REPORT

5259 DORCHESTER ROAD

NIAGARA FALLS, ONTARIO

NOISE AND VIBRATION IMPACT STUDY

RWDI #2505949

March 21, 2025

SUBMITTED TO

5259 Dorchester Road (Niagara) Ltd.
8485 Montrose Road
Niagara Falls, ON L2H 3L7

Attention: Nicholas Godfrey
Senior Planner, Upper Canada Planning & Engineering Ltd.
30 Hannover, Unit #3
St. Catharines, ON, L2W 1A3
Office: (905) 688-9400
Cell: (289) 969-3556
Email: nicholas@ucc.com

SUBMITTED BY

Scott Bell
Project Manager
E: Scott.Bell@rwdi.com

Khalid Hussein, P.Eng.
Senior Noise and Vibration Engineer
E: Khalid.Hussein@rwdi.com

RWDI - Toronto Office
625 Queen Street West
Toronto, Ontario, M5V 2B7
T: 647.475.1048

RWDI – Head office
600 Southgate Drive
Guelph, Ontario, N1G 4P6
T: 519.823.1311

VERSION HISTORY

Index	Date	Description	Prepared by	Reviewed by
1	December 23, 2021	Draft	JKK	SVG
2	March 21, 2025	Draft	Junchao Ma	Khalid Hussein

STATEMENT OF LIMITATIONS

This report entitled 5259 Dorchester Road Noise and Vibration Impact Study, dated March 21, 2025, was prepared by RWDI Air Inc. ("RWDI") for Upper Canada Planning & Engineering Ltd ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

EXECUTIVE SUMMARY

RWDI was retained to prepare a Noise and Vibration Impact Study (NVIS) for the proposed mixed-use development located at 5259 Dorchester Road in Niagara Falls, Ontario. The proposed development will consist of 8 apartment buildings with one featuring ground-level commercial spaces. This assessment was completed to support the Zoning By-law Amendment (ZBA) submission as required by the City of Niagara Falls.

The following noise control measures are recommended for the proposed development:

1. Installation of central air-conditioning so that all suites' windows can remain closed.
2. The inclusion of noise warning clauses related to:
    a. Transportation sound levels at the building façade and in the outdoor amenity areas
    b. Proximity to commercial/industrial land-use
3. Minimum sound isolation performance for each building as noted below:
    a. Suite bedroom window glazing with minimum sound isolation performance as follows
        i. Building 1 – STC 35
        ii. Building 2 – STC 35
        iii. Building 3 – STC 31
        iv. Building 4 – STC 33
        v. Building 5 – STC 34
        vi. Building 6 – STC 36
        vii. Building 7 – STC 35
        viii. Building 8 – STC 36.
4. Construction of perimeter noise barriers along the outdoor amenity areas if feasible, with the applicable warning clause.

The potential noise impact from stationary sources of sound were evaluated. Based on the noise modeling results and setback distances, the land use compatibility of the proposed development with respect to the nearby industrial land-uses is considered acceptable from the noise impact perspective. However, due to the proximity of the proposed development to the commercial and industrial facilities, a warning clause is recommended to inform prospective occupants of the potential for audible noise from these facilities.

At this stage in design the impact of the development on itself and its surroundings could not be quantitatively assessed. However, the impact on both the building itself and its surroundings is expected to be feasible to meet the applicable criteria. We recommend that the building design is evaluated prior during detailed design to ensure that the acoustical design is adequately implemented in order to meet the applicable criteria.

Based on the results of this assessment; the proposed development is recommended to be approved from the noise and vibration impact aspect.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

RWDI was retained to prepare a Noise and Vibration Impact Study (NVIS) for the proposed mixed-use development located at 5259 Dorchester Road in Niagara Falls, Ontario. The proposed development site is adjacent to the intersection of the Queen Elizabeth Way (QEW) and Highway 420 (420).

The proposed development will have nine apartment buildings with one featuring ground-level commercial spaces. The context site plan is shown in **Figure 1**.

The site is exposed to noise from road traffic on; the QEW to the west, the 420 to the south and Dorchester Road to the east.

The site is exposed to noise from rail traffic on the CN Stamford track that runs east-west to the north of the site. This rail line is beyond the 75 m required distance for a vibration impact study, so vibration impacts are not considered in this report.

A screening level assessment of nearby stationary sources was conducted. Conservative assumptions for potential noise emissions from Class I and Class II facilities within 70-meters from the development property line were included in the stationary source assessment. No Class III facilities were identified within the potential 1000-meter zone of influence.

This assessment was completed to support the Zoning By-law Amendment (ZBA) submission as required by the City of Niagara Falls. This assessment was based on design drawings dated December 10th, 2024. A copy of the drawings are included in **Appendix A.**

2 APPLICABLE CRITERIA

Applicable criteria for transportation noise sources (road and rail), stationary noise sources and rail vibration are adopted from the Ontario Ministry of the Environment, Conservation and Parks (MECP) NPC-300 Environmental Noise Guideline (MOE, 2013), with a summary of the applicable criteria included with **Appendix B**.

The proposed development site would be characterized as a “Class 1 Area”, which is defined according to NPC-300 as an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as "urban hum."

3 IMPACT OF THE ENVIRONMENT ON THE PROPOSED DEVELOPMENT

3.1 Transportation Source Assessment

3.1.1 Road Traffic Volume Data

The QEW, 420 and Dorchester Road volumes were obtained from the Ministry of Transportation Ontario (MTO).

Turning Movement Counts (TMCs) at the intersection of Dorchester Road and Dawson Street, and Dorchester Road and Highway 420 provided detailed traffic volumes for the two peak time periods: 07:00 to 09:00 and 16:00 to 18:00. The TMCs were used to determine the traffic volume and types of vehicles on each link during the AM and PM peaks and 8-hour interval which were assumed to be 9%, 10% and 60% of the Annual Average Daily Traffic (AADT), respectively. The lowest hourly traffic volumes were used to estimate the background sound levels in the area.

The maximum AADTs obtained from the approximation of each of these three time periods was used for the AADT for the respective roadway.

The traffic volumes for each of the respective roadways were increased at a rate of 2.5% per year to represent the predicted 20-year horizon volumes.

A summary of the traffic data used is included in **Table 1** below with more detailed information included in **Appendix C**.

Table 1: Road Traffic Volumes

Roadway	Segment	2041 Future Traffic (AADT)	% Day/Night	Speed Limit (km/hr)	% Trucks
QEW	Northbound	88391	87% / 13%	100	15
	Southbound	87527	92% / 8 %		
QEW	Ramp to Dorchester Road	11868	90% / 10%	70	2.2
420	Eastbound	30550	92% / 8 %	80	15
	Westbound	27469	86% / 14%		
Dorchester Road	North of the 420	33274	90% / 10%	50	2.1

3.1.2 Rail Traffic Volume Data

Freight rail volumes are not provided by the rail authorities (CN and CP). As such, typical volumes based on line-type (e.g. principal main line, secondary line) have been assumed as a basis for the analysis.

The data used for the analysis is summarized in **Table 2**, with details of the data used included in **Appendix C**.

Table 2: Rail Volumes and Configuration

Train Type	Daytime	Nighttime	Type of Locomotive	No of Locomotives	No of Cars	Speed (km/h)
CN Stamford Subdivision	16	8	Diesel	4	80	100

3.1.3 Representative Receptors

The selection of receptors affected by transportation noise sources was based on the drawings reviewed for this assessment. Using the "building evaluation" feature of Cadna/A, each façade of the residential buildings was assessed.

Outdoor Living Areas (OLAs) would include outdoor areas intended and designed for the quiet enjoyment of the outdoor environment and which are readily accessible from the building. OLAs may include any common outdoor amenity spaces associated with a multi-unit residential development (e.g. courtyards, roof-top terraces), and/or private backyards and terraces with a minimum depth of 4m provided they are the only outdoor living area for the occupant. Daytime sound levels were assessed at the following identified OLAs:

- OLA_01a: Building 1, Level 2 rooftop north
- OLA_01b: Building 1, Level 2 rooftop west
- OLA_02a: Building 2, Level 9 rooftop east
- OLA_02b: Building 2, Level 9 rooftop south
- OLA_03a: Building 3, Level 9 rooftop east
- OLA_03b: Building 3, Level 9 rooftop north
- OLA_04: Building 4, Level 5 rooftop centre
- OLA_05a: Building 5, Level 5 rooftop centre
- OLA_05b: Building 5, Level 5 rooftop west
- OLA_05c: Building 5, Level 5 rooftop east
- OLA_06: Building 6, Level 5 rooftop centre
- OLA_07a: Building 7, Level 5 rooftop north
- OLA_07b: Building 7, Level 5 rooftop south
- OLA_08a: Building 8, Level 5 rooftop north
- OLA_08b: Building 8, Level 5 rooftop south
- OLA_09: Ground outdoor amenity area #1
- OLA_10: Ground outdoor amenity area #2

The OLAs are indicated in **Figure 2a**.

3.1.4 Transportation Source Assessment - Analysis and Results

Sound levels due to the adjacent transportation sources were predicted using Cadna/A software package. Roads were modelled as line sources with reference sound power levels calculated with MECP's ORNAMENT algorithm (MOE 1989). The results were calibrated to match STAMSON v5.03 road traffic noise model. STAMSON calibration files are included in **Appendix C** and **Figure C-1**.

To assess the impact of transportation noise on suites, the maximum sound level on each façade was determined with the results summarized in Table 3..

Table 3: Predicted Ground Transportation Source Sound Levels – Plane of Window

Building	Façade	Road		Rail		Notes
		Day L_{EQ}, 16hr	Night L_{EQ}, 8hr	Day L_{EQ}, 16hr	Night L_{EQ}, 8hr	
Building 1	North	64	57	60	60	2
	East	65	59	58	58	2
	South	62	56	55	55	1
	West	58	52	58	58	2
Building 2	North	63	56	60	60	2
	East	65	59	55	55	1
	South	62	56	54	54	1
	West	57	51	58	58	2
Building 3	North	61	55	56	56	2
	East	65	59	54	54	1
	South	63	57	51	51	1
	West	56	50	56	56	2
Building 4	North	59	53	58	58	2
	East	66	59	58	58	2
	South	66	60	50	50	2
	West	64	58	55	55	1
Building 5	North	60	52	58	58	2
	East	63	57	54	54	1
	South	67	61	53	53	2
	West	66	60	59	59	2
Building 6	North	66	60	64	64	2
	East	60	54	61	61	2
	South	69	63	56	56	2
	West	69	63	63	63	2

Building	Façade	Road		Rail		Notes
		Day L_{EQ}, 16hr	Night L_{EQ}, 8hr	Day L_{EQ}, 16hr	Night L_{EQ}, 8hr	
Building 7	North	65	59	62	62	2
	East	59	53	60	60	2
	South	62	56	54	54	1
	West	63	57	56	56	2
Building 8	North	59	52	61	61	2
	East	61	50	58	58	2
	South	62	55	55	55	1
	West	61	55	60	60	2

Notes:

1. Applicable for low and medium density developments: Provision for future installation of air-conditioning, warning clause "Type C".
   Applicable for high density developments: Installation of air-conditioning to allow for windows and doors to remain closed, warning clause "Type D". Refer to **Appendix D** for guidance regarding air-conditioning as a noise mitigation measure.
2. The acoustical performance of building components must be specified to meet the indoor sound level criteria. Installation of air conditioning to allow for windows and doors to remain closed, warning clause "Type D". Refer to **Appendix D** for guidance regarding air-conditioning as a noise mitigation measure.

To assess the effect of transportation noise on the qualifying OLAs for the development, predicted sound level results are summarized in **Table 4**.

Table 4: Transportation Sound Levels in Outdoor Living Areas (OLAs)

Receptor	Description	Daytime L_{EQ}, 16hr	Notes
OLA_01a	Building 1, Level 2 rooftop north	64 dBA	2
OLA_01b	Building 1, Level 2 rooftop west	60 dBA	1
OLA_02a	Building 2, Level 9 rooftop east	61 dBA	2
OLA_02b	Building 2, Level 9 rooftop south	60 dBA	1
OLA_03a	Building 3, Level 9 rooftop east	61 dBA	2
OLA_03b	Building 3, Level 9 rooftop north	59 dBA	1
OLA_04	Building 4, Level 5 rooftop centre	63 dBA	2
OLA_05a	Building 5, Level 5 rooftop centre	62 dBA	2
OLA_05b	Building 5, Level 5 rooftop west	65 dBA	2

Receptor	Description	Daytime L_{EQ}, 16hr	Notes
OLA_05c	Building 5, Level 5 rooftop east	62 dBA	2
OLA_06	Building 6, Level 5 rooftop centre	67 dBA	2
OLA_07a	Building 7, Level 5 rooftop north	61 dBA	2
OLA_07b	Building 7, Level 5 rooftop south	59 dBA	1
OLA_08a	Building 8, Level 5 rooftop north	58 dBA	1
OLA_08b	Building 8, Level 5 rooftop south	59 dBA	1
OLA_09	Ground outdoor amenity area #1	61 dBA	2
OLA_10	Ground outdoor amenity area #2	60 dBA	1

Note(s):

1. For OLA sound levels >55 dBA and ≤60 dBA, noise controls may be applied to meet the 55 dBA criterion. If noise control measures are not provided, a warning clause "Type A" is recommended.
2. Noise mitigation is recommended to meet the ≤55 dBA OLA sound level criterion. If noise controls are not feasible to meet the 55 dBA criterion for technical, economic or administrative reasons, an exceedance of 5 dB may be acceptable (to a maximum sound level of 60 dBA). In this case, a warning clause "Type B" is recommended.

3.2 Stationary Source Assessment

Stationary sources could be grouped into two categories: Those that have a permit with the MECP through an Environmental Compliance Approval (ECA) or Environmental Activity and Sector Registry (EASR); and those that are exempt from ECA or EASR permit requirements.

In the case where a stationary source has an ECA or an EASR permit with the MECP, and would be put in a position where it is no longer in compliance with the applicable sound level criteria due to the encroachment of the proposed new development, source specific mitigation and/or formal classification of the proposed development lands as a "Class 4 Area" (refer to C.4.4.2 "Class 4 Area" in NPC-300) would be required. In this case, coordination and agreements between the stationary source owner, proposed new development owner, the land-use planning authority and potentially the MECP would be needed.

In the case where a stationary source is exempt from ECA or EASR permit requirements with the MECP, the noise provisions of the applicable Municipal Code and guidance from NPC-300 would be applicable. In this case, mitigation of sound levels due to stationary sources would be from a due diligence perspective to avoid nuisance complaints from future occupants of the proposed new development. Mitigation could be in the form of mitigation at the source (with agreement from the stationary source owner) and/or mitigation at the receptor through site and building element design (building orientation, acoustical barriers, façade sound insulation design).

3.2.1 Land-Use Compatibility Review (D-6 Guideline Assessment)

The MECP Guideline D-6 (MOE, 1995) was used as a tool to classify the identified industries and asses their potential influence on the proposed development. The classifications and setback guidelines are summarized in **Appendix B**.

3.2.1.1 Class III Industries

No facilities within the 1000m radius of the proposed development were identified as Class III.

3.2.1.2 Class II Industries

There are three industries within the 1000 m area surrounding the proposed development that have been classified as Class II. Only one of these industries (Constellation Brands Canada, Inc.) is within the potential influence area of 300 m from the proposed development. A summary of the Class II facilities is provided in **Tables E-1** and **E-2** in **Appendix E** and their locations are shown on **Figure 3**.

3.2.1.3 Class I Industries

There is one industry within the 1000 m area surrounding the proposed development that has been classified as Class I. The industry is not within 70 m of the proposed development. A summary of the facility is presented in **Tables E-1** and **E-2** in **Appendix E** and their locations are shown on **Figure 3**.

3.2.2 Stationary Source Modeling

RWDI conducted a screening level land-use compatibility assessment based on the guidance of the Ministry of the Environment D-6 Guideline (MOE, 1995a). Stationary sources of noise surrounding the proposed development were identified using a combination of source identification during a site visit on November 2nd, 2021, publicly available aerial and street-level imagery, business listing and the Ministry of the Environments Access Environment database. Classes were assessed using the noise impact perspective, as an air quality review was not considered for this study. A scale plan **Figure 3** is included indicating the 20 m, 70 m and 300 m D-6 Guideline minimum setback distances for the three industry classes.

The results of the D-6 assessment from a noise impact perspective are summarized in **Appendix E**, **Table E-1**, **Table E-2** and **Figure 3**. The results of the D-6 assessment indicate that the nearby facilities are beyond the setback distance from noise sensitive (residential) buildings for the proposed development; however, some facilities would be within the setback distance from the property line for the full development.

3.2.2.1 Representative Receptors

The worst-case receptor locations were assessed to evaluate the potential stationary source noise impact as seen in **Appendix E**, **Figure E-1.**

3.2.2.2 Assumed Sources and Sound Power Levels

Stationary sources of noise surrounding the proposed development were identified using a combination of site visits conducted on November 2nd, 2021, publicly available aerial imagery, and street-level imagery.

RWDI proxy data were used for the sound power levels of the HVAC units, cooling towers and trucks included in the model. The assumed sound power levels included in the screening level stationary source assessment are presented in **Table 5**. The locations of the sources summarized in **Table 5** included in the stationary source assessment are illustrated in **Appendix E**, **Figure E-1**.

Table 5: Stationary Source Sound Power Level Assumptions

Source	Proxy Data / Calculation	Sound Power Level (dBA)	Duty Cycle		
			Daytime and Evening (07:00h – 23:00h)	Permitted Facilities - Nighttime (23:00h – 07:00h)	Non-Permitted Facilities - Nighttime (23:00h – 07:00h)
HVAC_1Fan	Proxy Data	82	Continuous	Continuous	30 min/hour
HVAC_2Fan	Proxy Data	85	Continuous	Continuous	30 min/hour
HVAC_4Fan	Proxy Data	88	Continuous	Continuous	30 min/hour
HVAC_6Fan	Proxy Data	90	Continuous	Continuous	30 min/hour
HVAC_8Fan	Proxy Data	91	Continuous	Continuous	30 min/hour
HVAC_10Fan	Proxy Data	92	Continuous	Continuous	30 min/hour
CT	Proxy Data	96	Continuous	Continuous	30 min/hour
Truck	Proxy Data	96	4 trucks/hour	1 trucks/hour	N/A

Different nighttime duty cycles were used depending on the whether the facility was permitted (ECA or EASR) or non-permitted such as commercial or residential building. The assumed sound power level values and duty-cycles for the stationary sources are based on reasonable assumptions for the source type.

3.2.2.3 Analysis and Results

Stationary source noise modelling was carried out using the Cadna/A software package, a commercially available implementation of the ISO 9613 (ISO, 1994 and ISO, 1996) algorithms. The predicted sound levels are assessed against the Class 1 Area limits (refer to **Appendix B**) and the background sound levels (i.e. elevated limits).

The predicted sound levels during the worst-case 1-hour from existing stationary sources are presented in **Table 6**.

Table 6: Predicted Sound Levels at Worst-case Receptor Location – Continuous Stationary Sources

Façade/OLA	Time Period	Sound Level (dBA)	Class 1 Limit (dBA)	Background Level (dBA)	Meets Criteria
Building A Level 2-5 Northwest Corner Façade	Day/Evening	50	50	-	Yes
	Night	47	45	50	Yes
OPOR_1 [1]	Day/Evening	50	50	-	Yes

Note(s):

1. Outdoor areas are not assessed during the nighttime period.

As shown in **Table 6**, the daytime-evening continuous sound levels at the sound levels at the façade due to existing stationary sources are predicted to meet the applicable Class 1 sound level criteria based on screening level noise modelling analysis. The nighttime sound level is predicted to exceed the Class 1 sound level criteria however it is predicted to meet the elevated background levels due to road traffic in the area.

3.3 Recommendations

Based on the noise and vibration impact assessment results, the following recommendations were determined for the project. Recommendations are provided for both transportation sources and stationary sources.

3.3.1 Transportation Sources

The following recommendations are provided to address transportation sources.

3.3.1.1 Building Façade Components

Due to the elevated transportation sound levels in the area, acoustical design of the façade components including spandrel, window glazing, and exterior doors, are recommended to be specified for the proposed development.

To assess the development's feasibility, preliminary window glazing, and exterior balcony door sound isolation requirements were determined. These were based on following assumptions:

- Typical residential living room:
  - Glazing 60% of façade, Door: 20% of façade
  - 55% Façade to floor area Ratio
- Typical residential bedroom:
  - Glazing 80% of façade, Door: N/A
  - 81% Façade to floor area Ratio
- Acoustical character of rooms: High absorption finishes/furniture for bedrooms and intermediate absorption finishes/furniture for living rooms.

Based on the predicted plane of window sound levels and the assumptions listed above, recommendations for the minimum sound insulation ratings for the building components were determined using the National Research Council of Canada "BPN-56 method" (NRCC, 1985). The reported results are in terms of Sound Transmission Class (STC) ratings as summarized in **Table 7**.

Table 7: Recommended Facade Component Minimum Sound Insulation Rating

Portion of Development	Worst Case Façade	Window Glazing	Exterior Door	Façade Wall
Building 1	North Façade	STC 35	OBC	OBC
Building 2	North Façade	STC 35	OBC	OBC
Building 3	South Façade	STC 31	OBC	OBC
Building 4	North Façade	STC 33	OBC	OBC
Building 5	West Façade	STC 34	OBC	OBC
Building 6	North Façade	STC 36	OBC	OBC
Building 7	North Façade	STC 35	OBC	OBC
Building 8	North Façade	STC 36	OBC	OBC

Notes:

1. "OBC" denotes that the noise insulation design is not required to be specified. Building envelope assemblies meeting the minimum Ontario Building Code (OBC) requirements will also exhibit sufficient noise reduction to meet the interior sound level criteria.

The maximum requirement for the window glazing was determined to be STC-36, which is considered feasible as this can be achieved by various double-glazed configurations of insulated glazing units.

Taking into account the assumptions used as a basis to determine the glazing requirements, the applicable indoor transportation source sound level criteria are predicted to be achieved.

We recommend that the façade construction is reviewed during detailed design to ensure that the indoor sound level limits will be met, and that the window/door supplier is requested to provide STC laboratory test reports as part of shop drawing submittal to confirm that the glazing/door components will meet the minimum STC requirements.

3.3.1.2 Ventilation Recommendations

Due to the transportation sound levels at the plane of the façade, central air conditioning is recommended for the proposed development to allow for windows and doors to remain closed as a noise mitigation measure. Further, prospective purchasers or tenants should be informed by a warning clause "Type D".

3.3.1.3 Outdoor Living Areas

Due to exposure to transportation sources along the nearby QEW, Highway 420, Dorchester Road, and CN Stamford rail corridor, sound levels in OLAs are predicted to be elevated. The combined (rail and road) daytime average sound levels for the OLAs included in the assessment are in the range of 58-65 dBA. To reduce the transportation sound levels in OLAs to meet the applicable criteria, noise barriers are recommended.

The recommended geometry of the noise barriers are included with **Figure 2b** (to meet 60 dBA. The barrier heights are summarized in **Table 8**. General guidance with respect to noise barrier design is included with **Appendix D**.

Table 8: Barrier Height Recommendations for OLAs

Receptor	Description	Predicted OLA Sound Level	Barrier Height (m) to Meet Sound Level Criterion
		Daytime L_{EQ}, 16hr	≤ 60 dBA[1]
OLA_01a	Building 1, Level 2 rooftop north	64 dBA	1.8 m
OLA_01b	Building 1, Level 2 rooftop west	60 dBA	-
OLA_02a	Building 2, Level 9 rooftop east	61 dBA	0.6 m
OLA_02b	Building 2, Level 9 rooftop south	60 dBA	-
OLA_03a	Building 3, Level 9 rooftop east	61 dBA	0.3 m
OLA_03b	Building 3, Level 9 rooftop north	59 dBA	-
OLA_04	Building 4, Level 5 rooftop centre	63 dBA	1.1 m
OLA_05a	Building 5, Level 5 rooftop centre	62 dBA	1.1 m
OLA_05b	Building 5, Level 5 rooftop west	65 dBA	1.4 m
OLA_05c	Building 5, Level 5 rooftop east	62 dBA	0.7 m
OLA_06	Building 6, Level 5 rooftop centre	67 dBA	2.5 m
OLA_07a	Building 7, Level 5 rooftop north	61 dBA	1.3 m

Receptor	Description	Predicted OLA Sound Level	Barrier Height (m) to Meet Sound Level Criterion
		Daytime L_{EQ}, 16hr	≤ 60 dBA[1]
OLA_07b	Building 7, Level 5 rooftop south	59 dBA	-
OLA_08a	Building 8, Level 5 rooftop north	58 dBA	-
OLA_08b	Building 8, Level 5 rooftop south	59 dBA	-
OLA_09	Ground outdoor amenity area #1	61 dBA	1.6 m
OLA_10	Ground outdoor amenity area #2	60 dBA	-

Note(s):

1. Refer to Figure 2b for barrier geometry to meet 60 dBA. A warning clause "Type B" is recommended in cases where the OLA sound level is >55 dBA (to a maximum of 60 dBA).

3.3.2 Stationary Sources

Based on the noise modeling results and setback distances, the proposed development is not anticipated to infringe on the compliance of any commercial or industrial operations with environmental noise permits (ECA or EASR). As such, the land use compatibility of the proposed development with respect to the nearby industries is considered acceptable from the noise impact perspective.

Due to the proximity of the proposed development to the commercial and industrial facilities, a warning clause "Type E" is recommended to inform prospective occupants of the potential for audible noise from these facilities.

3.3.3 Warning Clauses

The following warning clauses are recommended for the proposed development:

1. NPC-300 Type D to address transportation sound levels at the plane of window
2. NPC-300 Type E to address proximity to commercial/industrial facilities

Warning clauses are recommended to be included on all development agreements, offers of purchase and agreements of purchase and sale or lease. The wording of the recommended warning clauses is included with **Appendix F**.

4 IMPACT OF THE PROPOSED DEVELOPMENT ON ITS SURROUNDINGS AND ON ITSELF

On-site stationary sources for the development are expected to consist of HVAC related equipment in the roof-top mechanical penthouse as well as various exhaust fans. Further, consideration should be given to control airborne and structure-borne noise generated within the proposed development.

Within the development itself the main sources of noise that are likely to affect the uses of the building are the mechanical systems. The potential noise impact of the commercial component of the development is recommended to be reviewed during detailed design, to ensure the applicable criteria will be met.

Provided that best practices for the acoustical design of the building are followed, noise from building services equipment associated with the development are expected to be feasible to meet the applicable sound level criteria due to the nature (residential/mixed-use) of the proposed development.

We recommend that the potential noise impact of the proposed development is reviewed during detailed design to ensure the applicable sound level criteria will be achieved.

5 CONCLUSIONS

RWDI was retained to prepare a Noise and Vibration Impact Study (NVIS) for the proposed mixed-use development located at 5259 Dorchester Road in Niagara Falls, Ontario.

The following noise control measures are recommended for the proposed development:

1. Installation of central air-conditioning so that all suites' windows can remain closed.
2. The inclusion of noise warning clauses related to:
    a. Transportation sound levels at the building façade
    b. Proximity to commercial/industrial land-use
3. Minimum sound isolation performance:
    a. Suite bedroom window glazing with minimum sound isolation performance as follows:
        i. Building 1 – STC 35
        ii. Building 2 – STC 35
        iii. Building 3 – STC 31
        iv. Building 4 – STC 33
        v. Building 5 – STC 34
        vi. Building 6 – STC 36
        vii. Building 7 – STC 35
        viii. Building
        ix. 8 – STC 36.
4. Construction of perimeter noise barriers along the outdoor amenity areas if feasible, with the applicable warning clause.

The potential noise impact from stationary sources of sound were evaluated. Based on the noise modeling results and setback distances, the land use compatibility of the proposed development with respect to the nearby industrial land-uses is considered acceptable from the noise impact perspective. However, due to the proximity of the proposed development to the commercial and industrial facilities, a warning clause is recommended to inform prospective occupants of the potential for audible noise from these facilities.

At this stage in design the impact of the development on itself and its surroundings could not be quantitatively assessed. However, the impact on both the building itself and its surroundings is expected to be feasible to meet the applicable criteria.

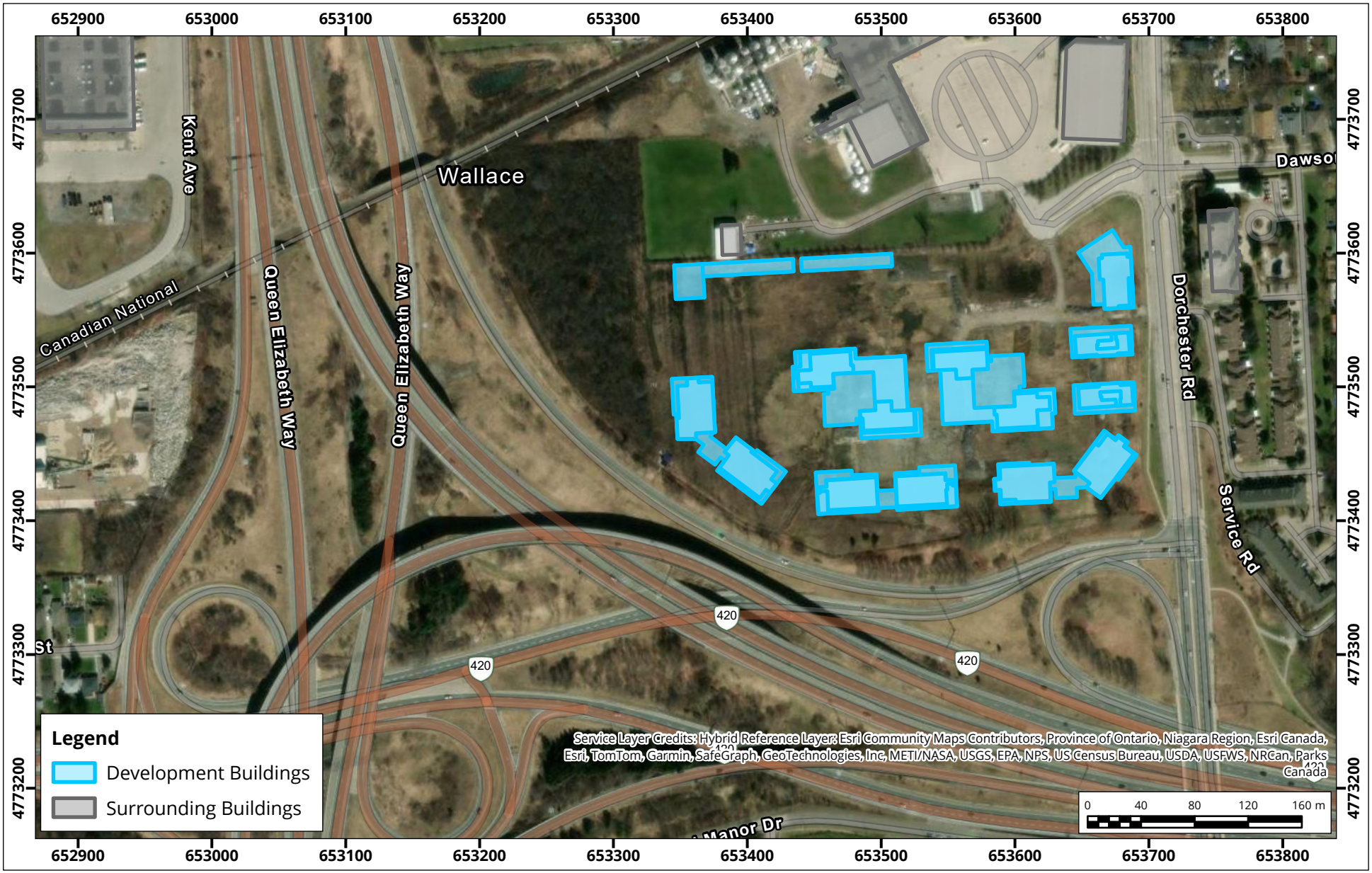
We recommend that the building design is evaluated prior to building permit to ensure that the acoustical design is adequately implemented in order to meet the applicable criteria.

Based on the results and recommendations included with this assessment; the proposed development is recommended to be approved from the noise and vibration impact aspect.

6 REFERENCES

1. Ontario Ministry of the Environment (MOE), August 2013, Publication NPC-300, Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning (MOE, 2013).
2. Richtlinien für den Lärmschutz an Strassen (RLS). BM für Verkehr, Bonn, 1990 (RLS, 1990).
3. Ontario Ministry of the Environment (MOE), 1989, ORNAMENT Ontario Road Noise Analysis Method for Environment and Transportation, Technical Publication (MOE, 1989)
4. Ontario Ministry of the Environment (MOE) Publication Guideline D-6, "Compatibility Between Industrial Facilities and Sensitive Land Uses", July 1995 (MOE, 1995).
5. Controlling Sound Transmission into Buildings (BPN-56), National Research Council Canada (NRCC, 1985).
6. Federal Transit Administration, U.S. Department of Transportation, Transit Noise and Vibration Impact Assessment, 2018 (FTA, 2018).
7. Institute of Transportation Engineers (ITE), 2010, *Traffic Engineering Handbook, 6th Edition* (ITE, 2010)
8. International Organization for Standardization (ISO), 1994b, International Standard ISO 9613-1:1994, Acoustics – Attenuation of Sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere. (ISO, 1994)
9. International Organization for Standardization (ISO), 1996, International Standard ISO 9613-2:1996, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation (ISO, 1996)

FIGURES



Site Context Plan

True North

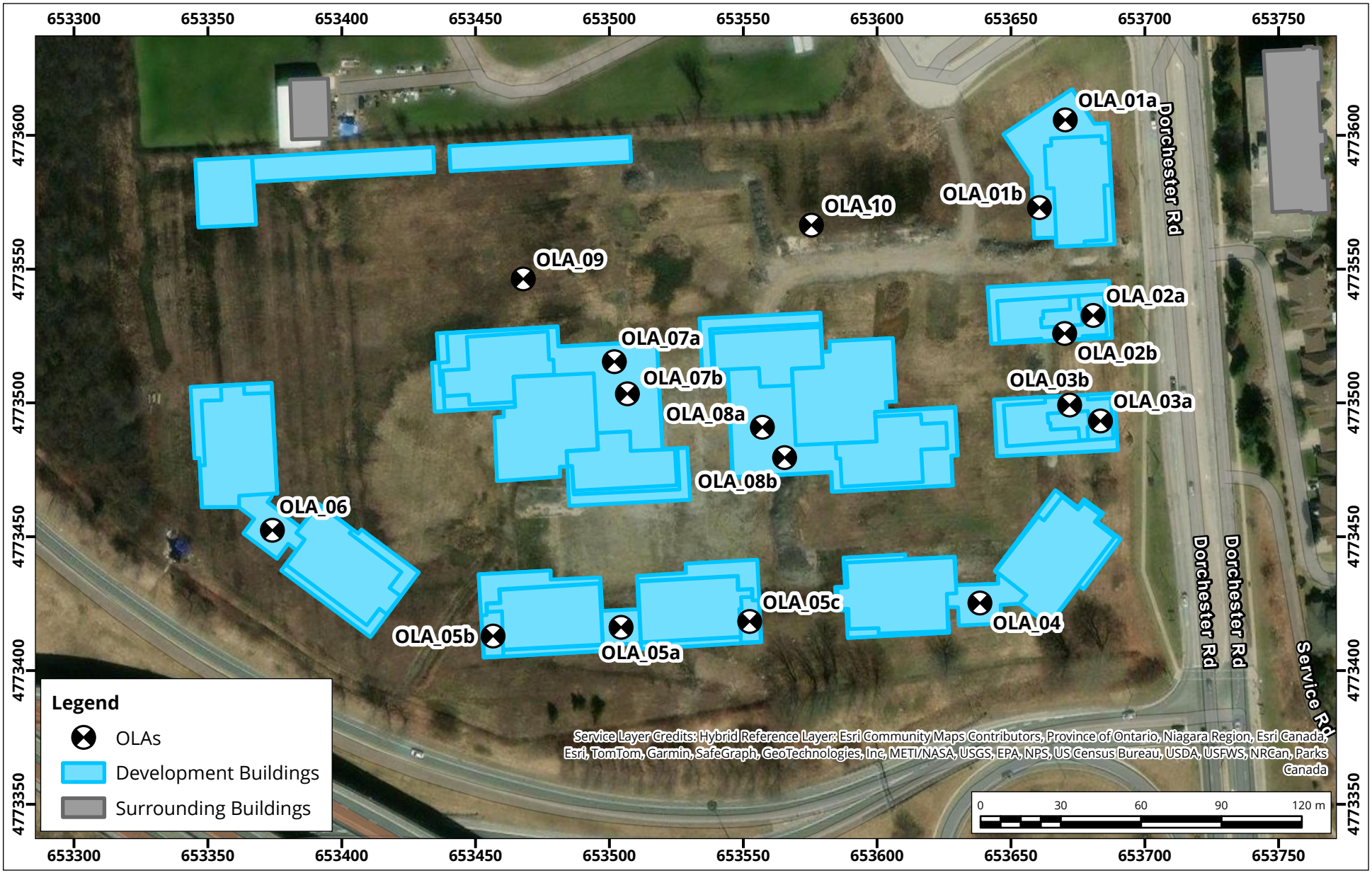
Drawn by: JM	Figure: 1
Approx. Scale:	1:4,000
Date Revised:	Mar 19, 2025

Map Projection: NAD 1983 UTM Zone 17N

5259 Dorchester Road- Niagara Falls, Ontario

Project #: 2505949

Map Document: \\rwdgroup\guelph\AM_Jobs\2025\2505949\03WorkItems\20EnvironmentalNoise\Figures\OntarioLUP.aprx



Outdoor Living Areas (OLAs)

Location of Common Outdoor Amenity Areas

Map Projection: NAD 1983 UTM Zone 17N

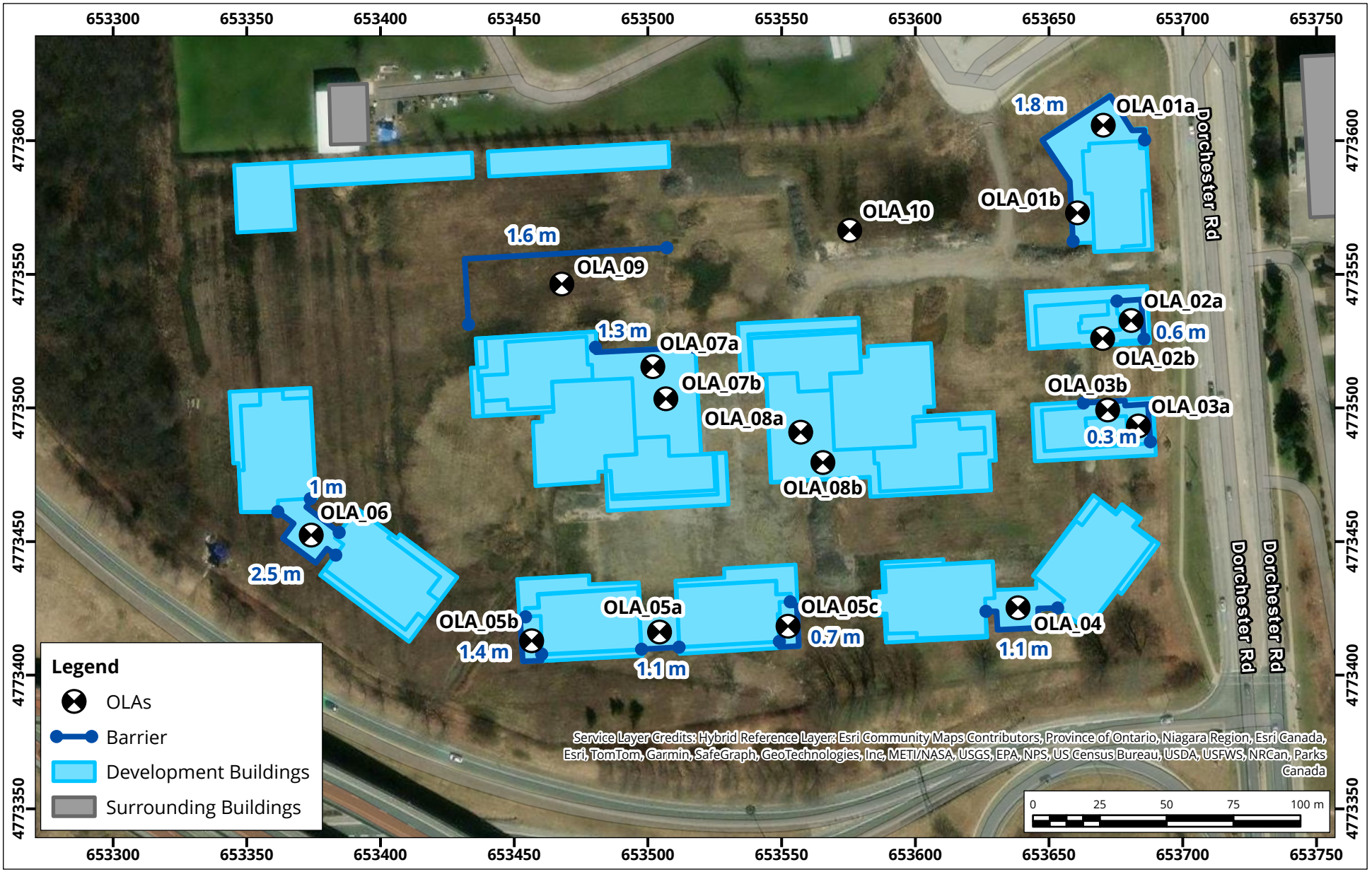
5259 Dorchester Road- Niagara Falls, Ontario

True North

Project #: 2505949

Drawn by: JM	Figure: 2a
Approx. Scale: 1:2,000	
Date Revised: Mar 19, 2025	

Map Document: \\rwdgroup\guelph\AM_Jobs\2025\2505949\03Worktems\20EnvironmentalNoise\Figures\OntarioLUP.aprx



Outdoor Living Areas (OLAs) Mitigation to 60 dBA

Recommended Barrier Geometry and Height to meet 60 dBA

Map Projection: NAD 1983 UTM Zone 17N

5259 Dorchester Road- Niagara Falls, Ontario

True North

Project #: 2505949

Drawn by: JM	Figure: 2b
Approx. Scale:	1:2,000
Date Revised:	Mar 21, 2025

Map Document: \\rwdgroup\guelph\AM_Jobs\2025\2505949\03WorkItems\20EnvironmentalNoise\Figures\OntarioLUP.aprx

Legend

- Property Line
- 20 m Setback
- 70 m Setback
- 300 m Setback
- 1,000 m Setback
- Class I Industries
- Class II Industries

ID	Business Name	Class
1	Constellation Brands Canada, Inc.	Class II
2	Lafarge Canada Inc.	Class II
3	Mike Emanuele Holdings Inc.	Class I
4	Niagara Block Incorporated	Class II

Service Layer Credits: Hybrid Reference Layer (road and water labels only): Esri Community Maps Contributors, Province of Ontario, Niagara Region, Esri Canada, Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada
World Imagery: Maxar

Industrial Sites in the Study Area

Map Projection: NAD 1983 UTM Zone 17N
5259 Dorchester Road - Niagara Falls, ON

True North

Project #: 2100639

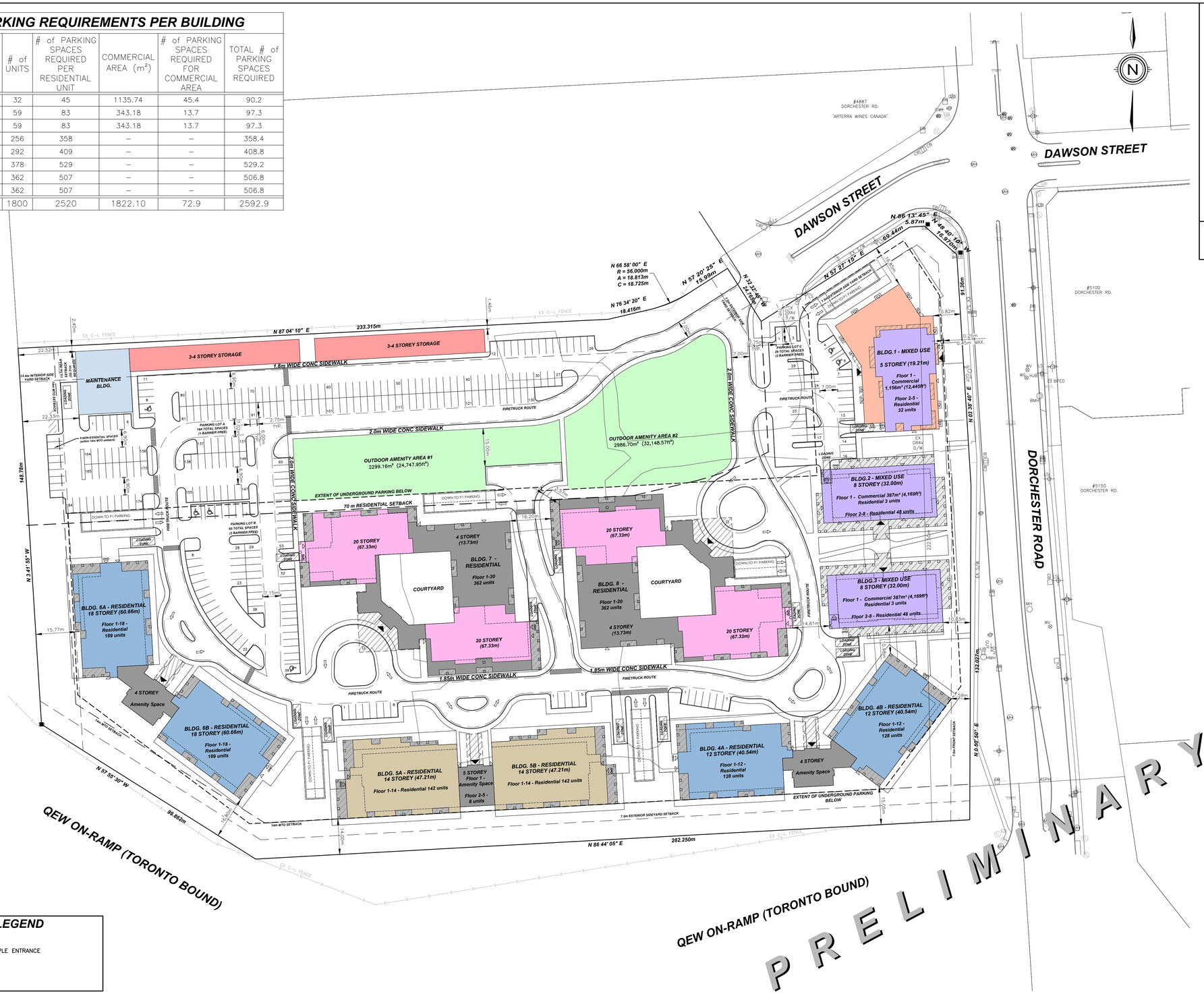
Drawn by:	LJN	Figure:	3
Approx. Scale:			1:11,000
Date Revised:			Jul 28, 2021

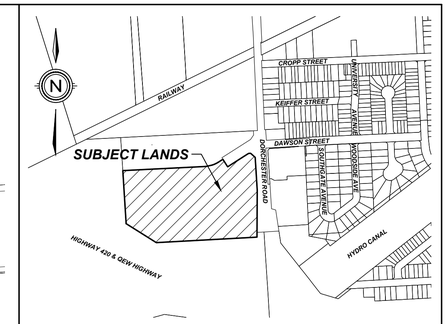
Map Document: C:\Users\LJN\OneDrive - ROWAN WILLIAMS DAVIES & IRWIN INC\Desktop\GIS\MSC\Dorchester\P2100639_5259_Dorchester.aprx

APPENDIX A

PARKING REQUIREMENTS PER BUILDING

BUILDING	# of UNITS	# of PARKING SPACES REQUIRED PER RESIDENTIAL UNIT	COMMERCIAL AREA (m^2)	# of PARKING SPACES REQUIRED FOR COMMERCIAL AREA	TOTAL # of PARKING SPACES REQUIRED
BUILDING #1	32	45	1135.74	45.4	90.2
BUILDING #2	59	83	343.18	13.7	97.3
BUILDING #3	59	83	343.18	13.7	97.3
BUILDING #4	256	358	–	–	358.4
BUILDING #5	292	409	–	–	408.8
BUILDING #6	378	529	–	–	529.2
BUILDING #7	362	507	–	–	506.8
BUILDING #8	362	507	–	–	506.8
TOTAL	1800	2520	1822.10	72.9	2592.9





KEY PLAN
N.T.S.

ZONING MATRIX

RESIDENTIAL APARTMENT SF DENSITY ZONE (RSF)

PROVISION	REQUIRED	PROVIDED
Minimum Lot Area	57 sq.m. for each dwelling unit	41.79sq.m
Minimum Lot Frontage	45 metres	222.50m
Minimum Front Yard Depth	7.5 metres plus 13.0 metres from the original centreline of Dorchester Road	7.59 m
Minimum Rear Yard Depth	One-half height of building or 10m whichever is greater (30.31m required)	15.77m
Minimum Interior Side Yard Width	One-quarter the height of the building	1.46m
Minimum Exterior Side Yard Width	7.5 metres	15.05m
Maximum Lot Coverage	30%	27.80%
Maximum Height of a Building or Structure	28 metres	67.40m
Number of Apartment Dwellings on One Lot	One only	8
Minimum Landscaped Open Space	55% of lot area	46.01%
Minimum Amenity Space for an Apartment Dwelling Unit	20sq. m. per dwelling unit	2.94m^2 per dwelling unit

PARKING

PROVISION	REQUIRED	PROVIDED
Minimum Parking Requirement (Residential)	1.4 spaces per dwelling unit (1800 units = 2520 spaces) 1 spaces per 25m^2 of Commercial Area (822.10m^2/25=72.8 spaces) TOTAL = 2592.8 spaces	2352 spaces
Minimum Required Accessible Spaces	11+1% = 36.9 spaces	41 spaces

YARD (4.14)

PROVISION	REQUIRED	PROVIDED
Projection of unsupported canopies in a required yard	Maximum 0.45 metres into a required yard	0.25m
Projection of balconies in a required yard	1.8 metres into a required front or rear yard	0m
	0.45 metres into a required side yard	0m

*Per By-law 79-200

SITE STATISTICS

AREA	Ha.	% COVERAGE
BUILDING	2.097	27.80
ROAD/DRIVEWAY/PARKING	1.976	26.19
LANDSCAPING	3.471	46.01
TOTAL	7.544	100.00
UNITS		1800
OUTDOOR AMENITY AREA		5,285.86m^2
COMMERCIAL AREA		1,822.10m^2
DEVELOPABLE AREA		7.544 Ha.
DENSITY (UNITS/DEVELOPABLE AREA)		238.60u/Ha.

REQUIRED PARKING
1.4 Spaces/Residential Unit — 2520 Spaces
1 Spaces per 25m^2 Commercial — 72.8 Spaces
TOTAL REQUIRED PARKING — 2592.8 Spaces

REQUIRED ACCESSIBLE PARKING (11+1% of required) — 36.9 Spaces
REQUIRED LOADING AREAS — 4 Spaces

PROPOSED PARKING
SURFACE — 307 Spaces (includes 6 accessible, 9 non-essential)
UNDERGROUND (includes 35 accessible) — 2045 Spaces
TOTAL PROPOSED PARKING — 2352 Spaces

PROPOSED ACCESSIBLE SPACES — 41 Spaces
PROPOSED LOADING AREAS — 14 Spaces

PRELIMINARY

LEGEND
◀ PRINCIPLE ENTRANCE

#	REVISION	DATE	INIT

NOTES:
1. THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWER, 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, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
2. PROPERTY LINES WERE PLOTTED USING REGISTERED PLANS AND BARS LOCATED IN THE FIELD. TO VERIFY THE ACCURACY OF THESE PROPERTY LINES, A LEGAL SURVEY SHOULD BE PERFORMED PRIOR TO CONSTRUCTION.
3. ALL CONSTRUCTION MUST COMPLY WITH THE NIAGARA PENINSULA STANDARD CONTRACT DOCUMENT.

DRAFTING M.K
DESIGN -
CHECKED BY -
APPROVED BY -

UPPER CANADA CONSULTANTS
ENGINEERS / PLANNERS

OWNER
OWNER NAME
STREET
CITY
POSTAL CODE

5259 DORCHESTER ROAD
CITY OF NIAGARA FALLS
SITE PLAN

CONSULTANT FILE No. 20136
DATE 2024-08-26
PRINTED 2024-12-10
SCALE 1:750 m
REF No.
DWG No. 20136-SP
REV 0

DRAWING FILE: F:\20136\Planning\20136-SITE PLAN_PRELIM -2.dwg PLOTTED: Dec 10, 2024 - 12:04pm PLOTTED BY: mark

APPENDIX B

CRITERIA

Transportation Sources

Guidance from the Ontario Ministry of the Environment, Conservation and Parks (MECP) NPC-300 Environmental Noise Guideline was used to assess environmental noise generated by transportation-related sources. There are three aspects to consider, which include the following:

i. Transportation source sound levels in indoor living areas (living rooms and sleeping quarters), which determines building façade elements (windows, exterior walls, doors) sound insulation design recommendations.
ii. Transportation source sound levels at the plane of the window, which determines air-conditioning and ventilation system recommendations and associated warning clauses which inform the future occupants that windows and doors must be closed in order to meet the indoor sound level criteria.
iii. Transportation source sound levels in Outdoor Living Areas (OLAs), which determines OLA noise mitigation and related warning clause recommendations.

Road and Rail

Indoor Sound Level Criteria

For assessing sound originating from transportation sources, NPC-300 defines sound level criteria as summarized in **Table 1** for indoor areas of sensitive uses. The specified values are maximum sound levels and apply to the indicated indoor spaces with the windows and doors closed.

Table 1: Indoor Sound Level Criteria for Road and Rail Sources

Type of Space	Source	Sound Level Criteria (Indoors)	
		Daytime $L_{eq,16\text{-}hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8\text{-}hr}$ 23:00h – 07:00h
Living Quarters Examples: Living, dining and den areas of residences, hospitals, nursing homes, schools and daycare centres	**Road**	45 dBA	
	Rail	40 dBA	
Sleeping Quarters	**Road**	45 dBA	40 dBA
	Rail	40 dBA	35 dBA

NPC-300 also provides guidelines for acceptable indoor sound levels that are extended to land uses and developments which are not normally considered noise sensitive. The guideline sound level criteria presented in **Table 2** are provided to inform good-practice design objectives.

Table 2: Supplementary Indoor Sound Level Criteria for Road and Rail Sources

Type of Space	Source	Sound Level Criteria (Indoors)	
		Daytime $L_{eq,16\text{-}hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8\text{-}hr}$ 23:00h – 07:00h
General offices, reception areas, retail stores, etc.	**Road**	50 dBA	-
	Rail	45 dBA	-
Theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	**Road**	45 dBA	-
	Rail	40 dBA	-
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	**Road**	-	40 dBA
	Rail	-	35 dBA
Sleeping quarters of hotels/motels	**Road**	-	45 dBA
	Rail	-	40 dBA

Outdoor Living Areas (OLAs)

Outdoor Living Areas (OLAs) would include outdoor areas intended and designed for the quiet enjoyment of the outdoor environment and which are readily accessible from the building.

OLAs may include any common outdoor amenity spaces associated with a multi-unit residential development (e.g. courtyards, roof-top terraces), and/or private backyards and terraces with a minimum depth of 4m provided they are the only outdoor living area for the occupant. The sound level criteria for outdoor living areas is summarized in **Table 3**.

Table 3: Sound Level Criteria – Outdoor Living Area

Assessment Location	Sound Level Criteria (Outdoors)	
	Daytime $L_{eq,16\text{-}hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8\text{-}hr}$ 23:00h – 07:00h
Outdoor Living Area (OLA) (Combined Road and Rail)	55 dBA	-

Outdoor and Plane of Window Sound Levels

In addition to the sound level criteria, noise control measures and requirements for ventilation and warning clauses requirements are recommended for residential land-uses based on predicted transportation source sound levels incident in the plane of window at bedrooms and living/dining rooms, and/or at outdoor living areas. These recommendations are summarized in **Table 4** below.

Table 4: Ventilation, Building Component, and Warning Clauses Recommendations for Road/Rail Sources

Assessment Location	Transportation Sound Level (Outdoors)		Recommendations
	Daytime $L_{eq,16\text{-}hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8\text{-}hr}$ 23:00h – 07:00h	
Plane of Window (Road)	> 65 dBA	> 60 dBA	Installation of air conditioning to allow windows to remained closed. The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria. Warning clause "Type D" is recommended.
	> 55 dBA	> 50 dBA	Applicable for low and medium density development: Forced-air ventilation system to allow for the future installation of air-conditioning. Warning clause "Type C" is recommended. Applicable for high density development: Air conditioning to allow windows to remained closed. Warning clause "Type D" is recommended.
Plane of Window (Rail [1, 2])	> 60 dBA	> 55 dBA	The acoustical performance of building façade components should be specified such that the indoor sound level limits are predicted to be achieved. Warning clause "Type D" is recommended.
	> 60 dBA ($L_{eq,\ 24hr}$) and < 100m from tracks		Exterior walls consisting of a brick veneer or masonry equivalent for the first row of dwellings. Warning clause "Type D" is recommended.
Outdoor Living Area (Combined Road and Rail [3])	≤ 60 dBA > 55 dBA	-	If sound levels are predicted to exceed 55 dBA, but are less than 60 dBA, noise controls may be applied to reduce the sound level to 55 dBA. If noise control measures are not provided, a warning clause "Type A" is recommended.
	> 60 dBA	-	Noise controls (barriers) should be implemented to meet the 55 dBA criterion. If mitigation is not feasible to meet the 55 dBA criterion for technical, economic or administrative reasons, an exceedance of 5 dB may be acceptable (to a maximum sound level of 60 dBA). In this case a warning clause "Type B" would be recommended.

Note(s):

1. Whistle noise is included (if applicable) in the determination of the sound level at the plane of window.
2. Some railway companies (e.g. CN, CP) may require that the exterior walls include a brick veneer or masonry equivalent for the façade facing the railway line, regardless of the sound level.
3. Whistle noise is not included in the determination of the sound level at the OLA.

Rail Layover Sites

NPC-300 provides a sound level limit for rail layover sites to be the higher of the background sound level or 55 dBA $L_{eq,1\text{-}hr,}$ for any one-hour period.

Rail Vibration Criteria

An assessment of rail vibration is generally recommended for developments within 75m of a rail corridor or rail yard, and adjacent to or within a setback of 15m of a transit (subway or light-rail) rail line.

The generally accepted vibration criterion for sensitive land-uses is the threshold of perception for human exposure to vibration, being a vibration velocity level of 0.14 mm/s RMS in any one-third octave band centre frequency in the range of 4 Hz to 200 Hz.

This vibration criterion is based on a one-second exponential time-averaged maximum hold root-mean-square (RMS) vibration velocity level and is consistent with the Railway Associations of Canada (RAC, 2013) guideline, the U.S. Federal Transit Authority (FTA, 2018) criterion for residential land-uses, the Toronto Transit Commission (TTC) guidelines for the assessment of potential vibration impact of future expansion (MOEE/TTC, 1993).

Aircraft

Land-use compatibility in the vicinity of airports is addressed in Ministry of the Environment, Conservation, and Parks (MECP) Guideline NPC-300 (MOE, 2013). The guideline provides recommendations for ventilation, and noise control for different Noise Exposure Forecast (NEF) values, which would be based on NEF contour maps available from the airport authority. The NEF values can be expressed as $L_{A,eq,24hr}$ sound levels by using the expression NEF = $L_{Aeq,24hr}$ -32 dBA.

Table 5: Indoor Sound Level Criteria for Aircraft Sources

Assessment Location	Indoor Sound Level Criteria NEF ($L_{eq,\ 24hr}$) [1]
Living/dining/den areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, etc.	NEF- 5 (37 dBA)
Sleeping quarters	NEF-0 (32 dBA)

NPC-300 also provides guidelines for acceptable indoor sound levels that are extended to land uses and developments which are not normally considered noise sensitive. The guideline sound level criteria presented in **Table 6** are provided to inform good-practice design objectives.

Table 6: Supplementary Indoor Sound Level Criteria for Aircraft Sources

Assessment Location	Indoor Sound Level Criteria[1]
General offices, reception areas, retail stores, etc.	NEF-15 (47 dBA)
Individual or semi-private offices, conference rooms, etc.	NEF-10 (42 dBA)
Sleeping quarters of hotels/motels, theatres, libraries, places of worship, etc.	NEF-5 (37 dBA)

Table 7: NPC-300 Sound Level Criteria for Aircraft (Outdoors)

Assessment Location	Outdoor Sound Level Criteria[1]
Outdoor areas, including OLA	NEF-30 (62 dBA)

Table 8: Ventilation, Building Component, and Warning Clauses Recommendations for Aircraft Sources

Assessment Location	Aircraft Sound Level	NPC-300 Requirements
	NEF ($L_{EQ,24\text{-}hr}$)	
Outdoors	≥NEF 30	Air conditioning to allow windows to remained closed. The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria. Warning clauses "Type D" and "Type B" are recommended.
	< NEF 30 ≥ NEF 25	The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria. Applicable for low and medium density development: Forced-air ventilation system to allow for the future installation of air-conditioning. Warning clause "Type C" is recommended. Applicable for high density development: Air conditioning to allow windows to remained closed. Warning clause "Type D" is recommended.
	< NEF 25	Further assessment not required

Stationary Sources

NPC-300 Sound Level Criteria – Stationary Sources

Guidance from the MECP NPC-300 Environmental Noise Guideline is used to assess environmental noise generated by stationary sources, for example industrial and commercial facilities.

Noise from stationary sources is treated differently from transportation sources and requires sound levels be assessed for the predictable worst-case one-hour average sound level (L_{eq}) for each period of the day. For assessing sound originating from stationary sources, NPC-300 defines sound level criteria for two types of Points of Reception (PORs): outdoor and plane of window.

The assessment criteria for all PORs is the higher of either the exclusion limit per NPC-300 or the minimum background sound level that occurs or is likely to occur at a POR. The applicable exclusion limit is determined based on the level of urbanization or "Class" of the area. The NPC-300 exclusion limits for continuously operating stationary sources are summarized in **Table 9**.

Table 9: NPC-300 Exclusion Limits – Continuous and Quasi-Steady Impulsive Stationary Sources (LAeq-1hr)

Time Period	Class 1 Area		Class 2 Area		Class 3 Area		Class 4 Area	
	Outdoor	Plane of Window	Outdoor	Plane of Window	Outdoor	Plane of Window	Outdoor	Plane of Window
Daytime 0700-1900h	50 dBA	50 dBA	50 dBA	50 dBA	45 dBA	45 dBA	55 dBA	60 dBA
Evening 1900-2300h	50 dBA	50 dBA	45 dBA	50 dBA	40 dBA	40 dBA	55 dBA	60 dBA
Nighttime 2300-0700h	--	45 dBA	--	45 dBA	--	40 dBA	--	55 dBA

Note(s):

1. The applicable sound level criterion is the background sound level or the exclusion limit, whichever is higher.
2. Class 1, 2 and 3 sound level criteria apply to a window that is assumed to be open.
3. Class 4 area criteria apply to a window that is assumed closed. Class 4 area requires formal designation by the land-use planning authority.
4. Sound level criteria for emergency backup equipment (e.g. generators) operating in non-emergency situations such as testing or maintenance are 5 dB greater than the applicable sound level criteria for stationary sources.

For impulsive sound, other than quasi-steady impulsive sound, from a stationary source, the sound level criteria at a POR is expressed in terms of the Logarithmic Mean Impulse Sound Level (L_{LM}), and is summarized in **Table 10**.

Table 10: NPC-300 Exclusion Limits – Impulsive Stationary Sources (L_{LM})

Time Period	Number of Impulses in Period of One-Hour	Class 1 and 2 Areas		Class 3 Areas		Class 4 Areas	
		Outdoor	Plane of Window	Outdoor	Plane of Window	Outdoor	Plane of Window
Daytime (0700-2300h)	9 or more	50 dBAI	50 dBAI	45 dBAI	45 dBAI	55 dBAI	60 dBAI
Nighttime (2300–0700h)		-	45 dBAI	-	40 dBAI	-	55 dBAI
Daytime (0700-2300h)	7 to 8	55 dBAI	55 dBAI	50 dBAI	50 dBAI	60dBAI	65 dBAI
Nighttime (2300–0700h)		-	50 dBAI	-	45 dBAI	-	60 dBAI
Daytime (0700-2300h)	5 to 6	60 dBAI	60 dBAI	55 dBAI	55 dBAI	65 dBAI	70 dBAI
Nighttime (2300–0700h)		-	55 dBAI	-	50 dBAI	-	65 dBAI
Daytime (0700-2300h)	4	65 dBAI	65 dBAI	60 dBAI	60 dBAI	70 dBAI	75 dBAI
Nighttime (2300–0700h)		-	60 dBAI	-	55 dBAI	-	70 dBAI
Daytime (0700-2300h)	3	70 dBAI	70 dBAI	65 dBAI	65 dBAI	75 dBAI	80 dBAI
Nighttime (2300–0700h)		-	65 dBAI	-	60 dBAI	-	75 dBAI
Daytime (0700-2300h)	2	75 dBAI	75 dBAI	70 dBAI	70 dBAI	80 dBAI	85 dBAI
Nighttime (2300–0700h)		-	70 dBAI	-	65 dBAI	-	80 dBAI
Daytime (0700-2300h)	1	80 dBAI	80 dBAI	75 dBAI	75 dBAI	85 dBAI	90 dBAI
Nighttime (2300–0700h)		-	75 dBAI	-	70 dBAI	-	85 dBAI

Note(s):

1. The applicable sound level criterion is the background sound level or the exclusion limit, whichever is higher.

D-Series Guidelines

The MECP D-series guidelines (MOE, 1995) provide direction for land use planning to maximize compatibility of industrial uses with adjacent land uses. The goal of Guideline D-6 is to minimize encroachment of sensitive land uses on industrial facilities and vice versa, in order to address potential incompatibility due to adverse effects such as noise, odour and dust.

For each class of industry, the guideline provides an estimate of potential influence area and states that this influence area shall be used in the absence of the recommended technical studies. Guideline D-6 also recommends a minimum separation distance between each class of industry and sensitive land uses (see **Table 11**). Section 4.10 of D-6 identifies exceptional circumstances with respect to redevelopment, infill and mixed-use areas. In these cases, the guideline suggests that separation distances at, or less than, the recommended minimum separation distance may be acceptable if a justifying impact assessment is provided.

Table 11: Summary of Guideline D-6

Industry Class	Definition	Potential Influence Area	Recommended Minimum Separation Distance (property line to property line)
Class I	Small scale, self-contained, daytime only, infrequent heavy vehicle movements, no outside storage.	70 m	20 m
Class II	Medium scale, outdoor storage of wastes or materials, shift operations and frequent heavy equipment movement during the daytime.	300 m	70 m
Class III	Large scale, outdoor storage of raw and finished products, large production volume, continuous movement of products and employees during daily shift operations.	1000 m	300 m

Guideline D-6 provides criteria for classifying industrial land uses, based on their outputs, scale of operations, processes, schedule and intensity of operations. **Table 12** provides the classification criteria and examples.

Table 12: Guideline D-6 Industrial Categorization Criteria

Criteria	Class I	Class II	Class III
Outputs	• Sound not audible off property • Infrequent dust and/ or odour emissions and not intense • No ground-borne vibration	• Sound occasionally audible off property • Frequent dust and/ or odour emissions and occasionally intense • Possible ground-borne vibration	• Sound frequently audible off property • Persistent and intense dust and/ or odour emissions • Frequent ground-borne vibration
Scale	• No outside storage • Small scale plant or scale is irrelevant in relation to all other criteria	• Outside storage permitted • Medium level of production	• Outside storage of raw and finished products • Large production levels
Process	• Self-contained plant or building which produces / stores a packaged product • Low probability of fugitive emissions	• Open process • Periodic outputs of minor annoyance • Low probability of fugitive emissions	• Open process • Frequent outputs of major annoyances • High probability of fugitive emissions
Operation / Intensity	• Daytime operations only • Infrequent movement of products and/or heavy trucks	• Shift operations permitted • Frequent movements of products and/or heavy trucks with majority of movements during daytime hours	• Continuous movement of products and employees • Daily shift operations permitted
Examples	• Electronics Manufacturing • Furniture refinishing • Beverage bottling • Auto parts • Packaging services • Dairy distribution • Laundry and linen supply	• Magazine printing • Paint spray booths • Metal command • Electrical production • Dairy product manufacturing • Feed packing plant	• Paint and varnish manufacturing • Organic chemicals manufacturing • Breweries • Solvent recovery plant • Soap manufacturing • Metal manufacturing

APPENDIX C

RAIL VOLUMES

Freight Rail Line Class	Characteristics	Freight Train Modelling Assumptions
Principal Main Line	• Traffic volume generally exceeds 10 trains per day • High speeds, usually exceeding 80 kph (50 mph) • Includes heavy trains with 3 or 4 locomotives per train, commuter and passenger trains	• Assume one freight train per hour, or 16 trains per 16-hour day and 8 trains per 8-hour night (24 total per 24 hours) • Continuously welded rail • 100 kph speed • Assume 4 locomotives per train
Secondary Main Line	• Traffic volume generally exceeds 10 trains per day • High speeds, usually exceeding 80 kph (50 mph) • Trains generally of light to moderate weight with 3 or 4 locomotives per train • Majority of traffic may be commuter and passenger trains	• Assume one freight train per 2 hours, or 8 trains per 16-hour day and 4 trains per 8-hour night (12 total per 24 hours) • Continuously welded rail • 80 kph speed • Assume 3 locomotives per train
Principal Branch Line	• Regular scheduled traffic, usually less than 5 trains per day • Low speeds, generally limited to 50 kph (30 mph) • Trains generally of light to moderate weight with 1 or 2 locomotives per train but may include heavier trains with more units	• Assume one freight train per 4 hours, or 4 trains per 16-hour day and 2 trains per 8-hour night (6 total per 24 hours) • Continuously welded rail • 50 kph speed • Assume 2 locomotives per train
Secondary Branch Line	• Intermittent, unscheduled traffic, usually less than 1 train per day • Low speeds, generally limited to 50 kph (30 mph) • Trains generally of light to moderate weight with 1 locomotive per train	• Assume one freight train per 8 hours, or 2 trains per 16-hour day and 1 train per 8-hour night (3 total per 24 hours) • Continuously welded rail • 50 kph speed • Assume 1 locomotive per train
Spur Line	• Unscheduled traffic on a demand basis • Low speeds, limited to 24kph (15 mph) • Trains generally of light to moderate weight with 1 locomotive per train	• Assume one freight train per 12 hours, or 1 train per 16-hour day and 1 train per 8-hour night (2 total per 24 hours) • Jointed rail • 24 kph speed • Assume 1 locomotive per train
NOTES:	1. Canadian Rail Atlas has been used to determine rail line classification and ownership (i.e., CN/CP/other) 2. Commuter (GO) and passenger (VIA) rail volumes are based on data received from the responsible authority.	

Dorchester Rd @ Dawson St

Morning Peak Diagram

Specified Period
From: 8:00:00
To: 10:00:00

One Hour Peak
From: 8:30:00
To: 9:30:00

Municipality: Niagara Falls
Site #: 0000000001
Intersection: Dorchester Rd & Dawson St
TFR File #: 1
Count date: 10-Sep-2019

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dorchester Rd runs N/S

North Leg Total: 1065
North Entering: 495
North Peds: 0
Peds Cross: ⋈

Cyclists	0	0	0	0
Trucks	0	15	1	16
Cars	2	462	15	479
Totals	2	477	16	

Cyclists	1
Trucks	18
Cars	551
Totals	570

East Leg Total: 123
East Entering: 75
East Peds: 2
Peds Cross: ⋈

Dorchester Rd

Cyclists	Trucks	Cars	Totals
0	1	11	12

Dawson St

Cyclists	Trucks	Cars	Totals
0	1	3	4
0	0	0	0
0	2	4	6
0	3	7	

N
W E
S

Cars	Trucks	Cyclists	Totals
26	1	0	27
0	0	0	0
46	2	0	48
72	3	0	

Dawson St

Cars	Trucks	Cyclists	Totals
44	4	0	48

Dorchester Rd

Peds Cross: ⋈
West Peds: 1
West Entering: 10
West Leg Total: 22

Cars	512	9	522	29	560
Trucks	19	1	16	3	20
Cyclists	0	0	1	0	1
Totals	531	10	539	32	

Peds Cross: ⋈
South Peds: 0
South Entering: 581
South Leg Total: 1112

Comments

Dorchester Rd @ Dawson St

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 12:00:00
To: 13:00:00

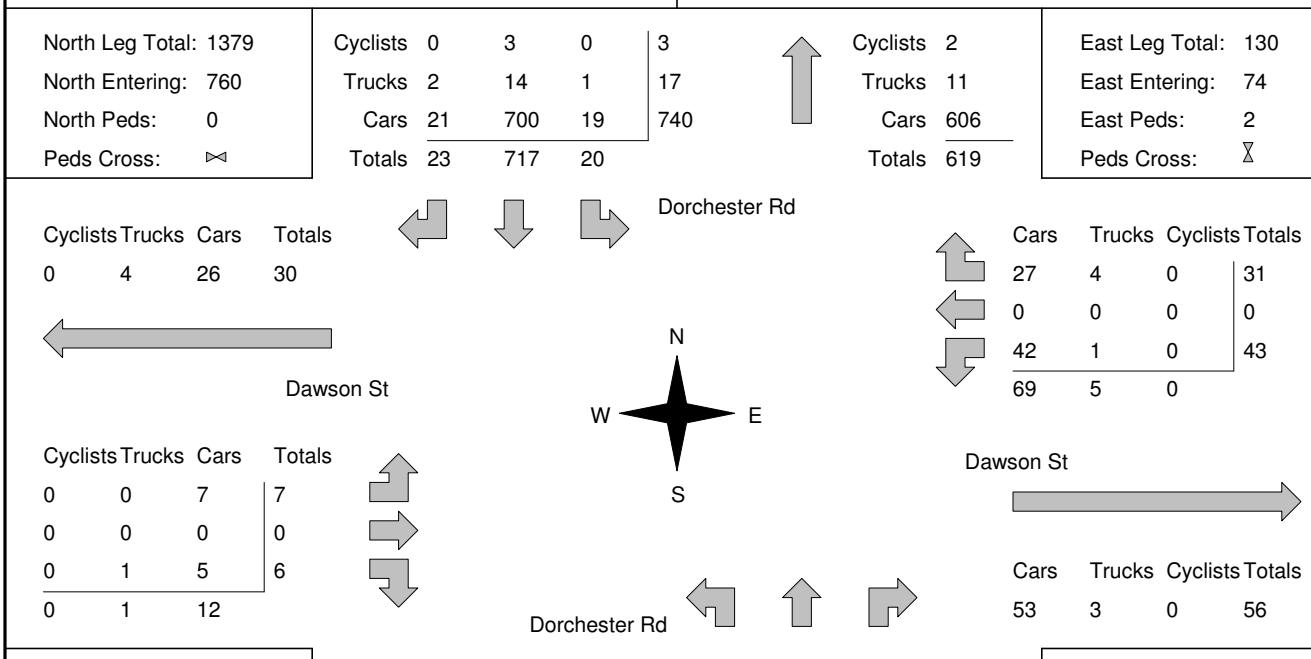
Municipality: Niagara Falls
Site #: 0000000001
Intersection: Dorchester Rd & Dawson St
TFR File #: 1
Count date: 10-Sep-2019

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dorchester Rd runs N/S



Comments

Dorchester Rd @ Dawson St

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 15:30:00
To: 16:30:00

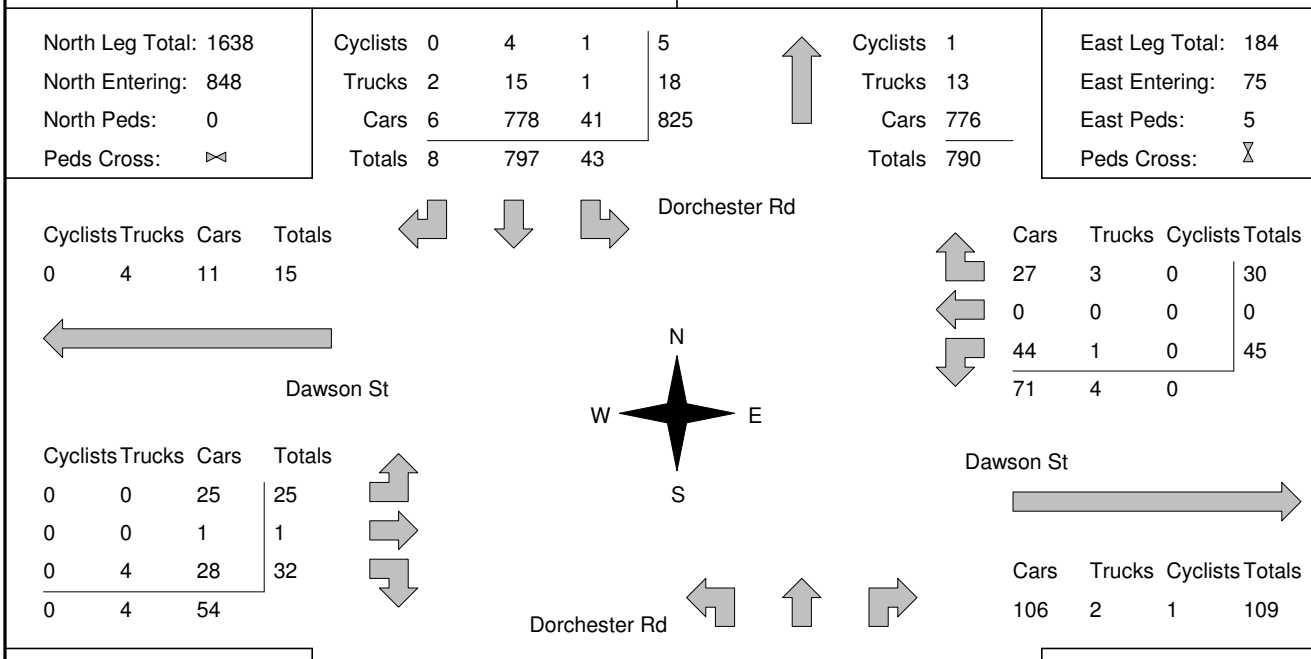
Municipality: Niagara Falls
Site #: 0000000001
Intersection: Dorchester Rd & Dawson St
TFR File #: 1
Count date: 10-Sep-2019

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dorchester Rd runs N/S



Comments

Dorchester Rd @ Dawson St

Total Count Diagram

Municipality: Niagara Falls
Site #: 0000000001
Intersection: Dorchester Rd & Dawson St
TFR File #: 1
Count date: 10-Sep-2019

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dorchester Rd runs N/S

North Leg Total:	10757			
North Entering:	5630			
North Peds:	1			
Peds Cross:	⋈			
Cyclists	1	18	2	21
Trucks	14	109	5	128
Cars	59	5197	225	5481
Totals	74	5324	232	
Cyclists	14			
Trucks	95			
Cars	5018			
Totals	5127			
East Leg Total:	1123			
East Entering:	573			
East Peds:	24			
Peds Cross:	⧖			

Dorchester Rd

Cyclists	Trucks	Cars	Totals
2	27	115	144

Dawson St

Cars	Trucks	Cyclists	Totals
206	12	0	218
0	0	0	0
348	6	1	355
554	18	1	

N
W E
S

Cyclists	Trucks	Cars	Totals
0	5	73	78
0	3	1	4
2	19	77	98
2	27	151	

Dawson St

Cars	Trucks	Cyclists	Totals
531	17	2	550

Dorchester Rd

Peds Cross:	⧖			
West Peds:	14			
West Entering:	180			
West Leg Total:	324			
Cars	5622			
Trucks	134			
Cyclists	21			
Totals	5777			
Cars	56	4739	305	5100
Trucks	13	78	9	100
Cyclists	1	14	0	15
Totals	70	4831	314	
Peds Cross:	⋈			
South Peds:	10			
South Entering:	5215			
South Leg Total:	10992			

Comments

Prepared For: City of Niagara Falls
Prepared By: *PYRAMID* Traffic Inc.
Location: Dorchester Rd, btwn Dawson St & Highway 420 Ramp
Start Date: Tuesday Nov 6, 2018

Site ID: 2698
Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	20	13	
0:30	6	12	
0:45	13	5	
1:00	7	6	82
1:15	6	12	67
1:30	5	4	58
1:45	8	3	51
2:00	1	10	49
2:15	6	5	42
2:30	2	4	39
2:45	6	3	37
3:00	2	3	31
3:15	7	4	31
3:30	5	8	38
3:45	7	3	39
4:00	4	8	46
4:15	4	5	44
4:30	8	7	46
4:45	10	10	56
5:00	8	5	57
5:15	9	22	79
5:30	11	18	93
5:45	11	24	108
6:00	26	35	156
6:15	28	32	185
6:30	31	41	228
6:45	39	73	305
7:00	52	56	352
7:15	59	62	413
7:30	99	70	510
7:45	109	128	635
8:00	150	109	786
8:15	143	127	935
8:30	207	140	1113
8:45	193	130	1199
9:00	222	140	1302
9:15	172	128	1332
9:30	185	88	1258
9:45	134	138	1207
10:00	225	128	1198
10:15	153	80	1131
10:30	143	182	1183
10:45	134	169	1214
11:00	142	184	1187
11:15	188	176	1318
11:30	180	212	1385
11:45	210	187	1479
12:00	190	201	1544

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
12:15	145	179	1504
12:30	144	192	1448
12:45	197	156	1404
13:00	135	189	1337
13:15	138	146	1297
13:30	165	159	1285
13:45	153	173	1258
14:00	169	210	1313
14:15	157	163	1349
14:30	170	180	1375
14:45	189	179	1417
15:00	153	237	1428
15:15	165	223	1496
15:30	217	185	1548
15:45	196	211	1587
16:00	209	215	1621
16:15	169	180	1582
16:30	191	212	1583
16:45	158	190	1524
17:00	195	207	1502
17:15	171	227	1551
17:30	174	188	1510
17:45	162	201	1525
18:00	165	168	1456
18:15	131	185	1374
18:30	125	125	1262
18:45	122	140	1161
19:00	105	136	1069
19:15	94	131	978
19:30	84	127	939
19:45	91	103	871
20:00	83	117	830
20:15	79	84	768
20:30	75	82	714
20:45	66	66	652
21:00	67	66	585
21:15	78	70	570
21:30	56	48	517
21:45	38	52	475
22:00	60	44	446
22:15	53	48	399
22:30	50	33	378
22:45	35	30	353
23:00	41	32	322
23:15	35	30	286
23:30	36	15	254
23:45	18	26	233
0:00	19	10	189

AM Peak: 1544 PM Peak: 1621 24 HR VOLUME: 18888

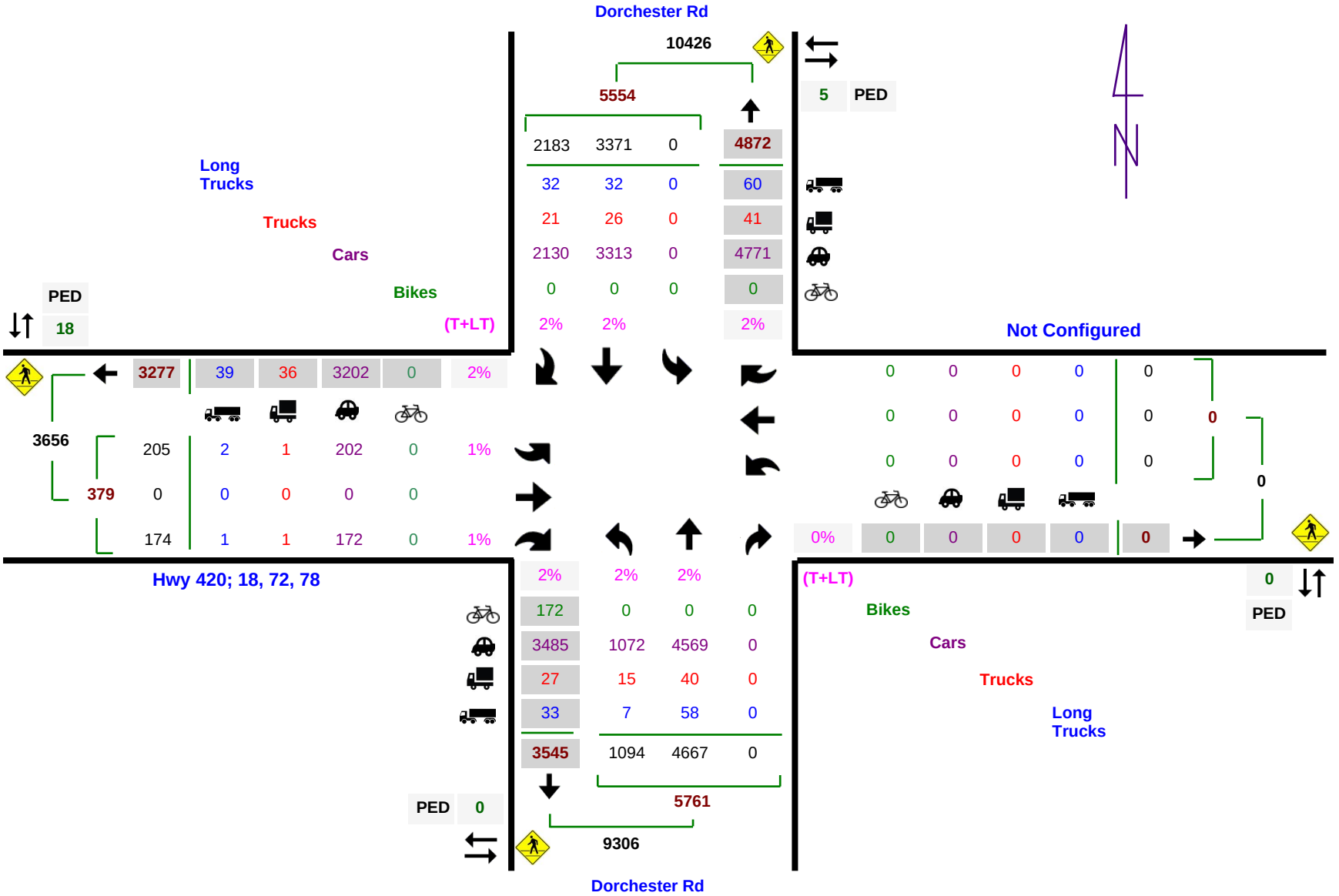
Ontario

Ministry of Transportation

TVIS II - Traffic Volume Information System

Turning Movement Count Total Report

Description: Hwy 420 @ Dorchester Rd IC (NRT)
Region: CENTRAL | **Survey Type:** TM – Interchange | **Hwy:** 420
Start Date: 08-Nov-2018 (Thu) | **I/C Side:** N | **LHRS:** 49806
End Date: 08-Nov-2018 (Thu) | **Int. Type:** T - W | **Offset:** 0
Schedule Summary: TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00



Ontario

Ministry of Transportation

TVIS II - Traffic Volume information System

ICS Weekly Volume Summary

Hwy:	420	**Between:**	DORCHESTER RD IC-NIAGARA FALLS				
TS:	414	**and:**	QEW IC-NIAGARA FALLS				
Regn:	CENTRAL	**Pattern:**	CTR	**PDCS:**	02	**Factor:**	1.12
LHRS:	49806	**Offset:**	0.160	**Locn:**	0.160 KM W OF DORCHESTER RD IC-NIAGARA FALLS		
Dir:	E	**Lanes:**	2	**Speed:**	80 km/h	**Dates:**	19-Oct-2018 to 26-Oct-2018

	Fri		Sat		Sun		Mon		Tue		Wed		Thu		Fri	
H. Interval	**10/19**		**10/20**	**Pk.**	**10/21**	**Pk.**	**10/22**	**Pk.**	**10/23**	**Pk.**	**10/24**	**Pk.**	**10/25**	**Pk.**	**10/26**	**Pk.**
00:00-01:00			264		270		124		109		119		128		149	
01:00-02:00			167		181		101		88		68		77		86	
02:00-03:00			110		117		46		58		40		45		59	
03:00-04:00			83		88		51		37		50		48		41	
04:00-05:00			70		66		49		61		53		65		62	
05:00-06:00			134		95		169		165		171		170		148	
06:00-07:00			268		210		489		501		489		489		459	
07:00-08:00			395		257		662		648		681		708		640	
08:00-09:00			585	◄	454	◄	894	◄	975	◄	1018	◄	966	◄	883	◄
09:00-10:00			818		716		800		770		707		813		832	
10:00-11:00			1091		904		847		869		806		933		921	
11:00-12:00			1450		1187		1065	◄	933		1002	◄	1009		1203	◄
AM Total			**5435**		**4545**		**5297**		**5214**		**5204**		**5451**		**5483**	
12:00-13:00	1152	◄	1483		1300		1057		1090	◄	944		1081	◄		
13:00-14:00	1119		1544	◄	1393	◄	1018		931		875		1043			
14:00-15:00	1253		1760		1363		1085		1031		1024		1125			
15:00-16:00	1350		1758	◄	1446	◄	1031	◄	1072	◄	1031		1089			
16:00-17:00	1356		1702		1313		1015		1045		958		1092			
17:00-18:00	1500	◄	1448		1231		988		1069		1099	◄	1147	◄		
18:00-19:00	1288		1232		939		802		812		900		1098			
19:00-20:00	1287		1115		614		654		603		684		776			
20:00-21:00	980		915		480		488		497		466		562			
21:00-22:00	822		689		409		377		433		436		512			
22:00-23:00	595		567		320		313		278		342		370			
23:00-00:00	422		435		210		233		220		235		263			
PM Total	**13124**		**14648**		**11018**		**9061**		**9081**		**8994**		**10158**			
24h. Total	**13124**		**20083**		**15563**		**14358**		**14295**		**14198**		**15609**		**5483**	
Noon - Noon	**18559**		**19193**		**16315**		**14275**		**14285**		**14445**		**15641**			

TVIS II - Traffic Volume information System

ICS Weekly Volume Summary

Hwy:	420	**Between:**	DORCHESTER RD IC-NIAGARA FALLS				
TS:	414	**and:**	QEW IC-NIAGARA FALLS				
Regn:	CENTRAL	**Pattern:**	CTR	**PDCS:**	02	**Factor:**	1.12
LHRS:	49806	**Offset:**	0.160	**Locn:**	0.160 KM W OF DORCHESTER RD IC-NIAGARA FALLS		
Dir:	W	**Lanes:**	2	**Speed:**	80 km/h	**Dates:**	19-Oct-2018 to 26-Oct-2018

	Fri		Sat		Sun		Mon		Tue		Wed		Thu		Fri	
H. Interval	**10/19**		**10/20**	**Pk.**	**10/21**	**Pk.**	**10/22**	**Pk.**	**10/23**	**Pk.**	**10/24**	**Pk.**	**10/25**	**Pk.**	**10/26**	**Pk.**
00:00-01:00			479		679		250		213		205		233		242	
01:00-02:00			348		468		158		127		137		111		152	
02:00-03:00			289		430		128		100		104		98		135	
03:00-04:00			197		267		117		82		90		99		94	
04:00-05:00			118		196		121		95		96		99		110	
05:00-06:00			150		145		211		196		205		188		207	
06:00-07:00			203		178		326		319		314		305		295	
07:00-08:00			317		241		459		455		466		469		435	
08:00-09:00			393	◄	353	◄	543	◄	539	◄	522	◄	574	◄	553	◄
09:00-10:00			578		665		536		550		527		580		620	
10:00-11:00			761		1119		697		684		610		646		737	
11:00-12:00			899		1368	◄	812	◄	747		733	◄	698		791	◄
AM Total			**4732**		**6109**		**4358**		**4107**		**4009**		**4100**		**4371**	
12:00-13:00	882	◄	948	◄	1227		748		742		702		800	◄		
13:00-14:00	837		905		1129		805		764	◄	730		745			
14:00-15:00	959		915		1069		893		810		856		868			
15:00-16:00	1047		1072		1100		1081		1017		1026	◄	967			
16:00-17:00	1103	◄	1112	◄	1152	◄	1091	◄	1083	◄	1006		1027	◄		
17:00-18:00	1000		1110		1107		919		936		867		988			
18:00-19:00	739		1066		970		773		696		614		765			
19:00-20:00	715		968		978		684		575		599		655			
20:00-21:00	626		837		824		568		544		474		586			
21:00-22:00	629		863		728		475		474		483		587			
22:00-23:00	677		837		539		447		395		528		638			
23:00-00:00	690		913		403		326		345		348		379			
PM Total	**9904**		**11546**		**11226**		**8810**		**8381**		**8233**		**9005**			
24h. Total	**9904**		**16278**		**17335**		**13168**		**12488**		**12242**		**13105**		**4371**	
Noon - Noon	**14636**		**17655**		**15584**		**12917**		**12390**		**12333**		**13376**			

Ontario

Ministry of Transportation

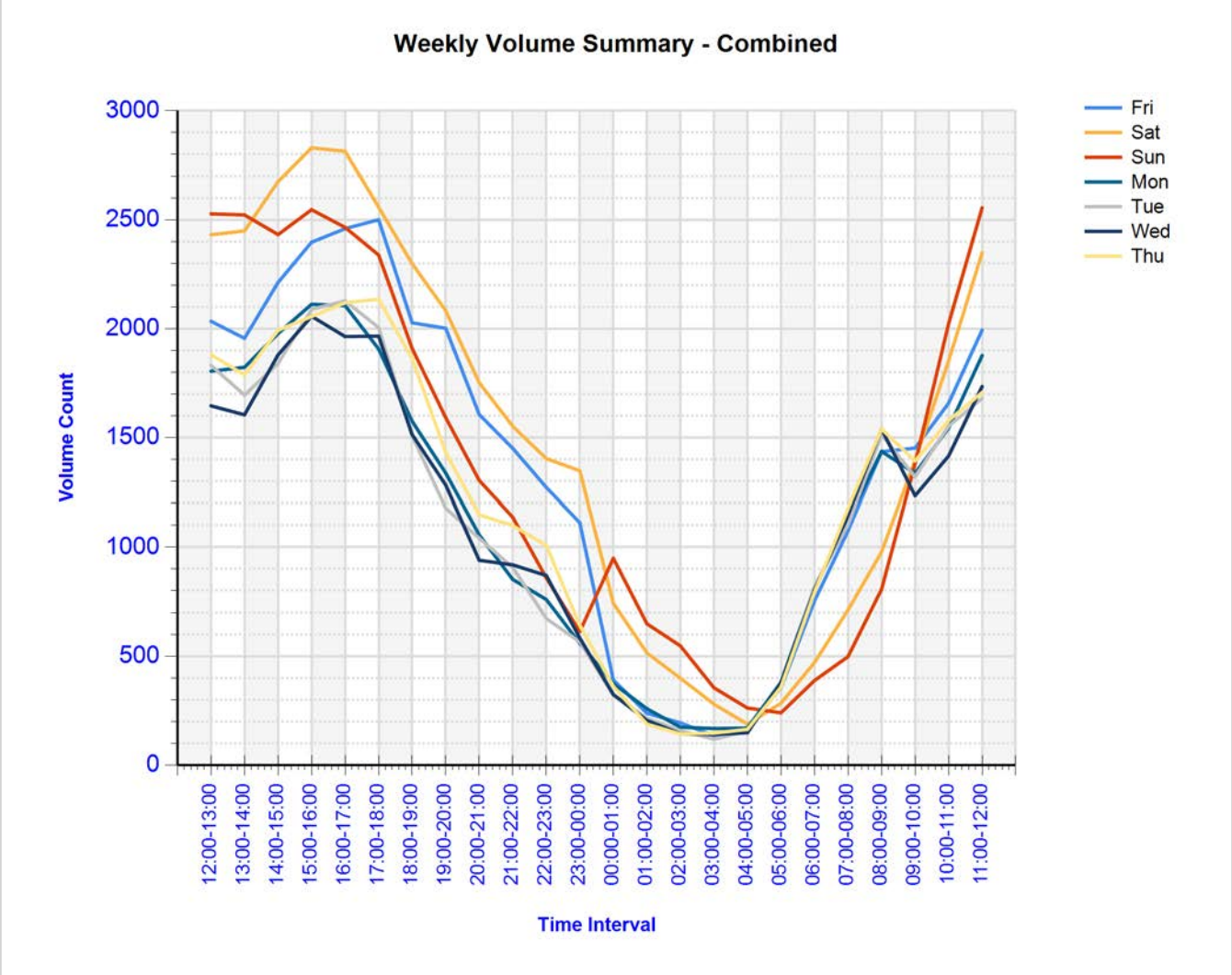
TVIS II - Traffic Volume information System

ICS Weekly Volume Summary

Hwy: 420 **Between:** DORCHESTER RD IC-NIAGARA FALLS
TS: 414 **and:** QEW IC-NIAGARA FALLS
Regn: CENTRAL **Pattern:** CTR **PDCS:** 02 **Factor:** 1.12
LHRS: 49806 **Offset:** 0.160 **Locn:** 0.160 KM W OF DORCHESTER RD IC-NIAGARA FALLS
Dir: COMBINED **Lanes:** 4 **Speed:** 80 km/h **Dates:** 19-Oct-2018 to 26-Oct-2018

	Fri		Sat		Sun		Mon		Tue		Wed		Thu		Fri	
H. Interval	10/19		10/20	Pk.	10/21	Pk.	10/22	Pk.	10/23	Pk.	10/24	Pk.	10/25	Pk.	10/26	Pk.
00:00-01:00			743		949		374		322		324		361		391	
01:00-02:00			515		649		259		215		205		188		238	
02:00-03:00			399		547		174		158		144		143		194	
03:00-04:00			280		355		168		119		140		147		135	
04:00-05:00			188		262		170		156		149		164		172	
05:00-06:00			284		240		380		361		376		358		355	
06:00-07:00			471		388		815		820		803		794		754	
07:00-08:00			712		498		1121		1103		1147		1177		1075	
08:00-09:00			978	◄	807	◄	1437	◄	1514	◄	1540	◄	1540	◄	1436	◄
09:00-10:00			1396		1381		1336		1320		1234		1393		1452	
10:00-11:00			1852		2023		1544		1553		1416		1579		1658	
11:00-12:00			2349		2555	◄	1877	◄	1680		1735	◄	1707		1994	◄
AM Total			**10167**		**10654**		**9655**		**9321**		**9213**		**9551**		**9854**	
12:00-13:00	2034	◄	2431		2527		1805		1832	◄	1646		1881	◄		
13:00-14:00	1956		2449	◄	2522		1823		1695		1605		1788			
14:00-15:00	2212		2675		2432		1978		1841		1880		1993			
15:00-16:00	2397		2830	◄	2546	◄	2112	◄	2089		2057	◄	2056			
16:00-17:00	2459		2814		2465		2106		2128	◄	1964		2119			
17:00-18:00	2500	◄	2558		2338		1907		2005		1966		2135	◄		
18:00-19:00	2027		2298		1909		1575		1508		1514		1863			
19:00-20:00	2002		2083		1592		1338		1178		1283		1431			
20:00-21:00	1606		1752		1304		1056		1041		940		1148			
21:00-22:00	1451		1552		1137		852		907		919		1099			
22:00-23:00	1272		1404		859		760		673		870		1008			
23:00-00:00	1112		1348		613		559		565		583		642			
PM Total	**23028**		**26194**		**22244**		**17871**		**17462**		**17227**		**19163**			
24h. Total	**23028**		**36361**		**32898**		**27526**		**26783**		**26440**		**28714**		**9854**	
Noon - Noon	**33195**		**36848**		**31899**		**27192**		**26675**		**26778**		**29017**			

ADT	AWD	AADT	SADT	SAWDT	WADT	DHV
30229	27416	33900	36900	37200	25700	2950



Ontario

Ministry of Transportation

TVIS II - Traffic Volume information System

ICS Weekly Volume Summary

Hwy:	QEW	**Between:**	HWY 420 IC-30				
TS:	55	**and:**	THOROLD STONE RD IC-32				
Regn:	CENTRAL	**Pattern:**	UC	**PDCS:**	74	**Factor:**	1.02
LHRS:	10040	**Offset:**	1.320	**Locn:**	1.320 KM N OF HWY 420 IC-30		
Dir:	N	**Lanes:**	2	**Speed:**	100 km/h	**Dates:**	08-Aug-2018 to 15-Aug-2018

	Wed		Thu		Fri		Sat		Sun		Mon		Tue		Wed	
H. Interval	**08/08**		**08/09**	**Pk.**	**08/10**	**Pk.**	**08/11**	**Pk.**	**08/12**	**Pk.**	**08/13**	**Pk.**	**08/14**	**Pk.**	**08/15**	**Pk.**
00:00-01:00			581		725		1091		1947		850		568		621	
01:00-02:00			348		442		675		1064		448		360		345	
02:00-03:00			275		293		548		776		320		284		301	
03:00-04:00			215		251		380		441		257		233		213	
04:00-05:00			365		363		325		331		399		353		355	
05:00-06:00			812		758		404		344		767		789		808	
06:00-07:00			1485		1407		609		465		1435		1453		1502	
07:00-08:00			2069		1939		1022		744		2003		2058		2118	
08:00-09:00			2368	◄	2376	◄	1460	◄	1145	◄	2348	◄	2319	◄	2412	◄
09:00-10:00			2124		2229		1966		1782		1901		2093		2217	
10:00-11:00			2432		2638		2392		2607		2261		2287		2475	
11:00-12:00			2585		2808		2590		3032	◄	2413		2393		2471	◄
AM Total			**15659**		**16229**		**13462**		**14678**		**15402**		**15190**		**15838**	
12:00-13:00	2505	◄	2555		2745		2581		2871		2493	◄	2353			
13:00-14:00	2436		2673	◄	2882	◄	2680	◄	2890		2300		2443	◄		
14:00-15:00	2745		2783		2966		2730		2900		2639		2574			
15:00-16:00	2900		3082		3139		2962		3143		2898		2956			
16:00-17:00	3094	◄	3457	◄	3390	◄	2955		3195		3220	◄	3304	◄		
17:00-18:00	2832		3338		3250		3070	◄	3168		2999		3101			
18:00-19:00	2226		2683		2646		2996		3319	◄	2279		2369			
19:00-20:00	1948		2223		2361		2944		2967		2123		2019			
20:00-21:00	1621		1873		1942		2805		2800		1870		1863			
21:00-22:00	1499		1766		1963		2298		2635		1717		1619			
22:00-23:00	1333		1849		1952		2533		2233		1325		1451			
23:00-00:00	991		1405		1717		2836		1559		1004		1031			
PM Total	**26130**		**29687**		**30953**		**33390**		**33680**		**26867**		**27083**			
24h. Total	**26130**		**45346**		**47182**		**46852**		**48358**		**42269**		**42273**		**15838**	
Noon - Noon	**41789**		**45916**		**44415**		**48068**		**49082**		**42057**		**42921**			

TVIS II - Traffic Volume information System

ICS Weekly Volume Summary

Hwy:	QEW	**Between:**	HWY 420 IC-30				
TS:	55	**and:**	THOROLD STONE RD IC-32				
Regn:	CENTRAL	**Pattern:**	UC	**PDCS:**	74	**Factor:**	1.02
LHRS:	10040	**Offset:**	1.320	**Locn:**	1.320 KM N OF HWY 420 IC-30		
Dir:	S	**Lanes:**	3	**Speed:**	100 km/h	**Dates:**	08-Aug-2018 to 15-Aug-2018

	Wed		Thu		Fri		Sat		Sun		Mon		Tue		Wed	
H. Interval	**08/08**		**08/09**	**Pk.**	**08/10**	**Pk.**	**08/11**	**Pk.**	**08/12**	**Pk.**	**08/13**	**Pk.**	**08/14**	**Pk.**	**08/15**	**Pk.**
00:00-01:00			489		488		598		624		359		327		360	
01:00-02:00			344		253		418		450		226		202		253	
02:00-03:00			188		180		245		295		168		155		184	
03:00-04:00			166		151		167		212		144		140		132	
04:00-05:00			195		257		195		175		162		179		154	
05:00-06:00			558		517		368		268		535		468		499	
06:00-07:00			1330		1285		803		620		1412		1333		1386	
07:00-08:00			1947		1887		1335		1038		2102		1956		1938	
08:00-09:00			2388	◄	2295	◄	1879	◄	1431	◄	2310	◄	2335	◄	2340	◄
09:00-10:00			2316		2353		2592		2263		2203		2171		2280	
10:00-11:00			2861		2831		3137		3077		2543		2619		2851	
11:00-12:00			3193	◄	3183		3412		3352		3032		3038	◄	3267	◄
AM Total			**15975**		**15680**		**15149**		**13805**		**15196**		**14923**		**15644**	
12:00-13:00	3093	◄	3110		3116		3480		3294		3047		2974			
13:00-14:00	2760		3054		3203	◄	3578	◄	3597	◄	3093	◄	2809			
14:00-15:00	2863		3007		3411		3674		3524		3133		2907			
15:00-16:00	3128		3209		3469		3381		3620	◄	3167		3053			
16:00-17:00	3302	◄	3345		3706	◄	3679	◄	3467		3354		3449	◄		
17:00-18:00	3239		3639	◄	3571		3420		3025		3484	◄	3446			
18:00-19:00	2487		2702		3138		3059		2405		2458		2452			
19:00-20:00	1825		2021		2797		2316		1814		1733		1898			
20:00-21:00	1569		1661		2247		1979		1616		1458		1568			
21:00-22:00	1335		1411		1918		1862		1355		1244		1355			
22:00-23:00	961		982		1335		1300		974		851		919			
23:00-00:00	695		763		971		950		633		603		647			
PM Total	**27257**		**28904**		**32882**		**32678**		**29324**		**27625**		**27477**			
24h. Total	**27257**		**44879**		**48562**		**47827**		**43129**		**42821**		**42400**		**15644**	
Noon - Noon	**43232**		**44584**		**48031**		**46483**		**44520**		**42548**		**43121**			

Ontario

Ministry of Transportation

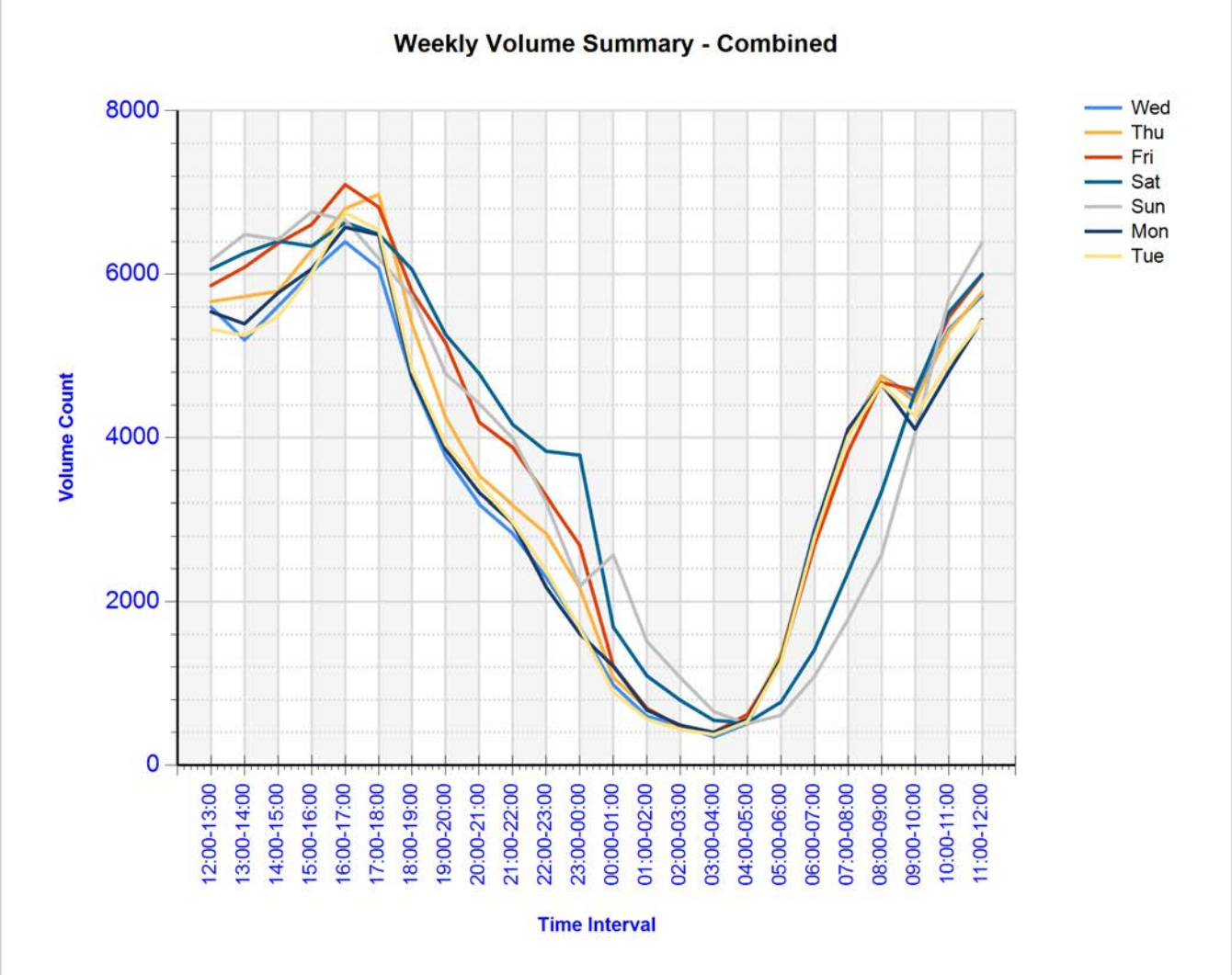
TVIS II - Traffic Volume information System

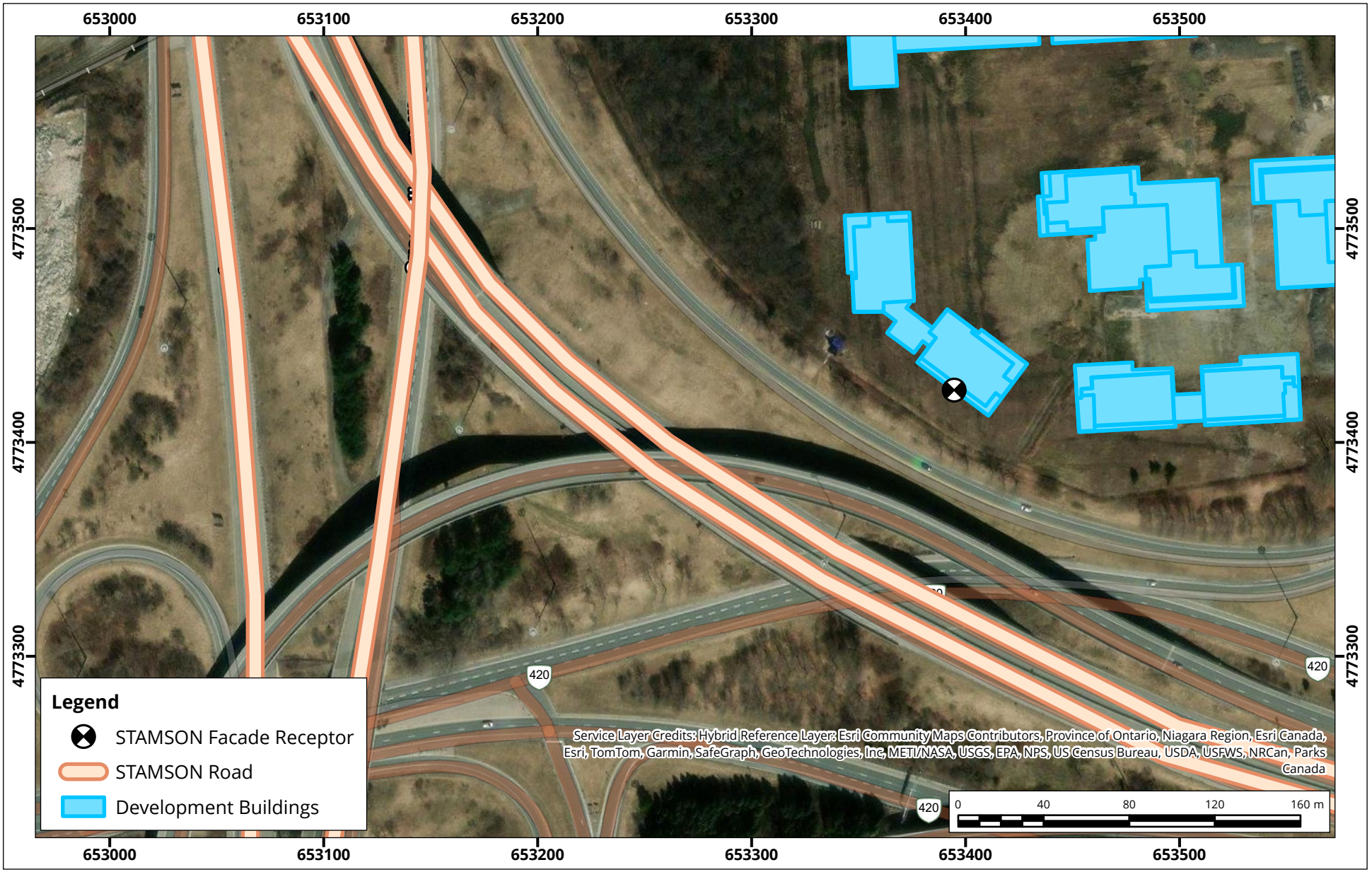
ICS Weekly Volume Summary

Hwy: QEW **Between:** HWY 420 IC-30
TS: 55 **and:** THOROLD STONE RD IC-32
Regn: CENTRAL **Pattern:** UC **PDCS:** 74 **Factor:** 1.02
LHRS: 10040 **Offset:** 1.320 **Locn:** 1.320 KM N OF HWY 420 IC-30
Dir: COMBINED **Lanes:** 5 **Speed:** 100 km/h **Dates:** 08-Aug-2018 to 15-Aug-2018

	Wed		Thu		Fri		Sat		Sun		Mon		Tue		Wed	
H. Interval	08/08		08/09	Pk.	08/10	Pk.	08/11	Pk.	08/12	Pk.	08/13	Pk.	08/14	Pk.	08/15	Pk.
00:00-01:00			1070		1213		1689		2571		1209		895		981	
01:00-02:00			692		695		1093		1514		674		562		598	
02:00-03:00			463		473		793		1071		488		439		485	
03:00-04:00			381		402		547		653		401		373		345	
04:00-05:00			560		620		520		506		561		532		509	
05:00-06:00			1370		1275		772		612		1302		1257		1307	
06:00-07:00			2815		2692		1412		1085		2847		2786		2888	
07:00-08:00			4016		3826		2357		1782		4105		4014		4056	
08:00-09:00			4756	◄	4671	◄	3339	◄	2576	◄	4658	◄	4654	◄	4752	◄
09:00-10:00			4440		4582		4558		4045		4104		4264		4497	
10:00-11:00			5293		5469		5529		5684		4804		4906		5326	
11:00-12:00			5778	◄	5991		6002		6384		5445		5431	◄	5738	◄
AM Total			**31634**		**31909**		**28611**		**28483**		**30598**		**30113**		**31482**	
12:00-13:00	5598	◄	5665		5861		6061		6165		5540	◄	5327			
13:00-14:00	5196		5727		6085	◄	6258	◄	6487	◄	5393		5252			
14:00-15:00	5608		5790		6377		6404		6424		5772		5481			
15:00-16:00	6028		6291		6608		6343		6763	◄	6065		6009			
16:00-17:00	6396	◄	6802		7096	◄	6634	◄	6662		6574	◄	6753	◄		
17:00-18:00	6071		6977	◄	6821		6490		6193		6483		6547			
18:00-19:00	4713		5385		5784		6055		5724		4737		4821			
19:00-20:00	3773		4244		5158		5260		4781		3856		3917			
20:00-21:00	3190		3534		4189		4784		4416		3328		3431			
21:00-22:00	2834		3177		3881		4160		3990		2961		2974			
22:00-23:00	2294		2831		3287		3833		3207		2176		2370			
23:00-00:00	1686		2168		2688		3786		2192		1607		1678			
PM Total	**53387**		**58591**		**63835**		**66068**		**63004**		**54492**		**54560**			
24h. Total	**53387**		**90225**		**95744**		**94679**		**91487**		**85090**		**84673**		**31482**	
Noon - Noon	**85021**		**90500**		**92446**		**94551**		**93602**		**84605**		**86042**			

ADT	AWD	AADT	SADT	SAWDT	WADT	DHV
89538	86542	91300	89500	86000	85100	7800





STAMSON Calibration

True North

Map Projection: NAD 1983 UTM Zone 17N

5259 Dorchester Road- Niagara Falls, Ontario

Project #: 2505949

Drawn by: JM	Figure: C-1
Approx. Scale:	1:2,500
Date Revised:	Mar 19, 2025

Map Document: \\rwdgroup\guelph\AM_Jobs\2025\2505949\03Worklterns\20EnvironmentalNoise\Figures\OntarioLUP.aprx

STAMSON 5.0 NORMAL REPORT Date: 17-03-2025 20:51:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 20250318.te Time Period: 16 hours
Description:

Road data, segment # 1: 420 EB

Car traffic volume : 23821 veh/TimePeriod
Medium truck volume : 1401 veh/TimePeriod
Heavy truck volume : 2802 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: 420 EB

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 107.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: 420 WB

Car traffic volume : 20151 veh/TimePeriod
Medium truck volume : 1185 veh/TimePeriod
Heavy truck volume : 2371 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: 420 WB

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 92.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: QEW NB

```
-----------------------------
Car traffic volume  : 65257 veh/TimePeriod
Medium truck volume :  3839 veh/TimePeriod
Heavy truck volume  :  7677 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: QEW NB
-----------------------------
Angle1   Angle2           : -46.00 deg   38.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 257.00 m
Receiver height           :   4.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 4: QEW SB
-----------------------------
Car traffic volume  : 68268 veh/TimePeriod
Medium truck volume :  4016 veh/TimePeriod
Heavy truck volume  :  8031 veh/TimePeriod
Posted speed limit  :   100 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 4: QEW SB
-----------------------------
Angle1   Angle2           : -46.00 deg   38.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 335.00 m
Receiver height           :   4.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: 420 EB
-----------------------------

Source height = 1.78 m

ROAD (0.00 + 62.44 + 0.00) = 62.44 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.56  77.06   0.00 -13.33  -1.29   0.00   0.00   0.00  62.44
```

Segment Leq : 62.44 dBA

↟
Results segment # 2: 420 WB

Source height = 1.78 m

ROAD (0.00 + 62.74 + 0.00) = 62.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.56	76.33	0.00	-12.30	-1.29	0.00	0.00	0.00	62.74

Segment Leq : 62.74 dBA

↟
Results segment # 3: QEW NB

Source height = 1.78 m

ROAD (0.00 + 60.42 + 0.00) = 60.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	38	0.56	83.23	0.00	-19.27	-3.54	0.00	0.00	0.00	60.42

Segment Leq : 60.42 dBA

↟
Results segment # 4: QEW SB

Source height = 1.78 m

ROAD (0.00 + 58.82 + 0.00) = 58.82 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-46	38	0.56	83.43	0.00	-21.07	-3.54	0.00	0.00	0.00	58.82

Segment Leq : 58.82 dBA

Total Leq All Segments: 67.40 dBA

↟

TOTAL Leq FROM ALL SOURCES: 67.40

APPENDIX D

NOISE MITIGATION GUIDANCE

Acoustic/Noise Barrier

Generally, noise controls to attenuate transportation sound levels at Outdoor Living Areas (OLAs) would consist of the implementation of acoustic/noise barriers with materials that would meet the guidance included in NPC-300, for example:

- A wall, berm, wall/berm combination or similar structure, used as a noise control measure, and high enough to break the line-of-sight between the source and the receptor.
- The minimum surface density (face weight) is 20 kg/m^2
    - Many materials could satisfy the surface density requirement, e.g. wood, glass, concrete, Plexiglas, Acrylite.
    - The required thickness can be determined by dividing the 20 kg/m^2 face weight by the material density (kg/m^3). Typically, this would imply:
        - 50 mm (2") thickness of wood
        - 13 mm (0.5") thickness of lighter plastic (like Plexiglas or PVC)
        - 6 mm (0.25") thickness of heavier material (like aluminum, glass, concrete)
- The barrier should be structurally sound, appropriately designed to withstand wind and snow load, and constructed without cracks or surface gaps. Joints between panels may need to be overlapped to ensure surfaces are free of gaps, particularly for wood construction.
- Any gaps under the barrier that are necessary for drainage purposes should be minimized and localized, so that the acoustical performance of the barrier is maintained.
- If a sound absorptive face is to be included in the barrier design, the minimum noise reduction coefficient is recommended to be NRC 0.7.

Building Ventilation and Air Conditioning

The use of air conditioning itself is not a noise control measure; however, it allows for windows and doors to remain closed, thereby reducing the indoor sound levels.

NPC-300 provides the following guidance with respect to implementation of building ventilation and air conditioning:

a. the noise produced by the proposed ventilation system in the space served does not exceed 40 dBA. In practice, this condition usually implies that window air conditioning units are not acceptable;
b. the ventilation system complies with all national, provincial and municipal standards and codes;
c. the ventilation system is designed by a heating and ventilation professional; and
d. the ventilation system enables the windows and exterior doors to remain closed.

Air conditioning systems also need to comply with Publication NPC-216, and/or any local municipal noise by-law that has provisions relating to air conditioning equipment.

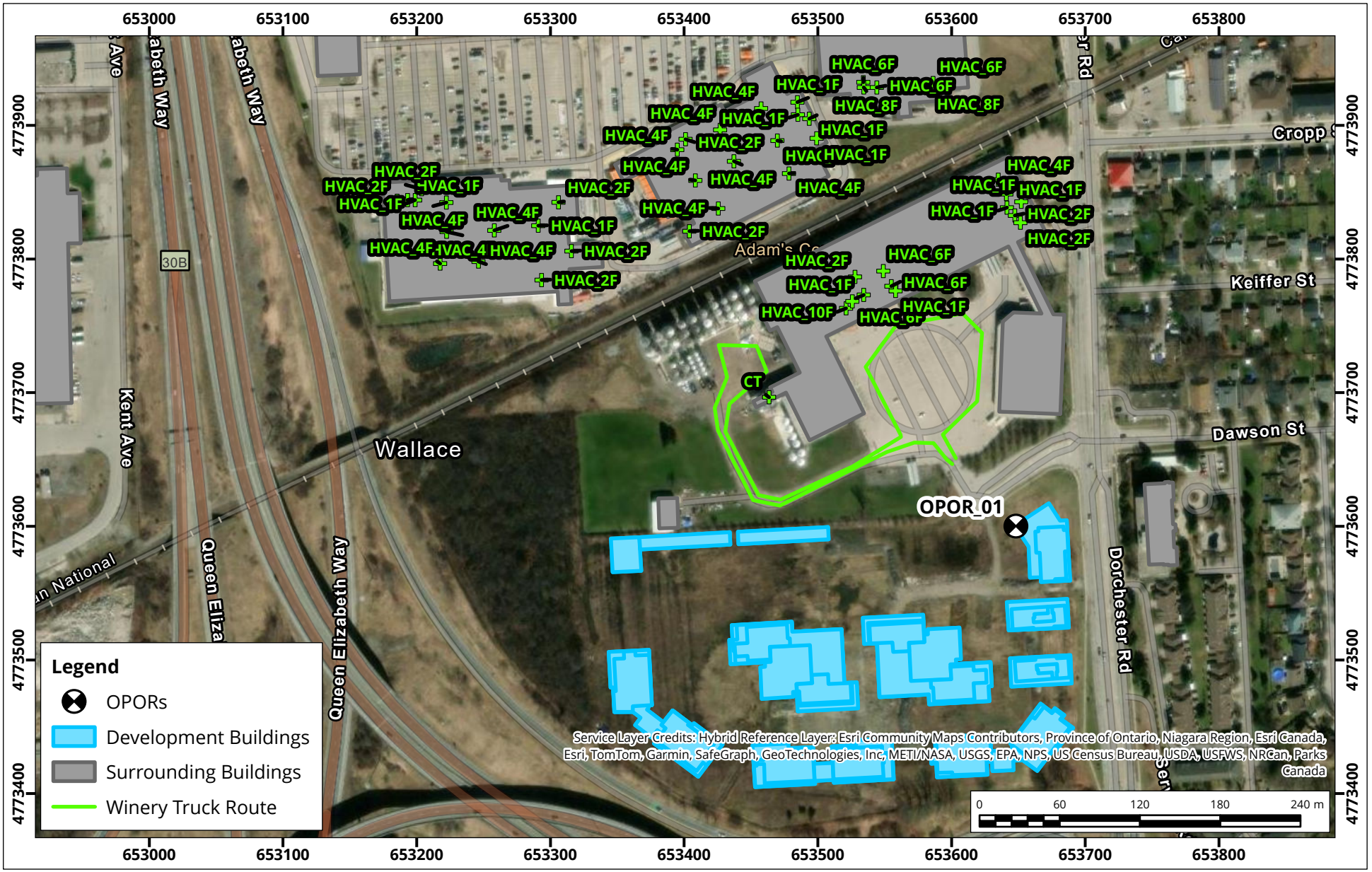
APPENDIX E

Table E-1: List of Industrial Sites Around the Proposed Development

Map Icon Number	BUSINESS NAME	ADDRESS	TYPE OF FACILITY/EQUIPMENT	APPROVAL / REGISTRATION NUMBER
1	Constellation Brands Canada, Inc.	4887 Dorchester Road	ECA for three natural gas boilers, three cooling towers, one standby generator set and fugitive emissions associated with wine manufacturing, grain alcohol receiving and process cleaning operations. Also, fugitive emissions from maintenance welding, fume hoods and wastewater treatment.	9797-AKRQJ2
2	Lafarge Canada Inc.	5268 Montrose Rd	ECA for a ready-mix concrete batching plant with 6 baghouses, 2 boilers and HVAC equipment.	6603-7NGQ4N
3	Mike Emanuele Holdings Inc.	6785 Cropp St	ECA for one paint spray booth for an autobody shop.	4738-794SN5
4	Niagara Block Incorporated	4938 Montrose Road	ECA for one baghouse.	4003-4RPMFV

Table E-2: List of Industrial Sites Around the Proposed Development

Map Icon Number	BUSINESS NAME	Comment on Operations	Tall Stacks Present	Approximate Distance to Site (m)	D-6 Classification
1	Constellation Brands Canada, Inc.	Industrial site with a process that is known to be odourous. The closest existing residential is located west of the facility on Dorchester Road, within approximately 45 meters to the closest edge of the faciltiy building and within 265 m of the outdoor tank farm.	No	45 m	Class II
2	Lafarge Canada Inc.	This site includes outdoor storage, unpaved roadways and handling of raw aggregate material that have the potential for fugitive dust. Air emissions must comply with MECP benchmarks at property line and beyond and a dust BMPP must be implemented to control fugitive dust emissions. The facility is located closer to existing residential, 50 m to the south, than to the subject lands.	No	305 m	Class II
3	Mike Emanuele Holdings Inc.	Well contained industrial site with low lying stacks. No evidence of outdoor storage or sources that can contribute to fugitive dust or odour. Air emissions must comply with MECP benchmarks at property line and beyond. Facility is located closer to existing residential, within 20 m to the south, than to the subject lands.	No	290 m	Class I
4	Niagara Block Incorporated	This site includes outdoor storage and handling of raw aggregate material that have the potential for fugitive dust. There are no sources that are expected to cause odour emissions. Facility is located closer to existing residential than to the subject lands.	No	465 m	Class II



Stationary Sources

Location of Stationary Sources in Relation to the Proposed Development

Location of Worst Case Receptors

Map Projection: NAD 1983 UTM Zone 17N

5259 Dorchester Road- Niagara Falls, Ontario

True North

Project #: 2505949

Drawn by: JM	Figure: E-1
Approx. Scale:	1:4,000
Date Revised:	Mar 21, 2025

Map Document: \\rwdgroup\guelph\AM_Jobs\2025\2505949\03WorkItems\20EnvironmentalNoise\Figures\OntarioLUP.aprx

APPENDIX F

WARNING CLAUSES

Warning clauses are recommended to be included on all development agreements, offers of purchase and agreements of purchase and sale or lease. Warning clauses may be used individually or in combination.

The following warning clauses are recommended based on the applicable guidelines; however, wording may be modified/customized during consultation with the planning authority to best suit the proposed development:

Transportation Sources

NPC-300 Type A: Recommended to address surface transportation sound levels in OLAs if sound level is in the range of >55 dBA but ≤ 60 dBA, and noise controls have not been provided.

"Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air traffic) may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."

NPC-300 Type B: Recommended to address surface transportation sound levels in OLAs if the sound level is in the range of >55 dBA but ≤ 60 dBA, and noise controls have been provided. Recommended to address outdoor aircraft sound levels ≥NEF 30.

"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic (rail traffic) (air traffic) may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."

NPC-300 Type C: Applicable for low and medium density developments only, recommended to address transportation sound levels at the plane of window.

"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments 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."

NPC-300 Type D: Recommended to address transportation sound levels at the plane of window.

"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."

Proximity to Railway Line: Metrolinx/CN/CP/VIA Warning Clause for developments that are within 300 metres of the right-of-way

"Warning: [Canadian National Railway Company] [Metrolinx / GO] [Canadian Pacific Railway Company] [VIA Rail Canada Inc.] or its assigns or successors in interest has or have a right-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the rail facilities on such right-of-way in the future including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). CNR/Metrolinx/GO/CPR/VIA will not responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way."

Stationary Sources

NPC-300 Type E: Recommended to address proximity to commercial/industrial land-use

"Purchasers/tenants are advised that due to the proximity of the adjacent industrial/commercial land-uses, noise from the industrial/commercial land-uses may at times be audible."

NPC-300 Type F: Recommended to for Class 4 Area Notification

"Purchasers/tenants are advised that sound levels due to the adjacent industry (facility) (utility) are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed."