.

The WB queue at Conroy / St. Laurent is not expected to impact the St. Laurent access and the EB queue at Walkley / Harding is not expected to impact the Walkley access.

***Phase 2 Analysis***

Additional analysis of the Conroy Road north driveway has been completed based on the closure of the WBL movement on Walkley Road at the site driveway and Phase 2 site development. Analysis considers the impact of additional traffic on the southbound left turn into the Conroy north driveway. Volume estimates include:

- 12 SBL vehicles on Conroy turning into the site (See **Figure 5**). This is an estimate of the trips for the full site redevelopment and includes trips for the Phase 3 Warehouse, a conservative estimate.
- 25 SBL vehicles on Conroy turning into the site, diverted from the WBL on Walkley at the site driveway (See **Figure 6**). This is an estimate of the full existing development and includes trips for the portions of the site that are demolished to accommodate Phases 1 and 2, a conservative estimate.

The Transportation Association of Canada (TAC, Chapter 9, page 102) suggests that the storage lane be sufficient to accommodate the vehicles that are likely to accumulate in two minutes. With a total volume of 37 SBL vehicles during the AM peak hour, a minimum storage lane of 9m is recommended. A storage length of 15m for the SB left turn lane on Conroy at the north site driveway is proposed (See **Appendix K**). No major changes in operations at the remaining intersections are expected with the Phase 2 development scenario.

### 6.7.3 2028 Total Traffic – Intersection Operations

Intersection capacity analysis has been completed for the 2028 AM and PM peak hours with the addition of site generated trips (See **Figure 12**). The results of the analysis are summarized in **Table 22** for the weekday AM and PM peak hours. Approaches where long queuing is expected are shown with the associated 50$^{th}$ and 95$^{th}$ percentile queue lengths in **Table 23**. Detailed *Synchro 10* reports are included in **Appendix L**.

**Table 22: 2028 Total Traffic - Intersection Operations**

| Intersection | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|
| | Max V/C or Delay (sec) | LOS | Mvmt | Max V/C or Delay (sec) | LOS | Mvmt |
| Walkley at Conroy | 0.87 | D | NBL | 0.88 | D | WBL |
| Conroy at St. Laurent | 0.51 | A | WBL | 0.83 | D | EBR |
| Walkley at Harding | 0.75 | C | SB | 0.83 | D | SB |
| Walkley at Site Driveway[1] | 10 | A | NB | 10 | B | NB |
| Conroy at North Site Driveway[1] | 12 | B | WB | 11 | B | WB |
| Conroy at South Site Driveway[1] | 0 | A | WB | 9 | A | WB |
| St. Laurent at Site Driveway[1] | 11 | B | SB | 12 | B | SB |

1. Unsignalized intersection

**Table 23: 2028 Total Traffic – Queuing**

| Intersection | Mvmt | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|
| | | v/c or Delay (sec) | 50th % Queue (m) | 95th % Queue (m) | v/c or Delay (sec) | 50th % Queue (m) | 95th % Queue (m) |
| Walkley at Conroy | EBT | 0.61 | 78 | 102 | 0.87 | 119 | #160 |
| | WBL | 0.69 | 31 | 45 | 0.88 | 58 | m#77 |
| | WBT | 0.54 | 47 | 53 | 0.48 | 93 | 125 |
| | NBL | 0.87 | 77 | 99 | 0.79 | 49 | 65 |
| | NBR | 0.79 | 31 | 73 | 0.61 | 0 | 22 |
| Conroy at St. Laurent | EBL | 0.04 | 1 | 4 | 0.14 | 6 | 12 |
| | EBT | 0.32 | 12 | 22 | 0.20 | 12 | 19 |
| | EBR | 0.34 | 0 | 12 | 0.83 | 39 | 59 |
| | WBL | 0.51 | 12 | 23 | 0.56 | 30 | 37 |
| | WBT | 0.23 | 8 | 16 | 0.06 | 4 | 8 |
| | NBL | 0.33 | 11 | 26 | 0.40 | 5 | #21 |
| | NBTR | 0.42 | 30 | 48 | 0.33 | 26 | 42 |
| | SBL | 0.46 | 6 | 25 | 0.16 | 4 | 12 |
| | SBTR | 0.19 | 10 | 19 | 0.75 | 81 | #144 |
| Walkley at Harding | EBL | 0.14 | 1 | m2 | 0.72 | 26 | m#43 |
| | EBTR | 0.52 | 31 | 44 | 0.58 | 8 | 18 |
| | WB | 0.54 | 42 | 78 | 0.83 | 131 | #200 |
| | SB | 0.75 | 18 | 40 | 0.83 | 23 | 49 |

#: volume for the 95th percentile cycle exceeds capacity
m: Volume for 95th percentile queue is metered by upstream signal

With construction of a left turn lane on Conroy Road at the North Site Driveway and conversion of the Walkley driveway to right-in, right-out (See **Appendix K**), all study intersections and site accesses are expected to operate with LOS D or better with site redevelopment.

The NB queue on Conroy at Walkley is not expected to impact the northerly Conroy access, and the SB left queue at the northerly Conroy access will be accommodated by the proposed turn lane and will not impact Walkley/Conroy.

The WB queue at Conroy / St. Laurent is not expected to impact the St. Laurent access and the EB queue at Walkley / Harding is not expected to impact the Walkley access.

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

*Development Design and Parking*

- Pedestrian facilities will be provided between the main buildings and the parking lots. New pedestrian walkways will be constructed to connect to all three frontages.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- The proposed vehicular parking spaces at each phase meet the requirements of the ZBL.
- The proposed bicycle parking spaces meet the minimum requirements of the ZBL.
- The number of barrier-free spaces meet the AODA requirements.
- A minimum of one loading space is required for each proposed warehouse, each will have 20 or 22 loading bays.

- Each of the three buildings have exterior access doors within a 240m walking distance from an OC Transpo stop.

*Boundary Street Multi-Modal Level of Service (MMLOS)*

The results of the segment MMLOS analysis for Walkley Road, Conroy Road, and St. Laurent Boulevard can be summarized as follows:

- The PLOS along Walkley Road, Conroy Road, and St. Laurent Boulevard is currently failing. A 2m sidewalk and 2m boulevard are both required to achieve the target C on Walkley Road. Given the speed and traffic volume along St. Laurent Boulevard and Conroy Road, respectively, the target PLOS A is not achievable due to the speed and volume. PLOS D and PLOS C are achievable on Conroy Road and St. Laurent Boulevard, respectively, with a 2m sidewalk and a 2m boulevard;
- The Walkley and St. Laurent corridors miss the BLOS target C, achieving E and D, respectively. The target BLOS can be achieved on both Walkley and St. Laurent with 1.5m onstreet bike lanes;
- Walkley Road misses the TLOS target B, achieving a D. A bus lane is required to achieve LOS B; and,
- Each study road achieves TkLOS A or B, surpassing the targets, where applicable.

*Transit*

- The new development is anticipated to generate 13 transit trips (10 in and 3 out) during the weekday AM peak hour and 13 transit trips (4 in and 9 out) during the weekday PM peak hour. These transit trips are fewer than the transit trips generated by the existing site, estimated to be 33 transit trips (28 in and 5 out) during the weekday AM peak hour and 34 transit trips (9 in and 25 out) during the weekday PM peak hour.

*Access Design*

- Sufficient corner clearance, as applicable is provided at each driveway.
- The south driveway to Conroy Road is about 8.3m wide, measured at the property line, meeting the width requirements under the City's Private Approach by-law.
- The driveways to Conroy Road (north), Walkley Road, and St. Laurent Boulevard are 9.4m wide, 11.5m wide and 11.8m wide (measured at the right-of-way line), respectively, but the width is required to accommodate the heavy trucks.
- Adequate stopping sight distance for heavy vehicles is available at each driveway.
- A southbound left turn lane is warranted along Conroy Road at the north site driveway.
- The available clear throat at the St. Laurent Boulevard (15m) and Conroy Road (30m) are sufficient for the industrial development.
- The available clear throat at the Walkley Road driveway (20m) is sufficient to accommodate an accessory office use of <5,000m$^2$ for the site. Accessory office uses will be less than 5,000m$^2$. Since the Walkley driveway will be right-in, right-out only, heavy vehicles coming from the highway will not be able to use this entrance to the site. Queuing of entering and exiting traffic at this driveway is expected to be accommodated within the 20m storage.

*Intersection MMLOS Analysis*

- The Walkley at Conroy intersection does not meet the target Auto LOS.
    - The eastbound, approach at the **Walkley Road / Conroy Road** intersection does not meet the target Auto LOS D in the PM peak hour. By increasing the cycle length

at the Walkley at Conroy intersection to 120 seconds (from 110 seconds) during the PM peak, the AutoLOS at the intersection can be improved to D.

Background Traffic:

- During the 2028 AM and PM peak hours without site development, all movements at the signalized study intersections are expected to operate with LOS D or better. The site driveway at Walkley Road will operate with LOS F with delays and queuing of about 2-3 vehicles.
- The delay at the Walkley site driveway is due to left turning traffic exiting the site. Converting this driveway to right-in, right-out only will improve the operations.

Total Traffic with Site Redevelopment:

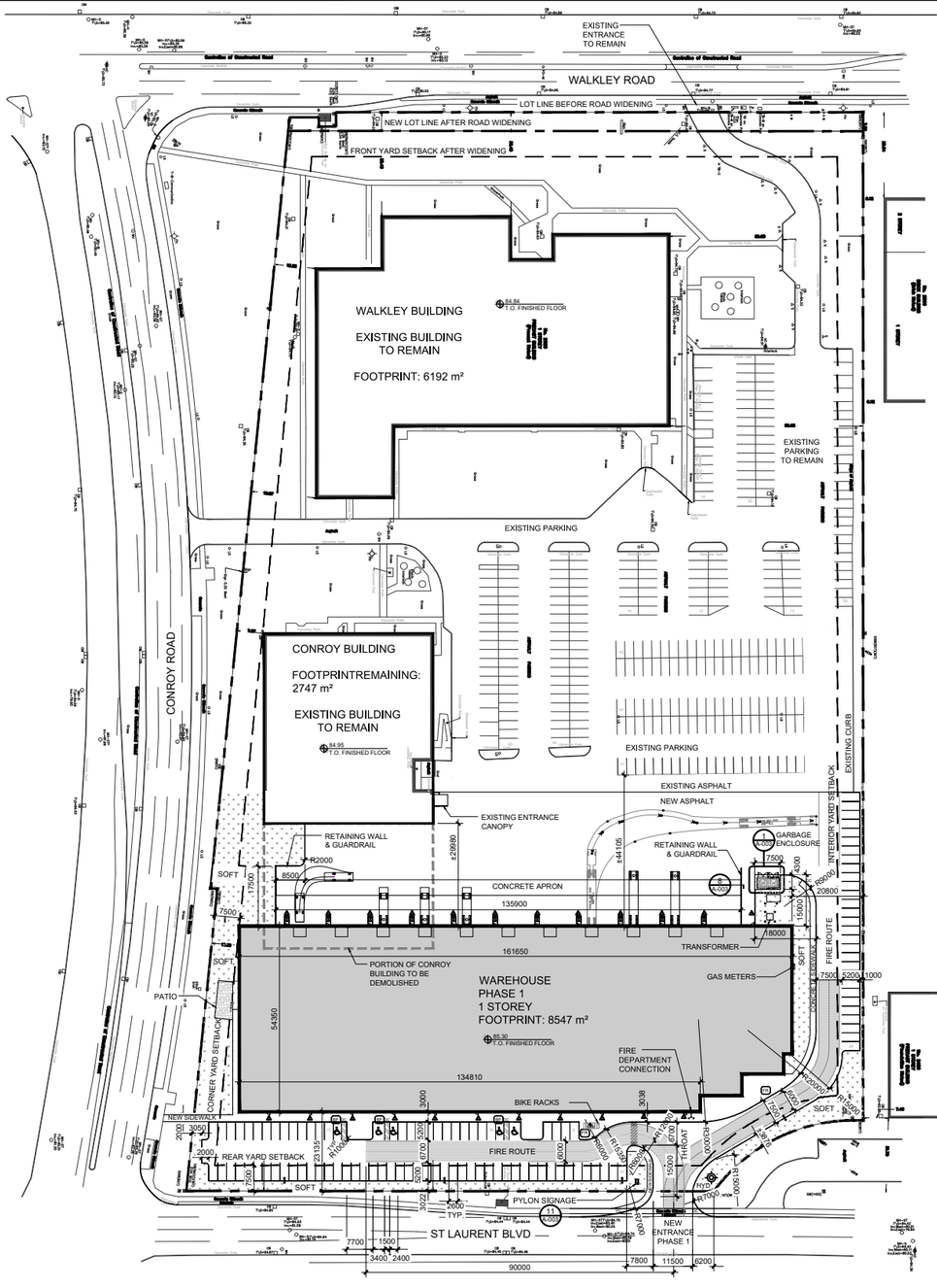
- With construction of a southbound left turn lane on Conroy Road at the North Site Driveway, all study intersections and site accesses are expected to operate with LOS D or better with site redevelopment.

**NOVATECH**
Prepared by:


Patrick Hatton, P.Eng.
Project Manager | Transportation/Traffic

# APPENDIX A

Preliminary Site Plan




1 / A001 SITE PLAN - PHASE 1 SCALE 1:700


2 / A001 KEY PLAN SCALE N/A

*TOPOGRAPHICAL PLAN OF SURVEY OF*

*PART OF LOTS A & 1*
*CONCESSION 5 (RIDEAU FRONT)*
*Geographic Township of Gloucester*
*CITY OF OTTAWA*
*Surveyed by Annis, O'Sullivan, Vollebekk Ltd.*

Surveyor's Certificate
I CERTIFY THAT :
1. This survey and plan comprising of sheets 1 and 2 are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 11th day of November, 2020.

**PROJECT INFORMATION:**

**BUILDING CLASSIFICATION:**
THE BUILDING IS CLASIFIED AND DESIGN TO CONFORM TO THE ONTARIO BUILDING CODE 2012 (CURRENT EDITION) PART 3

**OCCUPANCY:**
GROUP F, DIVISION 2, SPRINKLERED, ONE STOREY (3.2.2.67)

**PHASE 1 BUILDING STATISTICS:**

| | |
|---|---|
| BUILDING AREA (FOOTPRINT): | 8551 m² |
| GROSS FLOOR AREA: | ±8460 m² |
| NUMBER OF STOREYS ABOVE GRADE: | 1 |
| NUMBER OF STOREYS BELOW GRADE: | 0 |
| BUILDING SPRINKLERED: | YES |
| # OF STREET ACCESS ROUTES: | 1 |
| CONSTRUCTION TYPE: | NON-COMB. |
| FLOOR ASSEMBLY & F.R.R.: | 2 HOUR |
| MEZZANINE: | 1 HOUR |

## ZONING INFORMATION - PHASE 1

| ZONING MECHANISM | REQUIRED (OTTAWA ZONING BY-LAW, 2008-250) | PROVIDED |
|---|---|---|
| ZONING CODE | IL [1477 ] S117-h2 | WAREHOUSE |
| MINIMUM LOT AREA | 2,000 m² / 0,494 acre | 57,104,1 m² / 14,11 acre |
| MINIMUM FRONT YARD | 7,5 m | EXISTING |
| MINIMUM CORNER SIDE YARD | 7,5 m | 7,5 m |
| MINIMUM INTERIOR SIDE YARD | 7,5 m | 20,8 m |
| MINIMUM REAR YARD | 7,5 m | 23,03 m |
| MAXIMUM BUILDING HEIGHT | 12 m - 24 m - 36 m ( SCHEDULE 117 ) | 11,1 m 1 STOREY |
| MAXIMUM LOT COVERAGE | 65 % | 30 % |
| MINIMUM WIDTH OF LANDSCAPING | 3 m | 3 m |
| STANDARD PARKING SPACE | 2,6 m x 5,2 m | 2,6 m x 5,2 m |
| ACCESSIBLE PARKING SPACE | 3,4 m x 5,2 m TYPE 'A' 2,4 m x 5,2 m TYPE 'B' | |
| BICYCLE PARKING | 7 ( WAREHOUSE 1 / 2000 m² of G.F.A.) (OFFICE 1 / 250 m² of G.F.A.) | 7 |
| BUILDING FOOTPRINT — EXISTING | | 8483,2 m² |
| BUILDING FOOTPRINT — PROPOSED WAREHOUSE PHASE 1 | | 85471 m² |
| BUILDING FOOTPRINT — TOTAL | PERMITTED MAX. 83610 m² | 17030,2 m² |

## PARKING SPACE SCHEDULE
( AREA C, SCHEDULE 1 )

| | | BY-LAW REQUIRED | | PROVIDED |
|---|---|---|---|---|
| PROPOSED WAREHOUSE PHASE 1 | OFFICE | ( 2,4 / 100 m², 10%) | ±72 | 110 |
| | WAREHOUSE | ( 0,8 / 100 m², FIRST 5000 m² ) ( 0,4 / 100 m², ABOVE 5000 m² ) | | |
| EXISTING | OFFICE ( CITY OF OTTAWA) | ±68 G.F.A: ±2850 m² ( 2,4 / 100 m² ) | ±160 | 304 |
| | PERSONAL SERVICE ( GOODLIFE FITNESS) | ±52 G.F.A: ±1520 m² ( 3,4 / 100 m² ) | | |
| | OFFICE / WAREHOUSE | G.F.A: OFFICE ±1070 m² WAREHOUSE : ±1760 m² ±40 ( 2,4 / 100 m², 50% ) ( 0,8 / 100 m², 50% ) | | |
| TOTAL | | ±232 | | 414 |

LEGEND

- PROPERTY LINE
- YARD SETBACK
- EXISTING BUILDING TO REMAIN
- EXISTING BUILDING TO BE DEMOLISHED
- PROPOSED WAREHOUSE
- LANDSCAPED AREA REFER TO LANDSCAPE PLAN
- CONCRETE PAD & SIDEWALK
- 6m WIDE FIRE ROUTE, REFER TO CIVIL
- PAVER PATIO REFER TO LANDSCAPE PLAN
- GARBAGE ENCLOSURE
- BUILDING ENTRANCE
- NEW DEPRESSED CURB - SEE LANDSCAPE
- NEW CURB
- T.W.S.I.
- FIRE HYDRANT
- EXISTING PARKING TO REMAIN
- PROPOSED PARKING
- LIGHT POST
- FIRE DEPARTMENT CONNECTION

SIGNAGE LEGEND:

- FR FIRE ROUTE
- HP HANDICAP PARKING

NOTE
ALL SIDEWALKS TO BE MIN. 1800 PER CITY REQUIREMENTS

Canderel

| no. | revision | date |
|---|---|---|
| 1. | SITE PLAN APPLICATION | 05 MAR 2021 |


N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario, K1P 5N2
tel. 613.224.0095 fax 613.224.9811


project
**WALKLEY CONROY WAREHOUSES**

**MANULIFE**

construction north — true north

seal: ONTARIO ASSOCIATION OF ARCHITECTS — VINCENT G. MATTHEWS — LICENCE 2008

drawing title
SITE PLAN - PHASE 1

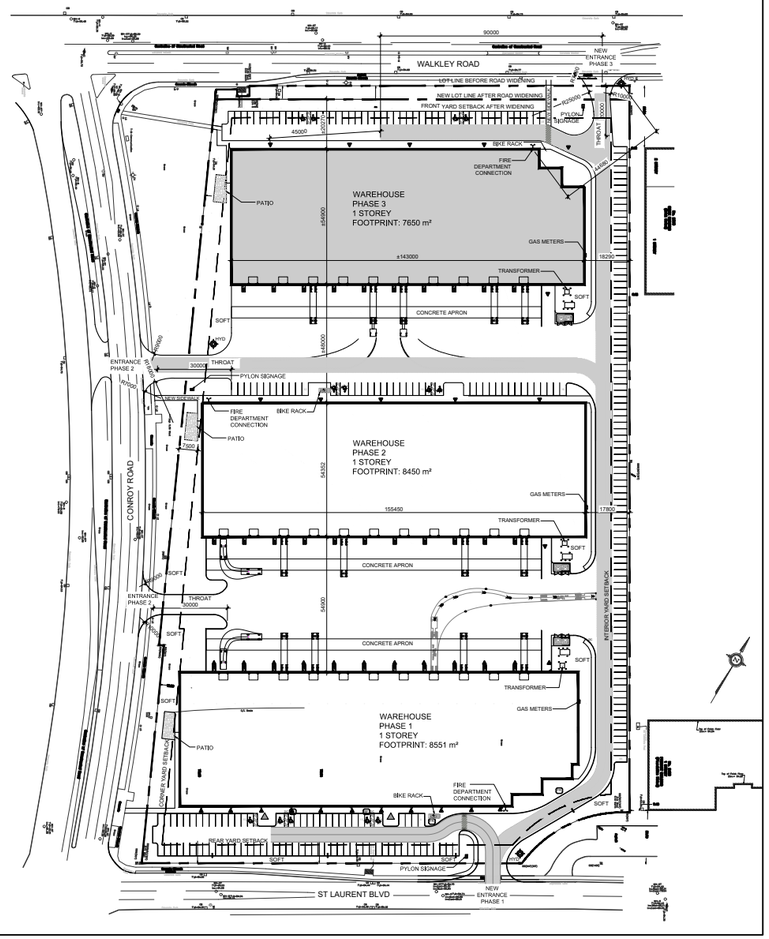
| | |
|---|---|
| scale: AS SHOWN | drawn by: J.J |
| date: Jan. 2021 | checked by: R.M |
| project number | drawing number: A001 |

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES.
DO NOT SCALE DRAWINGS.

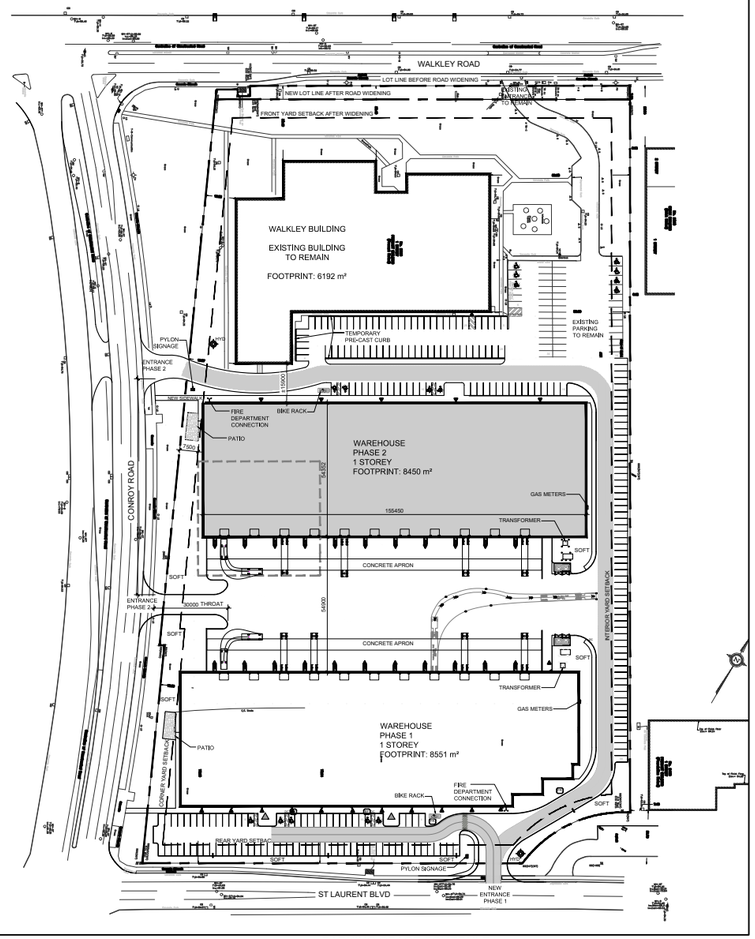
revision

CITY'S FILE NO.: xxxx

PLAN NO.: #XXXXX




2 A002 SITE PLAN - PHASE 3
SCALE 1:1000




1 A002 SITE PLAN - PHASE 2
SCALE 1:1000

## ZONING INFORMATION - PHASE 3

| | | REQUIRED | PROVIDED |
|---|---|---|---|
| ZONING MECHANISM | | OTTAWA ZONING BY-LAW, 2008-250 | |
| ZONING CODE | | IL [1477 ] S117-h2 | WAREHOUSE |
| MINIMUM LOT AREA | | 2,000 m² 0,494 acre | 57,104,1 m² 14,11 acre |
| MINIMUM FRONT YARD | | **7.5 m** | 30,48 m EXISTING |
| MINIMUM CORNER SIDE YARD | | 7.5 m | 7.5 m |
| MINIMUM INTERIOR SIDE YARD | | 7.5 m | 18.3 m |
| MINIMUM REAR YARD | | 7.5 m | 23,03 m |
| MAXIMUM BUILDING HEIGHT | | 12 m - 24 m - 36 m ( SCHEDULE 117 ) | ±11,5 m 1 STOREY |
| MAXIMUM LOT COVERAGE | | 65 % | 43,2 % |
| MINIMUM WIDTH OF LANDSCAPING | | 3 m | 3 m |
| STANDARD PARKING SPACE | | 2,6 m x 5,2 m | 2,6 m x 5,2 m |
| ACCESSIBLE PARKING SPACE | | 3,4 m x 5,2 m TYPE 'A' 2,4 m x 5,2 m TYPE 'B' | |
| BICYCLE PARKING | | 6 ( WAREHOUSE 1 / 2000 m² of G.F.A.) (OFFICE 1 / 250 m² of G.F.A.) | 6 |
| BUILDING FOOTPRINT | WAREHOUSE PHASE 1 | | 8547 m² |
| | WAREHOUSE PHASE 2 | | 8450 m² |
| | WAREHOUSE PHASE 3 | | 7650 m² |
| | TOTAL | PERMITTED MAX. 83610 m² | 24647 m² |

## PARKING SPACE SCHEDULE
( AREA C, SCHEDULE 1 )

| | | BY-LAW REQUIRED | | PROVIDED |
|---|---|---|---|---|
| WAREHOUSE PHASE 1 | OFFICE | ( 2,4 / 100 m², 10% ) | ±72 | |
| | WAREHOUSE | (0,8 / 100 m², FIRST 5000 m²) (0,4 / 100 m², ABOVE 5000 m²) | | |
| WAREHOUSE PHASE 2 | OFFICE | ( 2,4 / 100 m², 10% ) | ±71 | |
| | WAREHOUSE | (0,8 / 100 m², FIRST 5000 m²) (0,4 / 100 m², ABOVE 5000 m²) | | |
| WAREHOUSE PHASE 2 | OFFICE | ( 2,4 / 100 m², 10% ) | ±66 | |
| | WAREHOUSE | (0,8 / 100 m², FIRST 5000 m²) (0,4 / 100 m², ABOVE 5000 m²) | | |
| TOTAL | | ±209 | | 291 |

LEGEND

- PROPERTY LINE
- YARD SETBACK
- EXISTING BUILDING TO REMAIN
- EXISTING BUILDING TO BE DEMOLISHED
- PROPOSED WAREHOUSE
- LANDSCAPED AREA REFER TO LANDSCAPE PLAN
- CONCRETE PAD & SIDEWALK
- 6m WIDE FIRE ROUTE, REFER TO CIVIL
- PAVER PATIO REFER TO LANDSCAPE PLAN
- GARBAGE ENCLOSURE
- BUILDING ENTRANCE
- NEW DEPRESSED CURB - SEE LANDSCAPE
- NEW CURB
- T.W.S.I.
- FIRE HYDRANT
- EXISTING PARKING TO REMAIN
- PROPOSED PARKING
- LIGHT POST
- FIRE DEPARTMENT CONNECTION

SIGNAGE LEGEND:

- FR FIRE ROUTE
- HP HANDICAP PARKING

## ZONING INFORMATION - PHASE 2

| | | REQUIRED | PROVIDED |
|---|---|---|---|
| ZONING MECHANISM | | OTTAWA ZONING BY-LAW, 2008-250 | |
| ZONING CODE | | IL [1477 ] S117-h2 | WAREHOUSE |
| MINIMUM LOT AREA | | 2,000 m² 0,494 acre | 57,104,1 m² 14,11 acre |
| MINIMUM FRONT YARD | | **7.5 m** | 30,48 m EXISTING |
| MINIMUM CORNER SIDE YARD | | 7,5 m | 7.5 m |
| MINIMUM INTERIOR SIDE YARD | | 7,5 m | 17.8 m |
| MINIMUM REAR YARD | | 7,5 m | 23,03 m |
| MAXIMUM BUILDING HEIGHT | | 12 m - 24 m - 36 m ( SCHEDULE 117 ) | ±11,5 m 1 STOREY |
| MAXIMUM LOT COVERAGE | | 65 % | 40,7 % |
| MINIMUM WIDTH OF LANDSCAPING | | 3 m | 3 m |
| STANDARD PARKING SPACE | | 2.6 m x 5,2 m | 2.6 m x 5,2 m |
| ACCESSIBLE PARKING SPACE | | 3,4 m x 5,2 m TYPE 'A' 2,4 m x 5,2 m TYPE 'B' | |
| BICYCLE PARKING | | 7 ( WAREHOUSE 1 / 2000 m² of G.F.A.) (OFFICE 1 / 250 m² of G.F.A.) | 7 |
| BUILDING FOOTPRINT | EXISTING | | 6191,5 m² |
| | WAREHOUSE PHASE 1 | | 8547 m² |
| | WAREHOUSE PHASE 2 | | 8450 m² |
| | TOTAL | PERMITTED MAX. 83610 m² | 23188,5 m² |

## PARKING SPACE SCHEDULE
( AREA C, SCHEDULE 1 )

| | | BY-LAW REQUIRED | | | PROVIDED |
|---|---|---|---|---|---|
| WAREHOUSE PHASE 1 | OFFICE | ( 2,4 / 100 m², 10% ) | ±72 | | |
| | WAREHOUSE | (0,8 / 100 m², FIRST 5000 m²) (0,4 / 100 m², ABOVE 5000 m²) | | ±143 | 169 |
| WAREHOUSE PHASE 2 | OFFICE | ( 2,4 / 100 m², 10% ) | ±71 | | |
| | WAREHOUSE | (0,8 / 100 m², FIRST 5000 m²) (0,4 / 100 m², ABOVE 5000 m²) | | | |
| EXISTING | OFFICE ( CITY OF OTTAWA) | G.F.A. ±2850 m² ( 2,4 / 100 m² ) | ±68 | ±120 | 120 |
| | PERSONAL SERVICE ( GOODLIFE FITNESS) | G.F.A. ±1520 m² ( 3,4 / 100 m² ) | ±52 | | |
| TOTAL | | ±263 | | | 289 |

LEGEND

- PROPERTY LINE
- YARD SETBACK
- EXISTING BUILDING TO REMAIN
- EXISTING BUILDING TO BE DEMOLISHED
- PROPOSED WAREHOUSE
- LANDSCAPED AREA REFER TO LANDSCAPE PLAN
- CONCRETE PAD & SIDEWALK
- 6m WIDE FIRE ROUTE, REFER TO CIVIL
- PAVER PATIO REFER TO LANDSCAPE PLAN
- GARBAGE ENCLOSURE
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- NEW DEPRESSED CURB - SEE LANDSCAPE
- NEW CURB
- T.W.S.I.
- FIRE HYDRANT
- EXISTING PARKING TO REMAIN
- PROPOSED PARKING
- LIGHT POST
- FIRE DEPARTMENT CONNECTION

SIGNAGE LEGEND:

- FR FIRE ROUTE
- HP HANDICAP PARKING

Canderel

| no. | revision | date |
|---|---|---|
| 1 | SITE PLAN APPLICATION | 05 MAR 2021 |

N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario, K1P 5N2
tel. 613,224,0095 fax 613,224,9811

project

**WALKLEY CONROY WAREHOUSES**

**MANULIFE**

construction north

seal

ONTARIO ASSOCIATION OF ARCHITECTS — ROBERT G. MATTHEWS — LICENCE 2008

drawing title

SITE PLAN - PHASE 2 & 3

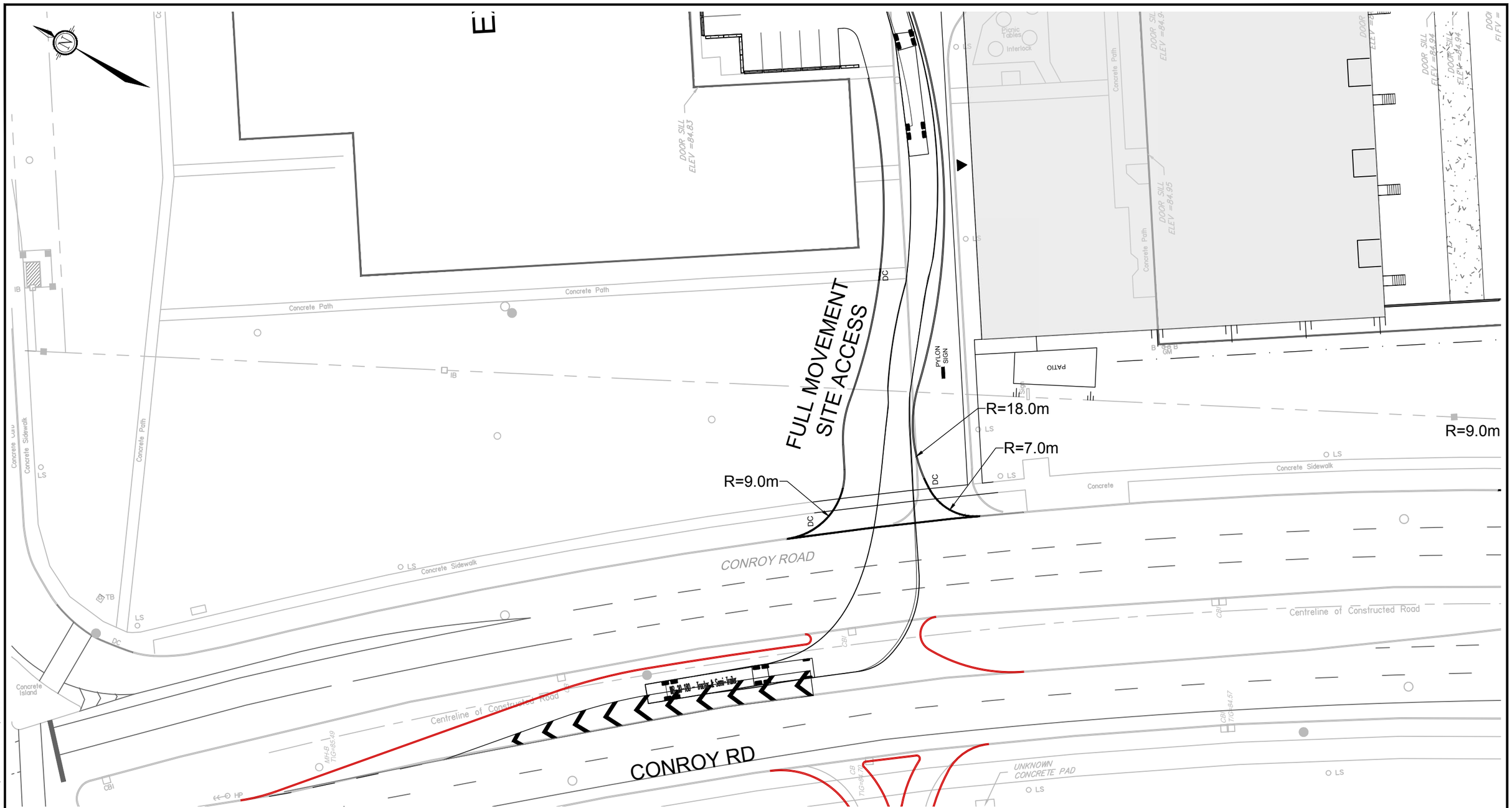
| | |
|---|---|
| scale AS SHOWN | drawn by J.J |
| date Jan. 2021 | checked by R.M |
| project number | drawing number A002 |

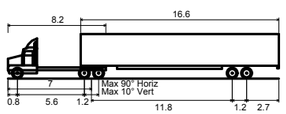
CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES.
DO NOT SCALE DRAWINGS.

revision

CITY'S FILE NO.: XXXX

PLAN NO.: #XXXXX




WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

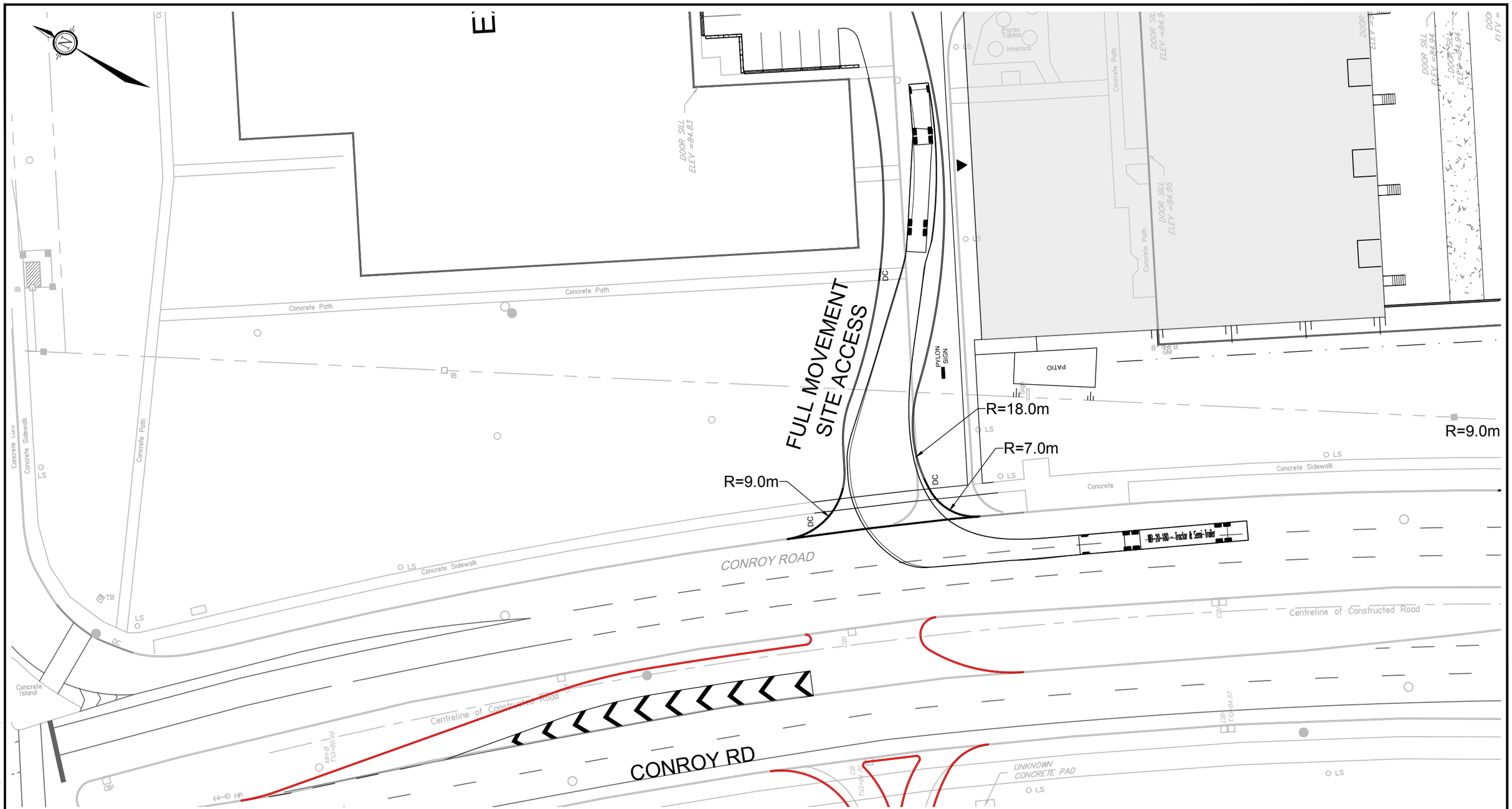
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

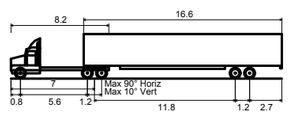
# 2020 WALKLEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-1




WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
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# 2020 WALKLEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-2

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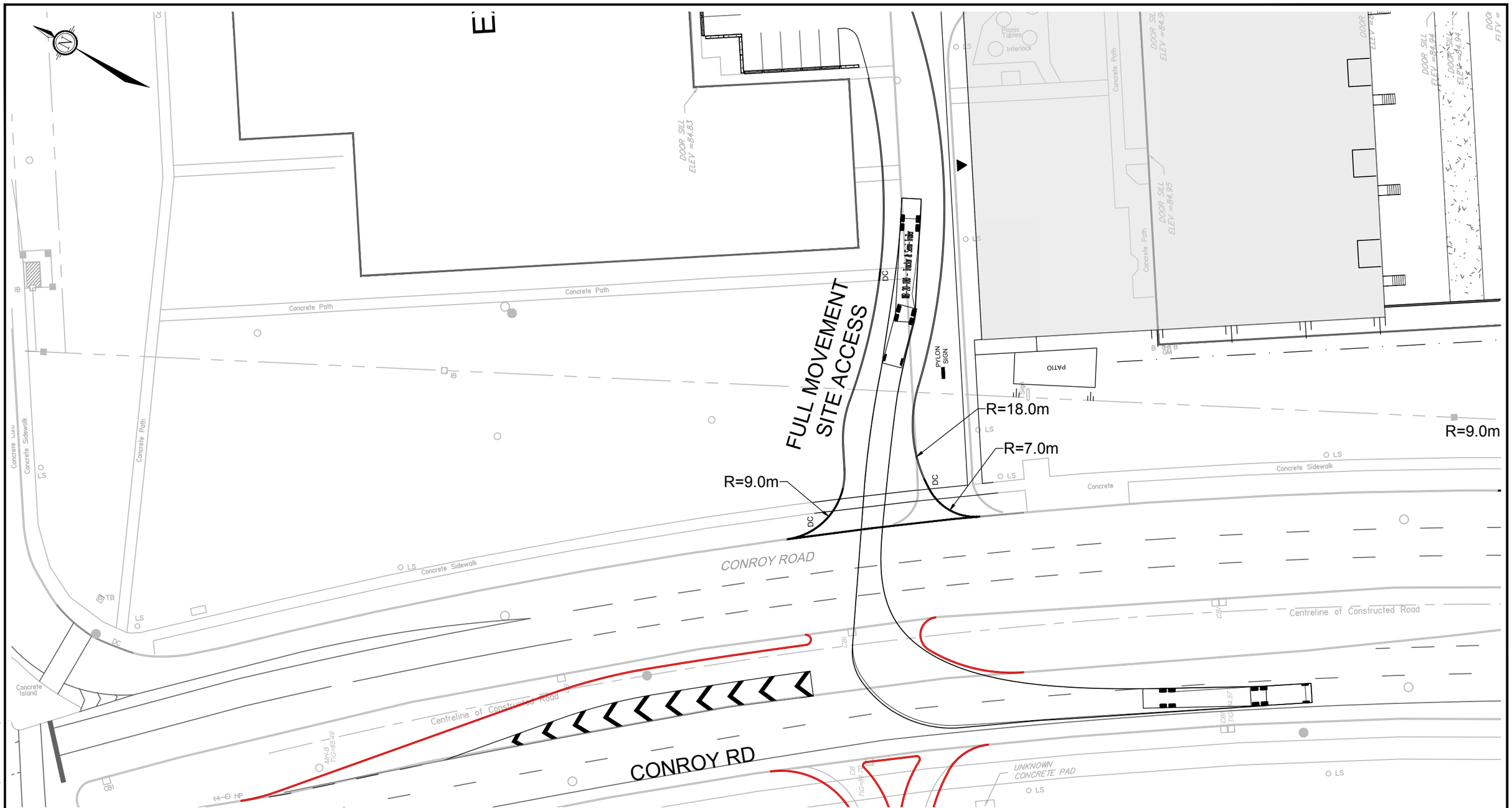


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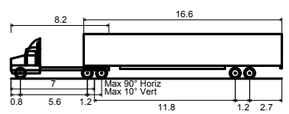


WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |

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Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
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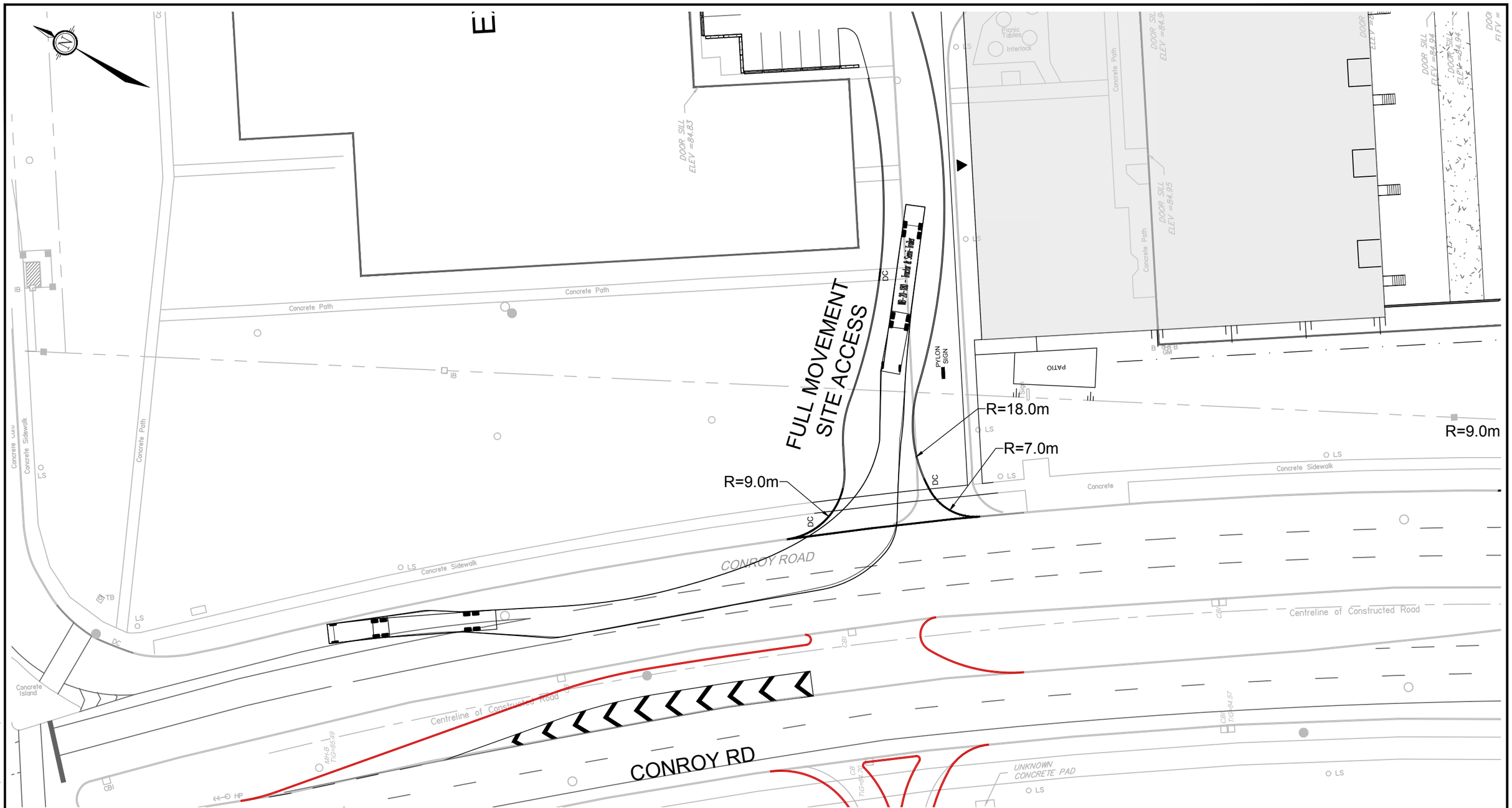
# 2020 WALKLEY ROAD & 2935 CONROY ROAD

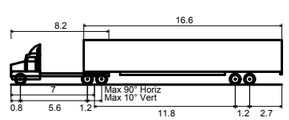
## TURNING MOVEMENTS (WB20) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-3

SHT11X17.DWG - 279mmX432mm




WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |

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# 2020 WALKLEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-4

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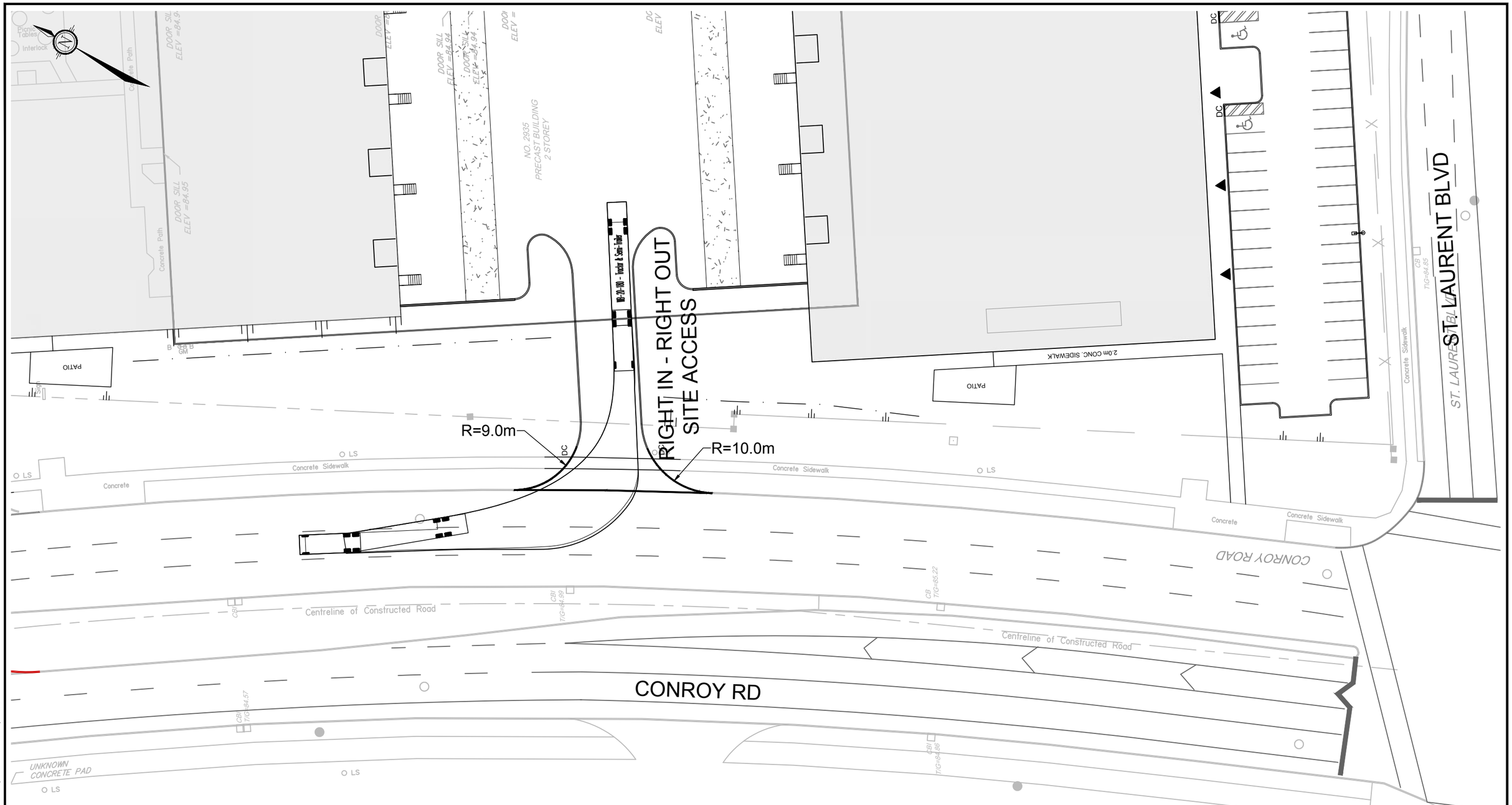


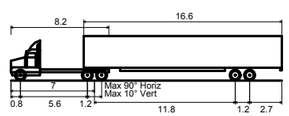


WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |

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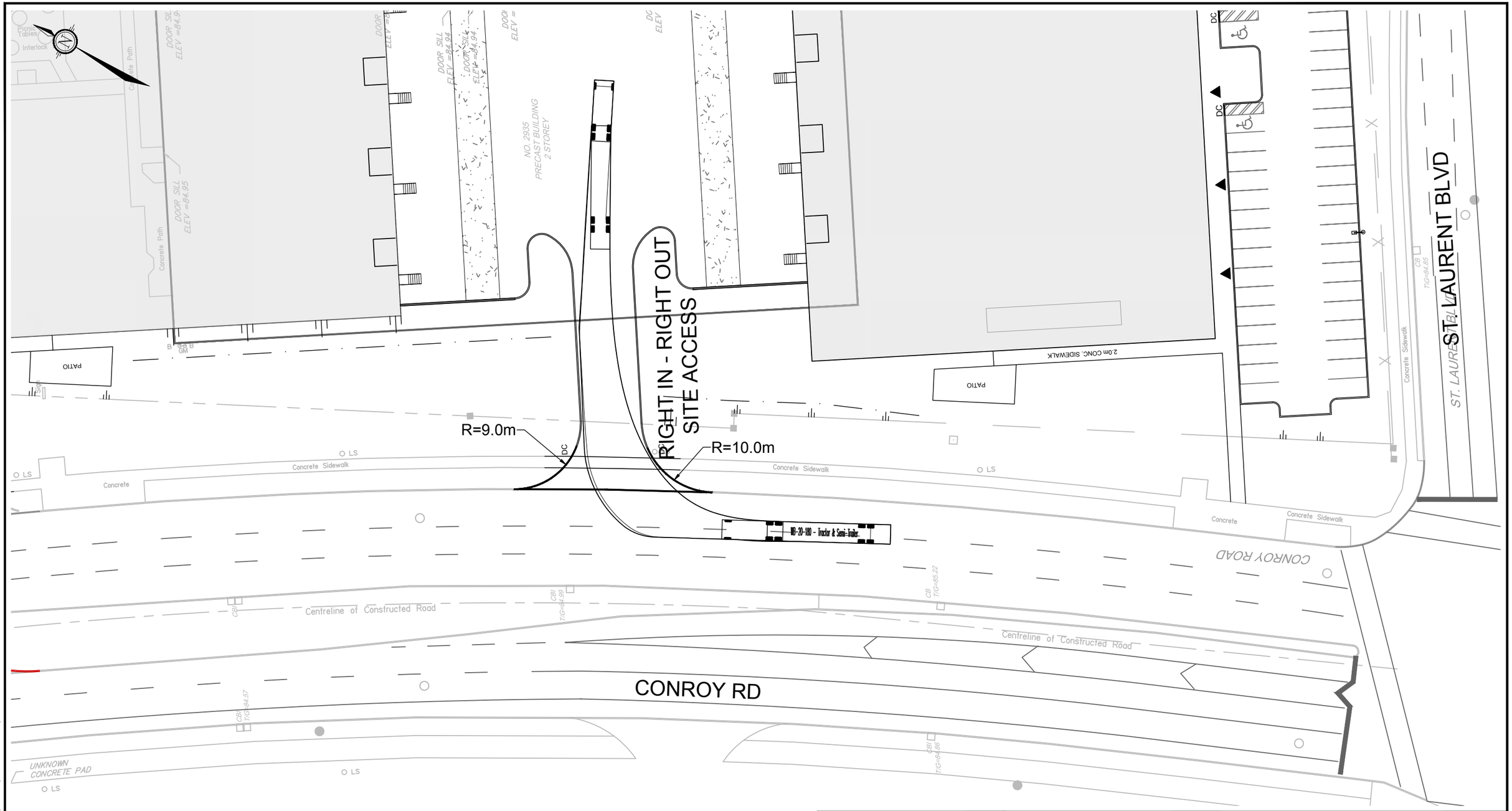
Facsimile (613) 254-5867
Website www.novatech-eng.com

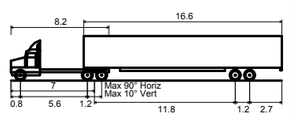
# 2020 WALKLEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-5




WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |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# 2020 WALKLEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-6

WAREHOUSE 1
FOOTPRINT: 8,547m²
FFE = 85.30

PATIO

2.0m CONC. SIDEWALK

1.8m CONC. SIDEWALK

DC

PYLON SIGN

R=7.0m

R=50.0m

R=7.0m

FULL MOVEMENT SITE ACCESS

Concrete Sidewalk

Depressed Curb

Asphalt

ST. LAURENT BLVD

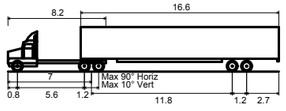
CB TIG=84.85

CB TIG=84.44

CB TIG=84.87

CB TIG=84.45

WB-20-180 - Tractor & Semi-Trailer




WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |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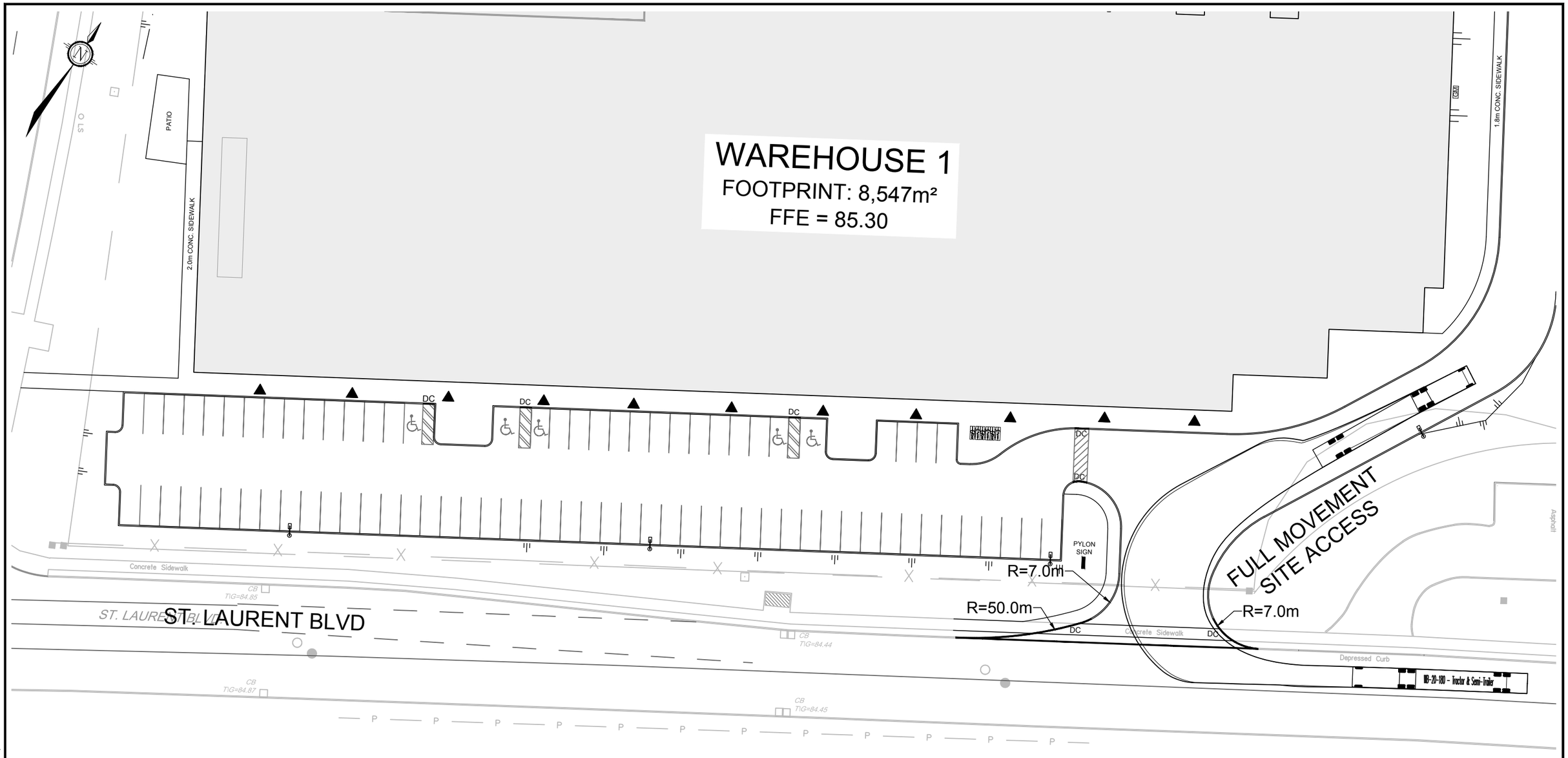
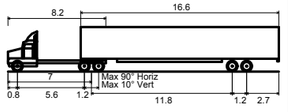
# 2020 WALKLEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-7




WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |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# 2020 WALKLEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-8

WAREHOUSE 1
FOOTPRINT: 8,547m²
FFE = 85.30

PATIO

2.0m CONC. SIDEWALK

1.6m CONC. SIDEWALK

DC

PYLON SIGN

R=7.0m

R=50.0m

FULL MOVEMENT SITE ACCESS

R=7.0m

Concrete Sidewalk

Depressed Curb

Asphalt

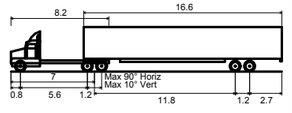
CB TIG=84.85

CB TIG=84.44

CB TIG=84.87

CB TIG=84.45

ST. LAURENT BLVD




WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |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# 2020 WALKLEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-9

SHT11X17.DWG - 279mmX432mm

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WAREHOUSE 1
FOOTPRINT: 8,547m²
FFE = 85.30

PATIO

2.0m CONC. SIDEWALK

1.6m CONC. SIDEWALK

CGM

DC

Concrete Sidewalk

PYLON SIGN

R=7.0m

R=50.0m

R=7.0m

FULL MOVEMENT SITE ACCESS

WB-20 - Tractor & Semi-Trailer

Asphalt

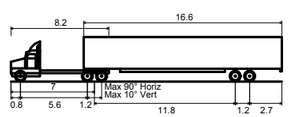
Depressed Curb

ST. LAURENT BLVD

CB TIG=84.85

CB TIG=84.87

CB TIG=84.45




| WB-20 - Tractor & Semi-Trailer | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |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# 2020 WALKLEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-10

SHT11X17.DWG - 279mmX432mm

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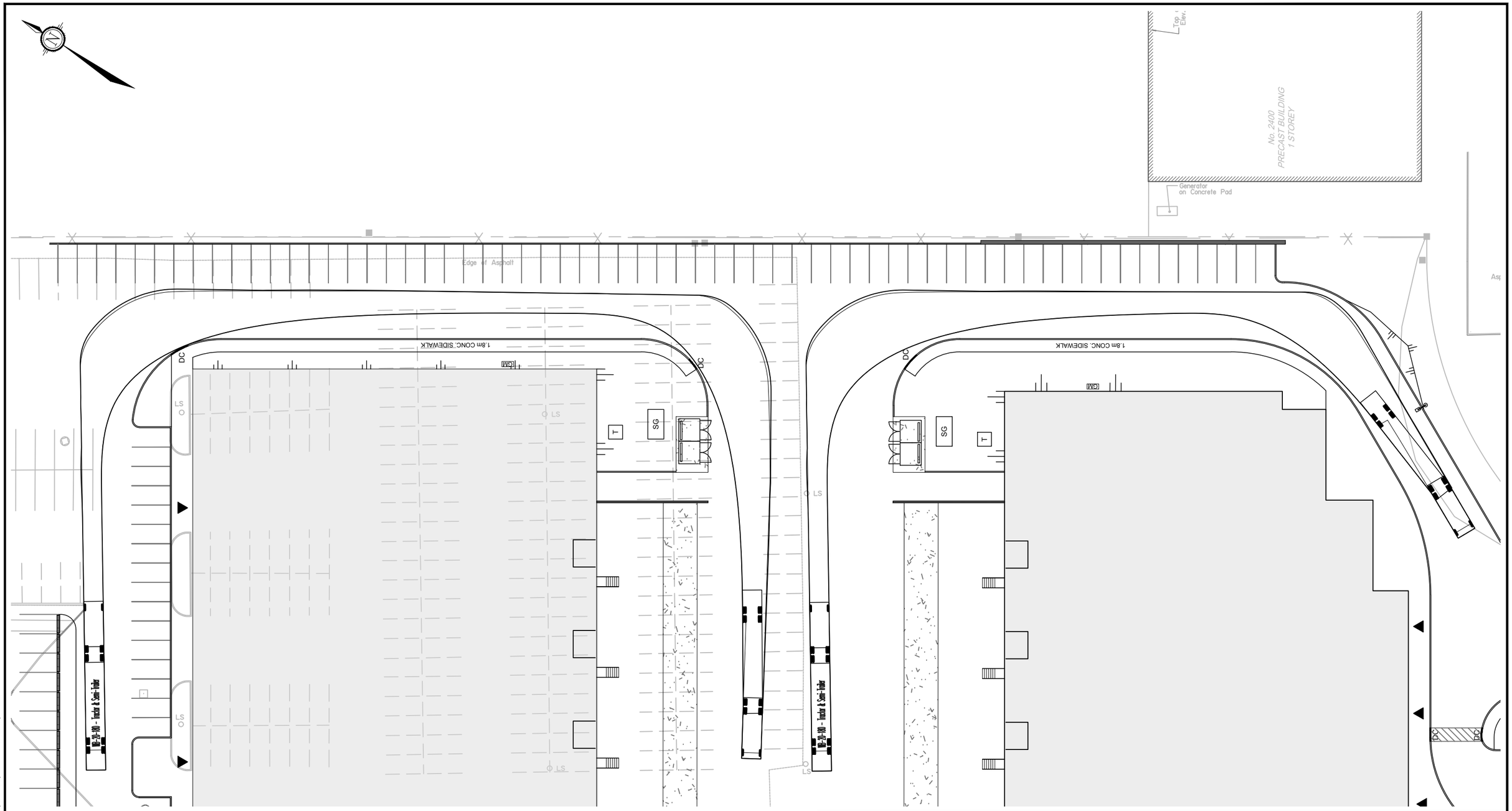


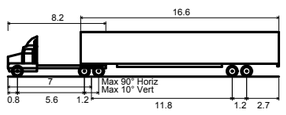


WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |

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# 2020 WALKLEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-11

RIGHT IN - RIGHT OUT ACCESS

R=10.0m

R=25.0m

R=7.0m

WALKEY RD

Centreline of Constructed Road

2 STOREY

NO. 2060 BRICK BUILDING

1 STOREY

1.8m CONC. SIDEWALK

Grass

Top of Slope

Concrete Sidewalk

Concrete Path

Concrete

Interlock

Picnic Tables

Stone Curb

Concrete Curb

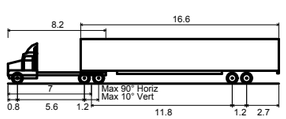
Sign

EX UMH T/G=84.64

EX UMH T/G=84.66

DOOR SILL ELEV.=84.87

DOOR SILL ELEV.=84.81




WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |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# 2020 WALKEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 3

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-12

SHT11X17.DWG - 279mmX432mm

C:\temp\AcPublish_70\119067-TM-PH3.dwg, TM-12, Feb 08, 2021 - 12:20pm, rhillier

RIGHT IN - RIGHT OUT ACCESS

R=10.0m

R=25.0m

R=7.0m

WALKEY RD

Centreline of Constructed Road

2 STOREY

NO. 2060 BRICK BUILDING

1 STOREY

1.8m CONC. SIDEWALK

Top of Slope

Grass

Concrete Path

Interlock

Picnic Tables

Concrete Curb

Stone Curb

EX UMH T/G=84.64

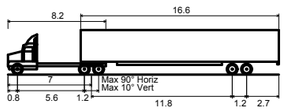
EX UMH T/G=84.66

DOOR SILL ELEV.=84.87

DOOR SILL ELEV.=84.81

Sign

Depressed Median




WB-20 - Tractor & Semi-Trailer

| | |
|---|---|
| Overall Length | 22.700m |
| Overall Width | 2.600m |
| Overall Body Height | 3.730m |
| Min Body Ground Clearance | 0.435m |
| Track Width | 2.600m |
| Lock-to-lock time | 4.00s |
| Curb to Curb Turning Radius | 14.300m |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# 2020 WALKEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (WB20) - PHASE 3

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-13

SHT11X17.DWG - 279mmX432mm

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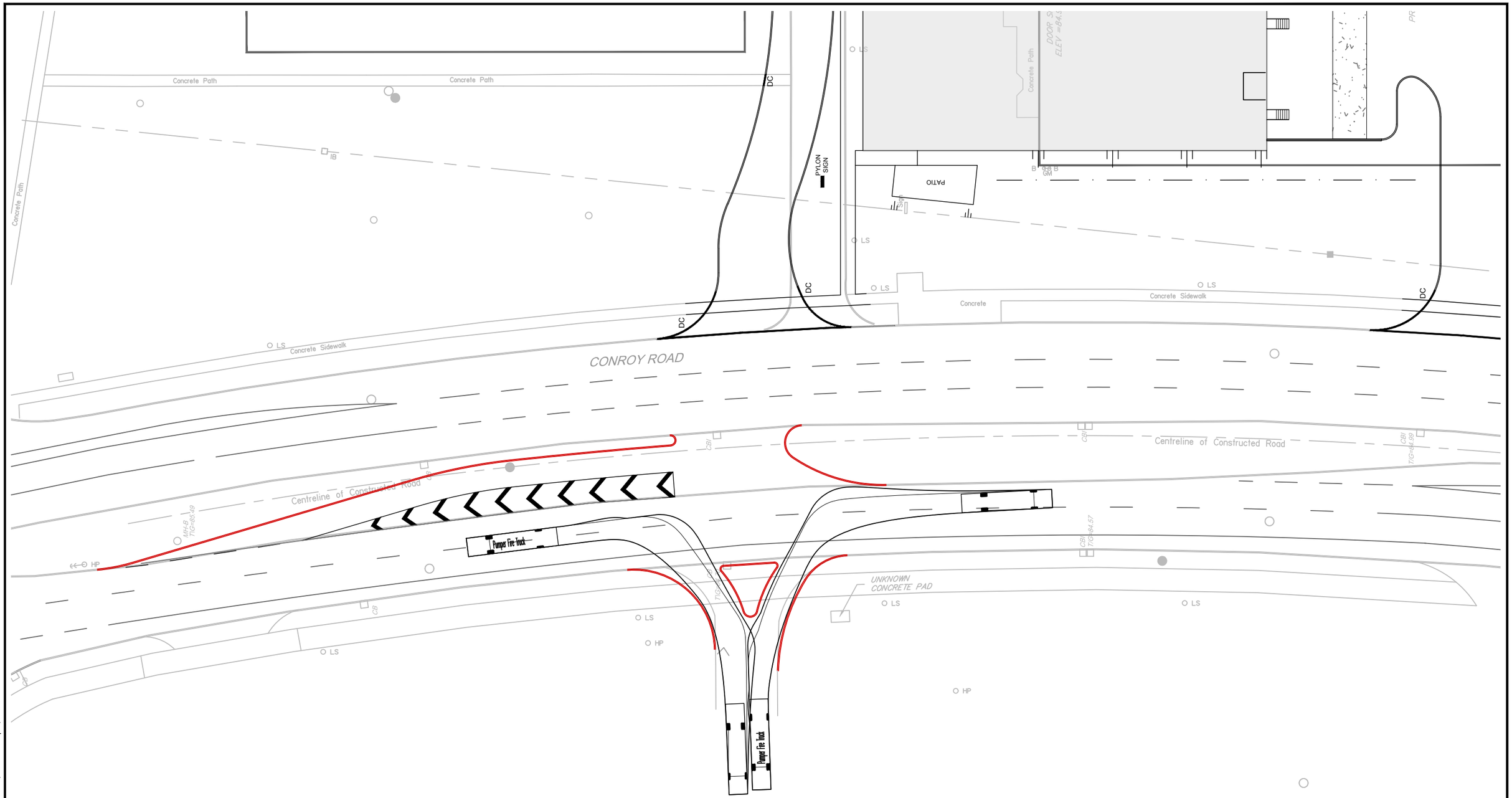



Pumper Fire Truck

| | |
|---|---|
| Overall Length | 12.192m |
| Overall Width | 2.489m |
| Overall Body Height | 2.361m |
| Min Body Ground Clearance | 0.200m |
| Track Width | 2.489m |
| Lock-to-lock time | 5.00s |
| Max Wheel Angle | 45.00° |

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# 2020 WALKLEY ROAD & 2935 CONROY ROAD

## TURNING MOVEMENTS (FIRE TRUCK) - PHASE 2

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE MAR 2021 | JOB 119067 | FIGURE TM-14

SHT11X17.DWG - 279mmX432mm

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# APPENDIX B

TIA Screening Form

# City of Ottawa 2017 TIA Guidelines Screening Form

## 1. Description of Proposed Development

| | |
|---|---|
| Municipal Address | **2020 Walkley Road / 2935 Conroy Road** |
| Description of Location | **SE of Walkley/Conroy** |
| Land Use Classification | **Warehouse** |
| Development Size (units) | |
| Development Size ($m^2$) | **265,836 sq.ft. (24,697 sq.m.)** |
| Number of Accesses and Locations | **2 accesses to Conroy Road, 1 access to Walkley Road, 1 access to St. Laurent Boulevard** |
| Phase of Development | **Three** |
| Buildout Year | **2023** |

**If available, please attach a sketch of the development or site plan to this form.**

## 2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

| Land Use Type | Minimum Development Size |
|---|---|
| Single-family homes | 40 units |
| Townhomes or apartments | 90 units |
| Office | 3,500 $m^2$ |
| Industrial | 5,000 $m^2$ |
| Fast-food restaurant or coffee shop | 100 $m^2$ |
| Destination retail | 1,000 $m^2$ |
| Gas station or convenience market | 75 $m^2$ |

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

**If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.**

## 3. Location Triggers

| | Yes | No |
|---|---|---|
| Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks? | x | |
| Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?* | | x |

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

**If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.**

## 4. Safety Triggers

| | Yes | No |
|---|---|---|
| Are posted speed limits on a boundary street are 80 km/hr or greater? | | x |
| Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway? | | x |
| Is the proposed driveway 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)? | x | |
| Is the proposed driveway within auxiliary lanes of an intersection? | x | |
| Does the proposed driveway make use of an existing median break that serves an existing site? | x | |
| Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development? | | x |
| Does the development include a drive-thru facility? | | x |

**If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.**

## 5. Summary

| | Yes | No |
|---|---|---|
| Does the development satisfy the Trip Generation Trigger? | | x |
| Does the development satisfy the Location Trigger? | x | |
| Does the development satisfy the Safety Trigger? | x | |

**If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).**

# APPENDIX C

OC Transpo System Information


Grasshopper Hill
49
48
Kilborn
Haig
Canterbury
Saunderson
Russell
55
291
140
Featherston
Jefferson
Ryder
Canterbury
Halifax
St-Laurent
48
rongate Square
Walkley
46
46
48
291
140
Site
40
St-Laurent
Hawthorne
Conroy
Ages
Swansea
40
Johnston
Johnston
Stevenage
Winterwood
Karsh
Lorry Greenberg
Blohm

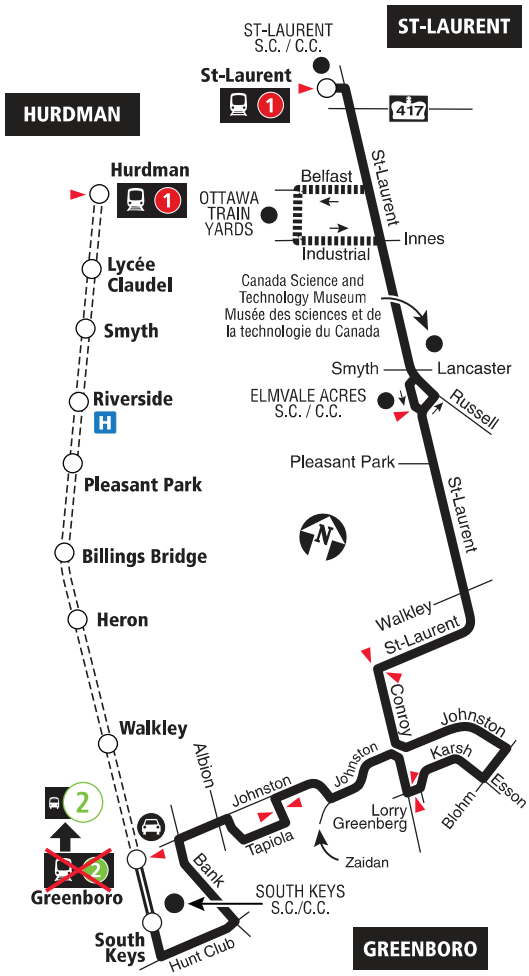
# 40 ST-LAURENT / GREENBORO / HURDMAN

Fréquent

**7 days a week / 7 jours par semaine**

All day service

Service toute la journée




| | |
|---|---|
| | Transitway & Station |
| | Peak periods / Périodes de pointe |
| | Some trips early morning only / Quelques trajets tôt le matin seulement |
| | Park & Ride / Parc-o-Bus |
| | Timepoint / Heures de passage |

2020.04

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

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

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

Customer Service
Service à la clientèle ..... **613-741-4390**

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

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

**Effective May 3, 2020**
**En vigueur 3 mai 2020**

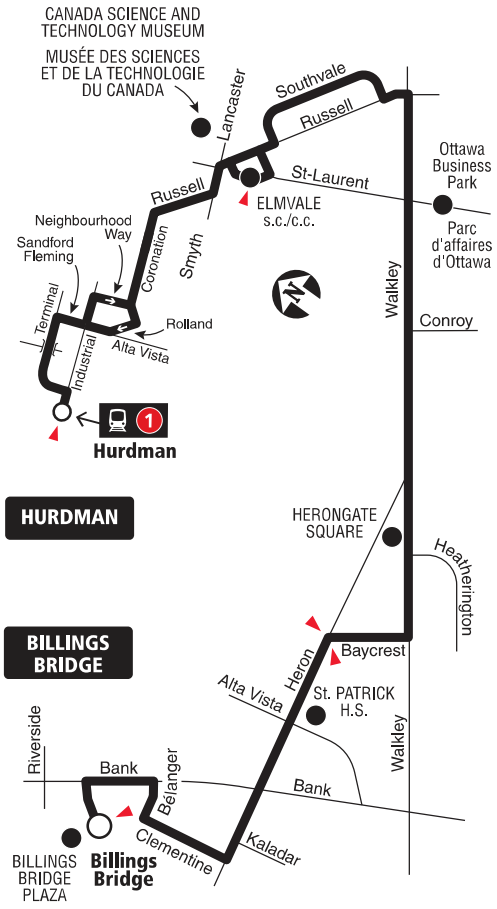
OC Transpo

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

# 46 BILLINGS BRIDGE / HURDMAN

*Local*

**7 days a week / 7 jours par semaine**
All day service
Service toute la journée




Station

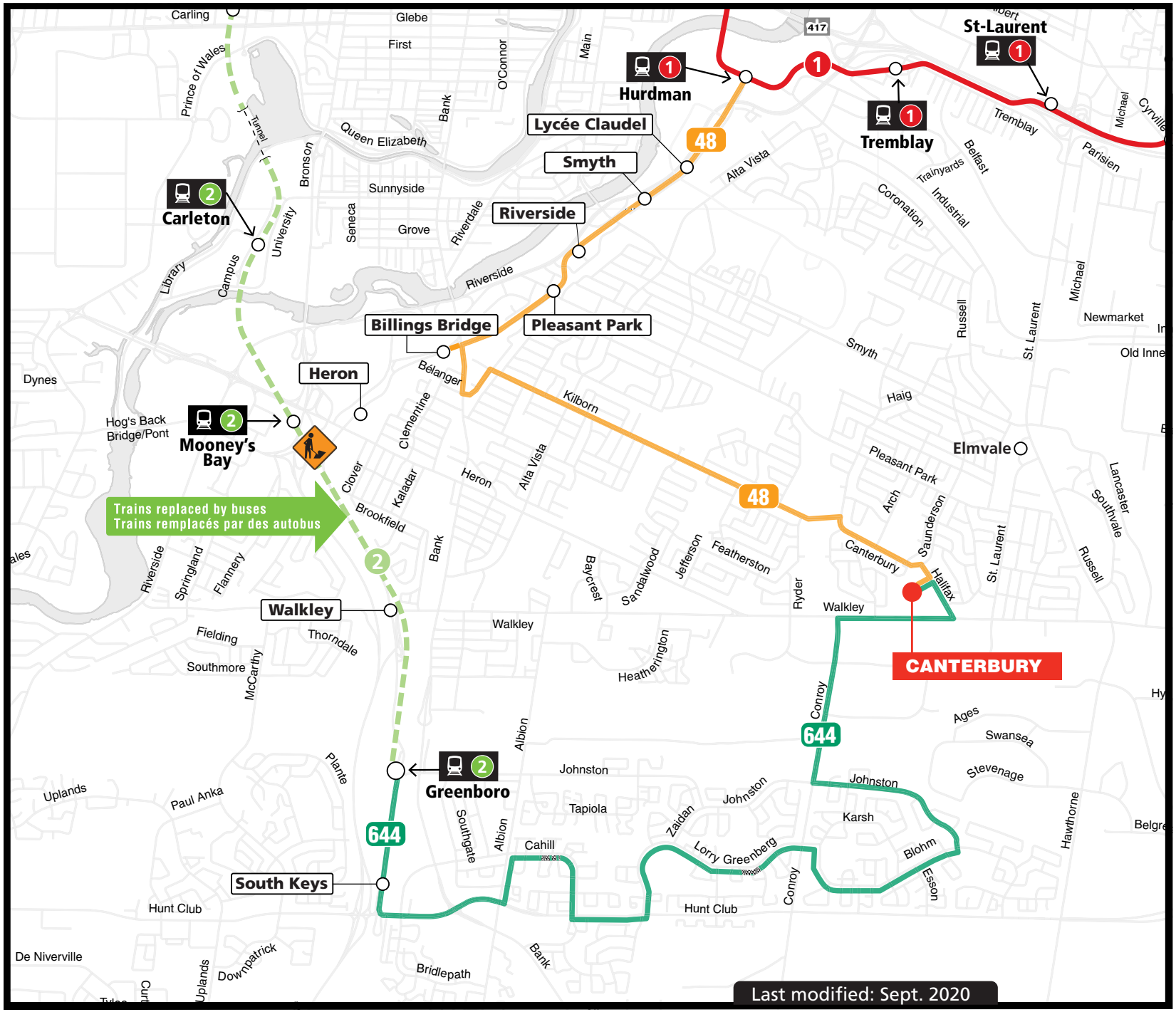
Timepointe / Heures de passage

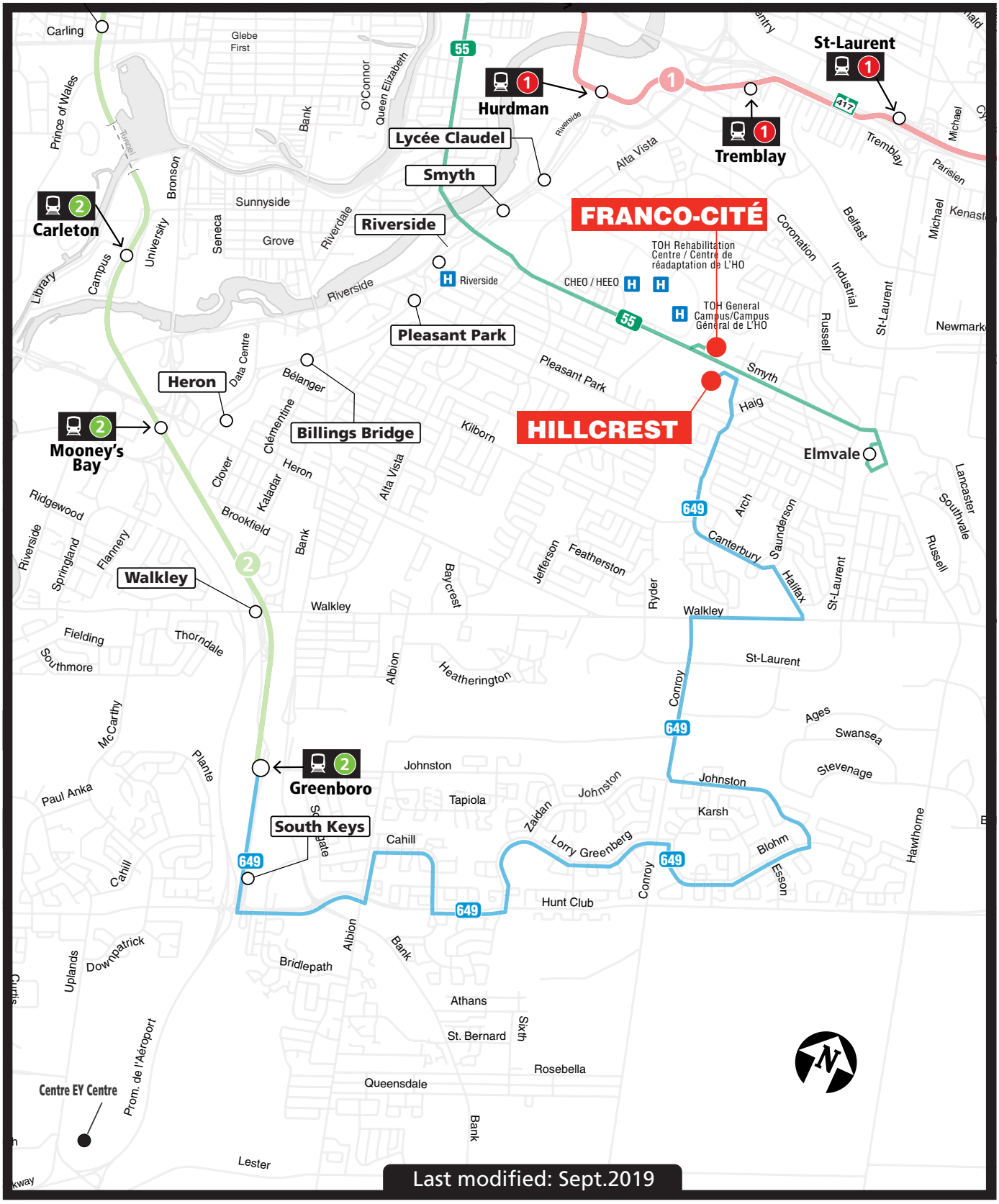
2019.07

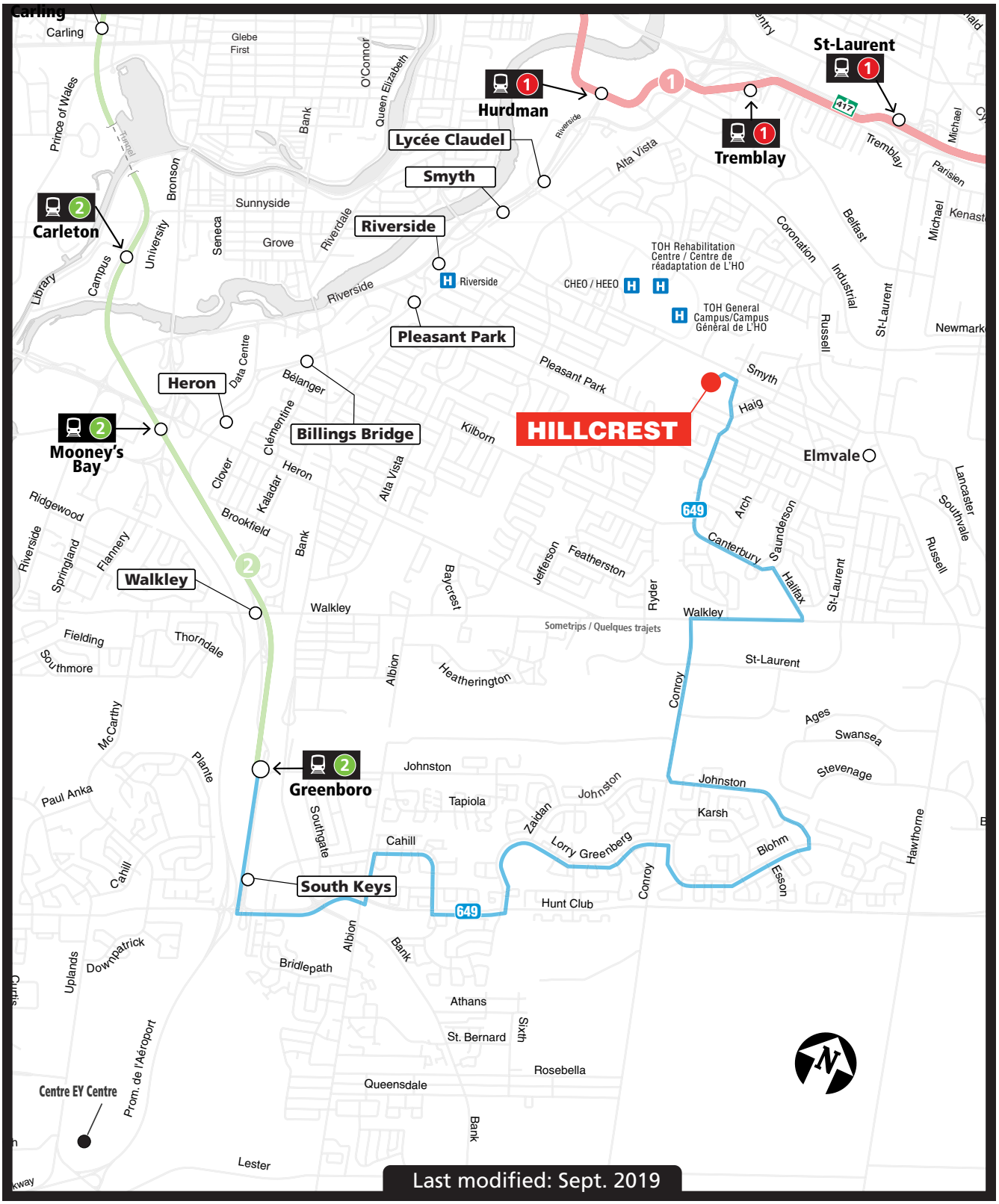
**Future route after O-Train Line 1 is open**
**Trajet du circuit après l'ouverture de la Ligne 1 de l'O-Train**

Lost and Found / Objets perdus..... **613-563-4011**
Security / Sécurité..... **613-741-2478**

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


Carling
Glebe
First
Prince of Wales
Tunnel
Bronson
Queen Elizabeth
Bank
O'Connor
Main
417
Hurdman
1
St-Laurent
Tremblay
Michael
Cyrville
Parisien
Lycée Claudel
48
Smyth
Alta Vista
Trainyards
Belfast
Coronation
Industrial
Carleton
2
Sunnyside
Seneca
Grove
Riverdale
Riverside
University
Library
Campus
Billings Bridge
Pleasant Park
Russell
St. Laurent
Newmarket
Old Inne
Dynes
Heron
Bélanger
Kilborn
Haig
Hog's Back
Bridge/Pont
Mooney's
Bay
Clementine
Clover
Kaladar
Brookfield
Elmvale
Pleasant Park
Arch
Saunderson
Lancaster
Southvale
Trains replaced by buses
Trains remplacés par des autobus
Riverside
Springland
Flannery
Bank
Baycrest
Sandalwood
Jefferson
Featherston
Canterbury
Halifax
Russell
Walkley
Fielding
Thorndale
Southmore
McCarthy
Heatherington
Ryder
CANTERBURY
Conroy
644
Ages
Swansea
Stevenage
Albion
Johnston
Greenboro
Plante
Uplands
Paul Anka
Tapiola
Karsh
Hawthorne
Belgre
Southgate
Cahill
Zaidan
Lorry Greenberg
Blohm
Esson
South Keys
Hunt Club
De Niverville
Downpatrick
Bridlepath
Last modified: Sept. 2020


Carling
Glebe
First
Prince of Wales
Tunnel
Bronson
Bank
O'Connor
Queen Elizabeth
55
Hurdman
Riverside
Lycée Claudel
Smyth
Alta Vista
St-Laurent
417
Tremblay
Michael
Parisien
Carleton
Sunnyside
Seneca
Grove
Riverdale
Riverside
FRANCO-CITÉ
TOH Rehabilitation Centre / Centre de réadaptation de L'HO
CHEO / HEEO
TOH General Campus/Campus Général de L'HO
Coronation
Belfast
Industrial
Russell
Newmark
Library
Campus
University
Pleasant Park
Data Centre
Bélanger
Heron
Billings Bridge
Kilborn
HILLCREST
Haig
Smyth
Elmvale
Mooney's Bay
Clémentine
Clover
Kaladar
Brookfield
Ridgewood
Springland
Flannery
Walkley
Baycrest
Jefferson
Featherston
Ryder
Arch
Saunderson
Canterbury
Halifax
Lancaster
Southvale
Fielding
Thorndale
Southmore
Albion
Heatherington
Conroy
Ages
Swansea
Stevenage
McCarthy
Plante
Paul Anka
Greenboro
Johnston
Tapiola
Zaidan
Karsh
Blohm
Esson
Hawthorne
South Keys
Cahill
Lorry Greenberg
649
Hunt Club
Uplands
Downpatrick
Bridlepath
Athans
St. Bernard
Sixth
Rosebella
Queensdale
Centre EY Centre
Prom. de l'Aéroport
Lester
Last modified: Sept.2019


Carling
Carling
Glebe
First
Prince of Wales
Bronson
Bank
O'Connor
Queen Elizabeth
Hurdman
Lycée Claudel
Smyth
Riverside
Alta Vista
St-Laurent
Tremblay
417
Michael
Parisien
Carleton
Sunnyside
Seneca
Grove
Riverdale
Riverside
University
Library
Campus
Riverside
TOH Rehabilitation Centre / Centre de réadaptation de L'HO
CHEO / HEEO
TOH General Campus/Campus Général de L'HO
Coronation
Belfast
Industrial
St-Laurent
Russell
Newmark
Pleasant Park
Data Centre
Bélanger
Heron
Billings Bridge
Kilborn
HILLCREST
Smyth
Haig
Mooney's Bay
Clémentine
Clover
Kaladar
Heron
Alta Vista
Elmvale
Ridgewood
Riverside
Springland
Flannery
Brookfield
Bank
Walkley
Baycrest
Jefferson
Featherston
Ryder
Arch
Saunderson
Canterbury
Halifax
St-Laurent
Lancaster
Southvale
Russell
649
Walkley
Sometrips / Quelques trajets
Fielding
Thorndale
Southmore
Albion
Heatherington
Conroy
St-Laurent
McCarthy
Ages
Swansea
Stevenage
Plante
Johnston
Greenboro
Paul Anka
Tapiola
Johnston
Johnston
Karsh
Zaidan
Lorry Greenberg
Blohm
Esson
Hawthorne
Southgate
Cahill
Cahill
South Keys
649
Hunt Club
Conroy
Albion
Bank
Uplands
Downpatrick
Bridlepath
Athans
St. Bernard
Sixth
Rosebella
Queensdale
Prom. de l'Aéroport
Centre EY Centre
Bank
Lester
Last modified: Sept. 2019

# APPENDIX D

Traffic Count Data

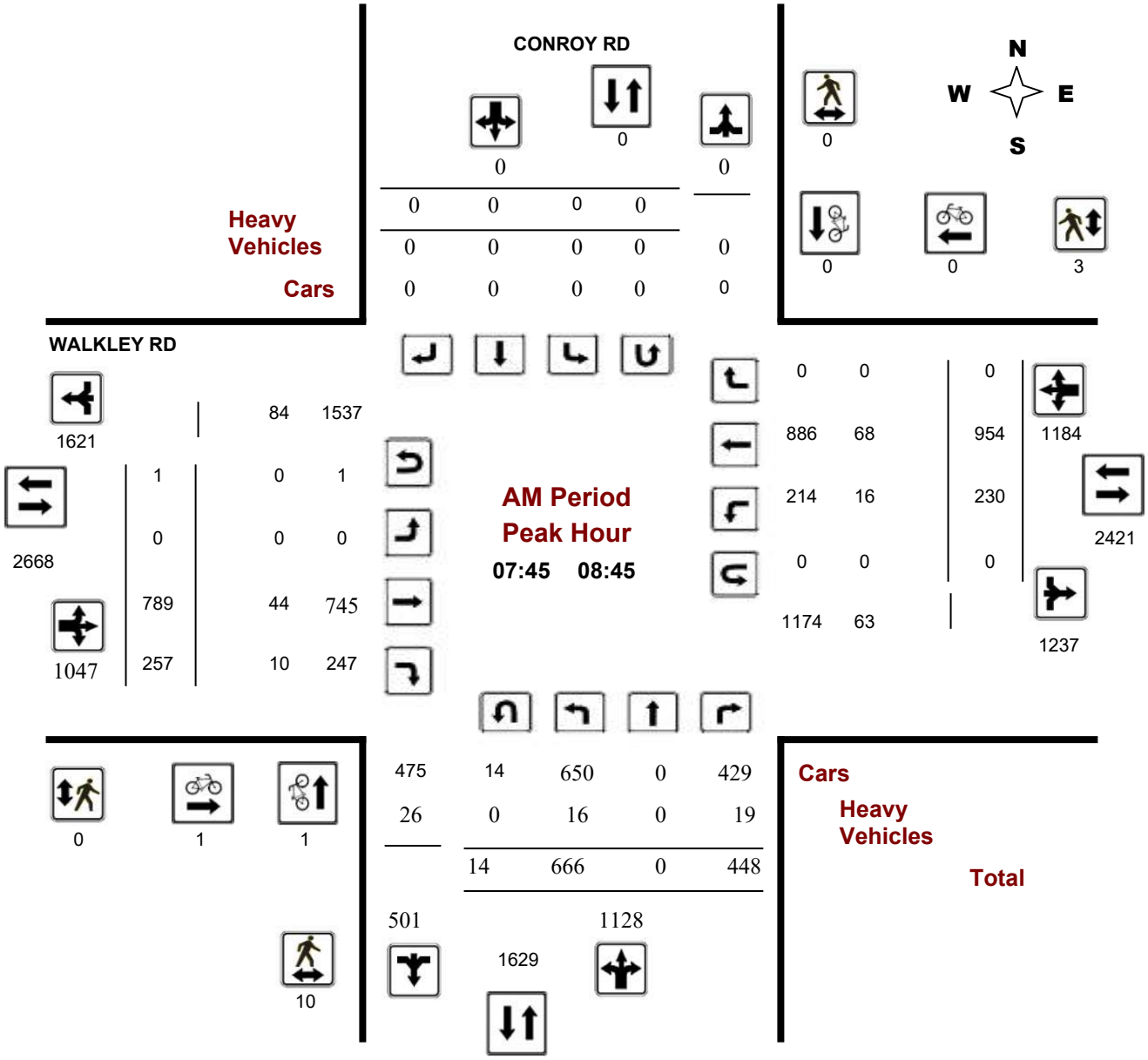
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

## CONROY RD @ WALKLEY RD

**Survey Date:** Thursday, February 22, 2018 **WO No:** 37565

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




**Comments**

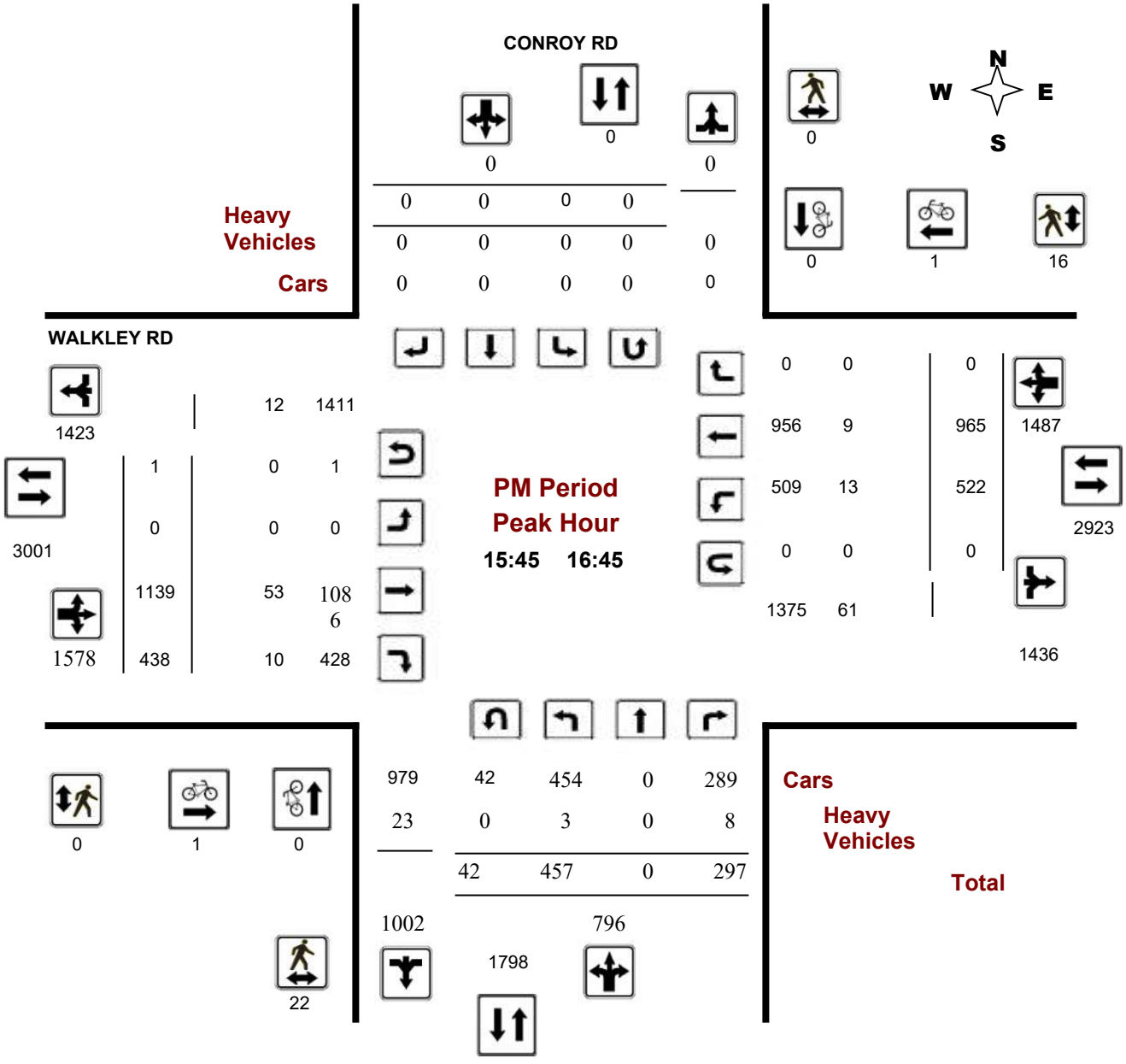
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

## CONROY RD @ WALKLEY RD

**Survey Date:** Thursday, February 22, 2018 **WO No:** 37565

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




**Comments**

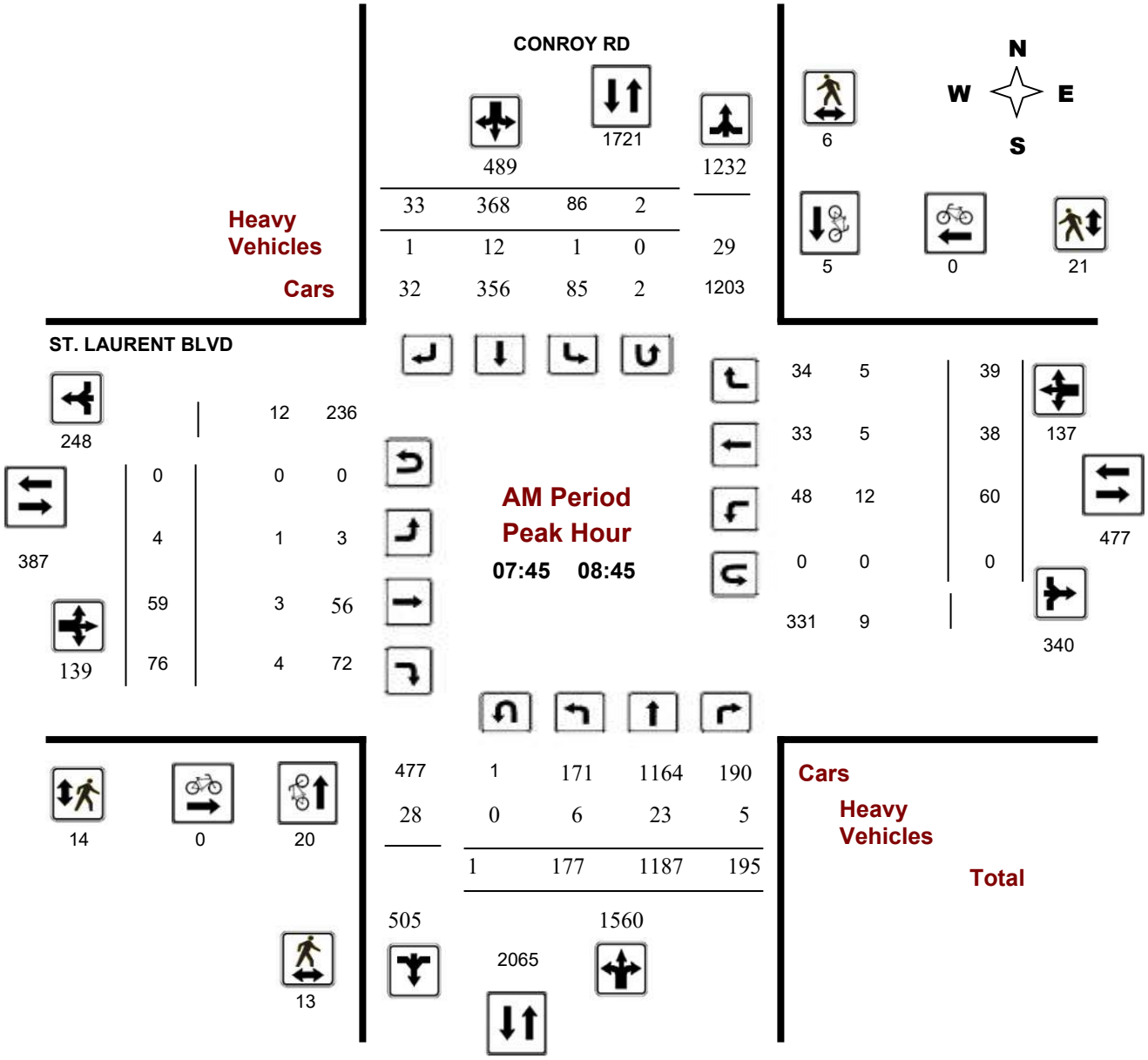
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

## CONROY RD @ ST. LAURENT BLVD

**Survey Date:** Thursday, June 01, 2017 **WO No:** 37032

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




**Comments**

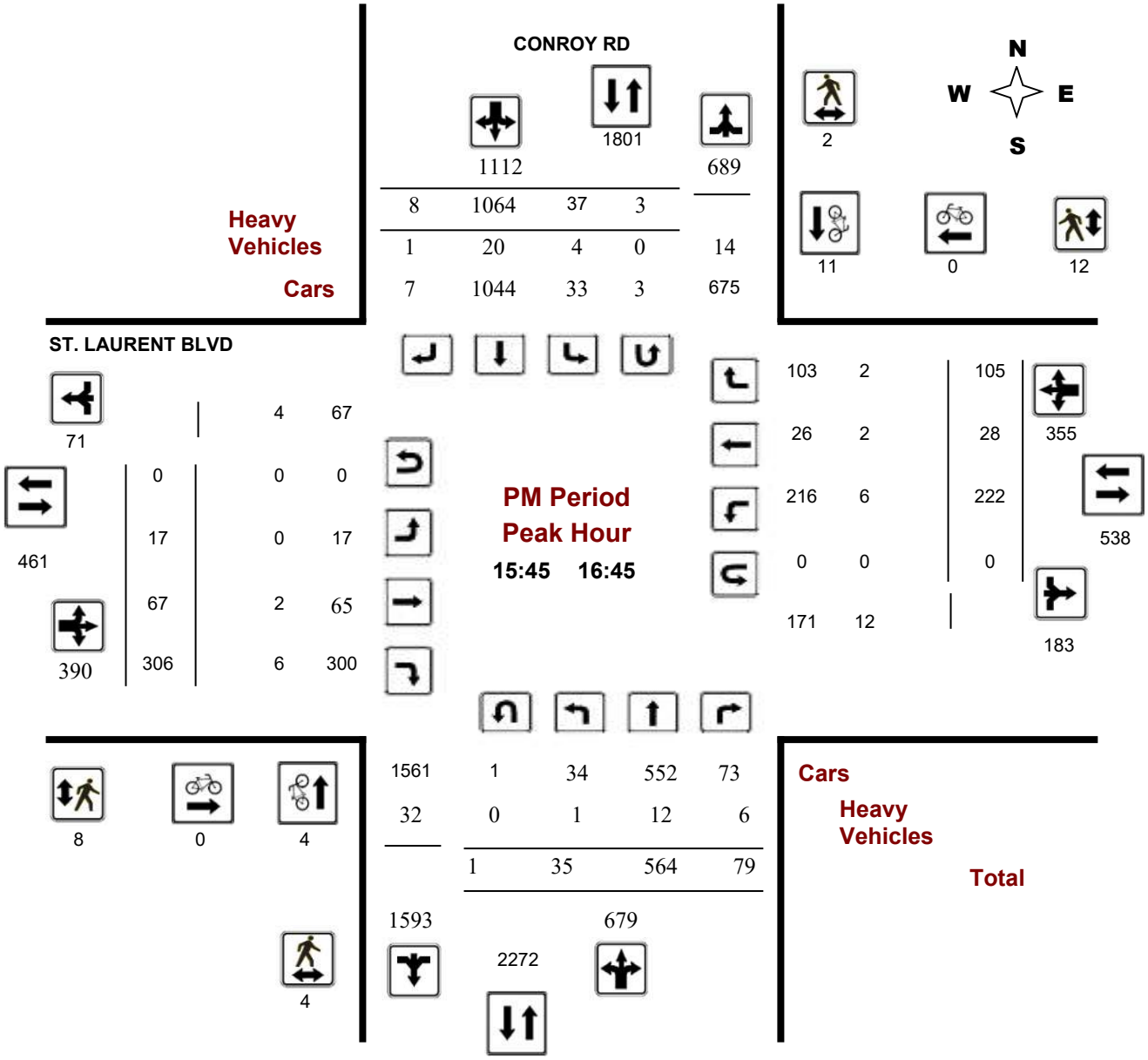
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

## CONROY RD @ ST. LAURENT BLVD

**Survey Date:** Thursday, June 01, 2017 **WO No:** 37032

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




**Comments**

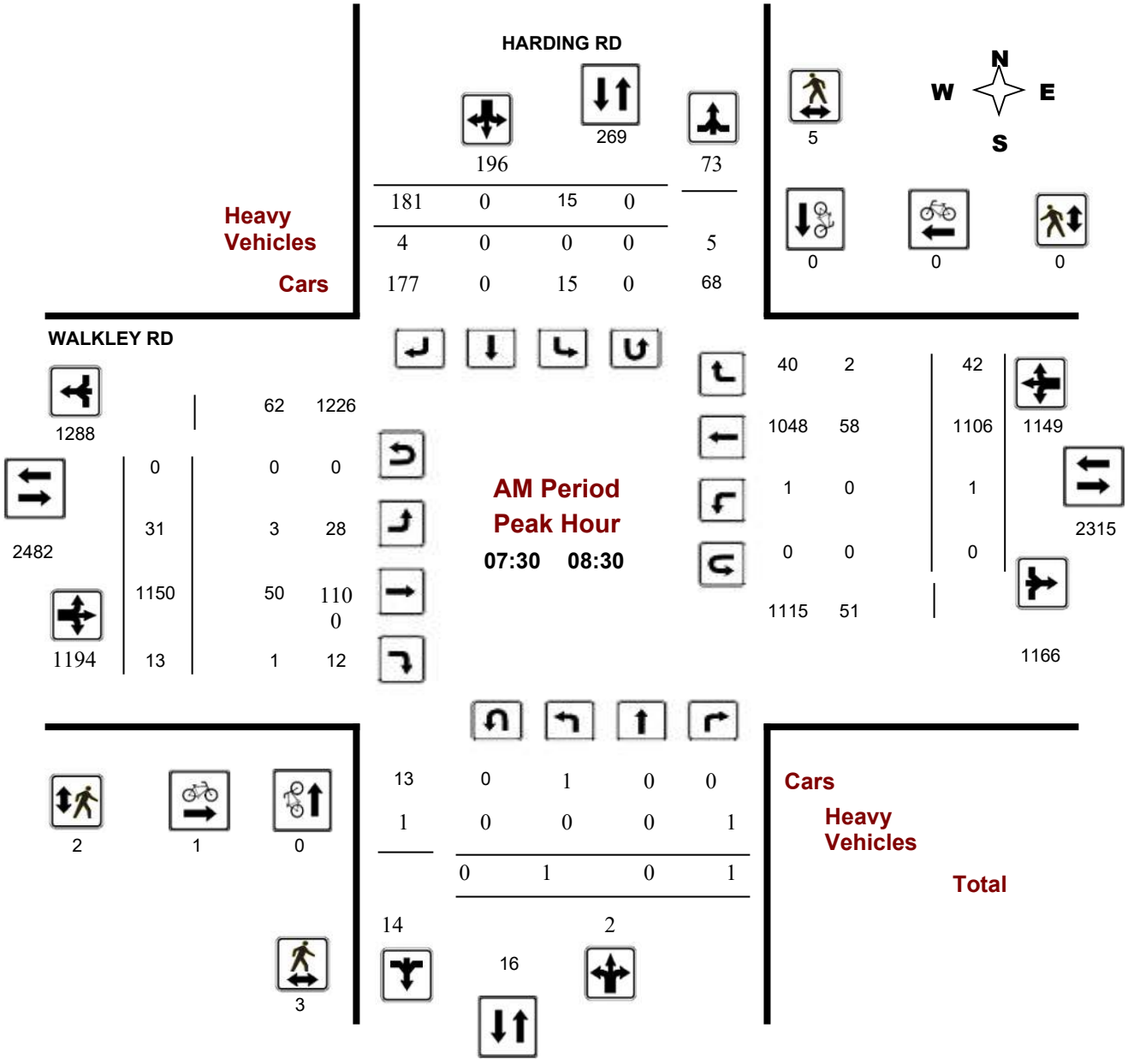
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

## HARDING RD @ WALKLEY RD

**Survey Date:** Tuesday, December 11, 2018 **WO No:** 38063

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




**Comments**

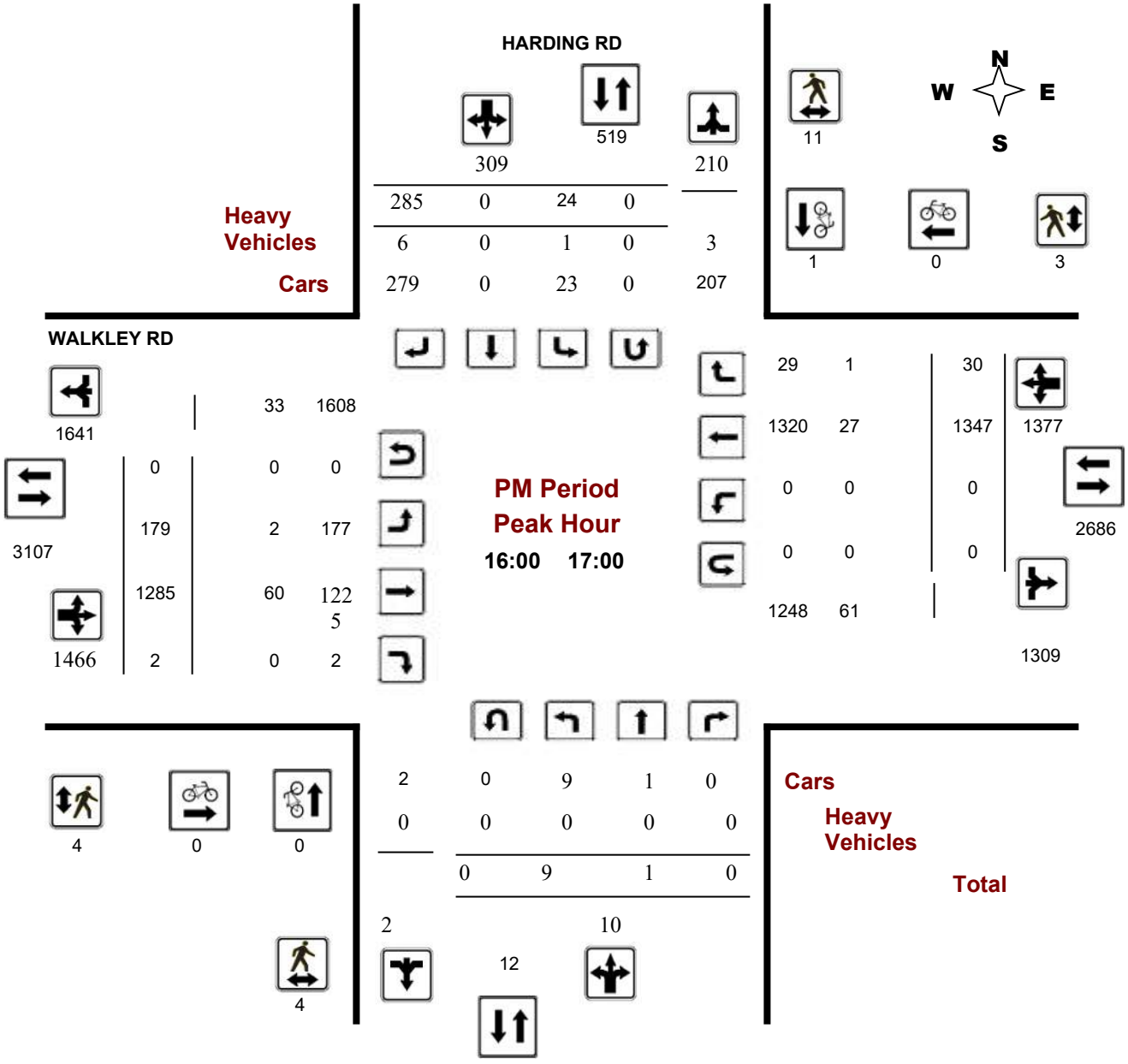
# Transportation Services - Traffic Services

## Turning Movement Count - Peak Hour Diagram

## HARDING RD @ WALKLEY RD

**Survey Date:** Tuesday, December 11, 2018 **WO No:** 38063

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




**Comments**

# APPENDIX E

Collision Records

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CONROY RD @ ST. LAURENT BLVD

**Traffic Control:** Traffic signal **Total Collisions:** 29

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2014-Jan-16, Thu,20:17 | Clear | Other | P.D. only | Dry | West | Reversing | Pick-up truck | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2014-Jan-27, Mon,17:10 | Clear | Rear end | Non-fatal injury | Wet | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Stopped | Passenger van | Other motor vehicle | |
| 2014-Feb-04, Tue,08:58 | Clear | Rear end | P.D. only | Wet | North | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Stopped | Automobile, station wagon | Other motor vehicle | |
| | | | | | North | Slowing or stopping | Passenger van | Other motor vehicle | |
| | | | | | North | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2014-Mar-06, Thu,23:58 | Clear | SMV unattended vehicle | Non-reportable | Dry | North | Going ahead | Passenger van | Unattended vehicle | 0 |
| 2014-Sep-18, Thu,17:13 | Clear | Rear end | P.D. only | Dry | East | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2014-Nov-18, Tue,08:29 | Clear | Rear end | P.D. only | Ice | North | Slowing or stopping | Passenger van | Other motor vehicle | 0 |
| | | | | | North | Slowing or stopping | Delivery van | Other motor vehicle | |
| 2015-Feb-02, Mon,17:51 | Snow | Rear end | P.D. only | Loose snow | West | Turning right | Passenger van | Other motor vehicle | 0 |
| | | | | | West | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2015-May-04, Mon,06:51 | Clear | Turning movement | Non-fatal injury | Dry | North | Going ahead | Bicycle | Other motor vehicle | 0 |
| | | | | | North | Turning right | Pick-up truck | Cyclist | |
| 2015-May-11, Mon,16:47 | Clear | Rear end | P.D. only | Dry | East | Turning right | Passenger van | Other motor vehicle | 0 |
| | | | | | East | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2015-Jul-09, Thu,00:23 | Clear | Sideswipe | P.D. only | Dry | South | Changing lanes | Pick-up truck | Other motor vehicle | 0 |
| | | | | | South | Overtaking | Automobile, station wagon | Other motor vehicle | |
| 2015-Dec-16, Wed,16:50 | Clear | Turning movement | Non-fatal injury | Dry | West | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CONROY RD @ ST. LAURENT BLVD

**Traffic Control:** Traffic signal **Total Collisions:** 29

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2016-Jun-20, Mon,09:52 | Clear | Rear end | P.D. only | Dry | South | Going ahead | Pick-up truck | Other motor vehicle | 0 |
| | | | | | South | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2016-Jul-18, Mon,18:21 | Clear | Rear end | Non-fatal injury | Dry | South | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | South | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2016-Aug-12, Fri,21:35 | Rain | Rear end | P.D. only | Wet | West | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2016-Oct-21, Fri,13:22 | Rain | Angle | Non-fatal injury | Wet | West | Going ahead | Pick-up truck | Other motor vehicle | 0 |
| | | | | | South | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2016-Nov-11, Fri,18:04 | Clear | Turning movement | P.D. only | Dry | North | Turning left | Unknown | Other motor vehicle | 0 |
| | | | | | South | Going ahead | Passenger van | Other motor vehicle | |
| 2016-Nov-11, Fri,18:45 | Clear | Angle | P.D. only | Dry | West | Going ahead | Passenger van | Other motor vehicle | 0 |
| | | | | | North | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2016-Nov-18, Fri,14:35 | Clear | Angle | Non-fatal injury | Dry | North | Going ahead | Passenger van | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2017-Jan-17, Tue,15:30 | Clear | Rear end | P.D. only | Dry | South | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | South | Going ahead | Pick-up truck | Other motor vehicle | |
| 2017-Feb-05, Sun,21:15 | Snow | Sideswipe | P.D. only | Loose snow | South | Slowing or stopping | Pick-up truck | Other motor vehicle | 0 |
| | | | | | South | Stopped | Passenger van | Other motor vehicle | |
| 2017-May-03, Wed,19:07 | Clear | Angle | P.D. only | Dry | West | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2017-Jun-18, Sun,11:10 | Clear | Sideswipe | Non-fatal injury | Dry | South | Unknown | Unknown | Other motor vehicle | 0 |
| | | | | | South | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2017-Jul-26, Wed,13:14 | Clear | Rear end | P.D. only | Dry | North | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Stopped | Automobile, station wagon | Other motor vehicle | |

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CONROY RD @ ST. LAURENT BLVD

**Traffic Control:** Traffic signal **Total Collisions:** 29

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2017-Jul-26, Wed,14:49 | Clear | Angle | P.D. only | Dry | North | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2017-Aug-11, Fri,13:18 | Clear | Rear end | P.D. only | Dry | West | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle | |
| 2017-Nov-21, Tue,13:45 | Clear | Sideswipe | P.D. only | Dry | North | Changing lanes | School van | Other motor vehicle | 0 |
| | | | | | North | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2018-Jan-08, Mon,10:34 | Snow | Angle | P.D. only | Loose snow | South | Going ahead | Police vehicle | Skidding/sliding | 0 |
| | | | | | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2018-May-03, Thu,07:24 | Clear | Angle | P.D. only | Dry | North | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Oct-09, Tue,07:06 | Fog, mist, smoke, dust | Turning movement | Non-fatal injury | Wet | South | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Going ahead | Automobile, station wagon | Other motor vehicle | |

**Location:** CONROY RD @ WALKLEY RD

**Traffic Control:** Traffic signal **Total Collisions:** 72

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2014-Feb-01, Sat,13:45 | Snow | Sideswipe | Non-fatal injury | Wet | West | Changing lanes | Pick-up truck | Other motor vehicle | 0 |
| | | | | | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2014-Feb-11, Tue,13:47 | Clear | Rear end | Non-fatal injury | Dry | East | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2014-Feb-22, Sat,10:58 | Clear | Rear end | P.D. only | Wet | East | Slowing or stopping | Tow truck | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2014-Mar-30, Sun,12:30 | Clear | Angle | P.D. only | Wet | East | Changing lanes | Municipal transit bus | Other motor vehicle | 0 |
| | | | | | North | Turning right | Snow plow | Other motor vehicle | |

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CONROY RD @ WALKLEY RD

**Traffic Control:** Traffic signal **Total Collisions:** 72

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2014-Aug-19, Tue,13:48 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Pick-up truck | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2014-Dec-05, Fri,16:14 | Clear | Rear end | P.D. only | Ice | East | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2014-Dec-06, Sat,14:59 | Clear | Rear end | P.D. only | Wet | North | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Turning right | Pick-up truck | Other motor vehicle | |
| 2014-Dec-15, Mon,12:20 | Clear | Rear end | P.D. only | Dry | West | Going ahead | Pick-up truck | Other motor vehicle | 0 |
| | | | | | West | Stopped | Pick-up truck | Other motor vehicle | |
| | | | | | West | Stopped | Pick-up truck | Other motor vehicle | |
| 2014-Dec-15, Mon,16:50 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Pick-up truck | Other motor vehicle | |
| 2014-Dec-29, Mon,12:34 | Clear | Rear end | P.D. only | Dry | East | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2015-Jan-31, Sat,16:16 | Clear | Rear end | P.D. only | Dry | West | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2015-Feb-20, Fri,14:55 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Delivery van | Other motor vehicle | 0 |
| | | | | | East | Stopped | Passenger van | Other motor vehicle | |
| | | | | | East | Stopped | Pick-up truck | Other motor vehicle | |
| 2015-Feb-21, Sat,14:38 | Snow | Sideswipe | P.D. only | Slush | West | Going ahead | Tow truck | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2015-Apr-05, Sun,15:10 | Clear | Rear end | P.D. only | Dry | North | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2015-Apr-14, Tue,17:00 | Clear | Rear end | P.D. only | Dry | East | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Pick-up truck | Other motor vehicle | |

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CONROY RD @ WALKLEY RD

**Traffic Control:** Traffic signal **Total Collisions:** 72

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2015-Apr-24, Fri,08:45 | Clear | Rear end | Non-fatal injury | Dry | West | Going ahead | Delivery van | Other motor vehicle | 0 |
| | | | | | West | Stopped | Passenger van | Other motor vehicle | |
| 2015-Apr-30, Thu,17:52 | Clear | Rear end | P.D. only | Dry | North | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Turning right | Pick-up truck | Other motor vehicle | |
| 2015-May-27, Wed,16:23 | Clear | Rear end | Non-fatal injury | Dry | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle | |
| | | | | | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle | |
| | | | | | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle | |
| 2015-May-29, Fri,06:34 | Clear | SMV other | Non-fatal injury | Dry | East | Overtaking | Motorcycle | Ran off road | 0 |
| 2015-Jun-18, Thu,21:04 | Rain | Sideswipe | P.D. only | Wet | West | Changing lanes | Passenger van | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2015-Sep-07, Mon,15:39 | Clear | Turning movement | P.D. only | Dry | East | Going ahead | Pick-up truck | Other motor vehicle | 0 |
| | | | | | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2015-Sep-15, Tue,09:07 | Clear | Rear end | Non-fatal injury | Dry | North | Turning right | Municipal transit bus | Other motor vehicle | 0 |
| | | | | | North | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2015-Sep-25, Fri,15:03 | Clear | Sideswipe | P.D. only | Dry | West | Turning left | Passenger van | Other motor vehicle | 0 |
| | | | | | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2015-Oct-13, Tue,12:55 | Clear | Angle | P.D. only | Dry | West | Going ahead | Pick-up truck | Other motor vehicle | 0 |
| | | | | | North | Turning left | Pick-up truck | Other motor vehicle | |
| 2015-Oct-23, Fri,17:13 | Clear | Rear end | Non-fatal injury | Dry | North | Turning left | Passenger van | Other motor vehicle | 0 |
| | | | | | North | Turning left | Pick-up truck | Other motor vehicle | |
| 2015-Oct-25, Sun,15:10 | Clear | Other | P.D. only | Dry | East | Reversing | Pick-up truck | Other motor vehicle | 0 |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle | |

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CONROY RD @ WALKLEY RD

**Traffic Control:** Traffic signal **Total Collisions:** 72

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2015-Nov-05, Thu,17:36 | Clear | Rear end | P.D. only | Dry | South | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | South | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2015-Dec-17, Thu,11:22 | Rain | Rear end | P.D. only | Wet | North | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Turning right | Passenger van | Other motor vehicle | |
| 2016-Jan-17, Sun,16:20 | Snow | Rear end | P.D. only | Loose snow | North | Turning right | Pick-up truck | Other motor vehicle | 0 |
| | | | | | North | Turning right | Pick-up truck | Other motor vehicle | |
| 2016-Feb-09, Tue,10:45 | Snow | Rear end | P.D. only | Loose snow | North | Slowing or stopping | Pick-up truck | Other motor vehicle | 0 |
| | | | | | North | Slowing or stopping | Automobile, station wagon | Other motor vehicle | |
| 2016-Feb-16, Tue,13:00 | Snow | Rear end | P.D. only | Packed snow | West | Slowing or stopping | Pick-up truck | Other motor vehicle | 0 |
| | | | | | West | Stopped | Passenger van | Other motor vehicle | |
| 2016-Feb-19, Fri,08:40 | Clear | Rear end | P.D. only | Ice | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Stopped | Pick-up truck | Other motor vehicle | |
| 2016-Feb-23, Tue,12:31 | Clear | Rear end | P.D. only | Dry | East | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2016-Mar-10, Thu,15:54 | Clear | Rear end | Non-fatal injury | Wet | West | Going ahead | Truck - tank | Other motor vehicle | 0 |
| | | | | | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle | |
| 2016-Mar-29, Tue,18:15 | Clear | Sideswipe | P.D. only | Dry | North | Turning left | Unknown | Other motor vehicle | 0 |
| | | | | | North | Turning left | Pick-up truck | Other motor vehicle | |
| 2016-Apr-02, Sat,13:38 | Clear | Rear end | P.D. only | Wet | North | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Turning right | Pick-up truck | Other motor vehicle | |
| 2016-Apr-19, Tue,16:43 | Clear | Rear end | P.D. only | Dry | West | Going ahead | Passenger van | Other motor vehicle | 0 |
| | | | | | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle | |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CONROY RD @ WALKLEY RD

**Traffic Control:** Traffic signal **Total Collisions:** 72

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2016-Jun-02, Thu,18:38 | Clear | Turning movement | P.D. only | Dry | West | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2016-Jul-18, Mon,15:58 | Clear | Turning movement | Non-fatal injury | Dry | West | Turning left | Police vehicle | Other motor vehicle | 0 |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2016-Jul-22, Fri,08:50 | Clear | Turning movement | P.D. only | Dry | West | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2016-Sep-26, Mon,15:48 | Clear | Rear end | P.D. only | Dry | West | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2016-Oct-11, Tue,01:58 | Clear | Sideswipe | P.D. only | Dry | North | Overtaking | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Turning right | Pick-up truck | Other motor vehicle | |
| 2016-Oct-27, Thu,17:45 | Snow | Rear end | P.D. only | Wet | East | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2016-Nov-04, Fri,17:07 | Clear | Rear end | Non-fatal injury | Dry | West | Going ahead | Pick-up truck | Other motor vehicle | 0 |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2016-Dec-06, Tue,10:30 | Clear | Sideswipe | P.D. only | Wet | West | Changing lanes | Pick-up truck | Other motor vehicle | 0 |
| | | | | | West | Turning left | Tow truck | Other motor vehicle | |
| 2016-Dec-07, Wed,07:35 | Snow | Rear end | P.D. only | Slush | North | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Stopped | Automobile, station wagon | Other motor vehicle | |
| | | | | | North | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2016-Dec-19, Mon,06:27 | Clear | Angle | P.D. only | Packed snow | East | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2017-Jan-26, Thu,10:41 | Snow | Rear end | P.D. only | Wet | East | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CONROY RD @ WALKLEY RD

**Traffic Control:** Traffic signal **Total Collisions:** 72

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2017-Apr-25, Tue,08:16 | Clear | Rear end | P.D. only | Dry | North | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Turning right | Pick-up truck | Other motor vehicle | |
| 2017-May-11, Thu,16:15 | Clear | Sideswipe | P.D. only | Dry | West | Changing lanes | Pick-up truck | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Passenger van | Other motor vehicle | |
| 2017-Jun-04, Sun,19:14 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2017-Jun-12, Mon,19:30 | Clear | Rear end | P.D. only | Dry | East | Unknown | Unknown | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2017-Jun-15, Thu,18:43 | Clear | Rear end | Non-fatal injury | Dry | East | Going ahead | Passenger van | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2017-Jun-22, Thu,17:14 | Clear | Sideswipe | P.D. only | Dry | East | Changing lanes | Passenger van | Other motor vehicle | 0 |
| | | | | | East | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2017-Jul-06, Thu,16:25 | Clear | Rear end | P.D. only | Dry | North | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2017-Sep-05, Tue,08:21 | Clear | Rear end | Non-fatal injury | Wet | North | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2017-Sep-26, Tue,13:25 | Clear | Rear end | P.D. only | Dry | North | Turning right | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | North | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2017-Oct-11, Wed,16:09 | Clear | Rear end | P.D. only | Dry | North | Going ahead | Passenger van | Other motor vehicle | 0 |
| | | | | | North | Turning right | Automobile, station wagon | Other motor vehicle | |
| 2017-Nov-08, Wed,15:15 | Clear | Rear end | P.D. only | Dry | East | Turning right | Pick-up truck | Other motor vehicle | 0 |
| | | | | | East | Turning right | Pick-up truck | Other motor vehicle | |
| 2017-Dec-23, Sat,14:25 | Snow | Rear end | P.D. only | Loose snow | East | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** CONROY RD @ WALKLEY RD

**Traffic Control:** Traffic signal **Total Collisions:** 72

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2018-Jan-09, Tue,17:40 | Clear | Rear end | P.D. only | Slush | East | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Slowing or stopping | Automobile, station wagon | Other motor vehicle | |
| 2018-Jan-26, Fri,12:20 | Clear | Sideswipe | P.D. only | Dry | West | Changing lanes | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Feb-11, Sun,14:18 | Rain | Turning movement | P.D. only | Wet | East | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2018-Feb-14, Wed,09:31 | Clear | Rear end | P.D. only | Wet | West | Going ahead | Automobile, station wagon | Skidding/sliding | 0 |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2018-Apr-23, Mon,16:31 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Passenger van | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2018-May-15, Tue,08:56 | Clear | Sideswipe | P.D. only | Dry | West | Changing lanes | Pick-up truck | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-May-17, Thu,15:00 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2018-May-29, Tue,08:48 | Clear | Other | P.D. only | Dry | West | Reversing | School bus | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2018-Jun-25, Mon,15:50 | Clear | Rear end | P.D. only | Dry | West | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2018-Oct-03, Wed,07:44 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2018-Nov-11, Sun,07:45 | Clear | Angle | P.D. only | Dry | North | Making "U" turn | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Nov-22, Thu,11:15 | Clear | Rear end | P.D. only | Dry | North | Turning right | Pick-up truck | Other motor vehicle | 0 |
| | | | | | North | Turning right | Automobile, station wagon | Other motor vehicle | |

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** HARDING RD @ WALKLEY RD

**Traffic Control:** Traffic signal **Total Collisions:** 33

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2014-Mar-03, Mon,17:18 | Clear | Turning movement | P.D. only | Dry | West | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Turning left | Automobile, station wagon | Other motor vehicle | |
| 2014-Jun-13, Fri,08:10 | Rain | SMV other | P.D. only | Wet | South | Going ahead | Automobile, station wagon | Curb | 0 |
| 2014-Sep-12, Fri,14:50 | Clear | Rear end | P.D. only | Dry | East | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Stopped | Pick-up truck | Other motor vehicle | |
| 2014-Oct-24, Fri,13:45 | Clear | Rear end | P.D. only | Dry | West | Going ahead | Pick-up truck | Other motor vehicle | 0 |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2014-Nov-01, Sat,23:21 | Clear | Angle | P.D. only | Dry | East | Going ahead | Bicycle | Other motor vehicle | 0 |
| | | | | | South | Turning right | School bus | Cyclist | |
| 2014-Nov-20, Thu,09:59 | Clear | Angle | P.D. only | Wet | West | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | South | Turning left | Pick-up truck | Other motor vehicle | |
| 2014-Dec-03, Wed,20:05 | Rain | Rear end | P.D. only | Ice | East | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2015-Jan-05, Mon,15:30 | Clear | Rear end | P.D. only | Ice | South | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | South | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2015-Jan-18, Sun,18:08 | Clear | Angle | Non-fatal injury | Wet | West | Going ahead | Passenger van | Other motor vehicle | 0 |
| | | | | | South | Turning left | Pick-up truck | Other motor vehicle | |
| 2015-Jan-30, Fri,10:59 | Clear | Rear end | P.D. only | Loose snow | West | Going ahead | Bus (other) | Other motor vehicle | 0 |
| | | | | | West | Slowing or stopping | Pick-up truck | Other motor vehicle | |
| 2015-Feb-03, Tue,13:44 | Clear | SMV other | P.D. only | Loose snow | East | Going ahead | Automobile, station wagon | Ran off road | 0 |
| 2015-Jul-29, Wed,10:30 | Clear | Rear end | P.D. only | Dry | West | Slowing or stopping | Truck and trailer | Other motor vehicle | 0 |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle | |

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** HARDING RD @ WALKLEY RD

**Traffic Control:** Traffic signal **Total Collisions:** 33

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2015-Aug-25, Tue,08:55 | Clear | Turning movement | P.D. only | Dry | East | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2015-Sep-19, Sat,18:21 | Clear | Sideswipe | P.D. only | Dry | East | Changing lanes | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2016-Mar-17, Thu,12:09 | Clear | Sideswipe | P.D. only | Wet | West | Changing lanes | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2016-Apr-04, Mon,08:51 | Clear | Rear end | P.D. only | Dry | West | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Pick-up truck | Other motor vehicle | |
| 2016-Apr-08, Fri,16:23 | Clear | Turning movement | P.D. only | Wet | East | Turning left | Passenger van | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2016-May-18, Wed,15:14 | Clear | Rear end | P.D. only | Dry | West | Slowing or stopping | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2016-Jun-17, Fri,18:53 | Clear | Turning movement | P.D. only | Dry | West | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2016-Aug-23, Tue,15:17 | Clear | Turning movement | P.D. only | Dry | East | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2016-Sep-20, Tue,08:48 | Clear | Angle | Non-fatal injury | Dry | East | Going ahead | Bicycle | Other motor vehicle | 0 |
| | | | | | South | Turning right | Passenger van | Cyclist | |
| 2017-Apr-12, Wed,13:17 | Clear | Angle | Non-fatal injury | Dry | East | Going ahead | Pick-up truck | Other motor vehicle | 0 |
| | | | | | South | Going ahead | Passenger van | Other motor vehicle | |
| 2017-Jun-30, Fri,17:05 | Clear | Turning movement | Non-fatal injury | Dry | East | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Pick-up truck | Other motor vehicle | |

# Transportation Services - Traffic Services

## Collision Details Report - Public Version

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

**Location:** HARDING RD @ WALKLEY RD

**Traffic Control:** Traffic signal **Total Collisions:** 33

| Date/Day/Time | Environment | Impact Type | Classification | Surface Cond'n | Veh. Dir | Vehicle Manoeuver | Vehicle type | First Event | No. Ped |
|---|---|---|---|---|---|---|---|---|---|
| 2017-Jul-25, Tue,14:45 | Clear | Rear end | Non-fatal injury | Dry | East | Going ahead | Unknown | Other motor vehicle | 0 |
| | | | | | East | Slowing or stopping | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2017-Jul-31, Mon,08:34 | Clear | Angle | Non-fatal injury | Dry | South | Turning right | Automobile, station wagon | Cyclist | 0 |
| | | | | | West | Going ahead | Bicycle | Other motor vehicle | |
| 2017-Sep-12, Tue,15:56 | Clear | Turning movement | P.D. only | Dry | West | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Jan-24, Wed,19:49 | Clear | Turning movement | P.D. only | Dry | East | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Feb-07, Wed,15:56 | Snow | Rear end | P.D. only | Loose snow | East | Going ahead | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2018-Mar-14, Wed,09:13 | Snow | Turning movement | P.D. only | Loose snow | West | Turning left | Passenger van | Other motor vehicle | 0 |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Mar-14, Wed,22:36 | Snow | Rear end | P.D. only | Wet | West | Going ahead | Passenger van | Other motor vehicle | 0 |
| | | | | | West | Stopped | Automobile, station wagon | Other motor vehicle | |
| 2018-Jul-16, Mon,14:23 | Clear | Turning movement | P.D. only | Dry | East | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Aug-09, Thu,13:16 | Clear | Turning movement | Non-fatal injury | Dry | West | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | East | Going ahead | Automobile, station wagon | Other motor vehicle | |
| 2018-Dec-05, Wed,14:33 | Snow | Turning movement | Non-fatal injury | Loose snow | East | Turning left | Automobile, station wagon | Other motor vehicle | 0 |
| | | | | | West | Going ahead | Automobile, station wagon | Other motor vehicle | |

# APPENDIX F

Excerpts from Relevant Traffic Studies

Through discussions with City of Ottawa staff, the following intersections were identified as part of the study area:

1. Walkley Road at Don Reid Drive / Ryder Street;
2. Walkley Road at Conroy Road;
3. Conroy Road at St Laurent Blvd; and
4. St Laurent Blvd at the proposed site access (north) and existing site access (south).

## 2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The subject site is located in the Alta Vista District of the City of Ottawa at the northwest quadrant of the St Laurent Blvd. / Conroy Road intersection.

The proposed development consists of 6,329.86 $m^2$ of office space within two, two-story buildings. It is proposed to include a total of 18 office units, 169 parking spaces, 2 loading areas, and 20 bicycle parking spaces.

**Figure 1** illustrates the location of the site at 2500 St Laurent Blvd.

**Attachment 1** illustrates the site plan.

**Reference: 2500 St Laurent Blvd Transportation Brief**

## Figure 1 - Site Location

As outlined in **Table 1**, all study area intersections currently operate acceptably under 2017 existing conditions during both the AM and PM peak hours.

# 4.0 FUTURE TRANSPORTATION ENVIRONMENT

## 4.1 CYCLING AND WALKING FACILITIES

The City of Ottawa's Cycling Plan Ultimate Cycling Network identifies Walkley Road as a spine route as part of the crosstown bikeway network. The City's Ultimate Cycling Network also designates St Laurent Blvd. to be a "local route". No other cycling or walking facilities are planned in the vicinity of the site.

## 4.2 SITE TRAFFIC GENERATION

### 4.2.1 Land Use and Trip Generation Rates

The Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition, was used to estimate the volume of traffic expected to be generated by the proposed development during the AM and PM peak hours. Land use code 710 – General Office Building was thought to be the most representative of the proposed land use.

**Table 2** summarizes the trip rates obtained from the ITE Trip Generation Manual and the ensuing sections describe the methodology used to convert these trips to person trips across all modes.

**Table 2 - ITE Trip Generation Rates**

| ITE TRIP GENERATION RATES | | | | | | | |
|---|---|---|---|---|---|---|---|
| Land Use Code | 1000 Sq. Ft Gross Floor Area | AM Peak Hour | | | PM Peak Hour | | |
| | | Inbound | Outbound | Rate | Inbound | Outbound | Total |
| 710 - General Office Building | 39 | 88% | 12% | 2.31 | 17% | 83% | 3.13 |

### 4.2.2 Conversion of ITE Rates to Person Trips

The notion of quantifying the volume of "person" trips expected to be generated by a given development is becoming a commonly accepted practice. It is aimed at quantifying the expected demands across the primary modes of transportation.

In order to convert ITE rates to person trips, the rates obtained from the ITE Trip Generation Manual were adjusted to account for the transit modal share and auto occupancy thought to be inherent within the ITE rates. An assumed transit share of 10% was thought to be inherent within the ITE rates and an auto occupancy rate of 1.15 persons per vehicle was also assumed to be inherent within the ITE rates.

The proposed development is anticipated to generate 113 and 152 person trips during the AM and PM peak hours, respectively.

Table 3 outlines the conversion from auto trips to person trips.

**Table 3 - Conversion from Auto Trips to Person Trips**

| ITE LAND USE | | | MORNING PEAK HOUR | | | AFTERNOON PEAK HOUR | | |
|---|---|---|---|---|---|---|---|---|
| | | | IN | OUT | TOTAL | IN | OUT | TOTAL |
| 710 - General Office Building | Trip Gen | | 79 | 11 | 90 | 21 | 101 | 122 |
| | Transit Share | 10% | 8 | 1 | 9 | 2 | 10 | 12 |
| | Auto Occupancy | 1.15 | 12 | 2 | 14 | 3 | 15 | 18 |
| | Total Person Trips | | 99 | 14 | 113 | 26 | 126 | 152 |

### 4.2.3 Modal Shares

To reflect local travel characteristics, the person trips were assigned to the four primary modal shares (i.e. auto, passenger, transit, and active moves) according to the TRANS Committee's 2011 Origin-Destination (O-D) Survey for the Alta Vista District.

Table 4 summarizes the expected person trips by modal share.

**Table 4 - Site Trips by Modal Share**

| ITE LAND USE | | | MORNING PEAK HOUR | | | AFTERNOON PEAK HOUR | | |
|---|---|---|---|---|---|---|---|---|
| | | | IN | OUT | TOTAL | IN | OUT | TOTAL |
| 710 - General Office Building | Auto | 65% | 65 | 9 | 72 | 17 | 82 | 99 |
| | Passenger | 15% | 15 | 2 | 17 | 3 | 19 | 22 |
| | Transit | 17% | 17 | 2 | 19 | 4 | 21 | 25 |
| | Active Modes | 3% | 3 | 0 | 3 | 1 | 4 | 5 |

The proposed development is anticipated to generate an additional 72 and 99 auto trips (two-way) during the AM and PM peak hours, respectively.

### 4.2.4 Trip Distribution and Assignment

Based on the location of the study area and the results of the TRANS Committee 2011 O-D Survey, the following cardinal trip distribution assumptions were adopted:

- 20% of site generated trips were assumed to come from or go to the south;
- 15% were assumed to come from or go to the west;
- 15% were assumed to come from or go to the east;
- 20% were assumed to come from or go to the north; and
- 30% were assumed to remain within the Alta Vista district.

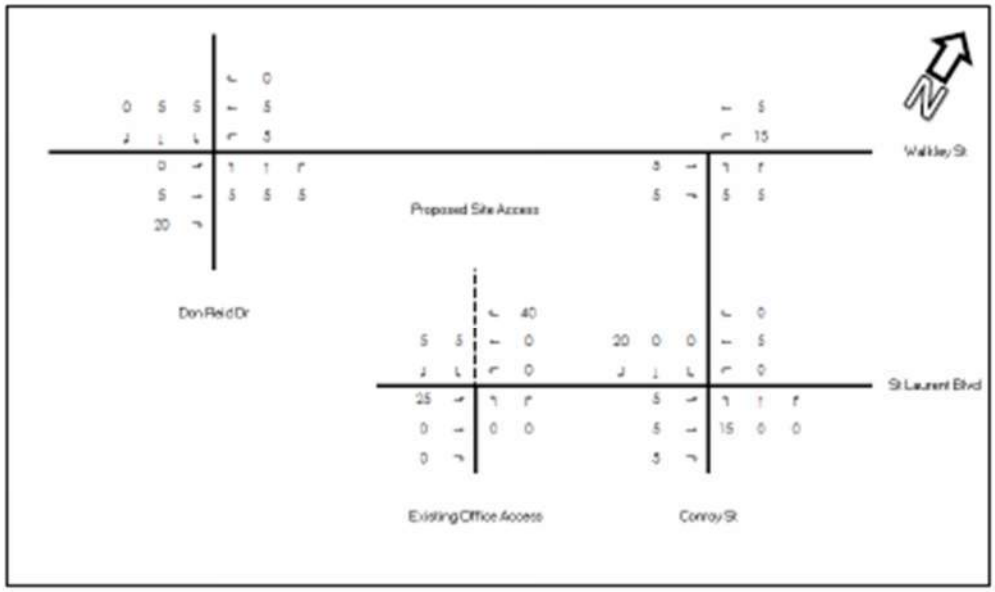
The following trip assignments were assumed:

- 40% of inbound/outbound trips would utilize the Walkley/Don Reid intersection; and
- 60% of inbound/outbound trips would utilize the St Laurent Blvd at Conroy Road intersection.

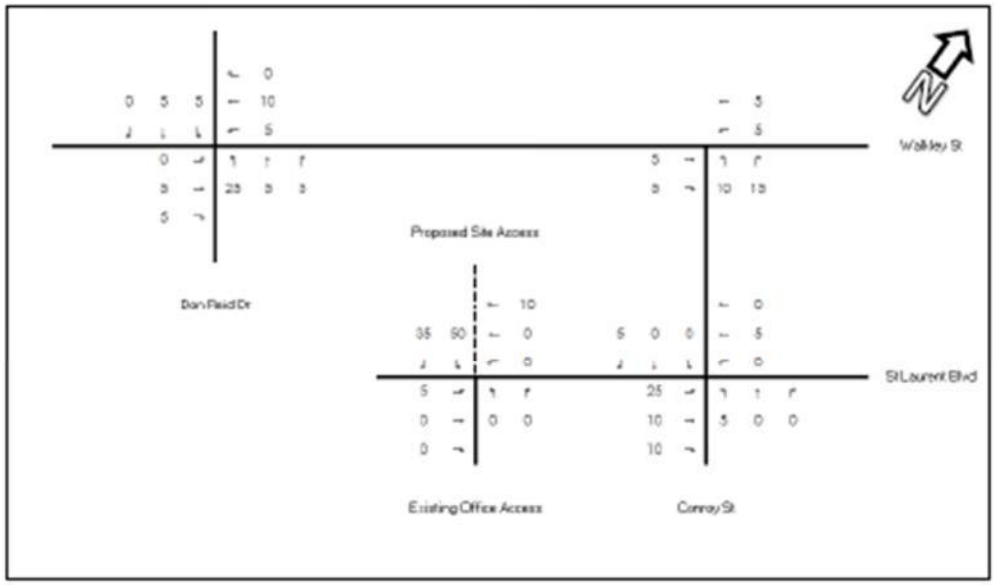
**Figure 7** and **Figure 8** illustrate the auto trips the proposed development is anticipated to generate during the AM and PM peak hours, respectively.

**Reference: 2500 St Laurent Blvd Transportation Brief**

## Figure 7 - Auto Trips Generated at the Site during AM Peak Period




## Figure 8 - Auto Trips generated at the Site during PM Peak Period



# 3.0 Forecasting

## 3.1 Development-Generated Travel Demand

### 3.1.1 Trip Generation and Mode Shares

The proposed new development is comprised entirely of high-rise apartment units within a single tower. Since the proposed development will be similar to the existing adjacent development, Dillon used the existing development as a proxy to estimate trip generation for the proposed development. Dillon compared the observed trip generation rate against the City's recommended method for trip generation calculations, the TRANS *Trip Generation Study Report (2009).*

**Table 4** compares the TRANS vehicle trip rates to the observed trip generation rates. The TRANS vehicle trip rates are slightly higher than those observed at the site. The TRANS Trip Rates have been carried forward as the basis for the proposed site trip generation.

**Table 4: Existing Site Trip Generation Rates**

| Source | Existing No. of Units | Peak Hour | In | | Out | | Total | |
|---|---|---|---|---|---|---|---|---|
| | | | Trips | Rate | Trips | Rate | Trips | Rate |
| Observed Trip Generation Rate | 410 | AM | 19 | 0.05 | 63 | 0.16 | 82 | 0.21 |
| | | PM | 64 | 0.17 | 23 | 0.06 | 87 | 0.22 |
| TRANS Trip Rate | 410 | AM | - | - | - | - | 98 | 0.24 |
| | | PM | - | - | - | - | 111 | 0.27 |

**Table 5** summarizes the trip generation rates and directional trip distribution as indicated within TRANS Tables 3.18 and 6.2, respectively. **Table 6** summarizes the number of trip generation for the proposed development.

**Table 5: Proposed Development Vehicle Trip Generation Rates**

| Land Use | Units | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Rate | In | Out | Rate | In | Out |
| 222: High-rise apartment 10+ floors | 202 | 0.24 | 23% | 77% | 0.27 | 61% | 39% |

**Table 6: Proposed Development Vehicle Trip Generation Traffic Volumes**

| Land Use | Units | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | Total | In | Out | Total | In | Out |
| 222: High-rise apartment 10+ floors | 202 | 48 | 11 | 37 | 54 | 33 | 21 |

Walkley Road is designated as a future Bus Rapid Transit (BRT) corridor, but this corridor will not be completed within the time horizon of this study. Within this studies horizon, it is anticipated the mode shares will remain relatively constant. Therefore we have assumed a mode share consistent with the mode shares outlined in TRANS Table 3.13.

**Table 7** summarizes the trip generation by mode for the proposed development; person trips are calculated using the vehicle trip generation values and the mode share rates, i.e. total person trips = 48 auto driver trips / (divide by) 37% auto driver mode share = 129 person trips.

**Table 7: Trip Generation by Mode**

| Travel Mode | Mode Share for Apartment in Urban Area (TRANS Table 3.13) | | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|---|
| | AM | PM | Total | In | Out | Total | In | Out |
| Auto Driver | 37% | 40% | 48 | 11 | 37 | 54 | 33 | 21 |
| Auto Passenger | 8% | 9% | 10 | 2 | 8 | 12 | 7 | 5 |
| Transit | 41% | 37% | 53 | 12 | 41 | 50 | 30 | 20 |
| Non-Motorized | 14% | 14% | 18 | 4 | 14 | 19 | 12 | 7 |
| **Total Person Trips** | **100%** | **100%** | **129** | **29** | **100** | **135** | **82** | **53** |

As a residential development, this site will not be generating any pass-by trips. **Appendix B** contains the TRANS Tables used for these calculations.

### 3.1.2 Trip Distribution

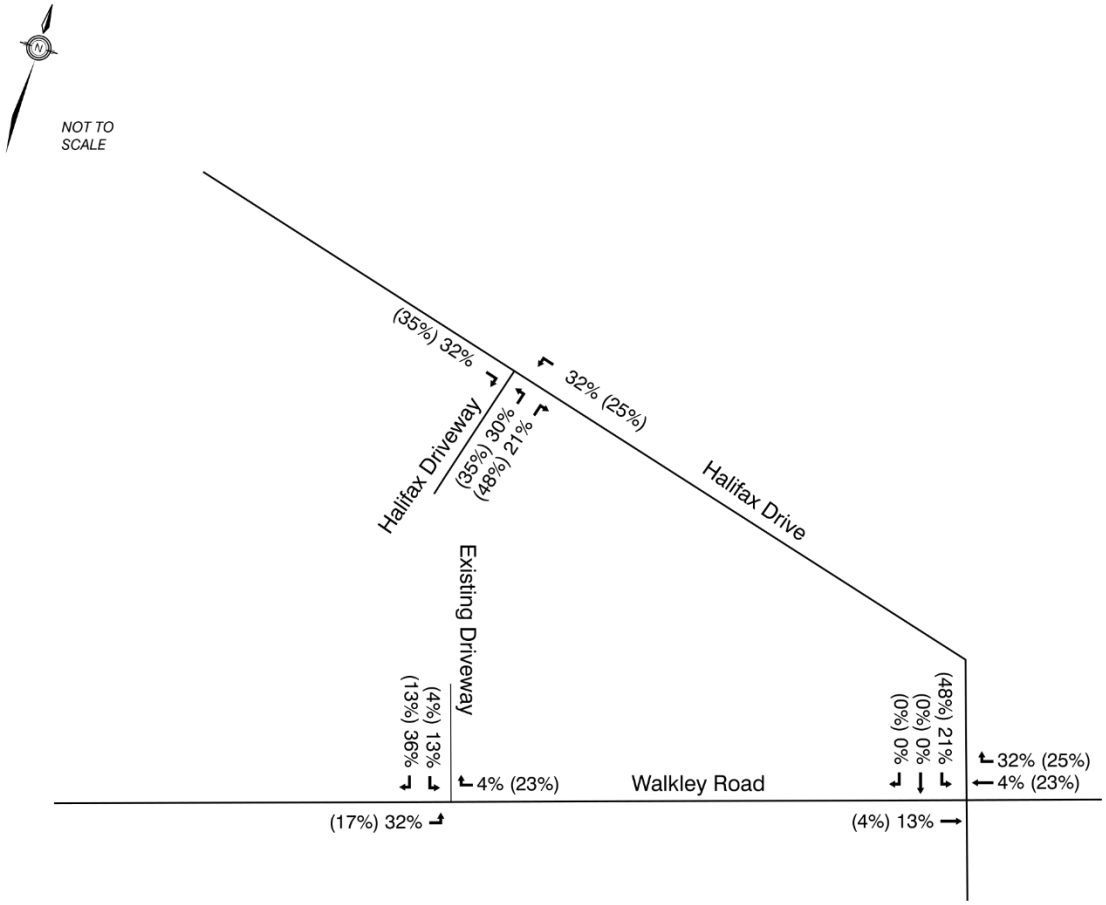
Trip distribution was identified based on the existing distribution of traffic to/from the existing site, which was determined through a review of the existing traffic counts.

### 3.1.3 Trip Assignment

**Figure 11** illustrates the site generated traffic assignment to the road network based on the trip distribution and logical routing through the transportation network.

**Figure 12** illustrates the site generated traffic volumes.

## Figure 11: Site Generated Traffic Assignment Percentages



## Figure 12: Site Generated Traffic Volumes

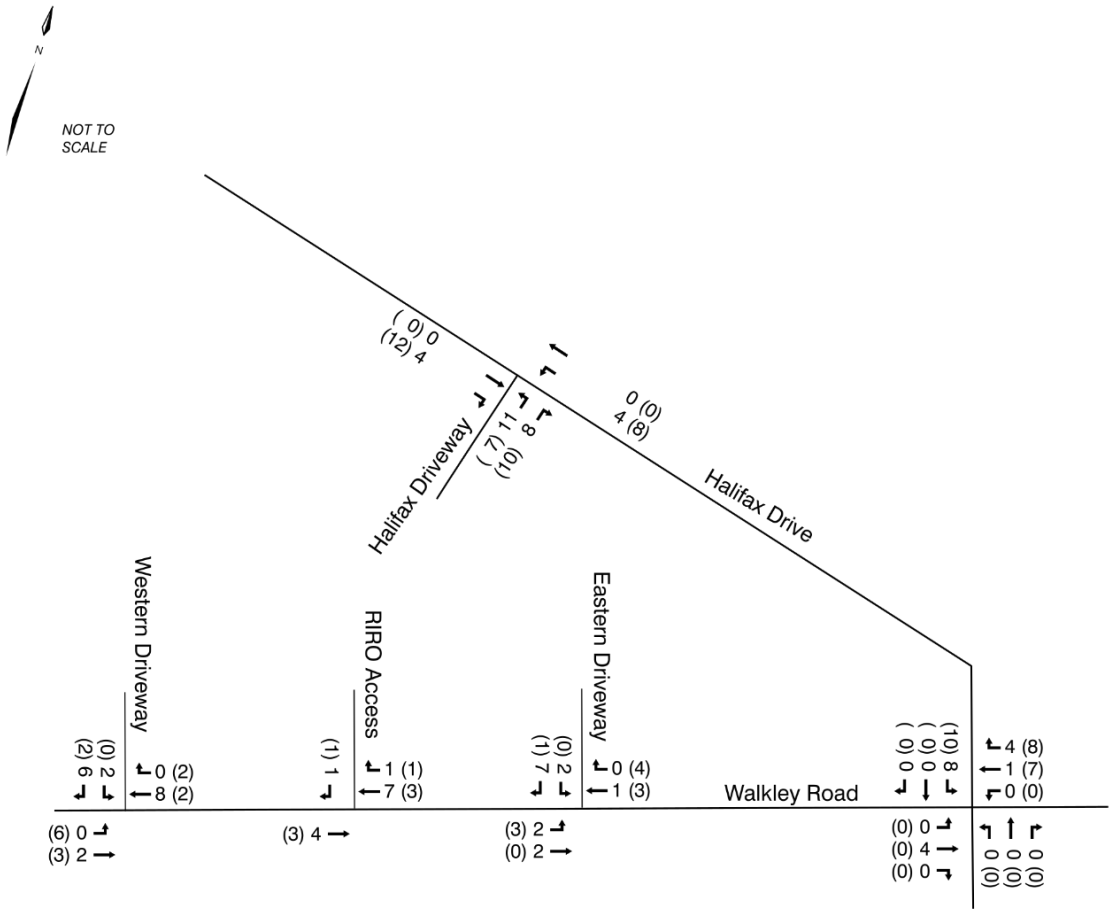


*Table 12: Trip Generation Person Trip Rates*

| Dwelling Type | Land Use Code | Peak Hour | Vehicle Trip Rate | Person Trip Rates |
|---|---|---|---|---|
| **Townhomes** | 221 | AM | 0.31 | 0.84 |
| | | PM | 0.34 | 0.85 |
| **Mid-rise Apartment** | 223 | AM | 0.24 | 0.65 |
| | | PM | 0.28 | 0.70 |
| **High-rise Apartment** | 222 | AM | 0.24 | 0.65 |
| | | PM | 0.27 | 0.68 |

Using the above Person Trip rates, the total person trip generation has been estimates. Table 13 below illustrates the total person trip generation for the redeveloping townhome (low rise), mid-rise apartment and high-rise apartment dwelling type. All mid-rise and high-rise units are considered single bedroom units for the Official Plan Amendment assessment. Of note, the entire Heron Gate area will total 6,402 units in the Official Plan Amendment, with the background 348 units at 2816 Sandalwood Drive, and existing 957 units at 2840, 2851, and 2861 Baycrest Drive and 2820 Cedarwood Drive. The trips from these sites are existing conditions and assessed within the background conditions.

*Table 13: Total Person Trip Generation*

| Land Use | Units / GFA | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | In | Out | Total | In | Out | Total |
| **Townhomes** | 118 | 86 | 148 | 234 | 105 | 93 | 198 |
| **Mid-rise Apartment** | 2,047 | 319 | 1011 | 1330 | 888 | 545 | 1433 |
| **High-rise Apartment** | 2,874 | 449 | 1418 | 1867 | 1211 | 742 | 1953 |
| **Total Person Trips** | | **854** | **2577** | **3431** | **2204** | **1380** | **3584** |

Using the most recent National Capital Region Origin-Destination survey (OD Survey), the existing mode shares for Alta Vista have been determined and compared to various modes share breakdowns identified by City Staff as potential interpretations of the data. Table 14 summarizes these modal shares.

*Table 14: Mode Shares*

| Travel Mode | Alta Vista (average) | Alta Vista (AM from/within) | Alta Vista (PM to/within) | BRT Area |
|---|---|---|---|---|
| **Auto Driver** | 60% | 50% | 55% | 35% |
| **Auto Passenger** | 15% | 15% | 15% | 15% |
| **Transit** | 20% | 20% | 15% | 35% |
| **Cycling** | 0% | 5% | 5% | 5% |
| **Walking** | 5% | 10% | 10% | 10% |
| **Total** | 100% | 100% | 100% | 100% |

As Heron Road is planned to include dedicated bus lanes, the above mode share targets for a BRT area and person trip rates, the person trips by mode have been projected. Table 15 summarizes the trip generation by mode for each phase of the Heron Gate redevelopment.

*Table 15: Trip Generation by Mode*

| Travel Mode | Mode Share | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | In | Out | Total | In | Out | Total |
| **Phase 2** | | | | | | | |
| **Auto Driver** | 35% | 43 | 136 | 179 | 118 | 72 | 191 |
| **Auto Passenger** | 15% | 19 | 58 | 77 | 51 | 31 | 81 |
| **Transit** | 35% | 43 | 136 | 179 | 118 | 72 | 191 |
| **Cycling** | 5% | 7 | 19 | 26 | 17 | 10 | 27 |

| Travel Mode | Mode Share | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | In | Out | Total | In | Out | Total |
| **Walking** | 10% | 12 | 39 | 51 | 34 | 20 | 54 |
| **Total** | **100%** | **123** | **389** | **512** | **338** | **207** | **545** |
| **Phase 3** | | | | | | | |
| **Auto Driver** | 35% | 66 | 183 | 250 | 154 | 101 | 255 |
| **Auto Passenger** | 15% | 28 | 79 | 107 | 67 | 43 | 109 |
| **Transit** | 35% | 66 | 183 | 250 | 154 | 101 | 255 |
| **Cycling** | 5% | 9 | 26 | 36 | 22 | 14 | 37 |
| **Walking** | 10% | 19 | 52 | 72 | 44 | 29 | 72 |
| **Total** | **100%** | **189** | **524** | **713** | **441** | **286** | **727** |
| **Phase 4** | | | | | | | |
| **Auto Driver** | 35% | 38 | 120 | 158 | 104 | 64 | 168 |
| **Auto Passenger** | 15% | 16 | 52 | 68 | 45 | 28 | 71 |
| **Transit** | 35% | 38 | 120 | 158 | 104 | 64 | 168 |
| **Cycling** | 5% | 5 | 17 | 22 | 15 | 9 | 24 |
| **Walking** | 10% | 11 | 34 | 45 | 30 | 19 | 48 |
| **Total** | **100%** | **108** | **345** | **453** | **297** | **182** | **479** |
| **Phase 5** | | | | | | | |
| **Auto Driver** | 35% | 69 | 217 | 285 | 187 | 115 | 302 |
| **Auto Passenger** | 15% | 29 | 93 | 123 | 80 | 49 | 129 |
| **Transit** | 35% | 69 | 217 | 285 | 187 | 115 | 302 |
| **Cycling** | 5% | 10 | 31 | 41 | 27 | 16 | 43 |
| **Walking** | 10% | 19 | 62 | 81 | 53 | 33 | 86 |
| **Total** | **100%** | **196** | **619** | **815** | **534** | **328** | **862** |
| **Phase 6** | | | | | | | |
| **Auto Driver** | 35% | 83 | 245 | 328 | 208 | 132 | 340 |
| **Auto Passenger** | 15% | 37 | 106 | 140 | 89 | 57 | 146 |
| **Transit** | 35% | 83 | 245 | 328 | 208 | 132 | 340 |
| **Cycling** | 5% | 12 | 35 | 47 | 30 | 19 | 48 |
| **Walking** | 10% | 24 | 70 | 94 | 60 | 38 | 98 |
| **Total** | **100%** | **238** | **700** | **938** | **594** | **377** | **971** |

Based on the assumed build-out phasing, Phases 2, 3 and 4 are anticipated to be completed by 2030 and the full build-out by 2040. Table 16 summarizes the net new trip generation by mode for both horizons. The conceptual build-out phasing is provided in Appendix E.

*Table 16: Summary of Trip Generation by Mode for Build-Out Horizons*

| Travel Mode | Mode Share | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | In | Out | Total | In | Out | Total |
| **Interim 2030 Build-Out** | | | | | | | |
| **Auto Driver** | 35% | 147 | 439 | 587 | 376 | 237 | 614 |
| **Auto Passenger** | 15% | 63 | 189 | 252 | 163 | 102 | 261 |
| **Transit** | 35% | 147 | 439 | 587 | 376 | 237 | 614 |
| **Cycling** | 5% | 21 | 62 | 84 | 54 | 33 | 88 |
| **Walking** | 10% | 42 | 125 | 168 | 108 | 68 | 174 |
| **Total** | **100%** | **420** | **1258** | **1678** | **1076** | **675** | **1751** |

| Travel Mode | Mode Share | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | In | Out | Total | In | Out | Total |
| **Full 2040 Build-Out** | | | | | | | |
| **Auto Driver** | 35% | 299 | 901 | 1200 | 771 | 484 | 1256 |
| **Auto Passenger** | 15% | 129 | 388 | 515 | 332 | 208 | 536 |
| **Transit** | 35% | 299 | 901 | 1200 | 771 | 484 | 1256 |
| **Cycling** | 5% | 43 | 128 | 172 | 111 | 68 | 179 |
| **Walking** | 10% | 85 | 257 | 343 | 221 | 139 | 358 |
| **Total** | **100%** | **854** | **2577** | **3431** | **2204** | **1380** | **3584** |

## 5.2 Trip Distribution

To understand the travel patterns of the subject development, the OD Survey has been reviewed to determine the travel for the residential component patterns were applied based on the build-out within the Alta Vista area. Table 17 below summarizes the distributions.

*Table 17: OD Survey Distribution – Alta Vista*

| To/From | Residential % of Trips | |
|---|---|---|
| **North** | 35% | 30% via Heron Road east, 5% via Walkley Road west |
| **South** | 25% | 15% via Walkley Road east, 10% via Walkley Road west |
| **East** | 20% | 10% via Walkley Road, 10% via Heron Road |
| **West** | 20% | 10% via Walkley Road, 10% via Heron Road |
| **Total** | 100% | |

## 5.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the Study Area road network. Figure 11 illustrates the new site generated volumes.

The pedestrian and cycling distribution have not been provided at this stage of study given the difficulty of predicting how and where these modes interact with the surrounding road network. In general, the pedestrian travel is considered to be east-west as there is little crossing desire of Heron Road or Walkley Road, and any transit users can access transit within the Heron Gate community and do not need to walk further than Baycrest Drive. For cyclists, the lack of facilities likely encourages the use of the pathway network in the area and avoidance of the existing road network. While not considered within the study, the future improvements to Heron Road and Walkley Road should provide these facilities and encourage cyclists back to these roadways. This can be assessed at the time of the environmental assessment/functional design and implementation of the improved corridors.

Given the above, and the fact that the redevelopment is replacing the existing residential area and not a direct increase to the existing, the existing pedestrian and cycling volumes illustrated in Figure 5 and Figure 6 have been carried forward within the modeling exercise to provide a potential impact of the pedestrian crossing and bike volumes on the study are intersections. These volumes will need to be further assessed at individual site plan application or draft plan of subdivision submissions.

*Figure 11: New 2030 Site Generation Auto Volumes*

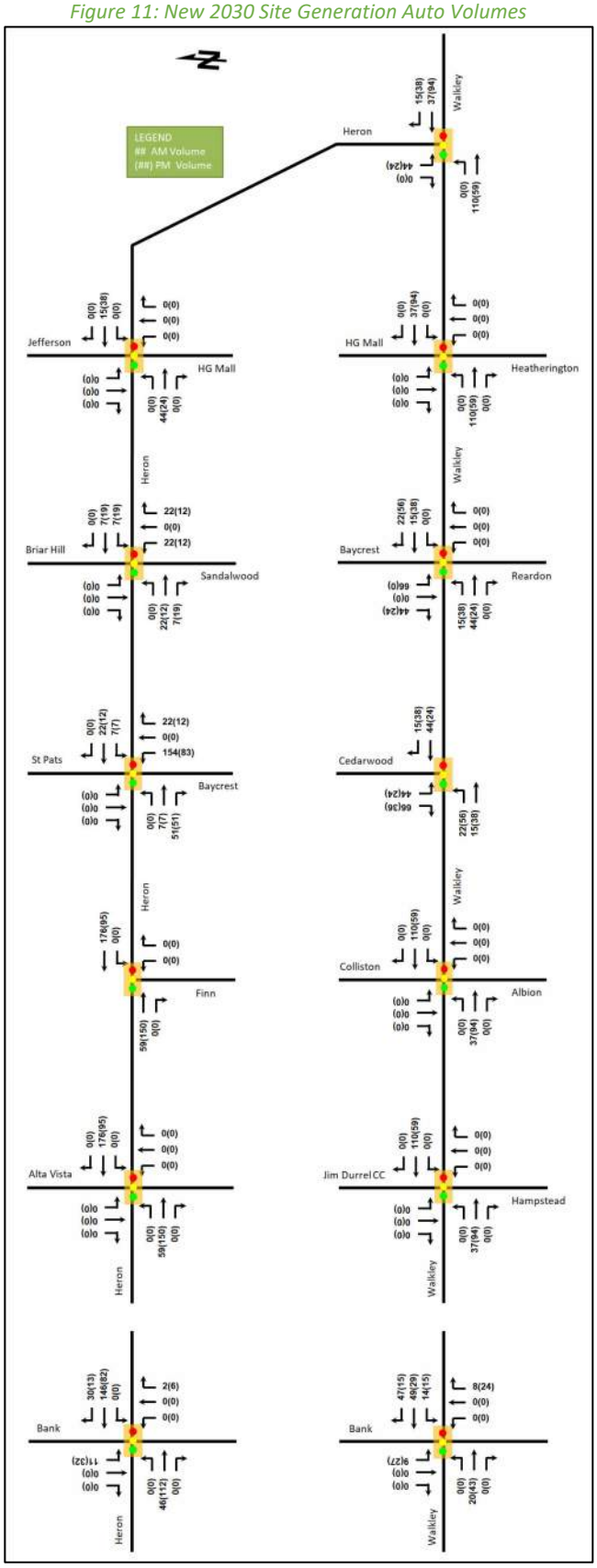
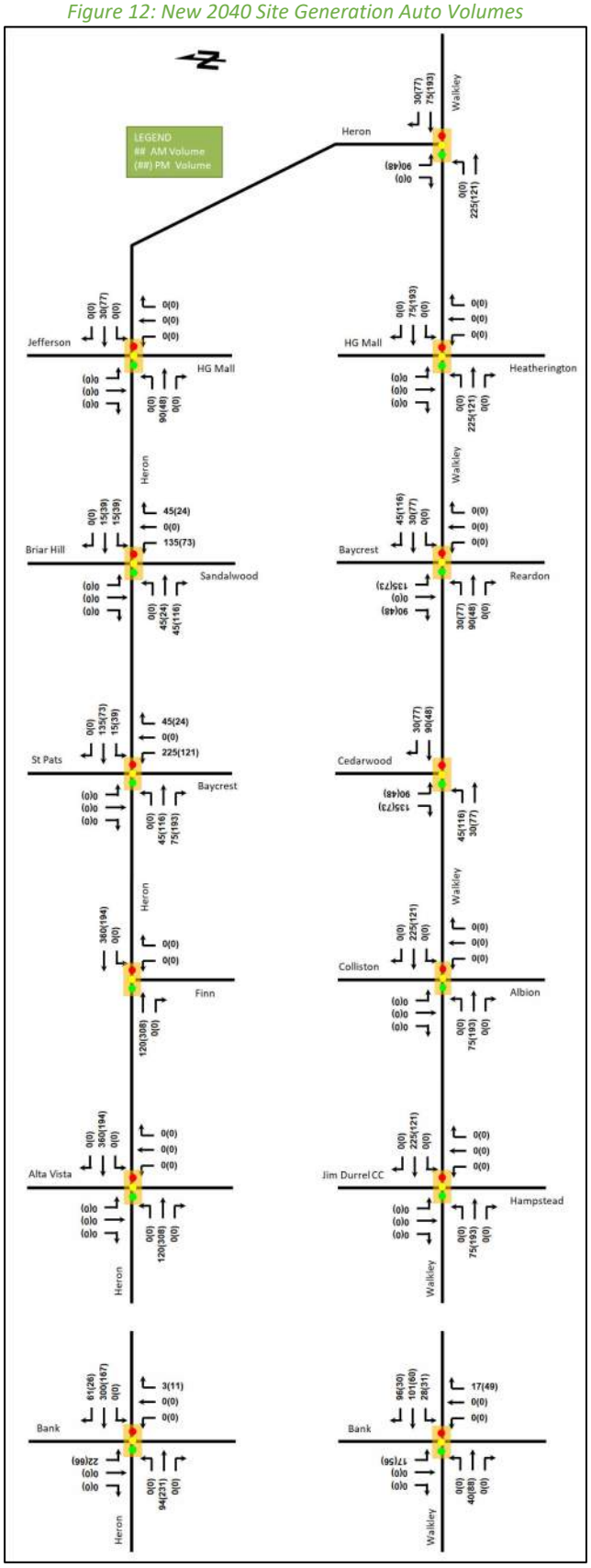


*Figure 12: New 2040 Site Generation Auto Volumes*



# 6 Background Network Travel Demands

## 6.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. The Heron Road BRT is now understood to be beyond the existing 2031 horizon with no confirmed date. Therefore, it is not considered in the future horizons.

The Bank Street Renewal is currently in the design process by the City. The geometric changes, as provided by the City project team, have been incorporated into the analysis. The timing of Alta Vista Drive renewal is unknown and not assessed in the background or future total conditions.

## 6.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the forecasted background growth context for each of the study area roadways. As growth within the City is not a linear process, a comparison of the existing volumes to the forecasted 2031 volumes has been included to determine how regional development has occurred and the impact on the study area. Table 18 summarizes the results of the model, and the projections are provided in Appendix F.

*Table 18: TRANS Regional Model Projections – Study Area Growth Rates (AM Peak)*

| Street | Direction Growth % from 2011 to 2031 | | Direction Growth % from Existing to 2031 | |
|---|---|---|---|---|
| | Eastbound | Westbound | Eastbound | Westbound |
| **Heron** | 0.42% | -0.16% | 0.58% | -1.05% |
| **Heron @ Bank** | 0.31% | -0.32% | -0.44% | -1.32% |
| **Walkley** | 1.43% | 0.52% | -2.09% | -3.35% |
| **Walkley @ Bank** | 1.12% | 0.82% | -1.19% | -3.23% |
| | **Northbound** | **Southbound** | **Northbound** | **Southbound** |
| **Jefferson** | 1.05% | -4.95% | -4.07% | -7.01% |
| **Briar Hill** | -0.27% | -1.04% | 5.65% | 7.42% |
| **Sandalwood** | 2.44% | -0.30% | 5.73% | 6.55% |
| **Baycrest @ Heron** | -0.41% | -0.89% | -2.44% | -6.72% |
| **Baycrest @ Walkley** | 0.57% | -0.51% | 2.97% | 0.14% |
| **Alta Vista** | 1.06% | -1.23% | 1.86% | -4.29% |
| **Heatherington** | 0.40% | -0.28% | 2.28% | 9.73% |
| **Albion** | 0.93% | -3.27% | -2.70% | -8.90% |
| **Bank @ Heron** | 0.20% | 0.18% | -0.12% | -0.60% |
| **Bank @ Walkley** | 0.18% | -0.29% | 0.03% | -1.96% |

In general, the TRANS forecasted volumes illustrate minimal or negative growth rates from 2011 to 2031. When compared to the existing volumes, the background growth in the area has not proceeded in a linear rate. Heron Road and Walkley Road have grown higher than the forecasted volumes and the various intersection roadways have similarly grown higher than the forecasted volumes. Given that roadways have a finite capacity and cannot grow unconstrained, the growth rates from the existing volumes to 2031 will used to generate the study area growth rates. Table 19 summarized the applied growth rates.

*Table 19: Study Area Growth Rates*

| Street | Direction Growth % | |
|---|---|---|
| | **Eastbound** | **Westbound** |
| **Heron** | 0.5%(0%) | 0%(0.5%) |
| **Heron @ Bank** | 0%(0%) | 0%(0%) |
| **Walkley** | | |
| | **Northbound** | **Southbound** |
| **Jefferson** | 0%(0%) | 0%(0%) |
| **Sandalwood** | | |
| **Baycrest** | | |
| **Albion** | | |
| **Bank** | | |
| **Briar Hill** | 5%(5%) | 5%(5%) |
| **Heatherington** | 0.5%(0%) | 0%(0.5%) |
| **Alta Vista** | 1.5%(0%) | 0%(1.5%) |

Format: AM (PM) growth percentage

## 6.3 Background Developments

### 6.3.1 Other Area Developments

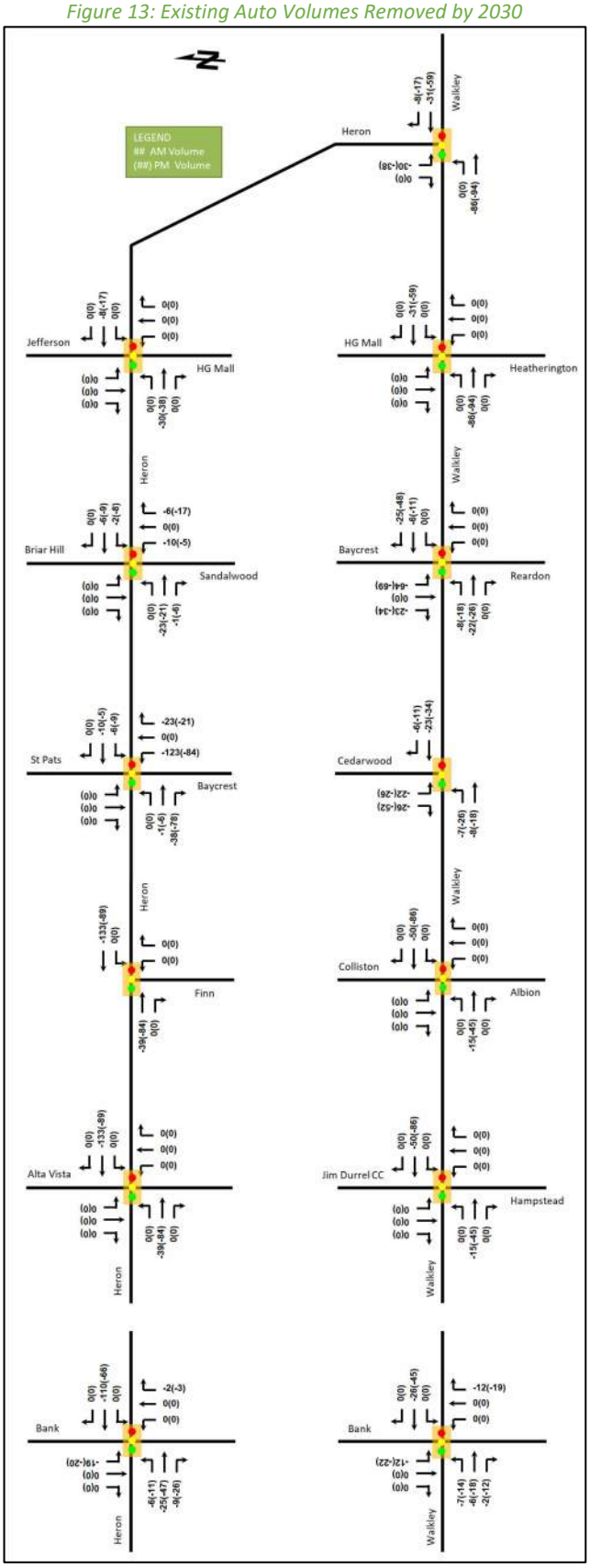
The HG7 redevelopment located at 2816 Sandalwood Drive was completed in the summer of 2020 and the development related trips from this development have been considered explicitly within the future background horizons.

### 6.3.2 Heron Gate Trip Reduction

As the Heron Gate area is redeveloped, the various phases will be demolished in advance of construction. This is illustrated in the phasing plan (Appendix E). The existing traffic for each of these areas will be removed for the interim 2030 and full build-out 2040 horizons, and have been illustrated in Figure 13 and Figure 14.

Of note, the traffic counts used in this study are predominantly 2018, HG 5 was still in place on the south side of Heron Road between Baycrest Drive and Sandalwood Drive. These trips have been removed from the background horizons and future total horizons. Additional traffic surveys were also conducted at the residential towers that will remain in place and have not been removed from the network in any horizon or scenario.

*Figure 13: Existing Auto Volumes Removed by 2030*



# APPENDIX G

Signal Timing Plans

# Traffic Signal Timing

*City of Ottawa, Transportation Services Department*

**Traffic Signal Operations Unit**

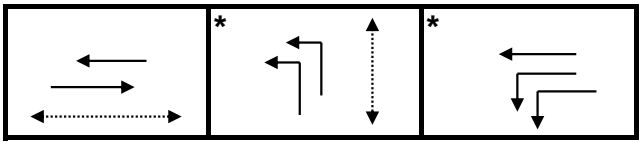
| | | | |
|---|---|---|---|
| **Intersection:** | ***Main:*** Walkley | ***Side:*** | Conroy |
| **Controller:** | **MS3200** | **TSD:** | **5399** |
| **Author:** | B. Amaral-Stewart | **Date:** | 21-Oct-2020 |

## Existing Timing Plans†

| | **Plan** | | | | | | **Ped Minimum Time** | | |
|---|---|---|---|---|---|---|---|---|---|
| | **AM Peak** 1 | **Off Peak** 2 | **PM Peak** 3 | **Night** 4 | **Weekend** 5 | **AM Heavy** 10 | ***Walk*** | ***DW*** | ***A+R*** |
| **Cycle** | 100 | 100 | 110 | 85 | 100 | 120 | | | |
| **Offset** | 90 | 47 | 20 | X | 18 | 43 | | | |
| EB Thru | 44 | 45 | 51 | 36 | 45 | 55 | 10 | 20 | 3.3 + 2.7 |
| WB Thru | 65 | 69 | 79 | 54 | 69 | 67 | 10 | 20 | 3.3 + 2.7 |
| *NB Left (fp)* | 35 | 31 | 31 | 31 | 31 | 40 | 7 | 17 | 3.7 + 2.7 |
| *WB Left (fp)* | 21 | 24 | 28 | 18 | 24 | 25 | - | - | 3.3 + 2.9 |

## Phasing Sequence‡

**Plan: All**




## Schedule

**Weekday**

| Time | Plan |
|---|---|
| 0:15 | 4 |
| 6:30 | 1 |
| 7:00 | 10 |
| 9:30 | 2 |
| 15:00 | 3 |
| 18:30 | 2 |
| 21:30 | 4 |

**Saturday**

| Time | Plan |
|---|---|
| 0:15 | 4 |
| 6:30 | 2 |
| 11:00 | 5 |
| 19:30 | 2 |
| 22:00 | 4 |

**Sunday**

| Time | Plan |
|---|---|
| 0:15 | 4 |
| 6:30 | 2 |
| 21:00 | 4 |

## Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $58.78 ($52.02 + HST)

# Traffic Signal Timing

*City of Ottawa, Transportation Services Department*

**Traffic Signal Operations Unit**

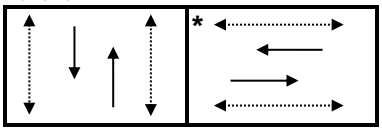
| | | | |
|---|---|---|---|
| **Intersection:** | ***Main:*** Conroy | ***Side:*** | St. Laurent |
| **Controller:** | **ATC 3** | **TSD:** | **5612** |
| **Author:** | B. Amaral-Stewart | **Date:** | 21-Oct-2020 |

## Existing Timing Plans†

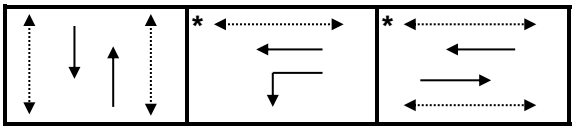
| | **Plan** | | | | | **Ped Minimum Time** | | |
|---|---|---|---|---|---|---|---|---|
| | **AM Peak** 1 | **Off Peak** 2 | **PM Peak** 3 | **Night** 4 | **Weekend** 5 | ***Walk*** | ***DW*** | ***A+R*** |
| **Cycle** | 100 | 90 | 95 | 90 | 90 | | | |
| **Offset** | 23 | 50 | 2 | X | 50 | | | |
| NB Thru | 56 | 46 | 36 | 46 | 46 | 7 | 17 | 3.7 + 2.6 |
| SB Thru | 56 | 46 | 36 | 46 | 46 | 7 | 17 | 3.7 + 2.6 |
| *WB Left* | - | - | 15 | - | - | - | - | 3.3 + 2.4 |
| EB Thru | 44 | 44 | 44 | 44 | 44 | 7 | 30 | 3.3 + 3.6 |
| WB Thru | 44 | 44 | 59 | 44 | 44 | 7 | 30 | 3.3 + 3.6 |

## Phasing Sequence‡

**Plan: 1, 2, 4, 5**




**Plan: 3**




## Schedule

**Weekday**

| Time | Plan |
|---|---|
| 0:15 | 4 |
| 6:30 | 1 |
| 9:30 | 2 |
| 15:00 | 3 |
| 18:30 | 2 |
| 21:30 | 4 |

**Saturday**

| Time | Plan |
|---|---|
| 0:15 | 4 |
| 6:30 | 2 |
| 11:00 | 5 |
| 19:30 | 2 |
| 22:00 | 4 |

**Sunday**

| Time | Plan |
|---|---|
| 0:15 | 4 |
| 6:30 | 2 |
| 21:00 | 4 |

## Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $58.78 ($52.02 + HST)

# Traffic Signal Timing

*City of Ottawa, Transportation Services Department*

**Traffic Signal Operations Unit**

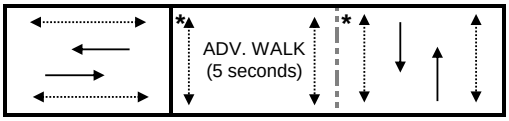
| | | | |
|---|---|---|---|
| **Intersection:** | ***Main:*** Walkley | ***Side:*** | Harding |
| **Controller:** | **MS 3200** | **TSD:** | **5633** |
| **Author:** | B. Amaral-Stewart | **Date:** | 21-Oct-2020 |

## Existing Timing Plans†

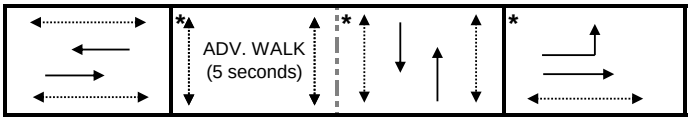
| | **Plan** | | | | | | | **Ped Minimum Time** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Morning** | **Off Peak** | **PM Peak** | **Night** | **Weekend** | **AM Peak** | **Late AM** | ***Walk*** | ***DW*** | ***A+R*** |
| | 1 | 2 | 3 | 4 | 5 | 10 | 11 | | | |
| **Cycle** | 100 | 100 | 110 | 80 | 100 | 120 | 120 | | | |
| **Offset** | 34 | 42 | 41 | X | 62 | 24 | 24 | | | |
| EB Thru | 67 | 67 | 77 | 47 | 67 | 87 | 87 | 32 | 8 | 3.3 + 2.6 |
| WB Thru | 67 | 55 | 61 | 47 | 67 | 87 | 72 | 32 | 8 | 3.3 + 2.6 |
| NB Thru | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 10 | 17 | 3.3 + 2.4 |
| SB Thru | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 10 | 17 | 3.3 + 2.4 |
| *EB Left* | - | 12 | 16 | - | - | - | 15 | - | - | 3.3 + 2.7 |

## Phasing Sequence‡

**Plan: 1, 4, 5, 10**




**Plan: 2, 3, 11**




**Notes:** 1) The EB Left Turn is prohibited weekdays 7:00-9:00
2) The NB Thru is prohibited weekdays 7:00-9:00
3) The EB Left Turn has a maximum green time of 10 seconds

## Schedule

**Weekday**

| Time | Plan |
|---|---|
| 0:15 | 4 |
| 6:30 | 1 |
| 7:00 | 10 |
| 9:00 | 11 |
| 9:30 | 2 |
| 15:00 | 3 |
| 18:30 | 2 |
| 21:30 | 4 |

**Saturday**

| Time | Plan |
|---|---|
| 0:15 | 4 |
| 6:30 | 2 |
| 11:00 | 5 |
| 19:30 | 2 |
| 22:00 | 4 |

**Sunday**

| Time | Plan |
|---|---|
| 0:15 | 4 |
| 6:30 | 2 |
| 21:00 | 4 |

## NOTES

†: Time for each direction includes amber and all red intervals
‡: Start of first phase should be used as reference point for offset
Asterisk (*) Indicates actuated phase
(fp): Fully Protected Left Turn
◄·····► Pedestrian signal

Cost is $58.78 ($52.02 + HST)

# APPENDIX H

Multi-Modal Level of Service

## Segment Level of Service

### Pedestrian Level of Service (PLOS)

| Side | Sidewalk Width | Boulevard Width | Motor Vehicle Traffic Volume (AADT) | Presence of On-Street Parking | Operating Speed | Segment PLOS |
|---|---|---|---|---|---|---|
| **Walkley Road** | | | | | | |
| North | 2 | 0 | > 3,000 vpd | No | 60 km/h | E |
| South | 1.5 | 0.5-2 | > 3,000 vpd | No | 60 km/h | E |
| **Conroy Road** | | | | | | |
| East | 1.5 | >2 | > 3,000 vpd | No | >60 km/h | E |
| West | >2 | >2 | > 3,000 vpd | No | >60 km/h | D |
| **St. Laurent Boulevard** | | | | | | |
| North | 1.5 | 0.5-2 | > 3,000 vpd | No | 60 km/h | E |
| South | none | 0 | > 3,000 vpd | Yes | 60 km/h | F |

### Bicycle Level of Service (BLOS)

| Bike Route | Type of Bikeway | Travel Lanes | Centreline Markings | Operating Speed | Segment BLOS |
|---|---|---|---|---|---|
| **Walkley Road** | | | | | |
| Spine | Mixed Traffic | 4 | Median | 60 km/h | F |
| **Conroy Road** | | | | | |
| Spine | Physically Seperated | 5 | Median | >60 km/h | A |
| **St. Laurent Boulevard** | | | | | |
| Local | Mixed Traffic | 2 | Yes | 60 km/h | D |

### Transit Level of Service (TLOS)

| Facility Type | Congestion, Friction, and Potential Incidents | Segment TLOS |
|---|---|---|
| **Walkley Road** | | |
| Mixed Traffic Limited parking/driveway friction | Congestion, Low Friction, Medium Incident Type | D |
| **Conroy Road** | | |
| Mixed Traffic Limited parking/driveway friction | Congestion, Low Friction, Medium Incident Type | D |
| **St. Laurent Boulevard** | | |
| Mixed Traffic Moderate parking/driveway friction | Congestion, Medium Friction, Medium Incident Type | E |

### Truck Level of Service (TkLOS)

| Curb Lane Width | Travel Lanes | Segment TkLOS |
|---|---|---|
| **Walkley Road** | | |
| >3.7m | More than 2 travel lanes | A |
| **Conroy Road** | | |
| 3.5m | More than 2 travel lanes | A |
| **St. Laurent Boulevard** | | |
| >3.7m | 2 travel lanes | B |

**Intersection MMLOS** **Pedestrian Level of Service**

| Criteria | South Approach | | East Approach | | West Approach | |
|---|---|---|---|---|---|---|
| **Walkley at Conroy** | | | | | | |
| **PETSI SCORE** | | | | | | |
| *CROSSING DISTANCE CONDITIONS* | | | | | | |
| Median > 2.4m in Width | No | -10 | No | -10 | N/A | N/A |
| Lanes Crossed (3.5m Lane Width) | 10 + | | 10 + | | N/A | |
| *SIGNAL PHASING AND TIMING* | | | | | | |
| Left Turn Conflict | Protected | 0 | No Left Turn/Prohibited | 0 | N/A | N/A |
| Right Turn Conflict | Permissive or Yield | -5 | Permissive or Yield | -5 | N/A | N/A |
| Right Turn on Red | N/A | 0 | N/A | 0 | N/A | N/A |
| Leading Pedestrian Interval | No | -2 | No | -2 | N/A | N/A |
| *CORNER RADIUS* | | | | | | |
| Parallel Radius | > 25m | -9 | > 15m to 25m | -8 | N/A | N/A |
| Parallel Right Turn Channel | Conventional without Receiving | 0 | Conventional without Receiving | 0 | N/A | N/A |
| Perpendicular Radius | > 15m to 25m | -8 | No Right Turn | 0 | N/A | N/A |
| Perpendicular Right Turn Channel | Conventional without Receiving | 0 | No Right Turn | 0 | N/A | N/A |
| *CROSSING TREATMENT* | | | | | | |
| Treatment | Standard | -7 | Standard | -7 | N/A | N/A |
| **PETSI SCORE** | | **-41** | | **-32** | | **N/A** |
| **LOS** | | **F** | | **F** | | **N/A** |
| **DELAY SCORE** | | | | | | |
| Cycle Length | | 120 | | 110 | | 120 |
| Pedestrian Walk Time | | 29 | | 7.6 | | N/A |
| **DELAY SCORE** | | **34.5** | | **47.7** | | **N/A** |
| **LOS** | | **D** | | **E** | | **N/A** |
| **OVERALL** | | **F** | | **F** | | **N/A** |

| Criteria | North Approach | | South Approach | | East Approach | | West Approach | |
|---|---|---|---|---|---|---|---|---|
| **Conroy at St. Laurent** | | | | | | | | |
| **PETSI SCORE** | | | | | | | | |
| *CROSSING DISTANCE CONDITIONS* | | | | | | | | |
| Median > 2.4m in Width | No | -10 | No | -10 | No | 55 | No | 23 |
| Lanes Crossed (3.5m Lane Width) | 10 + | | 10 + | | 6 | | 8 | |
| *SIGNAL PHASING AND TIMING* | | | | | | | | |
| Left Turn Conflict | Permissive | -8 | Perm + Prot | -8 | Permissive | -8 | Permissive | -8 |
| Right Turn Conflict | Permissive or Yield | -5 | Permissive or Yield | -5 | Permissive or Yield | -5 | Permissive or Yield | -5 |
| Right Turn on Red | RTOR Allowed | -3 | RTOR Allowed | -3 | RTOR Allowed | -3 | N/A | 0 |
| Leading Pedestrian Interval | No | -2 | No | -2 | No | -2 | No | -2 |
| *CORNER RADIUS* | | | | | | | | |
| Parallel Radius | > 10m to 15m | -6 | > 15m to 25m | -8 | > 15m to 25m | -8 | > 10m to 15m | -6 |
| Parallel Right Turn Channel | No Right Turn Channel | -4 | Conventional without Receiving | 0 | No Right Turn Channel | -4 | No Right Turn Channel | -4 |
| Perpendicular Radius | N/A | 0 | N/A | 0 | N/A | 0 | > 15m to 25m | -8 |
| Perpendicular Right Turn Channel | N/A | 0 | N/A | 0 | N/A | 0 | Conventional without Receiving | 0 |
| *CROSSING TREATMENT* | | | | | | | | |
| Treatment | Standard | -7 | Standard | -7 | Standard | -7 | Standard | -7 |
| **PETSI SCORE** | | **-45** | | **-43** | | **18** | | **-17** |
| **LOS** | | **F** | | **F** | | **F** | | **F** |
| **DELAY SCORE** | | | | | | | | |
| Cycle Length | | 100 | | 100 | | 95 | | 95 |
| Pedestrian Walk Time | | 7.1 | | 7.1 | | 12.7 | | 12.7 |
| **DELAY SCORE** | | **43.2** | | **43.2** | | **35.6** | | **35.6** |
| **LOS** | | **E** | | **E** | | **D** | | **D** |
| **OVERALL** | | **F** | | **F** | | **F** | | **F** |

| Criteria | North Approach | | South Approach | | East Approach | | West Approach | |
|---|---|---|---|---|---|---|---|---|
| **Walkley at Harding** | | | | | | | | |
| **PETSI SCORE** | | | | | | | | |
| *CROSSING DISTANCE CONDITIONS* | | | | | | | | |
| Median > 2.4m in Width | No | 88 | No | 120 | Yes | 60 | No | 39 |
| Lanes Crossed (3.5m Lane Width) | 4 | | 2 | | 6 | | 7 | |
| *SIGNAL PHASING AND TIMING* | | | | | | | | |
| Left Turn Conflict | Perm + Prot | -8 | No Left Turn/Prohibited | 0 | Permissive | -8 | Permissive | -8 |
| Right Turn Conflict | Permissive or Yield | -5 | Permissive or Yield | -5 | Permissive or Yield | -5 | Permissive or Yield | -5 |
| Right Turn on Red | RTOR Allowed | -3 | RTOR Allowed | -3 | RTOR Allowed | -3 | RTOR Allowed | -3 |
| Leading Pedestrian Interval | No | -2 | No | -2 | Yes | 0 | Yes | 0 |
| *CORNER RADIUS* | | | | | | | | |
| Parallel Radius | > 10m to 15m | -6 | <3m | -3 | <3m | -3 | > 5m to 10m | -5 |
| Parallel Right Turn Channel | No Right Turn Channel | -4 | No Right Turn Channel | -4 | No Right Turn Channel | -4 | No Right Turn Channel | -4 |
| Perpendicular Radius | N/A | 0 | N/A | 0 | N/A | 0 | N/A | 0 |
| Perpendicular Right Turn Channel | N/A | 0 | N/A | 0 | N/A | 0 | N/A | 0 |
| *CROSSING TREATMENT* | | | | | | | | |
| Treatment | Standard | -7 | Standard | -7 | Standard | -7 | Standard | -7 |
| **PETSI SCORE** | | **53** | | **96** | | **30** | | **7** |
| **LOS** | | **D** | | **A** | | **E** | | **F** |
| **DELAY SCORE** | | | | | | | | |
| Cycle Length | | 110 | | 110 | | 120 | | 120 |
| Pedestrian Walk Time | | 47.1 | | 63.1 | | 10.3 | | 10.3 |
| **DELAY SCORE** | | **18** | | **10** | | **50.1** | | **50.1** |
| **LOS** | | **B** | | **B** | | **E** | | **E** |
| **OVERALL** | | **D** | | **B** | | **E** | | **F** |

**Bicycle Level of Service**

| Approach | Bikeway Facility Type | Criteria | Travel Lanes and/or Speed[1] | BLOS |
|---|---|---|---|---|
| ***Walkley at Conroy – F Overall*** | | | | |
| South Approach | Pocket Bike Lane | Right turn lane characteristics | Bike lane shifts to the left turning speed ≤25km/h | **D** |
| | | Left turn accommodation | Dual left turn lanes | **F** |
| East Approach | Mixed Traffic Approach | Left turn accommodation | Dual left turn lanes | **F** |
| West Approach | Pocket Bike Lake | Right turn lane characteristics | Right turn lane >50m; turning speed ≤30km/h | **D** |
| ***Conroy at St. Laurent – F Overall*** | | | | |
| North Approach | Bike Lane or higher order facility | Right turn lane characteristics | No impact to LTS | - |
| | | Left turn accommodation | 2 or more lanes crossed; ≥ 50km/hr | **F** |
| South Approach | Bike Lane or higher order facility | Right turn lane characteristics | No impact to LTS | - |
| | | Left turn accommodation | 2 or more lanes crossed; ≥ 50km/hr | **F** |
| East Approach | Mixed Traffic Approach | Right turn lane characteristics | Right turn lane < 50m, turning speed ≤ 25km/h | **D** |
| | | Left turn accommodation | 1 lane crossed; ≥ 60km/hr | **F** |
| West Approach | Mixed Traffic Approach | Right turn lane characteristics | Right turn lane < 50m, turning speed ≤ 25km/h | **D** |
| | | Left turn accommodation | 1 lane crossed; 60km/hr | **F** |
| ***Walkley at Harding – F Overall*** | | | | |
| North Approach | Mixed Traffic Approach | Right turn lane characteristics | No impact to LTS | **-** |
| | | Left turn accommodation | 1 lane crossed; 60km/hr | **F** |
| East Approach | Mixed Traffic Approach | Right turn lane characteristics | No right turn lane | - |
| West Approach | Mixed Traffic Approach | Left turn accommodation | 2 or more lanes crossed; ≥ 50km/hr | **F** |

**Transit Level of Service**

| Transit Movement | AM (PM) Delay | LOS |
|---|---|---|
| ***Walkley at Conroy – F Overall*** | | |
| EB Through | 28 (42) | F |
| WB Through | 11 (18) | C |
| ***Conroy at St. Laurent – E Overall*** | | |
| NB Right | 8 (18) | C |
| WB Left | 40 (23) | E |
| ***Walkley at Harding – D Overall*** | | |
| EB Through | 4 (2) | B |
| WB Through | 7 (26) | D |

**Truck Level of Service**

| Approach | Effective Corner Radius (m) | Number of Receiving Lanes on Departure from Intersection | LOS |
|---|---|---|---|
| ***Walkley at Conroy – A Overall*** | | | |
| South Approach | > 15m | 2+ | A |
| East Approach | Not Applicable | Not Applicable | - |
| West Approach | > 15m | 2+ | A |
| ***Conroy at St. Laurent – E Overall*** | | | |
| North Approach | 10-15m | 1 | E |
| South Approach | > 15m | 1 | C |
| East Approach | 10-15m | 2+ | B |
| West Approach | > 15m | 2+ | A |
| ***Walkley at Harding – E Overall*** | | | |
| North Approach | <10m | 2+ | D |
| East Approach | 10-15m | 1 | E |
| West Approach | Not Applicable | Not Applicable | - |

# APPENDIX I

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Transportation Demand Management

# TDM-Supportive Development Design and Infrastructure Checklist:
*Non-Residential Developments (office, institutional, retail or industrial)*

***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: *Non-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)* | N/A |
| 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: *Non-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)* | N/A |
| 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: *Non-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 commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists | |
| BETTER | 2.1.5 | Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season | |
| | **2.2** | **Secure bicycle parking** | |
| REQUIRED | 2.2.1 | Where more than 50 bicycle parking spaces are provided for a single office 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)* | N/A |
| BETTER | 2.2.2 | Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met) | |
| | **2.3** | **Shower & change facilities** | |
| BASIC | 2.3.1 | Provide shower and change facilities for the use of active commuters | |
| BETTER | 2.3.2 | In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters | |
| | **2.4** | **Bicycle repair station** | |
| BETTER | 2.4.1 | 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) | |

| | TDM-supportive design & infrastructure measures: *Non-residential developments* | | Check if completed & add descriptions, explanations or plan/drawing references |
|---|---|---|---|
| | **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 | |
| | **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 | |
| | **4.2** | **Carpool parking** | |
| BASIC | 4.2.1 | Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools | |
| BETTER | 4.2.2 | At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement | |
| | **5.** | **CARSHARING & BIKESHARING** | |
| | **5.1** | **Carshare parking spaces** | |
| BETTER | 5.1.1 | Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(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 | |

| | | TDM-supportive design & infrastructure measures: *Non-residential developments* | Check if completed & add descriptions, explanations or plan/drawing references |
|---|---|---|---|
| | **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 | Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa) | |
| | **7.** | **OTHER** | |
| | **7.1** | **On-site amenities to minimize off-site trips** | |
| BETTER | 7.1.1 | Provide on-site amenities to minimize mid-day or mid-commute errands | |

# TDM Measures Checklist:
*Non-Residential Developments (office, institutional, retail or industrial)*

***Legend***

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

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

| | | TDM measures: *Non-residential developments* | Check if proposed & add descriptions |
|---|---|---|---|
| | | **1. TDM PROGRAM MANAGEMENT** | |
| | | **1.1 Program coordinator** | |
| BASIC | ★ | 1.1.1 Designate an internal coordinator, or contract with an external coordinator | |
| | | **1.2 Travel surveys** | |
| BETTER | | 1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress | |
| | | **2. WALKING AND CYCLING** | |
| | | **2.1 Information on walking/cycling routes & destinations** | |
| BASIC | | 2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances | |
| | | **2.2 Bicycle skills training** *Commuter travel* | |
| BETTER | ★ | 2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses | |
| | | **2.3 Valet bike parking** *Visitor travel* | |
| BETTER | | 2.3.1 Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games) | |

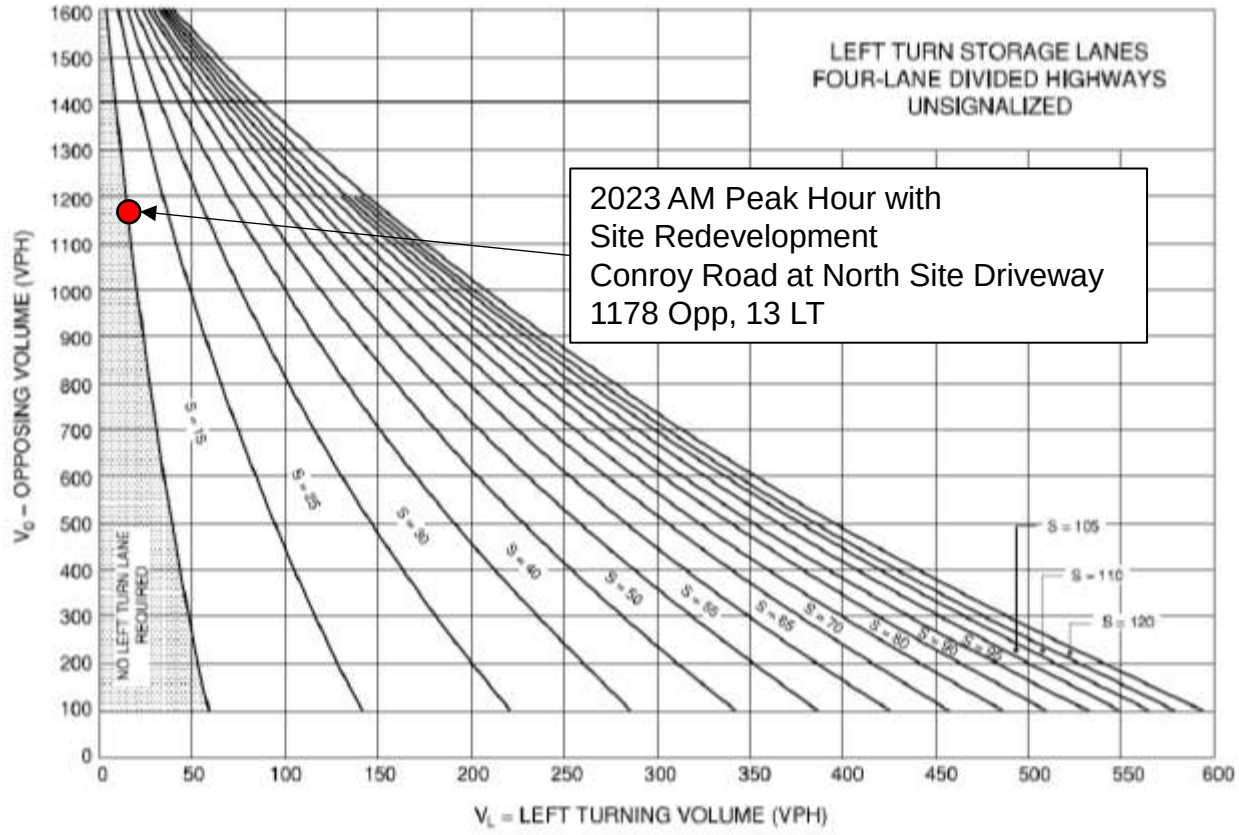
| | | | TDM measures: *Non-residential developments* | Check if proposed & add descriptions |
|---|---|---|---|---|
| | | **3.** | **TRANSIT** | |
| | | **3.1** | **Transit information** | |
| BASIC | | 3.1.1 | Display relevant transit schedules and route maps at entrances | |
| BASIC | | 3.1.2 | Provide online links to OC Transpo and STO information | |
| BETTER | | 3.1.3 | Provide real-time arrival information display at entrances | |
| | | **3.2** | **Transit fare incentives** | |
| | | | *Commuter travel* | |
| BETTER | | 3.2.1 | Offer preloaded PRESTO cards to encourage commuters to use transit | |
| BETTER | ★ | 3.2.2 | Subsidize or reimburse monthly transit pass purchases by employees | |
| | | | *Visitor travel* | |
| BETTER | | 3.2.3 | Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games) | |
| | | **3.3** | **Enhanced public transit service** | |
| | | | *Commuter travel* | |
| BETTER | | 3.3.1 | Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends) | |
| | | | *Visitor travel* | |
| BETTER | | 3.3.2 | Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games) | |
| | | **3.4** | **Private transit service** | |
| | | | *Commuter travel* | |
| BETTER | | 3.4.1 | Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends) | |
| | | | *Visitor travel* | |
| BETTER | | 3.4.2 | Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games) | |

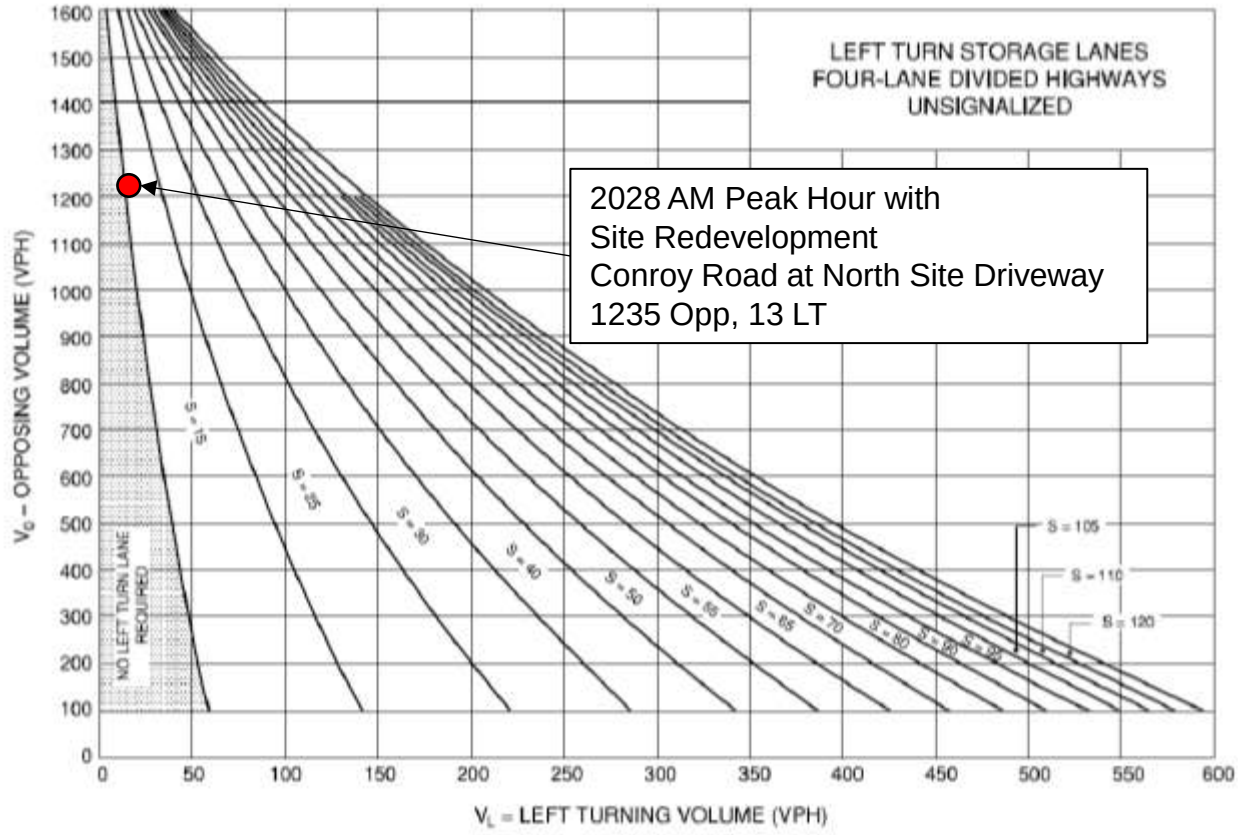
| | | | TDM measures: *Non-residential developments* | Check if proposed & add descriptions |
|---|---|---|---|---|
| | | **4.** | **RIDESHARING** | |
| | | **4.1** | **Ridematching service** | |
| | | | *Commuter travel* | |
| BASIC | ★ | 4.1.1 | Provide a dedicated ridematching portal at OttawaRideMatch.com | |
| | | **4.2** | **Carpool parking price incentives** | |
| | | | *Commuter travel* | |
| BETTER | | 4.2.1 | Provide discounts on parking costs for registered carpools | |
| | | **4.3** | **Vanpool service** | |
| | | | *Commuter travel* | |
| BETTER | | 4.3.1 | Provide a vanpooling service for long-distance commuters | |
| | | **5.** | **CARSHARING & BIKESHARING** | |
| | | **5.1** | **Bikeshare stations & memberships** | |
| BETTER | | 5.1.1 | Contract with provider to install on-site bikeshare station for use by commuters and visitors | |
| | | | *Commuter travel* | |
| BETTER | | 5.1.2 | Provide employees with bikeshare memberships for local business travel | |
| | | **5.2** | **Carshare vehicles & memberships** | |
| | | | *Commuter travel* | |
| BETTER | | 5.2.1 | Contract with provider to install on-site carshare vehicles and promote their use by tenants | |
| BETTER | | 5.2.2 | Provide employees with carshare memberships for local business travel | |
| | | **6.** | **PARKING** | |
| | | **6.1** | **Priced parking** | |
| | | | *Commuter travel* | |
| BASIC | ★ | 6.1.1 | Charge for long-term parking (daily, weekly, monthly) | |
| BASIC | | 6.1.2 | Unbundle parking cost from lease rates at multi-tenant sites | |
| | | | *Visitor travel* | |
| BETTER | | 6.1.3 | Charge for short-term parking (hourly) | |

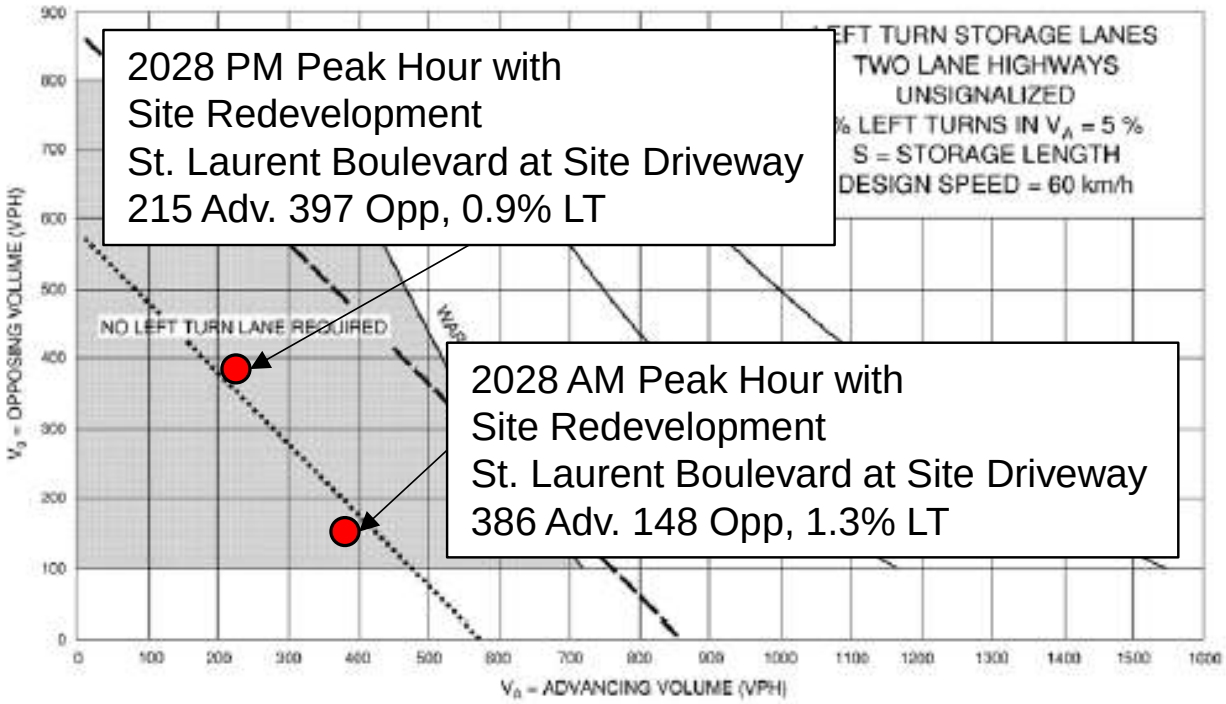
| | | | TDM measures: *Non-residential developments* | Check if proposed & add descriptions |
|---|---|---|---|---|
| | | **7.** | **TDM MARKETING & COMMUNICATIONS** | |
| | | **7.1** | **Multimodal travel information** | |
| | | | *Commuter travel* | |
| BASIC | ★ | 7.1.1 | Provide a multimodal travel option information package to new/relocating employees and students | |
| | | | *Visitor travel* | |
| BETTER | ★ | 7.1.2 | Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games) | |
| | | **7.2** | **Personalized trip planning** | |
| | | | *Commuter travel* | |
| BETTER | ★ | 7.2.1 | Offer personalized trip planning to new/relocating employees | |
| | | **7.3** | **Promotions** | |
| | | | *Commuter travel* | |
| BETTER | | 7.3.1 | Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes | |
| | | **8.** | **OTHER INCENTIVES & AMENITIES** | |
| | | **8.1** | **Emergency ride home** | |
| | | | *Commuter travel* | |
| BETTER | ★ | 8.1.1 | Provide emergency ride home service to non-driving commuters | |
| | | **8.2** | **Alternative work arrangements** | |
| | | | *Commuter travel* | |
| BASIC | ★ | 8.2.1 | Encourage flexible work hours | |
| BETTER | | 8.2.2 | Encourage compressed workweeks | |
| BETTER | ★ | 8.2.3 | Encourage telework | |
| | | **8.3** | **Local business travel options** | |
| | | | *Commuter travel* | |
| BASIC | ★ | 8.3.1 | Provide local business travel options that minimize the need for employees to bring a personal car to work | |
| | | **8.4** | **Commuter incentives** | |
| | | | *Commuter travel* | |
| BETTER | | 8.4.1 | Offer employees a taxable, mode-neutral commuting allowance | |
| | | **8.5** | **On-site amenities** | |
| | | | *Commuter travel* | |
| BETTER | | 8.5.1 | Provide on-site amenities/services to minimize mid-day or mid-commute errands | |

# APPENDIX J

Left Turn Warrant

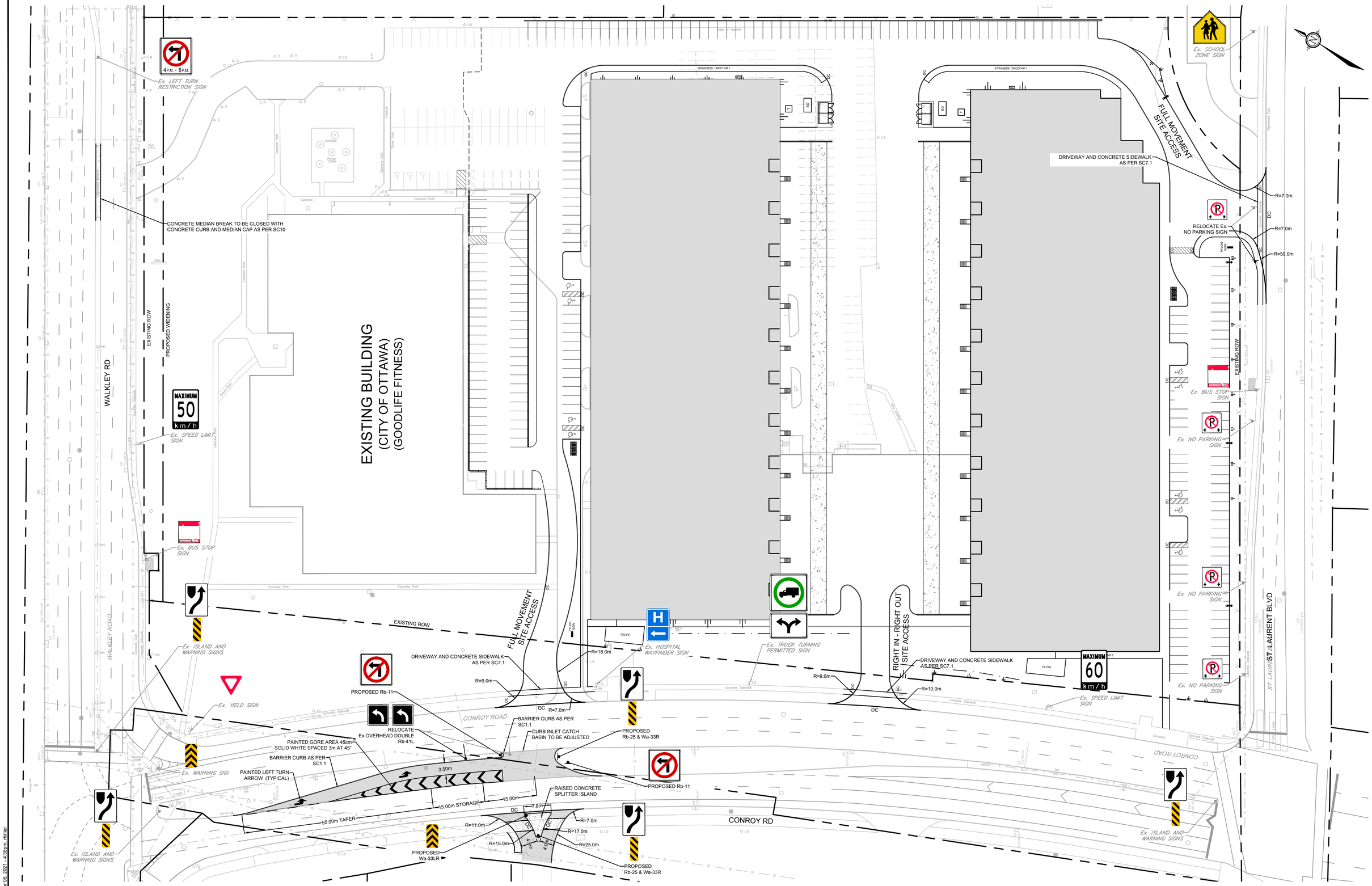

LEFT TURN STORAGE LANES
FOUR-LANE DIVIDED HIGHWAYS
UNSIGNALIZED
2023 AM Peak Hour with
Site Redevelopment
Conroy Road at North Site Driveway
1178 Opp, 13 LT
NO LEFT TURN LANE REQUIRED
S = 15
S = 25
S = 30
S = 40
S = 50
S = 55
S = 65
S = 70
S = 80
S = 90
S = 95
S = 105
S = 110
S = 120
$V_O$ – OPPOSING VOLUME (VPH)
$V_L$ = LEFT TURNING VOLUME (VPH)


LEFT TURN STORAGE LANES
FOUR-LANE DIVIDED HIGHWAYS
UNSIGNALIZED
2028 AM Peak Hour with
Site Redevelopment
Conroy Road at North Site Driveway
1235 Opp, 13 LT
NO LEFT TURN LANE REQUIRED
S = 15
S = 25
S = 30
S = 40
S = 50
S = 55
S = 65
S = 70
S = 80
S = 90
S = 95
S = 105
S = 110
S = 120
$V_O$ – OPPOSING VOLUME (VPH)
$V_L$ = LEFT TURNING VOLUME (VPH)


2028 PM Peak Hour with
Site Redevelopment
St. Laurent Boulevard at Site Driveway
215 Adv. 397 Opp, 0.9% LT
2028 AM Peak Hour with
Site Redevelopment
St. Laurent Boulevard at Site Driveway
386 Adv. 148 Opp, 1.3% LT
NO LEFT TURN LANE REQUIRED
EFT TURN STORAGE LANES
TWO LANE HIGHWAYS
UNSIGNALIZED
% LEFT TURNS IN $V_A$ = 5 %
S = STORAGE LENGTH
DESIGN SPEED = 60 km/h
$V_O$ = OPPOSING VOLUME (VPH)
$V_A$ = ADVANCING VOLUME (VPH)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600

# APPENDIX K

Functional Design of Roadway Modifications




NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

## LEGEND

- PROPOSED ASPHALT
- PROPOSED CONCRETE
- PROPOSED DEPRESSED CURB
- EXISTING LIGHT STANDARD
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING CATCHBASIN
- EXISTING HYDRO DUCT
- EXISTING BELL DUCT
- EXISTING CABLE DUCT
- EXISTING TRAFFIC DUCT
- EXISTING GAS MAIN

| No. | REVISION | DATE | BY |
|---|---|---|---|
| 1. | ISSUED FOR CITY REVIEW | MAR 10/21 | PH |

SCALE 1:500

1:500
0 5 10 15 20

DESIGN RCH
CHECKED PH
DRAWN RCH
CHECKED PH
APPROVED JLL

**FOR REVIEW ONLY**


NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
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Facsimile (613) 254-5867
Website www.novatech-eng.com


LOCATION
CITY of OTTAWA
2020 WALKLEY ROAD

DRAWING NAME
ROADWAY MODIFICATION
FUNCTIONAL DESIGN

PROJECT No. 119067
REV REV # 1
DRAWING No. 119067-FD

C:\temp\AcPublish_70\4119067-FD.dwg, FD, Mar 05, 2021 - 4:38pm, rhiller

PLAN&T.DWG - 347mmx594mm

# APPENDIX L

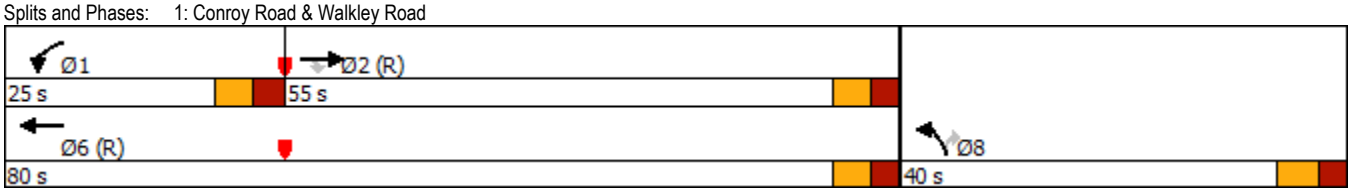
Synchro Reports

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 789 | 257 | 230 | 954 | 666 | 448 |
| Future Volume (vph) | 789 | 257 | 230 | 954 | 666 | 448 |
| Satd. Flow (prot) | 3191 | 1455 | 3066 | 3161 | 3216 | 1455 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3191 | 1419 | 3066 | 3161 | 3216 | 1436 |
| Satd. Flow (RTOR) | | 286 | | | | 344 |
| Lane Group Flow (vph) | 877 | 286 | 256 | 1060 | 740 | 498 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Total Split (s) | 55.0 | 55.0 | 25.0 | 80.0 | 40.0 | 40.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.2 | 6.0 | 6.4 | 6.4 |
| Act Effct Green (s) | 54.6 | 54.6 | 15.1 | 75.9 | 31.7 | 31.7 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.13 | 0.63 | 0.26 | 0.26 |
| v/c Ratio | 0.60 | 0.36 | 0.66 | 0.53 | 0.87 | 0.79 |
| Control Delay | 27.8 | 3.9 | 69.9 | 10.6 | 54.2 | 22.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 27.8 | 3.9 | 69.9 | 10.6 | 54.2 | 22.0 |
| LOS | C | A | E | B | D | C |
| Approach Delay | 21.9 | | | 22.1 | 41.3 | |
| Approach LOS | C | | | C | D | |
| Queue Length 50th (m) | 76.0 | 0.0 | 29.0 | 44.1 | 77.4 | 30.7 |
| Queue Length 95th (m) | 101.2 | 14.8 | 42.4 | 52.0 | 98.7 | 72.3 |
| Internal Link Dist (m) | 308.5 | | | 156.3 | 111.4 | |
| Turn Bay Length (m) | | 75.0 | | | | |
| Base Capacity (vph) | 1451 | 801 | 480 | 2000 | 900 | 649 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.60 | 0.36 | 0.53 | 0.53 | 0.82 | 0.77 |

**Intersection Summary**

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 43 (36%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 28.4 — Intersection LOS: C
Intersection Capacity Utilization 67.5% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Conroy Road & Walkley Road

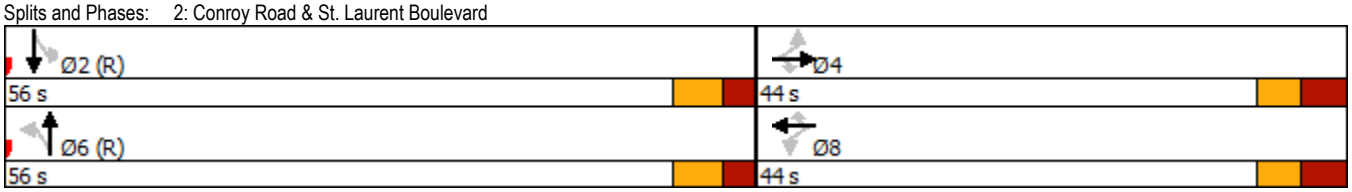


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 4 | 59 | 76 | 60 | 38 | 39 | 177 | 1187 | 195 | 86 | 368 | 33 |
| Future Volume (vph) | 4 | 59 | 76 | 60 | 38 | 39 | 177 | 1187 | 195 | 86 | 368 | 33 |
| Satd. Flow (prot) | 1537 | 1695 | 1441 | 1409 | 1575 | 1339 | 1642 | 4607 | 0 | 1674 | 3230 | 0 |
| Flt Permitted | 0.730 | | | 0.714 | | | 0.494 | | | 0.142 | | |
| Satd. Flow (perm) | 1176 | 1695 | 1409 | 1049 | 1575 | 1316 | 841 | 4607 | 0 | 249 | 3230 | 0 |
| Satd. Flow (RTOR) | | | 84 | | | 36 | | 45 | | | 13 | |
| Lane Group Flow (vph) | 4 | 66 | 84 | 67 | 42 | 43 | 197 | 1536 | 0 | 96 | 446 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 6 | | | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 6 | | | 2 | | |
| Total Split (s) | 44.0 | 44.0 | 44.0 | 44.0 | 44.0 | 44.0 | 56.0 | 56.0 | | 56.0 | 56.0 | |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Act Effct Green (s) | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 74.8 | 74.8 | | 74.8 | 74.8 | |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.75 | 0.75 | | 0.75 | 0.75 | |
| v/c Ratio | 0.02 | 0.23 | 0.28 | 0.39 | 0.16 | 0.17 | 0.31 | 0.44 | | 0.52 | 0.18 | |
| Control Delay | 27.8 | 34.7 | 8.3 | 40.3 | 32.9 | 12.8 | 10.0 | 8.1 | | 25.8 | 6.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 27.8 | 34.7 | 8.3 | 40.3 | 32.9 | 12.8 | 10.0 | 8.1 | | 25.8 | 6.5 | |
| LOS | C | C | A | D | C | B | B | A | | C | A | |
| Approach Delay | | 20.1 | | | 30.5 | | | 8.3 | | | 9.9 | |
| Approach LOS | | C | | | C | | | A | | | A | |
| Queue Length 50th (m) | 0.6 | 11.0 | 0.0 | 11.5 | 6.9 | 1.1 | 9.5 | 30.1 | | 5.8 | 9.7 | |
| Queue Length 95th (m) | 2.5 | 15.7 | 8.5 | 16.9 | 11.2 | 7.1 | 40.6 | 84.7 | | #41.8 | 31.7 | |
| Internal Link Dist (m) | | 170.0 | | | 224.1 | | | 245.6 | | | 179.5 | |
| Turn Bay Length (m) | 30.0 | | 35.0 | 35.0 | | 35.0 | 70.0 | | | 75.0 | | |
| Base Capacity (vph) | 436 | 628 | 575 | 389 | 584 | 510 | 629 | 3458 | | 186 | 2420 | |
| 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 | 0.01 | 0.11 | 0.15 | 0.17 | 0.07 | 0.08 | 0.31 | 0.44 | | 0.52 | 0.18 | |

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 23 (23%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 10.6 Intersection LOS: B
Intersection Capacity Utilization 69.9% ICU Level of Service C
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Conroy Road & St. Laurent Boulevard

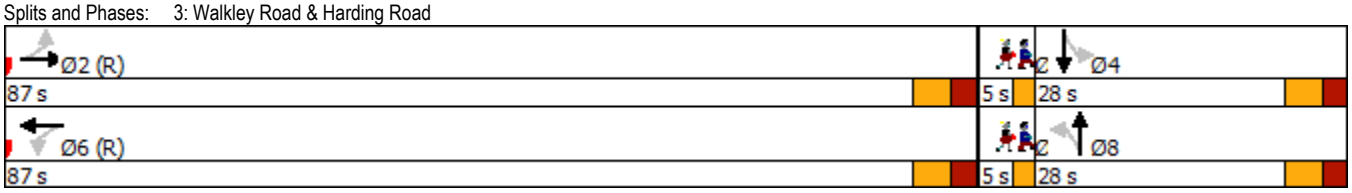


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 31 | 1150 | 13 | 1 | 1106 | 42 | 1 | 0 | 1 | 15 | 0 | 181 |
| Future Volume (vph) | 31 | 1150 | 13 | 1 | 1106 | 42 | 1 | 0 | 1 | 15 | 0 | 181 |
| Satd. Flow (prot) | 1537 | 3243 | 0 | 0 | 3199 | 0 | 0 | 1079 | 0 | 0 | 1504 | 0 |
| Flt Permitted | 0.194 | | | | 0.955 | | | 0.811 | | | 0.976 | |
| Satd. Flow (perm) | 314 | 3243 | 0 | 0 | 3055 | 0 | 0 | 896 | 0 | 0 | 1474 | 0 |
| Satd. Flow (RTOR) | | 2 | | | 7 | | | 45 | | | 131 | |
| Lane Group Flow (vph) | 34 | 1292 | 0 | 0 | 1277 | 0 | 0 | 2 | 0 | 0 | 218 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Total Split (s) | 87.0 | 87.0 | | 87.0 | 87.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Lost Time (s) | 5.9 | 5.9 | | | 5.9 | | | 5.7 | | | 5.7 | |
| Act Effct Green (s) | 93.1 | 93.1 | | | 93.1 | | | 15.3 | | | 15.3 | |
| Actuated g/C Ratio | 0.78 | 0.78 | | | 0.78 | | | 0.13 | | | 0.13 | |
| v/c Ratio | 0.14 | 0.51 | | | 0.54 | | | 0.01 | | | 0.72 | |
| Control Delay | 4.4 | 4.2 | | | 7.0 | | | 0.0 | | | 33.3 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 4.4 | 4.2 | | | 7.0 | | | 0.0 | | | 33.3 | |
| LOS | A | A | | | A | | | A | | | C | |
| Approach Delay | | 4.2 | | | 7.0 | | | | | | 33.3 | |
| Approach LOS | | A | | | A | | | | | | C | |
| Queue Length 50th (m) | 1.0 | 30.6 | | | 41.5 | | | 0.0 | | | 18.3 | |
| Queue Length 95th (m) | m2.6 | 51.6 | | | 90.3 | | | 0.0 | | | 37.9 | |
| Internal Link Dist (m) | | 85.4 | | | 213.8 | | | 35.2 | | | 112.2 | |
| Turn Bay Length (m) | 30.0 | | | | | | | | | | | |
| Base Capacity (vph) | 243 | 2515 | | | 2370 | | | 210 | | | 391 | |
| Starvation Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | 0.14 | 0.51 | | | 0.54 | | | 0.01 | | | 0.56 | |

**Intersection Summary**

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 24 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 7.7 — Intersection LOS: A
Intersection Capacity Utilization 57.7% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Harding Road



| Lane Group | Ø3 | Ø7 |
|---|---|---|
| Lane Configurations | | |
| Traffic Volume (vph) | | |
| Future Volume (vph) | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Satd. Flow (RTOR) | | |
| Lane Group Flow (vph) | | |
| Turn Type | | |
| Protected Phases | 3 | 7 |
| Permitted Phases | | |
| Total Split (s) | 5.0 | 5.0 |
| Total Lost Time (s) | | |
| 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 |
|---|

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1187 | 27 | 25 | 1263 | 6 | 7 |
| Future Volume (Veh/h) | 1187 | 27 | 25 | 1263 | 6 | 7 |
| 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) | 1319 | 30 | 28 | 1403 | 7 | 8 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | 180 | | | 109 | | |
| pX, platoon unblocked | | | 0.80 | | 0.80 | 0.80 |
| vC, conflicting volume | | | 1349 | | 1741 | 674 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 947 | | 1434 | 108 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 95 | | 93 | 99 |
| cM capacity (veh/h) | | | 579 | | 95 | 744 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 879 | 470 | 228 | 401 | 401 | 401 | 15 |
| Volume Left | 0 | 0 | 28 | 0 | 0 | 0 | 7 |
| Volume Right | 0 | 30 | 0 | 0 | 0 | 0 | 8 |
| cSH | 1700 | 1700 | 579 | 1700 | 1700 | 1700 | 178 |
| Volume to Capacity | 0.52 | 0.28 | 0.05 | 0.24 | 0.24 | 0.24 | 0.08 |
| Queue Length 95th (m) | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 | 0.0 | 1.9 |
| Control Delay (s) | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 27.0 |
| Lane LOS | | | A | | | | D |
| Approach Delay (s) | 0.0 | | 0.3 | | | | 27.0 |
| Approach LOS | | | | | | | D |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.3 | | | |
| Intersection Capacity Utilization | 47.7% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 5 | 1109 | 47 | 0 | 487 |
| Future Volume (Veh/h) | 0 | 5 | 1109 | 47 | 0 | 487 |
| 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) | 0 | 6 | 1232 | 52 | 0 | 541 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 204 | | | 135 |
| pX, platoon unblocked | 0.91 | 0.91 | | | 0.91 | |
| vC, conflicting volume | 1528 | 437 | | | 1284 | |
| vC1, stage 1 conf vol | 1258 | | | | | |
| vC2, stage 2 conf vol | 270 | | | | | |
| vCu, unblocked vol | 1233 | 33 | | | 964 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 99 | | | 100 | |
| cM capacity (veh/h) | 254 | 940 | | | 646 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 6 | 493 | 493 | 298 | 270 | 270 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 6 | 0 | 0 | 52 | 0 | 0 |
| cSH | 940 | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.29 | 0.29 | 0.18 | 0.16 | 0.16 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 8.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | | |
| Approach Delay (s) | 8.9 | 0.0 | | | 0.0 | |
| Approach LOS | A | | | | | |

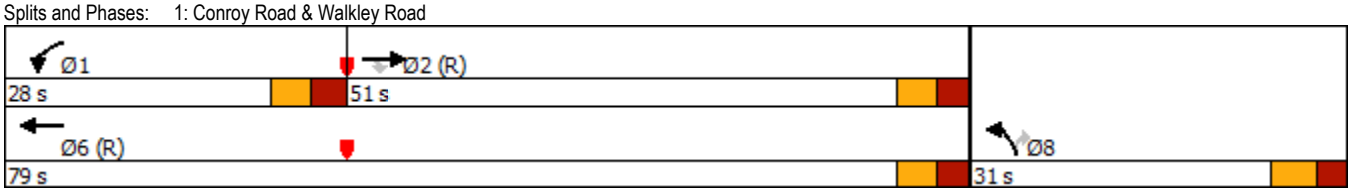
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 33.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1139 | 438 | 522 | 965 | 457 | 297 |
| Future Volume (vph) | 1139 | 438 | 522 | 965 | 457 | 297 |
| Satd. Flow (prot) | 3221 | 1483 | 3216 | 3349 | 3248 | 1469 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3221 | 1430 | 3216 | 3349 | 3248 | 1420 |
| Satd. Flow (RTOR) | | 474 | | | | 330 |
| Lane Group Flow (vph) | 1266 | 487 | 580 | 1072 | 508 | 330 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Total Split (s) | 51.0 | 51.0 | 28.0 | 79.0 | 31.0 | 31.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.2 | 6.0 | 6.4 | 6.4 |
| Act Effct Green (s) | 47.3 | 47.3 | 22.2 | 75.7 | 21.9 | 21.9 |
| Actuated g/C Ratio | 0.43 | 0.43 | 0.20 | 0.69 | 0.20 | 0.20 |
| v/c Ratio | 0.91 | 0.55 | 0.89 | 0.47 | 0.79 | 0.60 |
| Control Delay | 41.5 | 4.9 | 44.8 | 18.2 | 51.1 | 9.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.5 | 4.9 | 44.8 | 18.2 | 51.1 | 9.1 |
| LOS | D | A | D | B | D | A |
| Approach Delay | 31.4 | | | 27.6 | 34.5 | |
| Approach LOS | C | | | C | C | |
| Queue Length 50th (m) | 126.0 | 1.5 | 61.2 | 89.5 | 48.8 | 0.0 |
| Queue Length 95th (m) | #169.7 | 21.2 | m#86.0 | 119.3 | 64.3 | 21.8 |
| Internal Link Dist (m) | 308.5 | | | 156.3 | 111.4 | |
| Turn Bay Length (m) | | 75.0 | | | | |
| Base Capacity (vph) | 1385 | 885 | 657 | 2305 | 726 | 573 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.91 | 0.55 | 0.88 | 0.47 | 0.70 | 0.58 |

**Intersection Summary**

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 20 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 30.5 — Intersection LOS: C
Intersection Capacity Utilization 80.8% — 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Conroy Road & Walkley Road

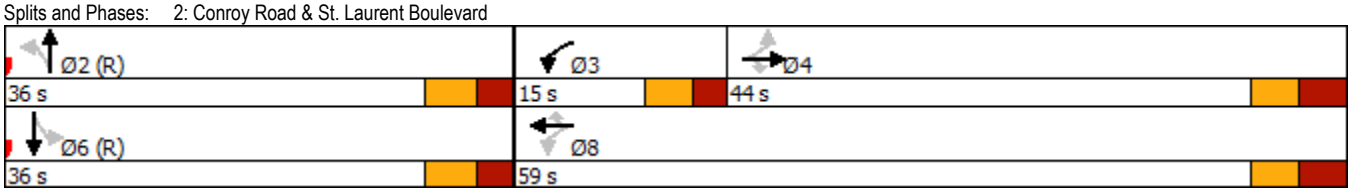


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 17 | 67 | 306 | 222 | 28 | 105 | 35 | 564 | 79 | 37 | 1064 | 8 |
| Future Volume (vph) | 17 | 67 | 306 | 222 | 28 | 105 | 35 | 564 | 79 | 37 | 1064 | 8 |
| Satd. Flow (prot) | 1691 | 1780 | 1469 | 1642 | 1664 | 1483 | 1642 | 4617 | 0 | 1523 | 3308 | 0 |
| Flt Permitted | 0.737 | | | 0.565 | | | 0.127 | | | 0.349 | | |
| Satd. Flow (perm) | 1310 | 1780 | 1447 | 974 | 1664 | 1463 | 219 | 4617 | 0 | 555 | 3308 | 0 |
| Satd. Flow (RTOR) | | | 115 | | | 68 | | 28 | | | 1 | |
| Lane Group Flow (vph) | 19 | 74 | 340 | 247 | 31 | 117 | 39 | 715 | 0 | 41 | 1191 | 0 |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Total Split (s) | 44.0 | 44.0 | 44.0 | 15.0 | 59.0 | 59.0 | 36.0 | 36.0 | | 36.0 | 36.0 | |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 5.7 | 6.9 | 6.9 | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Act Effct Green (s) | 22.3 | 22.3 | 22.3 | 38.5 | 37.3 | 37.3 | 44.5 | 44.5 | | 44.5 | 44.5 | |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.41 | 0.39 | 0.39 | 0.47 | 0.47 | | 0.47 | 0.47 | |
| v/c Ratio | 0.06 | 0.18 | 0.80 | 0.54 | 0.05 | 0.19 | 0.38 | 0.33 | | 0.16 | 0.77 | |
| Control Delay | 23.5 | 26.4 | 35.0 | 22.9 | 14.4 | 7.6 | 37.2 | 17.5 | | 21.4 | 27.8 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 23.5 | 26.4 | 35.0 | 22.9 | 14.4 | 7.6 | 37.2 | 17.5 | | 21.4 | 27.8 | |
| LOS | C | C | C | C | B | A | D | B | | C | C | |
| Approach Delay | | 33.0 | | | 17.7 | | | 18.5 | | | 27.6 | |
| Approach LOS | | C | | | B | | | B | | | C | |
| Queue Length 50th (m) | 2.5 | 10.2 | 37.0 | 29.1 | 3.3 | 5.2 | 4.0 | 25.0 | | 3.7 | 82.8 | |
| Queue Length 95th (m) | 6.0 | 16.0 | 52.0 | 32.7 | 5.9 | 10.8 | #20.4 | 44.7 | | 13.2 | #162.8 | |
| Internal Link Dist (m) | | 170.0 | | | 224.1 | | | 245.6 | | | 179.5 | |
| Turn Bay Length (m) | 30.0 | | 35.0 | 35.0 | | 35.0 | 70.0 | | | 75.0 | | |
| Base Capacity (vph) | 511 | 695 | 635 | 459 | 912 | 833 | 102 | 2178 | | 260 | 1550 | |
| 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 | 0.04 | 0.11 | 0.54 | 0.54 | 0.03 | 0.14 | 0.38 | 0.33 | | 0.16 | 0.77 | |

**Intersection Summary**

Cycle Length: 95
Actuated Cycle Length: 95
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 24.6 — Intersection LOS: C
Intersection Capacity Utilization 81.8% — 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: 2: Conroy Road & St. Laurent Boulevard

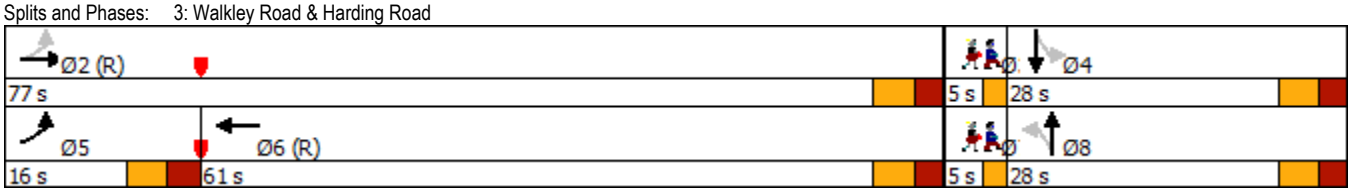


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 179 | 1285 | 2 | 0 | 1347 | 30 | 9 | 1 | 0 | 24 | 0 | 285 |
| Future Volume (vph) | 179 | 1285 | 2 | 0 | 1347 | 30 | 9 | 1 | 0 | 24 | 0 | 285 |
| Satd. Flow (prot) | 1674 | 3221 | 0 | 0 | 3303 | 0 | 0 | 1703 | 0 | 0 | 1495 | 0 |
| Flt Permitted | 0.072 | | | | | | | 0.484 | | | 0.974 | |
| Satd. Flow (perm) | 127 | 3221 | 0 | 0 | 3303 | 0 | 0 | 860 | 0 | 0 | 1462 | 0 |
| Satd. Flow (RTOR) | | | | | 3 | | | | | | 222 | |
| Lane Group Flow (vph) | 199 | 1430 | 0 | 0 | 1530 | 0 | 0 | 11 | 0 | 0 | 344 | 0 |
| Turn Type | pm+pt | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 5 | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | | | | 8 | | | 4 | | |
| Total Split (s) | 16.0 | 77.0 | | | 61.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Lost Time (s) | 6.0 | 5.9 | | | 5.9 | | | 5.7 | | | 5.7 | |
| Act Effct Green (s) | 81.1 | 81.2 | | | 62.1 | | | 17.2 | | | 17.2 | |
| Actuated g/C Ratio | 0.74 | 0.74 | | | 0.56 | | | 0.16 | | | 0.16 | |
| v/c Ratio | 0.72 | 0.60 | | | 0.82 | | | 0.08 | | | 0.83 | |
| Control Delay | 50.0 | 2.4 | | | 25.7 | | | 36.5 | | | 32.4 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 50.0 | 2.4 | | | 25.7 | | | 36.5 | | | 32.4 | |
| LOS | D | A | | | C | | | D | | | C | |
| Approach Delay | | 8.2 | | | 25.7 | | | 36.5 | | | 32.4 | |
| Approach LOS | | A | | | C | | | D | | | C | |
| Queue Length 50th (m) | 25.9 | 8.1 | | | 127.3 | | | 1.9 | | | 23.9 | |
| Queue Length 95th (m) | m#38.0 | m17.4 | | | #191.0 | | | 5.9 | | | 49.9 | |
| Internal Link Dist (m) | | 85.4 | | | 213.8 | | | 35.2 | | | 112.2 | |
| Turn Bay Length (m) | 30.0 | | | | | | | | | | | |
| Base Capacity (vph) | 278 | 2378 | | | 1865 | | | 182 | | | 484 | |
| Starvation Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | 0.72 | 0.60 | | | 0.82 | | | 0.06 | | | 0.71 | |

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 41 (37%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 18.3 Intersection LOS: B
Intersection Capacity Utilization 85.6% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Harding Road



| Lane Group | Ø3 | Ø7 |
|---|---|---|
| Lane Configurations | | |
| Traffic Volume (vph) | | |
| Future Volume (vph) | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Satd. Flow (RTOR) | | |
| Lane Group Flow (vph) | | |
| Turn Type | | |
| Protected Phases | 3 | 7 |
| Permitted Phases | | |
| Total Split (s) | 5.0 | 5.0 |
| Total Lost Time (s) | | |
| 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 |
|---|

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1437 | 9 | 8 | 1633 | 30 | 29 |
| Future Volume (Veh/h) | 1437 | 9 | 8 | 1633 | 30 | 29 |
| 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) | 1597 | 10 | 9 | 1814 | 33 | 32 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | 180 | | | 109 | | |
| pX, platoon unblocked | | | 0.63 | | 0.63 | 0.63 |
| vC, conflicting volume | | | 1607 | | 2074 | 804 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 791 | | 1531 | 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 % | | | 98 | | 51 | 95 |
| cM capacity (veh/h) | | | 520 | | 67 | 684 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 1065 | 542 | 268 | 518 | 518 | 518 | 65 |
| Volume Left | 0 | 0 | 9 | 0 | 0 | 0 | 33 |
| Volume Right | 0 | 10 | 0 | 0 | 0 | 0 | 32 |
| cSH | 1700 | 1700 | 520 | 1700 | 1700 | 1700 | 120 |
| Volume to Capacity | 0.63 | 0.32 | 0.02 | 0.30 | 0.30 | 0.30 | 0.54 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 18.0 |
| Control Delay (s) | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 65.8 |
| Lane LOS | | | A | | | | F |
| Approach Delay (s) | 0.0 | | 0.1 | | | | 65.8 |
| Approach LOS | | | | | | | F |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1.3 | | | |
| Intersection Capacity Utilization | 52.5% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 31 | 723 | 15 | 0 | 960 |
| Future Volume (Veh/h) | 0 | 31 | 723 | 15 | 0 | 960 |
| 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) | 0 | 34 | 803 | 17 | 0 | 1067 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 204 | | | 135 |
| pX, platoon unblocked | 0.94 | 0.94 | | | 0.94 | |
| vC, conflicting volume | 1345 | 276 | | | 820 | |
| vC1, stage 1 conf vol | 812 | | | | | |
| vC2, stage 2 conf vol | 534 | | | | | |
| vCu, unblocked vol | 1158 | 26 | | | 602 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 97 | | | 100 | |
| cM capacity (veh/h) | 317 | 985 | | | 917 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 34 | 321 | 321 | 178 | 534 | 534 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 34 | 0 | 0 | 17 | 0 | 0 |
| cSH | 985 | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.03 | 0.19 | 0.19 | 0.10 | 0.31 | 0.31 |
| Queue Length 95th (m) | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 8.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | | |
| Approach Delay (s) | 8.8 | 0.0 | | | 0.0 | |
| Approach LOS | A | | | | | |

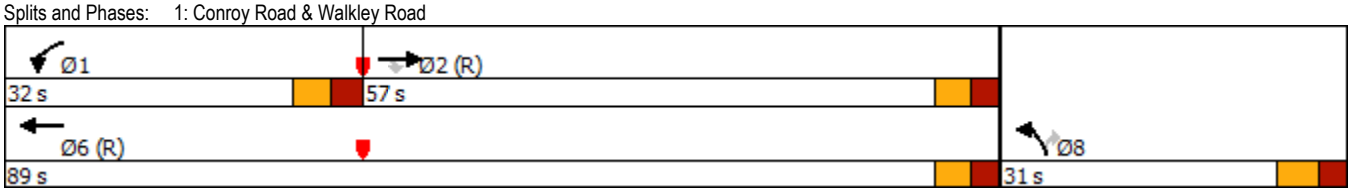
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 31.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1139 | 438 | 522 | 965 | 457 | 297 |
| Future Volume (vph) | 1139 | 438 | 522 | 965 | 457 | 297 |
| Satd. Flow (prot) | 3221 | 1483 | 3216 | 3349 | 3248 | 1469 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3221 | 1426 | 3216 | 3349 | 3248 | 1417 |
| Satd. Flow (RTOR) | | 447 | | | | 330 |
| Lane Group Flow (vph) | 1266 | 487 | 580 | 1072 | 508 | 330 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Total Split (s) | 57.0 | 57.0 | 32.0 | 89.0 | 31.0 | 31.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.2 | 6.0 | 6.4 | 6.4 |
| Act Effct Green (s) | 54.1 | 54.1 | 24.6 | 84.9 | 22.7 | 22.7 |
| Actuated g/C Ratio | 0.45 | 0.45 | 0.20 | 0.71 | 0.19 | 0.19 |
| v/c Ratio | 0.87 | 0.55 | 0.88 | 0.45 | 0.83 | 0.62 |
| Control Delay | 38.6 | 5.7 | 63.0 | 10.2 | 58.9 | 9.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 38.6 | 5.7 | 63.0 | 10.2 | 58.9 | 9.8 |
| LOS | D | A | E | B | E | A |
| Approach Delay | 29.5 | | | 28.8 | 39.6 | |
| Approach LOS | C | | | C | D | |
| Queue Length 50th (m) | 134.5 | 5.1 | 69.0 | 37.6 | 53.9 | 0.0 |
| Queue Length 95th (m) | #176.6 | 27.6 | #88.9 | 79.0 | 71.4 | 23.6 |
| Internal Link Dist (m) | 308.5 | | | 156.3 | 111.4 | |
| Turn Bay Length (m) | | 75.0 | | | | |
| Base Capacity (vph) | 1451 | 888 | 691 | 2369 | 665 | 552 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.87 | 0.55 | 0.84 | 0.45 | 0.76 | 0.60 |

**Intersection Summary**

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 31.2 — Intersection LOS: C
Intersection Capacity Utilization 80.8% — 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.

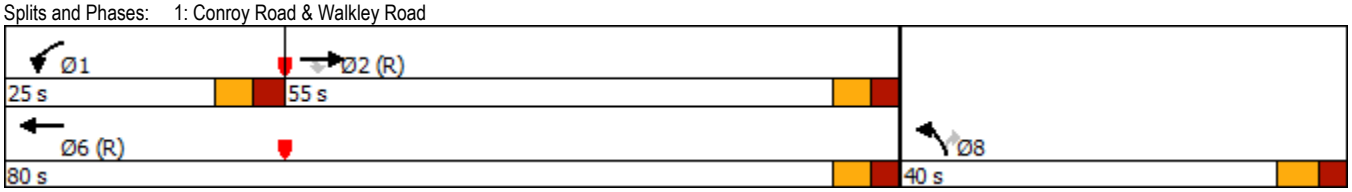
Splits and Phases: 1: Conroy Road & Walkley Road



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 834 | 275 | 261 | 1017 | 704 | 476 |
| Future Volume (vph) | 834 | 275 | 261 | 1017 | 704 | 476 |
| Satd. Flow (prot) | 3191 | 1455 | 3066 | 3161 | 3216 | 1455 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3191 | 1419 | 3066 | 3161 | 3216 | 1436 |
| Satd. Flow (RTOR) | | 275 | | | | 351 |
| Lane Group Flow (vph) | 834 | 275 | 261 | 1017 | 704 | 476 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Total Split (s) | 55.0 | 55.0 | 25.0 | 80.0 | 40.0 | 40.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.2 | 6.0 | 6.4 | 6.4 |
| Act Effct Green (s) | 55.2 | 55.2 | 15.2 | 76.6 | 31.0 | 31.0 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.13 | 0.64 | 0.26 | 0.26 |
| v/c Ratio | 0.57 | 0.34 | 0.67 | 0.50 | 0.85 | 0.76 |
| Control Delay | 26.7 | 3.9 | 70.8 | 10.0 | 52.8 | 18.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 26.7 | 3.9 | 70.8 | 10.0 | 52.8 | 18.9 |
| LOS | C | A | E | A | D | B |
| Approach Delay | 21.0 | | | 22.4 | 39.1 | |
| Approach LOS | C | | | C | D | |
| Queue Length 50th (m) | 70.2 | 0.0 | 30.5 | 41.2 | 73.4 | 23.5 |
| Queue Length 95th (m) | 94.8 | 14.7 | 42.4 | 46.2 | 92.9 | 62.0 |
| Internal Link Dist (m) | 308.5 | | | 156.3 | 111.4 | |
| Turn Bay Length (m) | | 75.0 | | | | |
| Base Capacity (vph) | 1467 | 801 | 480 | 2018 | 900 | 654 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.57 | 0.34 | 0.54 | 0.50 | 0.78 | 0.73 |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 43 (36%), Referenced to phase 2:EBT and 6:WBT, Start of Green | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay: 27.5 | Intersection LOS: C |
| Intersection Capacity Utilization 69.6% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Conroy Road & Walkley Road



# 2020 Walkley Road
## 2: Conroy Road & St. Laurent Boulevard

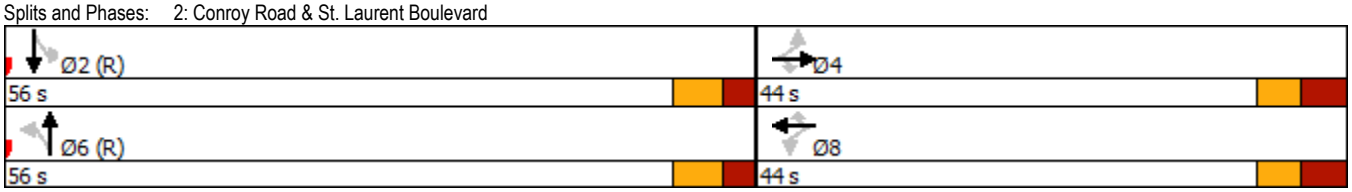
2023 FB AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 9 | 68 | 86 | 64 | 45 | 41 | 203 | 1259 | 207 | 91 | 394 | 55 |
| Future Volume (vph) | 9 | 68 | 86 | 64 | 45 | 41 | 203 | 1259 | 207 | 91 | 394 | 55 |
| Satd. Flow (prot) | 1537 | 1695 | 1441 | 1409 | 1575 | 1339 | 1642 | 4607 | 0 | 1674 | 3204 | 0 |
| Flt Permitted | 0.728 | | | 0.713 | | | 0.492 | | | 0.155 | | |
| Satd. Flow (perm) | 1173 | 1695 | 1409 | 1047 | 1575 | 1316 | 837 | 4607 | 0 | 272 | 3204 | 0 |
| Satd. Flow (RTOR) | | | 86 | | | 36 | | 45 | | | 22 | |
| Lane Group Flow (vph) | 9 | 68 | 86 | 64 | 45 | 41 | 203 | 1466 | 0 | 91 | 449 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 6 | | | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 6 | | | 2 | | |
| Total Split (s) | 44.0 | 44.0 | 44.0 | 44.0 | 44.0 | 44.0 | 56.0 | 56.0 | | 56.0 | 56.0 | |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Act Effct Green (s) | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 | 75.0 | 75.0 | | 75.0 | 75.0 | |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.75 | 0.75 | | 0.75 | 0.75 | |
| v/c Ratio | 0.05 | 0.24 | 0.28 | 0.37 | 0.17 | 0.17 | 0.32 | 0.42 | | 0.45 | 0.19 | |
| Control Delay | 29.0 | 35.1 | 8.3 | 39.9 | 33.4 | 12.0 | 10.2 | 7.8 | | 21.4 | 6.3 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 29.0 | 35.1 | 8.3 | 39.9 | 33.4 | 12.0 | 10.2 | 7.8 | | 21.4 | 6.3 | |
| LOS | C | D | A | D | C | B | B | A | | C | A | |
| Approach Delay | | 20.6 | | | 30.3 | | | 8.1 | | | 8.9 | |
| Approach LOS | | C | | | C | | | A | | | A | |
| Queue Length 50th (m) | 1.5 | 11.4 | 0.0 | 10.9 | 7.4 | 0.8 | 9.8 | 27.4 | | 5.0 | 9.4 | |
| Queue Length 95th (m) | 4.0 | 16.1 | 8.7 | 16.3 | 11.8 | 6.7 | 42.4 | 79.3 | | #37.1 | 31.4 | |
| Internal Link Dist (m) | | 170.0 | | | 224.1 | | | 245.6 | | | 179.5 | |
| Turn Bay Length (m) | 30.0 | | 35.0 | 35.0 | | 35.0 | 70.0 | | | 75.0 | | |
| Base Capacity (vph) | 435 | 628 | 576 | 388 | 584 | 510 | 627 | 3464 | | 203 | 2407 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.02 | 0.11 | 0.15 | 0.16 | 0.08 | 0.08 | 0.32 | 0.42 | | 0.45 | 0.19 | |

### Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 23 (23%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.45
Intersection Signal Delay: 10.4 — Intersection LOS: B
Intersection Capacity Utilization 71.7% — ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Conroy Road & St. Laurent Boulevard

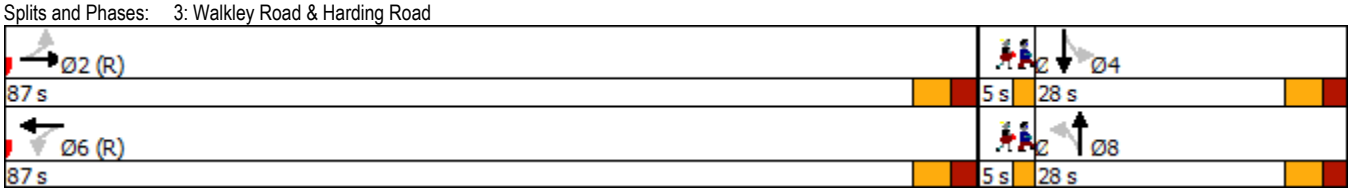


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 34 | 1219 | 14 | 1 | 1192 | 44 | 1 | 0 | 1 | 16 | 0 | 193 |
| Future Volume (vph) | 34 | 1219 | 14 | 1 | 1192 | 44 | 1 | 0 | 1 | 16 | 0 | 193 |
| Satd. Flow (prot) | 1537 | 3243 | 0 | 0 | 3202 | 0 | 0 | 1079 | 0 | 0 | 1503 | 0 |
| Flt Permitted | 0.195 | | | | 0.955 | | | 0.849 | | | 0.977 | |
| Satd. Flow (perm) | 315 | 3243 | 0 | 0 | 3058 | 0 | 0 | 938 | 0 | 0 | 1474 | 0 |
| Satd. Flow (RTOR) | | 2 | | | 7 | | | 45 | | | 139 | |
| Lane Group Flow (vph) | 34 | 1233 | 0 | 0 | 1237 | 0 | 0 | 2 | 0 | 0 | 209 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Total Split (s) | 87.0 | 87.0 | | 87.0 | 87.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Lost Time (s) | 5.9 | 5.9 | | | 5.9 | | | 5.7 | | | 5.7 | |
| Act Effct Green (s) | 89.6 | 89.6 | | | 89.6 | | | 17.8 | | | 13.8 | |
| Actuated g/C Ratio | 0.75 | 0.75 | | | 0.75 | | | 0.15 | | | 0.12 | |
| v/c Ratio | 0.14 | 0.51 | | | 0.54 | | | 0.01 | | | 0.71 | |
| Control Delay | 5.2 | 4.9 | | | 8.1 | | | 0.0 | | | 31.5 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 5.2 | 4.9 | | | 8.1 | | | 0.0 | | | 31.5 | |
| LOS | A | A | | | A | | | A | | | C | |
| Approach Delay | | 4.9 | | | 8.1 | | | | | | 31.5 | |
| Approach LOS | | A | | | A | | | | | | C | |
| Queue Length 50th (m) | 1.3 | 29.3 | | | 46.9 | | | 0.0 | | | 14.6 | |
| Queue Length 95th (m) | m2.9 | 48.3 | | | 86.4 | | | 0.0 | | | 35.2 | |
| Internal Link Dist (m) | | 85.4 | | | 213.8 | | | 35.2 | | | 112.2 | |
| Turn Bay Length (m) | 30.0 | | | | | | | | | | | |
| Base Capacity (vph) | 235 | 2420 | | | 2283 | | | 210 | | | 387 | |
| Starvation Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | 0.14 | 0.51 | | | 0.54 | | | 0.01 | | | 0.54 | |

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 24 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 8.4 Intersection LOS: A
Intersection Capacity Utilization 61.0% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Harding Road



| Lane Group | Ø3 | Ø7 |
|---|---|---|
| Lane Configurations | | |
| Traffic Volume (vph) | | |
| Future Volume (vph) | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Satd. Flow (RTOR) | | |
| Lane Group Flow (vph) | | |
| Turn Type | | |
| Protected Phases | 3 | 7 |
| Permitted Phases | | |
| Total Split (s) | 5.0 | 5.0 |
| Total Lost Time (s) | | |
| 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 |
|---|

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1261 | 27 | 25 | 1361 | 6 | 6 |
| Future Volume (Veh/h) | 1261 | 27 | 25 | 1361 | 6 | 6 |
| 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) | 1261 | 27 | 25 | 1361 | 6 | 6 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | 180 | | | 109 | | |
| pX, platoon unblocked | | | 0.82 | | 0.82 | 0.82 |
| vC, conflicting volume | | | 1288 | | 1665 | 644 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 912 | | 1372 | 127 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 96 | | 94 | 99 |
| cM capacity (veh/h) | | | 609 | | 108 | 738 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 841 | 447 | 219 | 389 | 389 | 389 | 12 |
| Volume Left | 0 | 0 | 25 | 0 | 0 | 0 | 6 |
| Volume Right | 0 | 27 | 0 | 0 | 0 | 0 | 6 |
| cSH | 1700 | 1700 | 609 | 1700 | 1700 | 1700 | 188 |
| Volume to Capacity | 0.49 | 0.26 | 0.04 | 0.23 | 0.23 | 0.23 | 0.06 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 1.4 |
| Control Delay (s) | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | 0.0 | 25.4 |
| Lane LOS | | | A | | | | D |
| Approach Delay (s) | 0.0 | | 0.3 | | | | 25.4 |
| Approach LOS | | | | | | | D |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 49.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 5 | 1175 | 47 | 0 | 536 |
| Future Volume (Veh/h) | 0 | 5 | 1175 | 47 | 0 | 536 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 5 | 1175 | 47 | 0 | 536 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 204 | | | 135 |
| pX, platoon unblocked | 0.92 | 0.92 | | | 0.92 | |
| vC, conflicting volume | 1466 | 415 | | | 1222 | |
| vC1, stage 1 conf vol | 1198 | | | | | |
| vC2, stage 2 conf vol | 268 | | | | | |
| vCu, unblocked vol | 1208 | 67 | | | 943 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 99 | | | 100 | |
| cM capacity (veh/h) | 263 | 906 | | | 667 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 5 | 470 | 470 | 282 | 268 | 268 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 5 | 0 | 0 | 47 | 0 | 0 |
| cSH | 906 | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.28 | 0.28 | 0.17 | 0.16 | 0.16 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 9.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | | |
| Approach Delay (s) | 9.0 | 0.0 | | | 0.0 | |
| Approach LOS | A | | | | | |

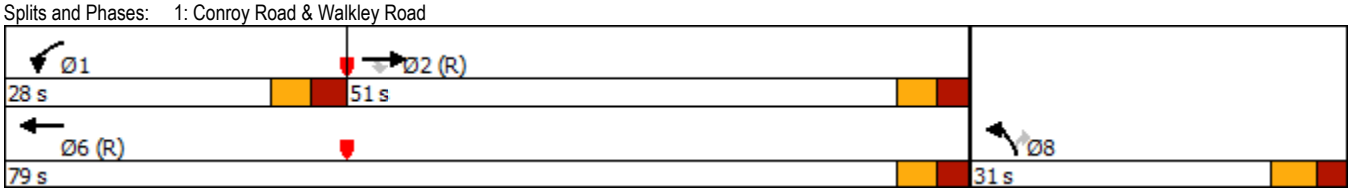
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 35.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1207 | 465 | 554 | 1021 | 490 | 330 |
| Future Volume (vph) | 1207 | 465 | 554 | 1021 | 490 | 330 |
| Satd. Flow (prot) | 3221 | 1483 | 3216 | 3349 | 3248 | 1469 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3221 | 1430 | 3216 | 3349 | 3248 | 1420 |
| Satd. Flow (RTOR) | | 465 | | | | 330 |
| Lane Group Flow (vph) | 1207 | 465 | 554 | 1021 | 490 | 330 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Total Split (s) | 51.0 | 51.0 | 28.0 | 79.0 | 31.0 | 31.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.2 | 6.0 | 6.4 | 6.4 |
| Act Effct Green (s) | 48.1 | 48.1 | 21.8 | 76.1 | 21.5 | 21.5 |
| Actuated g/C Ratio | 0.44 | 0.44 | 0.20 | 0.69 | 0.20 | 0.20 |
| v/c Ratio | 0.86 | 0.52 | 0.87 | 0.44 | 0.77 | 0.61 |
| Control Delay | 36.3 | 4.4 | 44.7 | 16.9 | 50.5 | 9.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 36.3 | 4.4 | 44.7 | 16.9 | 50.5 | 9.2 |
| LOS | D | A | D | B | D | A |
| Approach Delay | 27.4 | | | 26.7 | 33.9 | |
| Approach LOS | C | | | C | C | |
| Queue Length 50th (m) | 116.5 | 0.0 | 57.4 | 78.1 | 47.1 | 0.0 |
| Queue Length 95th (m) | #156.7 | 17.6 | #83.0 | 113.8 | 61.9 | 21.8 |
| Internal Link Dist (m) | 308.5 | | | 156.3 | 111.4 | |
| Turn Bay Length (m) | | 75.0 | | | | |
| Base Capacity (vph) | 1407 | 886 | 653 | 2316 | 726 | 573 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.86 | 0.52 | 0.85 | 0.44 | 0.67 | 0.58 |

**Intersection Summary**

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 20 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 28.4 — Intersection LOS: C
Intersection Capacity Utilization 84.3% — 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: Conroy Road & Walkley Road



# 2020 Walkley Road
## 2: Conroy Road & St. Laurent Boulevard

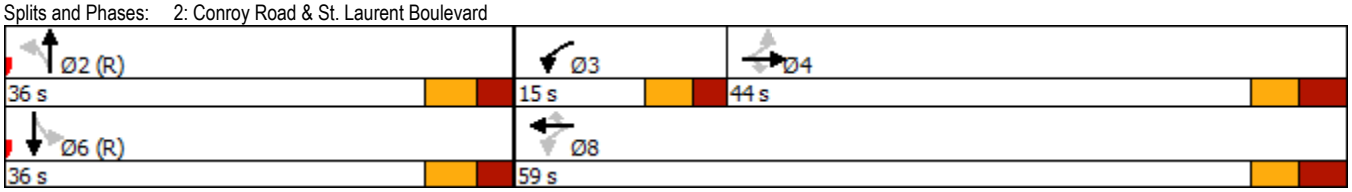
2023 FB PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 43 | 81 | 334 | 235 | 35 | 111 | 42 | 601 | 84 | 39 | 1129 | 13 |
| Future Volume (vph) | 43 | 81 | 334 | 235 | 35 | 111 | 42 | 601 | 84 | 39 | 1129 | 13 |
| Satd. Flow (prot) | 1691 | 1780 | 1469 | 1642 | 1664 | 1483 | 1642 | 4618 | 0 | 1523 | 3303 | 0 |
| Flt Permitted | 0.734 | | | 0.558 | | | 0.146 | | | 0.365 | | |
| Satd. Flow (perm) | 1305 | 1780 | 1447 | 962 | 1664 | 1463 | 252 | 4618 | 0 | 580 | 3303 | 0 |
| Satd. Flow (RTOR) | | | 120 | | | 76 | | 28 | | | 1 | |
| Lane Group Flow (vph) | 43 | 81 | 334 | 235 | 35 | 111 | 42 | 685 | 0 | 39 | 1142 | 0 |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Total Split (s) | 44.0 | 44.0 | 44.0 | 15.0 | 59.0 | 59.0 | 36.0 | 36.0 | | 36.0 | 36.0 | |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 5.7 | 6.9 | 6.9 | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Act Effct Green (s) | 21.7 | 21.7 | 21.7 | 37.9 | 36.7 | 36.7 | 45.1 | 45.1 | | 45.1 | 45.1 | |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.40 | 0.39 | 0.39 | 0.47 | 0.47 | | 0.47 | 0.47 | |
| v/c Ratio | 0.14 | 0.20 | 0.79 | 0.52 | 0.05 | 0.18 | 0.35 | 0.31 | | 0.14 | 0.73 | |
| Control Delay | 25.9 | 27.2 | 34.0 | 22.8 | 14.8 | 6.2 | 33.2 | 17.1 | | 20.7 | 26.2 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 25.9 | 27.2 | 34.0 | 22.8 | 14.8 | 6.2 | 33.2 | 17.1 | | 20.7 | 26.2 | |
| LOS | C | C | C | C | B | A | C | B | | C | C | |
| Approach Delay | | 32.0 | | | 17.2 | | | 18.0 | | | 26.0 | |
| Approach LOS | | C | | | B | | | B | | | C | |
| Queue Length 50th (m) | 5.9 | 11.3 | 35.2 | 27.9 | 3.7 | 3.7 | 4.2 | 23.4 | | 3.5 | 76.4 | |
| Queue Length 95th (m) | 10.7 | 17.2 | 49.8 | 31.1 | 6.5 | 9.4 | #20.4 | 42.7 | | 12.6 | #153.5 | |
| Internal Link Dist (m) | | 170.0 | | | 224.1 | | | 245.6 | | | 179.5 | |
| Turn Bay Length (m) | 30.0 | | 35.0 | 35.0 | | 35.0 | 70.0 | | | 75.0 | | |
| Base Capacity (vph) | 509 | 695 | 638 | 450 | 912 | 836 | 119 | 2205 | | 274 | 1567 | |
| 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 | 0.12 | 0.52 | 0.52 | 0.04 | 0.13 | 0.35 | 0.31 | | 0.14 | 0.73 | |

### Intersection Summary

Cycle Length: 95
Actuated Cycle Length: 95
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 23.7 — Intersection LOS: C
Intersection Capacity Utilization 86.2% — 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: Conroy Road & St. Laurent Boulevard

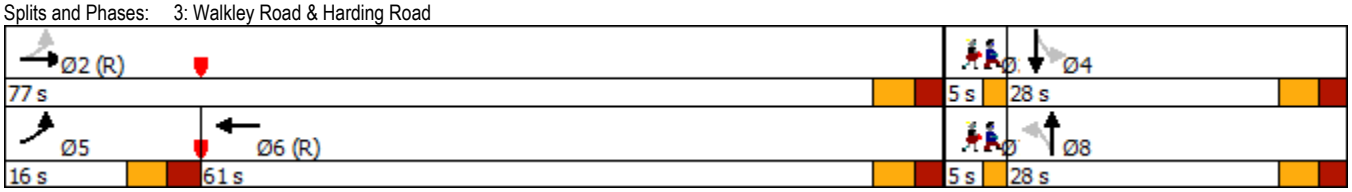


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 191 | 1375 | 2 | 0 | 1427 | 32 | 9 | 1 | 0 | 25 | 0 | 300 |
| Future Volume (vph) | 191 | 1375 | 2 | 0 | 1427 | 32 | 9 | 1 | 0 | 25 | 0 | 300 |
| Satd. Flow (prot) | 1674 | 3221 | 0 | 0 | 3303 | 0 | 0 | 1703 | 0 | 0 | 1494 | 0 |
| Flt Permitted | 0.091 | | | | | | | 0.487 | | | 0.975 | |
| Satd. Flow (perm) | 160 | 3221 | 0 | 0 | 3303 | 0 | 0 | 865 | 0 | 0 | 1462 | 0 |
| Satd. Flow (RTOR) | | | | | 3 | | | | | | 225 | |
| Lane Group Flow (vph) | 191 | 1377 | 0 | 0 | 1459 | 0 | 0 | 10 | 0 | 0 | 325 | 0 |
| Turn Type | pm+pt | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 5 | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | | | | 8 | | | 4 | | |
| Total Split (s) | 16.0 | 77.0 | | | 61.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Lost Time (s) | 6.0 | 5.9 | | | 5.9 | | | 5.7 | | | 5.7 | |
| Act Effct Green (s) | 82.3 | 82.4 | | | 63.8 | | | 16.0 | | | 16.0 | |
| Actuated g/C Ratio | 0.75 | 0.75 | | | 0.58 | | | 0.15 | | | 0.15 | |
| v/c Ratio | 0.65 | 0.57 | | | 0.76 | | | 0.08 | | | 0.80 | |
| Control Delay | 41.9 | 2.1 | | | 22.4 | | | 37.4 | | | 29.3 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 41.9 | 2.1 | | | 22.4 | | | 37.4 | | | 29.3 | |
| LOS | D | A | | | C | | | D | | | C | |
| Approach Delay | | 6.9 | | | 22.4 | | | 37.4 | | | 29.3 | |
| Approach LOS | | A | | | C | | | D | | | C | |
| Queue Length 50th (m) | 21.3 | 7.2 | | | 108.2 | | | 1.8 | | | 19.1 | |
| Queue Length 95th (m) | m32.8 | 17.7 | | | 162.0 | | | 5.6 | | | 43.9 | |
| Internal Link Dist (m) | | 85.4 | | | 213.8 | | | 35.2 | | | 112.2 | |
| Turn Bay Length (m) | 30.0 | | | | | | | | | | | |
| Base Capacity (vph) | 296 | 2413 | | | 1916 | | | 182 | | | 486 | |
| Starvation Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | 0.65 | 0.57 | | | 0.76 | | | 0.05 | | | 0.67 | |

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 41 (37%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 15.9 Intersection LOS: B
Intersection Capacity Utilization 89.6% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Harding Road



| Lane Group | Ø3 | Ø7 |
|---|---|---|
| Lane Configurations | | |
| Traffic Volume (vph) | | |
| Future Volume (vph) | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Satd. Flow (RTOR) | | |
| Lane Group Flow (vph) | | |
| Turn Type | | |
| Protected Phases | 3 | 7 |
| Permitted Phases | | |
| Total Split (s) | 5.0 | 5.0 |
| Total Lost Time (s) | | |
| 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 |
|---|

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1539 | 9 | 8 | 1728 | 30 | 29 |
| Future Volume (Veh/h) | 1539 | 9 | 8 | 1728 | 30 | 29 |
| 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) | 1539 | 9 | 8 | 1728 | 30 | 29 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | 180 | | | 109 | | |
| pX, platoon unblocked | | | 0.66 | | 0.66 | 0.66 |
| vC, conflicting volume | | | 1548 | | 1992 | 774 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 814 | | 1481 | 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 % | | | 99 | | 60 | 96 |
| cM capacity (veh/h) | | | 537 | | 76 | 720 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 1026 | 522 | 255 | 494 | 494 | 494 | 59 |
| Volume Left | 0 | 0 | 8 | 0 | 0 | 0 | 30 |
| Volume Right | 0 | 9 | 0 | 0 | 0 | 0 | 29 |
| cSH | 1700 | 1700 | 537 | 1700 | 1700 | 1700 | 135 |
| Volume to Capacity | 0.60 | 0.31 | 0.01 | 0.29 | 0.29 | 0.29 | 0.44 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 13.5 |
| Control Delay (s) | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 50.6 |
| Lane LOS | | | A | | | | F |
| Approach Delay (s) | 0.0 | | 0.1 | | | | 50.6 |
| Approach LOS | | | | | | | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.9 | | |
| Intersection Capacity Utilization | 55.5% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 31 | 789 | 15 | 0 | 1019 |
| Future Volume (Veh/h) | 0 | 31 | 789 | 15 | 0 | 1019 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 31 | 789 | 15 | 0 | 1019 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 204 | | | 135 |
| pX, platoon unblocked | 0.95 | 0.95 | | | 0.95 | |
| vC, conflicting volume | 1306 | 270 | | | 804 | |
| vC1, stage 1 conf vol | 796 | | | | | |
| vC2, stage 2 conf vol | 510 | | | | | |
| vCu, unblocked vol | 1140 | 51 | | | 612 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 97 | | | 100 | |
| cM capacity (veh/h) | 322 | 957 | | | 915 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 31 | 316 | 316 | 173 | 510 | 510 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 31 | 0 | 0 | 15 | 0 | 0 |
| cSH | 957 | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.03 | 0.19 | 0.19 | 0.10 | 0.30 | 0.30 |
| Queue Length 95th (m) | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 8.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | | |
| Approach Delay (s) | 8.9 | 0.0 | | | 0.0 | |
| Approach LOS | A | | | | | |

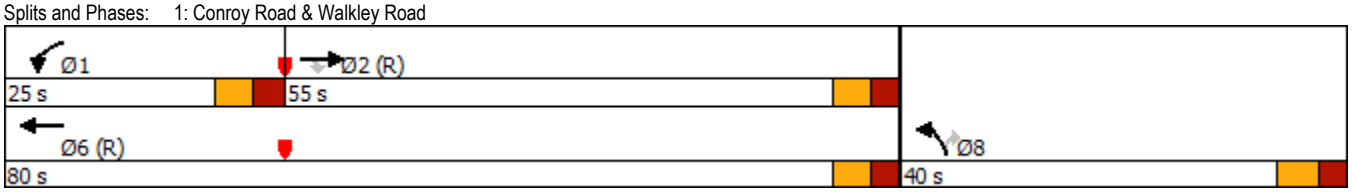
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 33.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 903 | 297 | 272 | 1074 | 741 | 499 |
| Future Volume (vph) | 903 | 297 | 272 | 1074 | 741 | 499 |
| Satd. Flow (prot) | 3191 | 1455 | 3066 | 3161 | 3216 | 1455 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3191 | 1419 | 3066 | 3161 | 3216 | 1436 |
| Satd. Flow (RTOR) | | 297 | | | | 341 |
| Lane Group Flow (vph) | 903 | 297 | 272 | 1074 | 741 | 499 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Total Split (s) | 55.0 | 55.0 | 25.0 | 80.0 | 40.0 | 40.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.2 | 6.0 | 6.4 | 6.4 |
| Act Effct Green (s) | 54.1 | 54.1 | 15.6 | 75.9 | 31.7 | 31.7 |
| Actuated g/C Ratio | 0.45 | 0.45 | 0.13 | 0.63 | 0.26 | 0.26 |
| v/c Ratio | 0.63 | 0.37 | 0.69 | 0.54 | 0.87 | 0.79 |
| Control Delay | 28.6 | 3.9 | 70.2 | 10.6 | 54.2 | 22.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 28.6 | 3.9 | 70.2 | 10.6 | 54.2 | 22.5 |
| LOS | C | A | E | B | D | C |
| Approach Delay | 22.5 | | | 22.7 | 41.4 | |
| Approach LOS | C | | | C | D | |
| Queue Length 50th (m) | 80.1 | 0.0 | 30.8 | 44.8 | 77.5 | 31.7 |
| Queue Length 95th (m) | 105.2 | 15.1 | 44.7 | 52.6 | 98.7 | 73.5 |
| Internal Link Dist (m) | 308.5 | | | 156.3 | 111.4 | |
| Turn Bay Length (m) | | 75.0 | | | | |
| Base Capacity (vph) | 1438 | 803 | 480 | 1998 | 900 | 647 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.63 | 0.37 | 0.57 | 0.54 | 0.82 | 0.77 |

**Intersection Summary**

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 43 (36%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 28.8 — Intersection LOS: C
Intersection Capacity Utilization 72.4% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Conroy Road & Walkley Road



# 2020 Walkley Road
## 2: Conroy Road & St. Laurent Boulevard

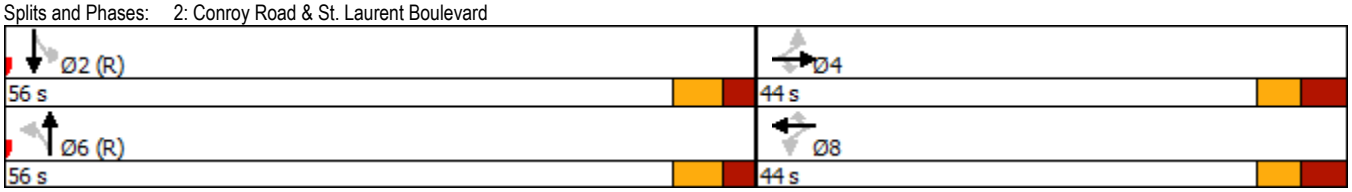
2028 FB AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 9 | 70 | 89 | 67 | 47 | 43 | 211 | 1322 | 216 | 95 | 421 | 57 |
| Future Volume (vph) | 9 | 70 | 89 | 67 | 47 | 43 | 211 | 1322 | 216 | 95 | 421 | 57 |
| Satd. Flow (prot) | 1537 | 1695 | 1441 | 1409 | 1575 | 1339 | 1642 | 4607 | 0 | 1674 | 3204 | 0 |
| Flt Permitted | 0.726 | | | 0.711 | | | 0.479 | | | 0.142 | | |
| Satd. Flow (perm) | 1169 | 1695 | 1409 | 1045 | 1575 | 1316 | 816 | 4607 | 0 | 249 | 3204 | 0 |
| Satd. Flow (RTOR) | | | 89 | | | 36 | | 45 | | | 21 | |
| Lane Group Flow (vph) | 9 | 70 | 89 | 67 | 47 | 43 | 211 | 1538 | 0 | 95 | 478 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 6 | | | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 6 | | | 2 | | |
| Total Split (s) | 44.0 | 44.0 | 44.0 | 44.0 | 44.0 | 44.0 | 56.0 | 56.0 | | 56.0 | 56.0 | |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Act Effct Green (s) | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | 74.8 | 74.8 | | 74.8 | 74.8 | |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.75 | 0.75 | | 0.75 | 0.75 | |
| v/c Ratio | 0.05 | 0.25 | 0.29 | 0.39 | 0.18 | 0.17 | 0.35 | 0.44 | | 0.51 | 0.20 | |
| Control Delay | 28.9 | 35.1 | 8.3 | 40.3 | 33.4 | 12.8 | 10.6 | 8.1 | | 25.6 | 6.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 28.9 | 35.1 | 8.3 | 40.3 | 33.4 | 12.8 | 10.6 | 8.1 | | 25.6 | 6.5 | |
| LOS | C | D | A | D | C | B | B | A | | C | A | |
| Approach Delay | | 20.6 | | | 30.7 | | | 8.4 | | | 9.6 | |
| Approach LOS | | C | | | C | | | A | | | A | |
| Queue Length 50th (m) | 1.5 | 11.7 | 0.0 | 11.5 | 7.8 | 1.1 | 10.5 | 30.0 | | 5.7 | 10.3 | |
| Queue Length 95th (m) | 4.0 | 16.7 | 8.8 | 16.9 | 12.3 | 7.1 | 45.1 | 84.8 | | #41.1 | 33.7 | |
| Internal Link Dist (m) | | 170.0 | | | 224.1 | | | 245.6 | | | 179.5 | |
| Turn Bay Length (m) | 30.0 | | 35.0 | 35.0 | | 35.0 | 70.0 | | | 75.0 | | |
| Base Capacity (vph) | 433 | 628 | 578 | 387 | 584 | 510 | 610 | 3458 | | 186 | 2402 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.02 | 0.11 | 0.15 | 0.17 | 0.08 | 0.08 | 0.35 | 0.44 | | 0.51 | 0.20 | |

### Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 23 (23%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 10.8 — Intersection LOS: B
Intersection Capacity Utilization 73.2% — 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: 2: Conroy Road & St. Laurent Boulevard

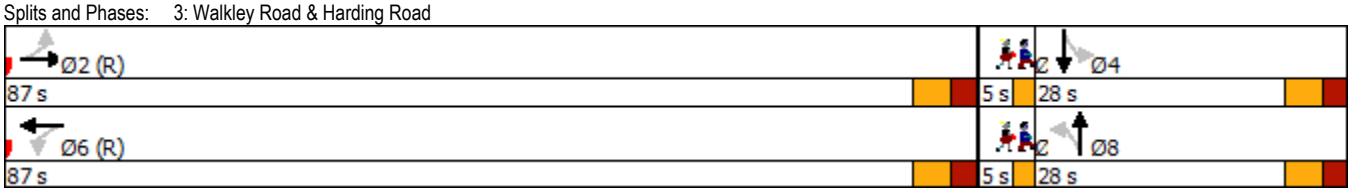


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 35 | 1305 | 14 | 1 | 1258 | 46 | 1 | 0 | 1 | 17 | 0 | 202 |
| Future Volume (vph) | 35 | 1305 | 14 | 1 | 1258 | 46 | 1 | 0 | 1 | 17 | 0 | 202 |
| Satd. Flow (prot) | 1537 | 3243 | 0 | 0 | 3202 | 0 | 0 | 1079 | 0 | 0 | 1503 | 0 |
| Flt Permitted | 0.186 | | | | 0.955 | | | 0.823 | | | 0.977 | |
| Satd. Flow (perm) | 301 | 3243 | 0 | 0 | 3058 | 0 | 0 | 910 | 0 | 0 | 1474 | 0 |
| Satd. Flow (RTOR) | | 2 | | | 7 | | | 45 | | | 126 | |
| Lane Group Flow (vph) | 35 | 1319 | 0 | 0 | 1305 | 0 | 0 | 2 | 0 | 0 | 219 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Total Split (s) | 87.0 | 87.0 | | 87.0 | 87.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Lost Time (s) | 5.9 | 5.9 | | | 5.9 | | | 5.7 | | | 5.7 | |
| Act Effct Green (s) | 92.8 | 92.8 | | | 92.8 | | | 15.6 | | | 15.6 | |
| Actuated g/C Ratio | 0.77 | 0.77 | | | 0.77 | | | 0.13 | | | 0.13 | |
| v/c Ratio | 0.15 | 0.53 | | | 0.55 | | | 0.01 | | | 0.73 | |
| Control Delay | 4.6 | 4.3 | | | 7.3 | | | 0.0 | | | 34.8 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 4.6 | 4.3 | | | 7.3 | | | 0.0 | | | 34.8 | |
| LOS | A | A | | | A | | | A | | | C | |
| Approach Delay | | 4.3 | | | 7.3 | | | | | | 34.8 | |
| Approach LOS | | A | | | A | | | | | | C | |
| Queue Length 50th (m) | 1.0 | 31.5 | | | 44.2 | | | 0.0 | | | 19.6 | |
| Queue Length 95th (m) | m2.6 | 52.1 | | | 93.6 | | | 0.0 | | | 39.3 | |
| Internal Link Dist (m) | | 85.4 | | | 213.8 | | | 35.2 | | | 112.2 | |
| Turn Bay Length (m) | 30.0 | | | | | | | | | | | |
| Base Capacity (vph) | 232 | 2509 | | | 2367 | | | 212 | | | 387 | |
| Starvation Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | 0.15 | 0.53 | | | 0.55 | | | 0.01 | | | 0.57 | |

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 24 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 8.0 Intersection LOS: A
Intersection Capacity Utilization 63.6% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Harding Road



| Lane Group | Ø3 | Ø7 |
|---|---|---|
| Lane Configurations | | |
| Traffic Volume (vph) | | |
| Future Volume (vph) | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Satd. Flow (RTOR) | | |
| Lane Group Flow (vph) | | |
| Turn Type | | |
| Protected Phases | 3 | 7 |
| Permitted Phases | | |
| Total Split (s) | 5.0 | 5.0 |
| Total Lost Time (s) | | |
| 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 |
|---|

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1348 | 27 | 25 | 1436 | 6 | 6 |
| Future Volume (Veh/h) | 1348 | 27 | 25 | 1436 | 6 | 6 |
| 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) | 1348 | 27 | 25 | 1436 | 6 | 6 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | 180 | | | 109 | | |
| pX, platoon unblocked | | | 0.79 | | 0.79 | 0.79 |
| vC, conflicting volume | | | 1375 | | 1770 | 688 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 952 | | 1451 | 86 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 96 | | 93 | 99 |
| cM capacity (veh/h) | | | 569 | | 92 | 758 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 899 | 476 | 230 | 410 | 410 | 410 | 12 |
| Volume Left | 0 | 0 | 25 | 0 | 0 | 0 | 6 |
| Volume Right | 0 | 27 | 0 | 0 | 0 | 0 | 6 |
| cSH | 1700 | 1700 | 569 | 1700 | 1700 | 1700 | 165 |
| Volume to Capacity | 0.53 | 0.28 | 0.04 | 0.24 | 0.24 | 0.24 | 0.07 |
| Queue Length 95th (m) | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.6 |
| Control Delay (s) | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 0.0 | 28.6 |
| Lane LOS | | | A | | | | D |
| Approach Delay (s) | 0.0 | | 0.3 | | | | 28.6 |
| Approach LOS | | | | | | | D |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.3 | | | |
| Intersection Capacity Utilization | 50.2% | ICU Level of Service | | A |
| Analysis Period (min) | 15 | | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 5 | 1235 | 47 | 0 | 569 |
| Future Volume (Veh/h) | 0 | 5 | 1235 | 47 | 0 | 569 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 5 | 1235 | 47 | 0 | 569 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 204 | | | 135 |
| pX, platoon unblocked | 0.91 | 0.91 | | | 0.91 | |
| vC, conflicting volume | 1543 | 435 | | | 1282 | |
| vC1, stage 1 conf vol | 1258 | | | | | |
| vC2, stage 2 conf vol | 284 | | | | | |
| vCu, unblocked vol | 1253 | 36 | | | 966 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 99 | | | 100 | |
| cM capacity (veh/h) | 251 | 936 | | | 645 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 5 | 494 | 494 | 294 | 284 | 284 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 5 | 0 | 0 | 47 | 0 | 0 |
| cSH | 936 | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.29 | 0.29 | 0.17 | 0.17 | 0.17 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 8.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | | |
| Approach Delay (s) | 8.9 | 0.0 | | | 0.0 | |
| Approach LOS | A | | | | | |

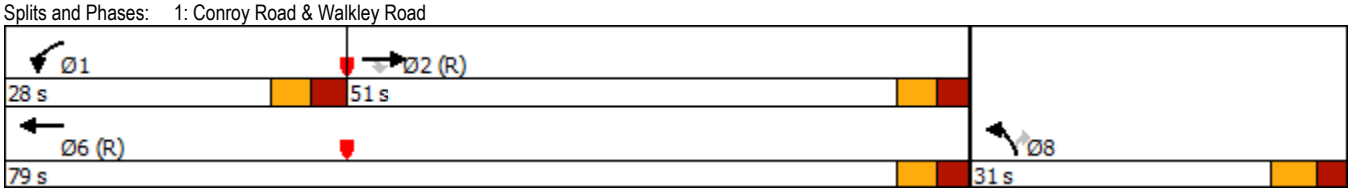
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 36.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1227 | 475 | 580 | 1112 | 527 | 345 |
| Future Volume (vph) | 1227 | 475 | 580 | 1112 | 527 | 345 |
| Satd. Flow (prot) | 3221 | 1483 | 3216 | 3349 | 3248 | 1469 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3221 | 1430 | 3216 | 3349 | 3248 | 1420 |
| Satd. Flow (RTOR) | | 475 | | | | 345 |
| Lane Group Flow (vph) | 1227 | 475 | 580 | 1112 | 527 | 345 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Total Split (s) | 51.0 | 51.0 | 28.0 | 79.0 | 31.0 | 31.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.2 | 6.0 | 6.4 | 6.4 |
| Act Effct Green (s) | 47.1 | 47.1 | 22.1 | 75.4 | 22.2 | 22.2 |
| Actuated g/C Ratio | 0.43 | 0.43 | 0.20 | 0.69 | 0.20 | 0.20 |
| v/c Ratio | 0.89 | 0.54 | 0.90 | 0.48 | 0.80 | 0.61 |
| Control Delay | 39.2 | 4.5 | 44.7 | 19.0 | 51.8 | 9.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.2 | 4.5 | 44.7 | 19.0 | 51.8 | 9.1 |
| LOS | D | A | D | B | D | A |
| Approach Delay | 29.5 | | | 27.8 | 34.9 | |
| Approach LOS | C | | | C | C | |
| Queue Length 50th (m) | 119.6 | 0.0 | 61.5 | 93.5 | 50.6 | 0.0 |
| Queue Length 95th (m) | #161.1 | 17.9 | m#82.7 | 124.8 | 67.1 | 22.4 |
| Internal Link Dist (m) | 308.5 | | | 156.3 | 111.4 | |
| Turn Bay Length (m) | | 75.0 | | | | |
| Base Capacity (vph) | 1379 | 883 | 654 | 2295 | 726 | 585 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.89 | 0.54 | 0.89 | 0.48 | 0.73 | 0.59 |

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 20 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 30.0 Intersection LOS: C
Intersection Capacity Utilization 86.3% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Conroy Road & Walkley Road

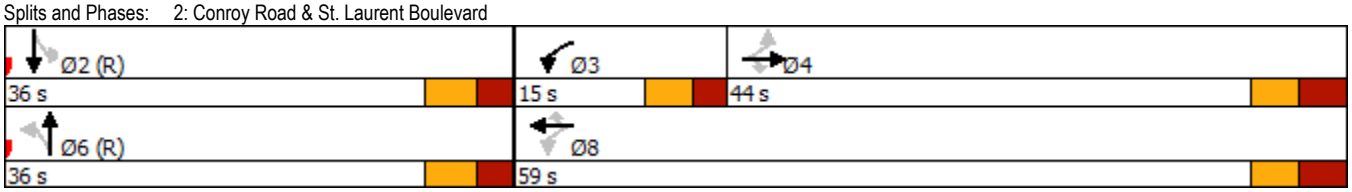


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 44 | 84 | 350 | 246 | 36 | 117 | 44 | 643 | 88 | 41 | 1170 | 14 |
| Future Volume (vph) | 44 | 84 | 350 | 246 | 36 | 117 | 44 | 643 | 88 | 41 | 1170 | 14 |
| Satd. Flow (prot) | 1691 | 1780 | 1469 | 1642 | 1664 | 1483 | 1642 | 4619 | 0 | 1523 | 3303 | 0 |
| Flt Permitted | 0.734 | | | 0.562 | | | 0.126 | | | 0.341 | | |
| Satd. Flow (perm) | 1305 | 1780 | 1447 | 969 | 1664 | 1463 | 218 | 4619 | 0 | 543 | 3303 | 0 |
| Satd. Flow (RTOR) | | | 115 | | | 63 | | 27 | | | 1 | |
| Lane Group Flow (vph) | 44 | 84 | 350 | 246 | 36 | 117 | 44 | 731 | 0 | 41 | 1184 | 0 |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 6 | | | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 6 | | | 2 | | |
| Total Split (s) | 44.0 | 44.0 | 44.0 | 15.0 | 59.0 | 59.0 | 36.0 | 36.0 | | 36.0 | 36.0 | |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 5.7 | 6.9 | 6.9 | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Act Effct Green (s) | 22.8 | 22.8 | 22.8 | 39.0 | 37.8 | 37.8 | 44.0 | 44.0 | | 44.0 | 44.0 | |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.24 | 0.41 | 0.40 | 0.40 | 0.46 | 0.46 | | 0.46 | 0.46 | |
| v/c Ratio | 0.14 | 0.20 | 0.81 | 0.53 | 0.05 | 0.19 | 0.44 | 0.34 | | 0.16 | 0.77 | |
| Control Delay | 25.2 | 26.5 | 35.7 | 22.3 | 14.4 | 8.1 | 41.2 | 17.9 | | 21.8 | 28.3 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 25.2 | 26.5 | 35.7 | 22.3 | 14.4 | 8.1 | 41.2 | 17.9 | | 21.8 | 28.3 | |
| LOS | C | C | D | C | B | A | D | B | | C | C | |
| Approach Delay | | 33.1 | | | 17.4 | | | 19.2 | | | 28.1 | |
| Approach LOS | | C | | | B | | | B | | | C | |
| Queue Length 50th (m) | 5.9 | 11.5 | 38.6 | 28.6 | 3.7 | 5.7 | 4.7 | 26.1 | | 3.8 | 83.4 | |
| Queue Length 95th (m) | 11.0 | 17.6 | 54.3 | 32.7 | 6.6 | 11.2 | #23.3 | 45.9 | | 13.3 | #161.6 | |
| Internal Link Dist (m) | | 170.0 | | | 224.1 | | | 245.6 | | | 179.5 | |
| Turn Bay Length (m) | 30.0 | | 35.0 | 35.0 | | 35.0 | 70.0 | | | 75.0 | | |
| Base Capacity (vph) | 509 | 695 | 635 | 463 | 912 | 830 | 100 | 2152 | | 251 | 1529 | |
| 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 | 0.12 | 0.55 | 0.53 | 0.04 | 0.14 | 0.44 | 0.34 | | 0.16 | 0.77 | |

Intersection Summary

Cycle Length: 95
Actuated Cycle Length: 95
Offset: 2 (2%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 25.1 Intersection LOS: C
Intersection Capacity Utilization 89.0% 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: Conroy Road & St. Laurent Boulevard

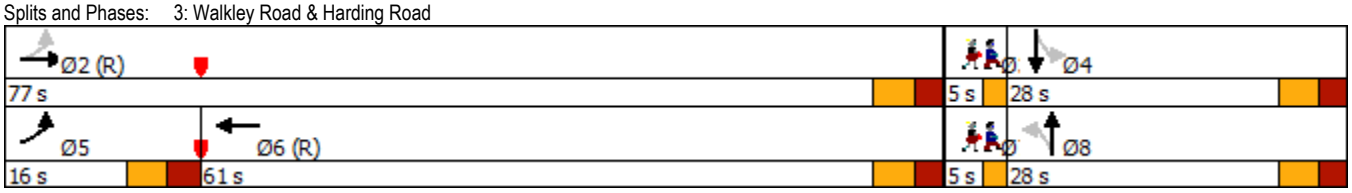


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 200 | 1403 | 2 | 0 | 1537 | 33 | 10 | 1 | 0 | 26 | 0 | 315 |
| Future Volume (vph) | 200 | 1403 | 2 | 0 | 1537 | 33 | 10 | 1 | 0 | 26 | 0 | 315 |
| Satd. Flow (prot) | 1674 | 3221 | 0 | 0 | 3303 | 0 | 0 | 1703 | 0 | 0 | 1494 | 0 |
| Flt Permitted | 0.065 | | | | | | | 0.481 | | | 0.975 | |
| Satd. Flow (perm) | 115 | 3221 | 0 | 0 | 3303 | 0 | 0 | 855 | 0 | 0 | 1462 | 0 |
| Satd. Flow (RTOR) | | | | | 3 | | | | | | 221 | |
| Lane Group Flow (vph) | 200 | 1405 | 0 | 0 | 1570 | 0 | 0 | 11 | 0 | 0 | 341 | 0 |
| Turn Type | pm+pt | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 5 | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | | | | 8 | | | 4 | | |
| Total Split (s) | 16.0 | 77.0 | | | 61.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Lost Time (s) | 6.0 | 5.9 | | | 5.9 | | | 5.7 | | | 5.7 | |
| Act Effct Green (s) | 81.3 | 81.4 | | | 62.1 | | | 17.0 | | | 17.0 | |
| Actuated g/C Ratio | 0.74 | 0.74 | | | 0.56 | | | 0.15 | | | 0.15 | |
| v/c Ratio | 0.73 | 0.59 | | | 0.84 | | | 0.08 | | | 0.83 | |
| Control Delay | 52.9 | 2.3 | | | 26.8 | | | 36.6 | | | 32.3 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 52.9 | 2.3 | | | 26.8 | | | 36.6 | | | 32.3 | |
| LOS | D | A | | | C | | | D | | | C | |
| Approach Delay | | 8.6 | | | 26.8 | | | 36.6 | | | 32.3 | |
| Approach LOS | | A | | | C | | | D | | | C | |
| Queue Length 50th (m) | 26.9 | 8.3 | | | 133.0 | | | 1.9 | | | 23.5 | |
| Queue Length 95th (m) | m#43.7 | m18.6 | | | #200.1 | | | 5.9 | | | 49.3 | |
| Internal Link Dist (m) | | 85.4 | | | 213.8 | | | 35.2 | | | 112.2 | |
| Turn Bay Length (m) | 30.0 | | | | | | | | | | | |
| Base Capacity (vph) | 273 | 2384 | | | 1866 | | | 181 | | | 483 | |
| Starvation Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | 0.73 | 0.59 | | | 0.84 | | | 0.06 | | | 0.71 | |

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 41 (37%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 19.1 Intersection LOS: B
Intersection Capacity Utilization 94.2% ICU Level of Service F
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Harding Road



| Lane Group | Ø3 | Ø7 |
|---|---|---|
| Lane Configurations | | |
| Traffic Volume (vph) | | |
| Future Volume (vph) | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Satd. Flow (RTOR) | | |
| Lane Group Flow (vph) | | |
| Turn Type | | |
| Protected Phases | 3 | 7 |
| Permitted Phases | | |
| Total Split (s) | 5.0 | 5.0 |
| Total Lost Time (s) | | |
| 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 |
|---|

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1576 | 9 | 8 | 1854 | 30 | 29 |
| Future Volume (Veh/h) | 1576 | 9 | 8 | 1854 | 30 | 29 |
| 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) | 1576 | 9 | 8 | 1854 | 30 | 29 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | 180 | | | 109 | | |
| pX, platoon unblocked | | | 0.65 | | 0.65 | 0.65 |
| vC, conflicting volume | | | 1585 | | 2060 | 792 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 819 | | 1551 | 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 % | | | 98 | | 55 | 96 |
| cM capacity (veh/h) | | | 522 | | 67 | 704 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 1051 | 534 | 273 | 530 | 530 | 530 | 59 |
| Volume Left | 0 | 0 | 8 | 0 | 0 | 0 | 30 |
| Volume Right | 0 | 9 | 0 | 0 | 0 | 0 | 29 |
| cSH | 1700 | 1700 | 522 | 1700 | 1700 | 1700 | 120 |
| Volume to Capacity | 0.62 | 0.31 | 0.02 | 0.31 | 0.31 | 0.31 | 0.49 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 15.7 |
| Control Delay (s) | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 61.0 |
| Lane LOS | | | A | | | | F |
| Approach Delay (s) | 0.0 | | 0.1 | | | | 61.0 |
| Approach LOS | | | | | | | F |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.1 | | |
| Intersection Capacity Utilization | 56.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 31 | 841 | 15 | 0 | 1055 |
| Future Volume (Veh/h) | 0 | 31 | 841 | 15 | 0 | 1055 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 31 | 841 | 15 | 0 | 1055 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 204 | | | 135 |
| pX, platoon unblocked | 0.94 | 0.94 | | | 0.94 | |
| vC, conflicting volume | 1376 | 288 | | | 856 | |
| vC1, stage 1 conf vol | 848 | | | | | |
| vC2, stage 2 conf vol | 528 | | | | | |
| vCu, unblocked vol | 1175 | 17 | | | 622 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 97 | | | 100 | |
| cM capacity (veh/h) | 311 | 994 | | | 897 | |

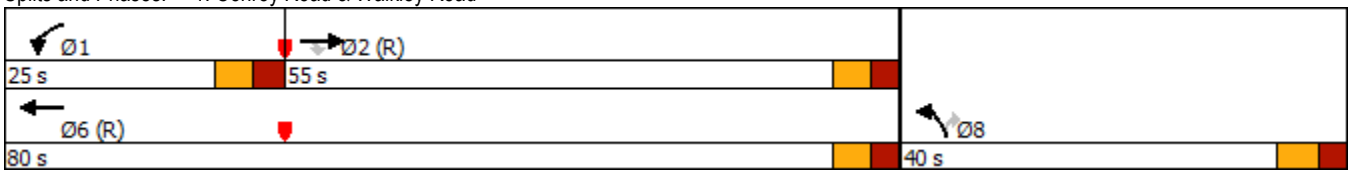
| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 31 | 336 | 336 | 183 | 528 | 528 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 31 | 0 | 0 | 15 | 0 | 0 |
| cSH | 994 | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.03 | 0.20 | 0.20 | 0.11 | 0.31 | 0.31 |
| Queue Length 95th (m) | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 8.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | | |
| Approach Delay (s) | 8.7 | 0.0 | | | 0.0 | |
| Approach LOS | A | | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 34.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 841 | 288 | 264 | 1060 | 706 | 476 |
| Future Volume (vph) | 841 | 288 | 264 | 1060 | 706 | 476 |
| Satd. Flow (prot) | 3191 | 1455 | 3066 | 3161 | 3216 | 1455 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3191 | 1419 | 3066 | 3161 | 3216 | 1436 |
| Satd. Flow (RTOR) | | 288 | | | | 350 |
| Lane Group Flow (vph) | 841 | 288 | 264 | 1060 | 706 | 476 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Total Split (s) | 55.0 | 55.0 | 25.0 | 80.0 | 40.0 | 40.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.2 | 6.0 | 6.4 | 6.4 |
| Act Effct Green (s) | 55.1 | 55.1 | 15.3 | 76.6 | 31.0 | 31.0 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.13 | 0.64 | 0.26 | 0.26 |
| v/c Ratio | 0.57 | 0.36 | 0.67 | 0.53 | 0.85 | 0.76 |
| Control Delay | 26.9 | 3.9 | 70.7 | 10.4 | 52.9 | 19.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 26.9 | 3.9 | 70.7 | 10.4 | 52.9 | 19.0 |
| LOS | C | A | E | B | D | B |
| Approach Delay | 21.0 | | | 22.5 | 39.2 | |
| Approach LOS | C | | | C | D | |
| Queue Length 50th (m) | 71.3 | 0.0 | 29.2 | 43.0 | 73.6 | 23.7 |
| Queue Length 95th (m) | 95.7 | 14.9 | 43.9 | 52.0 | 93.2 | 62.3 |
| Internal Link Dist (m) | 308.5 | | | 181.6 | 111.4 | |
| Turn Bay Length (m) | | 75.0 | | | | |
| Base Capacity (vph) | 1464 | 806 | 480 | 2018 | 900 | 654 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.57 | 0.36 | 0.55 | 0.53 | 0.78 | 0.73 |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 43 (36%), Referenced to phase 2:EBT and 6:WBT, Start of Green | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay: 27.5 | Intersection LOS: C |
| Intersection Capacity Utilization 69.7% | ICU Level of Service C |
| Analysis Period (min) 15 | |

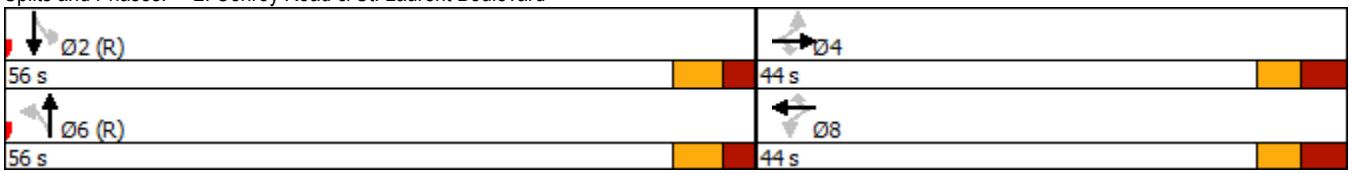
Splits and Phases: 1: Conroy Road & Walkley Road



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 6 | 69 | 86 | 66 | 45 | 27 | 203 | 1238 | 211 | 91 | 399 | 55 |
| Future Volume (vph) | 6 | 69 | 86 | 66 | 45 | 27 | 203 | 1238 | 211 | 91 | 399 | 55 |
| Satd. Flow (prot) | 1537 | 1695 | 1441 | 1409 | 1575 | 1339 | 1642 | 4600 | 0 | 1674 | 3204 | 0 |
| Flt Permitted | 0.728 | | | 0.712 | | | 0.490 | | | 0.163 | | |
| Satd. Flow (perm) | 1173 | 1695 | 1409 | 1046 | 1575 | 1316 | 834 | 4600 | 0 | 286 | 3204 | 0 |
| Satd. Flow (RTOR) | | | 86 | | | 36 | | 47 | | | 21 | |
| Lane Group Flow (vph) | 6 | 69 | 86 | 66 | 45 | 27 | 203 | 1449 | 0 | 91 | 454 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 6 | | | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 6 | | | 2 | | |
| Total Split (s) | 44.0 | 44.0 | 44.0 | 44.0 | 44.0 | 44.0 | 56.0 | 56.0 | | 56.0 | 56.0 | |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Act Effct Green (s) | 12.7 | 12.7 | 12.7 | 12.7 | 12.7 | 12.7 | 78.7 | 78.7 | | 78.7 | 78.7 | |
| Actuated g/C Ratio | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.79 | 0.79 | | 0.79 | 0.79 | |
| v/c Ratio | 0.04 | 0.32 | 0.34 | 0.50 | 0.23 | 0.14 | 0.31 | 0.40 | | 0.40 | 0.18 | |
| Control Delay | 36.5 | 42.7 | 12.0 | 52.8 | 40.6 | 10.4 | 6.2 | 4.8 | | 12.5 | 3.9 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 36.5 | 42.7 | 12.0 | 52.8 | 40.6 | 10.4 | 6.2 | 4.8 | | 12.5 | 3.9 | |
| LOS | D | D | B | D | D | B | A | A | | B | A | |
| Approach Delay | | 26.1 | | | 40.6 | | | 5.0 | | | 5.3 | |
| Approach LOS | | C | | | D | | | A | | | A | |
| Queue Length 50th (m) | 1.0 | 11.5 | 0.0 | 11.3 | 7.4 | 0.0 | 9.9 | 27.2 | | 4.9 | 9.7 | |
| Queue Length 95th (m) | 4.1 | 21.9 | 11.6 | 22.2 | 15.8 | 5.2 | 23.9 | 43.7 | | 19.5 | 17.9 | |
| Internal Link Dist (m) | | 170.0 | | | 103.1 | | | 245.6 | | | 68.3 | |
| Turn Bay Length (m) | 30.0 | | 35.0 | 35.0 | | 35.0 | 70.0 | | | 75.0 | | |
| Base Capacity (vph) | 435 | 628 | 576 | 388 | 584 | 510 | 656 | 3631 | | 225 | 2526 | |
| 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 | 0.01 | 0.11 | 0.15 | 0.17 | 0.08 | 0.05 | 0.31 | 0.40 | | 0.40 | 0.18 | |

| Intersection Summary | | |
|---|---|---|
| Cycle Length: 100 | | |
| Actuated Cycle Length: 100 | | |
| Offset: 23 (23%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green | | |
| Control Type: Actuated-Coordinated | | |
| Maximum v/c Ratio: 0.50 | | |
| Intersection Signal Delay: 8.4 | Intersection LOS: A | |
| Intersection Capacity Utilization 71.3% | ICU Level of Service C | |
| Analysis Period (min) 15 | | |

Splits and Phases: 2: Conroy Road & St. Laurent Boulevard

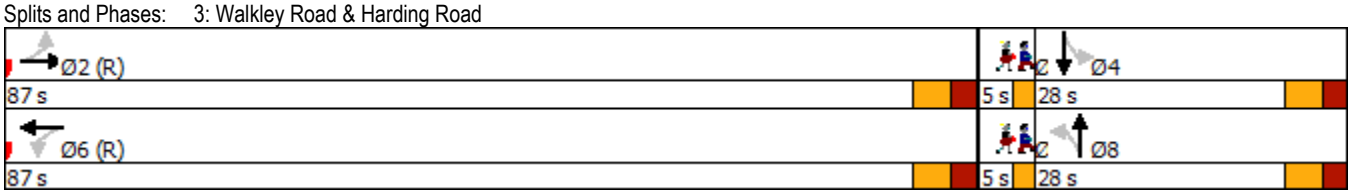


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 33 | 1244 | 14 | 1 | 1188 | 44 | 1 | 0 | 1 | 16 | 0 | 190 |
| Future Volume (vph) | 33 | 1244 | 14 | 1 | 1188 | 44 | 1 | 0 | 1 | 16 | 0 | 190 |
| Satd. Flow (prot) | 1537 | 3243 | 0 | 0 | 3202 | 0 | 0 | 1079 | 0 | 0 | 1503 | 0 |
| Flt Permitted | 0.208 | | | | 0.955 | | | 0.730 | | | 0.975 | |
| Satd. Flow (perm) | 336 | 3243 | 0 | 0 | 3058 | 0 | 0 | 807 | 0 | 0 | 1471 | 0 |
| Satd. Flow (RTOR) | | 2 | | | 7 | | | 45 | | | 140 | |
| Lane Group Flow (vph) | 33 | 1258 | 0 | 0 | 1233 | 0 | 0 | 2 | 0 | 0 | 206 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Total Split (s) | 87.0 | 87.0 | | 87.0 | 87.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Lost Time (s) | 5.9 | 5.9 | | | 5.9 | | | 5.7 | | | 5.7 | |
| Act Effct Green (s) | 95.1 | 95.1 | | | 95.1 | | | 13.3 | | | 13.3 | |
| Actuated g/C Ratio | 0.79 | 0.79 | | | 0.79 | | | 0.11 | | | 0.11 | |
| v/c Ratio | 0.12 | 0.49 | | | 0.51 | | | 0.02 | | | 0.72 | |
| Control Delay | 3.4 | 3.6 | | | 5.5 | | | 0.0 | | | 31.9 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 3.4 | 3.6 | | | 5.5 | | | 0.0 | | | 31.9 | |
| LOS | A | A | | | A | | | A | | | C | |
| Approach Delay | | 3.6 | | | 5.5 | | | | | | 31.9 | |
| Approach LOS | | A | | | A | | | | | | C | |
| Queue Length 50th (m) | 0.9 | 26.9 | | | 35.4 | | | 0.0 | | | 13.8 | |
| Queue Length 95th (m) | m2.1 | 39.9 | | | 67.0 | | | 0.0 | | | 35.2 | |
| Internal Link Dist (m) | | 60.1 | | | 213.8 | | | 35.2 | | | 112.2 | |
| Turn Bay Length (m) | 30.0 | | | | | | | | | | | |
| Base Capacity (vph) | 266 | 2571 | | | 2425 | | | 186 | | | 387 | |
| Starvation Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | 0.12 | 0.49 | | | 0.51 | | | 0.01 | | | 0.53 | |

**Intersection Summary**

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 24 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 6.6 — Intersection LOS: A
Intersection Capacity Utilization 60.7% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Harding Road



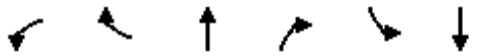
| Lane Group | Ø3 | Ø7 |
|---|---|---|
| Lane Configurations | | |
| Traffic Volume (vph) | | |
| Future Volume (vph) | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Satd. Flow (RTOR) | | |
| Lane Group Flow (vph) | | |
| Turn Type | | |
| Protected Phases | 3 | 7 |
| Permitted Phases | | |
| Total Split (s) | 5.0 | 5.0 |
| Total Lost Time (s) | | |
| 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 |
|---|

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1289 | 6 | 0 | 1379 | 0 | 2 |
| Future Volume (Veh/h) | 1289 | 6 | 0 | 1379 | 0 | 2 |
| 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) | 1289 | 6 | 0 | 1379 | 0 | 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) | 206 | | | 84 | | |
| pX, platoon unblocked | | | 0.82 | | 0.82 | 0.82 |
| vC, conflicting volume | | | 1295 | | 1637 | 648 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 918 | | 1335 | 127 |
| 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) | | | 605 | | 119 | 737 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 859 | 436 | 345 | 345 | 345 | 345 | 2 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 6 | 0 | 0 | 0 | 0 | 2 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 737 |
| Volume to Capacity | 0.51 | 0.26 | 0.20 | 0.20 | 0.20 | 0.20 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.9 |
| Lane LOS | | | | | | | A |
| Approach Delay (s) | 0.0 | | 0.0 | | | | 9.9 |
| Approach LOS | | | | | | | A |

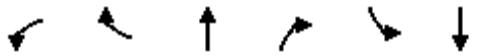
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 47.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1 | 3 | 1179 | 3 | 12 | 540 |
| Future Volume (Veh/h) | 1 | 3 | 1179 | 3 | 12 | 540 |
| 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) | 1 | 3 | 1179 | 3 | 12 | 540 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 204 | | | 135 |
| pX, platoon unblocked | 0.95 | 0.95 | | | 0.95 | |
| vC, conflicting volume | 1474 | 394 | | | 1182 | |
| vC1, stage 1 conf vol | 1180 | | | | | |
| vC2, stage 2 conf vol | 294 | | | | | |
| vCu, unblocked vol | 1299 | 157 | | | 990 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 98 | |
| cM capacity (veh/h) | 245 | 814 | | | 656 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|---|---|---|---|---|---|---|---|
| Volume Total | 4 | 472 | 472 | 239 | 12 | 270 | 270 |
| Volume Left | 1 | 0 | 0 | 0 | 12 | 0 | 0 |
| Volume Right | 3 | 0 | 0 | 3 | 0 | 0 | 0 |
| cSH | 515 | 1700 | 1700 | 1700 | 656 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.28 | 0.28 | 0.14 | 0.02 | 0.16 | 0.16 |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Control Delay (s) | 12.1 | 0.0 | 0.0 | 0.0 | 10.6 | 0.0 | 0.0 |
| Lane LOS | B | | | | B | | |
| Approach Delay (s) | 12.1 | 0.0 | | | 0.2 | | |
| Approach LOS | B | | | | | | |

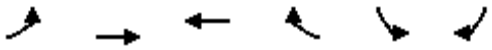
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 34.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 1274 | 2 | 0 | 545 |
| Future Volume (Veh/h) | 0 | 0 | 1274 | 2 | 0 | 545 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 0 | 1274 | 2 | 0 | 545 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 92 | | | 247 |
| pX, platoon unblocked | 0.91 | 0.91 | | | 0.91 | |
| vC, conflicting volume | 1548 | 426 | | | 1276 | |
| vC1, stage 1 conf vol | 1275 | | | | | |
| vC2, stage 2 conf vol | 272 | | | | | |
| vCu, unblocked vol | 1253 | 19 | | | 954 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 249 | 958 | | | 651 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 0 | 510 | 510 | 257 | 272 | 272 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 2 | 0 | 0 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.00 | 0.30 | 0.30 | 0.15 | 0.16 | 0.16 |
| Queue Length 95th (m) | 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 |
| Lane LOS | A | | | | | |
| Approach Delay (s) | 0.0 | 0.0 | | | 0.0 | |
| Approach LOS | A | | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 29.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 366 | 136 | 5 | 2 | 2 |
| Future Volume (Veh/h) | 5 | 366 | 136 | 5 | 2 | 2 |
| 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) | 5 | 366 | 136 | 5 | 2 | 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) | | 127 | | | | |
| pX, platoon unblocked | | | | | 0.98 | |
| vC, conflicting volume | 141 | | | | 514 | 138 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 141 | | | | 498 | 138 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 100 |
| cM capacity (veh/h) | 1442 | | | | 521 | 910 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 371 | 141 | 4 |
| Volume Left | 5 | 0 | 2 |
| Volume Right | 0 | 5 | 2 |
| cSH | 1442 | 1700 | 663 |
| Volume to Capacity | 0.00 | 0.08 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.1 |
| Control Delay (s) | 0.1 | 0.0 | 10.5 |
| Lane LOS | A | | B |
| Approach Delay (s) | 0.1 | 0.0 | 10.5 |
| Approach LOS | | | B |

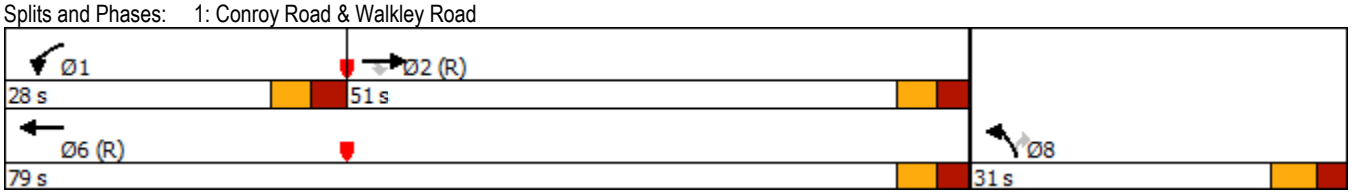
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 34.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1163 | 455 | 529 | 1060 | 489 | 325 |
| Future Volume (vph) | 1163 | 455 | 529 | 1060 | 489 | 325 |
| Satd. Flow (prot) | 3221 | 1483 | 3216 | 3349 | 3248 | 1469 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3221 | 1430 | 3216 | 3349 | 3248 | 1420 |
| Satd. Flow (RTOR) | | 455 | | | | 325 |
| Lane Group Flow (vph) | 1163 | 455 | 529 | 1060 | 489 | 325 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Total Split (s) | 51.0 | 51.0 | 28.0 | 79.0 | 31.0 | 31.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.2 | 6.0 | 6.4 | 6.4 |
| Act Effct Green (s) | 48.6 | 48.6 | 21.3 | 76.1 | 21.5 | 21.5 |
| Actuated g/C Ratio | 0.44 | 0.44 | 0.19 | 0.69 | 0.20 | 0.20 |
| v/c Ratio | 0.82 | 0.51 | 0.85 | 0.46 | 0.77 | 0.60 |
| Control Delay | 33.6 | 4.3 | 42.5 | 17.4 | 50.4 | 9.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 33.6 | 4.3 | 42.5 | 17.4 | 50.4 | 9.2 |
| LOS | C | A | D | B | D | A |
| Approach Delay | 25.4 | | | 25.7 | 34.0 | |
| Approach LOS | C | | | C | C | |
| Queue Length 50th (m) | 109.2 | 0.0 | 54.6 | 81.9 | 47.0 | 0.0 |
| Queue Length 95th (m) | #141.1 | 17.5 | #76.9 | 119.6 | 61.8 | 21.8 |
| Internal Link Dist (m) | 308.5 | | | 177.0 | 111.4 | |
| Turn Bay Length (m) | | 75.0 | | | | |
| Base Capacity (vph) | 1423 | 885 | 647 | 2316 | 726 | 569 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.82 | 0.51 | 0.82 | 0.46 | 0.67 | 0.57 |

**Intersection Summary**

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 20 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 27.3 Intersection LOS: C
Intersection Capacity Utilization 82.3% 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: Conroy Road & Walkley Road

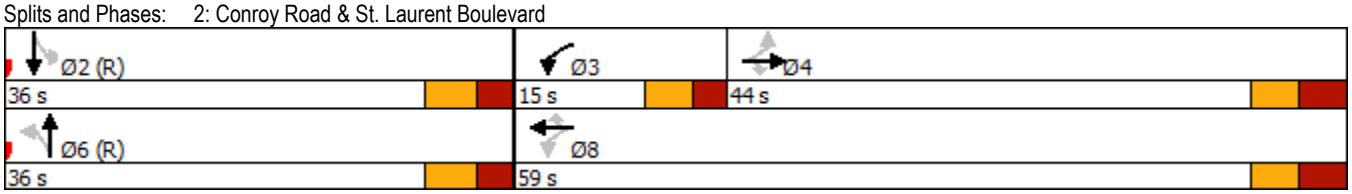


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 42 | 81 | 334 | 242 | 36 | 108 | 42 | 607 | 86 | 39 | 1093 | 13 |
| Future Volume (vph) | 42 | 81 | 334 | 242 | 36 | 108 | 42 | 607 | 86 | 39 | 1093 | 13 |
| Satd. Flow (prot) | 1691 | 1780 | 1469 | 1642 | 1664 | 1483 | 1642 | 4612 | 0 | 1523 | 3303 | 0 |
| Flt Permitted | 0.734 | | | 0.552 | | | 0.162 | | | 0.363 | | |
| Satd. Flow (perm) | 1305 | 1780 | 1447 | 952 | 1664 | 1463 | 280 | 4612 | 0 | 577 | 3303 | 0 |
| Satd. Flow (RTOR) | | | 117 | | | 74 | | 28 | | | 1 | |
| Lane Group Flow (vph) | 42 | 81 | 334 | 242 | 36 | 108 | 42 | 693 | 0 | 39 | 1106 | 0 |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 6 | | | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 6 | | | 2 | | |
| Total Split (s) | 44.0 | 44.0 | 44.0 | 15.0 | 59.0 | 59.0 | 36.0 | 36.0 | | 36.0 | 36.0 | |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 5.7 | 6.9 | 6.9 | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Act Effct Green (s) | 20.7 | 20.7 | 20.7 | 36.9 | 35.7 | 35.7 | 46.1 | 46.1 | | 46.1 | 46.1 | |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.22 | 0.39 | 0.38 | 0.38 | 0.49 | 0.49 | | 0.49 | 0.49 | |
| v/c Ratio | 0.15 | 0.21 | 0.82 | 0.55 | 0.06 | 0.18 | 0.31 | 0.31 | | 0.14 | 0.69 | |
| Control Delay | 27.5 | 28.7 | 38.4 | 24.7 | 16.1 | 6.9 | 27.2 | 16.0 | | 18.9 | 23.8 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 27.5 | 28.7 | 38.4 | 24.7 | 16.1 | 6.9 | 27.2 | 16.0 | | 18.9 | 23.8 | |
| LOS | C | C | D | C | B | A | C | B | | B | C | |
| Approach Delay | | 35.7 | | | 18.9 | | | 16.6 | | | 23.6 | |
| Approach LOS | | D | | | B | | | B | | | C | |
| Queue Length 50th (m) | 5.8 | 11.3 | 35.8 | 28.8 | 3.8 | 3.6 | 4.1 | 23.7 | | 3.5 | 72.7 | |
| Queue Length 95th (m) | 11.7 | 19.0 | 55.7 | 36.9 | 7.6 | 10.6 | 15.5 | 39.2 | | 11.5 | #128.2 | |
| Internal Link Dist (m) | | 170.0 | | | 104.4 | | | 245.6 | | | 79.6 | |
| Turn Bay Length (m) | 30.0 | | 35.0 | 35.0 | | 35.0 | 70.0 | | | 75.0 | | |
| Base Capacity (vph) | 509 | 695 | 636 | 437 | 912 | 835 | 136 | 2253 | | 279 | 1603 | |
| 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 | 0.12 | 0.53 | 0.55 | 0.04 | 0.13 | 0.31 | 0.31 | | 0.14 | 0.69 | |

**Intersection Summary**

Cycle Length: 95
Actuated Cycle Length: 95
Offset: 2 (2%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 23.1 Intersection LOS: C
Intersection Capacity Utilization 85.6% 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: Conroy Road & St. Laurent Boulevard

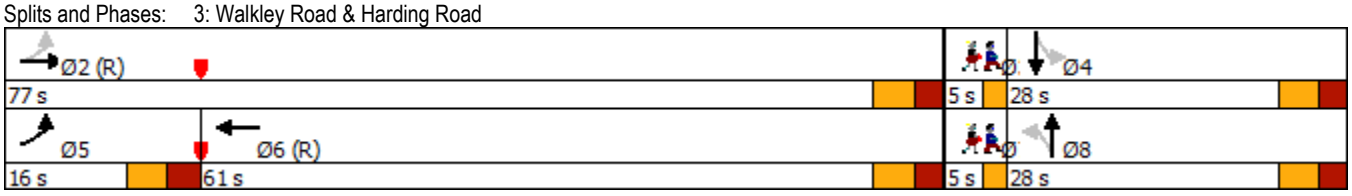


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 188 | 1313 | 2 | 0 | 1464 | 32 | 9 | 1 | 0 | 25 | 0 | 299 |
| Future Volume (vph) | 188 | 1313 | 2 | 0 | 1464 | 32 | 9 | 1 | 0 | 25 | 0 | 299 |
| Satd. Flow (prot) | 1674 | 3221 | 0 | 0 | 3303 | 0 | 0 | 1703 | 0 | 0 | 1494 | 0 |
| Flt Permitted | 0.085 | | | | | | | 0.481 | | | 0.974 | |
| Satd. Flow (perm) | 150 | 3221 | 0 | 0 | 3303 | 0 | 0 | 855 | 0 | 0 | 1460 | 0 |
| Satd. Flow (RTOR) | | | | | 3 | | | | | | 224 | |
| Lane Group Flow (vph) | 188 | 1315 | 0 | 0 | 1496 | 0 | 0 | 10 | 0 | 0 | 324 | 0 |
| Turn Type | pm+pt | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 5 | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | | | | 8 | | | 4 | | |
| Total Split (s) | 16.0 | 77.0 | | | 61.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Lost Time (s) | 6.0 | 5.9 | | | 5.9 | | | 5.7 | | | 5.7 | |
| Act Effct Green (s) | 82.7 | 82.8 | | | 64.1 | | | 15.6 | | | 15.6 | |
| Actuated g/C Ratio | 0.75 | 0.75 | | | 0.58 | | | 0.14 | | | 0.14 | |
| v/c Ratio | 0.65 | 0.54 | | | 0.78 | | | 0.08 | | | 0.81 | |
| Control Delay | 44.1 | 1.8 | | | 22.9 | | | 38.2 | | | 30.2 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 44.1 | 1.8 | | | 22.9 | | | 38.2 | | | 30.2 | |
| LOS | D | A | | | C | | | D | | | C | |
| Approach Delay | | 7.1 | | | 22.9 | | | 38.2 | | | 30.3 | |
| Approach LOS | | A | | | C | | | D | | | C | |
| Queue Length 50th (m) | 21.7 | 6.6 | | | 112.0 | | | 1.8 | | | 19.1 | |
| Queue Length 95th (m) | m34.9 | 16.2 | | | #173.9 | | | 5.8 | | | 44.7 | |
| Internal Link Dist (m) | | 64.7 | | | 213.8 | | | 35.2 | | | 112.2 | |
| Turn Bay Length (m) | 30.0 | | | | | | | | | | | |
| Base Capacity (vph) | 291 | 2423 | | | 1925 | | | 178 | | | 481 | |
| Starvation Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | 0.65 | 0.54 | | | 0.78 | | | 0.06 | | | 0.67 | |

## Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 41 (37%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 16.5 — Intersection LOS: B
Intersection Capacity Utilization 90.4% — 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Harding Road



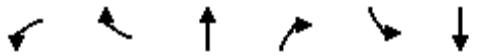
| Lane Group | Ø3 | Ø7 |
|---|---|---|
| Lane Configurations | | |
| Traffic Volume (vph) | | |
| Future Volume (vph) | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Satd. Flow (RTOR) | | |
| Lane Group Flow (vph) | | |
| Turn Type | | |
| Protected Phases | 3 | 7 |
| Permitted Phases | | |
| Total Split (s) | 5.0 | 5.0 |
| Total Lost Time (s) | | |
| 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 |
|---|

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1497 | 2 | 0 | 1772 | 0 | 6 |
| Future Volume (Veh/h) | 1497 | 2 | 0 | 1772 | 0 | 6 |
| 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) | 1497 | 2 | 0 | 1772 | 0 | 6 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | 201 | | | 89 | | |
| pX, platoon unblocked | | | 0.69 | | 0.69 | 0.69 |
| vC, conflicting volume | | | 1499 | | 1941 | 750 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 816 | | 1459 | 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 | 99 |
| cM capacity (veh/h) | | | 555 | | 82 | 745 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 998 | 501 | 443 | 443 | 443 | 443 | 6 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 2 | 0 | 0 | 0 | 0 | 6 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 745 |
| Volume to Capacity | 0.59 | 0.29 | 0.26 | 0.26 | 0.26 | 0.26 | 0.01 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.9 |
| Lane LOS | | | | | | | A |
| Approach Delay (s) | 0.0 | | 0.0 | | | | 9.9 |
| Approach LOS | | | | | | | A |

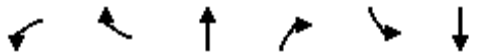
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 53.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 3 | 8 | 806 | 1 | 4 | 980 |
| Future Volume (Veh/h) | 3 | 8 | 806 | 1 | 4 | 980 |
| 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) | 3 | 8 | 806 | 1 | 4 | 980 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 203 | | | 135 |
| pX, platoon unblocked | 0.95 | 0.95 | | | 0.95 | |
| vC, conflicting volume | 1304 | 269 | | | 807 | |
| vC1, stage 1 conf vol | 806 | | | | | |
| vC2, stage 2 conf vol | 498 | | | | | |
| vCu, unblocked vol | 1143 | 55 | | | 620 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 100 | |
| cM capacity (veh/h) | 320 | 952 | | | 910 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|---|---|---|---|---|---|---|---|
| Volume Total | 11 | 322 | 322 | 162 | 4 | 490 | 490 |
| Volume Left | 3 | 0 | 0 | 0 | 4 | 0 | 0 |
| Volume Right | 8 | 0 | 0 | 1 | 0 | 0 | 0 |
| cSH | 619 | 1700 | 1700 | 1700 | 910 | 1700 | 1700 |
| Volume to Capacity | 0.02 | 0.19 | 0.19 | 0.10 | 0.00 | 0.29 | 0.29 |
| Queue Length 95th (m) | 0.4 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 10.9 | 0.0 | 0.0 | 0.0 | 9.0 | 0.0 | 0.0 |
| Lane LOS | B | | | | A | | |
| Approach Delay (s) | 10.9 | 0.0 | | | 0.0 | | |
| Approach LOS | B | | | | | | |

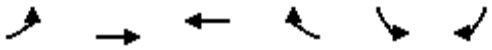
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 38.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 2 | 756 | 1 | 0 | 1150 |
| Future Volume (Veh/h) | 0 | 2 | 756 | 1 | 0 | 1150 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 2 | 756 | 1 | 0 | 1150 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 104 | | | 235 |
| pX, platoon unblocked | 0.93 | 0.93 | | | 0.93 | |
| vC, conflicting volume | 1332 | 252 | | | 757 | |
| vC1, stage 1 conf vol | 756 | | | | | |
| vC2, stage 2 conf vol | 575 | | | | | |
| vCu, unblocked vol | 1097 | 0 | | | 480 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 333 | 1010 | | | 1004 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 2 | 302 | 302 | 152 | 575 | 575 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 2 | 0 | 0 | 1 | 0 | 0 |
| cSH | 1010 | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.00 | 0.18 | 0.18 | 0.09 | 0.34 | 0.34 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 8.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | | |
| Approach Delay (s) | 8.6 | 0.0 | | | 0.0 | |
| Approach LOS | A | | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 36.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 204 | 377 | 2 | 5 | 9 |
| Future Volume (Veh/h) | 2 | 204 | 377 | 2 | 5 | 9 |
| 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) | 2 | 204 | 377 | 2 | 5 | 9 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | 128 | | | | |
| pX, platoon unblocked | | | | | 0.98 | |
| vC, conflicting volume | 379 | | | | 586 | 378 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 379 | | | | 570 | 378 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 99 | 99 |
| cM capacity (veh/h) | 1179 | | | | 474 | 669 |

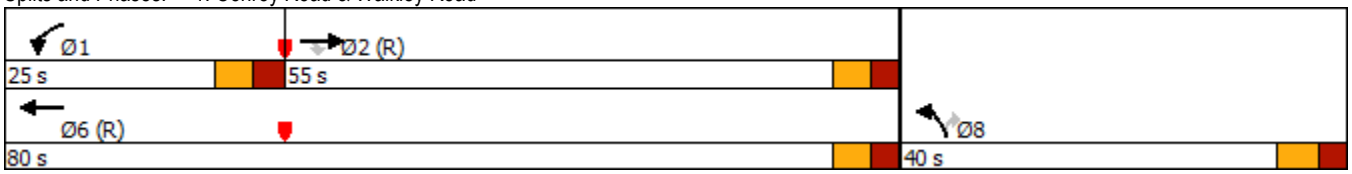
| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 206 | 379 | 14 |
| Volume Left | 2 | 0 | 5 |
| Volume Right | 0 | 2 | 9 |
| cSH | 1179 | 1700 | 583 |
| Volume to Capacity | 0.00 | 0.22 | 0.02 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.5 |
| Control Delay (s) | 0.1 | 0.0 | 11.3 |
| Lane LOS | A | | B |
| Approach Delay (s) | 0.1 | 0.0 | 11.3 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 31.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 881 | 301 | 275 | 1073 | 740 | 499 |
| Future Volume (vph) | 881 | 301 | 275 | 1073 | 740 | 499 |
| Satd. Flow (prot) | 3191 | 1455 | 3066 | 3161 | 3216 | 1455 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3191 | 1419 | 3066 | 3161 | 3216 | 1436 |
| Satd. Flow (RTOR) | | 301 | | | | 344 |
| Lane Group Flow (vph) | 881 | 301 | 275 | 1073 | 740 | 499 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Total Split (s) | 55.0 | 55.0 | 25.0 | 80.0 | 40.0 | 40.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.2 | 6.0 | 6.4 | 6.4 |
| Act Effct Green (s) | 54.1 | 54.1 | 15.6 | 75.9 | 31.7 | 31.7 |
| Actuated g/C Ratio | 0.45 | 0.45 | 0.13 | 0.63 | 0.26 | 0.26 |
| v/c Ratio | 0.61 | 0.37 | 0.69 | 0.54 | 0.87 | 0.79 |
| Control Delay | 28.3 | 4.0 | 70.8 | 10.6 | 54.2 | 22.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 28.3 | 4.0 | 70.8 | 10.6 | 54.2 | 22.1 |
| LOS | C | A | E | B | D | C |
| Approach Delay | 22.1 | | | 22.9 | 41.3 | |
| Approach LOS | C | | | C | D | |
| Queue Length 50th (m) | 77.5 | 0.0 | 30.8 | 44.6 | 77.4 | 30.9 |
| Queue Length 95th (m) | 101.6 | 15.1 | 45.1 | 52.9 | 98.7 | 72.6 |
| Internal Link Dist (m) | 308.5 | | | 181.6 | 111.4 | |
| Turn Bay Length (m) | | 75.0 | | | | |
| Base Capacity (vph) | 1437 | 804 | 480 | 2000 | 900 | 649 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.61 | 0.37 | 0.57 | 0.54 | 0.82 | 0.77 |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 43 (36%), Referenced to phase 2:EBT and 6:WBT, Start of Green | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.87 | |
| Intersection Signal Delay: 28.7 | Intersection LOS: C |
| Intersection Capacity Utilization 71.8% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Conroy Road & Walkley Road

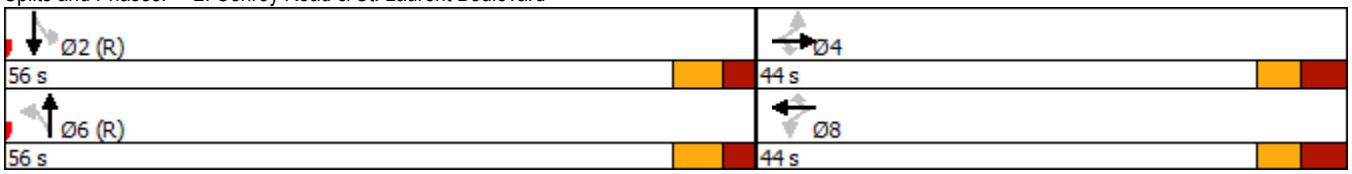


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 6 | 71 | 89 | 69 | 47 | 29 | 211 | 1298 | 220 | 95 | 417 | 57 |
| Future Volume (vph) | 6 | 71 | 89 | 69 | 47 | 29 | 211 | 1298 | 220 | 95 | 417 | 57 |
| Satd. Flow (prot) | 1537 | 1695 | 1441 | 1409 | 1575 | 1339 | 1642 | 4601 | 0 | 1674 | 3204 | 0 |
| Flt Permitted | 0.726 | | | 0.711 | | | 0.481 | | | 0.150 | | |
| Satd. Flow (perm) | 1169 | 1695 | 1409 | 1045 | 1575 | 1316 | 819 | 4601 | 0 | 263 | 3204 | 0 |
| Satd. Flow (RTOR) | | | 89 | | | 36 | | 47 | | | 21 | |
| Lane Group Flow (vph) | 6 | 71 | 89 | 69 | 47 | 29 | 211 | 1518 | 0 | 95 | 474 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 6 | | | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 6 | | | 2 | | |
| Total Split (s) | 44.0 | 44.0 | 44.0 | 44.0 | 44.0 | 44.0 | 56.0 | 56.0 | | 56.0 | 56.0 | |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.9 | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Act Effct Green (s) | 12.9 | 12.9 | 12.9 | 12.9 | 12.9 | 12.9 | 78.5 | 78.5 | | 78.5 | 78.5 | |
| Actuated g/C Ratio | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.78 | 0.78 | | 0.78 | 0.78 | |
| v/c Ratio | 0.04 | 0.32 | 0.34 | 0.51 | 0.23 | 0.14 | 0.33 | 0.42 | | 0.46 | 0.19 | |
| Control Delay | 36.2 | 42.5 | 11.9 | 53.2 | 40.4 | 11.3 | 6.6 | 5.1 | | 15.7 | 4.0 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 36.2 | 42.5 | 11.9 | 53.2 | 40.4 | 11.3 | 6.6 | 5.1 | | 15.7 | 4.0 | |
| LOS | D | D | B | D | D | B | A | A | | B | A | |
| Approach Delay | | 25.8 | | | 40.7 | | | 5.2 | | | 5.9 | |
| Approach LOS | | C | | | D | | | A | | | A | |
| Queue Length 50th (m) | 1.0 | 11.8 | 0.0 | 11.8 | 7.7 | 0.0 | 10.7 | 29.8 | | 5.6 | 10.3 | |
| Queue Length 95th (m) | 4.1 | 22.3 | 11.7 | 23.0 | 16.4 | 5.8 | 25.8 | 47.8 | | 24.6 | 19.1 | |
| Internal Link Dist (m) | | 170.0 | | | 103.1 | | | 245.6 | | | 68.3 | |
| Turn Bay Length (m) | 30.0 | | 35.0 | 35.0 | | 35.0 | 70.0 | | | 75.0 | | |
| Base Capacity (vph) | 433 | 628 | 578 | 387 | 584 | 510 | 642 | 3622 | | 206 | 2519 | |
| 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 | 0.01 | 0.11 | 0.15 | 0.18 | 0.08 | 0.06 | 0.33 | 0.42 | | 0.46 | 0.19 | |

**Intersection Summary**

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 23 (23%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 8.7 Intersection LOS: A
Intersection Capacity Utilization 72.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: Conroy Road & St. Laurent Boulevard

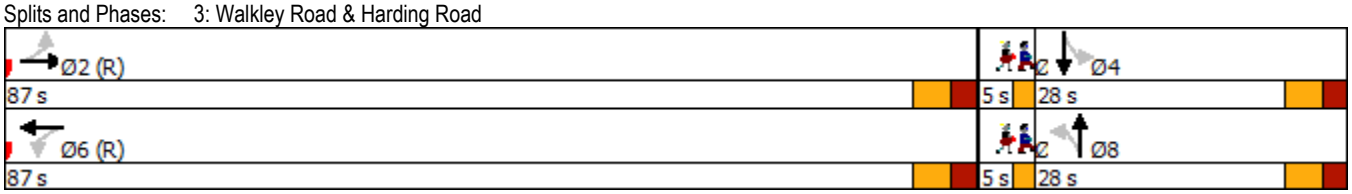


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 34 | 1301 | 14 | 1 | 1244 | 46 | 1 | 0 | 1 | 17 | 0 | 199 |
| Future Volume (vph) | 34 | 1301 | 14 | 1 | 1244 | 46 | 1 | 0 | 1 | 17 | 0 | 199 |
| Satd. Flow (prot) | 1537 | 3243 | 0 | 0 | 3202 | 0 | 0 | 1079 | 0 | 0 | 1504 | 0 |
| Flt Permitted | 0.192 | | | | 0.955 | | | 0.763 | | | 0.975 | |
| Satd. Flow (perm) | 310 | 3243 | 0 | 0 | 3058 | 0 | 0 | 843 | 0 | 0 | 1473 | 0 |
| Satd. Flow (RTOR) | | 2 | | | 7 | | | 45 | | | 129 | |
| Lane Group Flow (vph) | 34 | 1315 | 0 | 0 | 1291 | 0 | 0 | 2 | 0 | 0 | 216 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Total Split (s) | 87.0 | 87.0 | | 87.0 | 87.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Lost Time (s) | 5.9 | 5.9 | | | 5.9 | | | 5.7 | | | 5.7 | |
| Act Effct Green (s) | 94.1 | 94.1 | | | 94.1 | | | 14.3 | | | 14.3 | |
| Actuated g/C Ratio | 0.78 | 0.78 | | | 0.78 | | | 0.12 | | | 0.12 | |
| v/c Ratio | 0.14 | 0.52 | | | 0.54 | | | 0.01 | | | 0.75 | |
| Control Delay | 3.9 | 3.9 | | | 6.3 | | | 0.0 | | | 36.5 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 3.9 | 3.9 | | | 6.3 | | | 0.0 | | | 36.5 | |
| LOS | A | A | | | A | | | A | | | D | |
| Approach Delay | | 3.9 | | | 6.3 | | | | | | 36.5 | |
| Approach LOS | | A | | | A | | | | | | D | |
| Queue Length 50th (m) | 1.0 | 31.2 | | | 42.3 | | | 0.0 | | | 18.3 | |
| Queue Length 95th (m) | m2.1 | 44.1 | | | 77.6 | | | 0.0 | | | 39.9 | |
| Internal Link Dist (m) | | 60.1 | | | 213.8 | | | 35.2 | | | 112.2 | |
| Turn Bay Length (m) | 30.0 | | | | | | | | | | | |
| Base Capacity (vph) | 243 | 2542 | | | 2398 | | | 193 | | | 378 | |
| Starvation Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | 0.14 | 0.52 | | | 0.54 | | | 0.01 | | | 0.57 | |

**Intersection Summary**

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 24 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 7.5 — Intersection LOS: A
Intersection Capacity Utilization 63.0% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Harding Road



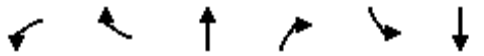
| Lane Group | Ø3 | Ø7 |
|---|---|---|
| Lane Configurations | | |
| Traffic Volume (vph) | | |
| Future Volume (vph) | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Satd. Flow (RTOR) | | |
| Lane Group Flow (vph) | | |
| Turn Type | | |
| Protected Phases | 3 | 7 |
| Permitted Phases | | |
| Total Split (s) | 5.0 | 5.0 |
| Total Lost Time (s) | | |
| 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 |
|---|

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1347 | 6 | 0 | 1444 | 0 | 2 |
| Future Volume (Veh/h) | 1347 | 6 | 0 | 1444 | 0 | 2 |
| 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) | 1347 | 6 | 0 | 1444 | 0 | 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) | 206 | | | 84 | | |
| pX, platoon unblocked | | | 0.80 | | 0.80 | 0.80 |
| vC, conflicting volume | | | 1353 | | 1711 | 676 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 948 | | 1394 | 105 |
| 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) | | | 578 | | 106 | 746 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 898 | 455 | 361 | 361 | 361 | 361 | 2 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 6 | 0 | 0 | 0 | 0 | 2 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 746 |
| Volume to Capacity | 0.53 | 0.27 | 0.21 | 0.21 | 0.21 | 0.21 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.8 |
| Lane LOS | | | | | | | A |
| Approach Delay (s) | 0.0 | | 0.0 | | | | 9.8 |
| Approach LOS | | | | | | | A |

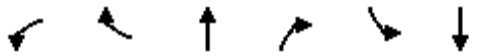
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 49.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1 | 3 | 1236 | 3 | 12 | 554 |
| Future Volume (Veh/h) | 1 | 3 | 1236 | 3 | 12 | 554 |
| 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) | 1 | 3 | 1236 | 3 | 12 | 554 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 204 | | | 135 |
| pX, platoon unblocked | 0.94 | 0.94 | | | 0.94 | |
| vC, conflicting volume | 1538 | 414 | | | 1239 | |
| vC1, stage 1 conf vol | 1238 | | | | | |
| vC2, stage 2 conf vol | 301 | | | | | |
| vCu, unblocked vol | 1334 | 132 | | | 1014 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 98 | |
| cM capacity (veh/h) | 235 | 836 | | | 636 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|---|---|---|---|---|---|---|---|
| Volume Total | 4 | 494 | 494 | 250 | 12 | 277 | 277 |
| Volume Left | 1 | 0 | 0 | 0 | 12 | 0 | 0 |
| Volume Right | 3 | 0 | 0 | 3 | 0 | 0 | 0 |
| cSH | 510 | 1700 | 1700 | 1700 | 636 | 1700 | 1700 |
| Volume to Capacity | 0.01 | 0.29 | 0.29 | 0.15 | 0.02 | 0.16 | 0.16 |
| Queue Length 95th (m) | 0.2 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Control Delay (s) | 12.1 | 0.0 | 0.0 | 0.0 | 10.8 | 0.0 | 0.0 |
| Lane LOS | B | | | | B | | |
| Approach Delay (s) | 12.1 | 0.0 | | | 0.2 | | |
| Approach LOS | B | | | | | | |

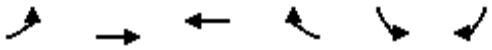
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 35.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 1336 | 2 | 0 | 559 |
| Future Volume (Veh/h) | 0 | 0 | 1336 | 2 | 0 | 559 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 0 | 1336 | 2 | 0 | 559 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 92 | | | 247 |
| pX, platoon unblocked | 0.90 | 0.90 | | | 0.90 | |
| vC, conflicting volume | 1616 | 446 | | | 1338 | |
| vC1, stage 1 conf vol | 1337 | | | | | |
| vC2, stage 2 conf vol | 280 | | | | | |
| vCu, unblocked vol | 1297 | 0 | | | 987 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 237 | 976 | | | 626 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 0 | 534 | 534 | 269 | 280 | 280 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 2 | 0 | 0 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.00 | 0.31 | 0.31 | 0.16 | 0.16 | 0.16 |
| Queue Length 95th (m) | 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 |
| Lane LOS | A | | | | | |
| Approach Delay (s) | 0.0 | 0.0 | | | 0.0 | |
| Approach LOS | A | | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 30.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 381 | 143 | 5 | 2 | 2 |
| Future Volume (Veh/h) | 5 | 381 | 143 | 5 | 2 | 2 |
| 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) | 5 | 381 | 143 | 5 | 2 | 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) | | 127 | | | | |
| pX, platoon unblocked | | | | | 0.98 | |
| vC, conflicting volume | 148 | | | | 536 | 146 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 148 | | | | 519 | 146 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 100 | 100 |
| cM capacity (veh/h) | 1434 | | | | 506 | 902 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 386 | 148 | 4 |
| Volume Left | 5 | 0 | 2 |
| Volume Right | 0 | 5 | 2 |
| cSH | 1434 | 1700 | 648 |
| Volume to Capacity | 0.00 | 0.09 | 0.01 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.1 |
| Control Delay (s) | 0.1 | 0.0 | 10.6 |
| Lane LOS | A | | B |
| Approach Delay (s) | 0.1 | 0.0 | 10.6 |
| Approach LOS | | | B |

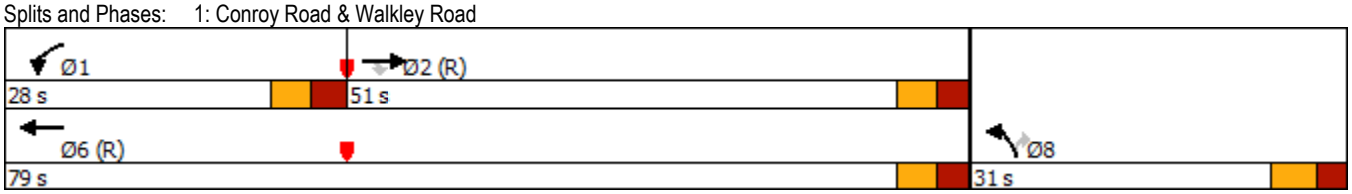
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 35.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1220 | 477 | 555 | 1109 | 512 | 340 |
| Future Volume (vph) | 1220 | 477 | 555 | 1109 | 512 | 340 |
| Satd. Flow (prot) | 3221 | 1483 | 3216 | 3349 | 3248 | 1469 |
| Flt Permitted | | | 0.950 | | 0.950 | |
| Satd. Flow (perm) | 3221 | 1430 | 3216 | 3349 | 3248 | 1420 |
| Satd. Flow (RTOR) | | 477 | | | | 340 |
| Lane Group Flow (vph) | 1220 | 477 | 555 | 1109 | 512 | 340 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Total Split (s) | 51.0 | 51.0 | 28.0 | 79.0 | 31.0 | 31.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.2 | 6.0 | 6.4 | 6.4 |
| Act Effct Green (s) | 47.8 | 47.8 | 21.7 | 75.7 | 21.9 | 21.9 |
| Actuated g/C Ratio | 0.43 | 0.43 | 0.20 | 0.69 | 0.20 | 0.20 |
| v/c Ratio | 0.87 | 0.54 | 0.88 | 0.48 | 0.79 | 0.61 |
| Control Delay | 37.4 | 4.4 | 42.5 | 18.8 | 51.3 | 9.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 37.4 | 4.4 | 42.5 | 18.8 | 51.3 | 9.1 |
| LOS | D | A | D | B | D | A |
| Approach Delay | 28.1 | | | 26.7 | 34.4 | |
| Approach LOS | C | | | C | C | |
| Queue Length 50th (m) | 118.6 | 0.0 | 58.0 | 92.6 | 49.2 | 0.0 |
| Queue Length 95th (m) | #159.5 | 18.1 | m#77.3 | 125.3 | 65.0 | 22.4 |
| Internal Link Dist (m) | 308.5 | | | 177.0 | 111.4 | |
| Turn Bay Length (m) | | 75.0 | | | | |
| Base Capacity (vph) | 1399 | 890 | 649 | 2304 | 726 | 581 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.87 | 0.54 | 0.86 | 0.48 | 0.71 | 0.59 |

**Intersection Summary**

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 20 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 28.8 — Intersection LOS: C
Intersection Capacity Utilization 85.1% — 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.
m Volume for 95th percentile queue is metered by upstream signal.

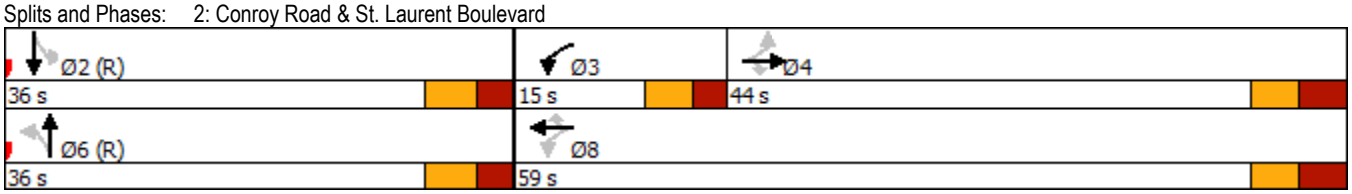
Splits and Phases: 1: Conroy Road & Walkley Road



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 43 | 84 | 350 | 253 | 37 | 114 | 44 | 635 | 90 | 41 | 1146 | 14 |
| Future Volume (vph) | 43 | 84 | 350 | 253 | 37 | 114 | 44 | 635 | 90 | 41 | 1146 | 14 |
| Satd. Flow (prot) | 1691 | 1780 | 1469 | 1642 | 1664 | 1483 | 1642 | 4612 | 0 | 1523 | 3303 | 0 |
| Flt Permitted | 0.733 | | | 0.559 | | | 0.137 | | | 0.345 | | |
| Satd. Flow (perm) | 1303 | 1780 | 1447 | 964 | 1664 | 1463 | 237 | 4612 | 0 | 549 | 3303 | 0 |
| Satd. Flow (RTOR) | | | 113 | | | 65 | | 28 | | | 1 | |
| Lane Group Flow (vph) | 43 | 84 | 350 | 253 | 37 | 114 | 44 | 725 | 0 | 41 | 1160 | 0 |
| Turn Type | Perm | NA | Perm | pm+pt | NA | Perm | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | 3 | 8 | | | 6 | | | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 6 | | | 2 | | |
| Total Split (s) | 44.0 | 44.0 | 44.0 | 15.0 | 59.0 | 59.0 | 36.0 | 36.0 | | 36.0 | 36.0 | |
| Total Lost Time (s) | 6.9 | 6.9 | 6.9 | 5.7 | 6.9 | 6.9 | 6.3 | 6.3 | | 6.3 | 6.3 | |
| Act Effct Green (s) | 22.2 | 22.2 | 22.2 | 38.4 | 37.2 | 37.2 | 44.6 | 44.6 | | 44.6 | 44.6 | |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.40 | 0.39 | 0.39 | 0.47 | 0.47 | | 0.47 | 0.47 | |
| v/c Ratio | 0.14 | 0.20 | 0.83 | 0.56 | 0.06 | 0.19 | 0.40 | 0.33 | | 0.16 | 0.75 | |
| Control Delay | 26.3 | 27.5 | 38.5 | 23.7 | 15.2 | 8.1 | 35.4 | 17.1 | | 20.4 | 26.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 26.3 | 27.5 | 38.5 | 23.7 | 15.2 | 8.1 | 35.4 | 17.1 | | 20.4 | 26.6 | |
| LOS | C | C | D | C | B | A | D | B | | C | C | |
| Approach Delay | | 35.5 | | | 18.5 | | | 18.2 | | | 26.3 | |
| Approach LOS | | D | | | B | | | B | | | C | |
| Queue Length 50th (m) | 5.8 | 11.5 | 39.0 | 29.6 | 3.8 | 5.1 | 4.7 | 25.9 | | 3.8 | 81.1 | |
| Queue Length 95th (m) | 11.5 | 18.9 | 58.7 | 37.2 | 7.5 | 11.8 | #20.6 | 42.4 | | 12.4 | #144.3 | |
| Internal Link Dist (m) | | 170.0 | | | 104.4 | | | 245.6 | | | 79.6 | |
| Turn Bay Length (m) | 30.0 | | 35.0 | 35.0 | | 35.0 | 70.0 | | | 75.0 | | |
| Base Capacity (vph) | 508 | 695 | 633 | 455 | 912 | 831 | 111 | 2182 | | 257 | 1552 | |
| 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 | 0.12 | 0.55 | 0.56 | 0.04 | 0.14 | 0.40 | 0.33 | | 0.16 | 0.75 | |

| Intersection Summary | |
|---|---|
| Cycle Length: 95 | |
| Actuated Cycle Length: 95 | |
| Offset: 2 (2%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay: 24.6 | Intersection LOS: C |
| Intersection Capacity Utilization 88.7% | 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: Conroy Road & St. Laurent Boulevard

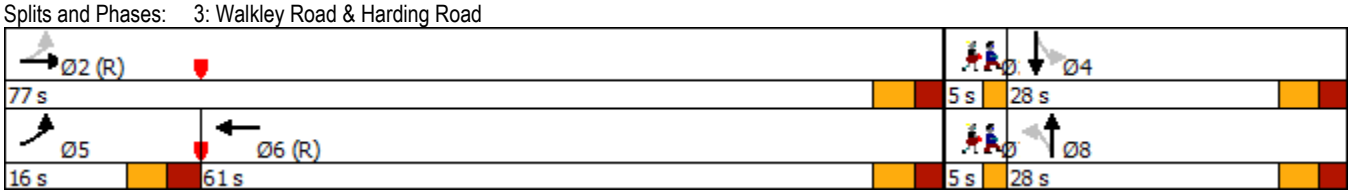


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 197 | 1378 | 2 | 0 | 1532 | 33 | 10 | 1 | 0 | 26 | 0 | 314 |
| Future Volume (vph) | 197 | 1378 | 2 | 0 | 1532 | 33 | 10 | 1 | 0 | 26 | 0 | 314 |
| Satd. Flow (prot) | 1674 | 3221 | 0 | 0 | 3303 | 0 | 0 | 1703 | 0 | 0 | 1494 | 0 |
| Flt Permitted | 0.067 | | | | | | | 0.480 | | | 0.975 | |
| Satd. Flow (perm) | 118 | 3221 | 0 | 0 | 3303 | 0 | 0 | 853 | 0 | 0 | 1462 | 0 |
| Satd. Flow (RTOR) | | | | | 3 | | | | | | 221 | |
| Lane Group Flow (vph) | 197 | 1380 | 0 | 0 | 1565 | 0 | 0 | 11 | 0 | 0 | 340 | 0 |
| Turn Type | pm+pt | NA | | | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | 5 | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | | | | 8 | | | 4 | | |
| Total Split (s) | 16.0 | 77.0 | | | 61.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Lost Time (s) | 6.0 | 5.9 | | | 5.9 | | | 5.7 | | | 5.7 | |
| Act Effct Green (s) | 81.4 | 81.5 | | | 62.4 | | | 16.9 | | | 16.9 | |
| Actuated g/C Ratio | 0.74 | 0.74 | | | 0.57 | | | 0.15 | | | 0.15 | |
| v/c Ratio | 0.72 | 0.58 | | | 0.83 | | | 0.08 | | | 0.83 | |
| Control Delay | 52.4 | 2.2 | | | 26.3 | | | 36.7 | | | 32.1 | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 52.4 | 2.2 | | | 26.3 | | | 36.7 | | | 32.1 | |
| LOS | D | A | | | C | | | D | | | C | |
| Approach Delay | | 8.4 | | | 26.3 | | | 36.7 | | | 32.1 | |
| Approach LOS | | A | | | C | | | D | | | C | |
| Queue Length 50th (m) | 26.2 | 7.6 | | | 130.7 | | | 1.9 | | | 23.2 | |
| Queue Length 95th (m) | m#43.0 | 17.5 | | | #198.7 | | | 5.9 | | | 49.0 | |
| Internal Link Dist (m) | | 64.7 | | | 213.8 | | | 35.2 | | | 112.2 | |
| Turn Bay Length (m) | 30.0 | | | | | | | | | | | |
| Base Capacity (vph) | 272 | 2385 | | | 1875 | | | 180 | | | 483 | |
| Starvation Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | 0 | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | 0.72 | 0.58 | | | 0.83 | | | 0.06 | | | 0.70 | |

**Intersection Summary**

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 41 (37%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 18.8 — Intersection LOS: B
Intersection Capacity Utilization 93.8% — ICU Level of Service F
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Walkley Road & Harding Road



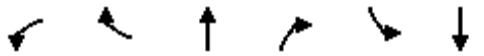
| Lane Group | Ø3 | Ø7 |
|---|---|---|
| Lane Configurations | | |
| Traffic Volume (vph) | | |
| Future Volume (vph) | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Satd. Flow (RTOR) | | |
| Lane Group Flow (vph) | | |
| Turn Type | | |
| Protected Phases | 3 | 7 |
| Permitted Phases | | |
| Total Split (s) | 5.0 | 5.0 |
| Total Lost Time (s) | | |
| 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 |
|---|

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1571 | 2 | 0 | 1856 | 0 | 6 |
| Future Volume (Veh/h) | 1571 | 2 | 0 | 1856 | 0 | 6 |
| 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) | 1571 | 2 | 0 | 1856 | 0 | 6 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | 201 | | | 89 | | |
| pX, platoon unblocked | | | 0.66 | | 0.66 | 0.66 |
| vC, conflicting volume | | | 1573 | | 2036 | 786 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 826 | | 1531 | 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 | 99 |
| cM capacity (veh/h) | | | 525 | | 71 | 712 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|
| Volume Total | 1047 | 526 | 464 | 464 | 464 | 464 | 6 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 2 | 0 | 0 | 0 | 0 | 6 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 712 |
| Volume to Capacity | 0.62 | 0.31 | 0.27 | 0.27 | 0.27 | 0.27 | 0.01 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.1 |
| Lane LOS | | | | | | | B |
| Approach Delay (s) | 0.0 | | 0.0 | | | | 10.1 |
| Approach LOS | | | | | | | B |

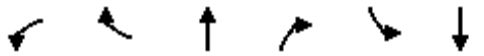
| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.0 | | | |
| Intersection Capacity Utilization | 55.9% | ICU Level of Service | | B |
| Analysis Period (min) | 15 | | | |



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 3 | 8 | 844 | 1 | 4 | 1028 |
| Future Volume (Veh/h) | 3 | 8 | 844 | 1 | 4 | 1028 |
| 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) | 3 | 8 | 844 | 1 | 4 | 1028 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 203 | | | 135 |
| pX, platoon unblocked | 0.94 | 0.94 | | | 0.94 | |
| vC, conflicting volume | 1366 | 282 | | | 845 | |
| vC1, stage 1 conf vol | 844 | | | | | |
| vC2, stage 2 conf vol | 522 | | | | | |
| vCu, unblocked vol | 1177 | 26 | | | 624 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 100 | |
| cM capacity (veh/h) | 310 | 984 | | | 899 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|---|---|---|---|---|---|---|---|
| Volume Total | 11 | 338 | 338 | 170 | 4 | 514 | 514 |
| Volume Left | 3 | 0 | 0 | 0 | 4 | 0 | 0 |
| Volume Right | 8 | 0 | 0 | 1 | 0 | 0 | 0 |
| cSH | 618 | 1700 | 1700 | 1700 | 899 | 1700 | 1700 |
| Volume to Capacity | 0.02 | 0.20 | 0.20 | 0.10 | 0.00 | 0.30 | 0.30 |
| Queue Length 95th (m) | 0.4 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 10.9 | 0.0 | 0.0 | 0.0 | 9.0 | 0.0 | 0.0 |
| Lane LOS | B | | | | A | | |
| Approach Delay (s) | 10.9 | 0.0 | | | 0.0 | | |
| Approach LOS | B | | | | | | |

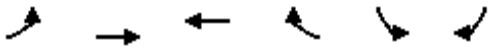
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 40.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 2 | 791 | 1 | 0 | 1206 |
| Future Volume (Veh/h) | 0 | 2 | 791 | 1 | 0 | 1206 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 0 | 2 | 791 | 1 | 0 | 1206 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | Raised | | | Raised |
| Median storage veh) | | | 1 | | | 1 |
| Upstream signal (m) | | | 104 | | | 235 |
| pX, platoon unblocked | 0.92 | 0.92 | | | 0.92 | |
| vC, conflicting volume | 1394 | 264 | | | 792 | |
| vC1, stage 1 conf vol | 792 | | | | | |
| vC2, stage 2 conf vol | 603 | | | | | |
| vCu, unblocked vol | 1135 | 0 | | | 482 | |
| tC, single (s) | 6.8 | 6.9 | | | 4.1 | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 322 | 1001 | | | 994 | |

| Direction, Lane # | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 2 | 316 | 316 | 159 | 603 | 603 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 2 | 0 | 0 | 1 | 0 | 0 |
| cSH | 1001 | 1700 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.00 | 0.19 | 0.19 | 0.09 | 0.35 | 0.35 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 8.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | A | | | | | |
| Approach Delay (s) | 8.6 | 0.0 | | | 0.0 | |
| Approach LOS | A | | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 38.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 213 | 395 | 2 | 5 | 9 |
| Future Volume (Veh/h) | 2 | 213 | 395 | 2 | 5 | 9 |
| 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) | 2 | 213 | 395 | 2 | 5 | 9 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | 128 | | | | |
| pX, platoon unblocked | | | | | 0.98 | |
| vC, conflicting volume | 397 | | | | 613 | 396 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 397 | | | | 597 | 396 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 100 | | | | 99 | 99 |
| cM capacity (veh/h) | 1162 | | | | 457 | 653 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 215 | 397 | 14 |
| Volume Left | 2 | 0 | 5 |
| Volume Right | 0 | 2 | 9 |
| cSH | 1162 | 1700 | 566 |
| Volume to Capacity | 0.00 | 0.23 | 0.02 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.5 |
| Control Delay (s) | 0.1 | 0.0 | 11.5 |
| Lane LOS | A | | B |
| Approach Delay (s) | 0.1 | 0.0 | 11.5 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 32.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |