REPORT

6104 GARNER ROAD DEVELOPMENT

NIAGARA FALLS, ONTARIO

LAND-USE COMPATIBILITY (AIR QUALITY AND NOISE)

RWDI # 2511752

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1 INTRODUCTION

RWDI undertook a land-use compatibility study at the request of the Niagara Region in support of the development at 6104 Garner Road in Niagara Falls, Ontario (the "subject lands"). Current Niagara Falls Zoning By-Law indicates that the proposed development is located in an area designated as Development Holding (DH). The location of the proposed development is shown on **Figure 1** and the zoning in **Figure 2.**

The scope of this study was to identify any existing and potential land use compatibility issues and evaluate options to achieve appropriate design, buffering and/or separation distances between the proposed sensitive land uses and nearby employment areas and/or major facilities.

2 BACKGROUND

2.1 Noise and Vibration Guidelines

Similar to how air quality impacts are regulated in Ontario, the primary noise and vibration management approach is to have emitters control their emissions to a degree that results in acceptable sound levels at surrounding sensitive receptor locations. This approach is implemented through the Ontario Environment Protection Act, the Environmental Assessment Act, associated regulations, and supporting guidelines.

The Ontario Ministry of the Environment, Conservation and Parks (MECP) Environmental Noise Guideline NPC-300 (MOECC, 2013) contains sound level criteria for stationary sources (e.g. industry) as well as for environmental sound from transportation sources (e.g., road and rail). The NPC-300 sound level criteria for stationary sources are consistent for facilities that are required to submit an Acoustic Assessment Report (AAR) in support of an ECA or EASR permit with the MECP. A summary of the applicable criteria is included with **Appendix A**, which also makes reference to warning clauses and mitigation guidance, found in **Appendix B**, and **Appendix C**, respectively.

2.1.1 Stationary Sources

Stationary sources could be categorized into two groups: Those that have a permit with the MECP through an ECA or EASR; and those that are exempt from ECA or EASR permit requirements.

In the case where a stationary source has a permit with the MECP (ECA or EASR), and would be put in a position where it is no longer in compliance with the applicable sound level criteria due to the encroachment due to conversion of land designation to include sensitive land use (e.g. residential), 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) may be a method to allow for infill sensitive land-uses. In this case, coordination and formal agreements between the stationary source owner, proposed new development owner, the land-use planning authority and the MECP would be required.

In the case where a stationary source is exempt from ECA or EASR permit requirements with the MECP, the noise provisions of the city's municipal code and guidance from NPC-300 (MOECC 2013) 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 sensitive land-use. 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 (e.g. building orientation, acoustical barriers, façade sound insulation design). In this case, acceptance of the proposed mitigation approach may be required by either the stationary source owner or land-use planning authority or both.

2.1.2 Transportation Sources

The site is located within the Niagara Region, thus the Region's Regional Road Traffic Noise Control policy was followed in addition to NPC-300.

Transportation noise that exceeds the NPC-300 sound level thresholds at the plane of window or sound level criteria for outdoor living areas for a proposed noise sensitive development would require specified noise insulation design of building components and air-conditioning and ventilation systems to ensure the indoor sound level criteria can be achieved. Typically, a detailed transportation source noise impact study is submitted with re-zoning, zoning by-law amendment and/or site plan approval applications.

2.1.3 Vibration Impact

Potential vibration impacts are to be assessed in cases where proposed sensitive developments are to be located on lands either adjacent to or in close proximity to facilities that may include activities causing vibration (e.g. with a stamping press) and/or rail lines (subway, streetcar and freight/passenger/commuter lines). This development is located far enough away from any such facility or activity that vibration levels are not expected to be significant.

2.2 Land Use Planning Compatibility Guidelines

Land-use planning plays a secondary role in managing air quality, noise and vibration effects in Ontario. For example, this can be achieved by creating a land-use buffer between industry and a sensitive land use, such as residences, schools, seniors' facilities, daycares, hospitals, churches and campgrounds. The MECP guideline D-6: Compatibility between Industrial Facilities (MOE, 1995) is typically referenced to assist planners in establishing adequate buffers.

The MECP's D-series guidelines deal with land use compatibility in Ontario. Guideline D-6 (Compatibility between Industrial Facilities) provides a classification scheme for industries based their potential for emissions that could cause adverse effects. For each class of industry, the guideline provides an estimate of potential influence area and a

minimum recommended separation distance, which are set out in **Table 1** below. Guideline D-6 recommends the following:

1. "...no sensitive land uses shall be permitted within the actual or potential influence areas of Class I, II or III industrial land uses, without evidence to substantiate the absence of a problem." (Sec. 4.5.1)

2. "No incompatible development other than that identified in Section 4.10, *Redevelopment, Infilling and Mixed-Use Areas* should occur [within the recommended minimum separation distances]" (Sec. 4.3)

3. "When a change in land use is proposed [in an area of urban redevelopment, infilling or transition to mixed use] for either industrial or sensitive land use, less than the minimum separation distance set out in Section 4.3 may be acceptable subject to either the municipality or the proponent providing a justifying impact assessment (i.e. a use specific evaluation of the industrial processes and the potential for off-site impacts on existing and proposed sensitive land uses). Mitigation is the key to dealing with less than the minimum to the greatest extent possible." (Sec. 4.10.3)

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 1: Summary of Guideline D-6

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

Guideline D-6 provides criteria for classifying industrial land uses, based on their outputs, scale of operations, processes, schedule and intensity of operations. **Table 2** provides the classification criteria and examples.

Table 2: Guideline D-6 Industrial Categorization Criteria

Criteria	Class I	Class II	Class III
Outputs	• Sound not audible off property • Infrequent dust and/or odour emissions and not intense • No ground-borne vibration	• Sound occasionally audible off property • Frequent dust and/or odour emissions and occasionally intense • Possible ground-borne vibration	• Sound frequently audible off property • Persistent and intense dust and/ or odour emissions • Frequent ground-borne vibration
Scale	• No outside storage • Small scale plant or scale is irrelevant in relation to all other criteria	• Outside storage permitted • Medium level of production	• Outside storage of raw and finished products • Large production levels
Process	• Self-contained plant or building which produces / stores a packaged product • Low probability of fugitive emissions	• Open process • Periodic outputs of minor annoyance • Low probability of fugitive emissions	• Open process • Frequent outputs of major annoyances • High probability of fugitive emissions
Operation / Intensity	• Daytime operations only • Infrequent movement of products and/or heavy trucks	• Shift operations permitted • Frequent movements of products and/or heavy trucks with majority of movements during daytime hours	• Continuous movement of products and employees • Daily shift operations permitted

3 METHODOLOGY

The compatibility assessment for the proposed development includes an initial screening of industrial uses and other potentially significant emission sources in the surrounding area. This involves the use of experience and professional judgement, with the classification system and potential influence areas of Guideline D-6 serving as a guidance. Based on Guideline D-6, the screening of industries within 1000 m of the proposed development are included.

The following tasks were included in the screening assessment:

- Review of potential constraints for new major facilities to reasonably be established in the employment area, based on the types of uses permitted in the zoning by-law;
- Review of potential constraints with respect to existing facilities in the employment area (increased risk of complaints, operational constraints, etc.), based on interpretation of the following information:
    - a visit to the site;
    - published satellite imagery;
    - published street-based photography;
    - MECP ECA and EASR permits for existing industries within 1000 m of the subject lands;
    - Environment and Climate Change Canada's (ECCC) National Pollutant Release Inventory (NPRI) data for industries within 1000 m of the subject lands; and
    - Guideline D-6 from the Ministry of the Environment, Conservation and Parks (MECP); and
    - meteorological data for the study area.
- Contact the applicable MECP District Office to determine if there have been any complaints in recent years or are any air quality or noise concerns within the area; and
- Review potential for future expansion and changes to industries in the study area.

The results of these tasks are summarized in the following sections.

3.1 Constraints for Existing Industrial Facilities

3.1.1 Site Visit, Satellite Imagery, Environmental Permits, etc.

RWDI have had several past projects in the vicinity of the subject lands and are therefore knowledgeable with the area. Furthermore, RWDI staff have conducted visits to the area on several occasions, the most recent being on November 2nd, 2021. The observations and conclusions based on our knowledge of the area, and the most recent site visit were applied for this study.

In addition to the site visit and past experience, satellite imagery, ECA documents, EASR registrations, and National Pollutant Release Inventory (NPRI) entries were reviewed to identify facilities of interest. See **Appendix D** for a listing of all facilities with current MECP approvals and registrations within a 1,000m radius of the proposed development.

The land uses within 1,000m of the subject lands are predominantly residential, commercial, and open space uses. The lands immediately west of the subject lands are a mix of designated Agricultural (A) and Open Space (OS). The lands immediately south of the subject lands are designated Open Space (OS). The lands north of the subject lands are a mix of designated Residential (R), Open Space (OS) and Tourist Commercial (TC). The lands located east of the subject lands are designated Residential (R).

One (1) facility within 1,000m of the proposed development was identified through the MECP ECA and EASR document search and reviewed and confirmed through satellite imagery. However, this site is currently occupied by another facility for which no environmental permits or registrations were found in the Access Environment database. This means the information of this one location is not updated in the database, and the previous facility ceased operation and was subsequently replaced by one with insignificant environmental concerns. Three (3) additional commercial facilities were considered for their potential noise impact at the development, but do not fall under the D-6 classification. **Table D-1** in **Appendix D** lists all these industries.

In addition, RWDI previously contacted the local MECP district office regarding concerns and complaints related to air quality or noise and were advised that the MECP is unable to provide this information directly; such inquiries have to be directed via the Ministry's Freedom of Information (FOI) office.

The proposed future land use plan was also reviewed. As part of the future planning, the areas immediately east and north of the subject property will be zoned as residential. Areas further north, along Lundy's Lane, will remain predominantly commercial. Rezoning the subject land is not expected to significantly impact land uses in the existing industrial zone on Garner Road, north of the development.

3.1.2 Meteorological Data

RWDI reviewed wind data from Niagara District Airport as part of this undertaking. A summary of the directional distribution of winds over a period from 2001-2021 is shown in **Figure 3**. The wind directions in the figure refer to the direction from which the wind blows, while the annual frequency of a given wind direction is shown as a

distance radially from the centre. The prevailing winds are mainly south-westerly, while northerly being the least frequent (less than 4% of the time).

4 RESULTS

4.1 Guideline D-6

The MECP Guideline D-6 was used as a tool to classify the identified industries and asses their potential influence on the proposed development. The results of the classification and potential influence on the proposed development is discussed below.

After reviewing the most currently available status of those industrial facilities identified and noted in earlier sections of this report, none of the facilities with ECA and EASR registrations on file that are associated with potential air quality impacts are located within the 1,000m study area; however, there are some facilities with Certificates of Approval of Municipal and Private Sewage Works only, and these facilities are deemed not to generate any potential adverse air quality impacts, hence their exclusion from this study.

Of these facilities, "Redpath Industries Ltd" is identified with ECA or EASR records, though this facility no longer exists and has since been replaced by "BVGlazing Systems" in the same location. This new manufacturer does not have an ECA or EASR for their operations on file with the MECP. It should also be noted that Lundy's Lane Sewage Pumping Station also does not have an ECA/EASR approval. These two facilities might have the potential to induce some air quality impacts.

Additionally, the remaining three facilities located within 300m of the subject lands are considered as non-industrial sites, which are listed in **Table D-1** in **Appendix D**. These three facilities include a golf course to the southwest and two social clubs to the northeast. None of these facilities operate under an MECP ECA or EASR permit. These non-industrial sites do not have any significant sources that would cause adverse air quality impacts at the proposed development. Although these facilities should already be in compliance at the existing residences at the subject lands, the rooftop HVAC equipment was included in the stationary noise source assessment.

4.1.1 Class I

One (1) facility within the 1,000m radius surrounding the subject lands has been classified as Class I. This facility is included in **Table 3** and its respective location identified on **Figure 4**. A summary of all facilities is provided in **Table D-1** in **Appendix D**.

Table 3: Class I Industries within 1,000m of the Development

Name	Address	Type of Operation	ECA or EASR Registration #	Approximate Distance to Subject Lands (m)
Lundy's Lane Sewage Pumping Station	8971 Lundy's Lane, Niagara Falls, Ontario	The facility is of very small scale and is well contained with low-lying ground level exhaust vent pipes. This is a sanitary sewage pumping station with no outdoor storage.	N/A	318

4.1.1.1 *Noise Impact*

The Lundy's Lane Sewage Pumping Station is located more than 300m from the subject lands. The pumping station appears to include an emergency generator and the following noise sources: generator intake, combustion exhaust, and radiator exhaust. As a conservative measure, potential noise impacts from the pumping station were assessed and included in the modelling.

4.1.1.2 *Air Quality Impact*

The Class I facility is located more than 300m from the subject lands. There is no evidence of significant industrial operations that would result in an impact on air quality at the proposed development as the facility is of small size and is well contained. Although infrequent odour emissions may be encountered, which may be intense on occasion, there are existing residential houses and several office houses located to the facility's northwest and its immediate east at approximately 200m and 100m, respectively, which are closer in proximity than the proposed development. In view of this, it is considered a Class I facility. As summarized in **Table 4** below, this facility does not have any evidence of outdoor operations or fugitive dust sources. Taking these factors into account, the impact on air quality at the proposed development is expected to be insignificant.

Table 4: Air Quality Summary for Class I Facility

Name	Outdoor Operations	Evidence of Fugitive Dust Sources	Evidence of Odour Sources	Tall stacks
Lundy's Lane Sewage Pumping Station	No	No	Yes	No

4.1.2 Class II

One (1) facility within the 1,000m area surrounding the subject lands has been classified as a Class II facility. This facility is included in **Table 5** and its respective location identified in **Figure 4**. A summary of all Class facilities is provided in **Table D-1** in **Appendix D**.

Table 5: Class II Industries within 1,000m of the Development

Name	Address	Type of Operation	ECA or EASR Registration #	Approximate Distance to Subject Lands [1] (m)
BV Glazing Systems	5855 Garner Road, Niagara Falls, Ontario	Site is medium scale, well contained with relatively low-lying exhaust vents. A residential railing and commercial glazing products manufacturing facility.	N/A	280

[1] From the development property line to facility's building

The official plan in the study area obtained from the City of Niagara Fall is also shown on **Figure 5** for reference. To the east of the proposed development are mainly residential properties, while west of the proposed development is mainly good general agricultural parcels.

4.1.2.1 *Noise Impact*

The Class II facility is located approximately 300m away from the proposed development. Significant noise sources include a dust collector, and forklift and truck movements on-site. These sources were included in the stationary noise source assessment.

4.1.2.2 *Air Quality Impact*

The Class II facility manufactures residential, railing, and commercial glazing products. The facility is well contained, without visible roof-top air emission stacks, and only some exhaust vent pipes are observed. While there was evidence of outdoor storage observed at the site, the materials stored outdoors are not emission sources of dust or odours. The facility is located approximately 100m away from existing residential developments, which is closer than the distance from this facility to the proposed development site. Therefore, based on this analysis, the BV Glazing Systems facility is not expected to impact air quality at the subject lands with the current separation distance of 300m considered sufficient for compatibility with the subject lands.

Table 6: Air Quality Summary for Class II Facility

Name	Outdoor Operations	Evidence of Fugitive Dust Sources	Evidence of Odour Sources	Tall stacks
BV Glazing Systems	Yes	No	No	No

4.1.3 Class III

There were no class III facilities identified within 1,000m of the subject lands.

4.2 Stationary Noise Source Assessment

RWDI conducted a screening level land-use compatibility assessment based on the guidance of the Ministry of the Environment D-6 Guideline (MOE, 1995a). Stationary sources of noise surrounding the proposed development were identified using a combination of source identification during a site visit conducted on November 2, 2021, publicly available aerial and street-level imagery, business listing and the MECP Access Environment database. Classes were assessed using the noise impact perspective, as an air quality review was not considered for this study. A scale plan is included in **Figure 4** indicating the 20m, 70m and 300m D-6 Guideline setback distances for the three industry classes.

The results of the D-6 assessment from a noise impact perspective are provided in **Section 4.1**. The results of the D-6 assessment note a mix of facilities located within and outside the required setback distances.

4.2.1 Representative Receptors

The noise sound pressure levels from stationary sources are evaluated along the building façades, using the "building evaluation" feature of Cadna/A to account for all plane of window point of receptions. The proposed development includes a rooftop patio, which is assessed as an outdoor living area (OLA). The OLA receptor is placed at the exposed edge of the patio, thereby representing the worst location.

4.2.2 Assumed Sources and Sound Power Levels

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

RWDI proxy data were used for the sound power levels of the previously mentioned HVAC units, dust collector, idling trucks, and generator sources included in the model. The assumed sound power levels included in the screening level stationary source assessment are presented in **Table 7**. The locations of the sources summarized in **Table 7** included in the stationary source assessment are illustrated in **Figure 6**.

Table 7: Stationary Source Sound Power Level Assumptions

Source	Proxy Data / Calculation	Sound Power Level (dBA)	Duty Cycle	
			Daytime and Evening (07:00h – 23:00h)	Nighttime (23:00h – 07:00h)
HVAC_1Fan	Proxy Data	82	Continuous	Continuous
HVAC_2Fan	Proxy Data	85	Continuous	Continuous
Idling Truck	Proxy Data	92	Continuous	Continuous
Dust Collector	Proxy Data	101	Continuous	Continuous
Generator Combustion Exhaust	Proxy Data	93	Continuous	Continuous
Generator Fresh Air Intake	Proxy Data	89	Continuous	Continuous
Generator Hot Air Exhaust	Proxy Data	94	Continuous	Continuous

The assumed sound power level values and duty-cycles for the stationary sources are based on reasonable assumptions for the source type. Continuous operations at the respective facilities represents the worst-case hour for the daytime and nighttime periods.

4.2.3 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, 1993 and ISO, 2024) algorithms. The predicted sound levels meet the Class 1 Area limits.

4.2.4 Recommendations

Based on the noise modeling results and setback distances, the proposed development is not anticipated to infringe on the compliance of any commercial or industrial operations with environmental noise permits (ECA or EASR). As such, the land use compatibility of the proposed development with respect to the nearby industries is considered acceptable from the noise impact perspective. **Table 8** details the stationary sources predicted noise levels.

Table 8: Stationary Sources Predicted Noise Levels

Receptor/Facade	Daytime Noise Level (dBA)	Nighttime Noise Level (dBA)	Meeting Criteria
North Façade	41	41	Yes
East Façade	34	34	Yes
South Façade	29	29	Yes
West Façade	40	40	Yes
OLA (Rooftop Patio)	42	-	Yes

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

4.3 Transportation Corridors

4.3.1 Noise and Vibration Impact

4.3.1.1 *Road Traffic Volume Data*

Traffic data for Garner Road and Lundy's Lane were obtained from the City of Niagara and Niagara Region. The total truck volume for Garner Road is 1.8% of the total traffic volume. It is assumed that there is a medium to heavy truck ratio of 5:8 as recommend in the Ministry of Transportation Environmental Guide for Noise document in the absence of detailed traffic data.

The traffic volume of Lundy's Lane is based on 2021 Summer Average Daily Traffic (SADT). The percentage of the truck volume is taken from the Annual Average Daily Traffic (AADT) traffic data available for Lundy's Lane between Montrose Road and Dorchester Road. 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 required by Niagara Region.

A summary of the traffic data used is included in **Table 9** below with more detailed information included in **Appendix E**.

Table 9: Road Traffic Volumes

Roadway	2045 Future Traffic (AADT/SADT)	% Day/Night	Speed Limit (km/hr)	% Trucks
Garner Road	6,982	94% / 6%	60	1.8%
Lundy's Lane East of Garner	27,131	91% / 9%	50	2.0%
Lundy's Lane West Garner	27,131		60	2.0%

4.3.1.2 *Rail Traffic Volume Data*

Rail is located more than 500m away from the site and therefore was not assessed in further detail.

4.3.1.3 *Representative Receptors*

The noise sound pressure levels from road traffic are evaluated along the building façades, using the "building evaluation" feature of Cadna/A to account for all plane of window point of receptions. The development includes a rooftop patio which is assessed as an outdoor living area (OLA). The OLA receptor is placed at the exposed edge of the patio, thereby representing the worst location.

4.3.1.4 *Transportation Source Assessment - Analysis and Results*

Due to the absence of any rail corridor or subway near the development, vibration assessment due to transportation sources is not required. Vibration at the proposed development is not expected to be a concern.

Sound levels due to the adjacent roads were predicted using emission algorithms from the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) guidelines (MOE, 1989) implemented in the Cadna/A software package.

To assess the impact of transportation noise on suites, the maximum sound level on each façade and in the OLA was determined with the results summarized in **Table 10**.

Table 10: Predicted Ground Transportation Source Sound Levels – Plane of Window

Receptor/Facade	Day L_{EQ}, 16hr	Night L_{EQ}, 8hr	Meeting Criteria	Warning Clause
North Façade	61	53	No	Type D[1,2]
East Façade	53	45	Yes	-
South Façade	57	49	No	Type D[1,2]
West Façade	62	54	No	Type D[1,2]
OLA (Rooftop Patio)	54	-	Yes	-

Notes:
1. Installation of central air conditioning should be implemented for all units on this façade with a warning clause "Type D".
2. Central air conditioning installation and warning clause "Type D" are recommended because the provision for adding central air conditioning and the warning clause "Type C" is not applicable to high density developments.

4.3.1.5 *Recommendations*

The following recommendations are provided to address transportation sources.

Ventilation Recommendations:

Due to the transportation sound levels at the plane of the façade, the apartment units on the west and north facades will be supplied with a central air conditioning system which will allow windows to remain closed as a noise mitigation measure. Furthermore, prospective purchasers or tenants should be informed by a warning clause "Type D".

Outdoor Living Areas (OLA):

Noise levels in the OLA due to road traffic meets NPC 300 criterion. Therefore, no mitigation or warning clause related to the OLA is required.

4.3.1.6 *Warning Clauses*

The following warning clauses are recommended for the proposed development:

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

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

4.3.2 Air Quality Impact

With reference to the City of Toronto Report: "Reducing Health Risks from Traffic Related Air Pollution (TRAP) in Toronto" (P.E23.7, October 16, 2017) [4], which states that:

> *"Health risk from TRAP is higher within 500m of highways with an average daily traffic volume of 100,000 vehicles or more, and within 100m of arterial roads with an average daily traffic volume of 15,000 vehicles or more".*

The City's report: "Avoiding the TRAP: Traffic-Related Air Pollution in Toronto and Options for Reducing Exposure" (October 2017) states that:

> *"TRAP exposure zones were defined as 500 metres on either side of a highway with an average of 100,000 vehicles or more per day, 150 metres on either side of a highway with an average of 50,000 vehicles or more per day, and 100 metres on either side of roadways with an average of 15,000 vehicles or more per day. "*

Queen Elizabeth Way (QEW) is a 400-series highway in the Canadian province of Ontario that links Toronto with the Niagara Peninsula as well as the City of Buffalo in New York State, USA. The QEW encounters an average of almost 140,000 vehicles per day in some sections according to 2021 data from the Ministry of Transportation Ontario (MTO). The subject lands are located more than 2,000m west of the QEW; at this distance, no significant air quality impacts are expected to present themselves at the proposed site from the QEW.

In addition, Garner Road and some other roads close to the vicinity of the project are mainly small roads with limited traffic, and are not expected to have traffic levels that would have a significant air quality impact on the proposed development.

5 CONCLUSIONS

RWDI has been retained to undertake a land-use compatibility/air quality/noise and vibration study in support of a proposed development at 6104 Garner Road in Niagara Falls, Ontario.

A review of the City of Niagara Falls zoning information, MECP ECA records, and ECCC NPRI reports were conducted as part of this assessment. The land uses within 1,000 m of the subject lands are predominantly residential, commercial, and open space uses.

5.1 Noise and Vibration

Vibration levels are not expected to be significant at the proposed development. Therefore, there are no mitigation measures recommended for vibration.

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

1. The dwellings on the west and north façade should be supplied with central air conditioning.
2. The inclusion of noise warning clauses related to:
    a. Transportation sound levels at the plane of window and the supply of central air conditioning; and
    b. Proximity to commercial/industrial land-use.

The proposed development is not anticipated to interfere with the compliance status of any regulated noise stationary sources. An overview D-6 assessment was completed along with stationary source modelling based on observations on-site showing that the sound impacts at the development are within NPC-300 Class 1 limits.

The impact of the development on itself and its surroundings is expected to be feasible to meet the applicable criteria through best-practice acoustical design, and by following the guidelines of NPC-216 for the installed HVAC equipment. The impact of the development on itself and on surrounding sensitive receptors will be addressed prior to the issuance of final planning approvals.

Based on the results and recommendations included with this assessment, the proposed development is recommended to be approved based on noise and vibration impacts.

5.2 Air Quality

The only two Class I and II facilities were identified in this study, which are expected to be compatible with the subject lands with respect to air quality. No additional study of this facility is required from an air quality perspective.

Regarding transportation, there are no expectations of negative impacts to local air quality conditions are the proposed development.

The proposed development is compatible with the surrounding land uses from an air quality and noise perspective given proper mitigation is introduced as necessary.

6 REFERENCES

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14. International Organization for Standardization (ISO), 2024, International Standard ISO 9613-2:2024, Acoustics — Attenuation of sound during propagation outdoors — Part 2: Engineering method for the prediction of sound pressure levels outdoors (ISO, 2024)
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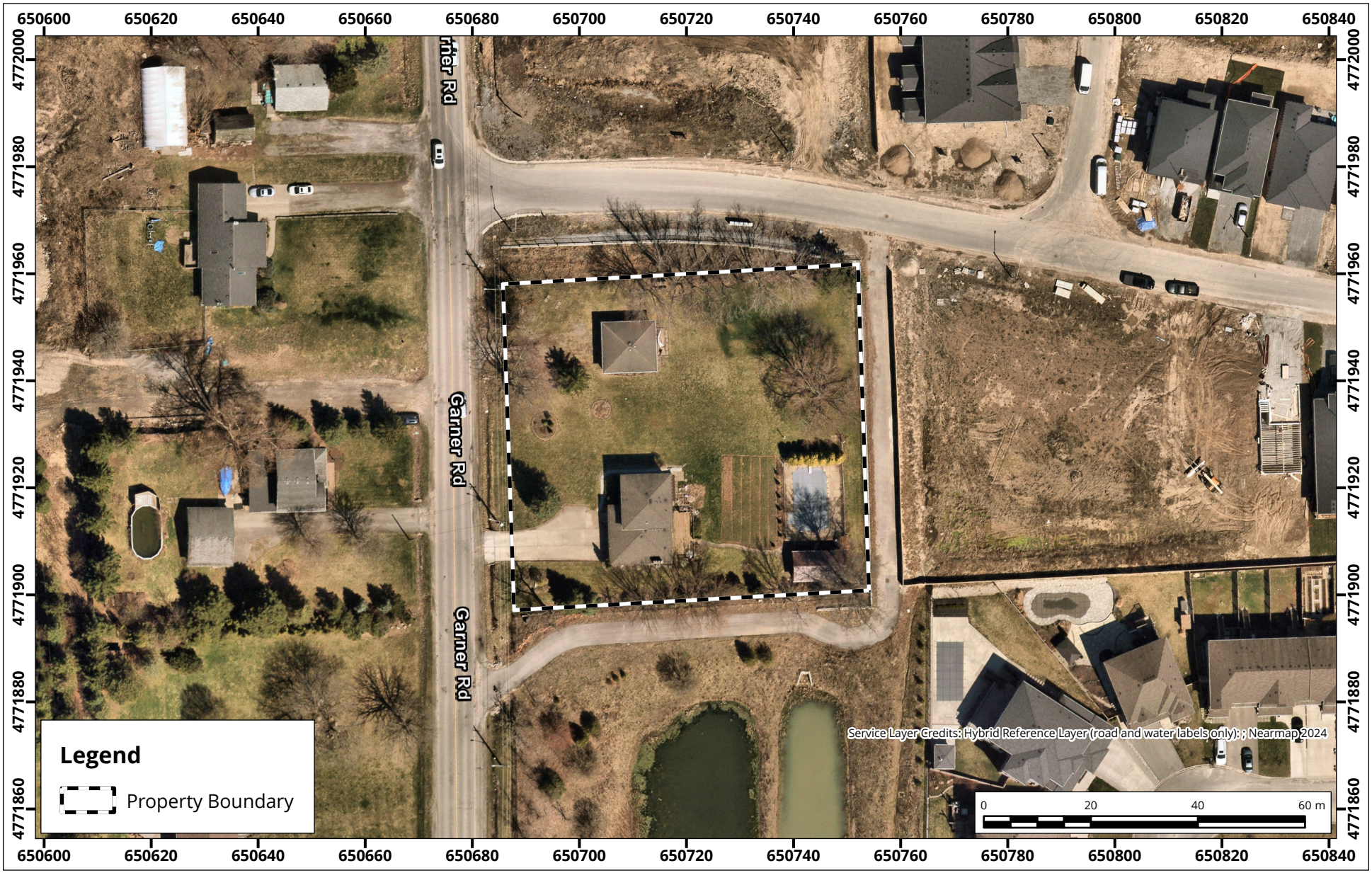
7 STATEMENT OF LIMITATIONS

This report entitled "6104 Garner Road Development: Land-Use Compatibility/Mitigation Study" was prepared by RWDI AIR Inc. ("RWDI") for Upper Canada Planning & Engineering Ltd. ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by the 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 any 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.

FIGURES



Site Location

Map Projection: NAD 1983 UTM Zone 17N

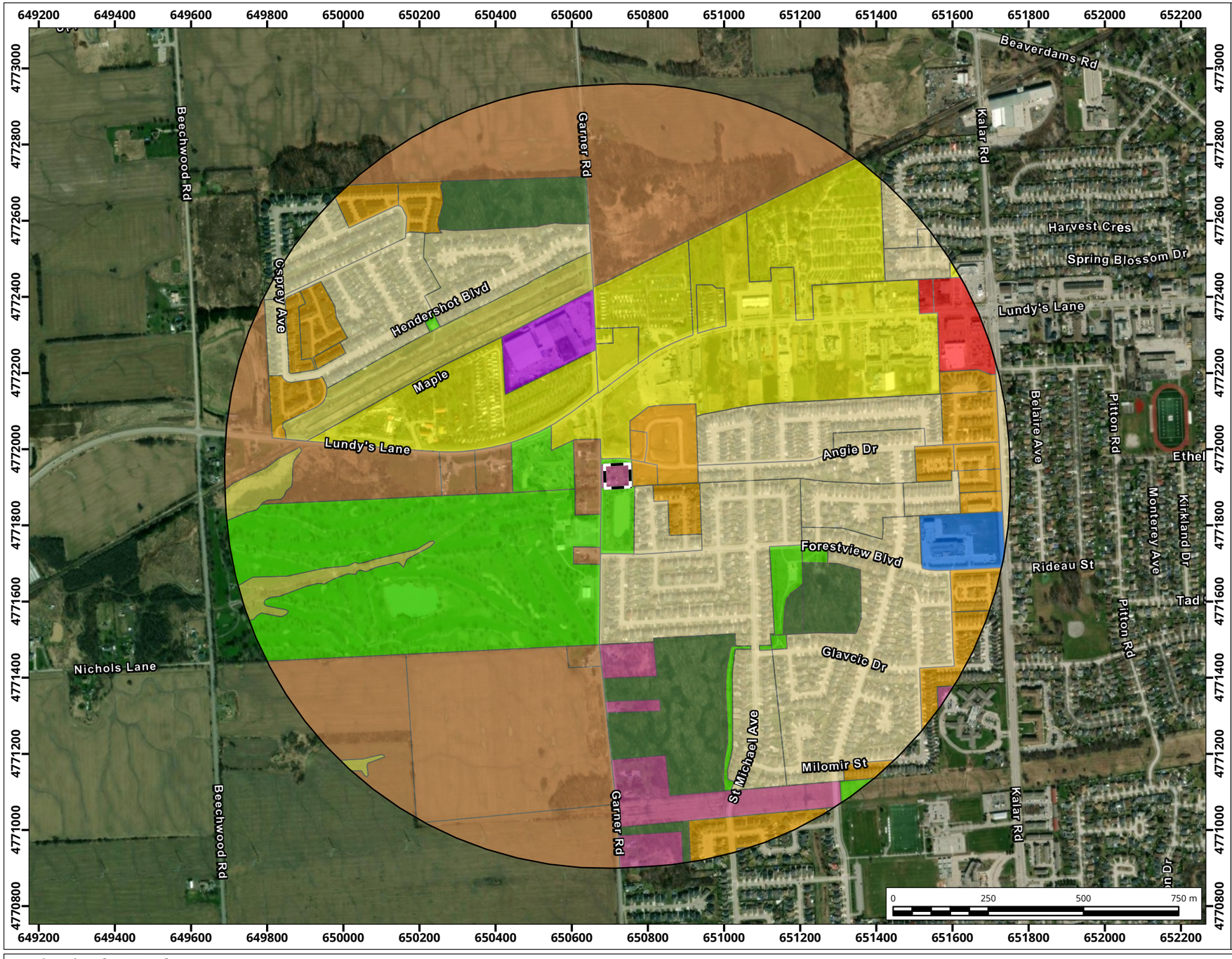
6104 Garner Road - Niagara Falls, Ontario

True North

Project #: 2511752

Drawn by: PIP	Figure: 1
Approx. Scale:	1:1,000
Date Revised: Jun 12, 2025	

Map Document: C:\WorkingFolder\Jobs_America\P2511752\P2511752.aprx



Legend

- Property Boundary
- 1,000m

Zoning Classification

- AGRICULTURAL
- COMMERCIAL
- DEVELOPMENT HOLDING
- ENVIRONMENTAL PROTECTION AREA
- HAZARD LAND
- INDUSTRIAL
- INSTITUTIONAL
- MULTIPLE RESIDENTIAL
- OPEN SPACE
- RESIDENTIAL
- TOURIST COMMERCIAL

Service Layer Credits: Zoning - Niagara Falls: City of Niagara Falls;Hybrid Reference Layer (road and water labels only): ;World Imagery: Maxar
Zoning Data from City of Niagara Falls

Zoning in the Study Area

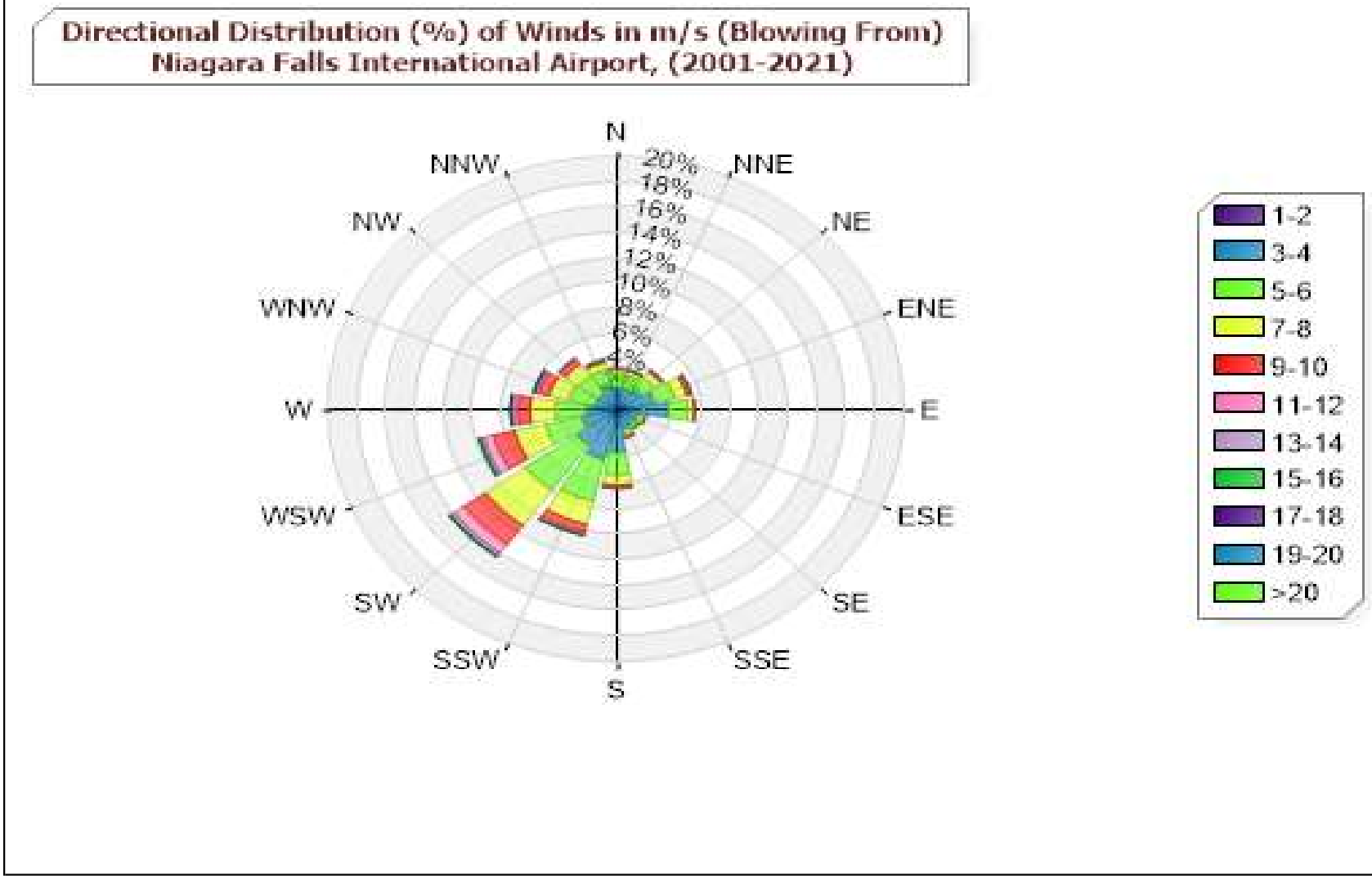
Map Projection: NAD 1983 UTM Zone 17N
6104 Garner Road - Niagara Falls, Ontario

True North

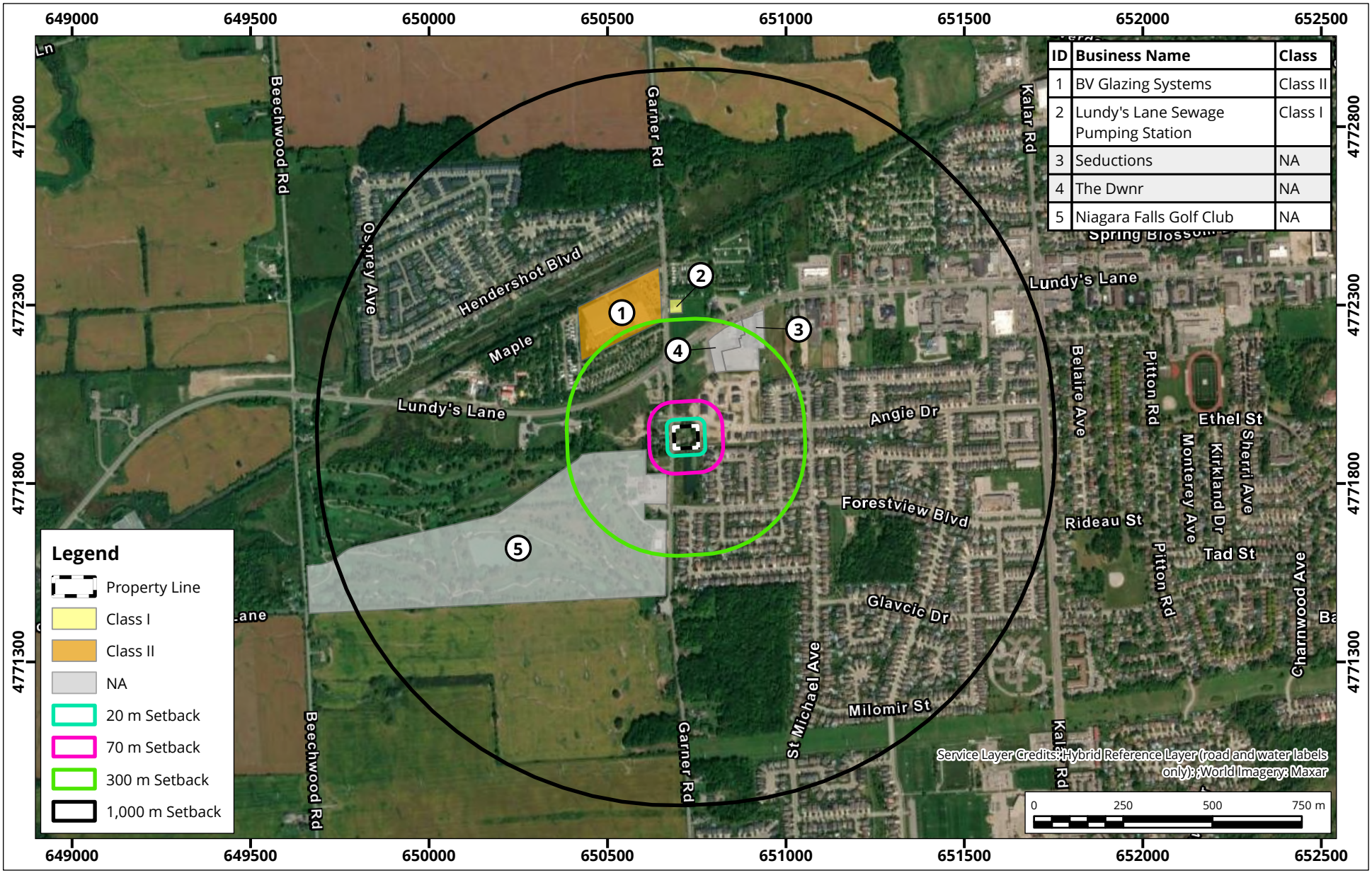
Project #: 2511752

Drawn by:	PIP	Figure:	2
Approx. Scale:			1:11,000
Date Revised:			Jun 12, 2025

Map Document: C:\Working\Folder\Jobs_Americal\P2511752\P2511752.aprx



Directional Distribution of Winds Blowing from St. Catharines Niagara District Airport	**Figure 3**	
6104 Garner Road Development, Niagara Falls, ON RWDI# 2511752	Date Revised: June 12, 2025	



ID	Business Name	Class
1	BV Glazing Systems	Class II
2	Lundy's Lane Sewage Pumping Station	Class I
3	Seductions	NA
4	The Dwnr	NA
5	Niagara Falls Golf Club	NA

Proposed Development and Surrounding Sites of Interest

Map Projection: NAD 1983 UTM Zone 17N

6104 Garner Road - Niagara Falls, Ontario

True North

Project #: 2511752

Drawn by:	PIP	Figure:	4
Approx. Scale:		1:15,000	
Date Revised:		Jul 8, 2025	

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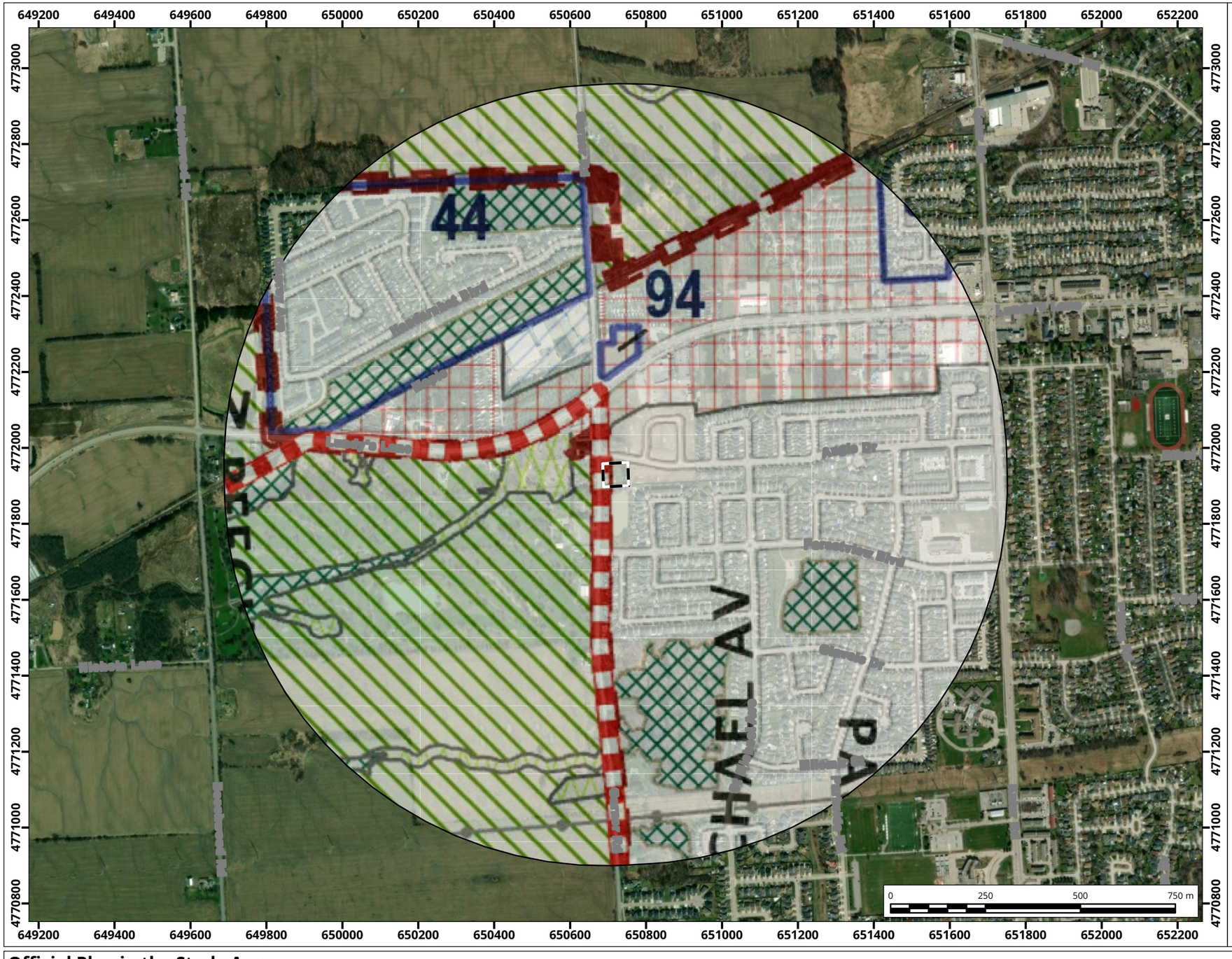

Legend

- Property Boundary
- 1,000m

City of Niagara Falls Land Use Designations

- Environmental Protection Area
- Extractive Industrial
- Good General Agriculture
- Residential
- Resort Commercial
- Secondary Plan Area
- Special Policy Area
- Urban Area Boundary

Service Layer Credits: Hybrid Reference Layer (road and water labels only): Esri Community Maps Contributors, Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, NRCan, Parks Canada;World Imagery: Maxar
Official Plan from City of Niagara Falls

Official Plan in the Study Area

Map Projection: NAD 1983 UTM Zone 17N
6104 Garner Road - Niagara Falls, Ontario

True North

Project #: 2511752

Drawn by:	PIP	Figure:	5
Approx. Scale:			1:11,000
Date Revised:			Jun 12, 2025

Map Document: C:\Working\Folder\Jobs_America\P2511752\P2511752.aprx

Stationary Sources

Location of Stationary Sources in Relation to the Proposed Development

6104 Garner Road - Niagara Falls, Ontario

True North

Project #2511752

Drawn by: KA	Figure: 6
Scale:	1:3300
Date:	June 30, 2025

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

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

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

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

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

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

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

Notes:

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

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

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

Table 6: Supplementary Indoor Sound Level Criteria for Aircraft Sources

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

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

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

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

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

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 **Error! Reference source not found.**.

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

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

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_{LM})

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

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)
Class I	Small scale, self-contained, daytime only, infrequent heavy vehicle movements, no outside storage.	70 m	20 m
Class II	Medium scale, outdoor storage of wastes or materials, shift operations and frequent heavy equipment movement during the daytime.	300 m	70 m
Class III	Large scale, outdoor storage of raw and finished products, large production volume, continuous movement of products and employees during daily shift operations.	1000 m	300 m

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

Table 12: Guideline D-6 Industrial Categorization Criteria

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

APPENDIX 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 ≤ 60 dBA, and noise controls have not been provided.

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

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

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

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

"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."

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

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

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

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

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."

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^2
    - Many materials could satisfy the surface density requirement, e.g. wood, glass, concrete, Plexiglas, Acrylite.
    - The required thickness can be determined by dividing the 20 kg/m^2 face weight by the material density (kg/m^3). Typically, this would imply:
        - 50 mm (2”) of wood
        - 13 mm (0.5") of lighter plastic (like Plexiglas or PVC)
        - 6 mm (0.25") 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.

APPENDIX D

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

Map Icon Number	Business Name	Address	Type of Approval/Facility/ Equipment	Approval / Registration Number	Comment on Operations	Tall Stacks Present (Y- Yes /N - No)	Approximate Distance to Site[1] (m)	D-6 Classification [2]
1	BVGlazing Systems	5855 Garner Road	NA	NA [Note 3]	Site is medium scale, well contained with relatively low lying exhaust vents. The facility is a residential railing and commercial glazing products manufacturing facility with some outdoor storage. No odours are expected from the operations. Potential for fugitive dust is minimal due to paved lot and driveway. No outdoor storage piles. Significant noise sources include the dust collector and on-site forklift and truck movements.	N	280	II
2	Lundy's Lane Sewage Pumping Station	8971 Lundy's Lane	NA	NA	Site is of very small scale with one storey structure only, which is well contained with low lying ground level exhaust vent pipes. This is a sanitary sewage pumping station with no outdoor storage. Although, frequent odour emissions, occasionally intense may potentially occur, some existing residential houses and office are located at approximately some 200m and 100m away from the facility, to its northwest and east, respectively, which are much closer to the facility revealed that its influence area is less than 70 m in existing condition. The emergency generator is a significant noise source.	N	318	I
3	Seductions	8860 Lundy's Ln	N/A	N/A	Site is small scale, well contained with rooftop HVAC units. This facility is a social club without outdoor storage. No odours or fugitive dust source is identified within the facility. Since it is not an Industrial site, hence D-6 Classification on the facility is considered not applicable. Rooftop HVAC units are potentially signficant noise sources.	N	172	NA
4	The Dwnr	8870 Lundy's Ln	N/A	N/A	Site is small scale, well contained with rooftop HVAC units. This facility is a social club without outdoor storage. No odours or fugitive dust is idenfied within the facility. Since it is not an Industrial site, hence D-6 Classification on the facility is considered not applicable. Rooftop HVAC units are potentially signficant noise sources.	N	157	NA
5	Niagara Falls Golf Club	6169 Garner Rd	N/A	N/A	Site is small scale, well contained with rooftop HVAC units. This facility is a social club with no outdoor storage. No odours or fugitive dust source is identified. Since it is not an Industrial site, hence it D-6 Classification on the facility is considered not applicable. Rooftop HVAC units are potentially signficant noise sources.	N	72	NA

Notes:

[1] Distances are measured parcel edge to edge.

[2] Classification is based on a combination of considering D-6 category examples as well as site specfici factores such as proximity to existing residential, presence or absence of tall stack(s), presence of mitigation measures stated in ECA, and proximity of site to the subject lands.

[3] The original approval numbers were 6177-56TKS6/7590-5DGSGP for the area, it was belonged to the previous facility that was located at the same location namely "Redpath Industries Limited" and is no longer exist, which had different operation functions as compared to the current uses of BVGlazing Systems.

APPENDIX E

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Niagara Region
Street: 610154 - EB
Location: 610154

A study of vehicle traffic was conducted with the device having serial number 406293. The study was done in the EB lane at 610154 - EB in Niagara Region, ON in county. The study began on 2021-08-31 at 12:00 AM and concluded on 2021-09-01 at 12:00 AM, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 7,450 vehicles passed through the location with a peak volume of 177 on 2021-08-31 at [05:15 PM-05:30 PM] and a minimum volume of 3 on 2021-08-31 at [02:15 AM-02:30 AM]. The AADT count for this study was 7,450.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 60 - 65 KM/H range or lower. The average speed for all classifed vehicles was 61 KM/H with 54.98% vehicles exceeding the posted speed of 60 KM/H. 1.93% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 60KM/H and the 85th percentile was 72.11 KM/H.

< to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 to 104	105 to >
185	165	579	964	1440	1451	1204	720	383	169	103	40	0	0	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.
Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 7091 which represents 96 percent of the total classified vehicles. The number of Small Trucks in the study was 84 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 107 which represents 1 percent of the total classified vehicles. The number of Tractor Trailers in the study was 121 which represents 2 percent of the total classified vehicles.

< to 4.9	5.0 to 7.9	8.0 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 21.9	22.0 to >							
2186	4905	84	107	50	21	44	6							

CHART 2

HEADWAY

During the peak traffic period, on 2021-08-31 at [05:15 PM-05:30 PM] the average headway between vehicles was 5.056 seconds. During the slowest traffic period, on 2021-08-31 at [02:15 AM-02:30 AM] the average headway between vehicles was 225 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 25.00 and 46.00 degrees C.

MH Corbin Traffic Analyzer Study
Computer Generated Summary Report
City: Niagara Region
Street: 610154 - WB
Location: 610154

A study of vehicle traffic was conducted with the device having serial number 405275. The study was done in the WB lane at 610154 - WB in Niagara Region, ON in county. The study began on 2021-08-31 at 12:00 AM and concluded on 2021-09-01 at 12:00 AM, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 7,456 vehicles passed through the location with a peak volume of 167 on 2021-08-31 at [05:00 PM-05:15 PM] and a minimum volume of 4 on 2021-08-31 at [04:30 AM-04:45 AM]. The AADT count for this study was 7,456.

SPEED

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 55 - 60 KM/H range or lower. The average speed for all classifed vehicles was 58 KM/H with 43.63% vehicles exceeding the posted speed of 60 KM/H. 0.63% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 55KM/H and the 85th percentile was 67.64 KM/H.

< to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	90 to 94	95 to 99	100 to 104	105 to >
221	157	731	1307	1768	1602	988	367	170	64	29	18	0	0	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin.
Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 7173 which represents 97 percent of the total classified vehicles. The number of Small Trucks in the study was 60 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 88 which represents 1 percent of the total classified vehicles. The number of Tractor Trailers in the study was 101 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 7.9	8.0 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 21.9	22.0 to >							
4238	2935	60	88	34	27	30	10							

CHART 2

HEADWAY

During the peak traffic period, on 2021-08-31 at [05:00 PM-05:15 PM] the average headway between vehicles was 5.357 seconds. During the slowest traffic period, on 2021-08-31 at [04:30 AM-04:45 AM] the average headway between vehicles was 180 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 25.00 and 46.00 degrees C.

Prepared For: Niagara Region
Prepared By: *PYRAMID* Traffic Inc.
Location: Lundy's Lane, btwn Kalar Rd & Garner Rd
Start Date: Tuesday Apr 20, 2021

Site ID: 610154
Interval: 15 min.

Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary
0:15	4	8	
0:30	10	2	
0:45	6	6	
1:00	7	7	50
1:15	3	3	44
1:30	2	1	35
1:45	1	0	24
2:00	3	3	16
2:15	1	5	16
2:30	2	1	16
2:45	2	2	19
3:00	4	1	18
3:15	3	2	17
3:30	6	2	22
3:45	7	4	29
4:00	0	2	26
4:15	4	7	32
4:30	5	3	32
4:45	4	6	31
5:00	10	3	42
5:15	5	10	46
5:30	17	11	66
5:45	19	20	95
6:00	23	23	128
6:15	25	25	163
6:30	42	57	234
6:45	30	68	293
7:00	64	56	367
7:15	56	46	419
7:30	55	51	426
7:45	89	78	495
8:00	86	65	526
8:15	56	82	562
8:30	76	52	584
8:45	82	87	586
9:00	86	68	589
9:15	71	64	586
9:30	73	62	593
9:45	71	55	550
10:00	59	66	521
10:15	89	83	558
10:30	75	79	577
10:45	81	59	591
11:00	82	71	619
11:15	72	92	611
11:30	78	73	608
11:45	82	75	625
12:00	77	99	648

Period Ending	Channel 1 EB	Channel 2 WB	Hourly Summary
12:15	81	81	646
12:30	91	83	669
12:45	92	70	674
13:00	83	90	671
13:15	90	88	687
13:30	94	90	697
13:45	94	92	721
14:00	82	105	735
14:15	106	87	750
14:30	111	90	767
14:45	105	115	801
15:00	93	102	809
15:15	112	110	838
15:30	74	82	793
15:45	94	97	764
16:00	110	99	778
16:15	102	110	768
16:30	106	127	845
16:45	103	111	868
17:00	111	106	876
17:15	140	109	913
17:30	107	104	891
17:45	72	97	846
18:00	79	72	780
18:15	68	81	680
18:30	88	61	618
18:45	66	56	571
19:00	62	65	547
19:15	60	55	513
19:30	62	57	483
19:45	47	56	464
20:00	54	42	433
20:15	48	37	403
20:30	35	46	365
20:45	25	25	312
21:00	38	32	286
21:15	27	35	263
21:30	33	23	238
21:45	30	27	245
22:00	22	20	217
22:15	20	21	196
22:30	19	22	181
22:45	15	21	160
23:00	16	14	148
23:15	16	28	151
23:30	12	10	132
23:45	13	8	117
0:00	9	13	109

AM Peak: 648 PM Peak: 913 24 HR VOLUME: 9939

Prepared For: City of Niagara Falls
Prepared By: *PYRAMID* Traffic Inc.
Location: Garner Rd, btwn Forestview Blvd & Lundys Ln
Start Date: Tuesday Dec 3, 2024

Geo ID: SNS_03297
Site ID: 77
Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	4	2	
0:30	1	8	
0:45	5	7	
1:00	1	5	33
1:15	2	4	33
1:30	0	4	28
1:45	2	4	22
2:00	1	6	23
2:15	0	1	18
2:30	2	1	17
2:45	2	4	17
3:00	0	4	14
3:15	1	2	16
3:30	3	2	18
3:45	1	0	13
4:00	1	1	11
4:15	0	0	8
4:30	1	2	6
4:45	0	0	5
5:00	2	4	9
5:15	0	1	10
5:30	0	4	11
5:45	6	6	23
6:00	9	5	31
6:15	15	7	52
6:30	15	8	71
6:45	16	12	87
7:00	30	8	111
7:15	23	9	121
7:30	18	15	131
7:45	34	42	179
8:00	46	34	221
8:15	35	39	263
8:30	35	36	301
8:45	41	27	293
9:00	47	32	292
9:15	33	33	284
9:30	26	31	270
9:45	42	29	273
10:00	33	40	267
10:15	33	21	255
10:30	28	22	248
10:45	28	33	238
11:00	40	32	237
11:15	31	36	250
11:30	24	47	271
11:45	15	35	260
12:00	18	36	242

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
12:15	14	38	227
12:30	22	38	216
12:45	22	38	226
13:00	30	34	236
13:15	32	32	248
13:30	24	40	252
13:45	22	35	249
14:00	15	42	242
14:15	22	41	241
14:30	29	49	255
14:45	25	57	280
15:00	19	43	285
15:15	20	60	302
15:30	24	67	315
15:45	28	39	300
16:00	24	52	314
16:15	23	52	309
16:30	26	55	299
16:45	26	71	329
17:00	35	78	366
17:15	18	81	390
17:30	19	65	393
17:45	17	69	382
18:00	28	41	338
18:15	20	49	308
18:30	17	49	290
18:45	15	58	277
19:00	20	33	261
19:15	13	42	247
19:30	14	48	243
19:45	7	39	216
20:00	2	34	199
20:15	8	36	188
20:30	5	30	161
20:45	5	31	151
21:00	18	30	163
21:15	4	28	151
21:30	2	27	145
21:45	0	33	142
22:00	1	27	122
22:15	1	26	117
22:30	0	25	113
22:45	1	16	97
23:00	1	13	83
23:15	0	17	73
23:30	1	15	64
23:45	0	12	59
0:00	4	8	57

AM Peak: 301 PM Peak: 393 24 HR VOLUME: 4157