

## 5566 ROBINSON STREET & 6158 ALLENDALE AVENUE

NIAGARA FALLS, ONTARIO

NOISE AND VIBRATION IMPACT STUDY

RWDI #2201139

April 13, 2022

### SUBMITTED TO

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## VERSION HISTORY

Index	Date	Description	Prepared by	Reviewed by
1	April 8, 2022	Draft	KD/MFA	EMJI/SVG
2	April 13, 2022	Final	KD/MFA	EMJI/SVG

## STATEMENT OF LIMITATIONS

This report entitled 5566 Robinson Street & 6158 Allendale Avenue dated April 13, 2022 was prepared by Rowan Williams Davies & Irwin Inc. ("RWDI") for La Pue International Inc. (Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein 5566 Robinson Street & 6158 Allendale Avenue ("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 a re-zoning application (RZA) for the proposed development located at 5566 Robinson Street and 6158 Allendale Avenue in Niagara Falls, Ontario. The proposed development will be a 77-storey building with a podium and tower, consisting of 962 residential units (condo and hotel), up to 5553 square feet of commercial space, bike parking, and below-, at-, and above-grade vehicle parking space.

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 (if noise controls are not provided); and
  - b. Proximity to commercial/industrial land-use.
3. A noise barrier up to 1 m in height may be required along the north and east perimeter of the OLA if warning clause Type A is not included.

The potential noise impact from stationary sources of sound was 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.

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.

Based on the results of the analysis, including implementation of the recommendations included with this assessment, the proposed development is predicted to meet the applicable sound and vibration criteria.



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# 1 INTRODUCTION

RWDI was retained a feasibility-level Noise and Vibration Impact Study (NVIS) for a rezoning application for the proposed development located at 5566 Robinson Street and 6158 Allendale Avenue in Niagara Falls, Ontario. The proposed development will be a 77-storey building with a podium and tower, consisting of 962 residential units (condo and hotel), up to 5553 square feet of commercial space, bike parking, and below-, at-, and above-grade vehicle parking space. The context site plan is shown in **Figure 1**.

The site is exposed to noise from road traffic on Murray Street to the south, Stanley Avenue to the east, Robinson Street to the north, and Allendale Avenue to the west. The proposed development is to be located in a mixed-use area, with nearby residential, commercial, and industrial facilities.

There are no rail corridors located within 1 km of the proposed development, thus no noise or vibration impacts from rail are expected.

This assessment was completed to support a Zoning By-law Amendment (ZBA). This assessment was based on design drawings file *121034 - Niagara77 - 2022.04.03.pdf* produced by Chamberlain Architect Services Limited and dated April 2, 2022.

# 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 A**.

The site is located within the Niagara Region, thus the Region's Regional Road Traffic Noise Control policy was also followed.

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

Turning Movement Counts (TMCs) obtained from the City of Niagara Falls at the intersection of Robinson Street at Allendale Avenue and Stanley Avenue at Murray Street provided data for an 8-hour interval. The TMCs were used to



determine the types of vehicles on each link during the 8-hour interval which was assumed to be 60% of the Summer Average Daily Traffic (SADT).

An 81%/19%, 92% / 8%, and 88% / 12% daytime/nighttime split was applied for Murray Street, Robinson Street, and Allendale Avenue, respectively, based on hourly traffic counts provided by the City of Niagara Falls. The SADT traffic data for Stanley Avenue was provided by The Region of Niagara. A 90%/10% daytime split was applied for Stanley Avenue as per the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT, 1989).

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 in accordance with the Region’s policy.

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

**Table 1: Road Traffic Volumes**

Roadway	2042 Future Traffic (SADT)	% Day/Night	Speed Limit (km/hr)	% Trucks
Stanley Avenue	28,216	90% / 10%	50	1.3%
Murray Street	3,316	81% / 19%	50	0.4%
Robinson Street	2,319	92% / 8%	50	2.0%
Allendale Avenue	1,031	88% / 12%	50	4.6%

### 3.1.2 Rail Traffic Volume Data

Rail is located further than 1 km away from the site and therefore was not assessed.

### 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 proposed residential units in the development 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\_1: Podium OLA 1 (south)
- OLA\_2: Podium OLA 2 (central east)
- OLA\_3: Podium OLA 3 (central north)

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

### 3.1.4 Transportation Source Assessment - Analysis and Results

Sound levels due to the adjacent transportation (road) sources were predicted using the RLS-90 standard (RLS,1990) as implemented in the Cadna/A software package.

To assess the impact of transportation noise on suites, the maximum sound level on each façade was determined with the results summarized in **Table 2**. Residential units in the proposed development are present only on the west portion of the podium so only the west façade was assessed for transportation noise.

**Table 2: Predicted Ground Transportation Source Sound Levels – Plane of Window**

Building	Façade	Road		Notes
		Day L <sub>EQ</sub> , 16hr	Night L <sub>EQ</sub> , 8hr	
Tower	North	65 dBA	59 dBA	1
	East	59 dBA	53 dBA	1
	South	56 dBA	50 dBA	1
	West	53 dBA	47 dBA	-
Podium	West	62 dBA	57 dBA	1

**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 C** for guidance regarding air-conditioning as a noise mitigation measure.

A sample ORNAMENT calculation was conducted as comparison to RLS-90. The location of the comparison is a second-storey window at the southern-most townhouse on the ground floor on the west façade of the development. The location is labelled in **Figure 2**. The Cadna/A and RLS-90 results at this location are 60 dBA for daytime and 55 dBA for nighttime. The results were found to be within 1 dB. Sample calculations for at the same location for ORNAMENT are provided in **Appendix E**.

To assess the impact of transportation noise on the qualifying OLAs for the development, predicted sound level results are summarized in **Table 3**.



**Table 3: Transportation Sound Levels in Outdoor Living Areas (OLAs)**

Receptor	Description	Daytime L <sub>EQ</sub> , 16hr	Notes
OLA_01	Podium OLA 1	51 dBA	1
OLA_02	Podium OLA 2	53 dBA	1
OLA_03	Podium OLA 3	56 dBA	2

**Notes:**

1. The predicted sound level meets the NPC-300 criterion for OLAs. Noise control measures are not required.
2. 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.

## 3.2 Stationary Source Assessment

Stationary sources could be grouped into two categories: Those that have a permit with the Ontario Ministry of the Environment, Conservation and Parks (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 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 assess their potential influence on the proposed development. The classifications and setback guidelines are summarized in **Appendix A**.

#### 3.2.1.1 Class III Industries

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



### *3.2.1.2 Class II Industries*

There is one industry within the 1000 m area surrounding the proposed development that has been classified as Class II. However, it is not within the potential influence area of 300 m from the proposed development. A summary of the Class II facility is provided in **Table F-1 and Table F-2** in **Appendix F** and location shown in **Figure F-3**.

### *3.2.1.3 Class I Industries*

There are several industries within the 1000 m area surrounding the proposed development that have been classified as Class I. However, none of these facilities are located within the potential influence area of 70 m from the proposed development. A summary of these facilities within a 1000 m radius has been provided in **Table F-1 and F-2** in **Appendix F** and their location is shown on **Figure F-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 based on the review of the publicly available aerial and street-view imagery.

The results of the D-6 assessment indicate that the nearby facilities are beyond the potential influence setback distances from noise-sensitive (residential) buildings for the proposed development.

Nevertheless, due to the proximity of nearby non-permitted commercial facilities within 70 m of the proposed development, supplementary noise modeling has been conducted to further inform the stationary source assessment.

### *3.2.2.1 Representative Receptors*

Using the “building evaluation” feature of Cadna/A, each façade of proposed residential units in the development was assessed. Additionally, outdoor points of reception (PORs) for this development are assessed at three locations:

- OPOR\_1: Outdoor POR 1
- OPOR\_2: Outdoor POR 2
- OPOR\_3: Outdoor POR 3

The outdoor PORs are displayed in **Figure 3**.

### *3.2.2.2 Assumed Sources and Sound Power Levels*

Stationary sources of noise surrounding the proposed development were identified using a combination of publicly available aerial imagery and street-level imagery.

RWDI proxy data were used for the sound power levels of the HVAC units, Make-up Air Units (MUAs) and exhaust fans included in the model. The assumed sound power levels included in the screening level stationary source assessment are presented in **Table 4**. The locations of the sources summarized in **Table 4** included in the stationary source assessment are illustrated in **Appendix F, Figure F-2**.



**Table 4: Stationary Source Sound Power Level Assumptions**

Source	Proxy Data / Calculation	Sound Power Level	Duty Cycle	
			Daytime and Evening (07:00h – 23:00h)	Nighttime (23:00h – 07:00h)
HVAC_Residential	Proxy Data	75 dBA	Continuous	Continuous/Intermittent <sup>[1]</sup>
HVAC_1Fan	Proxy Data	82 dBA	Continuous	Continuous/Intermittent <sup>[1]</sup>
HVAC_2Fan	Proxy Data	85 dBA or 75 <sup>[2]</sup> dBA	Continuous	Continuous
HVAC_3Fan	Proxy Data	89 dBA	Continuous	Intermittent <sup>[1]</sup>
Exhaust Fan	Proxy Data	78 dBA	Continuous	Continuous/Intermittent <sup>[1]</sup>
MUA	Proxy Data	90 dBA	Continuous	Continuous

**Notes:**

1. Continuous for all sources except at Passage to India and Young Garden, for which source during nighttime were operational 50% of the time.
2. All two-fan units were modelled with a power level of 85 dBA, except for two units at the Wyndham Garden Hotel located in the immediate vicinity of windows leading to sleeping quarters, which were modelled with a power level of 75 dBA. The lower sound power level has been used assuming the hotel selected equipment such that it will not cause any adverse effects in its own suites and their exterior façades.

*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 A**). A sample calculation is included with **Appendix E**.

The predicted sound levels during the worst-case 1-hour from existing stationary sources are presented in **Table 5**. The preliminary model shows the continuous sound levels are predicted to meet sound level criteria. Thus, mitigation for stationary sources is not required.

**Table 5: Predicted Sound Levels at Worst-case Receptor Locations – Continuous Stationary Sources**

Building	Evaluation Location	Stationary Source Sound Level, L <sub>EQ-1hr</sub>		Class 1 Sound Level Criteria L <sub>EQ-1hr</sub>	Notes
		Daytime-Evening 0700-2300h	Nighttime 2300-0700h <sup>[1]</sup>	Day / Night <sup>[1]</sup>	
Tower	North	43 dBA	40 dBA	50 / 45 dBA	Meets Criteria
	East	46 dBA	45 dBA		
	South	41 dBA	41 dBA		
	West	25 dBA	23 dBA		
Podium	West	29 dBA	29 dBA	50 / -- dBA	
OPOR 1	Outdoor POR 1	40 dBA	--		
OPOR 2	Outdoor POR 1	44 dBA	--		
OPOR 3	Outdoor POR 1	47 dBA	--		

**Note:**

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



### 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

Based on the predicted plane of window sound levels it was determined that a sufficient level of sound reduction would be achieved with the Ontario Building Code minimum requirements, for all residential and commercial spaces of the proposed development.

##### 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 the predicted sound levels in OLAs are predicted to be elevated. The combined daytime average sound levels for the OLAs included in the assessment are in the range of 51-56 dBA. To reduce the transportation sound levels in OLAs to meet the applicable criteria, noise barriers are recommended.

The recommended geometry of the noise barrier is included with **Figure 4** (to meet 55 dBA). The barrier heights are summarized in **Table 6**. General guidance with respect to noise barrier design is included with **Appendix C**.

**Table 6: Barrier Height Recommendations for OLAs**

Receptor	Description	Predicted OLA Sound Level	Barrier Height (m) to Meet Sound Level Criterion
		Daytime L <sub>EQ</sub> , 16hr	≤ 55 dBA <sup>1</sup>
OLA_01	Podium OLA 1	51	1 m <sup>[1,2]</sup>
OLA_02	Podium OLA 1	50	1 m <sup>[1,2]</sup>
OLA_03	Podium OLA 1	52	1 m <sup>[1,2]</sup>

**Notes:**

1. Refer to Figure 4 for barrier geometry to meet 55 dBA.
2. If noise control measures are not provided, a warning clause “Type A” is recommended.





### **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), nor cause infractions against the local or regional noise by-laws. 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 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 A to address transportation sound levels in OLAs (if noise controls are not provided).
2. NPC-300 Type D to address transportation sound levels at the plane of window.
3. 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 B**.

## **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 on 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 is expected to be feasible to meet the applicable sound level criteria due to the nature (residential) 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 residential development located 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 and, in the outdoor amenity areas (if noise controls are not provided); and
  - b. Proximity to commercial/industrial land-use.
3. A noise barrier up to 1 m in height may be required along the north and east perimeter of the OLA if warning clause Type A is not included.

The potential noise impact from stationary sources of sound was 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.

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 detailed design to ensure that the acoustical design is adequately implemented in order to meet the applicable criteria.

Based on the results of the analysis, including implementation of the recommendations included with this assessment, the proposed development is predicted to meet the applicable sound and vibration criteria.



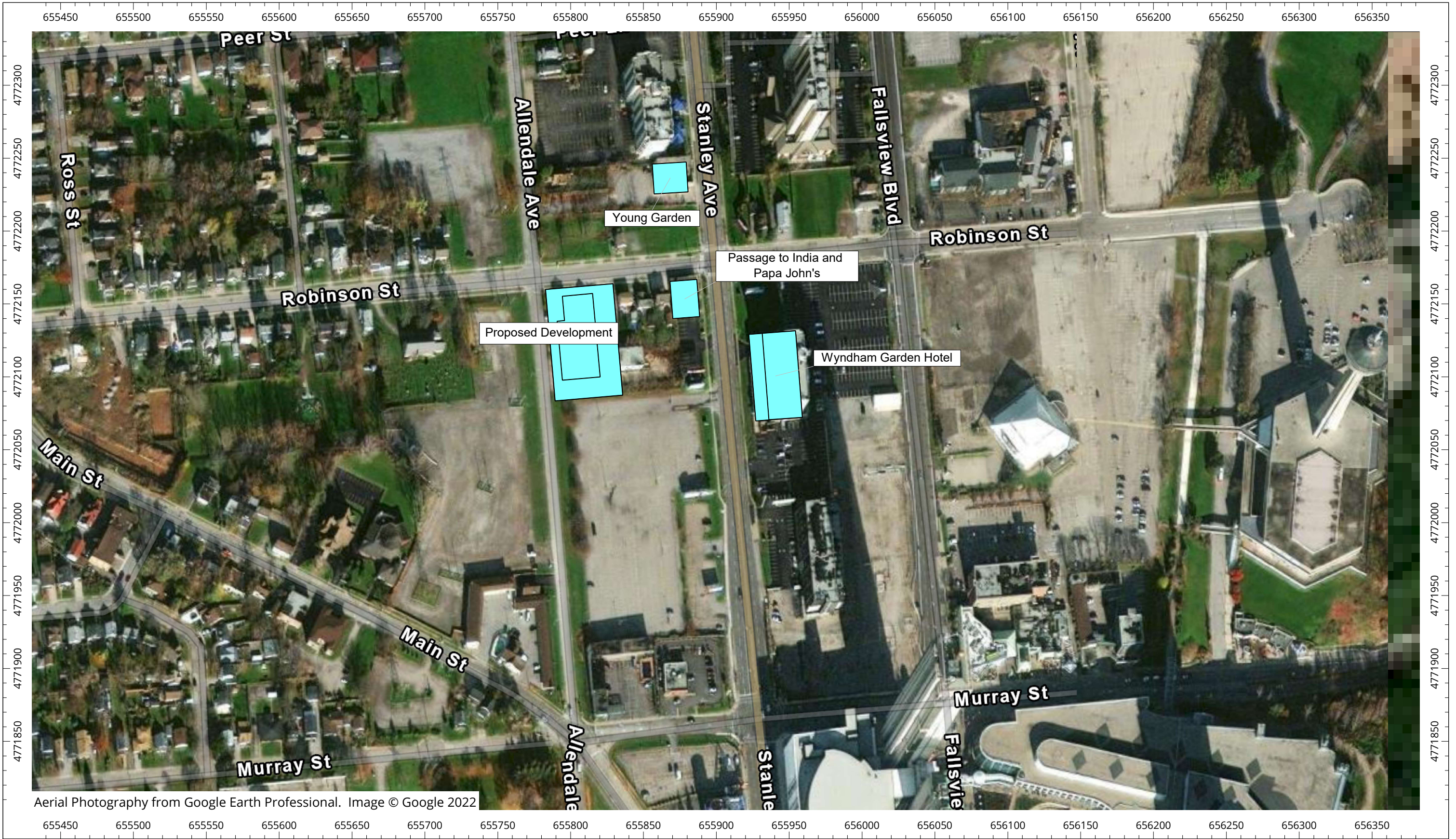
## 6 REFERENCES

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2. Richtlinien für den Lärmschutz an Strassen (RLS). BM für Verkehr, Bonn, 1990 (RLS, 1990).
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# FIGURES





Aerial Photography from Google Earth Professional. Image © Google 2022

**Context Site Plan**

5566 Robinson Street & 6158 Allendale Avenue - Niagara Falls, Ontario

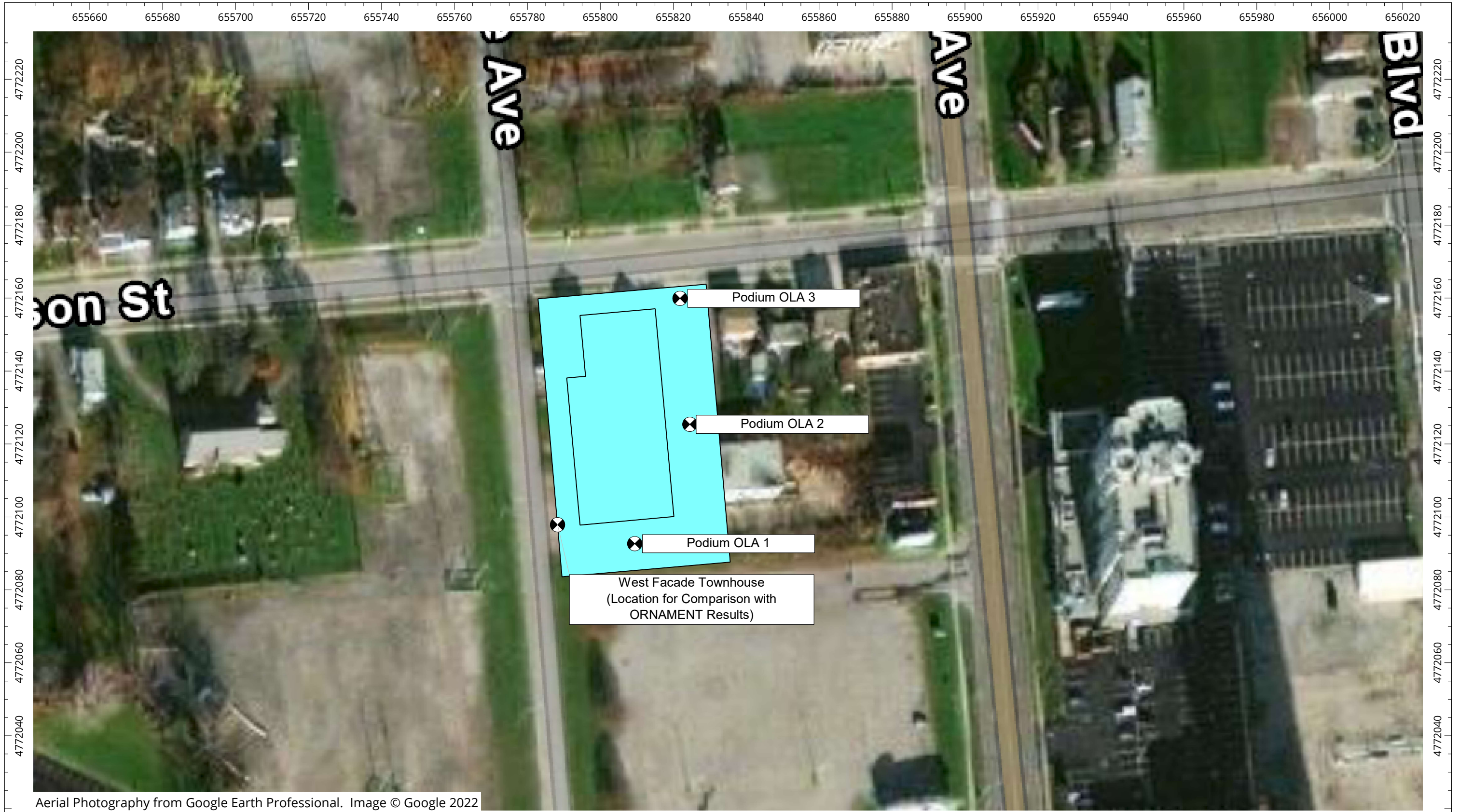


Project #2201139

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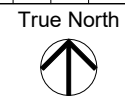


Aerial Photography from Google Earth Professional. Image © Google 2022

**Outdoor Living Areas (OLAs)**

Location of Common Outdoor Amenity Areas

5566 Robinson Street & 6158 Allendale Avenue - Niagara Falls, Ontario

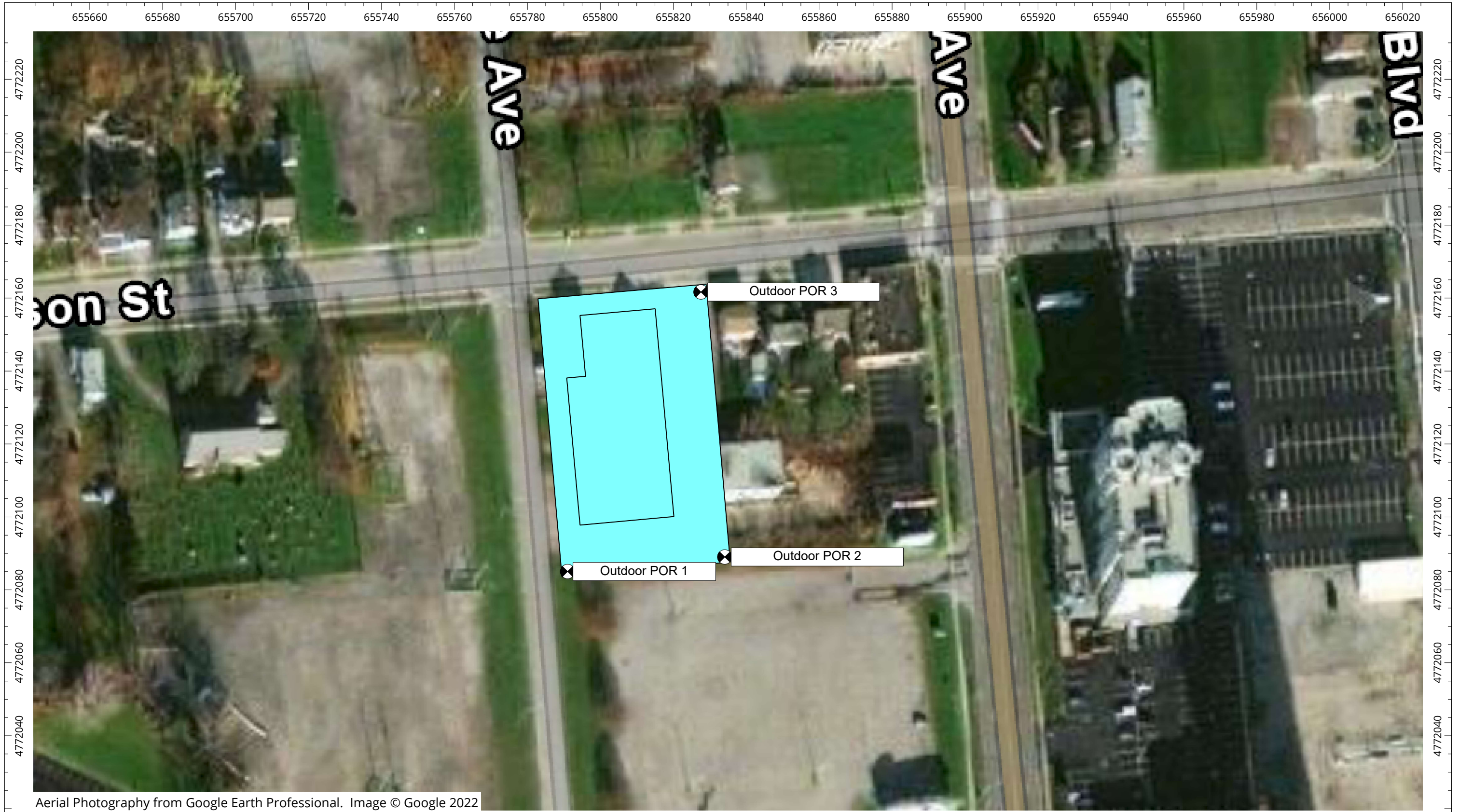


Project #2201139

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**Location of Worst-Case Outdoor Points of Reception (OPORs) for Stationary Source Assessment**

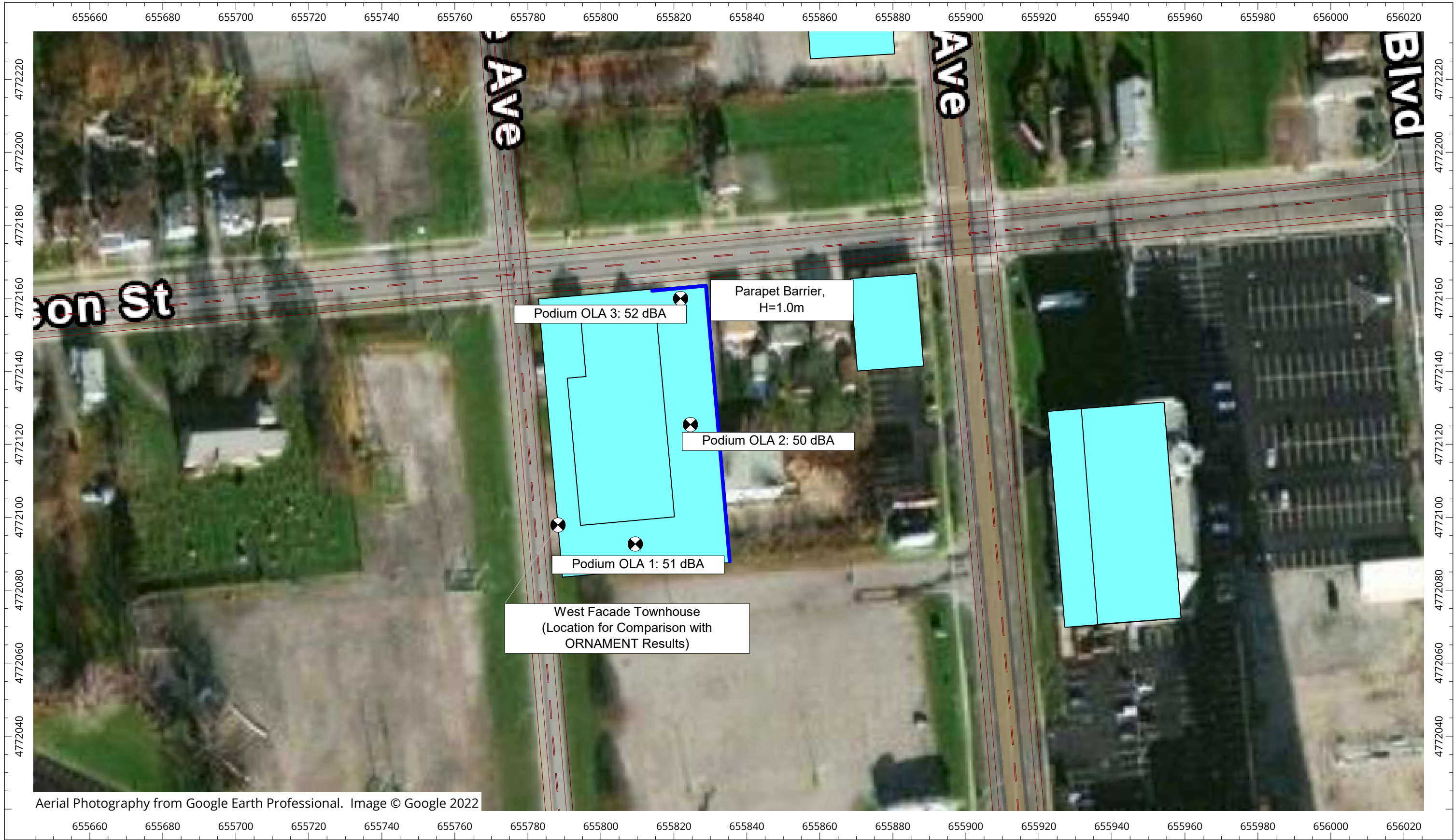
5566 Robinson Street & 6158 Allendale Avenue - Niagara Falls, Ontario

True North  
  
 Project #2201139

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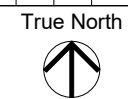




**Outdoor Living Areas (OLAs) Mitigation to 55 dBA**

Recommended Barrier Geometry and Height to meet 55 dBA

5566 Robinson Street & 6158 Allendale Avenue - Niagara Falls, Ontario Project Name - City, Ontario



Project #2201139

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# APPENDIX A

## APPENDIX A: CRITERIA

### A.1 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.

#### A.1.1 Road and Rail

##### A.1.1.1 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 $L_{eq,16-hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8-hr}$ 23:00h – 07:00h
<b>Living Quarters</b> Examples: Living, dining and den areas of residences, hospitals, nursing homes, schools and daycare centres	Road	45 dBA	
	Rail	40 dBA	
<b>Sleeping Quarters</b>	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 $L_{eq,16-hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8-hr}$ 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

### A.1.1.2 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 $L_{eq,16-hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8-hr}$ 23:00h – 07:00h
Outdoor Living Area (OLA) (Combined Road and Rail)	55 dBA	-

### A.1.1.3 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 $L_{eq,16-hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8-hr}$ 23:00h – 07:00h	
Plane of Window (Road)	> 65 dBA	> 60 dBA	<p>Installation of air conditioning to allow windows to remained closed.</p> <p>The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria.</p> <p>Warning clause “Type D” is recommended.</p>
	> 55 dBA	> 50 dBA	<p>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.</p> <p>Applicable for high density development: Air conditioning to allow windows to remained closed. Warning clause “Type D” is recommended.</p>

Assessment Location	Transportation Sound Level (Outdoors)		Recommendations
	Daytime $L_{eq,16-hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8-hr}$ 23:00h – 07:00h	
Plane of Window (Rail <sup>1,2</sup> )	> 60 dBA	> 55 dBA	<p>The acoustical performance of building façade components should be specified such that the indoor sound level limits are predicted to be achieved.</p> <p>Warning clause “Type D” is recommended.</p>
	> 60 dBA ( $L_{eq,24hr}$ ) and < 100m from tracks		<p>Exterior walls consisting of a brick veneer or masonry equivalent for the first row of dwellings.</p> <p>Warning clause “Type D” is recommended.</p>
Outdoor Living Area (Combined Road and Rail <sup>3</sup> )	≤ 60 dBA > 55 dBA	-	<p>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.</p> <p>If noise control measures are not provided, a warning clause “Type A” is recommended.</p>
	> 60 dBA	-	<p>Noise controls (barriers) should be implemented to meet the 55 dBA criterion.</p> <p>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.</p>

**Notes:**

- Whistle noise is included (if applicable) in the determination of the sound level at the plane of window.
- 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.
- Whistle noise is not included in the determination of the sound level at the OLA.

### A.1.1.4 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  $L_{eq,1-hr}$ , for any one-hour period.

### A.1.1.5 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).

## A.1.2 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  $NEF = L_{A,eq,24hr} - 32$  dBA.

**Table 5: Indoor Sound Level Criteria for Aircraft Sources**

Assessment Location	Indoor Sound Level Criteria NEF ( $L_{eq, 24hr}$ ) <sup>1</sup>
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 <sup>1</sup>
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 <sup>1</sup>
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 <sub>EQ,24-hr</sub> )	
Outdoors	≥NEF 30	<p>Air conditioning to allow windows to remained closed.</p> <p>The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria.</p> <p>Warning clauses “Type D” and “Type B” are recommended.</p>
	<p>&lt; NEF 30</p> <p>≥ NEF 25</p>	<p>The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria.</p> <p>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.</p> <p>Applicable for high density development: Air conditioning to allow windows to remained closed. Warning clause “Type D” is recommended.</p>
	< NEF 25	Further assessment not required

## A.2 Stationary Sources

### A.2.1 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 ( $L_{Aeq-1hr}$ )

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
<b>Daytime 0700-1900h</b>	50 dBA	50 dBA	50 dBA	50 dBA	45 dBA	45 dBA	55 dBA	60 dBA
<b>Evening 1900-2300h</b>	50 dBA	50 dBA	45 dBA	50 dBA	40 dBA	40 dBA	55 dBA	60 dBA
<b>Nighttime 2300-0700h</b>	--	45 dBA	--	45 dBA	--	40 dBA	--	55 dBA

**Notes:**

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<sub>LM</sub>)

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

**Notes:**

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

## A.2.2 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)
<b>Class I</b>	Small scale, self-contained, daytime only, infrequent heavy vehicle movements, no outside storage.	70 m	20 m
<b>Class II</b>	Medium scale, outdoor storage of wastes or materials, shift operations and frequent heavy equipment movement during the daytime.	300 m	70 m
<b>Class III</b>	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
<b>Outputs</b>	<ul style="list-style-type: none"> <li>• Sound not audible off property</li> <li>• Infrequent dust and/ or odour emissions and not intense</li> <li>• No ground-borne vibration</li> </ul>	<ul style="list-style-type: none"> <li>• Sound occasionally audible off property</li> <li>• Frequent dust and/ or odour emissions and occasionally intense</li> <li>• Possible ground-borne vibration</li> </ul>	<ul style="list-style-type: none"> <li>• Sound frequently audible off property</li> <li>• Persistent and intense dust and/ or odour emissions</li> <li>• Frequent ground-borne vibration</li> </ul>
<b>Scale</b>	<ul style="list-style-type: none"> <li>• No outside storage</li> <li>• Small scale plant or scale is irrelevant in relation to all other criteria</li> </ul>	<ul style="list-style-type: none"> <li>• Outside storage permitted</li> <li>• Medium level of production</li> </ul>	<ul style="list-style-type: none"> <li>• Outside storage of raw and finished products</li> <li>• Large production levels</li> </ul>
<b>Process</b>	<ul style="list-style-type: none"> <li>• Self-contained plant or building which produces / stores a packaged product</li> <li>• Low probability of fugitive emissions</li> </ul>	<ul style="list-style-type: none"> <li>• Open process</li> <li>• Periodic outputs of minor annoyance</li> <li>• Low probability of fugitive emissions</li> </ul>	<ul style="list-style-type: none"> <li>• Open process</li> <li>• Frequent outputs of major annoyances</li> <li>• High probability of fugitive emissions</li> </ul>
<b>Operation / Intensity</b>	<ul style="list-style-type: none"> <li>• Daytime operations only</li> <li>• Infrequent movement of products and/or heavy trucks</li> </ul>	<ul style="list-style-type: none"> <li>• Shift operations permitted</li> <li>• Frequent movements of products and/or heavy trucks with majority of movements during daytime hours</li> </ul>	<ul style="list-style-type: none"> <li>• Continuous movement of products and employees</li> <li>• Daily shift operations permitted</li> </ul>
<b>Examples</b>	<ul style="list-style-type: none"> <li>• Electronics Manufacturing</li> <li>• Furniture refinishing</li> <li>• Beverage bottling</li> <li>• Auto parts</li> <li>• Packaging services</li> <li>• Dairy distribution</li> <li>• Laundry and linen supply</li> </ul>	<ul style="list-style-type: none"> <li>• Magazine printing</li> <li>• Paint spray booths</li> <li>• Metal command</li> <li>• Electrical production</li> <li>• Dairy product manufacturing</li> <li>• Feed packing plant</li> </ul>	<ul style="list-style-type: none"> <li>• Paint and varnish manufacturing</li> <li>• Organic chemicals manufacturing</li> <li>• Breweries</li> <li>• Solvent recovery plant</li> <li>• Soap manufacturing</li> <li>• Metal manufacturing</li> </ul>

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# APPENDIX B

## APPENDIX B: 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:

### B.1 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  $\leq$  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  $\leq$  60 dBA, and noise controls have been provided. Recommended to address outdoor aircraft sound levels  $\geq$  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."*

## B.2 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."*

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# APPENDIX C

## APPENDIX C: NOISE MITIGATION GUIDANCE

### C.1 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<sup>2</sup>
  - 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<sup>2</sup> face weight by the material density (kg/m<sup>3</sup>). 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.

### C.2 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.



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# APPENDIX D

StationID	Reg_Rd_No	From_St	To_St	Length_Km	Count_Yr	AADT	SADT	WADT	Prev_Yr	Prev_Count	SHAPE_Length
610001	81	Regional Boundary	REG. RD. 10 (Casablanca Blvd.)	3.2	2020	5700	5900	6700	2017	7000	3076.00989
610002	10	REG. RD. 40 (South Service Rd.)	REG. RD. 512 (Livingston Ave.)	0.6	2020	10500	11100	11700	2017	12000	423.509196
610003	81	REG. RD. 10 (Casablanca Blvd.)	Kerman Avenue	1.8	2020	10500	11100	7600	2017	7600	1689.453546
610004	512	Kerman Avenue	REG. RD. 81 (Main St.W.)	0.8	2020	9900	10500	10900	2017	10900	970.962334
610006	81	REG. RD. 512 (Livingston Ave.)	REG. RD. 12 (Mountain St.)	0.2	2020	12900	11600	13300	2017	12900	187.2330605
610008	12	Elm Street	Ridge Road E.	1	2020	8200	8800	9200	2017	9100	477.2755804
610013	81	Maple Avenue	Park Road S.	2	2020	12500	12700	13400	2017	13300	2373.691803
610014	81	REG. RD. 14 (Bartlett Ave.)	Thirty Road	2.1	2020	9600	9900	11200	2017	11600	2647.430538
610017	73	Regional Boundary	Woolverton Road	3.1	2020	2300	2400	2700	2017	2800	2944.770106
610018	73	Woolverton Road	REG. RD. 12 (Mountain Rd.)	3.2	2020	2700	2700	3200	2017	3400	3282.129595
610020	12	REG. RD. 73 (Mud St.)	REG. RD. 20 (Highway 20)	3.2	2020	5500	5500	4200	2017	4800	3274.253786
610021	12	Ridge Road E.	REG. RD. 73 (Mud St.)	4.2	2020	6500	6700	6100	2017	7800	4837.372931
610022	73	REG. RD. 12 (Mountain Rd.)	Park Road S.	2.4	2020	3300	3400	3600	2017	3900	2482.391567
610025	14	REG. RD. 73 (Mud St. E.)	REG. RD. 20 (West St.)	4.4	2020	4300	4000	3600	2017	4000	4406.227593
610027	14	Convenient Street	REG. RD. 14 (Townline Rd.)	0.8	2020	7500	7300	7100	2017	7000	857.1768763
610028	14	Port Davidson Road	REG. RD. 65 (Bismark Rd.)	7.2	2020	3300	3600	3000	2017	3100	7509.895654
610030	65	REG. RD. 14 (Smithville Rd.)	Port Davidson Road	5	2020	4900	4400	4400	2017	4400	5174.279802
610032	65	Regional Boundary (Westbrook Rd.)	REG. RD. 2 (Caistorville Rd.)	1.4	2020	5900	6800	5800	2017	5600	1459.104312
610033	65	REG. RD. 2 (Caistorville Rd.)	Caistor Centre Road	5.8	2020	3700	4400	3200	2017	3600	6075.484696
610034	65	Caistor Centre Road	REG. RD. 14 (Smithville Rd.)	3.9	2020	3900	4600	3700	2017	4300	3847.094957
610035	2	REG. RD. 65 (Bismark Rd.)	REG. RD. 9 (York Rd.)	5	2017	2300	2300	2200	2014	2500	5122.620898
610036	9	Regional Boundary (Westbrook Rd.)	REG. RD. 2 (Caistorville Rd.)	3.2	2020	700	700	600	2017	700	3396.068935
610037	2	REG. RD. 9 (York Rd.)	Regional Boundary (Indian Line)	1.8	2017	3000	3200	2700	2014	2000	1782.859924
610038	14	REG. RD. 65 (Bismark Rd.)	Regional Boundary	6.1	2020	2100	2300	1700	2017	1900	6012.687275
610040	63	REG. RD. 45	Port Davidson Road	1	2020	2500	2700	2500	2017	2700	1267.711196
610041	45	REG. RD. 63 (Canborough Rd.)	REG. RD. 7 (Marshagan Rd.)	3.4	2020	1300	1500	1200	2017	1000	3470.215905
610042	15	REG. RD. 63 (Canborough Rd.)	Regional Boundary (Townline Rd.)	0.5	2020	2500	2700	2600	2017	2700	509.364458
610043	63	Port Davidson Road	REG. RD. 27 (Wellandport Rd.)	6.3	2020	1800	2700	1100	2017	1500	6367.801338
610044	7	REG. RD. 45 (Creek Rd.)	Regional Boundary	15.3	2020	400	500	400	2017	500	1512.001858
610045	45	REG. RD. 7 (Marshagan Rd.)	REG. RD. 27	4.7	2020	500	600	300	2017	500	4836.174736
610046	4	REG. RD. 27	King's Hwy 3	6.4	2020	2600	3000	2300	2017	2600	6677.902343
610047	27	REG. RD. 63 (Canborough Rd.)	REG. RD. 45	1	2020	2600	2800	2200	2017	2500	961.3668293
610048	27	REG. RD. 65 (Bismark Rd.)	REG. RD. 63 (Canborough Rd.)	4.8	2020	4100	4700	3800	2017	4100	4570.083041
610049	65	Port Davidson Road	REG. RD. 27 (Wellandport Rd.)	4.2	2020	3900	4800	3200	2017	3600	4224.639899
610051	69	REG. RD. 20 (Highway 20)	St. Ann's Road	1.3	2020	1200	1300	1700	2017	1700	1252.857709
610053	73	REG. RD. 14 (Thirty Rd.)	REG. RD. 18 (Mountain Rd.)	3.7	2020	3100	3100	2800	2017	3000	3618.577973
610054	18	REG. RD. 81 (King St.)	REG. RD. 73 (Fly Rd.)	3.7	2020	6300	6400	5800	2017	5700	3682.842216
610055	73	REG. RD. 18 (Mountain Rd.)	Camden Road	4.2	2020	2900	3200	2700	2017	2900	4230.92641
610056	81	Thirty Road	REG. RD. 18 (Ontario St.)	2	2020	6900	8400	9600	2017	9500	2434.873386
610057	81	REG. RD. 18 (Mountain St.)	Merritt Road	3.5	2020	6400	6800	7000	2017	7100	3415.324997
610058	18	Greenlane Road	REG. RD. 81 (King St.)	2.6	2020	12800	12400	15000	2017	13400	1690.707437
610059	81	Merritt Road	REG. RD. 24 (Victoria Ave.)	3.5	2020	6400	6900	6200	2017	6300	3641.522592
610060	81	REG. RD. 24 (Victoria Ave.)	Nineteenth Street	2.7	2019	6400	7300	5500	2016	5500	2493.036353
610061	81	Nineteenth Street	REG. RD. 26 (Jordan Rd.)	0.5	2019	5500	6800	4500	2016	4100	952.478128
610062	81	REG. RD. 26 (Jordan Rd.)	REG. RD. 34 (Seventh St. Louth)	4.5	2019	3700	4100	3500	2016	3400	4432.530127
610063	69	Mountain Road	Camden Road	4.2	2020	900	900	1200	2017	1200	4531.896569
610064	69	Camden Road	REG. RD. 24 (Vineland Townline Rd.)	3.5	2020	1000	1000	1100	2017	1100	3371.700538
610065	69	REG. RD. 24 (Vineland Townline Rd.)	REG. RD. 669 (Eighth Ave.)	3.5	2019	1200	1300	1200	2016	1100	4188.891733
610066	69	REG. RD. 669 (Eighth Ave.)	REG. RD. 28 (Fifth St. Louth)	4	2019	2500	2400	2600	2016	2400	4484.874839
610067	69	REG. RD. 28 (Fifth St. Louth)	Power Glen	2.3	2019	2900	3300	2600	2016	3100	2377.134371
610069	73	Camden Road	REG. RD. 24 (Victoria Ave.)	3.4	2020	2800	3000	3100	2017	3100	3406.862866
610072	24	Marina Boulevard	REG. RD. 81 (King St.)	4	2020	12400	13300	13200	2017	13400	4040.185879
610073	24	Sixth Avenue	REG. RD. 669 (Eighth Ave.)	2.1	2020	9500	10900	9600	2017	9700	2041.970697
610074	24	REG. RD. 81 (King St.)	REG. RD. 73 (Fly Rd.)	1.6	2020	10800	12000	10800	2017	10800	1649.053096
610075	24	REG. RD. 669 (Eighth Ave.)	REG. RD. 69 (Twenty Mile Rd.)	1.9	2020	9600	10600	7700	2017	9700	2080.037546
610076	24	REG. RD. 69 (Twenty Mile Rd.)	REG. RD. 20 (Highway 20)	6	2020	9100	10200	8900	2017	9200	5845.896134
610077	24	REG. RD. 20 (Highway 20)	REG. RD. 63 (Canborough Rd.)	2.1	2020	8000	9100	7800	2017	8100	2163.132617
610078	24	REG. RD. 63 (Canborough Rd.)	REG. RD. 29 (Webber Rd.)	4.3	2020	6700	7600	6500	2017	6800	4285.580822
610079	24	REG. RD. 29 (Webber Rd.)	REG. RD. 27	1.3	2020	5400	5700	5400	2017	5800	1143.737827
610080	24	REG. RD. 27	REG. RD. 23 (Forks Rd.)	3.5	2020	5800	6300	5700	2017	6100	3642.695794
610081	23	REG. RD. 24	Deeks Road S.	4.2	2019	3600	3900	3300	2016	3600	4184.092427
610082	3	REG. RD. 3 (Station Rd.)	King's Hwy 3	0.8	2019	1800	1900	1600	2014	2100	772.804499
610083	3	Brawn Road	REG. RD. 3 (Station Rd.)	0.8	2020	1400	1500	700	2017	1100	833.855006
610084	3	Regional Boundary	Brawn Road	4.8	2020	1100	1100	600	2017	900	4532.853753
610087	27	REG. RD. 627 (O'Reillys Rd. N.)	Broadway	4.2	2019	2300	2300	2500	2016	1800	4160.792044
610088	27	REG. RD. 45	REG. RD. 24 (Vineland Townline Rd.)	8.7	2020	2900	3300	2600	2017	2800	8652.01702
610089	29	REG. RD. 24 (Vineland Townline Rd.)	REG. RD. 529 (Effingham St.)	5.8	2019	4700	4700	4700	2016	4500	5781.023583
610090	63	REG. RD. 27 (Wellandport Rd.)	REG. RD. 24 (Vineland Townline Rd.)	8.8	2020	2700	3000	2600	2017	2800	8131.151669
610101	81	REG. RD. 34 (Seventh St. Louth)	REG. RD. 72 (Louth St.)	3.9	2019	8900	8900	7300	2016	7500	3925.080609
610102	26	REG. RD. 77 (Fourth Ave.)	REG. RD. 81 (King St.)	1.3	2019	2600	3000	2400	2016	2200	1252.537897
610103	26	Honsberger Avenue	REG. RD. 77 (Fourth Ave.)	0.9	2019	4700	5100	4400	2016	4600	2060.342012
610104	77	REG. RD. 26 (Jordan Rd.)	REG. RD. 34 (Seventh St. Louth)	2.7	2019	4700	5499	4100	2014	3100	4227.025777
610105	34	REG. RD. 40 (South Service Rd.)	REG. RD. 77 (Fourth Ave.)	2.7	2019	6600	6900	5800	2016	3400	2516.569553
610106	87	REG. RD. 34 (Seventh St. Louth)	REG. RD. 38 (Martindale Rd.)	1.9	2019	3800	4200	2900	2016	2500	1952.698447
610107	38	REG. RD. 87 (Lakeshore Rd. W.)	REG. RD. 40 (South Service Rd.)	1.8	2019	6600	6900	5400	2016	6100	1955.071125
610108	77	First Street Louth	REG. RD. 38 (Martindale Rd.)	1.1	2019	19700	15700	20700	2016	17300	1789.910038
610109	34	REG. RD. 77 (Fourth Ave.)	REG. RD. 81 (St. Paul St. W.)	1.6	2019	3200	3700	2800	2016	2100	1651.957264
610110	87	Seaway Haulage Road	REG. RD. 86 (Stewart Rd.)	1.3	2018	8400	8800	8000	2015	7300	1287.664452
610111	87	REG. RD. 86 (Stewart Rd.)	East and West Line	2.6	2018	7000	7100	6800	2015	6000	2611.298845
610112	87	East and West Line	Four Mile Creek Road	3	2018	3200	3800	2500	2015	2600	4361.5361
610113	87	Four Mile Creek Road	Shakespeare Avenue	4.5	2018	2800	2700	2800	2015	2500	2694.202036
610123	100	REG. RD. 55 (Niagara Stone Rd.)	REG. RD. 81 (York Rd.)	7.2	2018	7500	10000	6200	2015	6400	7381.425623
610124	81	REG. RD. 55 (Niagara Stone Rd.)	REG. RD. 89 (Glendale Ave.)	1.8	2018	5800	6200	5400	2015	5900	3184.755051
610125	81	REG. RD. 100 (Four Mile Creek Rd.)	Concession 1 Road	2.6	2018	6500	5200	7000	2015	4400	2654.176379
610126	81	Concession 1 Road	Niagara River Parkway	1	2018	1800	1900	1600	2015	1700	1172.047598
610128	70	REG. RD. 55 (Niagara Stone Rd.)	REG. RD. 58 (Homer Rd.)	0.8	2018	9300	9500	9100	2		

610156	98 REG. RD. 20 (Lundy's Lane)	McLeod Road	2.1	2018	9200	0	9100	2015	8900	2219.890276
610157	49 REG. RD. 98 (Montrose Rd.)	Oakwood Drive	0.2	2018	22600	23300	22100	2015	26800	1435.018868
610158	63 REG. RD. 70 (Thorold Townline Rd.)	REG. RD. 98 (Montrose Rd.)	4.5	2018	2300	2500	2200	2015	1800	4454.370001
610162	63 REG. RD. 82 (Allanport Rd.)	REG. RD. 84 (Moyer Rd.)	2.1	2018	2600	2600	2500	2016	2400	1170.916263
610163	84 REG. RD. 63 (Chippawa Creek Rd.)	Biggar Road	1.9	2018	6200	6200	6100	2015	4900	969.8545003
610164	98 REG. RD. 63 (Chippawa Creek Rd.)	REG. RD. 47 (Lyons Creek Rd.)	2.1	2018	6400	6300	6400	2015	6200	2127.586903
610167	47 REG. RD. 98 (Montrose Rd.)	REG. RD. 102 (Stanley Ave.)	4.8	2018	9000	9500	8700	2015	8000	3865.741329
610168	116 REG. RD. 47 (Lyons Creek Rd.)	Weinbrenner Road	1.8	2018	4800	5000	4600	2015	4000	367.3034464
610171	116 Q.E.W. (int. # 116QEW includes prov.Roads)	REG. RD. 25 (Netherby Rd.)	2.9	2018	8900	10300	8100	2015	8000	2758.569228
610173	25 REG. RD. 116 (Sodom Rd.)	Q.E.W.	2.7	2018	3800	3900	3600	2015	3500	2608.894249
610174	25 REG. RD. 98 (Montrose Rd.)	REG. RD. 116 (Sodom Rd.)	5.5	2018	5100	5400	4800	2015	4400	5431.745592
610175	116 REG. RD. 25 (Netherby Rd.)	East Main Street	2.5	2018	9400	9700	9200	2015	9800	2133.810131
610177	98 REG. RD. 27 (Schisler Rd.)	REG. RD. 25 (Netherby Rd.)	4.8	2018	4100	0	4000	2015	4300	4957.857518
610179	27 REG. RD. 84 (Moyer Rd.)	REG. RD. 98 (Montrose Rd.)	5.1	2018	7100	8000	6600	2015	7200	5207.977248
610180	84 Biggar Road	REG. RD. 27 (East Main St.)	2.1	2018	7800	7900	7700	2015	5800	3191.474724
610181	84 REG. RD. 27 (East Main St.)	Lyons Creek Road	1	2018	1900	2400	1500	2015	1400	961.9107184
610183	84 Lyons Creek Road	Ridge Road	2.1	2018	1800	2400	1400	2015	1400	2138.048344
610185	84 Ridge Road	REG. RD. 525 (Keefer Dr.)	1.1	2018	1300	1900	1000	2015	1400	1702.646474
610187	25 REG. RD. 525 (Townline Tunnel Rd.)	REG. RD. 98 (Montrose Rd.)	3.1	2018	6900	7400	6600	2015	6100	4571.667475
610188	84 REG. RD. 525 (Keefer Dr.)	Forkes Road	2.1	2018	1500	1700	1200	2015	1000	1719.520311
610193	84 Forkes Road	Main Street East	3.8	2018	1300	1600	1000	2015	900	5797.217349
610202	21 REG. RD. 116 (Stevensville Rd.)	Ridgemount Road	4	2018	1600	1900	1400	2015	1900	4094.244476
610203	116 REG. RD. 21 (Bowen Rd.)	King's Hwy 3	3.4	2018	8200	8600	7900	2015	8300	3378.73977
610207	116 King's Hwy 3	REG. RD. 1 (Dominion Rd.)	2.1	2018	9200	10900	8200	2015	9000	2067.551674
610211	1 Buffalo Road	REG. RD. 122 (Helena St.)	2.5	2018	3500	3500	3300	2015	3200	2475.048437
610212	1 REG. RD. 122 (Helena St.)	Lakeshore Road	1.6	2018	2600	2400	2600	2015	1900	1724.818613
610214	21 Ridgemount Road	Q.E.W. (int. # 021QEN)	1.8	2018	2200	2800	1700	2015	3000	1886.042032
610215	21 Q.E.W. (int. # 021QEN)	REG. RD. 122 (Thompson Rd.)	3.5	2018	2100	2800	1700	2015	2700	3278.185949
610216	21 REG. RD. 122 (Thompson Rd.)	REG. RD. 124 (Central Ave.)	2.1	2018	1700	1900	1500	2015	1800	2054.258089
610217	19 Spears Road N.	REG. RD. 122 (Thompson Rd.)	2.1	2018	4000	3600	4100	2015	3400	1742.750743
610218	19 REG. RD. 122 (Thompson Rd.)	Concession Road	1	2018	4100	3900	4100	2015	4000	1021.38782
610219	122 Bertie Street	REG. RD. 3 (Garrison Rd.)	0.8	2018	9400	9300	9300	2015	9400	1459.850075
610220	122 REG. RD. 3 (Garrison Rd.)	REG. RD. 1 (Dominion Rd.)	2.1	2018	1000	1000	900	2015	1300	2186.137422
610221	124 Jarvis Street	REG. RD. 19 (Gilmore Rd.)	0.8	2018	5200	5200	5100	2015	4000	1037.246302
610222	124 REG. RD. 19 (Gilmore Rd.)	Bertie Street	0.8	2018	5300	5300	5200	2015	5700	830.4044079
610223	124 Bertie Street	Q.E.W. (int. # 124QES)	0.5	2018	5900	7000	5200	2015	5500	956.8286751
610224	124 Q.E.W. (int. # 124QES)	REG. RD. 3 (Garrison Rd.)	0.2	2018	7300	7500	7200	2015	7100	338.9719381
610226	122 REG. RD. 19 (Gilmore Rd.)	Bertie Street	0.8	2018	3700	3600	3600	2015	3700	891.1181837
610228	3 Concession Road	REG. RD. 124 (Central Ave.)	1	2018	9800	10600	9300	2015	10700	1019.656627
610230	36 Thorold Road	REG. RD. 29 (Webber Rd.)	1.8	2019	9700	9100	9000	2016	9400	1727.168616
610231	29 REG. RD. 36 (S. Pelham Rd.)	REG. RD. 27 (Riverside Dr.)	1.6	2019	7900	8100	7500	2016	8500	1534.230284
610232	54 Quaker Road	REG. RD. 41 (Woodlawn Rd.)	1	2019	7000	5900	7800	2016	7700	1017.673905
610233	54 REG. RD. 20 (Highway 20 E.)	Port Robinson Road	1.1	2019	5900	5500	6900	2016	7000	1136.679816
610234	50 Port Robinson Road	REG. RD. 37 (Merritt Rd.)	1	2019	9300	8400	7500	2016	6300	1026.46918
610235	50 REG. RD. 20 (Highway 20)	Port Robinson Road	2.1	2019	7600	7900	6600	2016	6000	2162.17112
610236	54 Thorold Road	Fitch Street	1.1	2019	16800	16400	15500	2016	16400	1248.589001
610237	54 Fitch Street	REG. RD. 27 (West Main St.)	0.6	2019	22000	20200	20600	2016	18800	588.489051
610238	54 REG. RD. 27 (West Main St.)	REG. RD. 27 (Riverside Dr.)	0.2	2019	21400	22900	19000	2016	18500	138.3282412
610239	27 REG. RD. 29 (Lincoln St.)	REG. RD. 54 (Prince Charles Dr. N.)	1.1	2019	1400	1400	1100	2016	1300	1044.335938
610240	54 REG. RD. 27 (Riverside Dr.)	REG. RD. 29 (Lincoln St.)	0.5	2019	19300	20200	18100	2016	18200	671.3803357
610241	29 REG. RD. 27 (Riverside Dr.)	REG. RD. 54 (Prince Charles Dr. S.)	0.8	2019	10900	11200	11000	2016	10900	811.483316
610242	27 Broadway	REG. RD. 29 (Lincoln St.)	1.1	2019	3700	4000	3400	2016	4500	1151.802312
610244	54 Broadway	REG. RD. 33 (Humberstone Rd.)	1.4	2019	13100	12200	12400	2016	12300	1454.817022
610246	54 REG. RD. 29 (Lincoln St.)	Broadway	1.1	2019	16000	16300	15200	2016	17500	1057.429525
610251	27 REG. RD. 54 (Prince Charles Dr. N.)	REG. RD. 50 (Niagara St.)	0.5	2019	11100	11500	10000	2016	9900	516.7282192
610252	50 Thorold Road	REG. RD. 27 (West Main St.)	1.3	2019	14400	14200	12900	2016	12400	1407.332129
610253	27 REG. RD. 50 (Niagara St.)	REG. RD. 68 (King St.)	0.2	2019	8200	3900	9600	2016	9000	166.8846962
610254	27 REG. RD. 68 (King St.)	Hellems Avenue	0.3	2019	6900	7700	7200	2016	7500	329.5575886
610255	27 Hellems Avenue	REG. RD. 527 (Burgar St.)	0.3	2019	7700	7200	6300	2016	8400	232.381947
610256	527 REG. RD. 68 (King St.)	Hellems Avenue	0.3	2019	7500	7200	6300	2016	7200	361.7576255
610257	527 Hellems Avenue	REG. RD. 527 (Burgar St.)	0.3	2019	7400	6200	5000	2016	5100	262.7735559
610258	527 REG. RD. 527 (Division St.)	REG. RD. 27 (East Main St.)	0.2	2019	3100	3400	2700	2016	3200	119.5317903
610259	27 REG. RD. 527 (Burgar St.)	Crowland Avenue	0.6	2019	13100	13200	12700	2016	13800	619.1275187
610260	27 Crowland Avenue	Wellington Street	0.8	2019	15100	15500	14900	2016	14300	900.5481936
610261	27 Wellington Street	King's Hwy 140	1	2016	18900	21300	17600	2013	18600	3498.164007
610273	101 Q.E.W. (int. # 101QEN)	Dorchester Road	1.6	2018	12700	13200	12400	2015	12500	1790.929308
610274	101 Dorchester Road	REG. RD. 100 (St. Paul Ave.)	1	2018	10300	11600	9600	2015	9100	1052.004056
610275	100 REG. RD. 61 (Niagara Townline Rd.)	REG. RD. 101 (Mountain Rd.)	1.3	2018	10800	11700	10300	2015	9700	1354.321873
610276	101 REG. RD. 100 (St. Paul Ave.)	REG. RD. 101 (Portage Rd.)	0.6	2018	2700	2800	2600	2015	2600	675.3010959
610277	101 REG. RD. 101 (Mountain Rd.)	REG. RD. 102 (Stanley Ave.)	0.5	2018	3400	3600	3100	2015	3000	541.5490446
610278	102 REG. RD. 61 (Niagara Townline Rd.)	REG. RD. 101 (Portage Rd.)	1.1	2018	8200	9500	7500	2015	6400	1136.153388
610282	102 Church's Lane	REG. RD. 57 (Thorold Stone Rd.)	1.6	2018	5600	6100	5300	2015	4300	1699.53401
610283	57 Q.E.W.	Dorchester Road	0.6	2018	31300	31400	31100	2015	23100	1325.12026
610284	57 Dorchester Road	Drummond Road	1	2018	20400	21300	19900	2015	18000	1045.12604
610287	57 Drummond Road	REG. RD. 102 (Stanley Ave.)	1	2018	17500	15800	18200	2015	15300	1547.554493
610288	102 REG. RD. 57 (Thorold Stone Rd.)	REG. RD. 43 (Bridge St.)	0.8	2018	13700	14400	13200	2015	12500	756.5028423
610289	43 REG. RD. 102 (Stanley Ave.)	Victoria Avenue	1.1	2018	8800	9500	8400	2016	8600	1026.943444
610292	43 Victoria Avenue	River Road	1.1	2018	2300	2700	1900	2016	3900	1144.177134
610304	102 Morrison Street	REG. RD. 420 (Falls Ave.)	1	2018	16300	17100	15800	2015	13200	1097.99073
610305	102 REG. RD. 43 (Bridge St.)	Morrison Street	0.3	2018	10900	11500	10500	2015	10600	456.1851433
610306	20 REG. RD. 98 (Montrose Rd.)	Dorchester Road	1	2018	23000	24300	22200	2015	22500	1634.514071
610310	20 Dorchester Road	Drummond Road	1.1	2018	22300	24200	21300	2015	23200	1244.300345
610312	20 Drummond Road	Main Street	0.5	2018	18000	19400	17200	2015	16500	468.345565
610313	20 Main Street	REG. RD. 102 (Stanley Ave.)	0.6	2018	12700	14200	11800	2015	12800	736.8933835
610314	102 REG. RD. 420 (Falls Ave.)	REG. RD. 20 (Ferry St.)	0.6	2018	20500	25300	17900	2015	18200	834.8805503
610318	102 REG. RD. 20 (Ferry St.)	Robinson Street	0.3	2018	18900	22200	17200	2015	16300	361.1520099
610319	102 Murray Street	Dunn Street	0.5	2018	11400	13500	10200	2015	11200	735.7229828
610324	49 Oakwood Drive	Dorchester Road	0.8	2018	26800	29300	25400	2015	24400	759.5288545
610325	49 Dorchester Road	Drummond Road	1.1	2018	18600	20500	17600	2015	18600	1045.971524
610326	49 Drummond Road	REG. RD. 102 (Stanley Ave.)	1.1	2018	13900	16200	12700	2015	14700	1154.259114
610327	102 Dunn Street	REG. RD. 49 (Marineland Pkwy.)	0.9	2018	8500	10000	7600	2015	8400	1805.324702
610328	3 Port Colborne Wainfleet Townline Road	REG. RD. 5 (Killaly St. W.)	0.6	2019	8500	9000	9200	2016	7800	427.4113243
610329	3 REG. RD. 5 (Killaly St. W.)	West Side Road	1	2019	6400	7300	6000	2016	6700	1129.972745
610332	3 West Side Road	Steele Street	0.5	2019	8400	5600	9700	2016	10200	413.3517739
610340	3 King Street	REG. RD. 3A (Mellanby Ave.)	0.5	2019	11900	12000	12100	2016	11800	466.2625894
610342	3 REG. RD. 3A (Welland St.)	Wellington Street	0.6	2016	12500	12700	12300	2013	12000	374.2972999
610343	87 REG. RD. 87 (Main St.)	REG. RD. 87 (Lakeport Rd.)	0.1	2019	12000	10600	8000	2016	8100	125.2421671
610344	87 REG. RD. 87 (Lakeport Rd.)	Lake Street	0.8	2019	14700	15900	13500	2016	11300	876.392153
610345	87 REG. RD. 87 (Lock St.)	REG. RD. 42 (Ontario St.)	0.5	2019	13700	13500	9100	2016	9800	937.0561779
610347	42 Linwell Road									

610357	89 REG. RD. 50 (Glenridge Ave.)	Tremont Drive	1.1	2019	14700	17300	12200	2016	14900	1564.908818
610358	89 King's Hwy 406 Ramp (int. # 089H6E)	REG. RD. 56 (Burlleigh Hill Dr.)	0.4	2019	26900		29300	2016	28500	269.6702748
610359	89 REG. RD. 56 (Burlleigh Hill Dr.)	Merritt Street	0.3	2019	28300	31200	27600	2016	27000	980.9441446
610360	89 Merritt Street	Welland Canal	3.2	2019	13800	13800	13600	2016	12900	2038.913288
610362	81 REG. RD. 72 (Louth St.)	Pelham Road	0.8	2019	10300	10800	9800	2016	9200	871.5545218
610363	81 Pelham Road	REG. RD. 681 (William St.)	0.8	2019	12800	14000	10200	2016	9600	1265.333982
610367	42 REG. RD. 681 (King St.)	REG. RD. 81 (St. Paul St.)	0.2	2016	12400	12100	12500	2013	11400	235.7810453
610372	42 REG. RD. 77 (Welland Ave.)	Lake Street	0.6	2016	10700	12800	9600	2013	11500	574.5359353
610374	77 REG. RD. 42 (Ontario St.)	Lake Street	0.5	2019	14200	14800	13900	2016	12800	447.8665796
610378	46 Queenston Street	Race Street	0.3	2016	23100	23400	17900	2013	23100	377.738073
610380	91 Oakdale Avenue	REG. RD. 81 (Queenston St.)	0.5	2019	10000	9200	12200	2016	12000	539.2883557
610382	77 Geneva Street	REG. RD. 48 (Niagara St.)	0.5	2019	14400	15800	13600	2016	13200	367.0042561
610383	48 REG. RD. 77 (Welland Ave.)	REG. RD. 46 (Geneva St.)	0.3	2019	12700	12300	12700	2013	12400	675.1491116
610386	77 Lake Street	Geneva Street	1	2019	11500	12000	11400	2016	11900	931.345578
610387	46 REG. RD. 581 (Church St.)	Queenston Street	0.2	2016	15600	14800	15900	2013	17900	188.214656
610390	581 REG. RD. 46 (Geneva St.)	REG. RD. 48 (Niagara St.)	0.2	2019	9600	8300	10900	2016	8800	137.8309198
610393	42 REG. RD. 83 (Carlton Street)	REG. RD. 77 (Welland Ave.)	1	2016	21200	20100	21700	2013	18400	1063.199464
610394	83 REG. RD. 42 (Ontario St.)	Lake Street	1.1	2019	7700	7900	7700	2016	9300	1132.125411
610396	83 Lake Street	Geneva Street	1	2019	5500	5300	5400	2016	5800	915.0878186
610398	48 Q.E.W.	REG. RD. 77 (Welland Ave.)	0.6	2019	18300	19100	16700	2016	16500	1038.864588
610399	77 REG. RD. 48 (Niagara St.)	Vine Street S.	0.5	2019	13600	14300	12200	2016	14000	551.8931639
610400	48 REG. RD. 83 (Carlton St.)	Vine Street	0.6	2019	15000	15300	14000	2016	14800	651.3016217
610401	83 Geneva Street	Vine Street	1	2019	10400	11500	10200	2016	12100	912.5045663
610407	48 Scott Street	REG. RD. 83 (Carlton St.)	1.1	2019	11500	11500	10800	2016	11600	1151.168399
610408	83 Grantham Avenue	Bunting Road	0.8	2019	11200	11200	11100	2016	11600	908.4237368
610411	81 Eastchester Avenue	Hartzel Road	0.8	2019	8200	8500	7600	2016	9900	906.0511474
610412	81 Hartzel Road	Bunting Road	0.5	2019	13000	13800	12000	2016	13200	407.8253084
610413	81 Bunting Road	Emmett Road	1.3	2019	7900	8500	6900	2016	7900	1055.276265
610417	83 Bunting Road	Welland Canal Parkway	0.8	2019	8200	6500	5300	2016	6600	842.0832728
610420	48 Linwell Road	Scott Street	1.3	2019	9200	9100	8800	2016	9200	1267.067479
610423	87 REG. RD. 48 (Niagara St.)	Bunting Road	0.3	2019	10700	11900	9500	2016	8700	288.4256613
610424	48 REG. RD. 87 (Lakeshore Rd.)	Linwell Road	1.6	2019	7200	7800	6600	2016	8200	1625.410698
610425	87 Vine Street	REG. RD. 48 (Niagara St.)	1.3	2019	11600	13000	9700	2016	9000	1318.461086
610426	87 Geneva Street	Vine Street	1	2019	13100	14100	11700	2016	11200	1034.789257
610428	87 Lake Street	Geneva Street	1	2019	16100	17100	14400	2019	14600	985.9361013
610429	42 Church Street	REG. RD. 681 (King St.)	0.1	2016	10100	10600	9700	2013	11900	153.4929734
610430	77 Vine Street S.	Dunkirk Road	0.5	2019	14000	15000	12600	2016	14600	501.338709
610431	71 Barbican Gate/Tupper Drive	REG. RD. 56 (Burlleigh Hill Drive/Collier Road)	0.6							649.7928447
610432	56 REG. RD. 89 (Glendale Ave.)	St. David's Road	1	2019	9000	8500	9700	2016	7500	1026.620072
610433	56 St. David's Road	Richmond Street	1.1	2019	6700	6800	6900	2016	4900	1096.975953
610434	56 Richmond Street	King's Hwy 58	0.4	2019	8600	9000	7600	2016	8000	233.5611409
610435	56 King's Hwy 58	REG. RD. 67 (Beaverdams Rd.)	0.5	2019	7700	8500	7600	2016	7000	782.8458285
610436	67 REG. RD. 56 (Collier Rd. S.)	REG. RD. 67 (Pine St. S.)	1	2019	5000	5700	4500	2016	4200	1168.818549
610437	67 REG. RD. 67 (Beaverdams Rd.)	King's Hwy 58 (int. # 06758E)	0.3	2019	3100	3600	2400	2016	2600	297.0131271
610441	71 King's Hwy. 406 East Ramp	Barbican Gate/Tupper Drive	0.5							2125.391715
610445	81 Emmett Road	REG. RD. 55 (Niagara Stone Rd.)	0.8	2018	7800	8000	7600	2016	8700	1132.824309
610446	86 REG. RD. 87 (Lakeshore Rd.)	REG. RD. 83 (Carlton St.)	3.2	2018	2600	3000	2300	2015	2300	3155.650791
610447	83 REG. RD. 86 (Stewart Rd.)	REG. RD. 55 (Niagara Stone Rd.)	5.3	2018	1900	2000	1700	2015	2100	3961.567154
610448	86 REG. RD. 83 (Carlton St.)	REG. RD. 55 (Niagara Stone Rd.)	2.4	2018	3900	4100	3700	2015	3600	2635.571338
610452	669 Twenty-First Street	REG. RD. 69 (Twenty Rd.)	2.4	2019	1300	1500	1200	2016	1500	2509.135232
610453	669 REG. RD. 24 (Victoria Ave.)	Twenty-First Street	1.1	2019	1200	1400	1000	2016	1100	1108.510968
610458	83 Vine Street	REG. RD. 48 (Niagara St.)	0.3	2019	8200	7800	7600	2016	6900	351.7947753
610461	73 Park Road S.	REG. RD. 14 (Thirty Rd.)	1.6	2020	2900	3000	3200	2017	3500	1622.735361
610464	27 King's Hwy 140	REG. RD. 84 (Moyer Rd.)	2.7	2018	13400	14000	13000	2016	12500	2858.118357
610465	525 King's Hwy 58A	Netherby Road	1.6	2018	6700	7200	6300	2016	7800	1399.346177
610466	525 Netherby Road	REG. RD. 25 (Netherby Rd.)	0.2	2018	6300	6000	6300	2016	6200	689.8027278
610467	25 REG. RD. 84 (Doans Ridge Rd.)	REG. RD. 525 (Townline Tunnel Rd.)	0.8	2018	1800	2200	1400	2015	1100	818.4471224
610468	29 REG. RD. 529 (Effingham St.)	REG. RD. 36 (South Pelham Rd.)	2.1	2019	5300	5400	5200	2016	5200	2112.364226
610469	529 REG. RD. 29 (Webber Rd.)	REG. RD. 529 (River Rd.)	1.6	2019	500	500	500	2016	600	1725.23796
610470	122 REG. RD. 21 (Bowen Rd.)	REG. RD. 19 (Gilmore Rd.)	1.1	2018	3500	3500	3500	2015	3300	1064.363746
610471	1 Prospect Point Road	Stonemill Road	4	2018	3800	4400	3400	2015	4100	4028.830597
610472	1 REG. RD. 116 (Gorham Rd.)	Prospect Point Road	0.8	2018	4600	5000	4300	2015	4600	840.9292071
610478	102 REG. RD. 49 (Marineland Pkwy.)	Chippawa Parkway	2.4	2018	4300	4300	4200	2015	4600	2254.611243
610479	50 Quaker Road	REG. RD. 41 (Woodlawn Rd.)	1	2019	16500	15900	15600	2016	17400	1709.134155
610483	627 REG. RD. 529 (River Rd.)	REG. RD. 27	1.3	2019	600	600	500	2016	600	211.6181623
610484	27 REG. RD. 24 (Vineland Townline Rd.)	REG. RD. 627 (O'Reillys Rd. N.)	5.5	2019	2100	2500	1800	2016	2000	5333.130696
610488	124 Niagara Boulevard	REG. RD. 21 (Phipps St.)	0.5	2018	1000	1100	800	2015	900	593.0576727
610489	19 Concession Road	REG. RD. 124 (Central Ave.)	0.8	2018	4000	3800	4000	2015	3900	766.3856608
610492	12 Olive Street	Q.E.W.	0.2	2020	5100	5200	6100	2017	6700	634.5163319
610493	12 Q.E.W.	REG. RD. 81 (Main St. W.)	0.4	2020	12900	11900	14200	2017	14400	816.1103726
610495	14 Lake Street	REG. RD. 14 (south limit)	0.6	2020	10900	10300	11300	2017	11800	1817.22054
610496	81 Park Road S.	REG. RD. 14 (Bartlett Ave.)	0.3	2020	12700	13400	13700	2017	13800	228.1058105
610497	3 REG. RD. 3 (Lakeshore Rd.)	REG. RD. 3 (Concession 1 Rd.)	2.7	2020	1300	1400	700	2017	1100	2683.290918
610503	101 REG. RD. 98 (Kalar Rd.)	Q.E.W. (int. # 101QEN)	0.6	2018	12100	13800	11200	2015	9400	782.5335308
610504	98 Cardinal Drive	REG. RD. 57 (Thorold Stone Rd.)	0.7	2018	3300	3600	3100	2015	3000	830.3540743
610506	98 REG. RD. 47 (Lyons Creek Rd.)	REG. RD. 27 (Schisler Rd.)	2.6	2018	9900	9700	9900	2015	10400	2701.802634
610507	98 REG. RD. 25 (Netherby Rd.)	REG. RD. 98 (Forks Rd.)	1.6	2018	1000	1000	900	2015	1400	1708.780463
610508	98 REG. RD. 98 (Schill Rd.)	REG. RD. 98 (Wilhelm Rd.)	0.8	2018	1000	900	900	2015	1400	717.7883491
610509	98 REG. RD. 98 (Forks Rd.)	Highway 3	6.1	2018	1200	1300	1000	2015	1500	6126.678481
610519	124 REG. RD. 3 (Garrison Rd.)	Lakeshore Road	0.2	2018	2600	3400	2100	2015	2600	348.559065
610520	87 REG. RD. 38 (Martindale Rd.)	REG. RD. 87 (Lock St.)	2.1	2019	11100	10900	7100	2016	7900	2108.314327
610521	42 REG. RD. 87 (Lakeport Rd.)	Linwell Road	1.6	2016	16700	21300	14400	2013	12800	1184.724337
610524	42 Scott Street	REG. RD. 83 (Carlton St.)	1	2016	19200	18700	19400	2013	17700	981.0961369
610525	83 REG. RD. 48 (Niagara St.)	Grantham Avenue	0.6	2019	12700	12900	12000	2016	13200	655.266236
610526	42 Lake Street	Church Street	0.1	2016	9600	10600	9000	2013	11800	36.89987127
610528	50 REG. RD. 41 (Woodlawn Rd.)	Thorold Road	1	2019	23000	23200	20500	2016	21700	1294.90799
610530	68 REG. RD. 27 (E.Main St.)	REG. RD. 527 (Division St.)	0.2	2019	5900	5500	5700	2016	7900	211.6524149
610533	69 St. Ann's Road	Mountain Road	1.6	2020	1700	1800	1800	2017	1900	1556.668344
610534	102 REG. RD. 101 (Portage Rd.)	Church's Lane	0.8	2018	8300	9800	7500	2015	6600	810.4118075
610535	19 REG. RD. 124 (Central Ave.)	Niagara Boulevard	0.5	2018	1300	1200	1200	2015	1900	587.682375
610537	21 REG. RD. 124 (Central Ave.)	Niagara Boulevard	0.3	2018	500	500	400	2015	600	340.3401086
610538	3 Elm Street	King Street	0.2	2019	11700	12000	11900	2016	13100	190.861012
610539	14 REG. RD. 14 (Canborough St.)	Port Davidson Road	0.1	2020	4400	4400	4400	2017	4600	105.7903289
610540	83 Welland Canal Parkway	REG. RD. 88 (Seaway Haulage Rd.)	0.9	2018	6200	7100	5700	2016	7000	907.6601381
610541	34 REG. RD. 87 (Lakeshore Rd. W.)	REG. RD. 40 (South Service Rd.)	0.5	2019	7200	7200	5800	2016	4800	1416.854505
610543	48 Vine Street	Q.E.W.	0.2	2019	25800	25100	25300	2016	25400	130.920252
610547	89 Welland Canal	REG. RD. 58 (Homer Rd.)	1	2018	12800	12500	12900	2016	10900	1376.303412
610548	63 REG. RD. 84 (Moyer Rd.)	REG. RD. 70 (Thorold Townline Rd.)	1	2018	4600	5400	4200	2015	3600	898.0225295
610549	54 Port Robinson Road	Quaker Road	2.4	2019	7500		7500	2016	7500	2071.018071
610550	24 REG. RD. 73 (Fly Rd.)	Sixth Avenue	0.3	2020	9600	10600	8300	2017	8700	357.1673781
610552	63 REG. RD. 15 (Robinson Rd.)	REG. RD. 45	2.3	2020	2600	2900	2500	2017	2800	566.1046845

610572	41 REG. RD. 50 (Niagara St.)	River Road	0.8	2019	20300	18500	20700	2016	19200	1626.99544
610573	50 REG. RD. 37 (Merritt St.)	Quaker Road	1	2019	16300	16200		2016	15100	1070.224673
610575	38 Vansickle Road N.	REG. RD. 77 (Fourth Ave.)	1.5	2019	9700	2300	12600	2016	13700	1793.418975
610579	98 Canadian Drive	REG. RD. 63 (Chippawa Creek Rd.)	1.3	2018	6700	6000	6900	2015	5800	1487.974076
610581	81 REG. RD. 89 (Glendale Ave.)	Concession 7 Road	1.8	2018	10100	10000	10000	2015	9100	1828.201813
610584	102 Chippawa Parkway	REG. RD. 47 (Lyons Creek Rd.)	1.6	2018	5100	5300	4800	2015	4600	979.5131504
610586	87 Shakespeare Avenue	REG. RD. 55 (Mississauga St.)	0.4	2018	4000	4300	3800	2015	3700	689.8638943
610587	89 REG. RD. 70 (Taylor Rd.)	REG. RD. 81 (York Rd.)	0.7	2018	800	1100	500	2016	400	1237.457331
610588	81 Concession 7 Road	REG. RD. 100 (Four Mile Creek Rd.)	3.6	2018	6200	5900	6300	2015	6900	3535.563566
610589	61 General Brock Parkway Ramp	REG. RD. 102 (Stanley Ave.)	0.1	2018	5100	6000	4600	2015	5400	310.9394744
610590	57 Kalar Road	REG. RD. 98 (Montrose Rd.)	1	2018	22700	22900	22500	2015	22200	1137.907767
610591	20 Kalar Road	REG. RD. 98 (Montrose Rd.)	2	2018	23400	25300	22300	2015	23400	1148.153057
610592	47 REG. RD. 102 (Stanley Ave.)	REG. RD. 116 (Sodom Rd.)	4.8	2018	5800	6400	5400	2015	5100	2386.4946
610593	116 Weinbrenner Road	Q.E.W. (int. # 116QEW)	5.1	2018	2900	3000	2700	2015	2600	7055.722234
610596	116 East Main Street	REG. RD. 21 (Bowen Rd.)	0.9	2018	8900	9800	8300	2015	9500	1272.403471
610597	1 Stonemill Road	Buffalo Road	2.5	2018	3000	3700	2600	2015	3100	2416.694339
610598	124 REG. RD. 21 (Phipps St.)	Jarvis Street	0.5	2018	4300	4400	4200	2015	3700	197.3464652
610599	102 Robinson Street	Murray Street	0.3	2018	15000	15600	14700	2015	12300	389.7550973
610610	81 Elm Street	Maple Avenue	0.9	2020	14500	13700	14200	2017	13700	388.5823545
610611	12 REG. RD. 81 (Main St. W.)	Elm Street	0.3	2020	6400	6900	6700	2017	7900	200.3552338
610612	81 Kerman Avenue	Gibson Street	0.5	2020	5600	5600	6600	2017	9700	914.8601404
610701	49 REG. RD. 102 (Stanley Ave. N.)	REG. RD. 102 (Stanley Ave. S.)	0.2	2018	11600	10100	12200	2015	15000	574.6564684
610702	98 REG. RD. 101 (Mountain Rd.)	REG. RD. 98 (Montrose Rd.)	0.2	2018	6900	7200	6600	2015	6000	216.0117015
610703	98 McLeod Road	REG. RD. 98 (Niagara Sq. Dr.)	0.4	2018	4800	5000	4600	2015	4400	893.0664187
610704	98 REG. RD. 98 (Niagara Square Dr.)	Canadian Drive	0.4	2018	5400	5300	5400	2012	5000	710.5399192
610705	25 Q.E.W.	Niagara River Parkway	3.7	2018	800	1000	600	2015	800	1863.921546
617100	28 REG. RD. 81 (St. Paul St. W.)	REG. RD. 69 (Pelham Rd.)	3.5	2019	2200	2300	2100	2016	2400	3474.920879
617300	55 REG. RD. 83 (Line 4 Rd.)	REG. RD. 81 (York Rd.)	5.2	2018	7800	8100	7600	2015	6600	5278.847608
617301	55 REG. RD. 100 (Four Mile Creek Rd.)	REG. RD. 83 (Line 4 Rd.)	2.9	2018	13700	13800	13600	2015	11800	3316.462958
617302	55 East and West Line	REG. RD. 100 (Four Mile Creek Rd.)	1.9	2018	14900	15600	14400	2015	14100	1913.775778
617303	55 REG. RD. 87 (Mary St.)	East and West Line	2.8	2018	8700	9500	8200	2015	8900	2963.110889
617500	39 Victoria Avenue	Jordan Road	2.8	2019	3400	3700	2600	2016	2900	2888.367267
617510	39 Jordan Road	REG. RD. 34 (Seventh St. Louth)	4.3	2019	1800	1800	1800	2016	1200	4417.304506
617520	39 REG. RD. 34 (Seventh St. Louth)	Third Street Louth	1.9	2019	1000	1000	1000	2016	700	1901.501197
617530	40 REG. RD. 24 (Victoria Ave.)	Twenty-First Street	1.4	2011	1200	2200	600	2008	600	1362.62045
617540	40 REG. RD. 40 (west limit)	REG. RD. 25 (Jordan Rd.)	0.6	2019	200	200	300	2016	100	677.7009899
617550	40 REG. RD. 26 (Jordan Rd.)	REG. RD. 34 (Seventh St. Louth)	4.3	2011	1200	2000	700	2008	800	4425.344888
617560	40 REG. RD. 34 (Seventh St. Louth)	Third Street Louth	1.9	2019	3900	4300	2700	2011	2800	1835.545937
617570	40 Third Street Louth	REG. RD. 38 (Martindale Rd.)	1	2019	5300	4400	6400	2016	8500	1029.208047
617600	90 REG. RD. 55 (Niagara Stone Rd.)	Queenston Road	2.4	2018	4900	5300	4600	2016	2800	2399.193303
617610	90 Queenston Road	REG. RD. 81 (York Rd.)	0.4	2018	5800	6700	5200	2016	5900	414.6030509
617700	33 Feeder Road	REG. RD. 54 (Prince Charles Dr. S.)	0.5	2019	1000	1000	1000	2016	1500	770.5681865
619902	91 REG. RD. 50 (Glenridge Ave.)	REG. RD. 46 (Geneva St.)	0.3	2019	17300	19900	14400	2016	16500	322.2607211
619903	91 REG. RD. 46 (Geneva St.)	King's Hwy 406 (int. # 091H46)	0.3	2019	17000	17000	17000	2016	19600	442.5208452
619904	91 King's Hwy 406 (int. # 091H46)	Oakdale Avenue	0.6	2019	18800	18000	18000	2016	13500	504.945369
619905	46 Race Street	REG. RD. 91 (Westchester Ave.)	0.2	2016	9700	19400	4700	2013	14300	385.7323589
619906	91 REG. RD. 81 (St. Paul St. W.)	REG. RD. 50 (Glenridge Ave.)	0.3	2019	16300	15000	15000	2016	17400	625.2988356
619911	41 REG. RD. 54 (Rice Rd.)	First Avenue	0.8	2019	14100	13600	14500	2016	14000	1311.973956
619912	41 First Avenue	REG. RD. 50 (Niagara St.)	0.8	2019	15600	14800	15100	2016	14900	1005.655484
619918	3 Steele Street	Elm Street	0.4	2019	10300	11200	10200	2016	11900	434.2168002
619919	3 REG. RD. 3A (Mellanby Ave.)	REG. RD. 3A (Welland St.)	0.2	2019	10400	9700	11500	2016	12200	223.6672151
619933	77 REG. RD. 38 (Martindale Rd.)	King's Hwy 406 (int. # 077H46)	0.6	2019	37200	38300	36100	2016	31800	1058.480056
619934	87 Bunting Road	Seaway Haulage Road	0.6	2016	9600	10300	9100	2013	8500	612.4162943
619936	88 Read Road	REG. RD. 83 (Carlton St.)	0.8	2018	400	400	300	2015	400	475.1866235
619937	83 REG. RD. 88 (Seaway Haulage Rd.)	REG. RD. 86 (Stewart Rd.)	0.5	2018	4500	5300	4000	2015	4600	778.1094326
619940	54 REG. RD. 41 (Woodlawn Rd.)	Thorold Road	1	2019	12400	12500	12000	2016	12500	1028.832381
619941	527 REG. RD. 27 (W. Main St.)	REG. RD. 68 (King St.)	0.2	2019	7400	9000	6899	2016	8200	222.5556937
619942	70 Thorold Townline Road	REG. RD. 57 (Thorold Stone Rd.)	0.7	2018	8100	0	8000	2015	5400	333.4966593
619944	41 REG. RD. 36 (S. Pelham Rd.)	REG. RD. 54 (Rice Rd.)	1.3	2019	9600	9500	8900	2016	9200	1297.369987
619946	525 REG. RD. 25 (Doans Ridge Rd.)	REG. RD. 525 (Townline Tunnel Rd.)	0.2	2018	600	700	500	2016	500	474.3744609
619947	36 REG. RD. 41 (Woodlawn Rd.)	Thorold Road	1	2019	10800	10800	10900	2016	12100	1015.500093
619948	98 Morrison Street (int. # 098MRR)	King's Hwy 420	1.6	2018	13200	13500	13000	2015	12800	956.8695516
619949	98 REG. RD. 98 (Kalar Rd.)	Cardinal Drive	1.9	2018	5400	6100	4900	2015	5000	2054.263328
619950	26 South Service Road	Honsberger Avenue	2	2019	4300	4700	4200	2016	4600	829.3877702
619952	69 Power Glen	REG. RD. 72 (Louth St.)	1.7	2016	5400	5600	5300	2013	4700	1847.554055
619953	77 REG. RD. 34 (Seventh St. Louth)	First Street Louth	3	2019	7900	7600	5100	2016	5700	3609.204537
699010	18 REG. RD. 40 (South Service Rd.)	Greenlane Road	0.6	2020	19600	19800	20600	2017	20800	804.9694586
699020	41 River Road	King's Hwy 406	1	2016	15400	19300	13300	2013	15100	1090.561627
699070	39 Grimsby Boundary (Lake Street)	Ontario Street N.	2.6	2017	1800	2200	1500	2014	1500	3460.486833
699080	39 Ontario Street N.	Victoria Avenue	6.8	2017	1700	1800	1600	2014	1800	7141.454638
699100	40 Regional Boundary	REG. RD. 10 (Casablanca Blvd.)	2.3	2020	5200	5400	4200	2017	4100	2910.943979
699110	40 REG. RD. 10 (Casablanca Blvd.)	REG. RD. 12 (Christie St.)	2.9	2020	5000	5000	6000	2017	6700	3015.96136
699120	40 REG. RD. 14 (Bartlett Ave.)	REG. RD. 18 (Ontario St.)	3.9	2020	3500	3200	4300	2017	4300	4534.587859
699130	40 REG. RD. 18 (Ontario St.)	REG. RD. 24 (Victoria Ave.)	6.8	2020	1700	1700	1200	2017	1400	7335.202279
699200	3 Rose Hill Road	Pettit Road	1.2	2018	15900	19400	14000	2015	14100	1251.801022
699201	3 Pettit Road	REG. RD. 122 (Helena St.)	2	2018	19100	19800	18700	2015	17500	2479.195396
699202	3 REG. RD. 122 (Helena St.)	Concession Road	1	2018	13000	12600	13000	2015	13000	1327.217765
699205	20 Westbrook Road	Caistor Centre Road	5.3	2020	6500	6400	7500	2017	7400	5339.882786
699206	20 Caistor Centre Road	REG. RD. 12 (Grimsby Rd.)	5.2	2020	5700	5500	6800	2017	6700	5273.119355
699207	20 REG. RD. 12 (Grimsby Rd.)	REG. RD. 14 (Station St.)	5.8	2020	8300	7800	10000	2017	9700	4386.686163
699208	20 REG. RD. 14 (Station St.)	Convenient Street	0.2	2020	9900	9500	10300	2017	6200	123.6758839
699209	20 Convenient Street	REG. RD. 69 (Twenty Mile Rd.)	3.2	2020	8600	7600	8100	2017	8200	3292.610015
699210	20 REG. RD. 69 (Twenty Mile Rd.)	REG. RD. 65 (Bismark Rd.)	4.9	2020	5100	5000	5400	2017	5400	4874.842151
699211	20 REG. RD. 27 (Wellandport Rd.)	REG. RD. 24 (Vineland Townline Rd.)	9.3	2020	4700	5400	5000	2017	5300	9404.304373
699212	20 REG. RD. 24 (Vineland Townline Rd.)	Effingham Street	6.3	2019	13100	14100	11200	2016	13700	6280.36445
699213	20 Effingham Street	Pelham Street	2.1	2019	16400	16400	15000	2016	15500	2121.117306
699214	20 Pelham Street	REG. RD. 54 (Rice Rd.)	1.4	2019	19000	17800	17900	2016	16600	1523.59149
699215	20 REG. RD. 54 (Rice Rd.)	REG. RD. 50 (Merrittville Hwy)	2	2019	23200	24700	21100	2016	21100	2047.863152
699216	20 REG. RD. 50 (Merrittville Hwy)	King's Hwy 406	1.4	2019	19600	19500	17700	2016	18900	1631.12734
699217	20 King's Hwy 406	Holland Road	2.1	2019	14900	14300	8400	2016	11300	2659.204454
699218	20 Holland Road	King's Hwy 58	1.4	2016	10700	11400	10200	2013	10000	1346.516002
699300	23 Deeks Road S.	Nugent Road	5	2019	3900	3900	3800	2016	4300	5049.736346
699310	37 REG. RD. 50 (Niagara St.)	King's Hwy 406	1.4	2019	10100	9400	11300	2016	9500	1946.967725
699319	5 REG. RD. 3 (Main St. W.)	Steele Street	1.1	2019	8300	9000	8500	2016	8300	1242.72712
699320	5 Steele Street	REG. RD. 3A (Mellanby Ave.)	1.4	2019	4800	5000	4600	2016	4600	1479.674333
699321 03A	REG. RD. 3 (Main St. W.)	Jacknife Bridge	0.55	2018	4100	4700	3800	2016	4300	613.524995
699322 03A	Jacknife Bridge	REG. RD. 3 (Main St. E.)	0.55	2018	6500	11200	4100	2016	5400	568.0020928
699323	40 REG. RD. 12 (Christie St.)	Ontario Street	0.4	2020	3000		6700	2017	5700	393.7212536
699324	40 Ontario Street	Nelles Road N.	1	2020	2300		4800	2017	6900	999.9574447
699325	40 Nelles Road North	REG. RD. 14 (Bartlett Ave.)	1.8	2020	3600		5400	2017	4800	1821.154313
699326										

Prepared For: City of Niagara Falls  
 Prepared By: **PYRAMID Traffic Inc.**  
 Location: Allendale Ave, btwn Murray St & Robinson St  
 Start Date: Wednesday Jul 10, 2019

Site ID: 2930  
 Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary	Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	2	1		12:15	10	0	45
0:30	2	0		12:30	9	4	47
0:45	1	0		12:45	10	5	49
1:00	1	2	9	13:00	6	7	51
1:15	3	2	11	13:15	12	5	58
1:30	2	1	12	13:30	8	3	56
1:45	2	1	14	13:45	6	5	52
2:00	0	0	11	14:00	3	4	46
2:15	2	0	8	14:15	7	5	41
2:30	2	0	7	14:30	11	3	44
2:45	2	0	6	14:45	14	4	51
3:00	1	1	8	15:00	12	7	63
3:15	0	0	6	15:15	8	4	63
3:30	1	0	5	15:30	20	2	71
3:45	2	0	5	15:45	12	4	69
4:00	2	0	5	16:00	9	3	62
4:15	0	0	5	16:15	12	7	69
4:30	1	0	5	16:30	9	2	58
4:45	1	1	5	16:45	13	3	58
5:00	0	0	3	17:00	13	3	62
5:15	2	1	6	17:15	10	4	57
5:30	3	1	9	17:30	8	3	57
5:45	0	4	11	17:45	6	0	47
6:00	2	2	15	18:00	11	1	43
6:15	3	2	17	18:15	7	4	40
6:30	2	6	21	18:30	7	0	36
6:45	3	2	22	18:45	11	1	42
7:00	8	5	31	19:00	6	1	37
7:15	6	6	38	19:15	5	2	33
7:30	3	2	35	19:30	9	3	38
7:45	4	5	39	19:45	10	0	36
8:00	6	6	38	20:00	9	1	39
8:15	6	5	37	20:15	7	0	39
8:30	8	6	46	20:30	3	3	33
8:45	4	7	48	20:45	6	0	29
9:00	6	2	44	21:00	5	0	24
9:15	6	3	42	21:15	7	0	24
9:30	6	3	37	21:30	5	2	25
9:45	7	2	35	21:45	8	3	30
10:00	6	5	38	22:00	6	2	33
10:15	6	2	37	22:15	7	3	36
10:30	7	5	40	22:30	8	1	38
10:45	10	4	45	22:45	9	1	37
11:00	12	5	51	23:00	9	0	38
11:15	5	3	51	23:15	4	4	36
11:30	8	3	50	23:30	7	1	35
11:45	9	4	49	23:45	2	2	29
12:00	9	2	43	0:00	4	0	24

AM Peak: **51**

PM Peak: **71**

24 HR VOLUME: **818**

Prepared For: City of Niagara Falls  
 Prepared By: **PYRAMID Traffic Inc.**  
 Location: Murray St, btwn Allendale Ave & Stanley Ave  
 Start Date: Wednesday Jul 17, 2019

Site ID: 2996  
 Interval: 15 min.

Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary	Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary
0:15	10	22		12:15	17	19	167
0:30	6	13		12:30	22	18	160
0:45	7	13		12:45	18	17	164
1:00	7	8	86	13:00	24	14	149
1:15	4	4	62	13:15	23	22	158
1:30	5	11	59	13:30	23	20	161
1:45	7	10	56	13:45	22	19	167
2:00	6	11	58	14:00	18	27	174
2:15	2	9	61	14:15	30	21	180
2:30	3	5	53	14:30	22	26	185
2:45	6	8	50	14:45	22	22	188
3:00	3	5	41	15:00	9	25	177
3:15	2	3	35	15:15	25	32	183
3:30	1	6	34	15:30	27	38	200
3:45	5	2	27	15:45	33	37	226
4:00	1	0	20	16:00	23	25	240
4:15	2	3	20	16:15	19	35	237
4:30	2	6	21	16:30	25	39	236
4:45	5	5	24	16:45	26	30	222
5:00	1	3	27	17:00	21	29	224
5:15	3	3	28	17:15	21	22	213
5:30	10	3	33	17:30	20	25	194
5:45	6	8	37	17:45	12	31	181
6:00	5	11	49	18:00	21	24	176
6:15	6	19	68	18:15	18	26	177
6:30	7	16	78	18:30	14	25	171
6:45	16	30	110	18:45	19	24	171
7:00	18	27	139	19:00	19	26	171
7:15	18	13	145	19:15	20	29	176
7:30	13	16	151	19:30	17	25	179
7:45	14	14	133	19:45	18	27	181
8:00	23	18	129	20:00	19	16	171
8:15	18	22	138	20:15	20	28	170
8:30	11	24	144	20:30	27	25	180
8:45	17	26	159	20:45	9	22	166
9:00	17	26	161	21:00	12	24	167
9:15	20	21	162	21:15	10	19	148
9:30	25	19	171	21:30	27	15	138
9:45	19	23	170	21:45	18	18	143
10:00	18	21	166	22:00	26	16	149
10:15	17	21	163	22:15	12	22	154
10:30	18	20	157	22:30	11	32	155
10:45	24	28	167	22:45	15	26	160
11:00	19	21	168	23:00	16	21	155
11:15	19	21	170	23:15	11	34	166
11:30	19	28	179	23:30	10	24	157
11:45	11	20	158	23:45	9	18	143
12:00	16	37	171	0:00	6	17	129

AM Peak: **179**

PM Peak: **240**

24 HR VOLUME: **3297**

# Allendale Ave @ Robinson St

Municipality: Niagara Falls  
 Major Road: Robinson St  
 Minor Road: Allendale Ave

Date: Jul 11, 2019

Major Road Runs: East/West  
 Weather Conditions: Clear/Dry  
 Person No. 1 Cam  
 Person No. 2

Period Ending	North Approach							East Approach							South Approach							West Approach							Veh. Summary	
	Cars			Trucks			Ped. Cross.	Cars			Trucks			Ped. Cross.	Cars			Trucks			Ped. Cross.	Cars			Trucks			Ped. Cross.	15	60
	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right			
10:15	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	9	0	0	0	3	0	7	0	0	0	0	22	
10:30	0	1	0	0	0	0	0	0	8	0	0	2	0	0	0	0	6	6	0	0	0	0	1	4	1	0	0	0	2	29
10:45	2	1	2	0	0	0	1	0	7	1	0	0	0	0	0	0	3	7	0	0	0	0	0	12	1	0	0	0	36	
11:00	3	1	0	0	0	0	1	0	12	2	0	0	0	0	0	0	6	9	0	1	0	0	0	18	0	0	0	0	52	139
11:15	0	2	0	0	0	0	2	0	6	2	0	2	0	0	0	0	0	4	0	1	0	1	0	14	0	0	0	0	31	148
11:30	3	0	0	0	0	0	0	2	7	2	0	0	0	0	1	7	12	0	0	0	0	1	10	0	0	0	0	45	164	
11:45	0	2	1	1	0	0	0	0	6	0	0	0	0	0	1	2	13	0	0	0	0	0	8	1	0	0	0	35	163	
12:00	1	2	0	0	0	0	0	0	2	0	0	0	0	0	0	1	6	0	0	0	0	0	15	0	0	0	0	27	138	
12:15	0	2	1	0	0	0	1	0	12	1	0	0	0	0	0	0	5	0	0	0	0	0	6	0	0	0	0	27	134	
12:30	0	1	1	0	0	0	0	1	8	0	0	0	0	0	2	2	5	0	1	0	2	0	6	3	0	0	1	31	120	
12:45	1	2	3	1	0	0	2	0	8	0	0	0	0	2	1	7	3	0	1	0	1	0	11	0	0	0	0	38	123	
13:00	0	4	1	0	0	0	1	1	7	2	0	0	0	0	1	4	0	0	0	0	0	1	10	1	0	0	0	32	128	
13:15	4	1	1	0	0	0	1	0	13	0	0	1	0	0	0	3	7	0	0	0	2	1	9	0	0	0	0	40	141	
13:30	0	1	0	0	0	0	2	0	6	0	0	0	0	1	3	1	3	0	0	0	0	0	10	1	0	0	0	25	135	
13:45	3	1	1	0	0	0	1	0	8	1	0	1	0	0	1	6	2	0	0	0	0	0	8	0	0	0	0	32	129	
14:00	0	0	0	0	0	0	0	1	8	0	0	1	1	0	2	4	2	0	0	0	1	0	10	0	0	0	0	29	126	
15:15	4	1	0	0	0	0	2	1	20	0	0	1	0	1	1	6	4	0	0	0	1	0	7	0	0	0	0	45		
15:30	0	0	0	0	0	0	4	3	12	1	0	0	0	0	0	6	7	0	0	0	1	0	24	0	1	0	0	54		
15:45	5	3	0	0	0	0	2	1	20	0	0	0	0	0	0	8	2	0	1	0	0	0	13	0	0	0	0	53		
16:00	4	0	1	0	1	0	4	2	13	1	0	1	0	0	2	3	3	0	0	0	0	1	16	0	0	0	0	48	200	
16:15	3	5	1	0	0	0	0	0	16	1	0	1	0	2	1	3	2	0	0	0	0	0	9	0	0	0	0	42	197	
16:30	0	3	1	0	1	0	6	4	11	0	0	0	0	0	0	4	5	0	1	0	2	5	12	0	0	0	0	47	190	
16:45	1	1	1	0	0	0	2	5	25	0	0	0	0	0	0	5	2	0	0	0	1	0	19	3	0	1	0	63	200	
17:00	3	1	1	0	0	0	2	1	15	0	0	0	0	2	0	3	6	0	0	0	0	0	13	0	0	0	0	43	195	
17:15	4	3	1	0	0	0	3	2	19	1	0	1	0	0	0	3	4	0	0	0	1	1	10	0	0	0	0	49	202	
17:30	4	2	0	0	0	0	3	1	20	1	0	0	0	1	0	6	1	0	1	0	0	0	13	0	0	1	0	50	205	
17:45	0	2	1	0	0	0	2	1	12	4	0	0	0	0	1	4	5	0	0	0	0	1	13	2	0	0	0	46	188	
18:00	0	1	1	0	0	0	7	0	15	2	0	0	0	1	1	3	5	0	0	0	0	1	13	1	0	0	0	43	188	
18:15	3	2	1	0	0	0	4	0	10	1	0	0	0	0	1	4	4	0	1	0	2	2	9	0	0	0	0	38	177	
18:30	2	1	0	0	0	0	2	1	10	0	0	1	0	4	1	2	4	0	0	0	0	0	8	0	0	0	0	30	157	
18:45	4	2	1	0	0	0	1	2	6	4	0	0	0	4	1	4	3	0	0	0	1	1	9	0	0	0	0	37	148	
19:00	1	2	0	0	0	0	6	0	8	0	0	0	0	0	1	2	3	0	0	0	0	3	11	0	0	0	0	31	136	
	56	50	21	2	2	0	29	352	27	0	12	1	21	118	157	0	8	0	19	357	14	1	2	1						



Prepared For: City of Niagara Falls  
 Prepared By: **PYRAMID Traffic Inc.**  
 Location: Robinson St, btwn Allendale Ave & Stanley Ave  
 Start Date: Thursday Jul 19, 2018

Site ID: 2649  
 Interval: 15 min.

Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary	Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary
0:15	7	16		12:15	20	12	163
0:30	5	8		12:30	18	7	136
0:45	3	7		12:45	16	12	128
1:00	3	4	53	13:00	22	11	118
1:15	3	5	38	13:15	20	16	122
1:30	3	8	36	13:30	17	10	124
1:45	1	7	34	13:45	21	12	129
2:00	2	5	34	14:00	24	14	134
2:15	2	7	35	14:15	13	12	123
2:30	3	6	33	14:30	25	16	137
2:45	1	5	31	14:45	23	14	141
3:00	0	3	27	15:00	18	13	134
3:15	2	2	22	15:15	19	18	146
3:30	2	0	15	15:30	16	15	136
3:45	0	3	12	15:45	25	20	144
4:00	1	0	10	16:00	23	18	154
4:15	1	2	9	16:15	16	18	151
4:30	2	0	9	16:30	20	23	163
4:45	0	0	6	16:45	22	20	160
5:00	3	0	8	17:00	29	33	181
5:15	0	3	8	17:15	12	25	184
5:30	0	2	8	17:30	13	19	173
5:45	1	0	9	17:45	15	17	163
6:00	4	2	12	18:00	17	14	132
6:15	4	4	17	18:15	11	27	133
6:30	9	1	25	18:30	15	22	138
6:45	6	1	31	18:45	20	17	143
7:00	11	4	40	19:00	18	10	140
7:15	7	5	44	19:15	15	14	131
7:30	9	5	48	19:30	13	10	117
7:45	9	5	55	19:45	9	8	97
8:00	22	7	69	20:00	19	11	99
8:15	15	6	78	20:15	14	17	101
8:30	18	6	88	20:30	16	12	106
8:45	27	13	114	20:45	14	11	114
9:00	21	15	121	21:00	12	7	103
9:15	22	3	125	21:15	14	15	101
9:30	24	6	131	21:30	7	7	87
9:45	27	7	125	21:45	19	10	91
10:00	24	9	122	22:00	13	18	103
10:15	24	10	131	22:15	14	9	97
10:30	21	4	126	22:30	11	13	107
10:45	31	5	128	22:45	8	25	111
11:00	32	13	140	23:00	6	15	101
11:15	21	11	138	23:15	5	17	100
11:30	33	19	165	23:30	8	12	96
11:45	25	11	165	23:45	5	19	87
12:00	31	12	163	0:00	10	17	93

AM Peak: 165

PM Peak: 184

24 HR VOLUME: 2291

# Stanley Ave @ Murray St

Municipality: Niagara Falls  
 Major Road: Stanley Ave  
 Minor Road: Murray St

Date: Jul 1, 2018

Major Road Runs: North/South  
 Weather Conditions: Clear/Dry  
 Person No. 1 Cam  
 Person No. 2

Period Ending	North Approach							East Approach							South Approach							West Approach							Veh. Summary	
	Cars			Trucks			Ped. Cross.	Cars			Trucks			Ped. Cross.	Cars			Trucks			Ped. Cross.	Cars			Trucks			Ped. Cross.	15	60
	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right			
17:15	43	110	32	0	1	0	107	20	22	48	2	0	0	7	14	86	14	1	7	0	37	8	41	8	0	0	0	25	457	
17:30	30	117	32	0	1	0	110	23	15	38	0	0	0	8	16	103	9	1	3	0	29	12	35	4	0	0	1	24	440	
17:45	56	133	28	0	1	0	112	18	19	44	0	0	0	4	24	96	16	1	1	0	35	9	39	7	0	0	0	31	492	
18:00	49	125	16	0	2	0	132	18	25	30	0	0	0	5	19	84	15	0	2	0	46	9	21	4	0	1	0	21	420	1809
18:15	76	101	25	0	1	0	142	13	24	40	0	0	1	6	28	105	27	1	1	0	52	14	43	5	0	0	1	32	506	1858
18:30	52	108	29	0	0	0	157	17	24	49	0	0	0	28	20	98	21	0	2	1	54	18	50	9	0	1	0	28	499	1917
18:45	36	103	27	0	2	0	180	11	23	36	0	0	0	6	14	76	14	2	4	0	21	17	38	8	0	1	0	45	412	1837
19:00	27	110	21	0	4	0	232	19	24	50	0	0	1	14	5	55	10	0	4	0	97	17	26	12	0	0	0	49	385	1802
19:15	30	108	31	0	0	0	203	24	20	37	0	0	0	30	16	57	18	0	0	0	57	15	29	6	0	0	0	40	391	1687
19:30	38	103	26	0	1	0	155	15	21	36	1	0	0	9	10	45	8	0	0	0	78	17	20	3	0	0	1	31	345	1533
19:45	40	83	27	0	3	0	132	7	26	37	0	0	0	14	11	76	18	0	1	0	81	13	44	2	0	0	0	72	388	1509
20:00	44	81	30	0	0	0	173	12	26	43	0	1	0	20	11	97	21	1	1	0	80	12	38	8	0	0	0	80	426	1550
20:15	22	123	15	0	0	0	173	14	25	25	0	0	0	18	18	58	11	0	0	0	72	14	9	7	0	0	0	26	341	1500
20:30	26	103	30	0	2	0	156	9	13	33	0	0	0	33	10	73	15	0	0	1	91	13	10	6	0	0	0	69	344	1499
20:45	30	81	31	0	2	1	205	4	25	44	0	1	0	7	6	49	12	0	0	0	126	19	39	11	0	2	0	70	357	1468
21:00	39	88	22	0	2	0	147	3	28	39	0	0	1	26	16	63	16	2	0	0	87	14	24	10	0	0	0	35	367	1409
21:15	27	114	12	0	1	0	350	5	23	39	1	0	0	14	13	66	17	0	1	0	180	19	21	13	1	0	1	59	374	1442
21:30	47	101	33	0	0	0	289	13	21	28	0	0	1	10	12	52	13	0	3	0	67	15	17	12	0	0	0	83	368	1466
21:45	26	91	26	0	0	0	235	6	29	29	0	0	0	6	3	45	18	0	0	0	119	8	17	9	0	0	0	59	307	1416
22:00	19	120	36	0	1	0	208	6	19	25	0	0	0	2	12	45	10	0	0	0	196	9	5	7	0	1	0	67	315	1364
22:15	23	85	11	0	1	0	185	4	16	28	0	0	0	3	13	37	10	0	0	0	80	4	8	6	0	0	0	35	246	1236
22:30	46	98	34	0	1	0	493	6	11	15	0	0	0	6	5	41	6	0	0	0	408	14	15	7	0	0	0	118	299	1167
22:45	34	96	15	0	0	0	481	4	28	20	0	0	0	5	11	72	9	0	4	0	275	14	7	10	0	0	0	154	324	1184
23:00	42	112	13	0	0	0	370	3	21	37	0	0	0	3	9	41	7	0	0	0	216	12	8	8	0	0	0	111	313	1182
23:15	41	78	38	0	3	1	170	11	34	13	0	0	0	8	14	44	7	0	0	0	159	12	13	11	0	0	0	120	320	1256
23:30	39	76	40	0	0	0	181	10	35	20	0	0	0	12	14	24	2	0	0	0	139	9	12	8	0	0	0	80	289	1246
23:45	40	69	41	0	1	0	176	22	34	28	0	0	0	31	19	42	3	1	0	0	117	5	23	2	0	0	0	53	330	1252
0:00	40	72	22	0	1	0	225	11	31	18	0	0	0	34	14	59	13	0	0	0	79	10	13	3	0	0	0	48	307	1246
0:15	30	69	25	0	1	0	185	23	40	21	0	0	0	14	27	49	7	0	0	0	61	8	12	5	0	0	0	94	317	1243
0:30	29	60	32	0	0	0	165	14	30	31	0	0	0	28	31	69	11	0	0	0	69	13	25	7	0	0	0	49	352	1306
0:45	30	58	38	0	0	0	160	21	44	31	1	0	0	23	31	57	10	0	0	0	29	13	25	3	0	0	0	44	362	1338
1:00	32	53	30	0	0	0	110	31	35	50	0	0	0	14	25	75	9	0	0	0	37	8	22	6	0	0	0	21	376	1407

The background features a large, light gray circular shape on the right side, partially overlapping a blue triangular shape on the left. The text 'APPENDIX E' is centered within the gray area.

# APPENDIX E

Filename: 2201139.te            Time Period: Day/Night 16/8 hours  
Description: Townhouse (west podium facade)

Road data, segment # 1: Allendale (day/night)

-----  
Car traffic volume : 1205/336    veh/TimePeriod  
Medium truck volume : 0/0        veh/TimePeriod  
Heavy truck volume : 58/16      veh/TimePeriod  
Posted speed limit : 50 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Allendale (day/night)

-----  
Angle1    Angle2            : -90.00 deg    90.00 deg  
Wood depth : 0            (No woods.)  
No of house rows : 0 / 0  
Surface : 2            (Reflective ground surface)  
Receiver source distance : 15.00 / 15.00 m  
Receiver height : 4.50 / 4.50 m  
Topography : 1            (Flat/gentle slope; no barrier)  
Reference angle : 0.00

↑  
Results segment # 1: Allendale (day)

-----  
Source height = 1.46 m

ROAD (0.00 + 56.90 + 0.00) = 56.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	56.90	0.00	0.00	0.00	0.00	0.00	0.00	56.90

-----  
Segment Leq : 56.90 dBA

Total Leq All Segments: 56.90 dBA

↑  
Results segment # 1: Allendale (night)

-----  
Source height = 1.46 m

ROAD (0.00 + 54.33 + 0.00) = 54.33 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	54.33	0.00	0.00	0.00	0.00	0.00	0.00	54.33

Segment Leq : 54.33 dBA

Total Leq All Segments: 54.33 dBA

↑

TOTAL Leq FROM ALL SOURCES (DAY): 56.90

+ 3.00 (to account for distance)  
=59.90

(NIGHT): 54.33

+ 3.00 (to account for distance)  
- 3.00 (to account for doubling of traffic)  
=54.33

↑

↑

A large decorative graphic on the left side of the page. It features a blue triangular shape in the top-left corner, a white curved line separating it from a large, light gray circular area that dominates the lower and right portions of the page.

# APPENDIX F

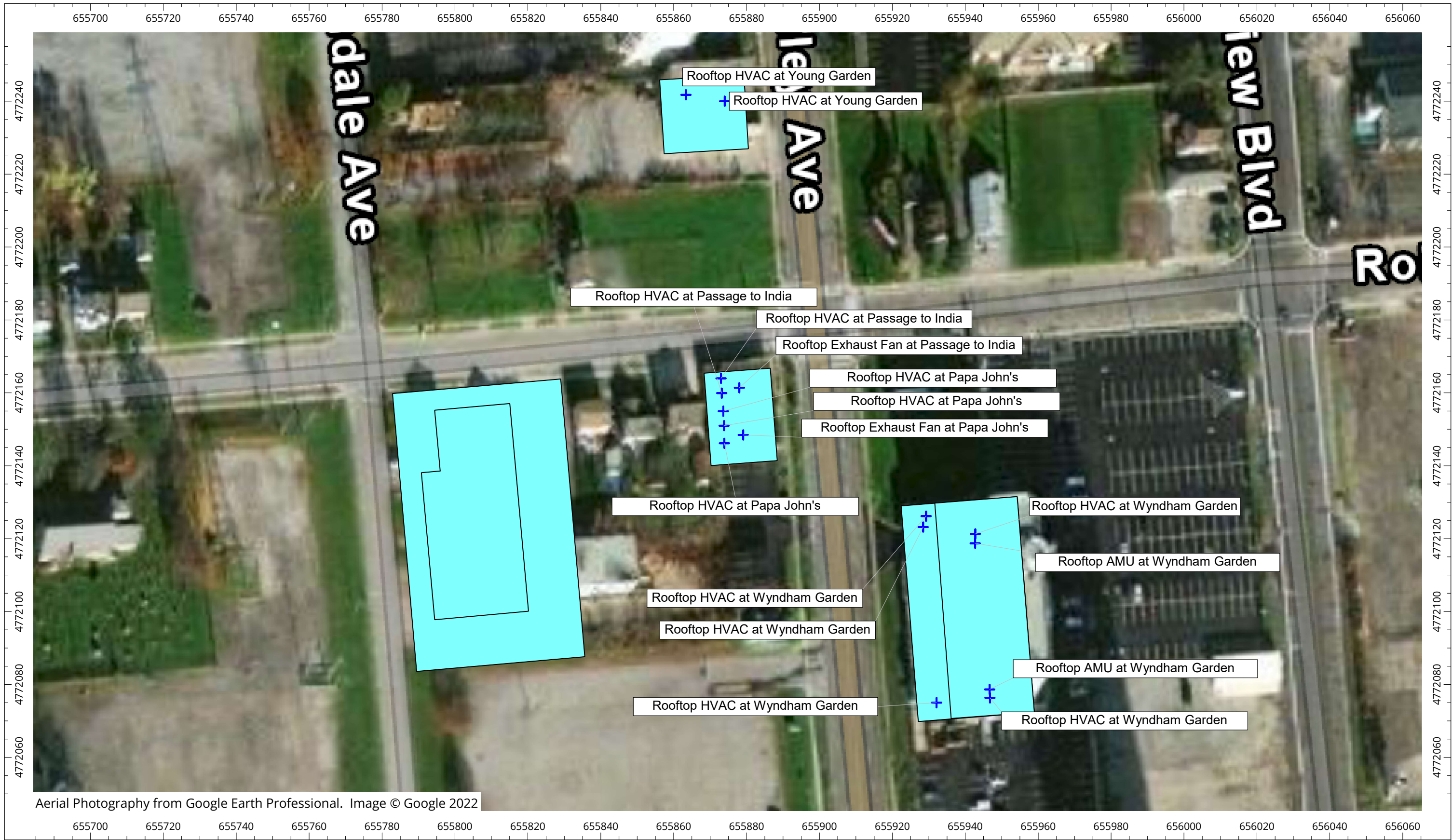
**Table F-1: Industrial Sites Surrounding the Proposed Development**

Map Icon Number	Business Name	Address	Type Of Approval/ Facility/Equipment	Approval / Registration Number
1	1179462 Ontario Inc.	5400 Robinson Street	ECA-AIR	0186-595L9U
2	Hospitality Fallsview Holdings Incorporated	6361 Fallsview Boulevard	ECA-AIR	8749-ACBLYS
3	Falls Management Company	6380 Fallsview Boulevard	ECA-AIR	3297-5PYLHD
4	Niagara Parks Commission	5920 Niagara Parkway	ECA-AIR	7489-7DHGPL
5	Harry Oakes	4946 Clifton Hill	ECA-AIR	8573-5JSHYJ
6	Hoco Limited	4960 Clifton Hill	ECA-AIR	0609-6R2PLS
7	Post Foods Canada Incorporated	5651 Lewis Avenue	EASR-Air Emissions	R-010-2110483729
8	The Regional Municipality of Niagara	5685 North ST	EASR-Standby Power System	R-002-8651049959
9	Niagara Health System	5546 Portage Road	EASR-Standby Power System	R-002-1547998780
10	Maid of the Mist Steamboat Company, Limited	5920 River Road	ECA-AIR	2453-58LQEU
11	The Corporation of the City of Niagara Falls	6815 Stanley Ave	ECA-AIR	7958-86RLGY

**Table E-2: Industrial Sites Surrounding the Proposed Development**

Map Icon Number	Business Name	Comments on Operations	Approximate Distance to Site (m)	D-6 Classification
1	1179462 Ontario Inc.	Permitted exhaust stacks are potentially significant noise sources. However, facility does not appear to exist anymore.	170	I
2	Hospitality Fallsview Holdings Incorporated	Exhaust stacks, diesel generators, and cooling towers are potentially significant noise sources.	270	I
3	Falls Management Company	Exhaust stacks, diesel generators, and cooling towers are potentially significant noise sources.	300	I
4	Niagara Parks Commission	The on-site standby diesel generator is a potentially significant noise source when operational.	500	I
5	Harry Oakes	The on-site standby diesel generator is a potentially significant noise source when operational.	580	I
6	Hoco Limited	The on-site standby diesel generator is a potentially significant noise source when operational.	580	I
7	Post Foods Canada Incorporated	Various rooftop HVAC, AHU, exhaust units, generators, and sources associated with silos are potentially significant noise sources.	800	II
8	The Regional Municipality of Niagara	The on-site standby power system is a potentially significant noise source when operational.	810	I
9	Niagara Health System	The on-site standby power system is a potentially significant noise source when operational.	810	I
10	Maid of the Mist Steamboat Company, Limited	Three exhaust stacks are potentially significant noise sources.	940	I
11	The Corporation of the City of Niagara Falls	The on-site standby natural gas generator is a potentially significant noise source when operational.	975	I





**Stationary Sources**

Location of Stationary Sources in Relation to the Proposed Development

5566 Robinson Street & 6158 Allendale Avenue - Niagara Falls, Ontario

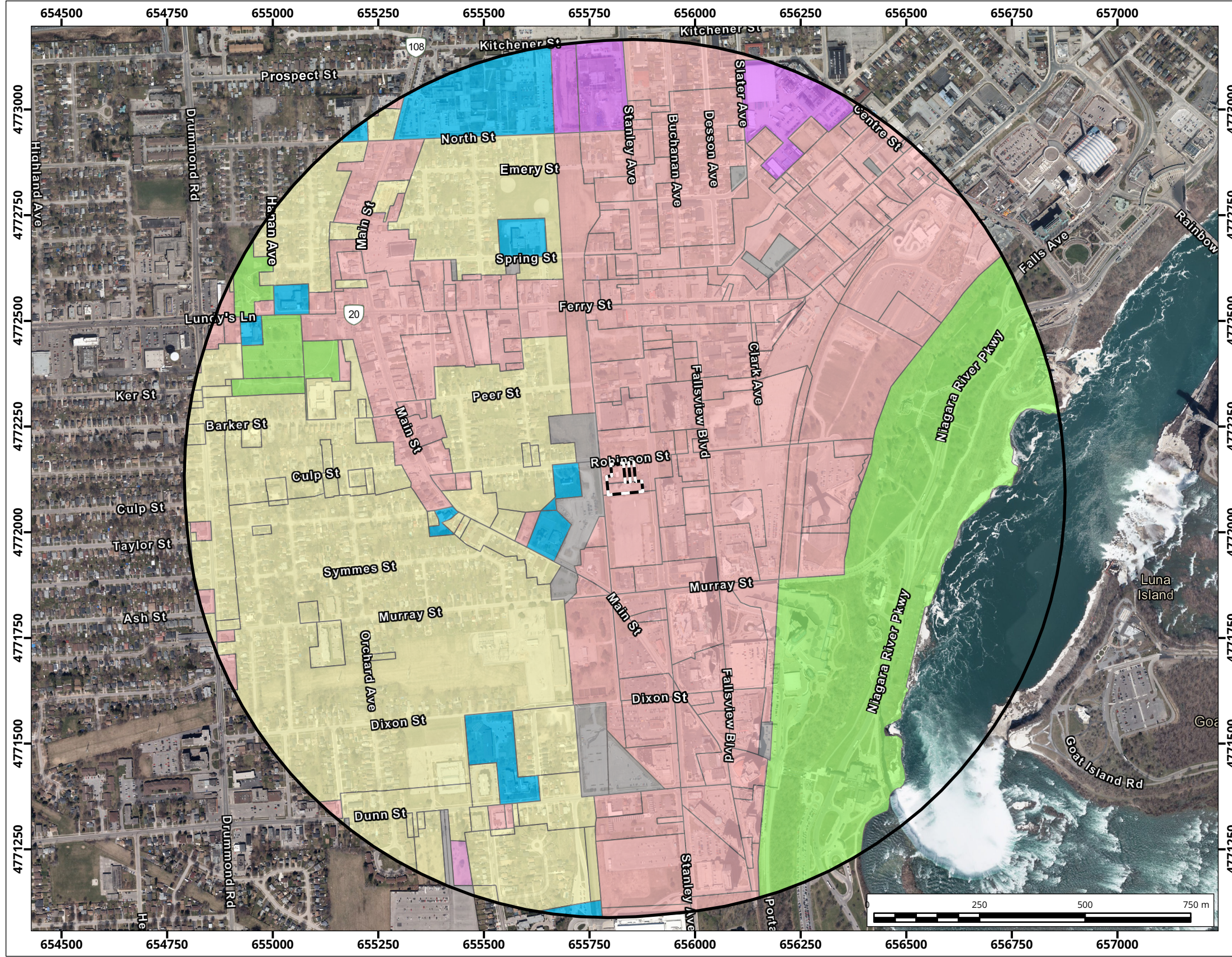


Project #2201139

Drawn by: MFA	Figure: <b>F-3</b>
Scale: 1:1000	
Date: April 8, 2022	







**Legend**

- Property Line
- 1,000 m Setback

**Zoning Classification**

- COMMERCIAL; COMMERCIAL; RESORT COMMERCIAL; TOURIST COMMERCIAL
- DEVELOPMENT HOLDING
- INDUSTRIAL; LIGHT INDUSTRIAL
- INSTITUTIONAL
- MULTIPLE RESIDENTIAL; RESIDENTIAL
- OPEN SPACE
- PARKING

Service Layer Credits: 2018 Niagara Region MapCast Mapping Services:  
 Hybrid Reference Layer (road and water labels only): Esri Community Maps Contributors, Province of Ontario, Niagara Region, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada  
 World Imagery: Maxar Niagara Zoning from Open data zoning-bylaw-79-200

**Zoning Map of Subject Lands and Surrounding Areas**

Map Projection: NAD 1983 UTM Zone 17N  
 Allendale and Robinson - Niagara Falls, Ontario

True North

By: LJN	Figure: F-4
Approx. Scale: 1:10,000	
Date Revised: Apr 8, 2022	

Project #: 2101139



Map Document: C:\Users\LJN\OneDrive - ROWAN WILLIAMS DAVIES & IRWIN INC\Desktop\GIS\LandUseComp\F2101139\_Allendale\_Robinson.aprx