



Chateaux of Caledon Mid-Rise

Old Church Road and Atchison Drive, Caledon

Noise Impact Study

SACL #SW17460A0

February 2, 2018

Submitted to:

John Spina

Chateaux of Caledon Corporation
55 Blue Willow Drive
Woodbridge, Ontario L4L 9E8
Tel: 905-265-1976

jspina@mediterracorp.onmicrosoft.com

Submitted by:

Pearlie Yung, M.Sc., P.Eng.

Senior Project Engineer

Swallow Acoustic Consultants Ltd.

23-366 Revus Ave.

Mississauga, Ontario L5G 4S5

Tel: 905-271-7888

pyung@thorntomasetti.com

Reviewed by:

Galen Wong, M.A.Sc.

Senior Project Director

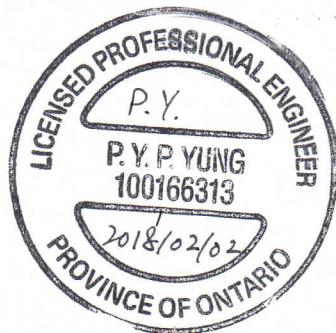


Table of Contents

| | |
|--|-----------|
| 1. Introduction | 1 |
| 2. Site | 1 |
| 3. Noise Source | 1 |
| 4. Critical Noise Receptors | 1 |
| 5. Sound Levels | 2 |
| 6. Sound Level Limits | 3 |
| 6.1 Outdoor Sound Level Limits | 3 |
| 6.2 Indoor Sound Level Limits | 4 |
| 6.3 Town of Caledon Requirements | 5 |
| 7. Noise Control Measures | 6 |
| 7.1 Ventilation | 6 |
| 7.2 Building Components | 6 |
| 7.3 Warning Clauses..... | 7 |
| 8. Concluding Comments | 8 |
| Figures | 9 |
| Appendices | 12 |

LIST OF TABLES

| | |
|---|----------|
| Table 1: Critical Noise Receptors | 2 |
| Table 2: Summary of Traffic Data | 2 |
| Table 3: Calculated Outdoor Sound Level | 3 |
| Table 4: MOECC Outdoor Sound Level Limit | 3 |
| Table 5: MOECC Noise Control Requirements for Outdoor Receptors | 4 |
| Table 6: MOECC Indoor Sound Level Limit | 4 |
| Table 7: Combination of Road and Rail Noise, Ventilation and Warning Clause Requirements | 4 |
| Table 8: Road Noise Building Component Requirements | 5 |
| Table 9: Noise Control Measures | 6 |
| Table 10: Building Envelope Requirements | 6 |



LIST OF FIGURES

Figure 1: Site Plan

Figure 2: Aerial Photo

LIST OF APPENDICES

Appendix A: Traffic Data

Appendix B: STAMSON Calculations



1. Introduction

This document is a Noise Impact Study for a proposed mixed-use development located at the northeast corner of Old Church Road and Atchison Drive in Caledon, Ontario (Project). We understand that the study is required by the Town of Caledon for approval of a draft plan of subdivision.

The proposed mixed-use development consists of a 5-storey building with part of the ground floor for retail. The site plan is shown in [Figure 1](#). The objective of this study is to determine if the proposed development can meet the requirements of the Town of Caledon, using criteria developed by the Ontario Ministry of the Environment and Climate Change (MOECC). Noise control recommendations are summarised in Section 7.

2. Site

The Project is located at the northeast corner of Old Church Road and Atchison Drive. An aerial photo of the area is provided in [Figure 2](#). There are existing townhouses to the north and west, and single houses to the east. The Caledon Town Hall is located south of the Project.

The proposed mixed-use development consists of retail spaces on part of the ground floor and 85 residential units on all 5 floors. A public square is located at the southwest corner of the site and there is a surface parking area on the north side of the site. All private balconies, patios and terraces are less than 4 m deep so they are not considered designated outdoor amenity areas. There is no shared outdoor amenity area for the residents.

3. Noise Source

The major noise source that may impact the site is the road traffic along Old Church Road. Atchison Drive to the west of the Project is not an arterial road but a local road that provides access to the nearby subdivisions. Although the traffic on Atchison Drive is not considered a major noise source, it is included in the analysis for the receptor along the west façade of the proposed building.

There are no significant stationary noise sources associated with the Caledon Town Hall.

4. Critical Noise Receptors

Critical Noise Receptors are those receptors likely to be most affected by the identified noise sources. The critical indoor noise receptors are the residential units exposed to the traffic noise on Old Church Road. Their locations are summarised in Table 1 and shown in [Figure 1](#).



Table 1: Critical Noise Receptors

| Receptor ID | Receptor Location | Height (m) |
|--------------------|---|-------------------|
| POR1 | Southeast corner of building, facing Old Church Road | 4.5 |
| POR2 | East façade of building, near Old Church Road | 13.5 |
| POR3 | Southwest corner of building, facing Old Church Road and Atchison Drive | 13.5 |

5. Sound Levels

Traffic volume data for Old Church Road, as summarised in Table 2, was obtained from the Region of Peel. Traffic volume data for Atchison Drive was obtained from NexTrans Consulting Engineers. The traffic data are provided in Appendix A.

Atchison Drive is not an arterial road but a local road to access the subdivisions to the north and northwest from the Project. Existing or planned AADT for Atchison Drive is not available. The ratio between the existing 6-hour turning movement counts of Old Church road and Atchison Drive, which is 47%, is used to estimate the planned AADT. The estimated planned AADT of Atchison Drive is 7679. The truck percentages and day/night split of Old Church Road are used to calculate traffic noise from Atchison Drive. Traffic noise from Atchison Drive is only considered for POR3 due to its proximity.

Table 2: Summary of Traffic Data

| Parameter | Old Church Road |
|-------------------------|------------------------|
| Existing AADT | 4,600 |
| Planned AADT | 16,200 |
| Day/Night Split | 82%/18% |
| Daytime medium truck | 13% |
| Daytime heavy truck | 14% |
| Night-time medium truck | 14% |
| Night-time heavy truck | 9% |
| Posted Speed Limit | 50 km/h |

According to the Town of Caledon Development Standards, Policies & Guidelines Version 4 – January 2009, the traffic speed for noise impact analysis should be 10 km/hr over the posted speed limit. Therefore the speed limit used in our traffic noise prediction model is 60 km/h for both

Old Church Road and Atchison Drive.

Calculations of traffic sound levels were performed using STAMSON 5.04, the traffic (and railway) noise prediction model developed and accepted by MOECC. A sample calculation report for traffic noise predictions is attached as Appendix B. The calculated sound levels are as follows:

Table 3: Calculated Outdoor Sound Level

| <i>Receptor ID</i> | <i>Calculated Sound Level (dBA)</i> | |
|--------------------|-------------------------------------|------------------------------|
| | <i>Day Leq (16 hrs)</i> | <i>Night Leq (8 hrs)</i> |
| POR1 | 71 | 66 |
| POR2 | 67 | 62 |
| POR3 | 71 | 66 |

6. Sound Level Limits

Guidelines for acceptable sound levels of road traffic on residential developments are given in Part C of the MOE publication NPC-300 “Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning” dated 2013.

6.1 Outdoor Sound Level Limits

The MOECC outdoor sound level limit for traffic noise is as follows:

Table 4: MOECC Outdoor Sound Level Limit

| <i>Time Period</i> | <i>Sound Level (Leq)</i> |
|-----------------------------|--------------------------|
| Day-time (07:00 - 23:00) | 55 |

In addition to the above outdoor levels, the MOECC has a sliding scale to determine the need for outdoor noise reduction measures depending on outdoor sound levels:



Table 5: MOECC Noise Control Requirements for Outdoor Receptors

| <i>Outdoor Sound Level (Day-time Leq)</i> | <i>Need for Noise Reduction Measures</i> |
|--|---|
| 56 to 60 dBA | Noise control measures may be implemented. If no noise control measures are planned, a warning clause must be included in the unit title or lease agreement. |
| Above 60 dBA | Control measures (barriers) required to reduce the Leq to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible. A warning clause is required if resultant Leq exceeds 55 dBA. |

6.2 Indoor Sound Level Limits

The indoor sound levels limits developed by MOECC for road sources are as follows:

Table 6: MOECC Indoor Sound Level Limit

| <i>Room</i> | <i>Time Period</i> | <i>Road Sound Level (Leq)</i> |
|--------------------|----------------------------|--|
| Living rooms | Day-time (07:00 - 23:00) | 45 dBA |
| | Night-time (23:00 - 07:00) | 45 dBA |
| Bedrooms | Day-time (07:00 - 23:00) | 45 dBA |
| | Night-time (23:00 - 07:00) | 40 dBA |

In addition to the above indoor levels, the MOECC has a sliding scale to determine the need for noise reduction measures depending on the outdoor sound level:

Table 7: Combination of Road and Rail Noise, Ventilation and Warning Clause Requirements

| <i>ASSESSMENT LOCATION</i> | <i>Leq</i> | <i>VENTILATION REQUIREMENTS</i> | <i>WARNING CLAUSE</i> |
|---------------------------------------|--|---|----------------------------------|
| PLANE OF BEDROOM, LIVING ROOM | Greater than 55 dBA to less than or equal to 65 dBA. | Forced air heating with provision for central air conditioning. | Required |



| ASSESSMENT LOCATION | Leq | VENTILATION REQUIREMENTS | WARNING CLAUSE |
|--|--|---|-----------------------|
| WINDOW (07:00-23:00) | Greater than 65 dBA. | Central air conditioning | Required |
| PLANE OF BEDROOM, LIVING ROOM WINDOW (07:00-23:00) | Greater than 50 dBA to less than or equal to 60 dBA. | Forced air heating with provision for central air conditioning. | Required |
| | Greater than 60 dBA | Central air conditioning | Required |

Table 8: Road Noise Building Component Requirements

| ASSESSMENT LOCATION | Leq | BUILDING COMPONENT REQUIREMENTS |
|---|------------------------------|--|
| PLANE OF BEDROOM, LIVING ROOM WINDOW (07:00-23:00) | Less than or equal to 65 dBA | Building compliant with the Ontario Building Code. |
| | Greater than 65 dBA | Building components must be designed to achieve indoor sound level criteria. |
| PLANE OF BEDROOM, LIVING ROOM WINDOW (23:00-07:00) | Less than or equal to 60 dBA | Building compliant with the Ontario Building Code. |
| | Greater than 60 dBA | Building components must be designed to achieve indoor sound level criteria |

6.3 Town of Caledon Requirements

In addition to the MOECC requirements, the Town of Caledon has the following sound level limits in their Development Standards, Policies & Guidelines Version 4 – January 2009:

- “The Town of Caledon will NOT accept sound levels in excess of the following levels, unless design features exceed standard detail.
 - For outdoor areas the equivalent sound level Leq from 7:00 a.m. to 11:00 p.m. is 55 dBA.
 - For indoor areas such as living rooms during the day the Leq is 45 dBA for roads and 40 dBA for rail.
 - For bedrooms at night the Leq is 40 dBA for road and 35 dBA for rail.”

7. Noise Control Measures

Noise control recommendations for the critical receptors are summarized in Table 9 and discussed in the subsequent sections. As there are no designated outdoor amenity areas in the Project, only noise control measures for indoor receptors are required.

Table 9: Noise Control Measures

| <i>Receptor</i> | <i>Ventilation</i> | <i>Building Components</i> | <i>Warning Clause</i> |
|-----------------|---------------------------|--|-----------------------|
| POR1 | Central air conditioning. | Design to achieve indoor sound level criteria. | Yes, Type D |
| POR2 | Central air conditioning. | Design to achieve indoor sound level criteria. | Yes Type D |
| POR3 | Central air conditioning. | Design to achieve indoor sound level criteria. | Yes Type D |

7.1 Ventilation

Since the predicted sound levels for POR1, POR2 and POR3 are above 65 dBA during daytime and above 60 dBA during night-time, central air conditioning is required for all residential units.

7.2 Building Components

Since the predicted sound levels are above 65 dBA during daytime and above 60 dBA during night-time, building components should be designed to meet the indoor sound level limits.

As the building design is at an early stage, floor plans and the construction of building envelope are not available yet. The sound transmission loss of the building façade components required to meet MOECC interior sound levels with the above calculated outdoor sound level were determined based on maximum building components percentages. The transmission losses, in terms of Sound Transmission Class (STC), are provided in Table 10.

Table 10: Building Envelope Requirements

| <i>Component</i> | <i>Maximum Component Area Percentage Versus Floor Area of Room</i> | <i>STC Required</i> |
|--|--|---------------------|
| Exterior wall | 100% | STC 40 |
| Fixed glazing | 40% | STC 35 |
| Operable glazing including sliding glass doors | 20% | STC 32 |



Typical minimum constructions for exterior wall and glazing were determined to provide a basis for the final design.

Exterior Wall

The following construction can achieve STC-40:

- Wood siding or metal siding
- Fibre backer board
- 25-30 mm rigid insulation
- 50 mm or thicker mineral wool or glass fibre batt insulation in inter-stud cavities
- 92 mm metal studs @ 400 mm o.c.
- Vapour barrier
- 13 mm gypsum board

Fixed Glazing

Fixed glazing sealed to the frame and consists of two 6 mm panes of glass separated by an airspace of 13 mm can achieve STC-35.

Operable Glazing

Operable glazing consists of two 6 mm panes separated by an airspace of 13 mm can achieve STC-32.

The above constructions are provided for reference only. Any constructions with equivalent or greater STC values will be acceptable. Changes in window sizes and unit layouts will change these requirements. Specifically, reduced window sizes will reduce the window requirements.

7.3 Warning Clauses

Since central air conditioning is required for all residential units, the following Type D warning clause should be inserted in all development agreements of each of the dwellings:

“This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment.”



8. Concluding Comments

With the incorporation of the noise control measures as presented in Section 7 of this report, the noise impact from the transportation noise sources on the proposed mixed-use development will meet the MOECC criteria. There are no significant stationary noise sources near the project.

The proposed mixed-use development Chateaux of Caledon Mid-Rise located at the northeast corner of Old Church Road and Atchison Drive in the Town of Caledon should therefore be approved from the noise aspect.

----- End -----



Figures

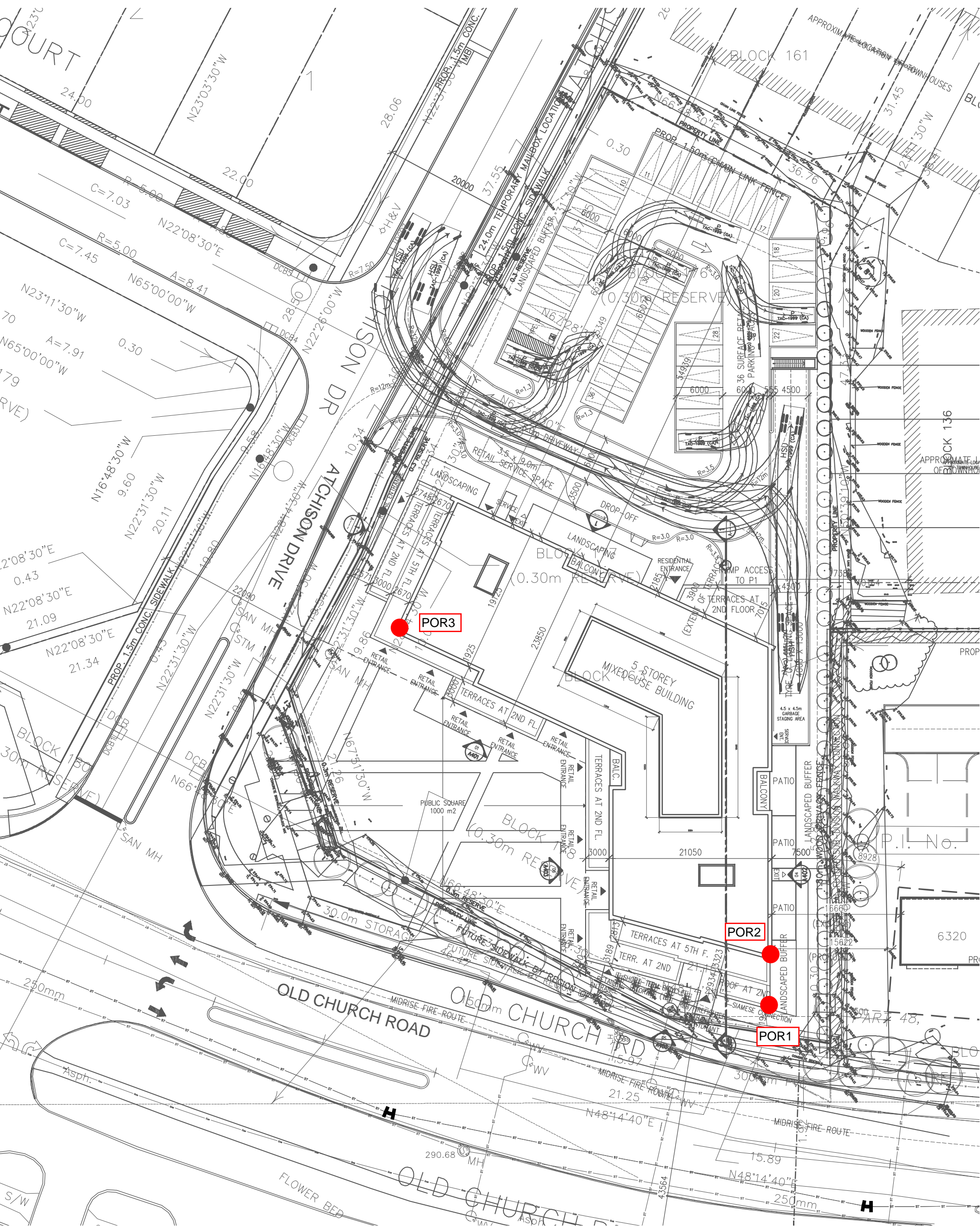


Figure 1 Site Plan

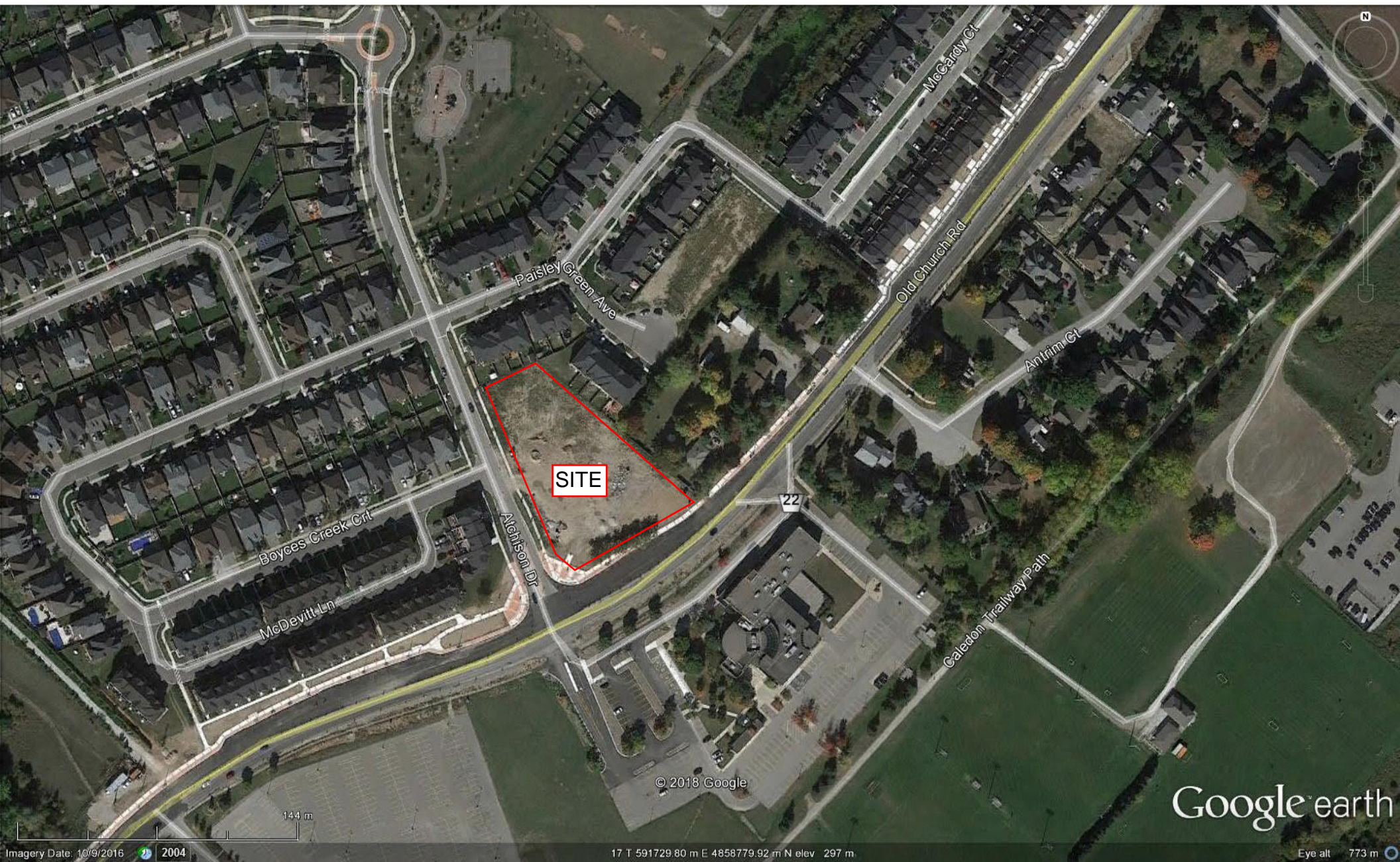


Figure 2 Aerial Photo



Appendices

Chateaux of Caledon Mid-Rise
SACL Project #SW17460A0
February 2, 201



Appendix A: Traffic Data

Yung, Pearlie

From: Shan, Rosalie <rosalie.shan@peelregion.ca>
Sent: 2018/01/17 10:56 AM
To: Yung, Pearlie
Cc: Kuczynski, Roman
Subject: Peel Region - re-data request - Old Church Road

Hi Pearlie,

This is Rosalie from Region of Peel. Please find the following data summary table as per your request.

The data is based on the nearest Regional Traffic Count Station located on Old Church Road 1.5 km east of Airport Road.

| | Existing | Planned |
|-------------------------------------|-------------------------|-------------------------|
| 24 Hour Traffic Volume | 4,600 | 16,200 |
| # of Lanes | 2 | 2 |
| Day/Night Split | 82/18 | 82/18 |
| Day Trucks (% of Total Volume) | 13% Medium 14% Heavy | 13% Medium 14% Heavy |
| Night Trucks (% of Total Volume) | 14% Medium 9% Heavy | 14% Medium 9% Heavy |
| Right-of-Way Width | 30 meters | |
| Posted Speed Limit | 50 km/h | |

Please let me know if you have any questions or need more information on this. Thank you.

Regards,

Rosalie Shan
Planner (A)
Transportation Systems Planning
Region of Peel

Tel: 905-791-7800, ext. 7999
E-mail: rosalie.shan@peelregion.ca



Turning Movement Count (2 . OLD CHURCH RD & ATCHISON DR)

| Start Time | N Approach ATCHISON DR | | | | | | Approach Total | E Approach OLD CHURCH RD | | | | | | Approach Total | S Approach ATCHISON DR | | | | | | Approach Total | W Approach OLD CHURCH RD | | | | | | Approach Total | Int. Total (15 min) | Int. Total (1 hr) |
|--------------------|---------------------------|-------------|-------------|---------------|------------|--------------|----------------|-----------------------------|-------------|---------------|------------|--------------|-------------|----------------|---------------------------|---------------|------------|--------------|-------------|-------------|----------------|-----------------------------|------------|-------------|-------------|----------|----------|----------------|------------------------|----------------------|
| | Right N:W | Thru N:S | Left N:E | U-Turn N:N | Peds N: | Right E:N | | Thru E:W | Left E:S | U-Turn E:E | Peds E: | Right S:E | Thru S:N | | Left S:W | U-Turn S:S | Peds S: | Right W:S | Thru W:E | Left W:N | | U-Turn W:W | Peds W: | | | | | | | |
| 07:00:00 | 21 | 1 | 15 | 0 | 0 | 37 | 2 | 15 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 1 | 0 | 0 | 28 | 82 | | | |
| 07:15:00 | 28 | 0 | 12 | 0 | 0 | 40 | 2 | 27 | 1 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 3 | 0 | 0 | 31 | 101 | | | |
| 07:30:00 | 21 | 0 | 13 | 0 | 0 | 34 | 1 | 32 | 5 | 0 | 0 | 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 5 | 0 | 1 | 55 | 127 | | | |
| 07:45:00 | 30 | 0 | 17 | 0 | 1 | 47 | 1 | 51 | 5 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 60 | 6 | 0 | 2 | 74 | 178 | 488 | | |
| 08:00:00 | 22 | 0 | 15 | 0 | 0 | 37 | 0 | 55 | 6 | 0 | 0 | 61 | 0 | 0 | 1 | 0 | 0 | 1 | 6 | 6 | 70 | 6 | 0 | 0 | 82 | 181 | 587 | | | |
| 08:15:00 | 19 | 0 | 9 | 0 | 1 | 28 | 3 | 39 | 21 | 0 | 0 | 63 | 0 | 0 | 2 | 0 | 0 | 2 | 29 | 43 | 6 | 0 | 0 | 78 | 171 | 657 | | | | |
| 08:30:00 | 18 | 0 | 12 | 0 | 3 | 30 | 6 | 24 | 10 | 1 | 0 | 41 | 1 | 0 | 0 | 0 | 1 | 1 | 30 | 35 | 7 | 0 | 1 | 72 | 144 | 674 | | | | |
| 08:45:00 | 18 | 3 | 2 | 0 | 0 | 23 | 3 | 33 | 27 | 0 | 2 | 63 | 0 | 0 | 1 | 0 | 0 | 1 | 31 | 28 | 6 | 0 | 0 | 65 | 152 | 648 | | | | |
| 09:00:00 | 22 | 1 | 7 | 0 | 0 | 30 | 6 | 52 | 16 | 0 | 0 | 74 | 1 | 0 | 0 | 0 | 0 | 1 | 17 | 49 | 13 | 0 | 0 | 79 | 184 | 651 | | | | |
| 09:15:00 | 11 | 0 | 3 | 0 | 0 | 14 | 6 | 48 | 6 | 0 | 0 | 60 | 2 | 0 | 2 | 0 | 0 | 4 | 10 | 34 | 3 | 0 | 3 | 47 | 125 | 605 | | | | |
| 09:30:00 | 11 | 0 | 12 | 0 | 0 | 23 | 3 | 25 | 4 | 0 | 0 | 32 | 2 | 1 | 1 | 0 | 3 | 4 | 3 | 26 | 8 | 0 | 4 | 37 | 96 | 557 | | | | |
| 09:45:00 | 9 | 0 | 6 | 0 | 1 | 15 | 1 | 21 | 3 | 0 | 1 | 25 | 6 | 1 | 3 | 0 | 1 | 10 | 3 | 22 | 3 | 0 | 0 | 28 | 78 | 483 | | | | |
| ***BREAK*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16:00:00 | 16 | 0 | 8 | 0 | 1 | 24 | 4 | 55 | 3 | 0 | 0 | 62 | 2 | 0 | 15 | 0 | 0 | 17 | 0 | 44 | 23 | 1 | 0 | 68 | 171 | | | | | |
| 16:15:00 | 14 | 1 | 6 | 0 | 0 | 21 | 16 | 51 | 5 | 0 | 0 | 72 | 3 | 1 | 2 | 0 | 1 | 6 | 1 | 49 | 29 | 0 | 1 | 79 | 178 | | | | | |
| 16:30:00 | 14 | 0 | 5 | 0 | 0 | 19 | 7 | 63 | 3 | 0 | 0 | 73 | 11 | 1 | 52 | 1 | 1 | 65 | 0 | 51 | 33 | 0 | 1 | 84 | 241 | | | | | |
| 16:45:00 | 8 | 0 | 4 | 0 | 0 | 12 | 8 | 40 | 2 | 0 | 0 | 50 | 4 | 0 | 15 | 0 | 0 | 19 | 0 | 37 | 30 | 0 | 0 | 67 | 148 | 738 | | | | |
| 17:00:00 | 14 | 1 | 7 | 0 | 1 | 22 | 7 | 47 | 4 | 0 | 0 | 58 | 4 | 0 | 12 | 0 | 0 | 16 | 0 | 32 | 26 | 0 | 0 | 58 | 154 | 721 | | | | |
| 17:15:00 | 22 | 0 | 2 | 0 | 2 | 24 | 10 | 45 | 3 | 0 | 0 | 58 | 1 | 0 | 5 | 0 | 0 | 6 | 3 | 30 | 25 | 0 | 0 | 58 | 146 | 689 | | | | |
| 17:30:00 | 12 | 2 | 6 | 0 | 0 | 20 | 6 | 46 | 5 | 0 | 0 | 57 | 0 | 0 | 4 | 0 | 0 | 4 | 2 | 38 | 39 | 0 | 0 | 79 | 160 | 608 | | | | |
| 17:45:00 | 16 | 0 | 3 | 0 | 0 | 19 | 10 | 45 | 3 | 0 | 0 | 58 | 1 | 0 | 5 | 0 | 0 | 6 | 5 | 38 | 29 | 0 | 0 | 72 | 155 | 615 | | | | |
| 18:00:00 | 13 | 0 | 9 | 0 | 1 | 22 | 13 | 31 | 3 | 0 | 0 | 47 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 34 | 18 | 0 | 0 | 54 | 123 | 584 | | | | |
| 18:15:00 | 20 | 3 | 5 | 0 | 1 | 28 | 7 | 32 | 4 | 0 | 0 | 43 | 3 | 0 | 0 | 0 | 0 | 3 | 1 | 27 | 22 | 0 | 0 | 50 | 124 | 562 | | | | |
| 18:30:00 | 22 | 1 | 2 | 0 | 1 | 25 | 7 | 32 | 5 | 0 | 0 | 44 | 10 | 0 | 1 | 0 | 0 | 11 | 3 | 38 | 15 | 0 | 0 | 56 | 136 | 538 | | | | |
| 18:45:00 | 9 | 0 | 6 | 0 | 1 | 15 | 7 | 31 | 5 | 0 | 0 | 43 | 3 | 1 | 0 | 0 | 0 | 4 | 0 | 28 | 24 | 0 | 0 | 52 | 114 | 497 | | | | |
| Grand Total | 410 | 13 | 186 | 0 | 14 | 609 | 136 | 940 | 149 | 1 | 3 | 1226 | 54 | 5 | 121 | 1 | 7 | 181 | 154 | 918 | 380 | 1 | 13 | 1453 | 3469 | - | - | | | |
| Approach% | 67.3% | 2.1% | 30.5% | 0% | - | 11.1% | 76.7% | 12.2% | 0.1% | - | 29.8% | 2.8% | 66.9% | 0.6% | - | 10.6% | 63.2% | 26.2% | 0.1% | - | - | - | - | - | - | - | - | | | |
| Totals % | 11.8% | 0.4% | 5.4% | 0% | 17.6% | 3.9% | 27.1% | 4.3% | 0% | 35.3% | 1.6% | 0.1% | 3.5% | 0% | 5.2% | 4.4% | 26.5% | 11% | 0% | 41.9% | - | - | - | - | - | - | | | | |
| Heavy | 6 | 0 | 3 | 0 | - | 6 | 52 | 1 | 0 | - | 1 | 0 | 1 | 0 | - | 1 | 47 | 10 | 0 | - | - | - | - | - | - | - | | | | |
| Heavy % | 1.5% | 0% | 1.6% | 0% | - | 4.4% | 5.5% | 0.7% | 0% | - | 1.9% | 0% | 0.8% | 0% | - | 0.6% | 5.1% | 2.6% | 0% | - | - | - | - | - | - | - | | | | |
| Bicycles | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 1 | 0 | 0 | - | - | - | - | - | - | - | | | | |
| Bicycle % | 0% | 0% | 0% | 0% | - | 0% | 0% | 0% | 0% | - | 0% | 0% | 0% | 0% | - | 0% | 0.1% | 0% | 0% | - | - | - | - | - | - | - | | | | |



Turning Movement Count
Location Name: OLD CHURCH RD & ATCHISON DR
Date: Wed, Nov 15, 2017 Deployment Lead: Theo Daglis

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6



Peak Hour: 07:45 AM - 08:45 AM Weather: Mostly Cloudy (1.6 °C)

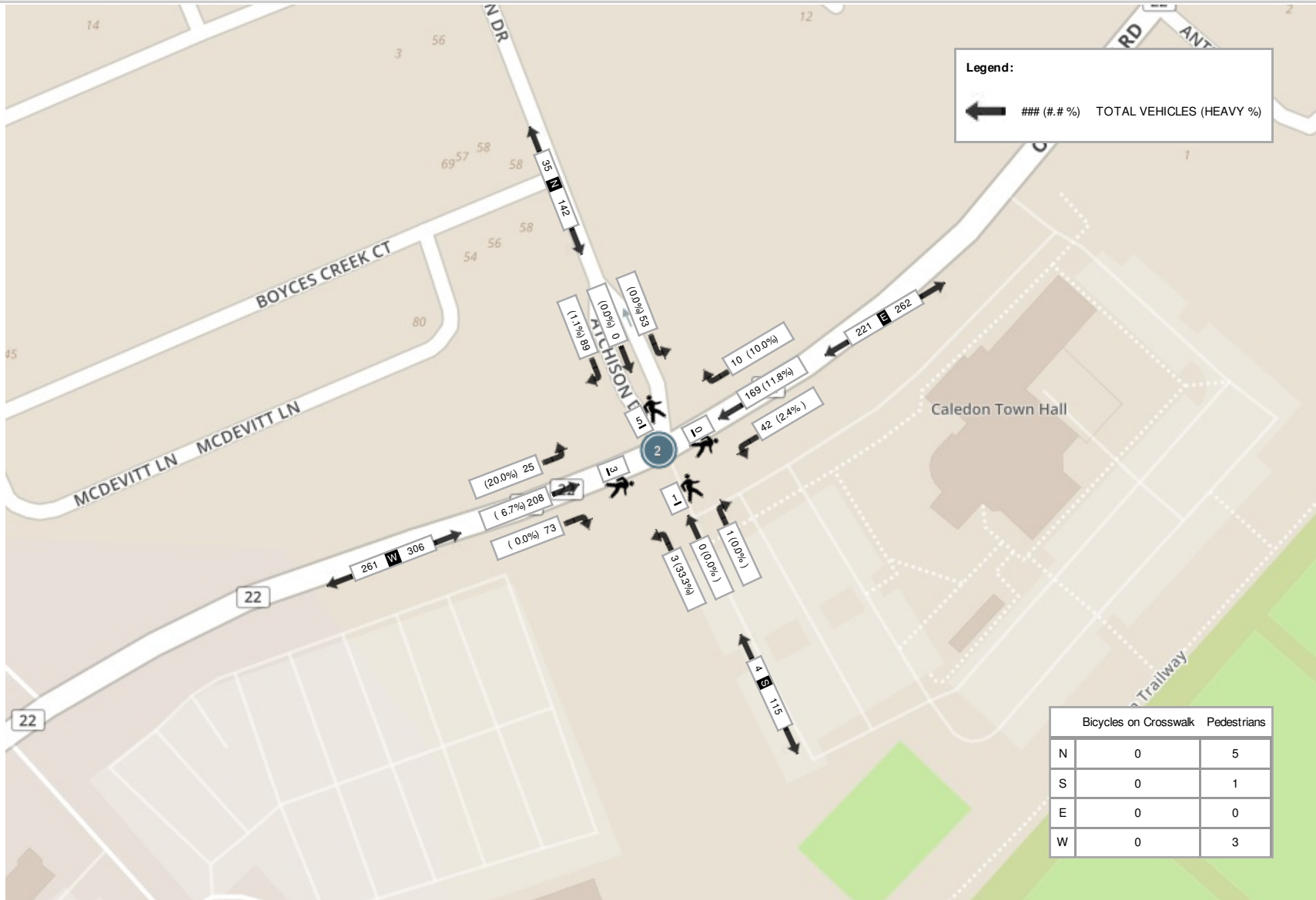
| Start Time | N Approach ATCHISON DR | | | | | | E Approach OLD CHURCH RD | | | | | | S Approach ATCHISON DR | | | | | | W Approach OLD CHURCH RD | | | | | | Int. Total (15 min) |
|-------------------------------|---------------------------|----------|-----------|----------|----------|----------------|-----------------------------|------------|-----------|----------|----------|----------------|---------------------------|----------|----------|----------|----------|----------------|-----------------------------|------------|-----------|----------|----------|----------------|------------------------|
| | Right | Thru | Left | U-Turn | Peds | Approach Total | Right | Thru | Left | U-Turn | Peds | Approach Total | Right | Thru | Left | U-Turn | Peds | Approach Total | Right | Thru | Left | U-Turn | Peds | Approach Total | |
| 07:45:00 | 30 | 0 | 17 | 0 | 1 | 47 | 1 | 51 | 5 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 60 | 6 | 0 | 2 | 74 | 178 |
| 08:00:00 | 22 | 0 | 15 | 0 | 0 | 37 | 0 | 55 | 6 | 0 | 0 | 61 | 0 | 0 | 1 | 0 | 0 | 1 | 6 | 70 | 6 | 0 | 0 | 82 | 181 |
| 08:15:00 | 19 | 0 | 9 | 0 | 1 | 28 | 3 | 39 | 21 | 0 | 0 | 63 | 0 | 0 | 2 | 0 | 0 | 2 | 29 | 43 | 6 | 0 | 0 | 78 | 171 |
| 08:30:00 | 18 | 0 | 12 | 0 | 3 | 30 | 6 | 24 | 10 | 1 | 0 | 41 | 1 | 0 | 0 | 0 | 1 | 1 | 30 | 35 | 7 | 0 | 1 | 72 | 144 |
| Grand Total | 89 | 0 | 53 | 0 | 5 | 142 | 10 | 169 | 42 | 1 | 0 | 222 | 1 | 0 | 3 | 0 | 1 | 4 | 73 | 208 | 25 | 0 | 3 | 306 | 674 |
| Approach% | 62.7% | 0% | 37.3% | 0% | - | - | 4.5% | 76.1% | 18.9% | 0.5% | - | - | 25% | 0% | 75% | 0% | - | 23.9% | 68% | 8.2% | 0% | - | - | - | |
| Totals % | 13.2% | 0% | 7.9% | 0% | 21.1% | 1.5% | 25.1% | 6.2% | 0.1% | 32.9% | 0.1% | 0% | 0.4% | 0% | 0.6% | 10.8% | 30.9% | 3.7% | 0% | 45.4% | - | - | - | - | |
| PHF | 0.74 | 0 | 0.78 | 0 | 0.76 | 0.42 | 0.77 | 0.5 | 0.25 | 0.88 | 0.25 | 0 | 0.38 | 0 | 0.5 | 0.61 | 0.74 | 0.89 | 0 | 0.93 | - | - | - | - | |
| Heavy | 1 | 0 | 0 | 0 | 1 | 1 | 20 | 1 | 0 | 22 | 0 | 0 | 1 | 0 | 1 | 0 | 14 | 5 | 0 | 19 | - | - | - | - | |
| Heavy % | 1.1% | 0% | 0% | 0% | 0.7% | 10% | 11.8% | 2.4% | 0% | 9.9% | 0% | 0% | 33.3% | 0% | 25% | 0% | 6.7% | 20% | 0% | 6.2% | - | - | - | - | |
| Lights | 88 | 0 | 53 | 0 | 141 | 9 | 149 | 41 | 1 | 200 | 1 | 0 | 2 | 0 | 3 | 73 | 194 | 20 | 0 | 287 | - | - | - | - | |
| Lights % | 98.9% | 0% | 100% | 0% | 99.3% | 90% | 88.2% | 97.6% | 100% | 90.1% | 100% | 0% | 66.7% | 0% | 75% | 100% | 93.3% | 80% | 0% | 93.8% | - | - | - | - | |
| Single-Unit Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 6 | 3 | 0 | 9 | - | - | - | - | - | |
| Single-Unit Trucks % | 0% | 0% | 0% | 0% | 0% | 0% | 1.8% | 0% | 0% | 1.4% | 0% | 0% | 0% | 0% | 0% | 2.9% | 12% | 0% | 2.9% | - | - | - | - | - | |
| Buses | 1 | 0 | 0 | 0 | 1 | 1 | 17 | 1 | 0 | 19 | 0 | 0 | 1 | 0 | 1 | 7 | 2 | 0 | 9 | - | - | - | - | - | |
| Buses % | 1.1% | 0% | 0% | 0% | 0.7% | 10% | 10.1% | 2.4% | 0% | 8.6% | 0% | 0% | 33.3% | 0% | 25% | 3.4% | 8% | 0% | 2.9% | - | - | - | - | - | |
| Articulated Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | - | - | - | - | - | |
| Articulated Trucks % | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.5% | 0% | 0% | 0.3% | - | - | - | - | - | |
| Pedestrians | - | - | - | - | 5 | - | - | - | - | 0 | - | - | - | - | 1 | - | - | - | 3 | - | - | - | - | - | |
| Pedestrians% | - | - | - | - | 55.6% | - | - | - | - | 0% | - | - | - | - | 11.1% | - | - | - | 33.3% | - | - | - | - | - | |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | 0 | - | - | - | - | - | |
| Bicycles on Crosswalk% | - | - | - | - | 0% | - | - | - | - | 0% | - | - | - | - | 0% | - | - | - | 0% | - | - | - | - | - | |
| Bicycles on Road | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Bicycles on Road% | - | - | - | - | 0% | - | - | - | - | 0% | - | - | - | - | 0% | - | - | - | 0% | - | - | - | - | - | |



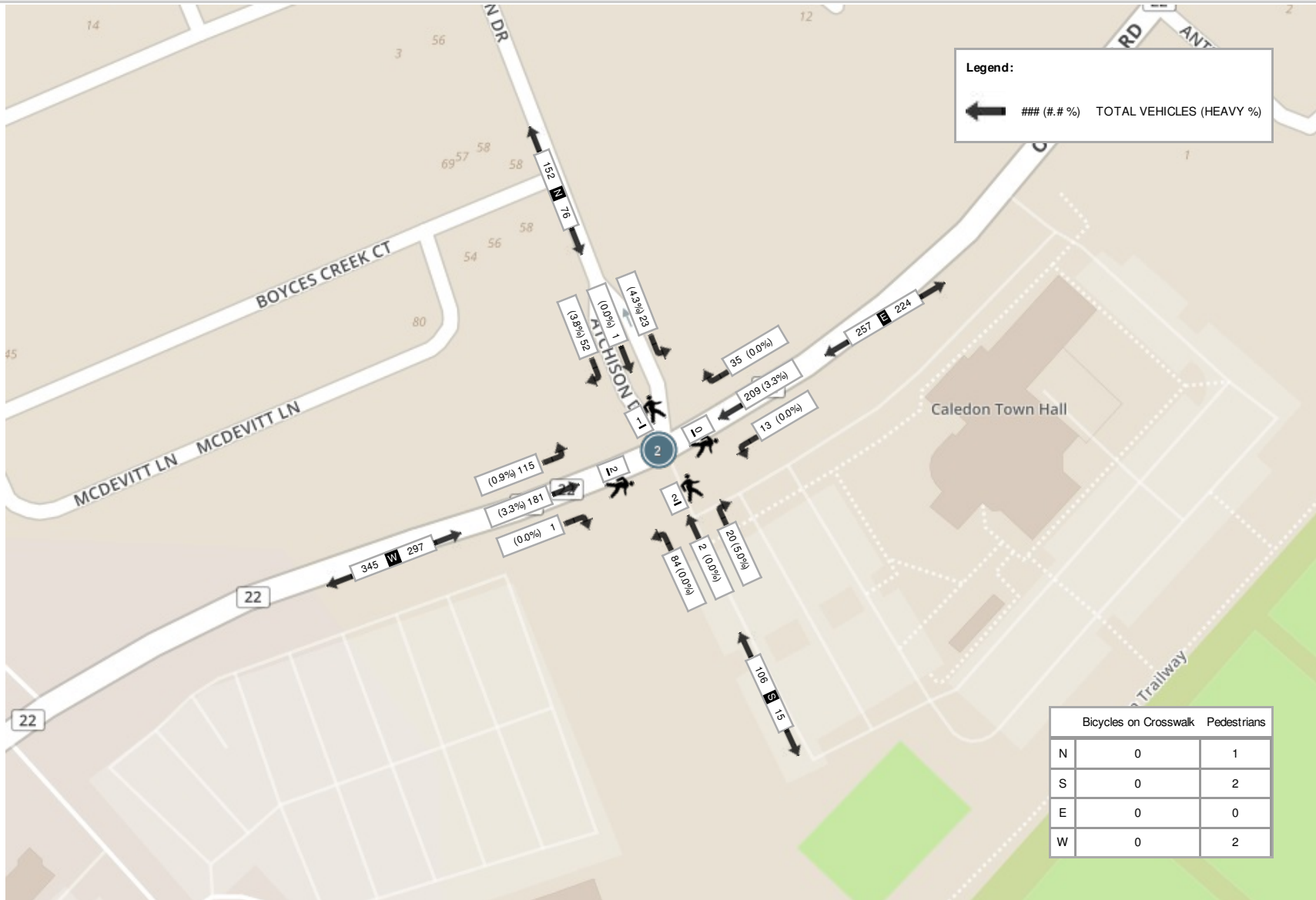
Peak Hour: 04:00 PM - 05:00 PM Weather: Rain (2.8 °C)

| Start Time | N Approach ATCHISON DR | | | | | | E Approach OLD CHURCH RD | | | | | | S Approach ATCHISON DR | | | | | | W Approach OLD CHURCH RD | | | | | | Int. Total (15 min) |
|-------------------------------|---------------------------|----------|-----------|----------|----------|----------------|-----------------------------|------------|-----------|----------|----------|----------------|---------------------------|----------|-----------|----------|----------|----------------|-----------------------------|------------|------------|----------|----------|----------------|------------------------|
| | Right | Thru | Left | U-Turn | Peds | Approach Total | Right | Thru | Left | U-Turn | Peds | Approach Total | Right | Thru | Left | U-Turn | Peds | Approach Total | Right | Thru | Left | U-Turn | Peds | Approach Total | |
| 16:00:00 | 16 | 0 | 8 | 0 | 1 | 24 | 4 | 55 | 3 | 0 | 0 | 62 | 2 | 0 | 15 | 0 | 0 | 17 | 0 | 44 | 23 | 1 | 0 | 68 | 171 |
| 16:15:00 | 14 | 1 | 6 | 0 | 0 | 21 | 16 | 51 | 5 | 0 | 0 | 72 | 3 | 1 | 2 | 0 | 1 | 6 | 1 | 49 | 29 | 0 | 1 | 79 | 178 |
| 16:30:00 | 14 | 0 | 5 | 0 | 0 | 19 | 7 | 63 | 3 | 0 | 0 | 73 | 11 | 1 | 52 | 1 | 1 | 65 | 0 | 51 | 33 | 0 | 1 | 84 | 241 |
| 16:45:00 | 8 | 0 | 4 | 0 | 0 | 12 | 8 | 40 | 2 | 0 | 0 | 50 | 4 | 0 | 15 | 0 | 0 | 19 | 0 | 37 | 30 | 0 | 0 | 67 | 148 |
| Grand Total | 52 | 1 | 23 | 0 | 1 | 76 | 35 | 209 | 13 | 0 | 0 | 257 | 20 | 2 | 84 | 1 | 2 | 107 | 1 | 181 | 115 | 1 | 2 | 298 | 738 |
| Approach% | 68.4% | 1.3% | 30.3% | 0% | - | - | 13.6% | 81.3% | 5.1% | 0% | - | - | 18.7% | 1.9% | 78.5% | 0.9% | - | 0.3% | 60.7% | 38.6% | 0.3% | - | - | - | - |
| Totals % | 7% | 0.1% | 3.1% | 0% | 10.3% | 4.7% | 28.3% | 1.8% | 0% | 34.8% | 2.7% | 0.3% | 11.4% | 0.1% | 14.5% | 0.1% | 24.5% | 15.6% | 0.1% | 40.4% | - | - | - | - | - |
| PHF | 0.81 | 0.25 | 0.72 | 0 | 0.79 | 0.55 | 0.83 | 0.65 | 0 | 0.88 | 0.45 | 0.5 | 0.4 | 0.25 | 0.41 | 0.25 | 0.89 | 0.87 | 0.25 | 0.89 | - | - | - | - | - |
| Heavy | 2 | 0 | 1 | 0 | 3 | 0 | 7 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 0 | 6 | 1 | 0 | 7 | - | - | - | - | - |
| Heavy % | 3.8% | 0% | 4.3% | 0% | 3.9% | 0% | 3.3% | 0% | 0% | 2.7% | 5% | 0% | 0% | 0% | 0.9% | 0% | 3.3% | 0.9% | 0% | 2.3% | - | - | - | - | - |
| Lights | 50 | 1 | 22 | 0 | 73 | 35 | 202 | 13 | 0 | 250 | 19 | 2 | 84 | 1 | 106 | 1 | 175 | 114 | 1 | 291 | - | - | - | - | - |
| Lights % | 96.2% | 100% | 95.7% | 0% | 96.1% | 100% | 96.7% | 100% | 0% | 97.3% | 95% | 100% | 100% | 100% | 99.1% | 100% | 96.7% | 99.1% | 100% | 97.7% | - | - | - | - | - |
| Single-Unit Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | - | - | - | - | - |
| Single-Unit Trucks % | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0.8% | 5% | 0% | 0% | 0% | 0.9% | 0% | 0.6% | 0% | 0% | 0.3% | - | - | - | - | - |
| Buses | 2 | 0 | 1 | 0 | 3 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 0 | 5 | - | - | - | - | - |
| Buses % | 3.8% | 0% | 4.3% | 0% | 3.9% | 0% | 1.9% | 0% | 0% | 1.6% | 0% | 0% | 0% | 0% | 0% | 0% | 2.2% | 0.9% | 0% | 1.7% | - | - | - | - | - |
| Articulated Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | - | - | - | - | - |
| Articulated Trucks % | 0% | 0% | 0% | 0% | 0% | 0% | 0.5% | 0% | 0% | 0.4% | 0% | 0% | 0% | 0% | 0% | 0% | 0.6% | 0% | 0% | 0.3% | - | - | - | - | - |
| Pedestrians | - | - | - | - | 1 | - | - | - | - | 0 | - | - | - | - | 2 | - | - | - | - | 2 | - | - | - | - | - |
| Pedestrians% | - | - | - | - | 20% | - | - | - | - | 0% | - | - | - | - | 40% | - | - | - | - | 40% | - | - | - | - | - |
| Bicycles on Crosswalk | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | 0 | - | - | - | - | - |
| Bicycles on Crosswalk% | - | - | - | - | 0% | - | - | - | - | 0% | - | - | - | - | 0% | - | - | - | - | 0% | - | - | - | - | - |
| Bicycles on Road | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | - | - | - | - |
| Bicycles on Road% | - | - | - | - | 0% | - | - | - | - | 0% | - | - | - | - | 0% | - | - | - | - | 0% | - | - | - | - | - |

Peak Hour: 07:45 AM - 08:45 AM Weather: Mostly Cloudy (1.6 °C)



Peak Hour: 04:00 PM - 05:00 PM Weather: Rain (2.8 °C)



Chateaux of Caledon Mid-Rise
SACL Project #SW17460A0
February 2, 201



Appendix B: STAMSON Calculations

Filename: porlday.te Time Period: 16 hours
Description: Daytime Sound Level at POR1

Road data, segment # 1: OldChurch

Car traffic volume : 9697 veh/TimePeriod *
Medium truck volume : 1727 veh/TimePeriod *
Heavy truck volume : 1860 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: OldChurch

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 27.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: OldChurch

Source height = 1.93 m

ROAD (0.00 + 70.67 + 0.00) = 70.67 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90 | 90 | 0.00 | 73.23 | 0.00 | -2.55 | 0.00 | 0.00 | 0.00 | 0.00 | 70.67 |

Segment Leq : 70.67 dBA

Total Leq All Segments: 70.67 dBA

TOTAL Leq FROM ALL SOURCES: 70.67

Filename: porlni.te Time Period: 8 hours
Description: Night-time Sound Level at POR1

Road data, segment # 1: OldChurch

Car traffic volume : 2245 veh/TimePeriod *
Medium truck volume : 408 veh/TimePeriod *
Heavy truck volume : 262 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: OldChurch

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 27.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: OldChurch

Source height = 1.73 m

ROAD (0.00 + 65.88 + 0.00) = 65.88 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90 | 90 | 0.00 | 68.44 | 0.00 | -2.55 | 0.00 | 0.00 | 0.00 | 0.00 | 65.88 |

Segment Leq : 65.88 dBA

Total Leq All Segments: 65.88 dBA

TOTAL Leq FROM ALL SOURCES: 65.88

Filename: por2day.te Time Period: 16 hours
Description: Daytime Sound Level at POR2

Road data, segment # 1: OldChurch

Car traffic volume : 9697 veh/TimePeriod *
Medium truck volume : 1727 veh/TimePeriod *
Heavy truck volume : 1860 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: OldChurch

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.26 m
Receiver height : 13.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: OldChurch

Source height = 1.93 m

ROAD (0.00 + 66.76 + 0.00) = 66.76 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90 | 0 | 0.00 | 73.23 | 0.00 | -3.46 | -3.01 | 0.00 | 0.00 | 0.00 | 66.76 |

Segment Leq : 66.76 dBA

Total Leq All Segments: 66.76 dBA

TOTAL Leq FROM ALL SOURCES: 66.76

Filename: por2ni.te Time Period: 8 hours
Description: Night-time Sound Level at POR2

Road data, segment # 1: OldChurch

Car traffic volume : 2245 veh/TimePeriod *
Medium truck volume : 408 veh/TimePeriod *
Heavy truck volume : 262 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: OldChurch

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.26 m
Receiver height : 13.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: OldChurch

Source height = 1.73 m

ROAD (0.00 + 61.97 + 0.00) = 61.97 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -90 | 0 | 0.00 | 68.44 | 0.00 | -3.46 | -3.01 | 0.00 | 0.00 | 0.00 | 61.97 |

Segment Leq : 61.97 dBA

Total Leq All Segments: 61.97 dBA

TOTAL Leq FROM ALL SOURCES: 61.97

Filename: por3day.te Time Period: 16 hours
Description: Daytime Sound Level at POR3

Road data, segment # 1: OldChurch

Car traffic volume : 9697 veh/TimePeriod *
Medium truck volume : 1727 veh/TimePeriod *
Heavy truck volume : 1860 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: OldChurch

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 53.00 m
Receiver height : 13.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -54.00 deg
Barrier height : 15.00 m
Barrier receiver distance : 26.60 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Atchison

Car traffic volume : 4597 veh/TimePeriod *
Medium truck volume : 819 veh/TimePeriod *
Heavy truck volume : 882 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Atchison

Angle1 Angle2 : -70.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 17.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: OldChurch

Source height = 1.93 m

Barrier height for grazing incidence

| Source Height (m) | Receiver Height (m) | Barrier Height (m) | Elevation of Barrier Top (m) |
|-------------------|---------------------|--------------------|------------------------------|
| 1.93 | 13.50 | 7.70 | 7.70 |

ROAD (0.00 + 47.92 + 66.77) = 66.83 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|--------|--------|
| -90 | -54 | 0.00 | 73.23 | 0.00 | -5.48 | -6.99 | 0.00 | 0.00 | -12.83 | 47.92 |
| -54 | 90 | 0.00 | 73.23 | 0.00 | -5.48 | -0.97 | 0.00 | 0.00 | 0.00 | 66.77 |

Segment Leq : 66.83 dBA

Results segment # 2: Atchison

Source height = 1.93 m

ROAD (0.00 + 68.93 + 0.00) = 68.93 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -70 | 90 | 0.00 | 69.99 | 0.00 | -0.54 | -0.51 | 0.00 | 0.00 | 0.00 | 68.93 |

Segment Leq : 68.93 dBA

Total Leq All Segments: 71.02 dBA

TOTAL Leq FROM ALL SOURCES: 71.02

Filename: por3ni.te Time Period: 8 hours
Description: Night-time Sound Level at POR3

Road data, segment # 1: OldChurch

Car traffic volume : 2245 veh/TimePeriod *
Medium truck volume : 408 veh/TimePeriod *
Heavy truck volume : 262 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: OldChurch

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 53.00 m
Receiver height : 13.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -54.00 deg
Barrier height : 15.00 m
Barrier receiver distance : 26.60 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Road data, segment # 2: Atchison

Car traffic volume : 1064 veh/TimePeriod *
Medium truck volume : 194 veh/TimePeriod *
Heavy truck volume : 124 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Atchison

Angle1 Angle2 : -70.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: OldChurch

Source height = 1.73 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)
-----+-----+-----+-----
1.73 ! 13.50 ! 7.59 ! 7.59

ROAD (0.00 + 43.05 + 61.99) = 62.04 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|--------|--------|
| -90 | -54 | 0.00 | 68.44 | 0.00 | -5.48 | -6.99 | 0.00 | 0.00 | -12.91 | 43.05 |
| -54 | 90 | 0.00 | 68.44 | 0.00 | -5.48 | -0.97 | 0.00 | 0.00 | 0.00 | 61.99 |

Segment Leq : 62.04 dBA

Results segment # 2: Atchison

Source height = 1.73 m

ROAD (0.00 + 63.54 + 0.00) = 63.54 dBA

| Angle1 | Angle2 | Alpha | RefLeq | P.Adj | D.Adj | F.Adj | W.Adj | H.Adj | B.Adj | SubLeq |
|--------|--------|-------|--------|-------|-------|-------|-------|-------|-------|--------|
| -70 | 90 | 0.65 | 65.19 | 0.00 | 0.00 | -1.65 | 0.00 | 0.00 | 0.00 | 63.54 |

Segment Leq : 63.54 dBA

Total Leq All Segments: 65.86 dBA

TOTAL Leq FROM ALL SOURCES: 65.86