Appendix K – Noise Report

407 TRANSITWAY – WEST OF BRANT STREET TO WEST OF HURONTARIO STREET

MINISTRY OF TRANSPORTATION - CENTRAL REGION

ARCADIS Design & Consultancy for natural and built assets

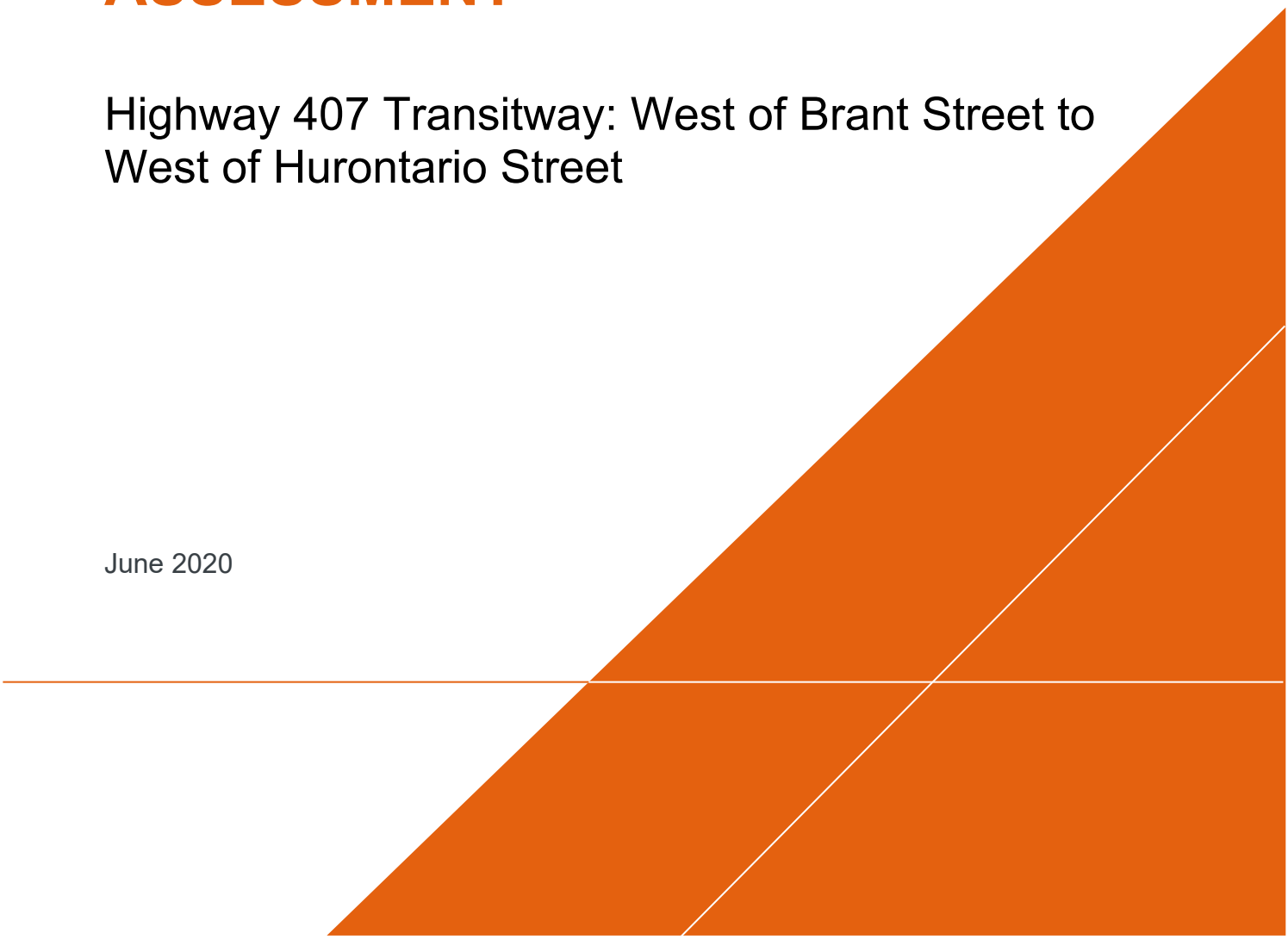
Ontario Ministry of Transportation

FINAL

NOISE AND VIBRATION IMPACT ASSESSMENT

Highway 407 Transitway: West of Brant Street to West of Hurontario Street

June 2020



NOISE AND VIBRATION IMPACT ASSESSMENT

407 Transitway: West of Brant Street to West of Hurontario Street

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Our Ref.:

351344

Date:

June 2020

VERSION CONTROL

Issue	Revision No	Date Issued	Page No	Description	Reviewed by
1.0	0	October 2019		Original	Fred Bernard
1.0	1	December 2019	Tables 5.1, 5.2 and 6.1, All figures, page 6-1	Updated alignment near NSA12 and Derry Station, revised station layouts (Mississauga, Britannia, Bronte) and removal of bus storage yard/garage.	Fred Bernard
1.0	2	January 2020		Addressing MTO comments, inclusion of modified bus storage facility. New Figure 4.14.	Fred Bernard
1.0	3	March 2020		Addressing MECP comments. New Appendix G	Fred Bernard
1.0	4	June 2020		Addressing additional MECP comments and updated Appendix G	Fred Bernard

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TABLES

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ACRONYMS AND ABBREVIATIONS

Arcadis	Arcadis Canada Inc.
BRT	Bus Rapid Transit
dBA	A-weighted decibels
EPR	Environmental Project Report
ETR	Express Toll Route
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HVAC	Heating Ventilation and Air Conditioning
km/hr	kilometers per hour
L_{eq}	Energy Equivalent Sound Level
LGL	LGL Limited
LRT	Light Rail Transit
MECP	Ontario Ministry of the Environment, Conservation and Parks
mm/s	Millimetres Per Second
MOECC	Ontario Ministry of the Environment and Climate Change
MTO	Ontario Ministry of Transportation
NSA	Noise Sensitive Area
NVIA	Noise and Vibration Impact Assessment
OLA	Outdoor Living Area
POR	Point of Reception
PPUDO	Passenger Pick-up and Drop-off
PPV	Peak Particle Velocity

RMS	Root Mean Square
TNM	Traffic Noise Model
TPAP	Transit Project Assessment Process
TTC	Toronto Transit Commission

RMS Root Mean Square

EXECUTIVE SUMMARY

The Ontario Ministry of Transportation (MTO) is proposing a transitway facility along the Highway 407 Express Toll Route (ETR) corridor through the Regional Municipalities of Halton and Peel, from west of Brant Street in the City of Burlington to west of Hurontario Street in the City of Mississauga (407 Transitway). The 407 Transitway will extend for about 43 km and will include a runningway, several stations, that will include parking facilities, transit integration and other amenities. Subject to the outcome of the study, the 407 Transitway will be implemented initially as bus rapid transit (BRT) facility with the opportunity to convert to light rail transit (LRT) in the future; however, this assessment only focuses on BRT. The transitway will be a high-speed fully grade-separated facility on a separate right-of-way running parallel, and crossing over or under Highway 407 ETR. Portions crossing the major hydro corridor within the project area will be located below ground.

Arcadis Canada Inc. (Arcadis) was retained by LGL Limited (LGL), on behalf of the MTO, to complete a Noise and Vibration Impact Assessment (NVIA) in support of the Transit Project Assessment Process (TPAP) for the 407 Transitway project (the "Project"). For continuity, the modelling and evaluation for this report was completed by RWDI on behalf of Arcadis. The RWDI employee completing the work was previously employed at Arcadis and completed the modelling and evaluation for Transitway 3 and the initial stage of Transitway 4.

The following potential impacts have been assessed in this study:

- noise impacts at existing and proposed sensitive locations from buses operating on the proposed 407 Transitway, inclusive of changes to local topography;
- air-borne vibration of house structure elements induced by sound levels from bus engines; and
- noise and vibration considerations during construction of the Transitway.

Ground-borne vibration was considered but was concluded not to have an impact; it has been shown in past Transitway studies that the operation of buses does not generate perceptible levels of vibration beyond the right-of-way. Furthermore, traffic volumes for this segment are lower than others previously evaluated.

As the Project is under the jurisdiction of the MTO, guidelines developed by the MTO, as part of the *Environmental Guide for Noise* document, were the primary reference for the assessment methodology and impact assessment criteria. Where no assessment guidance had been developed by the MTO for a potential project effects, relevant guidelines from the Ontario Ministry of the Environment, Conservation and Parks (MECP) and published literature were applied as appropriate.

The assessment methodology involved identifying the locations of Noise Sensitive Areas (NSAs) along the route, and selecting points of reception (POR) that are representative of each of these

locations. Assessment scenarios were developed to estimate future sound levels associated with the Project. The difference in noise and vibration levels predicted between the future no-build scenario and the future build scenario is an indication of the impact of the Project. The future no-build scenario is where no changes are assumed to current configurations and only traffic volumes are projected. Traffic noise modelling of these scenarios was completed using methodology prescribed by the MTO, and compared to the adopted assessment criteria. In addition, potential noise and vibration impacts from construction were considered. Sections of the alignment, as well as one station, will be constructed below ground. Construction information was not sufficient enough at this stage of the work to complete a detailed assessment. Prior to construction, consideration shall be given to have an acoustic/vibration specialist assess the potential for impacts and monitor noise/vibration for homes in close proximity, i.e., within 50 m of staging and construction areas.

No mitigation measures are recommended for this segment. Incremental and absolute noise impact changes were noted to be below MTO's criteria for mitigation for the majority of the receptor locations. Two receptors were noted to have impacts above the 65 dBA criteria; however, the assessment concluded that mitigation is not warranted.

With regard to construction, the NVIA outlines the requirements of the municipal noise by-laws that would be applicable, (Oakville, Milton, Burlington, Mississauga, Halton Hills), and sets out setback distances that would be required in order to avoid vibration impacts from construction. A number of best practices are also provided for consideration in construction planning from a noise and vibration control perspective.

1.0 INTRODUCTION

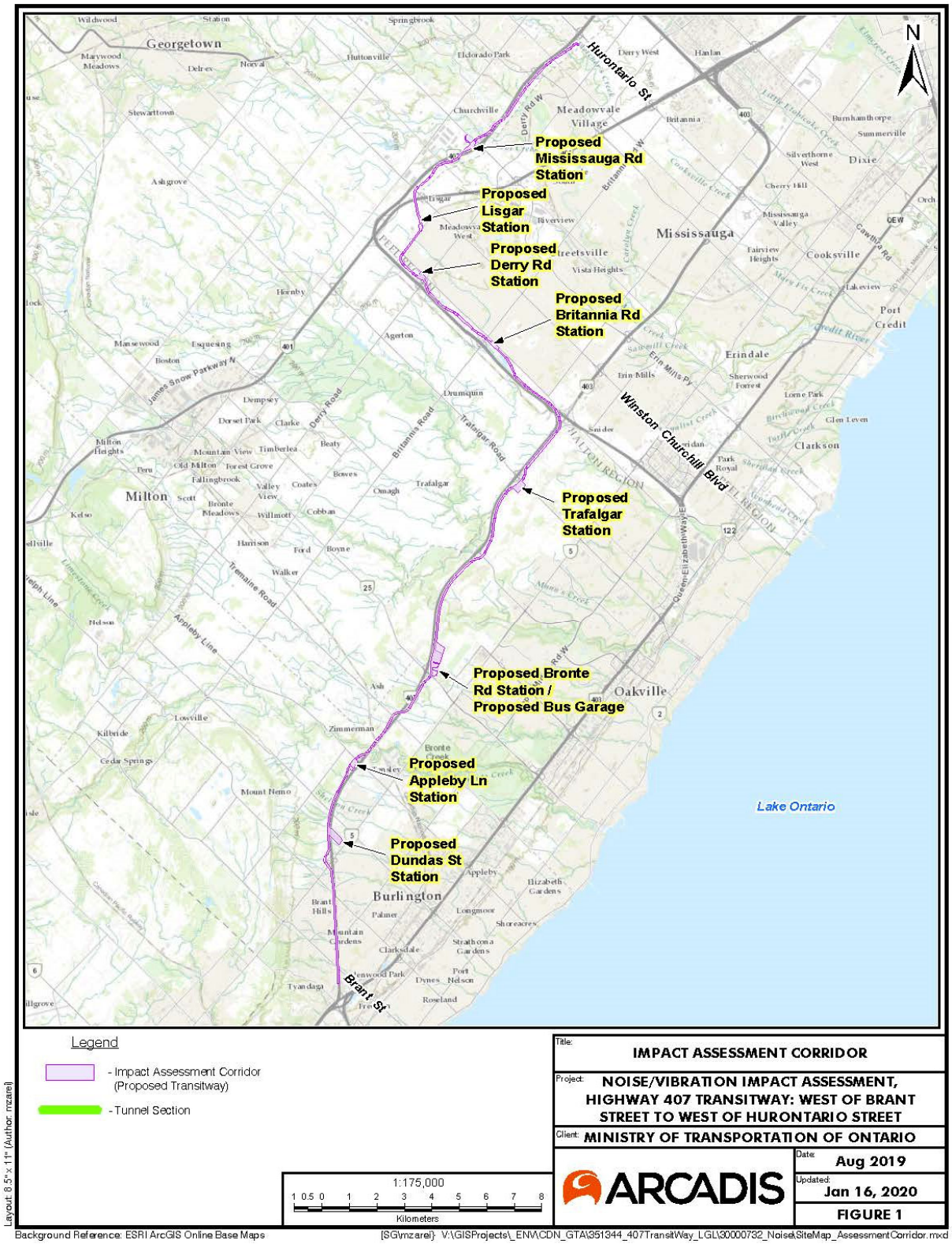
1.1 Project Description

The Ministry of Transportation (MTO) is proposing a transitway facility along the Highway 407 Express Toll Route (ETR) corridor through the Regional Municipalities of Halton and Peel, from west of Brant Street, in the City of Burlington, to west of Hurontario Street in the City of Mississauga (407 Transitway). The 407 Transitway will extend for about 43 km and will include a runningway, several stations that will include parking facilities, transit integration and other amenities. Subject to the outcome of the study, the 407 Transitway will be implemented initially as bus rapid transit (BRT) with the opportunity to convert to light rail transit (LRT) in the future.

This segment forms part of the 150 km long high-speed interregional facility planned to be ultimately constructed on a separate right-of-way that parallels Highway 407 ETR from Burlington to Highway 35/115, with stations, parking and access connections. This transitway is a component of the official plans of the stakeholder municipalities and of the Province's commitment to support transit initiatives in the Greater Golden Horseshoe through the Metrolinx Regional Transportation Plan.

The transitway will be a high-speed fully grade-separated facility on a separate right-of-way running parallel, and crossing over or under Highway 407 ETR. The transitway, and the stations will initially be designed to support the busway service with provisions for future conversion to light-rail transit technology. The project limits are presented in Figure 1.

Figure 1 Impact Assessment Corridor



The environmental impact of this transit project will be assessed according to the transit project assessment process (TPAP) as prescribed in Ontario Regulation 231/08, Transit Projects and Metrolinx Undertakings.

Arcadis Canada Inc. was retained by LGL Limited (LGL), on behalf of the MTO, to complete a Noise and Vibration Impact Assessment (NVIA) in support of the Transit Project Assessment Process (TPAP) for the 407 Transitway project (the "Project"). For continuity, the modelling and evaluation for this report was completed by RWDI on behalf of Arcadis. The RWDI employee completing the work was previously employed at Arcadis and completed the modelling and evaluation for Transitway 3 and the initial stage of Transitway 4. The design of the 407 Transitway, developed by Parsons Corporation, was used for this NVIA. This NVIA focuses on the potential BRT impacts.

1.2 Potential Noise and Vibration Impacts

Transportation projects in high density areas have the potential to impact the existing sound environment, and also introduce a potential source of vibration particularly when rail infrastructure is proposed. This NVIA assesses not only the noise and vibration impact associated with the use of the new transit alignment, but also the impact of the proposed changes to the local topography required to accommodate the new infrastructure, and secondary effects such as noise-induced vibration on house structure elements. The following potential impacts are addressed in this study:

- noise impacts at existing and proposed sensitive locations from buses operating on the proposed 407 Transitway, inclusive of changes to local topography;
- air-borne vibration of house structure elements induced by sound levels from bus engines; and
- noise and vibration considerations during construction of the Transitway.

Ground-borne vibration was considered but was concluded not to have an impact as it has been shown in previous Transitway assessments [16] that buses do not generate perceptible levels of vibration beyond the right-of-way. Furthermore, this NVIA only focuses on the potential BRT impacts and not any related to the potential operation of light rail transit.

1.3 Report Organization

In addition to this introductory chapter, this report includes the following information:

- Chapter 2 – Describes the study area.
- Chapter 3 – Discusses the assessment criteria that has been applied to identify noise and vibration impacts, inclusive of a summary of the local noise ordinances.

- Chapter 4 – Discusses the approaches to assessing the sound levels associated with the Project.
- Chapter 5 – Outlines the results of the noise impact assessment.
- Chapter 6 – Outlines the results of the vibration impact assessment.
- Chapter 7 – Outlines the conclusions of the assessment and provides recommendations.
- Chapter 8 – Summarizes references used throughout the assessment.

2.0 STUDY AREA DESCRIPTION

In the first segment of the study area, eastward from west of Brant Street to shortly east of Dundas Street, road traffic is the major contributor of noise as several heavily travelled roadways such as Brant Street, Guelph Line, Dundas Street intersect the 407 ETR right-of-way (407 ROW). Land uses include residential subdivisions from Brant Street to Highway 5 on both sides of 407 ETR. A busy commercial plaza adjacent to Brant Street is a significant contributor of noise in the immediate vicinity from sources such as rooftop ventilation, on-site road traffic and loading/unloading operations. Lands immediately north of Dundas Street are vacant undeveloped lands (see Figure 2.1). Overall, this area can be considered as having a moderate to high ambient noise environment.

Moving east of Dundas Street, there are residential subdivisions within 250 m to 300 m south of 407 ETR bound by Walkers Line Appleby Line, as well as a large commercial plaza on both sides of Appleby Line. Road traffic along Appleby Line and Walkers Line is the major contributor of noise within this area. Commercial noise is a minor contributor affecting the eastern portion of this subdivision. This area can be considered as having a moderate to high ambient noise environment.

The area east of Appleby Line to Ninth Line/Highway 403 is predominantly comprised of vacant undeveloped lands and agricultural lands with associated residential dwellings (see Figures 2.1 and 2.2). There are no large residential subdivisions within this segment of the study area, however, there are some single-family residential dwellings in close proximity to 407 ETR on both sides. A few minor industrial and commercial sites are present; however, road traffic is still the predominant noise source. Bronte Road, Neyagawa Boulevard, Trafalgar Road are the major contributors to road traffic noise within this segment of the study area. Some rail traffic is present immediately east of Appleby Line as the rail line crosses 407 ETR. Also present are intermittent airplane activities as part of Lester B. Pearson International Airport (LBPIA) arrivals and departures, which are outside the scope of this assessment. Overall, this area can be considered to have a moderate ambient noise environment.

At the interchange of Highway 403 and Ninth Line, the study area moves northwest until its intersection with Highway 401, where it turns east (see Figure 2.3 and Figure 2.4). The study area runs east from there until its end at west of Hurontario Street. Within this segment of the study area, there is a large residential subdivision located immediately east of 407 ETR. Road traffic along Ninth Line, Eglinton Avenue West, Britannia Road West, Derry Road West and Highway 401, is the major noise contributor within this segment. The lands west of 407 ETR are a mix of vacant undeveloped lands, agricultural lands, and scattered single dwelling residences. The Hydro One Trafalgar Transformer Station and the Union Gas Parkway Compressor Station are the major industrial facilities within this segment in the study area. Both facilities are currently operating under an Environmental Compliance Approvals and are in compliance with NPC-300. Their noise impacts can be considered minor compared to the road traffic within the area. The Milton GO line is located at the north end of the residential subdivision east of Ninth Line and

intersects the study area just south of Highway 401. Rail traffic noise impacts a small area on the north end of the residential subdivision within this segment of the study area. Overall, this area can be considered to have a moderate to high ambient noise environment.

East of the Highway 401 interchange up to the extent of the study area, land uses are predominantly industrial and commercial (see Figure 2.4). A number of subdivisions have been developed near Financial Drive and Mavis Road. Residences on the north side of Highway 407 are located closer to the existing highway network, while residences to the south are located further away due to the presence of a large hydro corridor. This area can be considered to have a moderate to high ambient noise environment.

Figure 2.1 Existing Land Condition – 2017 Imagery (Between West of Brant Street and Termaine Road)

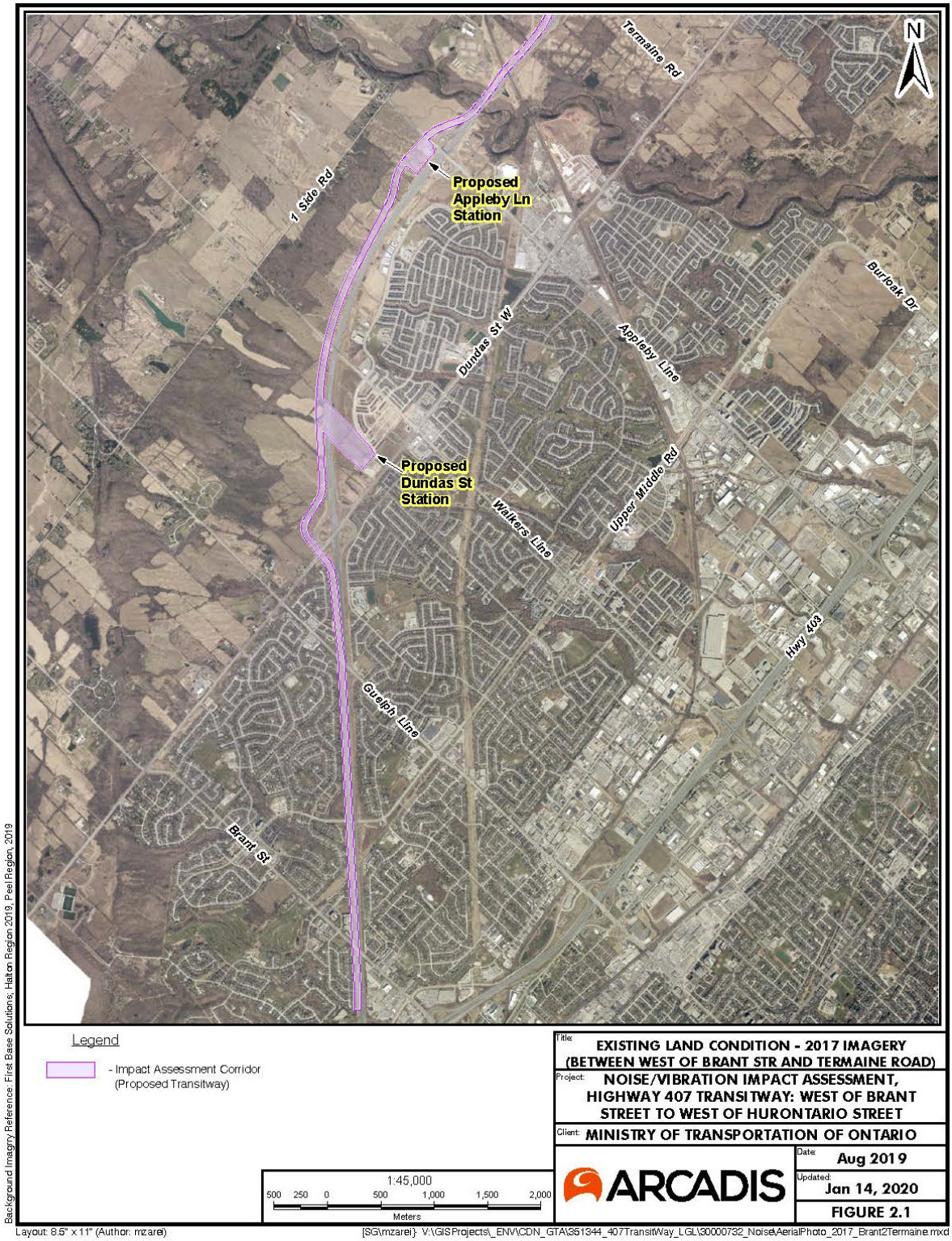


Figure 2.2 Existing Land Condition – 2017 Imagery (Between Termaine Road and Fifth Line)

Figure 2.3 Existing Land Condition – 2017 & 2019 Imagery (Fifth and Ninth Line)

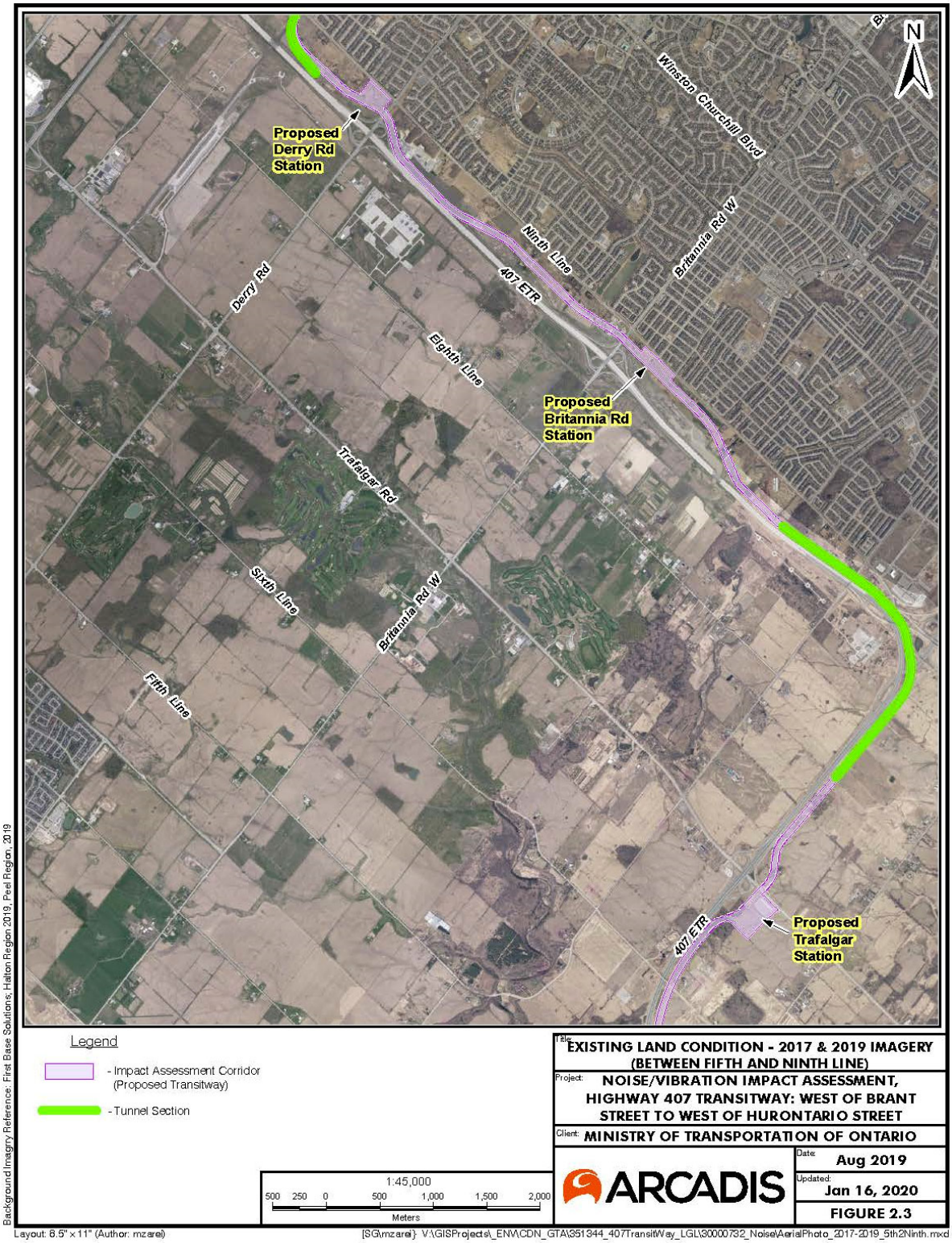
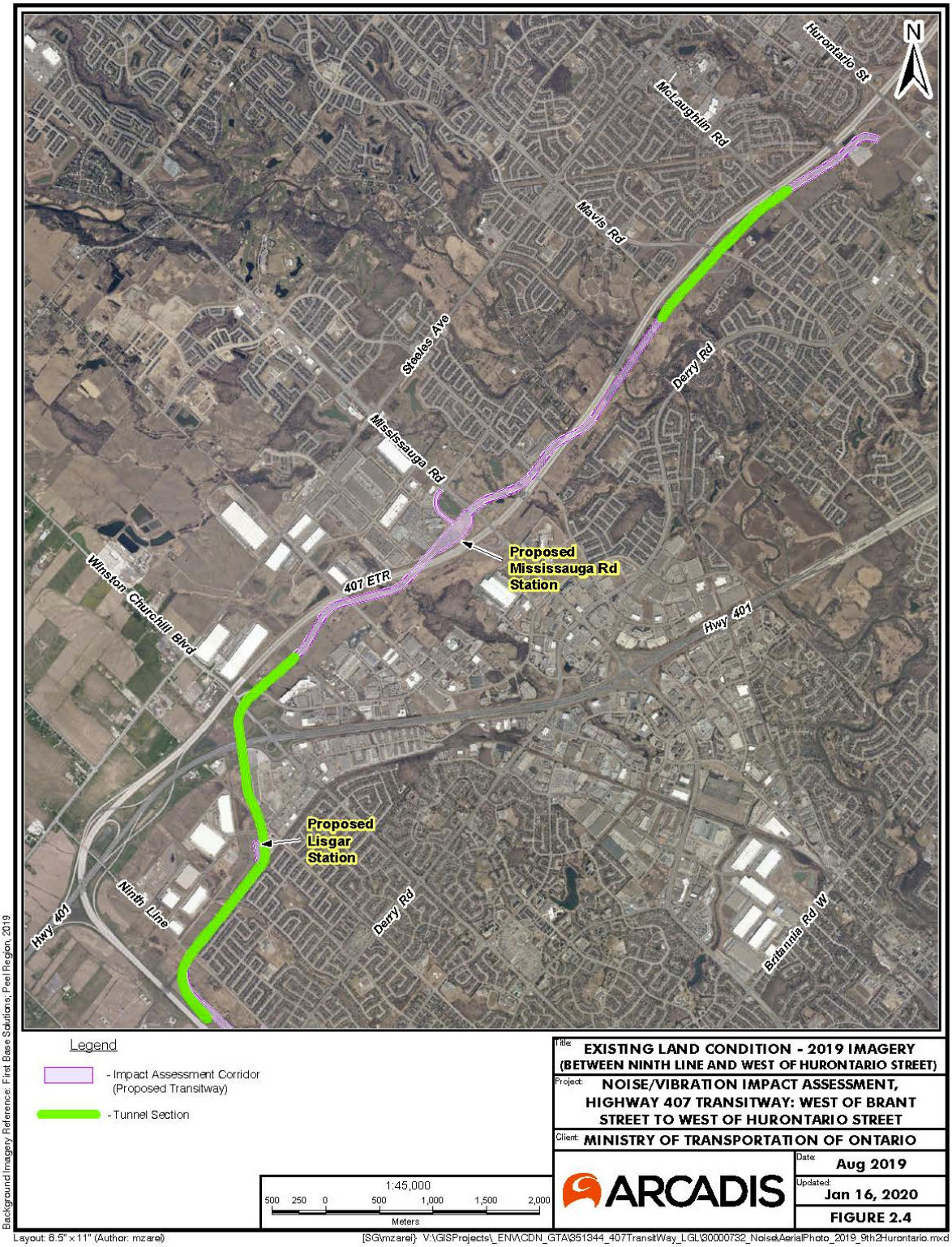


Figure 2.4 Existing Land Condition – 2019 Imagery (Between Ninth Line and West of Hurontario Street)



3.0 ASSESSMENT CRITERIA

The following sections summarize the assessment criteria that have been applied in the evaluation of potential noise and vibration impacts related to the Project. As the Project is under the jurisdiction of the Ontario Ministry of Transportation (MTO), guidelines developed by the MTO, as part of the *Environmental Guide for Noise* document, were the primary reference for the assessment methodology and impact assessment criteria. Where no assessment guidance had been developed by the MTO for a potential project effect, such as vibrations due to project construction and operation, relevant guidelines from the Ontario Ministry of the Environment, Conservation and Parks (MECP) and published literature were applied as appropriate. Relevant information from the municipal noise by-laws are also summarized with regard to construction activities herein.

3.1 Noise from Transportation Sources

The MTO has summarized its requirements for the assessment of noise impacts from projects under its jurisdiction in the *Environmental Guide for Noise* [1] and the *Environmental Reference for Highway Design* [2]. In addition to outlining requirements for the assessment documentation and qualifications of the assessors, these documents present the accepted procedures for identifying and inventorying noise sensitive points of reception, assessing and determining the significance of potential noise impacts at these locations, and evaluating the need for noise control measures where necessary.

The criteria for the assessment of noise impacts are applied at Noise Sensitive Areas (NSAs), which are to be identified at the outset of the assessment. NSAs generally include residential land uses, educational facilities, hospitals and commercial properties with overnight accommodations (i.e., hotels, motels, campgrounds). Refer to Appendix A for the full definition of an NSA. NSAs must have an associated Outdoor Living Area (OLA) to qualify for inclusion in the noise assessment by MTO standards. An OLA is a ground-level space adjacent to the building on an NSA that accommodates outdoor living activities (refer to Appendix A for the full definition). The impact assessment is completed at the most-exposed side of the unit with respect to the project, regardless of where the OLA is located. If an assessment of mitigation is required, then the point of reception is to be moved to the OLA if these locations differ.

The MTO procedures require that future sound levels (10 years after construction) at the identified NSAs be predicted both with and without the Project on a 24-hour energy equivalent basis. The difference between these sound levels provides an estimation of the degree to which the Project would be expected to increase sound levels at the NSAs compared to the future no-build scenario. These increments, as well as the predicted future sound levels at the NSAs, are used to assess whether there are likely to be any adverse noise effects associated with the Project using the assessment criteria summarized in Table 3.1.

Table 3.1 MTO Noise Assessment Criteria

Change in Noise Level Above Ambient / Projected Noise Levels with Proposed Improvements	Mitigation Effort Required
< 5 dBA change; AND < 65 dBA	None
≥ 5 dBA change; OR ≥ 65 dBA	• Investigate noise control measures on right-of-way; • Introduce noise control measures within right-of-way and mitigate to ambient if technically, economically and administratively feasible; • Noise control measures, where introduced, should achieve a minimum of 5 dB attenuation over first row receivers.

The mitigation effort described in Table 3.1 identifies that noise control measures must be "technically, economically and administratively feasible". The different aspects of feasibility are detailed in Table 3.2 [1].

Table 3.2 MTO Feasibility Description

Feasibility Aspect	Descriptions
Technical Feasibility	Review the constructability of the noise mitigation (i.e., design of wall, roadside safety, shadow effect, topography, achieve a 5 dB reduction, ability to provide a continuous barrier, etc.).
Economic Feasibility	Carry out a cost/benefit assessment of the noise mitigation (i.e., determine cost per benefited receiver).
Administrative Feasibility	Determine ability to locate the noise mitigation on lands within public ownership (i.e., provincial or municipal right-of-way).

To comply with MTO assessment procedures, all predictions must be completed using calculation methods that are approved by the MTO and MECP. These include the MECP traffic noise prediction method ORNAMENT for simple geographical settings, and the United States Federal Highway Administration (FHWA) STAMINA 2.0 model for more complex scenarios where changes in topography and grade separated roads are involved.

3.2 Noise from Stationary Sources

The MTO *Environmental Guide for Noise* does not include a procedure for the assessment of noise impacts from stationary sources, instead outlining that the assessment of stationary sources is to follow the procedures developed by the MECP in its Publication NPC-205. MECP Publication NPC-205 has been superseded by Publication NPC-300: *Environmental Noise Guideline* [3]. It should be noted, however, that there are no stationary sources associated with the project design at this time. While the bus stations are stationary facilities, they are not considered to be

stationary sources of noise according to MECP definitions. The rationale for excluding the stations as stationary sources is discussed in the following paragraphs.

The planned stations will consist of a canopied platform with staircases and elevators to provide pedestrian access from street level, bus access to and from the platform, car parking facilities and designated passenger pick-up and drop off (PPUDO) sites. Based on these open concept design plans, the stations are not anticipated to have any significant stationary noise sources associated with them (e.g., building ventilation, heating ventilation and air conditioning (HVAC) sources, etc.). The dominant sources of noise at the stations are anticipated to be associated with the transitway vehicles entering and exiting the station, and the vehicular activity in the parking/PPUDO areas, which are not considered stationary sources by the MECP. The definition of a "stationary source" is provided in Part A of NPC-300. Section 5 of this definition outlines sources that are not considered as "stationary sources", including *transportation corridors (i.e., railways and roadways)*, and *commuter parking lots* [3]. The access/egress of vehicles from the stations and vehicular activity in the parking lot area have each been included in the assessment of noise from transportation sources as outlined in Section 3.1 for comparison to the criteria outlined in Table 3.1.

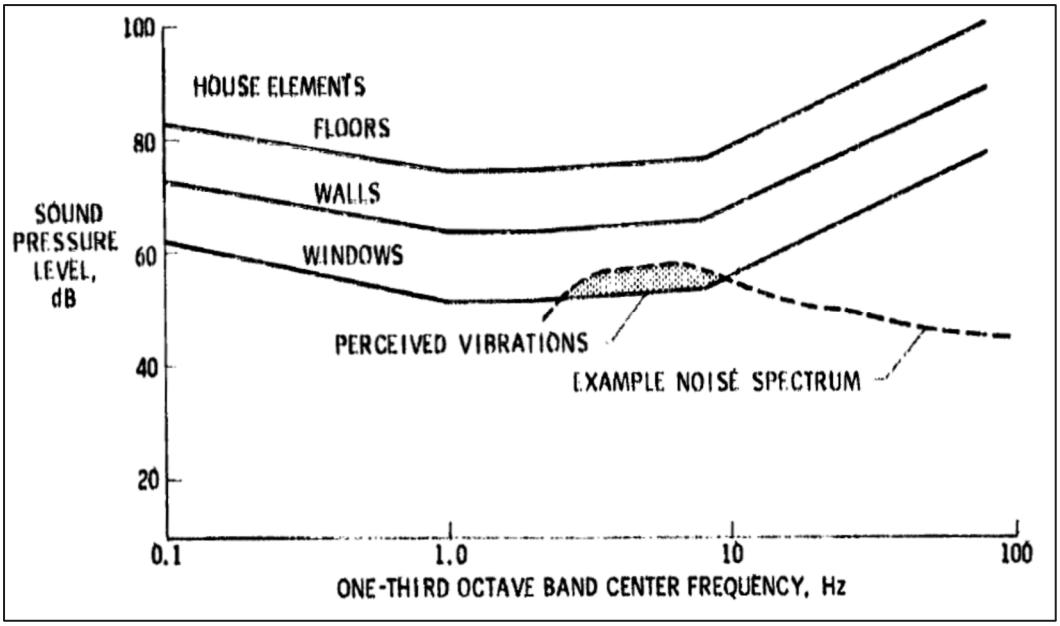
3.3 Vibration from Transportation Sources

The focus of this NVIA is the assessment of the BRT and not the LRT. Ground-borne vibrations are not anticipated to be significant at NSAs from rubber-tired vehicles operating on a smooth surface (i.e., buses). However, there is potential for air-borne vibration due to bus engine noise in the low frequency range. Such vibrations may result in rattling of windows or other structural elements, depending on the magnitude of the sound produced.

NASA conducted research in the 1980s to assist in the siting of large wind turbines, which included the investigation of source characteristics, sound propagation characteristics and the effect of exposure at the receiver location. The research was summarized in a technical memorandum titled *Guide to the evaluation of human exposure to noise from large wind turbines* [6]. In the evaluation of noise effects at the receiver location, this technical memorandum summarized research into the magnitude of sound pressure required to excite building components such as windows, walls and floors. The results are presented in Figure 3.1. These frequency-based thresholds have been applied to predictions of maximum expected sound levels of bus pass-by events, to evaluate the potential for noise-induced vibrations due to operations on the 407 Transitway.

Ground-borne vibration due to the LRT has not been assessed as part of this NVIA.

Figure 3.1 Thresholds for Perceptible Vibration of House Structure Elements (from [6])



3.4 Noise from Construction

The MTO *Environmental Guide for Noise* outlines that construction must be conducted in a manner that minimizes noise and abides by the municipal by-laws. A procedure by which to address noise complaints must be in place as part of the contract documents. Such procedures involve responding to persistent complaints by completing sound testing of the construction equipment to ensure operating sound levels are within those recommended by the MECP. The following sections summarize MECP construction equipment guideline limits, and relevant requirements of the applicable municipalities with regard to construction noise.

Although the following sections outline the prohibitions and exemption processes for each jurisdiction, MTO is legally exempt from the requirements of municipal noise by-laws when construction work does not align with local noise by-laws (e.g. nighttime construction work). Therefore, MTO will no longer be applying for these exemptions. MTO recognizes the impacts construction related noise can have on a community, and all reasonable attempts will be made to work within local by-laws, including as appropriate, public notification and mitigation measures to reduce noise. This change is meant to streamline processes while continuing to maintain existing best practices to reduce noise impacts to the community.

3.4.1 MECP NPC Guidelines

Construction activities are not considered to be “stationary sources” by the MECP (per the definition of Stationary Source in Part A of Publication NPC-300), and are therefore not required to meet the sound level limits outlined in Publication NPC-300. The MECP does not currently

prescribe sound level limits for the cumulative impact of construction operations. In Publication NPC-115, the MECP has instead outlined a series of equipment-specific sound level limits that must be met by individual pieces of construction equipment, depending on the location of use and date of manufacture [7]. The sound level limits for construction equipment manufactured after January 1st, 1981 are summarized in Table 3.3.

In addition, any heavy vehicle (motorized conveyance with a gross weight >4,500 kg) with a diesel engine that is associated with a construction activity would be subject to the sound level limits prescribed in MECP Publication NPC-118 [8]. For vehicles manufactured after 1979, the maximum allowable sound level is 95 dBA at a distance of 15 m.

Table 3.3 MECP NPC-115 Construction Equipment Sound Level Limits

Equipment	Standard	Measurement Distance (m)	Maximum Sound Level (dBA)
Excavator, Dozer, Loader, Backhoe, Other	Quiet Zone	15	Power Rating <75 kW: 83 dBA Power Rating >75 kW: 85 dBA
	Residential Zone		Power Rating <75 kW: 83 dBA Power Rating >75 kW: 85 dBA
Pneumatic Pavement Breaker	Quiet Zone	7	85 dBA
	Residential Zone		85 dBA
Portable Air Compressor	Quiet Zone	7	70 dBA
	Residential Zone		76 dBA
Tracked Drills	Quiet Zone	15	100 dBA
	Residential Zone		100 dBA

3.4.2 Municipal Noise By-Laws

The Project spans a number of municipalities that have their own noise by-laws that include general prohibitions and “time and place prohibitions” mainly related to construction. The municipalities through which the current alignment passes have been noted below, along with references to their noise by-laws. Copies of the by-laws are provided as appendices to this report.

The alignment is expected to pass through:

- The City of Burlington (Noise Control By-Law 19-2003, provided in Appendix B)
- Town of Oakville (Noise By-Law 2008-098, provided in Appendix C)
- Town of Milton (Noise By-Law 133-2012, provided in Appendix D)
- City of Mississauga (Noise Control By-Law 360-79, provided in Appendix E)
- Town of Halton Hills (Noise By-Law 2010-0030, provided in Appendix F)

3.5 Vibration from Construction

In Section 5 of the Ontario Model Municipal By-law [11], the MECP recommends limits for impulse vibration, which may be applicable to some construction activities such as pile driving. Other types of construction activities have potential to be sources of non-impulsive vibration, such as vibratory compaction. Construction vibration limits from the U.S. Federal Transit Administration (FTA) have therefore also been considered [5].

Construction vibrations are generally assessed in terms of peak particle velocities (PPV) rather than root mean square (RMS) levels, since public concerns are generally related more to the potential for building damage than perceptibility during construction. The MECP outlines the limits presented in Table 3.4 for impulse vibration, which vary depending on the frequency of occurrence[11].

Table 3.4 MECP NPC-207 Impulse Vibration Limits

Time Required to Observe 20 Impulses (minutes)	Limit on the Average Peak Vibration Velocity (mm/s)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
20 minutes or less	0.30	0.30
Less or equal to 60 minutes but more than 20 minutes	0.60	0.30
Less or equal to 120 minutes but more than 60 minutes	1.00	0.30
120 minutes	10.00	0.30

The U.S. FTA provides a series of criteria that vary depending on details of the building that is receiving the vibration, and are set to protect against building damage [5]. These criteria are summarized in Table 3.5. As a conservative measure, the vibration analysis in this assessment utilizes the Category III criteria of 5.1 mm/s.

Table 3.5 Construction Vibration Damage Criteria

Building Category	PPV (mm/s)
I. Reinforced concrete, steel, or timber (no plaster)	12.7
II. Engineered concrete and masonry (no plaster)	7.6
III. Non-engineered timber and masonry buildings	5.1
IV. Buildings extremely susceptible to vibration damage	3.0

3.6 Summary of Assessment Criteria

The assessment criteria that has been adopted for each aspect of the Project is summarized in Table 3.6.

Table 3.6 Summary of Assessment Criteria

Component	Protocol	Criteria	Mitigation
Existing/ Future Noise	MTO	Future ambient noise levels without the influence of the proposed improvement.	To be considered when criteria is exceeded by more than 5 dB, or when sound levels increase from <65 dBA to ≥65 dBA
	NPC-300	Stationary Sources: Day: 50 dBA Evening: 50 dBA Night: 45 dBA	To be implemented when criteria is exceeded
Construction and Operation Noise and Vibration	NPC-115	See Table 3.2	Adherence as applicable
	NPC-118	See Section 3.4.1	Adherence as applicable
	NPC-207	See Table 3.5	Adherence as applicable
	U.S. FTA	See Table 3.6	Adherence as applicable
	City of Burlington Nuisance and Noise Control By-Law	• Prohibition of audible noise between 19:00 and 07:00 hours at points of reception. • Compliance with NPC-205 (now NPC-300). • Compliance with NPC-115 at work sites within 600 m of residential area. • Exemptions permitted.	Reasonable attempts will be made to work within local by-law
	Town of Oakville Noise By-Law	• Town-issued permit for work necessary on weekends and overnight to minimize traffic impacts. • Residential Area and Control Area prohibitions: between 19:00 and 07:00 hours, and all day Sundays and Statutory Holidays. • Exemptions permitted.	Reasonable attempts will be made to work within local by-law
	Town of Milton Noise By-Law	• Point of Reception Prohibitions: between 21:00 and 07:00 hours. • Compliance with NPC-205 and NPC-232 (now NPC-300). • Exemptions permitted.	Reasonable attempts will be made to work within local by-law
	City of Mississauga Noise By-Law	• Quiet Zone Prohibition: between 17:00 and 07:00 hours, except all day Sundays and Statutory Holidays. • Residential Area Prohibition: between 1900 and 0700 hours weekdays and Saturday, and all day Sundays and Statutory Holidays. • Exemptions permitted.	Reasonable attempts will be made to work within local by-law
	Town of Halton Hills Noise By-Law	• Residential Area Prohibition: 7:00 pm one day to 7:00 am the next day Monday to Thursday; 7:00 pm Friday to 8:00 am Saturday; 6:00 pm Saturday to 7:00 am Monday and any statutory holidays in accordance with the “Retail Business Holidays Act”. • Compliance with specific construction equipment sound level limits within 600 m of Residential Areas. • Exemptions permitted.	Reasonable attempts will be made to work within local by-law

4.0 IMPACT ASSESSMENT METHODOLOGY

4.1 Identification of NSAs

Existing NSAs were identified using recent aerial photography, and by field reconnaissance. Representative points of reception (POR) were identified to represent groups of NSAs with similar exposure to the 407 Transitway. The receptors and number of dwellings represented are summarized in Table 4.1 and illustrated in Figures 4.1 through 4.13. For each NSA, the side of the building that is most exposed to the transitway was assessed, per MTO guidelines. In cases where the most exposed side is on the same side as the Outdoor Living Area (OLA), the OLA was selected as the POR of choice. The majority of the receptors closest to the proposed transitway are single dwellings or townhouses. There is one multi-dwelling condominium, Balmoral Condominium, that features a clearly defined OLA that is fully exposed to the transitway and the existing Highway 407. This receptor was evaluated in accordance with the MTO Noise Guide and was considered to be representative of 21 ground-level units. Balconies and facades of the condominium were not assessed as “apartment balconies above ground floor” are not considered noise sensitive areas.

There are several schools with OLAs adjacent to the Transitway that were not included in this assessment as they are further set back than surrounding residences and are expected to experience lower sound level impacts. There are also several places of worship within the study area, however, they were not included in this assessment as they do not meet MTO’s definition of NSAs as per Appendix A of MTO’s Noise Guide. Furthermore, the places of worship in close proximity to the transitway do not have associated OLAs and are not considered Noise Sensitive Areas, which trigger the need to assess impacts in accordance with the MTO Noise Guide. Like the educational facilities, many of the places of worship are near residential receptors that have been evaluated and the modelled sound levels will be a close proxy.

Field reconnaissance revealed a number of vacant lands where residential development has been approved, or development was in the initial stages and foundations could be seen on some lots. These developments are mostly located on the western end of the study area near Dundas Street within the City of Burlington. These vacant lands were included in the assessment. Receptor locations were estimated based on similar, completed, developments within the area and publicly available subdivision plans. Land-use zoning was reviewed for the study area and it was concluded that at the time of this report, there were no other future proposed residential developments, or any vacant lands committed for residential development, or with the allowance for residential buildings. Land use designation maps are provided in Appendix G.

Noise mitigation measures were assessed as per MTO’s Noise Guide by assessing the most exposed sides for each POR. PORs where the most exposed side was the same as the OLA, were re-assessed at the OLA location if MTO’s criteria for mitigation assessment was met. Any existing noise barrier walls or privacy fences were also noted and included in the assessment (see Figure 4.14).

4.2 Description of Assessment Scenarios

The potential noise and vibration impacts associated with the Project were assessed by predicting noise and vibration conditions at the nearest NSAs under two operating scenarios: future conditions (2041) (i.e. future no-build), and future conditions (2041) (i.e. future build). Each of these scenarios are described in more detail in the following sections. An existing conditions scenario was not assessed due to MTO's policies requiring comparison between "future no-build" and "future build" scenarios for assessment for mitigation requirements.

There is a Non-Disclosure Agreement between MTO and 407 ETR which states that traffic volume data on Highway 407 ETR is confidential, and as a result, although Highway 407 traffic volumes were used in the modelling to calculate the sound levels, the 407 ETR traffic volume data was not included in this Noise Report. A similar approach was used in the previous approved Transitway TPAPs east of Hurontario Street.

4.2.1 Future No-Build (2041)

In order to assess the impacts associated with full operations on the Transitway at the future horizon year of 2041, conditions must first be established for the same year in the absence of the Transitway. This scenario, termed the future no-build scenario, provides a baseline condition for assessing the potential impacts associated with the Project.

In the future no-build scenario, it has been assumed that existing traffic volumes on the Highway 407 ETR will increase with population growth in the area. Projected traffic volumes were calculated based on annual growth rates provided by IBI Group, and modelled in the same manner as the existing traffic scenario (discussed in Section 4.3.1) to describe the future ambient condition at the NSAs.

Table 4.1 provides a summary of the NSAs within the study area. Two hundred and eleven PORs were identified. These PORs have been represented by twelve distinct NSA groups.

Table 4.1 Summary of NSAs

ID	No. of Units Represented	Type of Unit	Segment	Figure
NSA1_R01	8	Residential (Single dwelling)	NSA1	Figure 4.2a
NSA1_R02	10	Residential (Single dwelling)	NSA1	Figure 4.2a
NSA1_R03	16	Residential (Single dwelling)	NSA1	Figure 4.2a
NSA1_R04	7	Residential (Single dwelling)	NSA1	Figure 4.2a
NSA1_R05 [1]	21	Residential (Condominium)	NSA1	Figure 4.2a
NSA1_R06	6	Residential (Townhouse)	NSA1	Figure 4.2a
NSA1_R07	6	Residential (Townhouse)	NSA1	Figure 4.2a
NSA1_R08	6	Residential (Townhouse)	NSA1	Figure 4.2a
NSA1_R09	6	Residential (Townhouse)	NSA1	Figure 4.2a

Table 4.1 (Cont'd) Summary of NSAs

ID	No. of Units Represented	Type of Unit	Segment	Figure
NSA1_R10	6	Residential (Townhouse)	NSA1	Figure 4.2a
NSA1_R11	8	Residential (Townhouse)	NSA1	Figure 4.2a
NSA1_R12	16	Residential (Townhouse)	NSA1	Figure 4.2a
NSA1_R13	15	Residential (Single dwelling)	NSA1	Figure 4.2a
NSA1_R14	6	Residential (Single dwelling)	NSA1	Figure 4.2a
NSA1_R15	16	Residential (Townhouse)	NSA1	Figure 4.2a
NSA1_R16	8	Residential (Townhouse)	NSA1	Figure 4.2a
NSA1_R17	8	Residential (Townhouse)	NSA1	Figure 4.2a
NSA1_R18	5	Residential (Townhouse)	NSA1	Figure 4.2a
NSA1_R19	17	Residential (Townhouse)	NSA1	Figure 4.2a
NSA1_R20	5	Residential (Single dwelling)	NSA1	Figure 4.2a
NSA1_R21	5	Residential (Single dwelling)	NSA1	Figure 4.2a
NSA1_R22	5	Residential (Single dwelling)	NSA1	Figure 4.2a
NSA1_R23	9	Residential (Townhouse)	NSA1	Figure 4.2b
NSA1_R24	8	Residential (Townhouse)	NSA1	Figure 4.2b
NSA1_R25	6	Residential (Townhouse)	NSA1	Figure 4.2b
NSA1_R26	16	Residential (Townhouse)	NSA1	Figure 4.2b
NSA1_R27	16	Residential (Townhouse)	NSA1	Figure 4.2b
NSA1_R28	9	Residential (Townhouse)	NSA1	Figure 4.2b
NSA1_R29	3	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R30	8	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R31	6	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R32	10	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R33	8	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R34	7	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R35	7	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R36	7	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R37	12	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R38	13	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R39	11	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R40	11	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R41	7	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R42	9	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R43	6	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA1_R44	7	Residential (Single dwelling)	NSA1	Figure 4.2b
NSA2_R01	1	Residential (Single dwelling)	NSA2	Figure 4.3a

Table 4.1 (Cont'd) Summary of NSAs

ID	No. of Units Represented	Type of Unit	Segment	Figure
NSA2_R02	2	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R03	9	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R04	9	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R05	9	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R06	9	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R07	7	Residential (Townhouse)	NSA2	Figure 4.3a
NSA2_R08	6	Residential (Townhouse)	NSA2	Figure 4.3a
NSA2_R09	6	Residential (Townhouse)	NSA2	Figure 4.3a
NSA2_R10	1	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R11	1	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R12	1	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R13	6	Residential (Townhouse)	NSA2	Figure 4.3a
NSA2_R14	2	Residential (Townhouse)	NSA2	Figure 4.3a
NSA2_R15	18	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R16	22	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R17	4	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R18	4	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R19	3	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R20	3	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R21	22	Residential (Townhouse)	NSA2	Figure 4.3a
NSA2_R22	6	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R23	9	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R24	2	Residential (Single dwelling)	NSA2	Figure 4.3a
NSA2_R25	24	Residential (Townhouse)	NSA2	Figure 4.3b
NSA2_R26	24	Residential (Townhouse)	NSA2	Figure 4.3b
NSA2_R27	3	Residential (Single dwelling)	NSA2	Figure 4.3b
NSA2_R28	10	Residential (Single dwelling)	NSA2	Figure 4.3b
NSA2_R29	3	Residential (Single dwelling)	NSA2	Figure 4.3b
NSA2_R30 [2]	2	Residential (Single dwelling)	NSA2	Figure 4.3b
NSA2_R31 [2]	10	Residential (Single dwelling)	NSA2	Figure 4.3b
NSA2_R32	1	Residential (Single dwelling)	NSA2	Figure 4.3b
NSA2_R33	2	Residential (Single dwelling)	NSA2	Figure 4.3b
NSA2_R34	3	Residential (Single dwelling)	NSA2	Figure 4.3b
NSA3_R01	5	Residential (Single dwelling)	NSA3	Figure 4.4
NSA3_R02	6	Residential (Single dwelling)	NSA3	Figure 4.4
NSA3_R03	5	Residential (Single dwelling)	NSA3	Figure 4.4

Table 4.1 (Cont'd) Summary of NSAs

ID	No. of Units Represented	Type of Unit	Segment	Figure
NSA3_R04	1	Residential (Single dwelling)	NSA3	Figure 4.4
NSA3_R05	11	Residential (Single dwelling)	NSA3	Figure 4.4
NSA3_R06	1	Residential (Single dwelling)	NSA3	Figure 4.4
NSA4_R01	1	Residential (Single dwelling)	NSA4	Figure 4.5
NSA4_R02	1	Residential (Single dwelling)	NSA4	Figure 4.5
NSA4_R03	1	Residential (Single dwelling)	NSA4	Figure 4.5
NSA4_R04	1	Residential (Single dwelling)	NSA4	Figure 4.5
NSA4_R05	1	Residential (Single dwelling)	NSA4	Figure 4.5
NSA5_R01	1	Residential (Single dwelling)	NSA5	Figure 4.6
NSA5_R02	1	Residential (Single dwelling)	NSA5	Figure 4.6
NSA6_R01	1	Residential (Single dwelling)	NSA6	Figure 4.7
NSA6_R02	1	Residential (Single dwelling)	NSA6	Figure 4.7
NSA6_R03	1	Residential (Single dwelling)	NSA6	Figure 4.7
NSA6_R04	1	Residential (Single dwelling)	NSA6	Figure 4.7
NSA6_R05	1	Residential (Single dwelling)	NSA6	Figure 4.7
NSA6_R06	1	Residential (Single dwelling)	NSA6	Figure 4.7
NSA7_R01	1	Residential (Single dwelling)	NSA7	Figure 4.8
NSA8_R01	1	Residential (Single dwelling)	NSA8	Figure 4.9a
NSA8_R02	1	Residential (Single dwelling)	NSA8	Figure 4.9a
NSA8_R03	1	Residential (Single dwelling)	NSA8	Figure 4.9a
NSA8_R04	1	Residential (Single dwelling)	NSA8	Figure 4.9a
NSA8_R05	1	Residential (Single dwelling)	NSA8	Figure 4.9a
NSA8_R06	1	Residential (Single dwelling)	NSA8	Figure 4.9a
NSA8_R07	1	Residential (Single dwelling)	NSA8	Figure 4.9a
NSA8_R08	1	Residential (Single dwelling)	NSA8	Figure 4.9b
NSA8_R09	1	Residential (Single dwelling)	NSA8	Figure 4.9b
NSA8_R10	1	Residential (Single dwelling)	NSA8	Figure 4.9b
NSA8_R11	1	Residential (Single dwelling)	NSA8	Figure 4.9b
NSA8_R12	1	Residential (Single dwelling)	NSA8	Figure 4.9b
NSA8_R13	15	Residential (Single dwelling)	NSA8	Figure 4.9b
NSA8_R14	16	Residential (Single dwelling)	NSA8	Figure 4.9b
NSA8_R15	9	Residential (Single dwelling)	NSA8	Figure 4.9b
NSA8_R16	8	Residential (Single dwelling)	NSA8	Figure 4.9b
NSA8_R17	13	Residential (Townhouse)	NSA8	Figure 4.9b
NSA9_R01	2	Residential (Single dwelling)	NSA9	Figure 4.10a
NSA9_R02	4	Residential (Single dwelling)	NSA9	Figure 4.10a

Table 4.1 (Cont'd) Summary of NSAs

ID	No. of Units Represented	Type of Unit	Segment	Figure
NSA9_R03	1	Residential (Single dwelling)	NSA9	Figure 4.10a
NSA9_R04	1	Residential (Single dwelling)	NSA9	Figure 4.10a
NSA9_R05	16	Residential (Single dwelling)	NSA9	Figure 4.10a
NSA9_R06	1	Residential (Single dwelling)	NSA9	Figure 4.10a
NSA9_R07	24	Residential (Single dwelling)	NSA9	Figure 4.10a
NSA9_R08	7	Residential (Single dwelling)	NSA9	Figure 4.10b
NSA9_R09	5	Residential (Single dwelling)	NSA9	Figure 4.10b
NSA9_R10	5	Residential (Single dwelling)	NSA9	Figure 4.10b
NSA9_R11	3	Residential (Single dwelling)	NSA9	Figure 4.10b
NSA9_R13	7	Residential (Single dwelling)	NSA9	Figure 4.10b
NSA9_R14	5	Residential (Single dwelling)	NSA9	Figure 4.10b
NSA9_R15	5	Residential (Single dwelling)	NSA9	Figure 4.10b
NSA10_R01	16	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R02	20	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R03	20	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R04	20	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R05	5	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R06	10	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R07	26	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R08	12	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R09	8	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R10	8	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R11	8	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R12	8	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R13	8	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R14	1	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R15	1	Residential (Single dwelling)	NSA10	Figure 4.11
NSA10_R16	1	Residential (Single dwelling)	NSA10	Figure 4.11
NSA11_R01	1	Residential (Single dwelling)	NSA11	Figure 4.12
NSA12_R01	4	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R02	4	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R03	4	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R04	4	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R05	4	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R06	10	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R07	10	Residential (Single dwelling)	NSA12	Figure 4.13a

Table 4.1 (Cont'd) Summary of NSAs

ID	No. of Units Represented	Type of Unit	Segment	Figure
NSA12_R08	2	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R09	2	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R10	1	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R11	5	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R12	10	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R13	14	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R14	20	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R15	16	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R16	1	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R17	3	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R18	3	Residential (Single dwelling)	NSA12	Figure 4.13a
NSA12_R19	9	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R20	10	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R21	12	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R22	10	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R23	10	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R24	8	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R25	3	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R26	5	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R27	5	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R28	5	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R29	8	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R30	8	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R31	8	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R32	8	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R33	10	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R34	1	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R35	8	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R36	12	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R37	6	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R38	12	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R39	12	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R40	2	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R41	7	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R42	8	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R43	8	Residential (Single dwelling)	NSA12	Figure 4.13b

Table 4.1 (Cont'd) Summary of NSAs

ID	No. of Units Represented	Type of Unit	Segment	Figure
NSA12_R44	7	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R45	7	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R46	8	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R47	8	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R48	6	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R49	6	Residential (Townhouse)	NSA12	Figure 4.13b
NSA12_R50	5	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R51	3	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R52	2	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R53	18	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R54	10	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R55	5	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R56	14	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R57	16	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R58	8	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R59	7	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R60	5	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R61	3	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R62	1	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R63	6	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R64	38	Residential (Single dwelling)	NSA12	Figure 4.13b
NSA12_R65	6	Residential (Single dwelling)	NSA12	Figure 4.13b

Notes:

[1] - Represents only ground-level units of Balmoral Condominium. Number of total units is greater than 500

[2] - Includes homes planned for adjacent vacant lands or are currently being constructed

Figure 4.1 NSAs Within Study Area

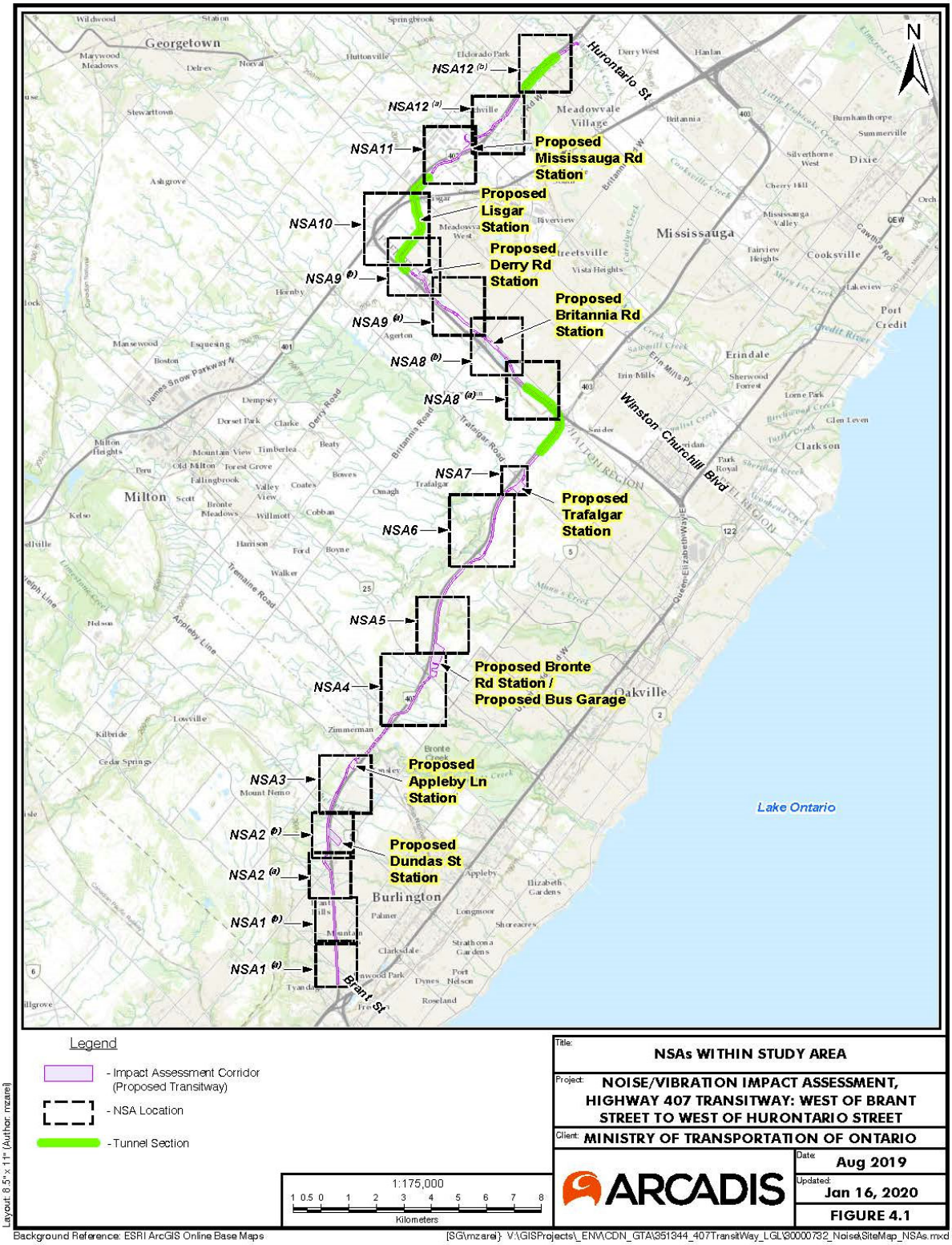


Figure 4.2a Receptor Location – NSA1[(a)]

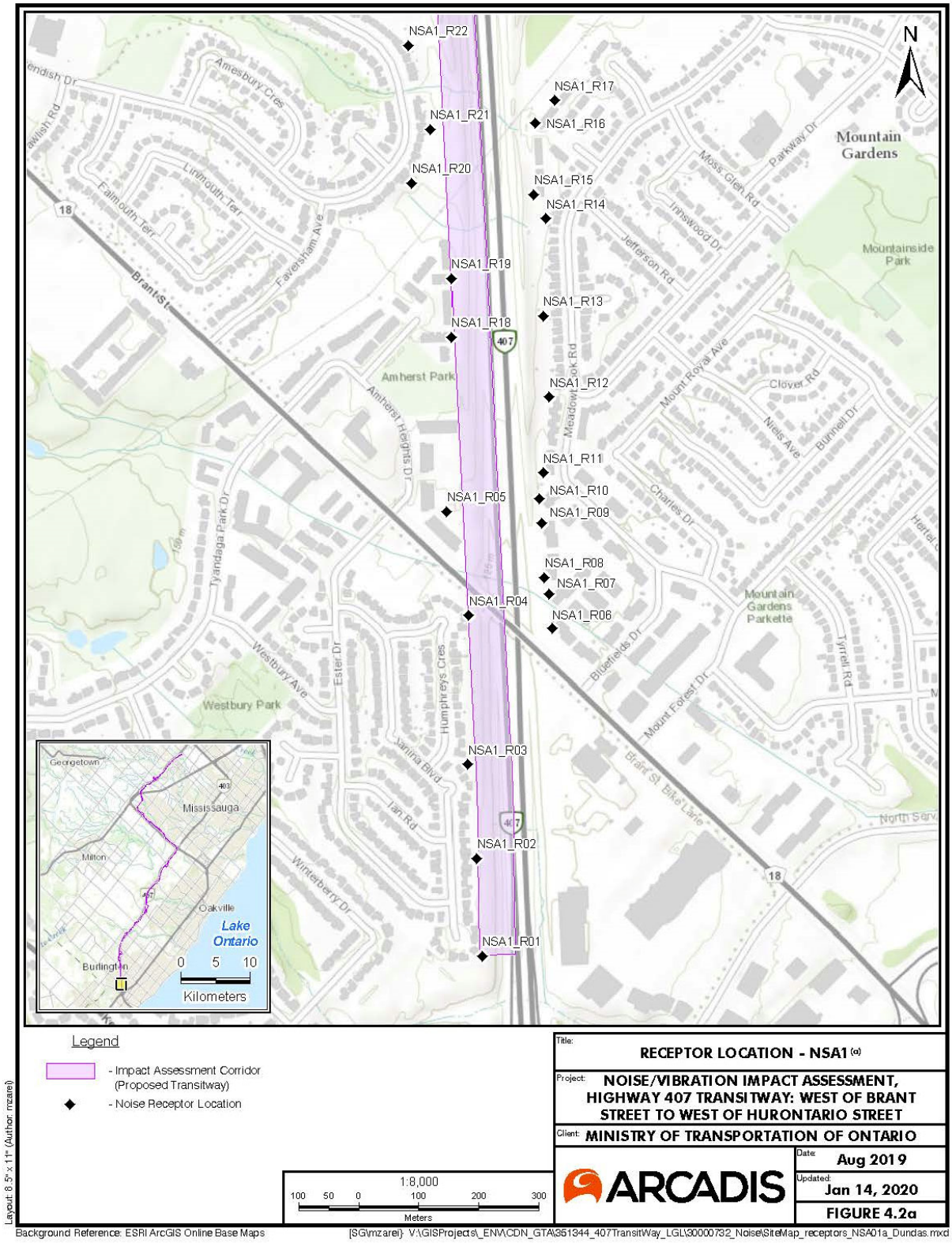


Figure 4.2b Receptor Location – NSA1[(b)]

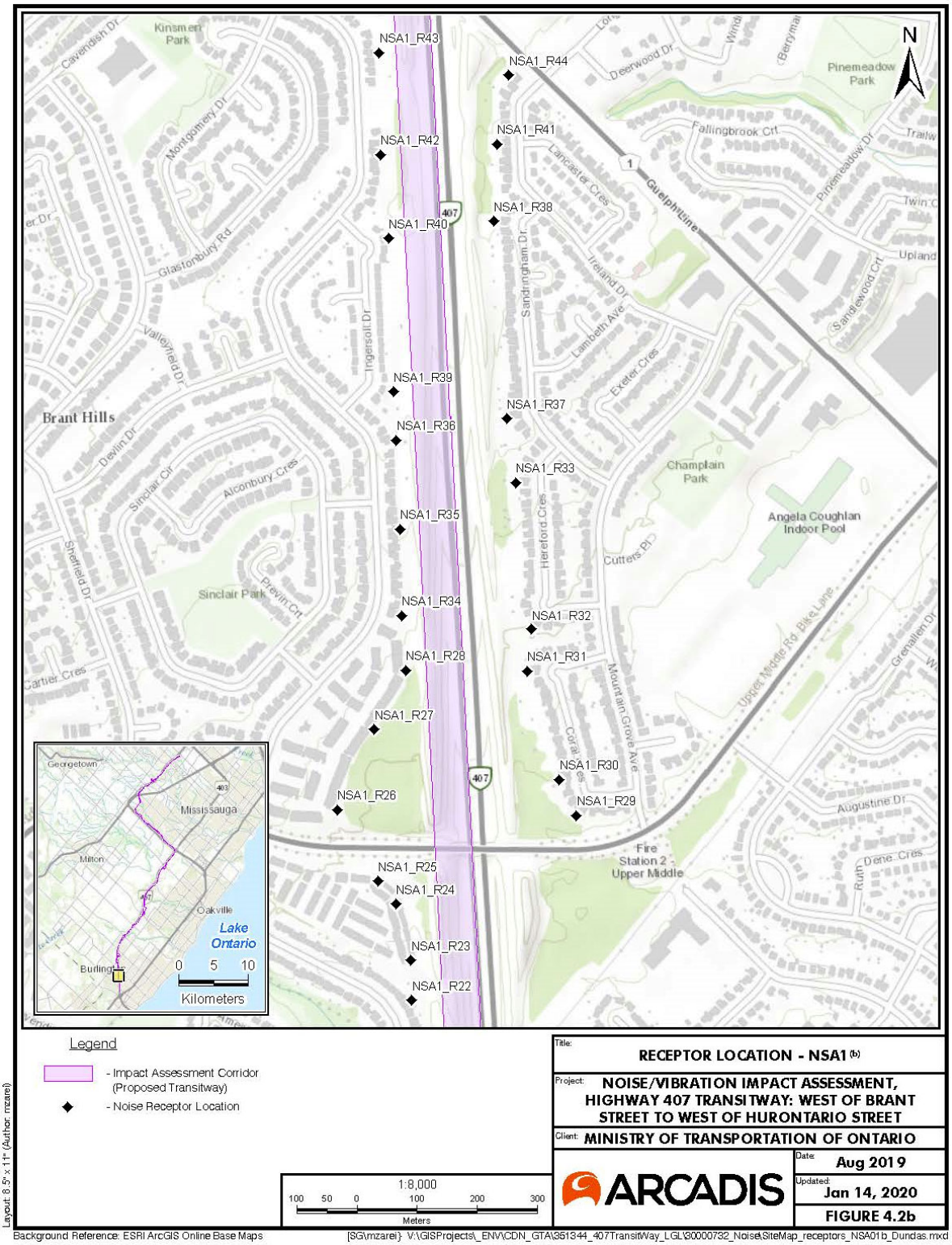


Figure 4.3a Receptor Location – NSA2[(a)]

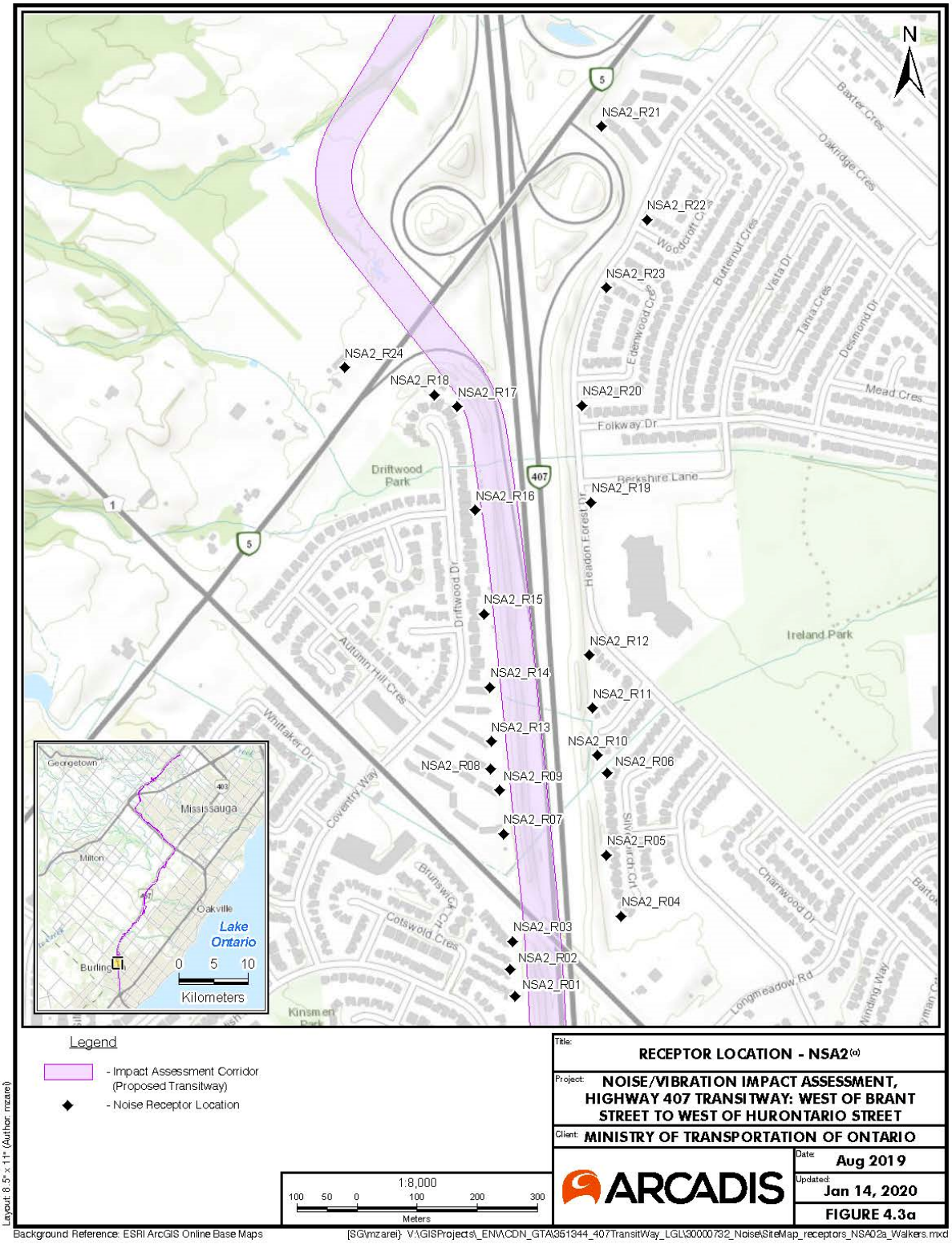


Figure 4.3b Receptor Location – NSA2(b)

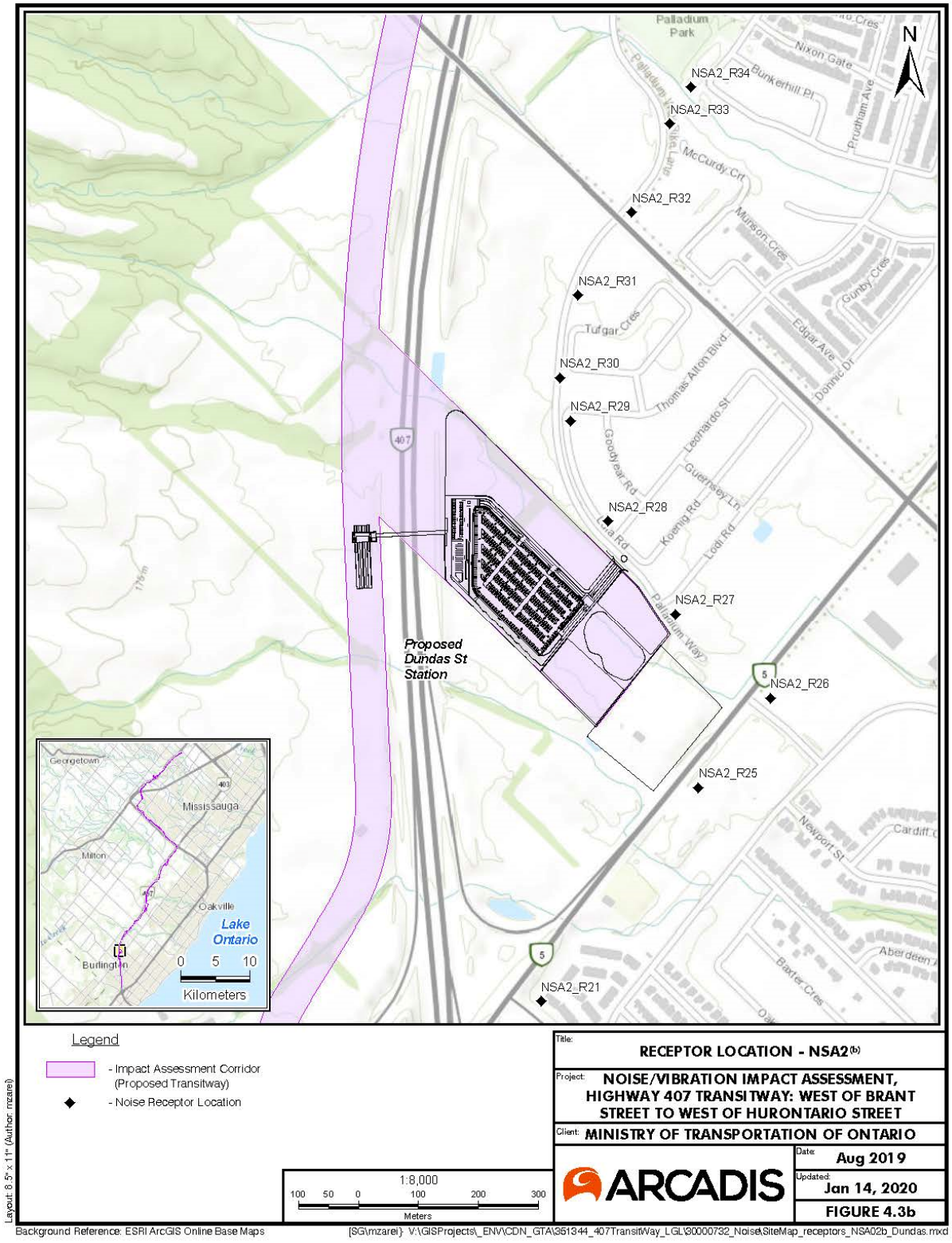


Figure 4.4 Receptor Location – NSA3

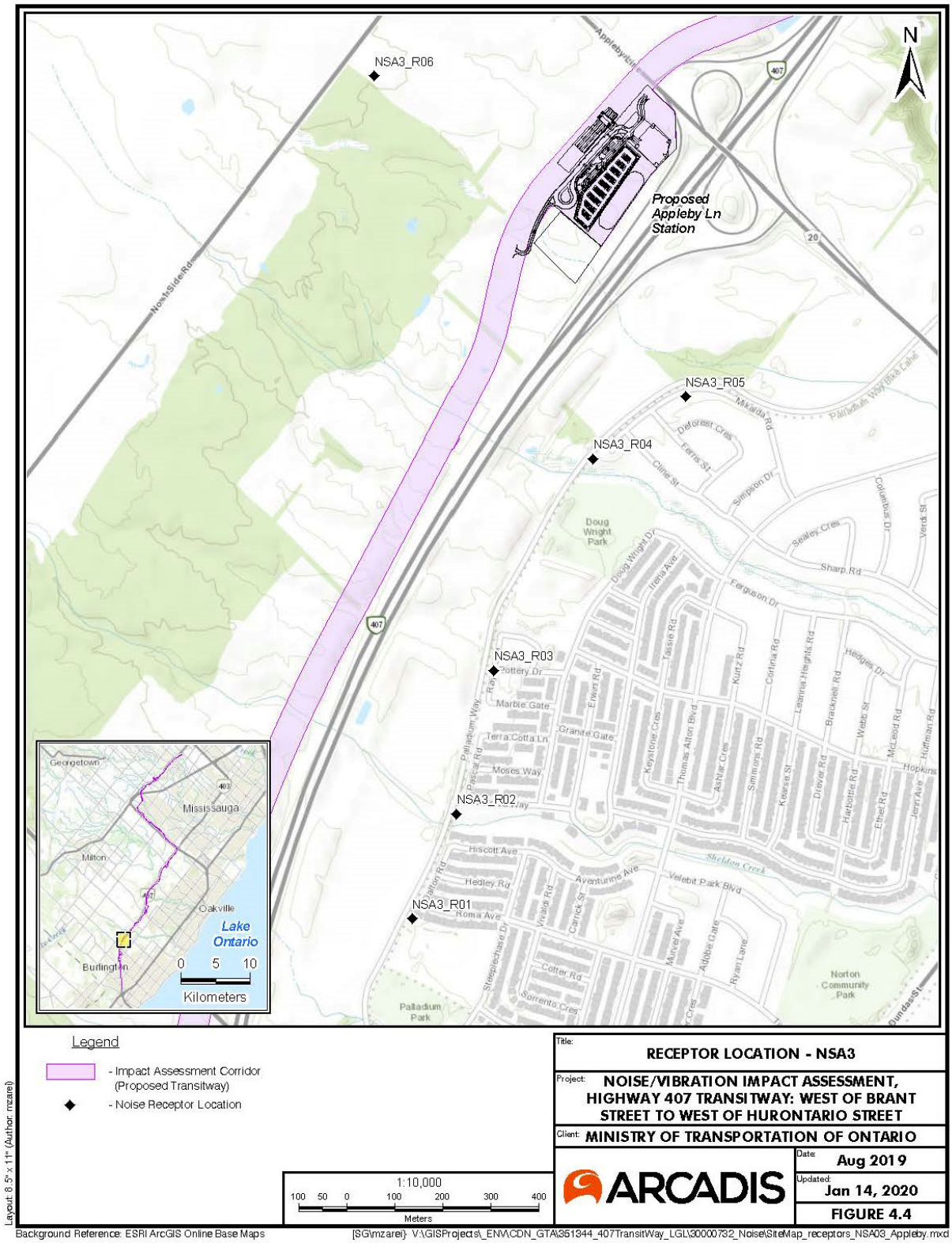


Figure 4.5 Receptor Location – NSA4

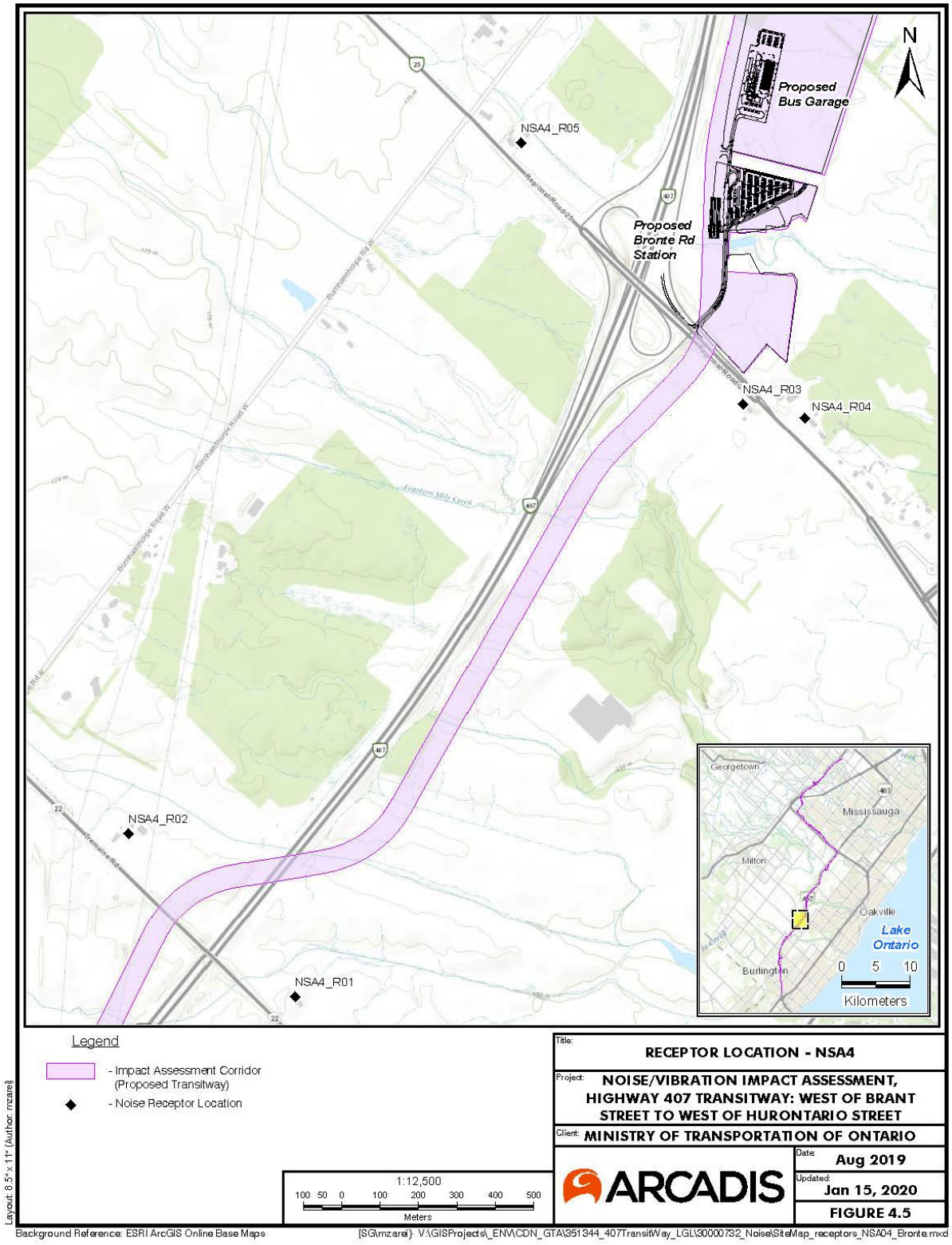


Figure 4.6 Receptor Location – NSA5

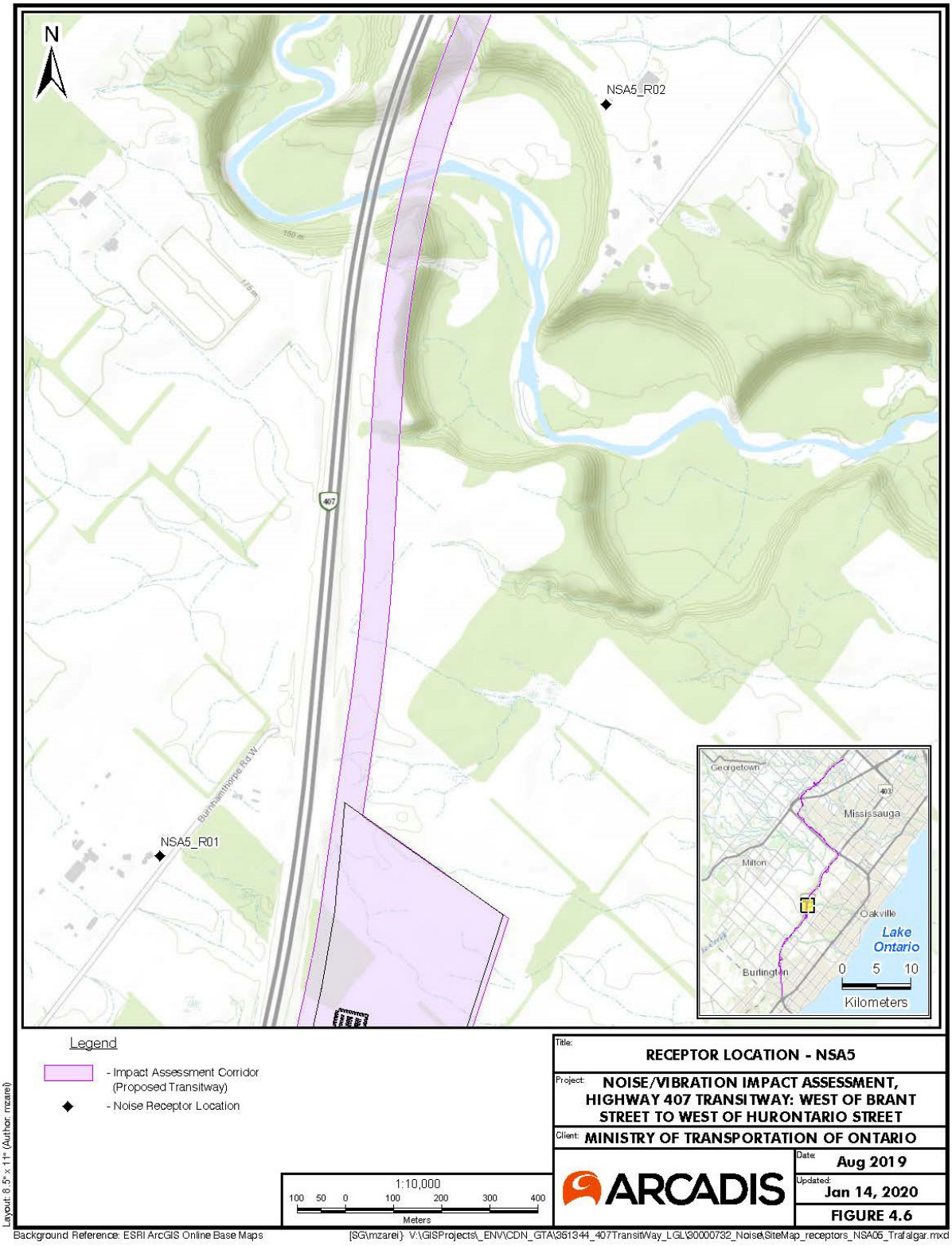


Figure 4.7 Receptor Location – NSA6

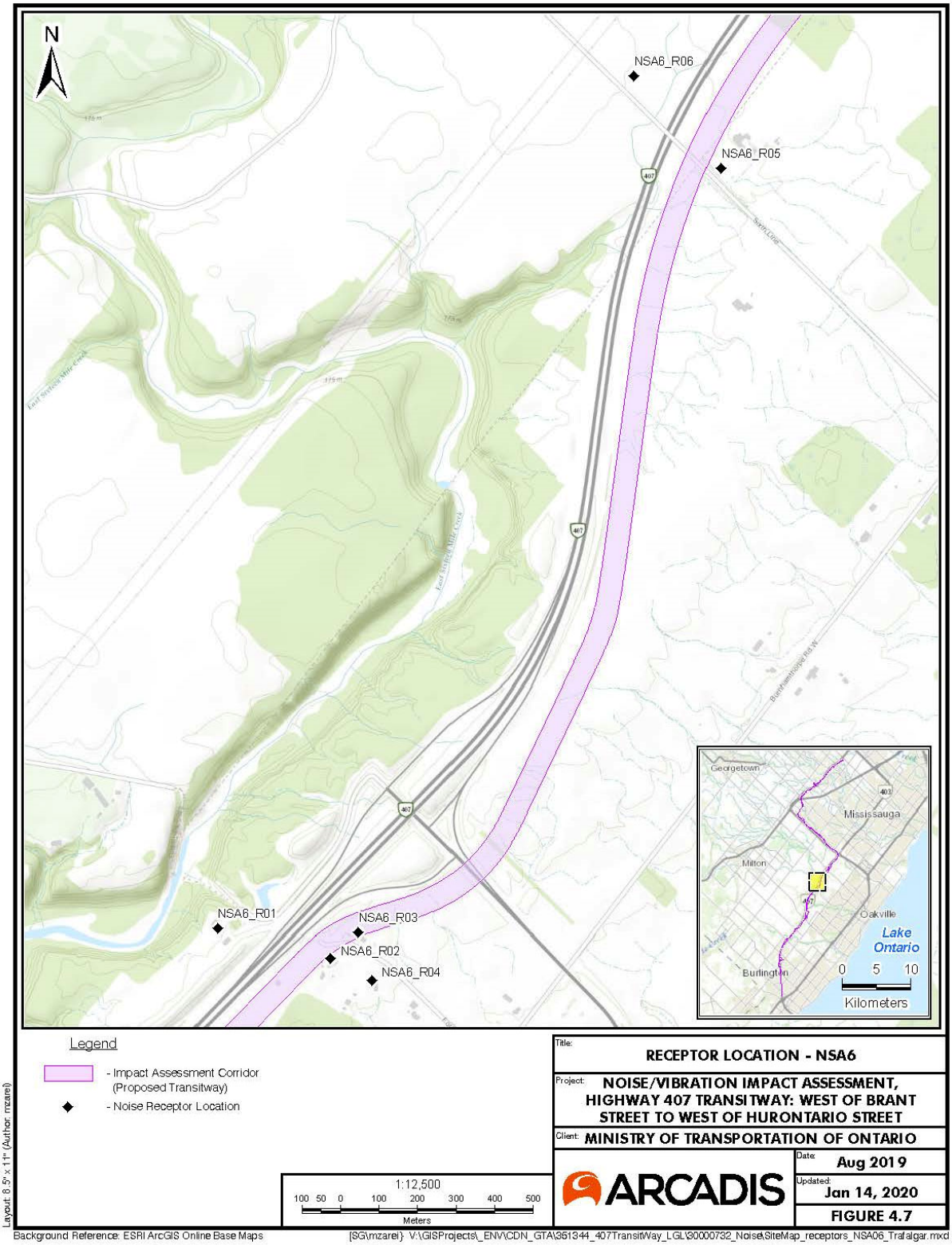


Figure 4.8 Receptor Location – NSA7

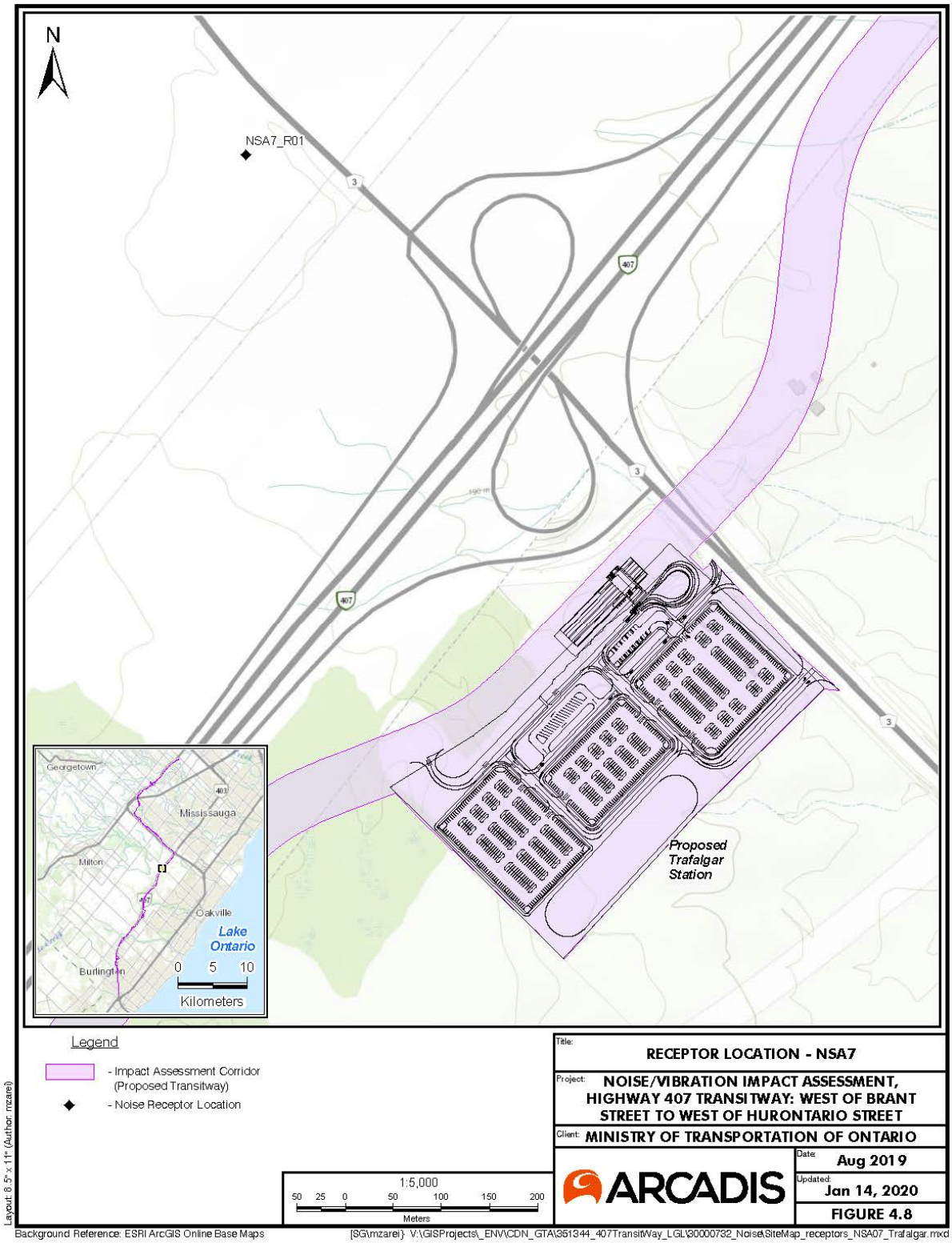


Figure 4.9a Receptor Location – NSA8[(a)]

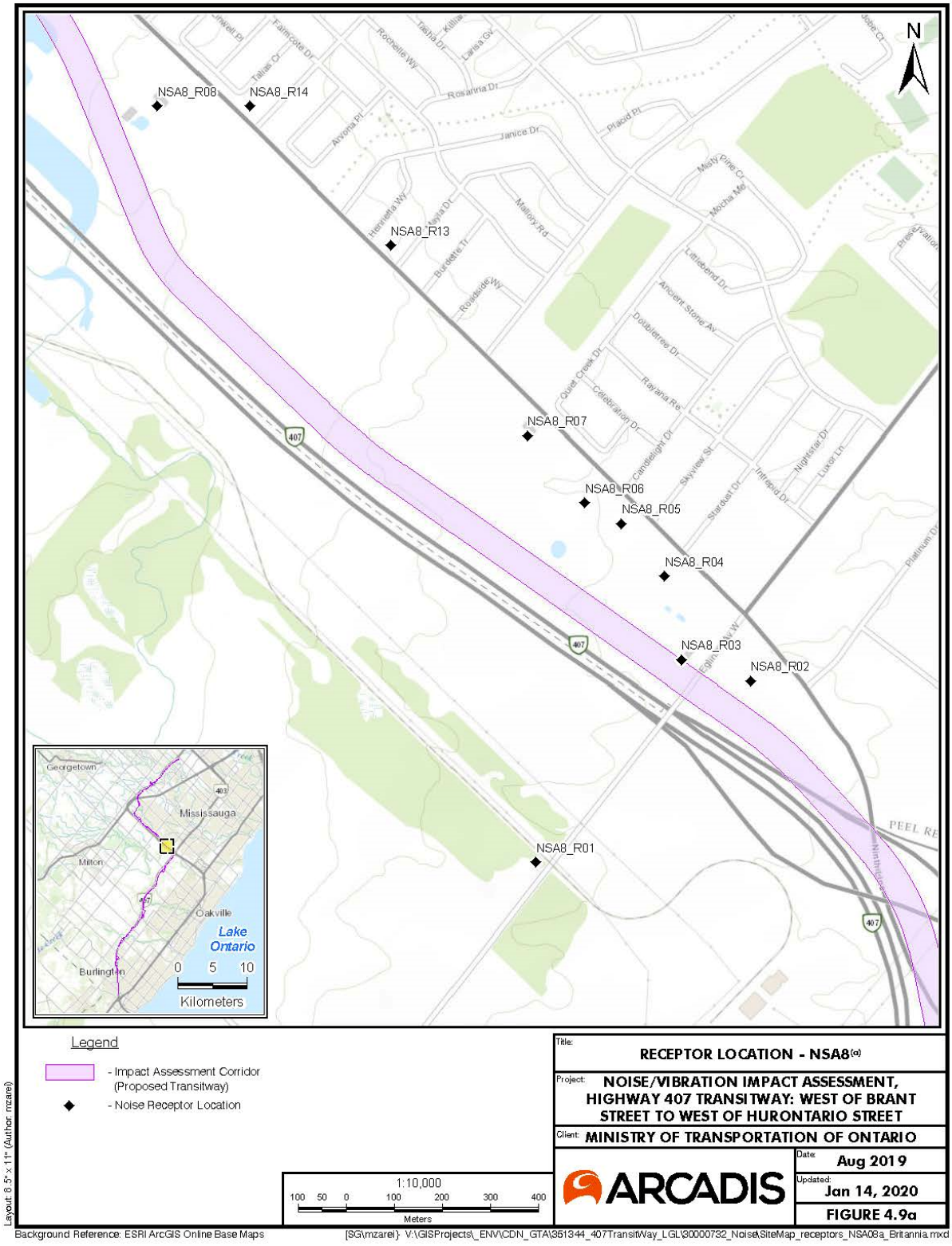


Figure 4.9b Receptor Location – NSA8(b)

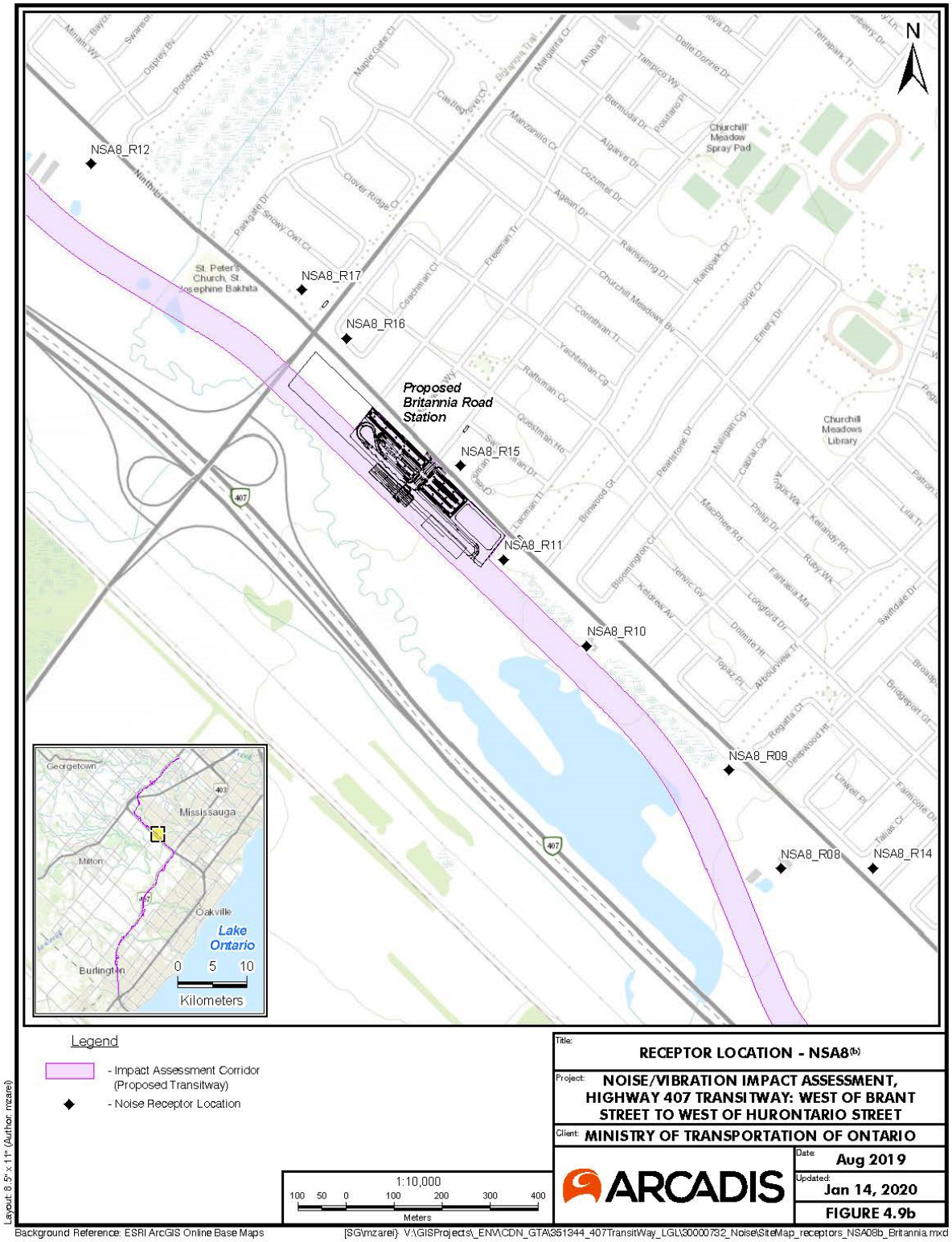


Figure 4.10a Receptor Location – NSA9[(a)]

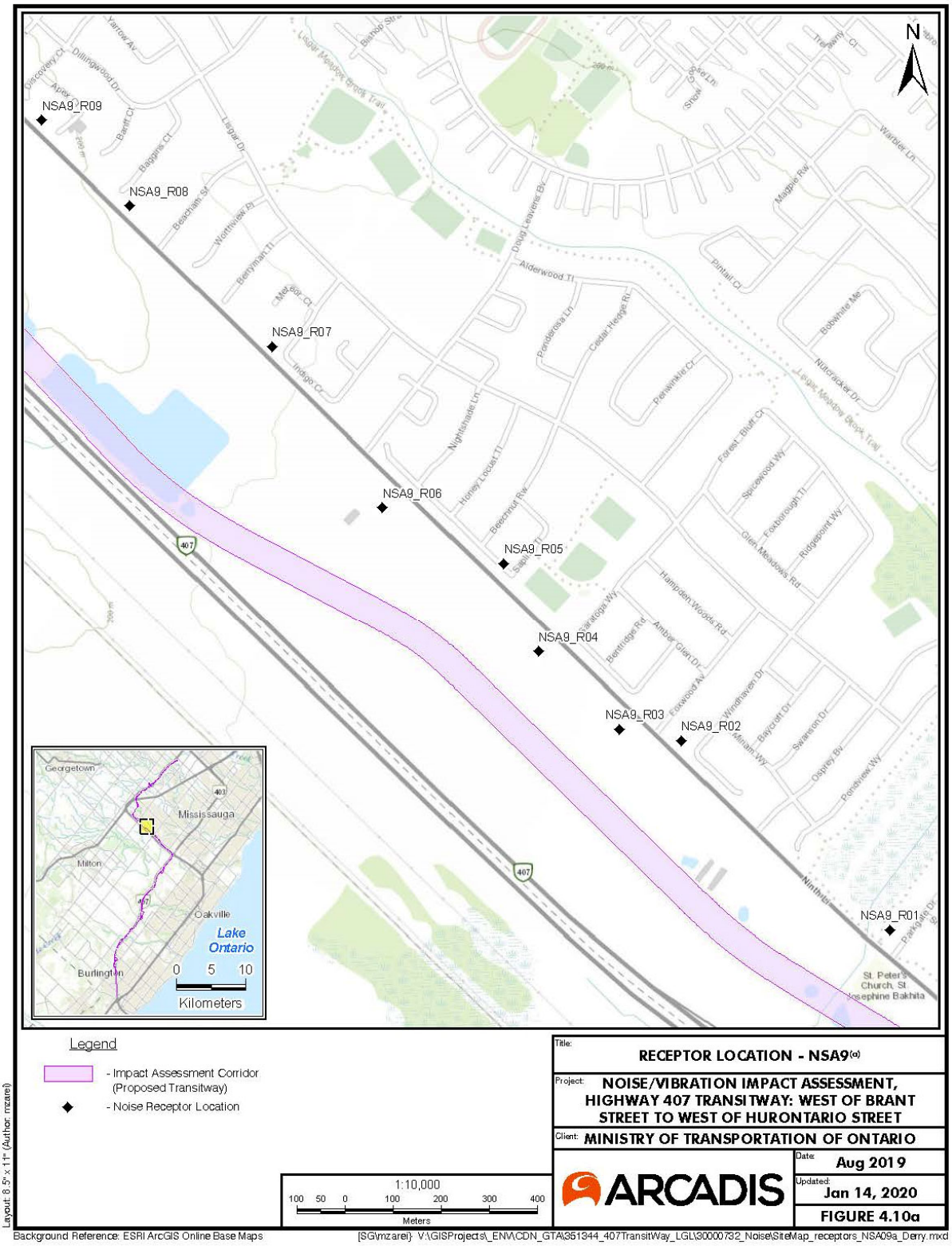


Figure 4.10b Receptor Location – NSA9(b)

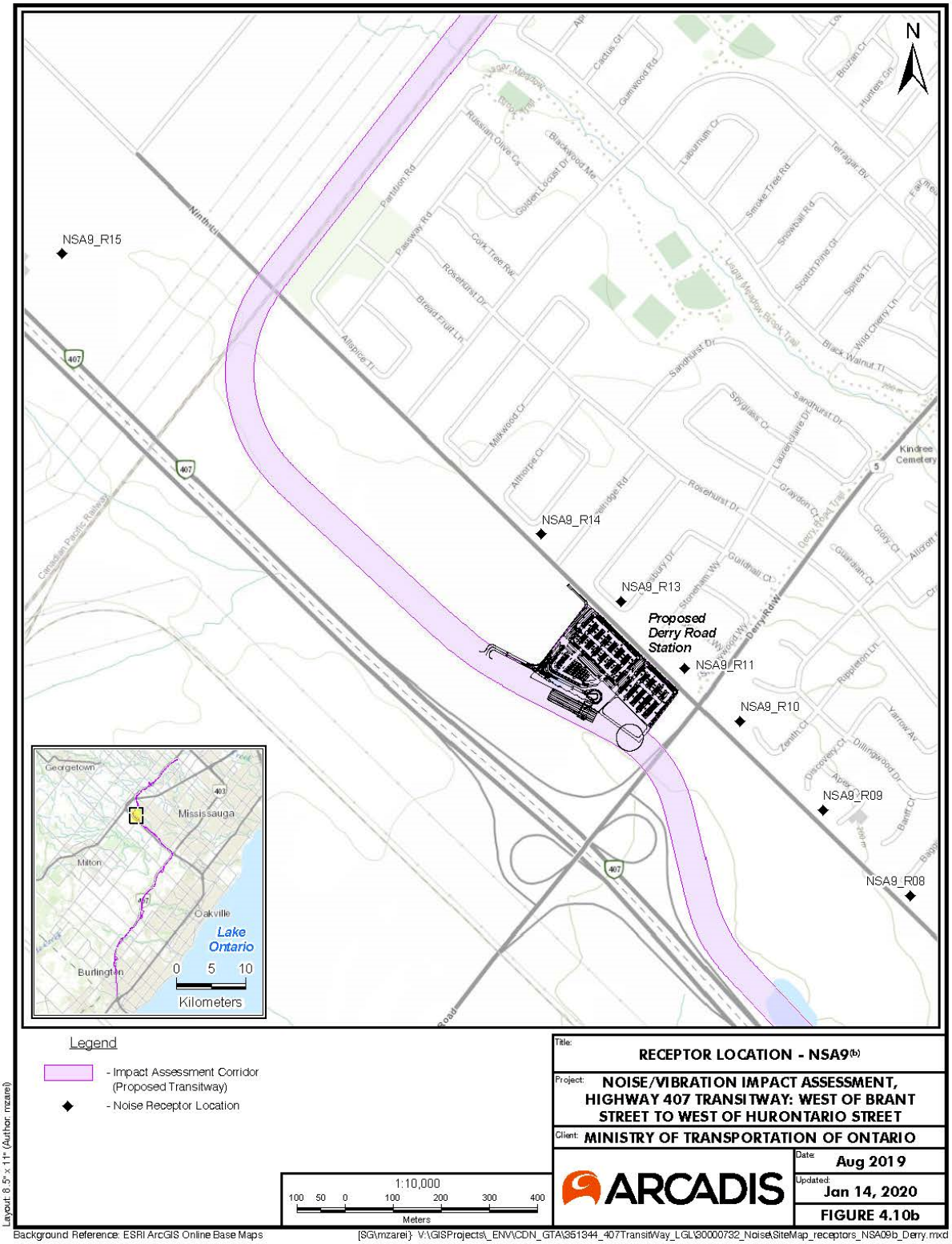


Figure 4.11 Receptor Location – NSA10

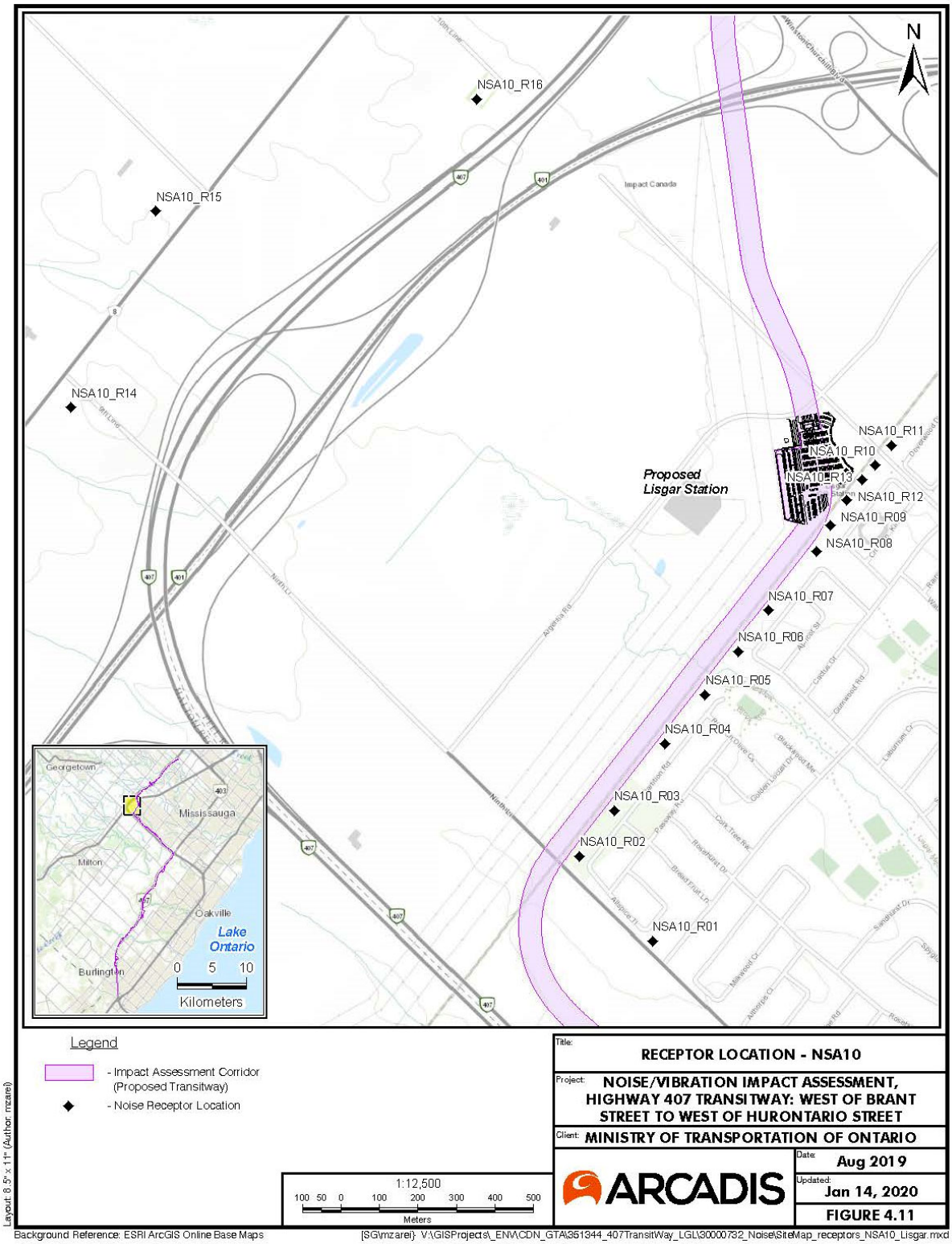


Figure 4.12 Receptor Location – NSA11

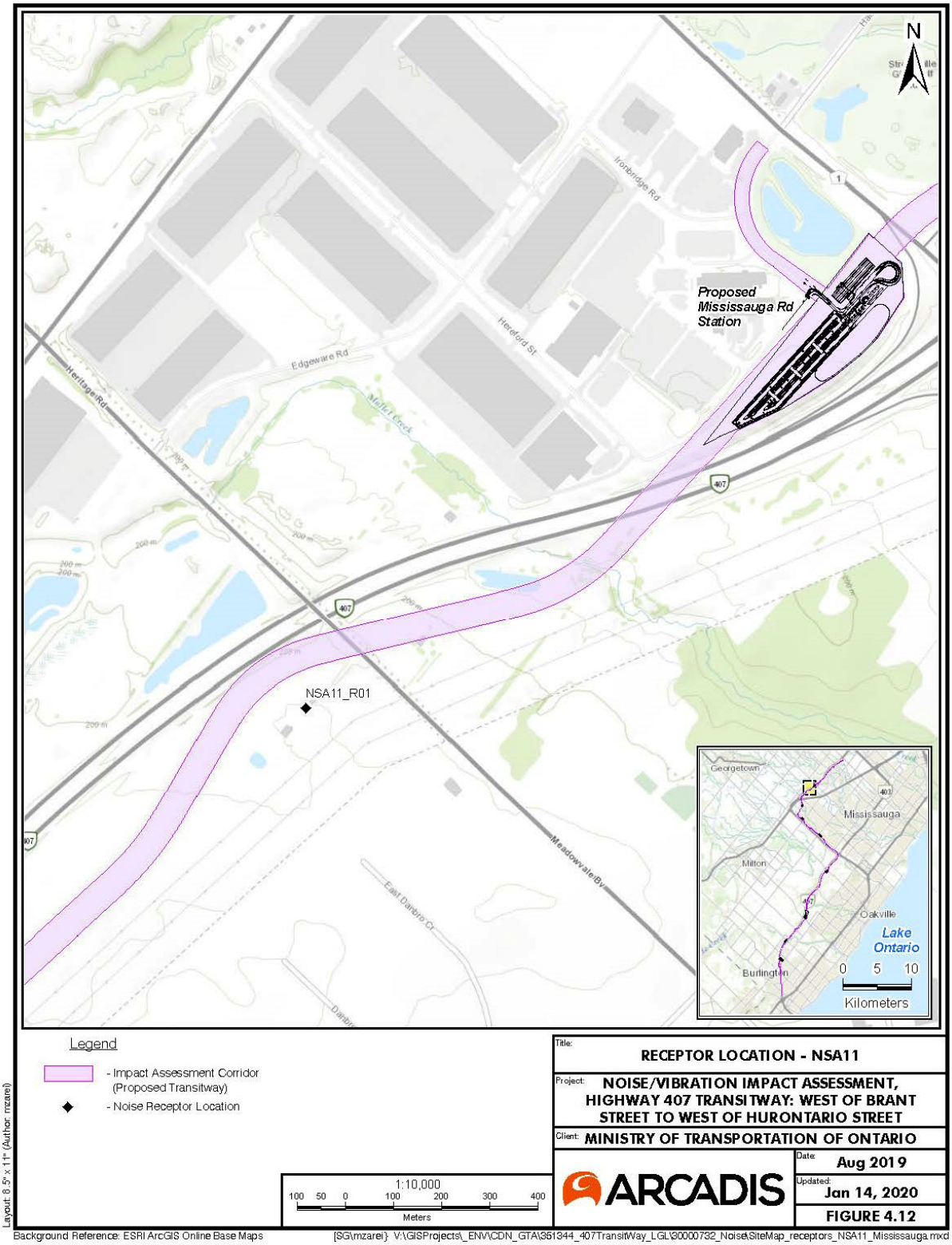


Figure 4.13a Receptor Location – NSA12(a)

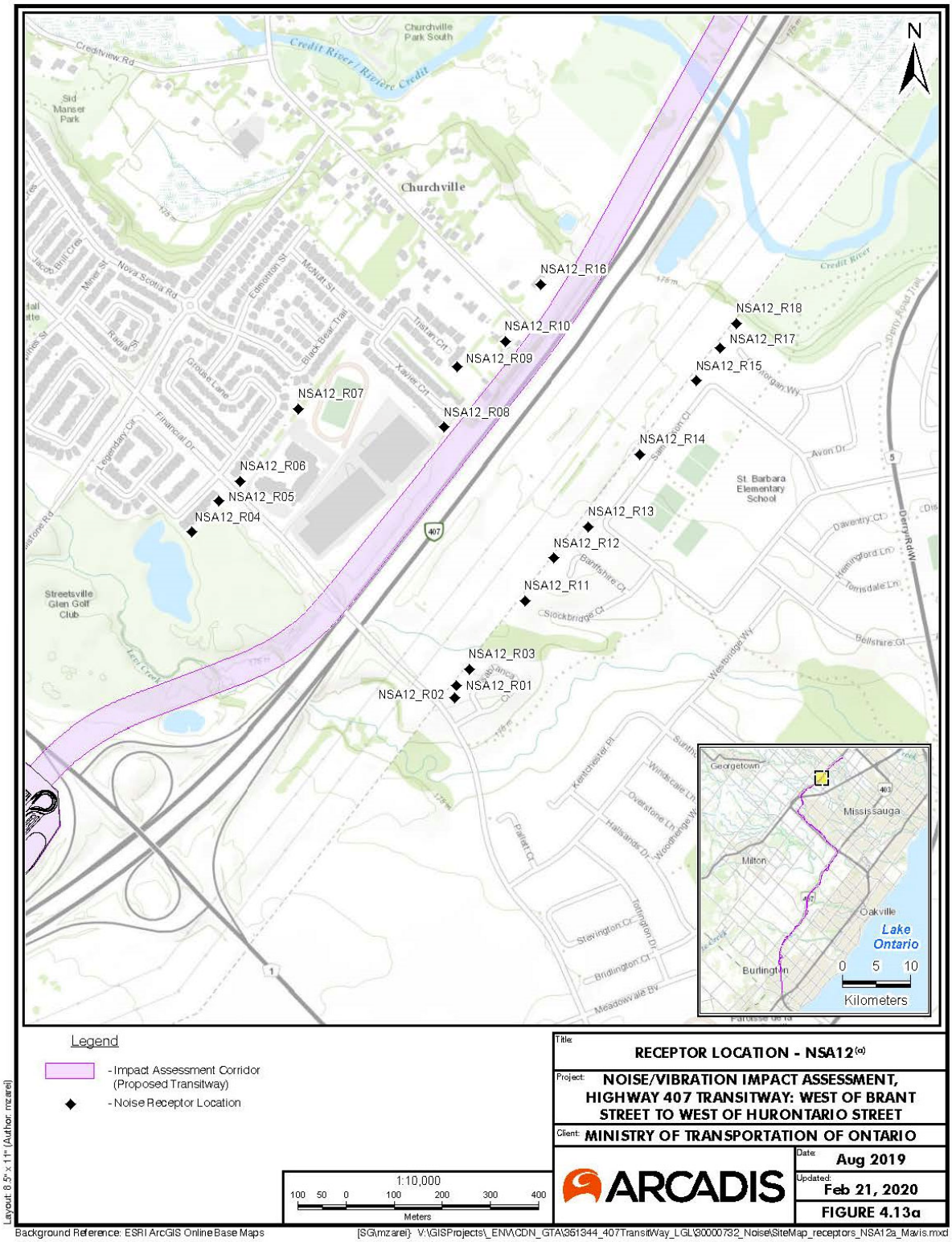


Figure 4.13b Receptor Location – NSA12(b)

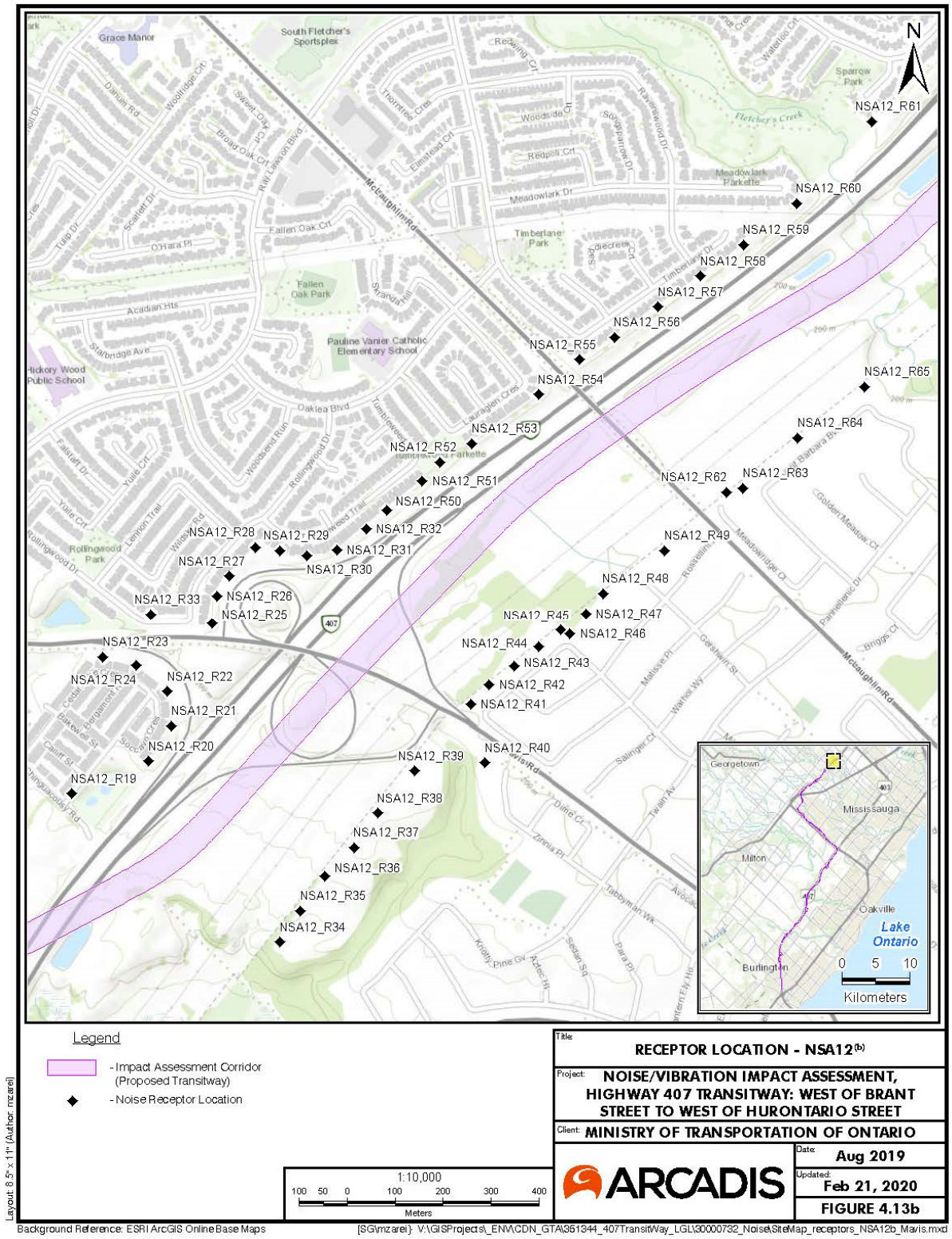
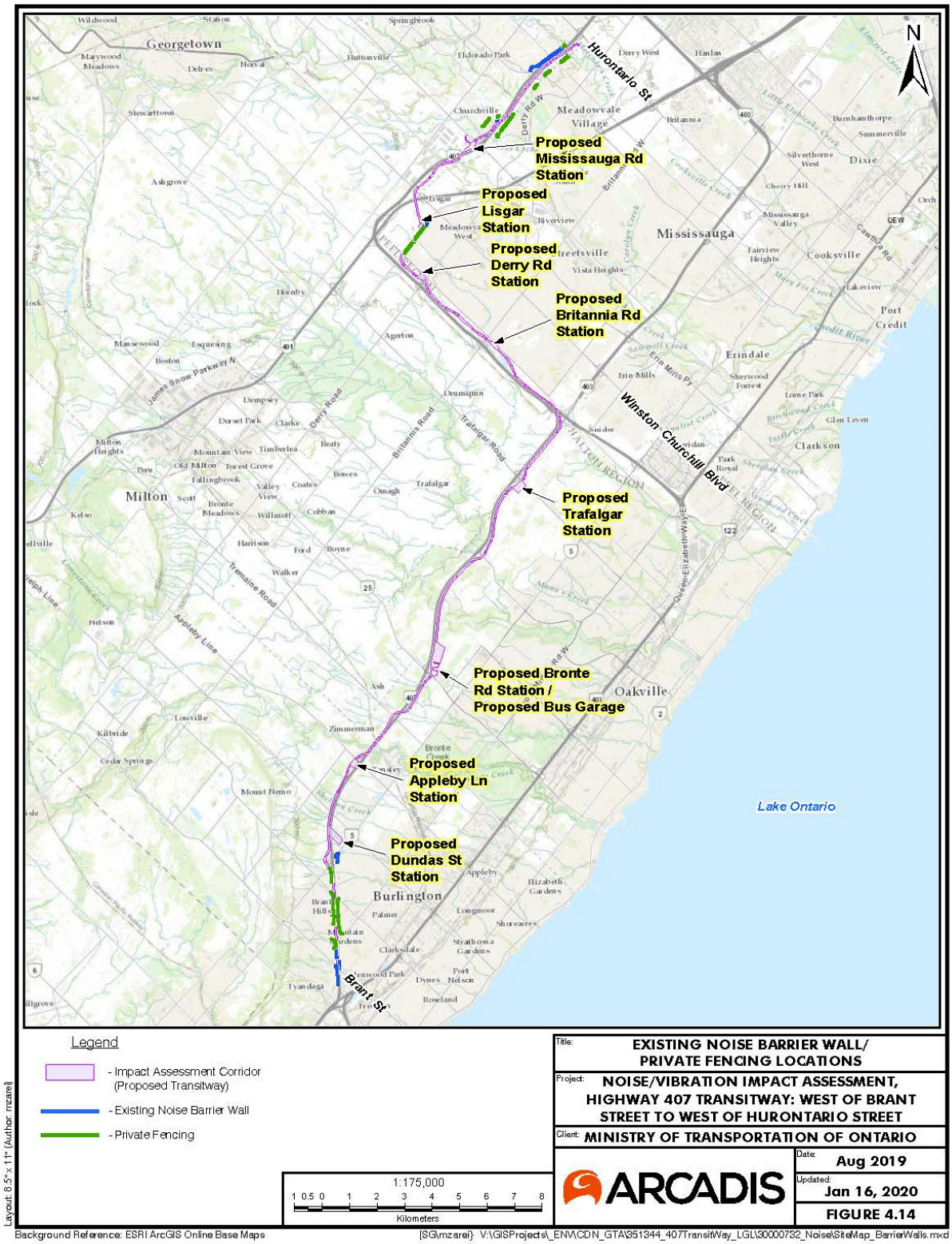


Figure 4.14 Existing Noise Barrier Wall/Private Fencing Locations



4.2.2 Future Build (2041)

The future-build scenario represents future conditions in the same year as the future no-build year, but inclusive of the 407 Transitway traffic. For traffic on the 407 ETR, the assessment of this scenario utilizes the same projected traffic data as was used in the assessment of future no-build conditions.

Projected noise levels at the NSAs in the future-build scenario were estimated through predictive modelling (discussed in Section 4.3.1), in the same manner as for the future no-build scenario. Modelling of the future build scenario accounts for any changes to local topography that will be required to accommodate the 407 Transitway, and also accounts for the planned vertical profile of the 407 Transitway (i.e., at-grade sections, overpasses and tunnels). To account for the effects of surface construction materials, the transitway was modelled with an asphalt and a concrete surface. Bus traffic noise along tunnel sections was not modelled as these sections will be below ground and without a line-of-sight to receptors. Tunnels are expected to have ventilation every 750 m; however, detailed information on ventilation equipment was not available and therefore was not modelled at this point. Ventilation is not expected to have a significant noise impact as sound levels in the area are already elevated from significant road traffic; however, it should be considered prior to construction.

As future plans for the 407 Transitway involve operations using BRT, the analysis also includes an assessment of ground-borne vibration from buses to confirm that levels would not be perceptible at the NSAs.

Potential vibration effects associated with bus pass-by events are more likely to be associated with airborne vibration caused by engine noise rather than ground-borne vibration. The potential for airborne (noise-induced) vibration from bus pass-by events was estimated using algorithms from the U.S. Federal Highway Administration (FHWA) Traffic Noise Model (TNM) version 2.5 [14], discussed further in Section 4.4.1.1.

4.3 Noise Modelling

4.3.1 Noise from Transportation Sources

The MTO requires that sound level predictions completed in support of transportation noise assessments be completed using either the MECP ORNAMENT calculation method, or the STAMINA 2.0 model [1]. The ORNAMENT calculation method serves as the basis for the MECP-developed STAMSON computer program, and is a modification of the FHWA-RD-77-108 algorithm to simplify calculations and to account for Ontario's then-current vehicle fleet. As such, ORNAMENT, through the use of STAMSON (ORNAMENT/STAMSON) is to be applied in situations with relatively straight roads, where the surrounding topography and vertical road profile are relatively flat. For scenarios with complex geometry, such as roads featuring grade separations or below grade sections, irregular topography or complex horizontal alignments, the

more rigorous STAMINA model may be used. The STAMINA model is based on algorithms from the U.S. FHWA. The most recent version of STAMINA is implemented in the FHWA TNM program. As per MTO requirements, all sound levels were assessed as 24-hour L_{eq}'s at a height of 1.5 m from the ground at the most exposed side, or OLA of each identified NSA [1].

The study area is located within a complex geographic terrain with several large, "spaghetti" interchanges, rail corridors, overpasses and a number of rivers/streams. As such, ORNAMENT is too simplistic for this stretch of the transitway to account for terrain changes. STAMINA is the preferred model, however, the size of the study area, and number of sensitive receptors makes this a laborious model to use given the outdated DOS-based interface. TNM is its replacement and was used with the agreement of MTO. Table 4.2 was prepared to show a comparison between STAMSON and TNM.

4.3.1.1 ORNAMENT/STAMSON

Sound levels in ORNAMENT are calculated based on the specific exposure of a given point of reception to the road(s) under assessment. As the road source geometry is considered from the specific point of view of the receptor, only one receptor may be modelled at a time and the results are applicable only to that receptor and those with a reasonably similar exposure to the road.

The ORNAMENT method is summarized in a Technical Document prepared in 1989[15], and is based on reference sound level data for three classes of vehicles: cars, medium trucks (inclusive of buses) and heavy trucks. A series of adjustments are then applied to the reference data based on site-specific variables, including the actual volume of each vehicle type, the speed of travel, distance between the road and receptor, road length and pavement type, road gradient, intervening ground surface, and obstacles to noise propagation (i.e., barriers, houses, dense foliage). Accuracy decreases significantly beyond 200 m of the noise source, and the method does not work for distances greater than 500 m. Prediction accuracy is further reduced in cases with highly irregular terrain, such as this study area.

As noted earlier, the ORNAMENT method is the basis for the STAMSON computer program, which was used for calculations for a representative receptor for each NSA for comparison with TNM results. NSAs are located within complex terrains with a combination of natural, or engineered safety and acoustic controls, such as berms and acoustic fences. The receptors selected below have relatively simple terrain geometry, considering the overall complexity of the study area, and can be modelled through STAMSON with the least amount of adjustments made by the software. This also allows for a relatively direct comparison. Other receptors are either well beyond the confidence range of STAMSON, or are subject to a number of terrain changes between the source and receiver, which cannot be easily modelled using STAMSON. Furthermore, the selected receptors are considered representative for a good number of the PORs within the NSAs as they share similar exposures to all road segments in terms of angle and distance. Table 4.2 documents this. Based on aerial photography and site observations, the

surrounding ground surface was set to absorptive. Vehicles were assumed to be operating at the posted speed limit, per MECP procedures outlined in the ORNAMENT Technical Document [15].

Table 4.2 TNM vs STAMSON Sample Comparison

ID	Sound Level Prediction (dBA)		Difference
	TNM	STAMSON	
NSA1_R02	53.9	55.5	-1.6
NSA2_R29	52.1	53.3	-1.2
NSA10_R16	62.8	61.6	+1.2

TNM results are slightly below or above the STAMSON results for all PORs shown in Table 4.2. However, this difference is likely to be imperceptible to humans. In these cases, TNM can handle the complex terrain, the benefits from interfering structures, such as berms and residential acoustical fences, and number of reflections, better than STAMSON. In all cases, the differences in sound levels is below the 3 dBA threshold of perception.

4.3.1.2 FHWA STAMINA/TNM

TNM version 2.5 was developed by the FHWA for the assessment and analysis of highway traffic noise, and to assist in the design of noise barriers for highway projects [14] and is the successor to MTO's approved model for complex terrain, STAMINA. The model utilizes 1/3-octave band reference sound level data for several vehicle types operating on a variety of pavement surfaces. Test cases are checked against real-world noise measurements to ensure the accuracy of the model. The vehicle types that may be modelled include: automobiles, medium trucks, heavy trucks, buses and motorcycles. In this program, the user plots the road alignment and sensitive receptor locations of interest, and assigns the traffic mix to each plotted road segment as appropriate. The model accounts for the speed of each vehicle type, the pavement surface type, the separation distance between the road and receptor, as well as the effect of intervening distance, ground type, topography and absorption of sound by the atmosphere. TNM allows for the simultaneous calculation of multiple receptor points in a single run, as opposed to ORNAMENT, for which each run is receptor-specific.

TNM version 2.5 was applied in the assessment of traffic noise impacts for the receptors in this assessment, as the 407 Transitway involves many above grade sections in order to pass over the interchanges that connect with the 407 ETR. Furthermore, the horizontal alignment of some existing and proposed road infrastructure is curved (e.g., on/off ramps, flyovers), which does not lend well to the use of ORNAMENT. However, the results of select receptors within each NSA have been compared to results obtained using ORNAMENT in Table 4.2.

The existing road infrastructure was input to TNM based on plan drawings and topographical plots provided by Parsons. The volumes of the various vehicle types were input based on the existing and projected future traffic data, and speeds were assigned based on the posted speed limits of

the associated roads. The selected representative receptors discussed in Section 4.1 were plotted and assigned a height of 1.5 m per MTO requirements. It was assumed that the vehicles travel on an average pavement type, except for along Highway 407 ETR east of its intersection with Highway 403, which was modelled as concrete, and that the surrounding area is grassed (based on observations and aerial photography). The 407 Transitway infrastructure was input based on plan and profile drawings, and typical cross-sectional drawings provided by Parsons, and was modelled to have an asphalt and a concrete surface for comparison purposes.

4.3.2 Noise from Construction

As noted in Section 3.4.1, the sound level limits recommended by the MECP for construction noise have been developed on a per-unit basis rather than a cumulative basis. As such, there are no applicable criteria values for the simultaneous operation of multiple pieces of construction equipment. Noise modelling of individual pieces of construction equipment to confirm compliance with the NPC-115 limits has therefore not been undertaken for this assessment, as it is assumed that the equipment supplier will ensure that all equipment meets the applicable NPC-115 limits.

4.4 Vibration Assessment

4.4.1 Vibration from Transportation Sources

Rail infrastructure is a known source of ground-borne vibration, caused by the transfer of energy along the vertical axis from the rolling vehicle to the track system, and subsequently from the track system to the ground where it may propagate towards nearby structures. However, the focus of this Report is the BRT and as such future LRT impacts were not evaluated. Ground-borne vibration impacts are not a common environmental problem associated with buses operating on smooth surfaces. The U.S. FTA [8] states that on smooth roadways, vibrations from rubber-tired traffic are rarely perceptible. As such, the focus of this assessment has been placed on air-borne vibrations which are more common. Furthermore, previous Transitway assessments [16] have shown that ground-borne vibration is not an issue and is rarely perceptible beyond the right-of-way. This segment of the overall Transitway alignment also has lower traffic volumes than other Transitway segments, which in general is expected to generate lower noise and vibration impacts.

The assessment procedures for evaluating potential airborne vibration levels are discussed in the following sections.

4.4.1.1 Airborne Vibration

Noise from heavy vehicles operating in close vicinity to receptors has the potential to induce vibration in building components such as windows, walls and floors. To evaluate whether the buses operating on the 407 Transitway would be expected to cause airborne vibration of building components, it was necessary to derive octave band sound level data for a bus pass-by event for comparison to the frequency-dependent criteria summarized in Section 3.3. As described in Section 4.3.1.2, the FHWA TNM 2.5 is based on 1/3-octave band reference data for various types

of vehicle, including buses. The reference data for each vehicle type is descriptive of a single vehicle pass-by at a known distance and speed.

The TNM 2.5 model outputs overall A-weighted receptor sound levels based on all user inputs; however, it is possible to calculate the reference sound levels based on information provided in the Technical Manual for the model [14]. The calculation is based on the vehicle type, pavement type, throttle setting, travel speed and 17 constants provided in the manual. The calculation results in a maximum pass-by sound level for the associated vehicle at 15 m from the road.

For purposes of this calculation, it was assumed that the bus is travelling on average pavement, at 100 km/hr and full throttle. The closest receptor to the 407 Transitway is located at 40 m from the centerline, and so the reference sound level was projected to this distance using line source attenuation and assuming full 180^{O} exposure to the road. The resulting octave band sound level due to a bus pass-by of this assessment is discussed in Section 6.1 to determine whether any of the criteria are exceeded.

4.4.2 Vibration from Construction

The operation of construction equipment may result in perceptible ground vibrations in the vicinity of the construction site. As detailed construction plans are not available at this time, the potential for vibration impacts has been assessed on a setback basis by typical equipment type. Measurement data from literature have been used in conjunction with the construction vibration criteria in Section 3.5 to define the minimum separation distance required for each type of construction equipment that may be used during construction.

The U.S. FTA has compiled vibration measurement data for various sources from literature, and summarized each source in terms of a reference PPV vibration level (in/sec) at a distance of 25 ft [5]. The following equation is provided to extrapolate the reference level to further distances.

$$PPV_{equip} = PPV_{ref}\left(\frac{25}{D}\right)^{1.5}$$

Where:

PPV_{equip} = peak particle velocity of the equipment in in/sec of the equipment, adjusted for distance;

PPV_{ref} = reference vibration level in in/sec at 25 ft from the equipment; and

D = the distance from the equipment to the receiver (ft).

The above equation was rearranged to solve for D with the PPV_{equip} variable being set to the applicable criteria value from Section 3.5. The solution to the resulting equation provides the minimum distance required between each type of equipment and the receiver to achieve the applicable criteria. The results of the construction vibration impact assessment are discussed in Section 6.2.

5.0 NOISE IMPACT ASSESSMENT

5.1 Noise from Transportation Sources

5.1.1 Impact Assessment

The noise modelling of the transportation sources was completed using TNM version 2.5 and the full results are summarized in Table 5.1 and Table 5.2. This assessment includes all existing acoustic barriers (berms and fences) constructed as part of subdivision plan approvals, any road work, as well as any naturally occurring berms (see Figure 4.14). The predictions indicate that the majority of the future build sound levels are projected to be below the MTO absolute sound level criteria of 65 dBA at the representative receptor locations for operations as a busway system. For the NSA located near the Highway 407 interchange with Mavis Road, there are two PORs (NSA12_R20 and NSA12_R21) that are expected to experience sound levels of over 65 dBA. However, these elevated sound levels are modelled at the “most exposed side” of the residences within the NSA. The residences are identified as townhouses, which do not have a clearly defined OLA at ground level but do feature a narrow porch that is in-line with the “most exposed side” that could be considered representative of the porch. Mitigation was investigated qualitatively at a high level as the Transitway in this area is located below ground and has a low impact on the receptors. Furthermore, the primary source of noise in the area is road traffic along the existing Highway 407, which is immediately adjacent to the residences noted above and illustrated in Figure 4.13b. Any form of physical noise mitigation located at the Transitway right-of-way will not have an effect on the overall sound levels thus mitigation is not considered to be technically feasible nor warranted.

The incremental impacts are less than the MTO criteria of ≥5 dBA at all locations due to the already high ambient levels in the study area. The highest increase is approximately 4 dBA at NSA9_R13. As such, no mitigation measures were considered.

Minimal variation is expected in the degree of impact at the receptors from the Transitway due to the similarities in exposure conditions between the future no-build and build scenarios. A number of NSAs are expected to see a nominal reduction in sound levels due to grading changes, which would partially block lines-of-sight or change propagation.

The type of surface will be ultimately at the contractor’s discretion. Based on the modelled results shown in Tables 5.1 and 5.2, the acoustical difference between the surface types can be considered insignificant and the overall noise impacts at the NSAs within this study area should be similar regardless of the surface type. This is true for this Project because the existing Highway 407 is dominant and any differences due to surface materials used for the Transitway will be completely lost to the future road traffic volumes and resulting noise along the highway. Any differences will be well below the threshold of human perception. Overall, the operation of the transitway is not expected to have a significant impact due to the already elevated sound levels from the high traffic volumes of the adjacent 400-series highways and major interchanges.

Bus stations are not expected to have associated garages, layover, or overnight stationary activities and as such were not treated as stationary sources. An overnight bus storage facility is planned as part of this segment near Bronte Station. The facility includes a storage area with capacity for 35 buses, and a routine daily cleaning section, and office area. All repairs and bus maintenance will be conducted in the main 407 Transitway Maintenance and Storage Facility located at Jane Street (TPAP approved in 2012). The overnight storage facility was treated the same way as modelled stations and the peak number of buses per hour (8) was modelled to represent the worst-case hour of activities. The worst-case hour was then modelled on a 24-hour basis to meet MTO requirements. Ventilation was not assessed as method of construction of deep underground sections will be evaluated and defined during Detail Design. For bored tunnels, ventilation shafts will be included at regulated spacing; however, a total sound power level of 96 dBA at the façade of each ventilation opening should result in an insignificant sound level at the receptors closest to the proposed tunnel locations.

Table 5.1 Noise Impacts (First Row Receptors), Asphalt Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA1_R01	NSA1	8	55.2	56.5	1.3	N
NSA1_R02	NSA1	10	53.9	53.6	-0.3	N
NSA1_R03	NSA1	16	53.2	52.9	-0.3	N
NSA1_R04	NSA1	7	57.2	55.3	-1.9	N
NSA1_R05	NSA1	21	55.7	54.0	-1.7	N
NSA1_R06	NSA1	6	55.2	54.4	-0.8	N
NSA1_R07	NSA1	6	53.1	52.9	-0.2	N
NSA1_R08	NSA1	6	54.1	53.2	-0.9	N
NSA1_R09	NSA1	6	53.4	52.7	-0.7	N
NSA1_R10	NSA1	6	53.8	52.6	-1.2	N
NSA1_R11	NSA1	8	52.4	52.9	0.5	N
NSA1_R12	NSA1	16	49.1	49.6	0.5	N
NSA1_R13	NSA1	15	49.6	50.8	1.2	N
NSA1_R14	NSA1	6	46.3	46.0	-0.3	N
NSA1_R15	NSA1	16	50.6	52.4	1.8	N
NSA1_R16	NSA1	8	48.7	49.1	0.4	N
NSA1_R17	NSA1	8	46.1	48.0	1.9	N
NSA1_R18	NSA1	5	54.9	54.9	0.0	N
NSA1_R19	NSA1	17	54.9	54.9	0.0	N
NSA1_R20	NSA1	5	56.1	55.7	-0.4	N
NSA1_R21	NSA1	5	61.4	60.8	-0.6	N
NSA1_R22	NSA1	5	58.5	58.1	-0.4	N
NSA1_R23	NSA1	9	56.0	56.1	0.1	N
NSA1_R24	NSA1	8	53.3	54.1	0.8	N
NSA1_R25	NSA1	6	53.7	53.7	0.0	N
NSA1_R26	NSA1	16	51.4	50.8	-0.6	N
NSA1_R27	NSA1	16	51.0	52.5	1.5	N
NSA1_R28	NSA1	9	49.1	48.6	-0.5	N
NSA1_R29	NSA1	3	61.1	61.5	0.4	N
NSA1_R30	NSA1	8	63.1	63.1	0.0	N
NSA1_R31	NSA1	6	58.8	55.5	-3.3	N
NSA1_R32	NSA1	10	64.4	64.7	0.3	N
NSA1_R33	NSA1	8	57.4	58.1	0.7	N
NSA1_R34	NSA1	7	61.8	62.3	0.5	N
NSA1_R35	NSA1	7	59.0	59.4	0.4	N
NSA1_R36	NSA1	7	59.5	59.9	0.4	N
NSA1_R37	NSA1	12	59.0	58.7	-0.3	N
NSA1_R38	NSA1	13	54.0	54.8	0.8	N

Table 5.1 (Cont'd) Noise Impacts (First Row Receptors), Asphalt Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA1_R39	NSA1	11	60.6	60.8	0.2	N
NSA1_R40	NSA1	11	59.0	60.8	1.8	N
NSA1_R41	NSA1	7	58.6	58.2	-0.4	N
NSA1_R42	NSA1	9	64.3	62.6	-1.7	N
NSA1_R43	NSA1	6	60.4	60.7	0.3	N
NSA1_R44	NSA1	7	53.2	53.2	0.0	N
NSA2_R01	NSA2	1	58.5	59.3	0.8	N
NSA2_R02	NSA2	2	56.9	57.5	0.6	N
NSA2_R03	NSA2	9	56.6	55.5	-1.1	N
NSA2_R04	NSA2	9	49.5	49.6	0.1	N
NSA2_R05	NSA2	9	53.0	53.4	0.4	N
NSA2_R06	NSA2	9	47.9	47.9	0.0	N
NSA2_R07	NSA2	7	48.8	48.7	-0.1	N
NSA2_R08	NSA2	6	50.8	51.8	1.0	N
NSA2_R09	NSA2	6	49.1	50.5	1.4	N
NSA2_R10	NSA2	1	48.6	51.1	2.5	N
NSA2_R11	NSA2	1	51.2	51.6	0.4	N
NSA2_R12	NSA2	1	48.6	49.1	0.5	N
NSA2_R13	NSA2	6	52.9	52.9	0.0	N
NSA2_R14	NSA2	2	59.8	58.9	-0.9	N
NSA2_R15	NSA2	18	62.4	61.3	-1.1	N
NSA2_R16	NSA2	22	61.9	62.2	0.3	N
NSA2_R17	NSA2	4	62.1	61.2	-0.9	N
NSA2_R18	NSA2	4	60.5	59.9	-0.6	N
NSA2_R19	NSA2	3	53.2	53.0	-0.2	N
NSA2_R20	NSA2	3	52.5	52.5	0.0	N
NSA2_R21	NSA2	22	52.5	52.6	0.1	N
NSA2_R22	NSA2	6	50.9	50.5	-0.4	N
NSA2_R23	NSA2	9	52.9	52.7	-0.2	N
NSA2_R24	NSA2	2	60.8	61.0	0.2	N
NSA2_R25	NSA2	24	64.3	64.3	0.0	N
NSA2_R26	NSA2	24	63.9	63.8	-0.1	N
NSA2_R27	NSA2	3	53.6	53.4	-0.2	N
NSA2_R28	NSA2	10	52.0	51.8	-0.2	N
NSA2_R29	NSA2	3	52.1	53.8	1.7	N
NSA2_R30	NSA2	2	52.7	51.5	-1.2	N
NSA2_R31	NSA2	10	52.0	51.5	-0.5	N
NSA2_R32	NSA2	1	52.1	52.2	0.1	N
NSA2_R33	NSA2	2	51.8	50.6	-1.2	N

Table 5.1 (Cont'd) Noise Impacts (First Row Receptors), Asphalt Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA2_R34	NSA2	3	51.3	51.7	0.4	N
NSA3_R01	NSA3	5	54.0	53.7	-0.3	N
NSA3_R02	NSA3	6	51.5	51.5	0.0	N
NSA3_R03	NSA3	5	54.5	55.1	0.6	N
NSA3_R04	NSA3	1	57.5	57.2	-0.3	N
NSA3_R05	NSA3	11	54.1	54.3	0.2	N
NSA3_R06	NSA3	1	46.0	46.7	0.7	N
NSA4_R01	NSA4	1	53.0	54.2	1.2	N
NSA4_R02	NSA4	1	50.5	50.7	0.2	N
NSA4_R03	NSA4	1	63.5	63.6	0.1	N
NSA4_R04	NSA4	1	53.0	53.3	0.3	N
NSA4_R05	NSA4	1	51.0	51.6	0.6	N
NSA5_R01	NSA5	1	51.7	52.0	0.3	N
NSA5_R02	NSA5	1	55.5	55.3	-0.2	N
NSA6_R01	NSA6	1	54.9	55.1	0.2	N
NSA6_R02	NSA6	1	58.0	59.8	1.8	N
NSA6_R03	NSA6	1	58.5	60.1	1.6	N
NSA6_R04	NSA6	1	55.1	55.1	0.0	N
NSA6_R05	NSA6	1	57.2	57.3	0.1	N
NSA6_R06	NSA6	1	53.5	51.0	-2.5	N
NSA7_R01	NSA7	1	54.8	54.9	0.1	N
NSA8_R01	NSA8	1	50.8	50.2	-0.6	N
NSA8_R02	NSA8	1	55.5	55.5	0.0	N
NSA8_R03	NSA8	1	58.2	57.5	-0.7	N
NSA8_R04	NSA8	1	54.3	54.5	0.2	N
NSA8_R05	NSA8	1	53.1	54.1	1.0	N
NSA8_R06	NSA8	1	53.5	54.6	1.1	N
NSA8_R07	NSA8	1	53.9	53.5	-0.4	N
NSA8_R08	NSA8	1	55.3	56.8	1.5	N
NSA8_R09	NSA8	1	52.7	55.5	2.8	N
NSA8_R10	NSA8	1	52.5	56.9	4.4	N
NSA8_R11	NSA8	1	52.8	56.5	3.7	N
NSA8_R12	NSA8	1	54.4	53.8	-0.6	N
NSA8_R13	NSA8	15	50.2	51.8	1.6	N
NSA8_R14	NSA8	16	50.4	50.4	0.0	N
NSA8_R15	NSA8	9	51.3	53.1	1.8	N
NSA8_R16	NSA8	8	54.1	54.9	0.8	N
NSA8_R17	NSA8	13	52.9	53.9	1.0	N
NSA9_R01	NSA9	2	51.8	52.5	0.7	N

Table 5.1 (Cont'd) Noise Impacts (First Row Receptors), Asphalt Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA9_R02	NSA9	4	50.2	50.8	0.6	N
NSA9_R03	NSA9	1	50.8	53.1	2.3	N
NSA9_R04	NSA9	1	49.9	52.4	2.5	N
NSA9_R05	NSA9	16	50.9	50.9	0.0	N
NSA9_R06	NSA9	1	55.5	53.6	-1.9	N
NSA9_R07	NSA9	24	48.2	48.6	0.4	N
NSA9_R08	NSA9	7	50.2	52.0	1.8	N
NSA9_R09	NSA9	5	50.0	50.4	0.4	N
NSA9_R10	NSA9	5	55.2	56.5	1.3	N
NSA9_R11	NSA9	3	55.9	56.5	0.6	N
NSA9_R13	NSA9	7	51.2	52.2	1.0	N
NSA9_R14	NSA9	5	52.1	52.7	0.6	N
NSA9_R15	NSA9	5	62.6	61.4	-1.2	N
NSA10_R01	NSA10	16	55.5	56.0	0.5	N
NSA10_R02	NSA10	20	49.9	49.9	0.0	N
NSA10_R03	NSA10	20	52.2	52.2	0.0	N
NSA10_R04	NSA10	20	46.5	48.0	1.5	N
NSA10_R05	NSA10	5	48.8	48.4	-0.4	N
NSA10_R06	NSA10	10	51.8	50.2	-1.6	N
NSA10_R07	NSA10	26	51.0	50.5	-0.5	N
NSA10_R08	NSA10	12	49.3	49.5	0.2	N
NSA10_R09	NSA10	8	55.4	55.2	-0.2	N
NSA10_R10	NSA10	8	56.4	56.2	-0.2	N
NSA10_R11	NSA10	8	47.1	47.4	0.3	N
NSA10_R12	NSA10	8	56.8	56.8	0.0	N
NSA10_R13	NSA10	8	56.2	56.4	0.2	N
NSA10_R14	NSA10	1	54.7	56.4	1.7	N
NSA10_R15	NSA10	1	54.3	54.1	-0.2	N
NSA10_R16	NSA10	1	62.8	63.5	0.7	N
NSA11_R01	NSA11	1	57.5	58.4	0.9	N
NSA12_R01	NSA12	4	52.4	49.6	-2.8	N
NSA12_R02	NSA12	4	51.3	51.3	0.0	N
NSA12_R03	NSA12	4	52.2	52.4	0.2	N
NSA12_R04	NSA12	4	52.0	51.8	-0.2	N
NSA12_R05	NSA12	4	52.9	53.3	0.4	N
NSA12_R06	NSA12	10	50.0	50.2	0.2	N
NSA12_R07	NSA12	10	51.5	51.6	0.1	N
NSA12_R08	NSA12	2	52.1	52.2	0.1	N
NSA12_R09	NSA12	2	51.7	50.7	-1.0	N

Table 5.1 (Cont'd) Noise Impacts (First Row Receptors), Asphalt Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA12_R10	NSA12	1	58.5	58.7	0.2	N
NSA12_R11	NSA12	5	57.1	57.2	0.1	N
NSA12_R12	NSA12	10	47.6	47.6	0.0	N
NSA12_R13	NSA12	14	47.6	47.6	0.0	N
NSA12_R14	NSA12	20	47.3	47.3	0.0	N
NSA12_R15	NSA12	16	51.7	51.7	0.0	N
NSA12_R16	NSA12	1	60.7	60.9	0.2	N
NSA12_R17	NSA12	3	61.6	61.6	0.0	N
NSA12_R18	NSA12	3	61.4	61.9	0.5	N
NSA12_R19	NSA12	9	61.5	61.7	0.2	N
NSA12_R20	NSA12	10	67.6	67.7 (1)	0.1	Y
NSA12_R21	NSA12	12	65.4	65.2 (1)	-0.2	Y
NSA12_R22	NSA12	10	57.1	57.2	0.1	N
NSA12_R23	NSA12	10	52.9	54.0	1.1	N
NSA12_R24	NSA12	8	55.6	55.4	-0.2	N
NSA12_R25	NSA12	3	50.1	49.9	-0.2	N
NSA12_R26	NSA12	5	50.2	50.5	0.3	N
NSA12_R27	NSA12	5	50.0	50.5	0.5	N
NSA12_R28	NSA12	5	56.4	56.2	-0.2	N
NSA12_R29	NSA12	8	53.8	53.8	0.0	N
NSA12_R30	NSA12	8	55.5	55.3	-0.2	N
NSA12_R31	NSA12	8	55.4	55.5	0.1	N
NSA12_R32	NSA12	8	53.5	53.8	0.3	N
NSA12_R33	NSA12	10	50.3	50.9	0.6	N
NSA12_R34	NSA12	1	49.7	50.5	0.8	N
NSA12_R35	NSA12	8	50.8	53.8	3.0	N
NSA12_R36	NSA12	12	50.7	52.1	1.4	N
NSA12_R37	NSA12	6	55.6	54.6	-1.0	N
NSA12_R38	NSA12	12	50.7	52.0	1.3	N
NSA12_R39	NSA12	12	52.4	52.6	0.2	N
NSA12_R40	NSA12	2	53.5	53.6	0.1	N
NSA12_R41	NSA12	7	57.0	54.7	-2.3	N
NSA12_R42	NSA12	8	50.4	51.9	1.5	N
NSA12_R43	NSA12	8	51.5	51.2	-0.3	N
NSA12_R44	NSA12	7	48.2	47.8	-0.4	N
NSA12_R45	NSA12	7	49.6	50.1	0.5	N
NSA12_R46	NSA12	8	51.6	51.0	-0.6	N
NSA12_R47	NSA12	8	52.2	52.9	0.7	N
NSA12_R48	NSA12	6	52.4	52.1	-0.3	N

Table 5.1 (Cont'd) Noise Impacts (First Row Receptors), Asphalt Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA12_R49	NSA12	6	52.3	52.0	-0.3	N
NSA12_R50	NSA12	5	55.7	55.7	0.0	N
NSA12_R51	NSA12	3	55.2	55.2	0.0	N
NSA12_R52	NSA12	2	57.1	56.8	-0.3	N
NSA12_R53	NSA12	18	55.7	55.8	0.1	N
NSA12_R54	NSA12	10	56.6	56.4	-0.2	N
NSA12_R55	NSA12	5	55.3	54.9	-0.4	N
NSA12_R56	NSA12	14	55.9	56.0	0.1	N
NSA12_R57	NSA12	16	56.4	56.9	0.5	N
NSA12_R58	NSA12	8	57.9	56.4	-1.5	N
NSA12_R59	NSA12	7	57.6	57.5	-0.1	N
NSA12_R60	NSA12	5	63.1	63.4	0.3	N
NSA12_R61	NSA12	3	63.7	64.0	0.3	N
NSA12_R62	NSA12	1	55.3	52.8	-2.5	N
NSA12_R63	NSA12	6	52.9	52.0	-0.9	N
NSA12_R64	NSA12	38	47.2	47.7	0.5	N
NSA12_R65	NSA12	6	50.8	50.7	-0.1	N

Notes:

(1) Impact at Most Exposed Side

Table 5.2 Noise Impacts (First Row Receptors), Concrete Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA1_R01	NSA1	8	55.2	56.5	1.3	N
NSA1_R02	NSA1	10	53.9	53.6	-0.3	N
NSA1_R03	NSA1	16	53.2	52.9	-0.3	N
NSA1_R04	NSA1	7	57.2	55.3	-1.9	N
NSA1_R05	NSA1	21	55.7	54.0	-1.7	N
NSA1_R06	NSA1	6	55.2	54.4	-0.8	N
NSA1_R07	NSA1	6	53.1	52.9	-0.2	N
NSA1_R08	NSA1	6	54.1	53.2	-0.9	N
NSA1_R09	NSA1	6	53.4	52.7	-0.7	N
NSA1_R10	NSA1	6	53.8	52.6	-1.2	N
NSA1_R11	NSA1	8	52.4	52.9	0.5	N
NSA1_R12	NSA1	16	49.1	49.6	0.5	N
NSA1_R13	NSA1	15	49.6	50.8	1.2	N
NSA1_R14	NSA1	6	46.3	46.0	-0.3	N
NSA1_R15	NSA1	16	50.6	52.4	1.8	N
NSA1_R16	NSA1	8	48.7	49.1	0.4	N
NSA1_R17	NSA1	8	46.1	47.9	1.8	N
NSA1_R18	NSA1	5	54.9	54.9	0.0	N
NSA1_R19	NSA1	17	54.9	54.9	0.0	N
NSA1_R20	NSA1	5	56.1	55.7	-0.4	N
NSA1_R21	NSA1	5	61.4	60.8	-0.6	N
NSA1_R22	NSA1	5	58.5	58.1	-0.4	N
NSA1_R23	NSA1	9	56.0	56.1	0.1	N
NSA1_R24	NSA1	8	53.3	54.1	0.8	N
NSA1_R25	NSA1	6	53.7	53.7	0.0	N
NSA1_R26	NSA1	16	51.4	50.8	-0.6	N
NSA1_R27	NSA1	16	51.0	52.5	1.5	N
NSA1_R28	NSA1	9	49.1	48.6	-0.5	N
NSA1_R29	NSA1	3	61.1	61.5	0.4	N
NSA1_R30	NSA1	8	63.1	63.1	0.0	N
NSA1_R31	NSA1	6	58.8	55.5	-3.3	N
NSA1_R32	NSA1	10	64.4	64.7	0.3	N
NSA1_R33	NSA1	8	57.4	58.1	0.7	N
NSA1_R34	NSA1	7	61.8	62.3	0.5	N
NSA1_R35	NSA1	7	59.0	59.4	0.4	N
NSA1_R36	NSA1	7	59.5	59.9	0.4	N
NSA1_R37	NSA1	12	59.0	58.7	-0.3	N
NSA1_R38	NSA1	13	54.0	54.8	0.8	N
NSA1_R39	NSA1	11	60.6	60.8	0.2	N

Table 5.2 (Cont'd) Noise Impacts (First Row Receptors), Concrete Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA1_R40	NSA1	11	59.0	60.8	1.8	N
NSA1_R41	NSA1	7	58.6	58.2	-0.4	N
NSA1_R42	NSA1	9	64.3	62.6	-1.7	N
NSA1_R43	NSA1	6	60.4	60.7	0.3	N
NSA1_R44	NSA1	7	53.2	53.2	0.0	N
NSA2_R01	NSA2	1	58.5	59.3	0.8	N
NSA2_R02	NSA2	2	56.9	57.5	0.6	N
NSA2_R03	NSA2	9	56.6	55.5	-1.1	N
NSA2_R04	NSA2	9	49.5	49.6	0.1	N
NSA2_R05	NSA2	9	53.0	53.4	0.4	N
NSA2_R06	NSA2	9	47.9	47.9	0.0	N
NSA2_R07	NSA2	7	48.8	48.7	-0.1	N
NSA2_R08	NSA2	6	50.8	51.8	1.0	N
NSA2_R09	NSA2	6	49.1	50.5	1.4	N
NSA2_R10	NSA2	1	48.6	51.1	2.5	N
NSA2_R11	NSA2	1	51.2	51.6	0.4	N
NSA2_R12	NSA2	1	48.6	49.1	0.5	N
NSA2_R13	NSA2	6	52.9	52.9	0.0	N
NSA2_R14	NSA2	2	59.8	58.9	-0.9	N
NSA2_R15	NSA2	18	62.4	61.3	-1.1	N
NSA2_R16	NSA2	22	61.9	62.2	0.3	N
NSA2_R17	NSA2	4	62.1	61.2	-0.9	N
NSA2_R18	NSA2	4	60.5	59.9	-0.6	N
NSA2_R19	NSA2	3	53.2	53.0	-0.2	N
NSA2_R20	NSA2	3	52.5	52.5	0.0	N
NSA2_R21	NSA2	22	52.5	52.6	0.1	N
NSA2_R22	NSA2	6	50.9	50.5	-0.4	N
NSA2_R23	NSA2	9	52.9	52.7	-0.2	N
NSA2_R24	NSA2	2	60.8	61.0	0.2	N
NSA2_R25	NSA2	24	64.3	64.3	0.0	N
NSA2_R26	NSA2	24	63.9	63.8	-0.1	N
NSA2_R27	NSA2	3	53.6	53.4	-0.2	N
NSA2_R28	NSA2	10	52.0	51.8	-0.2	N
NSA2_R29	NSA2	3	52.1	53.8	1.7	N
NSA2_R30	NSA2	2	52.7	51.5	-1.2	N
NSA2_R31	NSA2	10	52.0	51.5	-0.5	N
NSA2_R32	NSA2	1	52.1	52.2	0.1	N
NSA2_R33	NSA2	2	51.8	50.6	-1.2	N
NSA2_R34	NSA2	3	51.3	51.7	0.4	N

Table 5.2 (Cont'd) Noise Impacts (First Row Receptors), Concrete Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA3_R01	NSA3	5	54.0	53.7	-0.3	N
NSA3_R02	NSA3	6	51.5	51.5	0.0	N
NSA3_R03	NSA3	5	54.5	55.2	0.7	N
NSA3_R04	NSA3	1	57.5	57.1	-0.4	N
NSA3_R05	NSA3	11	54.1	54.4	0.3	N
NSA3_R06	NSA3	1	46.0	46.7	0.7	N
NSA4_R01	NSA4	1	53.0	54.2	1.2	N
NSA4_R02	NSA4	1	50.5	50.7	0.2	N
NSA4_R03	NSA4	1	63.5	63.6	0.1	N
NSA4_R04	NSA4	1	53.0	53.2	0.2	N
NSA4_R05	NSA4	1	51.0	51.6	0.6	N
NSA5_R01	NSA5	1	51.7	52.0	0.3	N
NSA5_R02	NSA5	1	55.5	55.3	-0.2	N
NSA6_R01	NSA6	1	54.9	55.1	0.2	N
NSA6_R02	NSA6	1	58.0	59.8	1.8	N
NSA6_R03	NSA6	1	58.5	60.1	1.6	N
NSA6_R04	NSA6	1	55.1	55.1	0.0	N
NSA6_R05	NSA6	1	57.2	57.3	0.1	N
NSA6_R06	NSA6	1	53.5	50.9	-2.6	N
NSA7_R01	NSA7	1	54.8	54.9	0.1	N
NSA8_R01	NSA8	1	50.8	50.2	-0.6	N
NSA8_R02	NSA8	1	55.5	55.5	0.0	N
NSA8_R03	NSA8	1	58.2	57.5	-0.7	N
NSA8_R04	NSA8	1	54.3	54.5	0.2	N
NSA8_R05	NSA8	1	53.1	54.1	1.0	N
NSA8_R06	NSA8	1	53.5	54.6	1.1	N
NSA8_R07	NSA8	1	53.9	53.5	-0.4	N
NSA8_R08	NSA8	1	55.3	56.8	1.5	N
NSA8_R09	NSA8	1	52.7	55.5	2.8	N
NSA8_R10	NSA8	1	52.5	56.8	4.3	N
NSA8_R11	NSA8	1	52.8	55.8	3.0	N
NSA8_R12	NSA8	1	54.4	53.8	-0.6	N
NSA8_R13	NSA8	15	50.2	51.8	1.6	N
NSA8_R14	NSA8	16	50.4	50.4	0.0	N
NSA8_R15	NSA8	9	51.3	52.3	1.0	N
NSA8_R16	NSA8	8	54.1	54.5	0.4	N
NSA8_R17	NSA8	13	52.9	53.6	0.7	N
NSA9_R01	NSA9	2	51.8	52.5	0.7	N
NSA9_R02	NSA9	4	50.2	50.8	0.6	N

Table 5.2 (Cont'd) Noise Impacts (First Row Receptors), Concrete Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA9_R03	NSA9	1	50.8	53.1	2.3	N
NSA9_R04	NSA9	1	49.9	52.4	2.5	N
NSA9_R05	NSA9	16	50.9	50.9	0.0	N
NSA9_R06	NSA9	1	55.5	53.6	-1.9	N
NSA9_R07	NSA9	24	48.2	48.6	0.4	N
NSA9_R08	NSA9	7	50.2	52.0	1.8	N
NSA9_R09	NSA9	5	50.0	50.3	0.3	N
NSA9_R10	NSA9	5	55.2	56.4	1.2	N
NSA9_R11	NSA9	3	55.9	56.4	0.5	N
NSA9_R13	NSA9	7	51.2	51.9	0.7	N
NSA9_R14	NSA9	5	52.1	52.5	0.4	N
NSA9_R15	NSA9	5	62.6	61.4	-1.2	N
NSA10_R01	NSA10	16	55.5	56.0	0.5	N
NSA10_R02	NSA10	20	49.9	49.9	0.0	N
NSA10_R03	NSA10	20	52.2	52.2	0.0	N
NSA10_R04	NSA10	20	46.5	48.0	1.5	N
NSA10_R05	NSA10	5	48.8	48.4	-0.4	N
NSA10_R06	NSA10	10	51.8	50.2	-1.6	N
NSA10_R07	NSA10	26	51.0	50.5	-0.5	N
NSA10_R08	NSA10	12	49.3	49.5	0.2	N
NSA10_R09	NSA10	8	55.4	55.2	-0.2	N
NSA10_R10	NSA10	8	56.4	56.2	-0.2	N
NSA10_R11	NSA10	8	47.1	47.4	0.3	N
NSA10_R12	NSA10	8	56.8	56.8	0.0	N
NSA10_R13	NSA10	8	56.2	56.4	0.2	N
NSA10_R14	NSA10	1	54.7	56.4	1.7	N
NSA10_R15	NSA10	1	54.3	54.1	-0.2	N
NSA10_R16	NSA10	1	62.8	63.5	0.7	N
NSA11_R01	NSA11	1	57.5	58.4	0.9	N
NSA12_R01	NSA12	4	52.4	49.6	-2.8	N
NSA12_R02	NSA12	4	51.3	51.3	0.0	N
NSA12_R03	NSA12	4	52.2	52.4	0.2	N
NSA12_R04	NSA12	4	52.0	51.7	-0.3	N
NSA12_R05	NSA12	4	52.9	53.2	0.3	N
NSA12_R06	NSA12	10	50.0	50.1	0.1	N
NSA12_R07	NSA12	10	51.5	51.5	0.0	N
NSA12_R08	NSA12	2	52.1	52.2	0.1	N
NSA12_R09	NSA12	2	51.7	50.8	-0.9	N
NSA12_R10	NSA12	1	58.5	58.8	0.3	N

Table 5.2 (Cont'd) Noise Impacts (First Row Receptors), Concrete Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA12_R11	NSA12	5	57.1	57.2	0.1	N
NSA12_R12	NSA12	10	47.6	47.6	0.0	N
NSA12_R13	NSA12	14	47.6	47.6	0.0	N
NSA12_R14	NSA12	20	47.3	47.4	0.1	N
NSA12_R15	NSA12	16	51.7	51.8	0.1	N
NSA12_R16	NSA12	1	60.7	61.0	0.3	N
NSA12_R17	NSA12	3	61.6	61.6	0.0	N
NSA12_R18	NSA12	3	61.4	61.9	0.5	N
NSA12_R19	NSA12	9	61.5	61.7	0.2	N
NSA12_R20	NSA12	10	67.6	67.7 (1)	0.1	Y
NSA12_R21	NSA12	12	65.4	65.2 (1)	-0.2	Y
NSA12_R22	NSA12	10	57.1	57.2	0.1	N
NSA12_R23	NSA12	10	52.9	54.0	1.1	N
NSA12_R24	NSA12	8	55.6	55.3	-0.3	N
NSA12_R25	NSA12	3	50.1	49.9	-0.2	N
NSA12_R26	NSA12	5	50.2	50.5	0.3	N
NSA12_R27	NSA12	5	50.0	50.5	0.5	N
NSA12_R28	NSA12	5	56.4	56.2	-0.2	N
NSA12_R29	NSA12	8	53.8	53.8	0.0	N
NSA12_R30	NSA12	8	55.5	55.3	-0.2	N
NSA12_R31	NSA12	8	55.4	55.5	0.1	N
NSA12_R32	NSA12	8	53.5	53.8	0.3	N
NSA12_R33	NSA12	10	50.3	50.9	0.6	N
NSA12_R34	NSA12	1	49.7	50.5	0.8	N
NSA12_R35	NSA12	8	50.8	53.8	3.0	N
NSA12_R36	NSA12	12	50.7	52.1	1.4	N
NSA12_R37	NSA12	6	55.6	54.6	-1.0	N
NSA12_R38	NSA12	12	50.7	52.0	1.3	N
NSA12_R39	NSA12	12	52.4	52.5	0.1	N
NSA12_R40	NSA12	2	53.5	53.6	0.1	N
NSA12_R41	NSA12	7	57.0	54.7	-2.3	N
NSA12_R42	NSA12	8	50.4	51.9	1.5	N
NSA12_R43	NSA12	8	51.5	51.2	-0.3	N
NSA12_R44	NSA12	7	48.2	47.8	-0.4	N
NSA12_R45	NSA12	7	49.6	50.1	0.5	N
NSA12_R46	NSA12	8	51.6	51.0	-0.6	N
NSA12_R47	NSA12	8	52.2	52.9	0.7	N
NSA12_R48	NSA12	6	52.4	52.1	-0.3	N
NSA12_R49	NSA12	6	52.3	52.0	-0.3	N

Table 5.2 (Cont'd) Noise Impacts (First Row Receptors), Concrete Surface

ID	Segment	No. of Units Represented	Sound Level Predictions (dBA)		Change due to Undertaking (dBA)	Mitigation Required (Y/N)?
			Future No-Build (2041)	Future Build (2041)		
NSA12_R50	NSA12	5	55.7	55.7	0.0	N
NSA12_R51	NSA12	3	55.2	55.2	0.0	N
NSA12_R52	NSA12	2	57.1	56.8	-0.3	N
NSA12_R53	NSA12	18	55.7	55.8	0.1	N
NSA12_R54	NSA12	10	56.6	56.4	-0.2	N
NSA12_R55	NSA12	5	55.3	54.9	-0.4	N
NSA12_R56	NSA12	14	55.9	56.0	0.1	N
NSA12_R57	NSA12	16	56.4	56.9	0.5	N
NSA12_R58	NSA12	8	57.9	56.4	-1.5	N
NSA12_R59	NSA12	7	57.6	57.5	-0.1	N
NSA12_R60	NSA12	5	63.1	63.5	0.4	N
NSA12_R61	NSA12	3	63.7	64.0	0.3	N
NSA12_R62	NSA12	1	55.3	52.9	-2.4	N
NSA12_R63	NSA12	6	52.9	52.0	-0.9	N
NSA12_R64	NSA12	38	47.2	47.8	0.6	N
NSA12_R65	NSA12	6	50.8	50.8	0.0	N

Notes:

(1) Impact at Most Exposed Side

5.2 Noise from Construction

5.2.1 Impact Assessment

As noted in Section 3.4.1, the sound level limits recommended by the MECP for construction noise have been developed on a per-unit basis rather than a cumulative basis. As such, there are no applicable criteria values for the simultaneous operation of multiple pieces of construction equipment. Noise modelling of individual pieces of construction equipment to confirm compliance with the NPC-115 limits has therefore not been undertaken for this assessment, as it is assumed that the equipment supplier will ensure that all equipment meets the applicable NPC-115 limits. This can be ensured by including special provisions within the contract language.

5.2.2 Noise Control Recommendations

The implementation of the following measures will help to mitigate potential noise impacts during construction:

- Limit construction to the time periods allowed by the Cities' noise by-laws, as summarized in Section 3.4.2 and Table 3.6.
- Should there be a need to complete work outside of the hours allowed in the applicable noise by-laws, the Contractor is to notify MTO and affected residents in advance of any work performed outside of the allowable time periods.
- The Contractor is expected to comply with all applicable requirements of the contract.
- Contracts shall include explicit indication that all construction equipment used on the project is to meet the sound level criteria from NPC-115 and NPC-118, and be well maintained and operating with effective muffling devices that are in good working order.
- The separation distance between construction staging areas and nearby sensitive receptors is to be maximized to the extent possible to reduce noise impacts.
- Any temporary roads for construction vehicle access are to be well maintained and free of pot-holes and ruts to avoid excessive noise from heavy vehicles travelling on uneven surfaces.
- A complaints protocol is to be established for receiving, investigating and addressing construction noise complaints from the public, including a plan for how the public is to be notified of their options for lodging a complaint.
- A noise complaint will trigger an investigation to verify whether the noise mitigation has been implemented, including verification of construction equipment sound levels per NPC-115 and NPC-118.
- In the presence of persistent complaints and subject to the results of a field investigation, alternative noise control measures may be required, where reasonably available. In selecting appropriate noise control and mitigation measures, consideration will be given to the technical, administrative and economic feasibility of the various alternatives.

6.0 VIBRATION IMPACT ASSESSMENT

6.1 Vibration from Transportation Sources

As noted in Section 4.4.1.1, FHWA algorithms were used to develop an estimate of the maximum bus pass-by noise in 1/3 octave bands. This sound level spectrum was then projected to the receptor location nearest to the 407 Transitway (number of receptors in NSA2) in order to estimate whether the low frequency noise levels have potential to cause vibration of building components based on sound pressure thresholds developed by NASA [4]. The results of the assessment are provided in Table 6.1, which shows that the anticipated maximum bus pass-by levels are not expected to be of sufficient magnitude to cause excitation of building components. Figure 3.1 shows that, on the low end, bus pass-by needs to be at least 60 dB in the 50 Hz to 100 Hz spectrum to have potential to cause perceptible vibrations. Walls and Floors require significantly higher sound levels.

Table 6.1 Low Frequency Sound Level Impacts at NSA2 Receptors

Receptor ID	1/3 Octave Band Sound Level (dB)			
	50 Hz	63 Hz	80 Hz	100 Hz
NSA12_R08	51	54	55	55

6.2 Vibration from Construction

6.2.1 Impact Assessment

As noted in Section 4.4.2, detailed construction plans are not available at this stage of the project. It is not known which types of construction equipment are likely to be operated, and where they may be situated in relation to receptors. Therefore, the potential vibration impacts from individual common types of construction equipment were assessed on a setback basis, using the construction vibration criteria presented in Section 3.5. A combination of applicable criteria was used to differentiate between impulsive and non-impulsive vibration equipment. Reference curves from literature that depict vibration level with distance were used in conjunction with the identified criteria to identify the appropriate setback distance to consider when planning construction activities. The results of the assessment are provided in Table 6.2.

Table 6.2 Minimum Setback Distances for Construction Equipment

Equipment Type	PPV_{ref}		Criteria[1]	Setback
	(in/s)	(mm/s)	(mm/s)	(m)
Pile Driver (impact)[2]	1.52 / 0.64	38.6 / 16.4	0.3	194 / 110
Pile Driver (sonic)[2]	0.73 / 0.17	18.6 / 4.3	0.3	120 / 45
Vibratory Roller	0.210	5.3	5.1	8
Small Bulldozer	0.003	0.1	5.1	1
Large Bulldozer	0.089	2.3	5.1	4
Loaded Trucks	0.076	1.9	5.1	4
Jackhammer	0.035	0.9	5.1	2

Note:

1. Applicable criteria is based on NPC-207 (for impulsive vibration equipment) and FTA (non-impulsive vibration equipment)
2. Range in vibration impacts and setbacks due to soil conditions.

As noted, the type of construction equipment is unknown at this point, however, the majority of the receptors within the study area are located well beyond the setbacks outlined in the table above. If equipment that is prone to have high vibration impacts needs to be used, its impacts must be evaluated in greater detail, especially for the nearest receptors. For pile drivers, the setbacks are also dependent on the soil conditions. A soil assessment is expected to be conducted prior to any construction. For segments in close proximity to noise sensitive areas (i.e. within 50 m), and those below grade, consideration shall be given to retaining an acoustic/vibration specialist to assess and monitor vibrations during construction.

6.2.2 Vibration Control Recommendations

The Contractor should adhere to the vibration criteria regardless of when construction occurs. The implementation of the following measures will help to mitigate potential vibration impacts during construction:

- The Contractor will be responsible for identifying the implications of the vibration generated, especially for work with high potential for vibration impacts (e.g. pile driving), and to make construction work plans available for review.
- Construction equipment with potential to cause off-site vibrations should be operated as far away from vibration-sensitive sites as possible.
- Where possible, activities that have potential to cause off-site vibrations should be phased such that as few as possible are occurring simultaneously.
- Construction activities that have potential to cause off-site vibration during the night-time hours should be avoided.

- A complaints protocol is to be established for this project for receiving, investigating and addressing construction vibration complaints received from the public.
- The Contract documents shall contain a provision that any initial vibration complaint will trigger verification that any general vibration control measures agreed to are in effect.
- In the presence of persistent vibration complaints, the MTO and its Contractor shall consider implementing a measurement program to evaluate the vibration impacts.
- In the presence of persistent complaints and subject to the results of a field investigation, alternative vibration control measures may be required, where reasonably available. In selecting appropriate vibration control measures, consideration will be given to the technical, administrative and economic feasibility of the various alternatives.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

The NVIA for the 407 Transitway extension from west of Brant Street to West of Hurontario Street included an assessment of the following potential impacts at existing and proposed future sensitive locations:

- noise impacts at existing and proposed sensitive locations from buses operating on the proposed 407 Transitway, inclusive of changes to local topography;
- airborne vibration of house structure elements induced by sound levels from bus engines; and
- noise and vibration considerations during construction of the Transitway.

The following key conclusions may be drawn from the assessment:

- no significant increases of 5 dBA or more were predicted for any of the NSAs;
- two receptors (NSA12_R20 and NSA12_R21) have overall impacts greater than 65 dBA at the most exposed side, but mitigation is not warranted because the Transitway is below ground at this location and there is no clear ground-level OLA; and
- no airborne vibration effects (i.e., rattling of house structure elements) due to bus engine pass-by noise were predicted.

7.2 Recommendations

Construction noise and vibration recommendations have been provided in sections 5.2.2 and 6.2.2, respectively.

The proposed undertaking does not include maintenance facilities; if in the future any changes to these plans are considered, an addendum to the Environmental Project Report (EPR) may be required.

8.0 REFERENCES

[1] Ontario Ministry of Transportation, "Environmental Guide for Noise (version 1.1)," Provincial and Environmental Planning Office, Ministry of Transportation, St. Catharines, Ontario, 2006.

[2] Ontario Ministry of Transportation, "Environmental Reference for Highway Design, Section 3.4: Noise," Provincial and Environmental Planning Office, St. Catharines, Ontario, 2006.

[3] Ontario Ministry of the Environment, "Environmental Noise Guideline: Stationary and Transportation Sources - Approval and Planning Publication NPC-300," Queen's Printer for Ontario, 2013.

[4] Ontario Ministry of the Environment, "MOEE/TTC Draft Protocol for Noise and Vibration Assessment for the Proposed Scarborough Rapid Transit Extension," 1993.

[5] Federal Transit Administration, "Transit Noise and Vibration Impact Assessment," U.S. Department of Transportation, Washington, D.C., 2018.

[6] D.G. Stephens, K.P. Shepherd, H.H. Hubbard and F.W. Gosveld, "NASA Technical Memorandum 83288 Guide to the Evaluation of Human Exposure to Noise from Large Wind Turbines," NASA Langley Research Center, Hampton, Virginia, 1982.

[7] Ontario Ministry of the Environment, "Model Municipal Noise Control By-law, Publication NPC-115: Construction," 1977.

[8] Ontario Ministry of the Environment, "Model Municipal Noise Control By-law, Publication NPC-118: Motorized Conveyances," 1977.

[9] City of Burlington, “Nuisance and Noise Control By-Law 19-2003”, The Corporation of the City of Burlington, City of Burlington, 2011.

[10] City of Mississauga, “Noise Control By-Law 360-79”, The Corporation of the City of Mississauga, City of Mississauga, 2008.

[11] Ontario Ministry of the Environment, "Model Municipal Noise Control By-Law; Publication NPC-207: Impulse Vibration in Residential Buildings," 1983.

[12] Town of Milton, “By-Law No. 133-2012”, The Corporation of the Town of Milton, Town of Milton, 2012.

[13] Town of Oakville, “Noise By-Law 2008-098”, The Corporation of the Town of Oakville, Oakville, 2008.

[14] Federal Highway Administration, "FHWA Traffic Noise Model Technical Manual," U.S. Department of Transportation, Washington, D.C., 1998.

[15] Ontario Ministry of the Environment, "Ontario Road Noise Analysis Method for Environment and Transportation: Technical Document," 1989.

[16] Arcadis Canada Inc., “Noise and Vibration Impact Assessment: Highway 407 Transitway: West of Hurontario Street to East of Highway 400”, July 2018.

APPENDIX A: GLOSSARY OF TERMS

Table A-1: Glossary of Terms

Term	Definition
A-weighting	A frequency-based adjustment applied to measured or modelled sound levels that de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear, and correlates well with subjective reactions to noise.
dBA	A-weighted decibels (see *A-weighting* and *Decibel*)
Decibel (dB)	When applied to sound pressure levels (SPL), the decibel (dB) is a logarithmic ratio of a given sound pressure level (p) in Pascals (Pa) to a reference quantity of 20 µPa (p_{ref}, the threshold of hearing). Expressing sound levels in dB rather than Pa allows the full range of audible sound, which spans six orders of magnitude when expressed in Pa, to be expressed within a much smaller range of 0 to 120 dB (the threshold of pain).
Energy Equivalent Sound Level (L_{eq})	The value of the constant sound level which would result in the exposure to the same total A-weighted energy as would the specified time-varying sound, if the constant sound persisted over an equal time interval
Noise Sensitive Area (NSA)	means the following land uses with an OLA associated with them: • Private homes such as single family residences (owned or rental); • Townhouses (owned or rental); • Multiple unit buildings, such as apartments with OLAs for use by all occupants; • Hospitals, nursing homes for the aged, where there are OLAs for all patients. There is no minimum number of land uses that defines a NSA. Therefore, all noise sensitive land uses, regardless of size or location (urban or rural), will be assessed for application of noise control measures. Where a new freeway/highway corridor or route is planned, the following land uses would qualify as NSAs in addition to the land uses noted above: • Educational facilities and day care centres, where there are OLAs for students; • Campgrounds that provide overnight accommodation; and • Hotels/motels where there are OLAs (i.e., swimming pool area, etc.) for visitors. Land uses listed below, by themselves do not qualify as NSAs: • Apartment balconies above ground floor; • Churches; • Cemeteries; • Parks and picnic areas which are not inherently part of an NSA; • All commercial; and • All industrial.

Octave band	A frequency band whose upper limit is twice the lower limit, and is identified by a geometric mean frequency, called the centre frequency.
Outdoor Living Area (OLA) [*MTO definition*]	means an area at ground level, adjacent to a NSA and accommodating outdoor living activities. This area may be situated on any side of the NSA. The usual distance from the dwelling unit wall is 3 m. The vertical height is 1.2 m above the existing ground surface. Where unknown, the side closest to the highway should be assumed. Paved areas for multiple dwelling residential units may not be defined as an OLA.
Peak particle velocity (PPV)	The peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal.
Point of Reception (POR)	The point at which a noise level has been calculated.
Root-mean-square (RMS) vibration velocity	The root mean square of a signal is the square root of the average of the squared amplitude of the signal and is calculated over a one-second period.

APPENDIX B: CITY OF BURLINGTON NOISE BY-LAW

The Corporation of the City of Burlington

BY-LAW NO. 19-2003

WHEREAS Council deems it appropriate to enact a by-law to prohibit and regulate certain public nuisances within the City of Burlington pursuant to section 128 of the Municipal Act, 2001, S.O. 2001, c. 25, as amended;

AND WHEREAS Council deems it appropriate to enact a by-law to prohibit and regulate certain noises within the City of Burlington pursuant to section 129 of the Municipal Act, 2001, S.O. 2001, c. 25, as amended;

NOW THEREFORE the Council of The Corporation of the City of Burlington enacts as follows:

Title

1. This by-law may be cited as "The Nuisance and Noise Control By-law".

Technical Terms

2. In this by-law all words that are of technical nature and are related to sound and vibration shall have the meanings specified for them in Schedule 4 – Publications, Publication NPC-101, as amended.

Definitions

3. In this by-law,
   (1) "***Applicable Publication"*** means a Publication referred to in the provisions of this by-law including a schedule hereto;
   (2) "***Authorized Emergency Vehicle***" has the same meaning as in Traffic By-Law No. 1984-1;
   (3) "***Certificate***" means a certificate of Competency in Environmental Acoustics Technology of a specified class issued by the Minister or other Agency;
   (4) "***Chief Noise Control Officer***" means the Director of Building who is appointed by council for the purpose of administration and enforcement of this by-law;
   (5) "***City***" means The Corporation of the City of Burlington;
   (6) "***Constable***" means a police constable who is a member of the Halton Regional Police Service;
   (7) "***Construction***" includes erection, alteration, repair, dismantling, demolition, structural maintenance, painting, moving, land clearing, earth moving, grading, excavating, filling, the laying of pipe and conduit whether above or below ground level, street and highway building, concreting, equipment installation and alteration and the structural installation of construction components and materials in any form

or for any purpose, and includes any work in connection therewith;

(8) "***Construction Equipment***" means any equipment or device designed and intended for use in construction, or material handling, including but not limited to, air compressors, pile drivers, pneumatic or hydraulic tools, bulldozers, tractors, excavators, trenchers, cranes, derricks, loaders, scrapers, pavers, generators, off-highway haulers or trucks, ditchers, compactors and rollers, pumps, concrete mixers, graders, or other material handling equipment;

(9) "***Construction Site***" means the area or portion of land used for construction or any other area used for any purpose related to the construction or for any related purpose;

(10) "***Conveyance***" includes a vehicle and any other device used to transport a person or persons or goods from place to place but does not include any vehicle or device operated only within the premises of a person;

(11) "***Council***" means the Council of The Corporation of the City of Burlington;

(12) "***Highway***" includes a common and public highway, street, avenue, parkway, driveway, square, place, bridge, viaduct or trestle designed and intended for or used by, the general public for the passage of vehicles;

(13) "***Minister***" means the Minister of the Environment;

(14) "***Ministry***" means the Ministry of the Environment;

(15) "***Motor Vehicle***" includes and automobile, motor-cycle and any other vehicle propelled or driven otherwise than by muscular power, but does not include the cars of electric or steam railways, or other motor vehicle running only upon rails, or a motorized snow vehicle, traction engine, farm tractor, self-propelled implement of husbandry or road building machine within the meaning of The Highway Traffic Act;

(16) "***Motorized Conveyance***" means a conveyance propelled or driven otherwise than muscular, gravitational or wind power;

(17) "***Municipal Law Enforcement Officer***" means any person who is appointed by Council as a Municipal Law Enforcement Officer for the City of Burlington;

(18) "***Municipality***" means the land within the geographic limit of The Corporation of the City of Burlington;

(19) "***Noise***" means unwanted sound;

(20) "***Noise Control Officer***" means any person who is a certificate holder appointed to assist the Chief Noise Control Officer;

(21) "***Nuisance"*** means anything that is injurious to health, indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.

(22) "***Point of Reception***" means any point on a premises of a person where sound or vibration originating from other than those premises is received;

(23) "***Publication***" means a specified publication of the Noise Pollution Control Section of the Pollution Control Branch of the Ministry of the Environment named in Schedule 4

– Publications, as amended. A copy of every Publication which is named in Schedule 4 – Publications is hereby made part of this by-law;

(24) "***Residential Area***" means an area of the municipality where a residential use is permitted by any zoning by-law in force;

(25) "***Residential Renovations***" means construction that does not require any building permits and/or renovations constructed without any heavy equipment;

(26) "***Source"*** or "***Source of Sound or Vibration***" means an activity, matter, thing, or tangible personal property or real property, from which sound or vibration is emitted;

(27) "***Stationary Source***" means a source of which does not normally move from place to place and includes the premises of a person as one stationary source unless the dominant source on the premises is construction or a conveyance.

Nuisances

4. No person shall cause a nuisance within the City of Burlington without limiting the generality of the foregoing:

(1) No strong light or moving or twinkling lights shall be used so that an unusual quantity or type of light shines upon the land of others so as to be or to cause a nuisance to the public generally or to others residing or carrying on a manufacture, trade or business in the vicinity.

(2) No noise or vibrations shall be made, caused or created so as to be heard or felt or otherwise perceived outside the property and which are, in the view of all the circumstances including the nature of the neighbourhood and the use to which adjoining properties are put and the time of day during which such noise or vibrations are made, caused or created excessive or which are, or may cause a nuisance to the public generally or to others residing or carrying on a manufacture, trade or business in the vicinity.

Prohibitions

5. No person shall emit or cause or permit the emission of sound resulting:

(1) from any act listed in Schedule 1 - General Prohibitions, and which sound is clearly audible at a point of reception;

(2) from any act listed in Schedule 2 - Time and Place Prohibitions, if clearly audible at a point of reception located in an area of the municipality specified within a prohibited time shown for such an area.

Limitations on Sound Emissions

6. No person shall emit or cause or permit the emission of any sound:
   (1) from a stationary source such that the level of resultant sound at a point of reception exceeds the applicable sound level limit prescribed in Schedule 4 – Publications, Publication NPC-205;
   (2) from any piece of construction equipment of a type referred to in Schedule 4 – Publications, Publication NPC-115, at a work site, any part of which is located within 600m of a residential area, unless;
      a) the piece of construction equipment was put into use prior to January 1, 1979; or
      b) the piece of construction equipment bears a label affixed by the manufacturer or distributor which states;
         (i) the year of manufacture, and
         (ii) that the item of equipment complies with the residential sound emission standards set out in Schedule 4 – Publications, Publication NPC-115, as applicable to that type of equipment and date of manufacture; or
      c) the owner, operator, manufacturer or distributor provides proof that the item of equipment complies with the residential sound emission standard set out in Schedule 4 – Publications, Publication NPC-115, as applicable to that type of equipment and date of manufacture.
   (3) from any air conditioning device of a type referred to in Schedule 4 – Publications, Publication NPC-216, unless:
      a) the device was put into use prior to January 1, 1979; or
      b) the device bears a label affixed by the manufacturer or distributor which states;
         (i) the year of manufacture, and
         (ii) that the device complies with the sound emission standard set out in Schedule 4 – Publications, Publication NPC-216, as applicable to that type of device and date of manufacture; or
      c) the owner, operator, manufacturer or distributor provides proof that the device complies with the sound emission standard set out in Schedule 4 – Publications, Publication NPC-216, as applicable to that type of device and date of manufacture.
   (4) from any domestic outdoor power tool of a type referred to in Schedule 4 – Publications, Publication NPC-117, which device is powered by an electric motor or an internal combustion engine unless:
      a) the device was manufactured prior to January 1st, 1979; or
      b) the device bears a label affixed by the manufacturer or distributor which states the year of manufacture and that the device when new complies with the sound emission standard set out in Schedule 4 – Publications, Publication NPC-117, as applicable to that type of device and date of manufacture; or
      c) the owner, operator, manufacturer or distributor provides proof that the device when new complied with the sound emission standard set out in Schedule 4 –

Publications, Publication NPC-117, as applicable to that type of device and date of manufacture.

(5) from any motorized conveyance of a type referred to in Schedule 4 – Publications, Publication NPC-118, unless the motorized conveyance complies with the sound emission standard set out in Schedule 4 – Publications, Publication NPC-118, as applicable to that type of motorized conveyance and date of manufacture.

(6) from a blasting operation of a type referred to in Schedule 4 – Publications, Publication NPC-119, unless the blasting operation complies with the sound emission standard set out in Schedule 4 – Publications, Publication NPC-119, as applicable to that type of blasting operation.

(7) Clause 6 (1) does not apply to any equipment, apparatus, or device used in agriculture for food crop seeding, chemical spraying, or harvesting.

Preemption

7. Where a source of sound is subject to more than one of the provisions (subsections 1 through 6) in Section 6, the less restrictive provision shall prevail.

Exemptions

8. Notwithstanding any other provision of this by-law, this by-law shall not apply to a person who emits or causes or permits the emission of sound or vibration in connection with any activities, listed in Schedule 3 – Exemptions, or as approved by Council.

9. The Chief Noise Control Officer may identify and require specific terms and conditions necessary for approval for exemption and upon application by any person:

(1) exempt the applicant; or

(2) exempt the applicant for any exemption of lesser effect; or

(3) refuse to grant any exemption,

from any provision of this by-law with respect to any source of sound or vibration for the purposes of extending hours of construction, or of similar activities, whereby time constraints or other such constraints exist as such that Council approval could not be obtained prior to the undertaking of the activity.

10. All other applications for exemptions shall be required to obtain Council approval through a report prepared by the Chief Noise Control Officer.

11. Every application for exemption shall be made to the Chief Noise Control Officer in writing and shall contain:

(1) the name and address of the applicant;

(2) a description of the source of sound or vibration in respect of which exemption is sought;

(3) a statement of the particular provision or provisions of the by-law from which exemption is sought;
(4) the period of time, of a duration not in excess of six months, for which the exemption is sought;
(5) the reasons why the exemption should be granted;
(6) a statement of the steps, if any, planned or presently being taken to bring about compliance with the by-law.

12. The Chief Noise Control Officer may require an applicant to provide such further and other information as may be necessary to consider an application.

13. No application shall be deemed complete until all required information has been provided by the applicant.

14. Where an application is not approved or approved upon terms and conditions or approval to a lesser extent than the exemption applied for, the Chief Noise Control Officer shall set out reasons therefore and shall serve a copy of the decision upon the applicant. The Chief Noise Control Officer may reconsider the application if additional information or documentation, required by the Chief Noise Control Officer, is submitted by the applicant.

15. Notwithstanding any other provision of this by-law, it shall be lawful during an emergency to emit or cause or permit the emission of sound or vibration in connection with emergency measures undertaken;

(1) for the immediate health, safety or welfare of the inhabitants or any of them, or
(2) for the preservation or restoration of property,

unless such sound or vibration is clearly of a longer duration or of a nature more disturbing than is reasonably necessary for the accomplishment of such emergency purpose.

Severability

16. Where a court of competent jurisdiction declares any provision of this by-law invalid, the provision shall be deemed conclusively to be severable from the by-law.

17. No part of this by-law not declared by a court of competent jurisdiction to be invalid shall be affected by the provision severable from the by-law.

Enforcement

18. The Chief Noise Control Officer shall administer and enforce this by-law.

19. Such noise control officer(s), municipal law enforcement officer(s), or constable(s), as are necessary for the purpose of enforcement of this by-law who possess a certificate shall enforce all portions of this by-law.

20. Such municipal law enforcement officer(s) or constable(s), as are necessary for the purpose of enforcement of this by-law who do not possess a certificate shall only enforce the portions of this by-law where sound level measurements are not required.

Penalty

21. Any person who contravenes any provision of this by-law is guilty of an offence and is liable upon conviction to a fine in accordance with the Provincial Offences Act.

Enactment

22. That By-laws 82-1991, 135-1981 and By-law 2840 as amended, be repealed.

23. This by-law comes into effect:

ENACTED AND PASSED this 24th day of February, 2003

_____ MAYOR
Robert S. MacIsaac

_____ CLERK
Kim Phillips

Schedule 1 - General Prohibitions

1. Racing of any motorized conveyance other than in a racing event regulated by law.

2. The operation of a motor vehicle in such a way that the tires squeal.

3. The operation of any combustion engine or pneumatic device without an effective exhaust muffling device in good working order and in constant operation.

4. The operation of a vehicle, or a vehicle with a trailer, resulting in banging, clanking, grinding, rattling, squealing or other like sounds due to improperly secured load or equipment, or inadequate maintenance.

5. The operation of an engine or motor in, or on, any motor vehicle or item of attached auxiliary equipment for a continuous period exceeding five minutes, while such vehicle is stationary in a residential area, unless:

    (1) the vehicle is in an enclosed structure constructed so as to effectively prevent excessive noise emission.

    (2) the original equipment manufacturer specifically recommends a longer idling period for normal and efficient operation of the motor vehicle in which case such recommended period shall not be exceeded.

    (3) operation of such engine or motor is essential to a basic function of the vehicle or equipment, including but not limited to, operation of ready mixed concrete trucks, lift platforms or refuse compactors and heat exchange systems.

    (4) weather conditions justify the use of heating or refrigerating systems powered by the motor or engine for the safety and welfare of the operator, passengers or animals, or preservation of perishable cargo.

    (5) prevailing low temperatures make longer idling periods necessary, immediately after starting the motor or engine.

    (6) the idling is for the purpose of cleaning and flushing the radiator and associated circulation system for seasonal change or antifreeze, cleaning of the fuel system, carburetor or the like, when such work is performed other than for profit.

6. The operation of a motor vehicle horn or other warning device except where required or authorized by law in accordance with good safety practices.

7. The operation of any item of construction equipment without effective muffling devices in good working order and in constant operation.

Schedule 2 – Time and Place Prohibitions

1.	The operation of a combustion engine which is, is used in, or is intended for use in a toy or a model or replica of a larger device, which model or replica has no function other than amusement and which is not a conveyance.	9:00 pm – 7:00 am* * (9:00 am Sundays)
2.	The operation of any auditory signalling device, including but not limited to the ringing of bells or gongs and the blowing of horns or sirens or whistles, or the production, reproduction or amplification of any similar sounds, by law or in accordance with good safety practices.	7:00 pm – 7:00 am
3.	The operation of any electronic device or group of connected electronic devices, incorporating one or more loudspeakers or other electro-mechanical transducers, and intended for the production, reproduction, or amplification of sound.	11:00 pm –7:00 am* * (9:00 am Sundays)
4.	The venting, release or pressure relief of air, steam or other gaseous material, product or compound from any autoclave, boiler, pressure vessel, pipe, valve, machine, device or system.	11:00 pm – 7:00 am
5.	The operation of any powered rail car including but not limited to refrigeration cars, locomotives or self-propelled passenger cars, while stationary on property not owned or controlled by a railway governed under the Railway Safety Act.	7:00 pm – 7:00 am
6.	The operation of any motorized conveyance other than on a highway or other place intended for its operation.	At any time
7.	The operation of commercial car wash with air drying equipment.	11:00 pm – 7:00 am
8.	The operation of any construction equipment in connection with construction.	9:00 pm – 7:00 am* * (12:00 noon Sundays)
9.	Loading, unloading, delivering, packing, unpacking, or otherwise handling any containers, produce, materials, or refuse whatsoever, unless necessary for the maintenance of essential services.	11:00 pm – 7:00 am
10.	The operation of solid waste, refuse, or recyclable bulk lift or refuse compacting equipment.	9:00 pm – 7:00 am
11.	Persistent barking, calling, whining or other similar persistent noise making by any domestic pet or any other animal kept or used for any purpose other than agriculture.	At any time
12.	Persistent yelling, shouting, screaming, hooting, whistling, or singing.	At any time
13.	All selling or advertising by shouting out-cry or amplified sound.	At any time
14.	The detonation of fireworks or explosive devices except as permitted in Business Licence By-law 102-2002.	At any time
15.	The discharge of firearms contrary to Firearms By-law 83-1991.	At any time
16.	The operation of any powered or non-powered tool for domestic purposes, other than snow removal.	9:00 pm – 7:00 am* * (9:00 am Sundays)
17.	The operation of a power assisted hang glider or parafoil.	7:00 pm – 7:00 am
18.	The operation of any item of snow making equipment.	7:00 pm – 7:00 am
19.	The operation of a sound emitting pest control device.	7:00 pm – 7:00 am

NOTE: For the purpose of Schedule 2, “motorized conveyance” includes: snowmobiles,

mopeds, go-carts, track bikes, and trail bikes.

Schedule 3 - Exemptions

1. Operation of authorized emergency vehicles.

2. Operation of bells, utilized as traffic control devices including the following:
   (1) bells at traffic signal locations;
   (2) bells at railway crossings.

3. Operation of equipment and machinery by or on behalf of the City carrying on or engaged in the performance of public works for emergency purposes, including, but not limited to:
   (1) winter snow clearing and removal equipment;
   (2) turfgrass maintenance and repair equipment;
   (3) traffic line painting machines;
   (4) catchbasin cleaners;
   (5) tree and shrub pruning and mulching equipment;
   (6) sidewalk grinding and repair equipment;
   (7) street cleaners and flushers.

Schedule 4 – Publications

1.	Publication NPC-101	Technical Definitions
2.	Publication NPC-102	Instrumentation
3.	Publication NPC-103	Procedures
4.	Publication NPC-104	Sound Level Adjustments
5.	Publication NPC-205	Stationary Sources (Urban)
6.	Publication NPC-232	Stationary Sources (Rural)
7.	Publication NPC-206	Sound Levels due to Road Traffic
8.	Publication NPC-115	Construction Equipment
9.	Publication NPC-216	Residential Air Conditioning Devices
10.	Publication NPC-117	Domestic Outdoor Power Tools
11.	Publication NPC-118	Motorized Conveyances
12.	Publication NPC-119	Blasting

THE CORPORATION OF THE CITY OF BURLINGTON

BY-LAW 45-2011

A by-law to amend Nuisance and Noise Control By-law 19-2003,
being a by-law to prohibit and regulate certain public nuisances
and noises in the City of Burlington.
File: 110-04-1 (PB-05-11)

WHEREAS Council deems it appropriate to enact a by-law to prohibit and regulate certain public nuisances within the City of Burlington pursuant to section 128 of the *Municipal Act*, 2001, S.O. 2001, c. 25, as amended; and

WHEREAS Council deems it appropriate to amend By-law 19-2003 a by-law to prohibit and regulate certain noises within the City of Burlington pursuant to section 129 of the *Municipal Act*, 2001, S.O. 2001, c. 25, as amended;

NOW THEREFORE, THE COUNCIL OF THE CORPORATION OF THE CITY OF BURLINGTON HEREBY ENACTS AS FOLLOWS:

1. That Section 11 of By-law 19-2003, a by-law to prohibit and regulate certain public nuisances within the City of Burlington pursuant to section 128 of the *Municipal Act*, 2001, S.O. 2001, c. 25, be amended by adding;

    7) an application fee of $65.00

    8) a notice of intention to apply for any exemption to this by-law, by the distribution of a flyer as approved by the City to all residences within a 150 meter radius of the subject property containing the information required by Clauses (1) through (6)

    9) the application shall be submitted at least 14 days in advance of the event taking place

2. That in all other aspects, By-law 19-2003 be and is hereby confirmed.

ENACTED AND PASSED THIS 24th day of May, 2011.

_____ MAYOR
Rick Goldring

_____ CITY CLERK
Angela Morgan

THE CORPORATION OF THE CITY OF BURLINGTON

BY-LAW NUMBER 49-2008

A by-law to amend Nuisance and Noise Control By-law 19-2003, being a by-law to prohibit and regulate certain public nuisances and noises in the City of Burlington.
File: 760-07 (CD-78-08)

WHEREAS Council deems it appropriate to enact a by-law to prohibit and regulate certain public nuisances within the City of Burlington pursuant to section 128 of the *Municipal Act*, 2001, S.O. 2001, c. 25, as amended; and

WHEREAS Council deems it appropriate to enact a by-law to prohibit and regulate certain noises within the City of Burlington pursuant to section 129 of the *Municipal Act*, 2001, S.O. 2001, c. 25, as amended;

NOW THEREFORE, THE COUNCIL OF THE CORPORATION OF THE CITY OF BURLINGTON HEREBY ENACTS AS FOLLOWS:

1. That Item "8" of Schedule 2 – "Time and Place Prohibitions" be revised to read:

8.	The operation of any construction equipment in connection with construction.	7:00 p.m. – 7:00 a.m.* *(All day Sunday and Statutory Holidays)

2. That in all other aspects, By-law 19-2003 be and is hereby confirmed.

ENACTED AND PASSED this 9th day of June, 2008.

_____MAYOR
Cam Jackson

_____DEPUTY CITY CLERK
Deb Caughlin

APPENDIX C: TOWN OF OAKVILLE NOISE BY-LAW

OAKVILLE

THE CORPORATION OF THE TOWN OF OAKVILLE

BY-LAW NUMBER 2008-098

A by-law to prohibit and regulate noise

WHEREAS section 129 of the *Municipal Act, 2001*, S.O. 2001, c. 25 authorizes municipalities to pass by-laws to prohibit and regulate noise;

WHEREAS excessive sound and inadequately controlled noise may impair public health, safety and welfare and may become a nuisance;

WHEREAS a recognized body of scientific and technological knowledge exists by which sound may be reasonably and accurately measured and can be substantially reduced;

THEREFORE COUNCIL OF THE CORPORATION OF THE TOWN OF OAKVILLE ENACTS AS FOLLOWS:

1. Interpretation

In this By-law, the following terms shall have the following meanings:

(a) "Authorized Emergency Vehicle" includes any ambulance or hearse, any vehicle of the fire department, any vehicle of the local, provincial or federal police, any vehicle (including a snow plough) operated by or for the Town or a public utility company while actively engaged in the construction, maintenance or repair of any highway, or any equipment or facilities thereon, or a snow plough or other maintenance vehicle operated by or for the Ministry of Transportation or the Regional Municipality of Halton;

(b) "Construction" includes erection, alteration, repair, dismantling, demolition, structural maintenance, land clearing, earth moving, grading, excavating, the laying of pipe and conduit whether above or below ground level, street and highway building, application of concrete, equipment installation and alteration and the structural installation of construction components and materials in any form or for any purpose, and includes any work in connection therewith;

(c) "Construction Equipment" means any equipment or device designed and intended for use in construction, or material handling, including but not limited to: hammers, saws, drills, augers, air compressors, pile drivers, pneumatic or hydraulic tools, bulldozers, tractors, excavators, trenchers, cranes, derricks, loaders, scrapers, pavers, generators, off-highway

haulers or trucks, ditchers, compactors and rollers, pumps, concrete mixers, graders, or other material handling equipment;

(d) “Controlled Area” means those areas of the Town designated C3R in the Zoning By-Law;

(e) “Conveyance” includes a vehicle and any other device employed to transport a person or persons or goods from place to place but does not include any such device or vehicle if operated only within the premises of a person;

(f) “Council” means the Council of the Corporation of the Town of Oakville;

(g) “dBA“ means the A-weighted sound pressure level;

(h) “dBAI“ means the A-weighted sound pressure level of an impulsive sound measured with a sound level meter set to "impulse" response;

(i) “Designated Official” means the Clerk of the Town of Oakville, or any successor to this position, and the designate or designates of this individual;

(j) “Highway” includes a common and public highway, street, avenue, parkway, square, place, bridge, viaduct or trestle designed and intended for, or used by, the general public for the passage of vehicles;

(k) “Leq“ means one hour equivalent sound level;

(l) “Llm“ means logarithmic mean impulse sound level;

(m) “Motor Vehicle” includes an automobile, motorcycle, and any other vehicle propelled or driven otherwise than by muscular power; but does not include the cars of electric or steam railways, or other motor vehicles running only upon rails, or a motorized snow vehicle, traction engine, farm tractor, self-propelled implement of husbandry or road-building machine within the meaning of the *Highway Traffic Act*;

(n) “Motorized Conveyance” means a conveyance propelled or driven otherwise than by muscular, gravitational or wind power;

(o) “Noise” means unwanted sound;

(p) “Point of Reception” means any point on the premises of a person where sound originating from other than those premises is received;

(q) “Residential Area” means those areas of the Town designated as residential in the Zoning By-Law, but for greater certainty excluding those areas which have been designated C3R;

(r) “Residential Renovation” means work, other than work performed by a licensed contractor, consisting of construction at a residential property by a person residing at the property (with or without the assistance of other persons) that does not require any building permit;

(s) "Sound" means an oscillation in pressure, stress, particle displacement or particle velocity, in a medium with internal forces (e.g., elastic, viscous), or the superposition of such propagated oscillations, which may cause an auditory sensation;

(t) "Stationary Source" means a source of sound, whether fixed or mobile, that exists or operates on the premises, property or facility, the combined sound levels of which are emitted beyond the property boundary of the premises, property or facility, unless the source is due to construction as defined in this By-law. Stationary source also includes the sound generated by back-up/reverse alarms mounted on vehicles when engaged in activities within a property, excluding those back-up/reverse alarms operated in connection with construction sites, road maintenance and emergency operations;

(u) "Town" means the Corporation of the Town of Oakville or the geographic area of the Town of Oakville as the context requires, and

(v) "Zoning By-Law" means Town of Oakville Zoning By-law as amended from time to time.

2. General Prohibitions

No person shall emit or cause or permit the emission of sound resulting from an act listed in Schedule 1 to this By-law and which sound is clearly audible at a point of reception.

3. Prohibitions by Time and Place

(1) No person shall emit or cause or permit the emission of sound resulting from any act listed in Column 1 of Schedule 2 to this By-law if clearly audible at a point of reception located in an area of the Town within a prohibited period of time for such an area as set out in Column 2 to Schedule 2 to this By-law.

(2) Notwithstanding subsection (1), where there is a conflict between section 3(1) and section 4(1), the least restrictive standard, being the sound level limit specified in section 4(1), shall apply. However, the noises listed in #3, #12 and #15 of Column 1 of Schedule 2 shall be governed by the most restrictive means, being sound that is clearly audible at a point of reception for those times and places specified in Schedule 2.

4. General Limitations on Sound Levels

(1) No person shall emit, cause or permit the emission of sound from a stationary source such that the level of sound from that source at a point of reception located in a Controlled Area or Residential Area, exceeds the following sound level limit when measured by a person empowered by section 9 to enforce this By-law:

One Hour Leq (dBA) or Llm (dBAI)

Time of Day

0700 hrs – 1900 hrs	50
1900 hrs – 2300 hrs	47
2300 hrs – 0700 hrs	45

(2) Subsection (1) does not apply to specific sources that are governed by section 5.

5. Limitations Applicable to Specific Sources

(1) No person shall emit, cause or permit the emission of sound from the operation of a residential air conditioning device resulting in a sound level at a point of reception located in a Controlled Area or Residential Area in excess of an Leq of 50 dBA. For greater certainty, this subsection does not apply to air conditioning units used in connection with institutional, commercial and industrial applications or multi-family dwellings sharing a common air conditioning device.

(2) No person shall emit, cause or permit the emission of any sound from any blasting operations without the approval of Council.

(3) No person shall operate or use or cause to be operated or used any sound reproduction device in any dwelling house, apartment house, hotel or other residence between 0700 hours (0900 hours on Sundays) and 1700 hours (1900 hours in a Controlled Area) of the same day, the noise from which sound reproduction device, is clearly audible in another dwelling within the said residence, and has an Leq greater than 45 dBA when measured in another dwelling within the said residence.

(4) No person shall operate or cause to be operated or used any sound reproduction device between 0700 hours (0900 hours on Sundays) and 1700 hours (1900 hours in a Controlled Area) of the same day, the noise from which sound reproduction device has an Leq greater than 55 dBA when measured outside of the business, dwelling house, apartment house, hotel or other residence, at the property line or inside the property of another person.

(5) No person shall operate or use or cause to be operated or used any sound reproduction device originating from or in connection with the operation of any commercial establishment between 0700 hours (0900 hours on Sundays) and 1700 hours (1900 hours in a Controlled Area) of the same day, the noise from which sound reproduction device when measured within the said business has an Leq greater than 45 dBA.

6. Exemptions

Notwithstanding any other provision of this By-law, it shall be lawful to emit or cause or permit the emission of sound in connection with:

(a) any of the activities listed in Schedule 3, or

(b) emergency measures undertaken for the immediate health, safety or welfare of the inhabitants of the Town, including emergency measures undertaken for the preservation or restoration of property.

7. Grant of Exemption by Designated Official

(1) Any person may make application to the Designated Official to be granted an exemption from any of the provisions of this By-law. The application shall be made in writing and shall contain:

(a) the name and address of the applicant;

(b) a description of the source of sound in respect of which exemption is sought;

(c) a statement of the particular provision or provisions of the By-law from which exemption is sought;

(c) the period of time, of a duration not in excess of six months, for which the exemption is sought;

(d) the reasons why the exemption should be granted; and

(f) a permit fee of $150.00.

(2) Pursuant to section 23.2 of the *Municipal Act, 2001*, S.O. 2001, c. 25, Council hereby delegates to the Designated Official the power to issue permits granting an exemption from any of the provisions of this By-law with respect to any source of sound for which the person might be prosecuted.

(3) The delegation of power in subsection (2) may be revoked by Council at any time without notice.

(4) Council shall exercise all powers and authority for granting exemptions under this By-law where the Designated Official refers the matter to Council.

(5) The Designated Official or Council may refuse to grant any exemption or may grant the exemption or any exemption of lesser effect, and any exemption granted shall specify the time period, not in excess of six months, during which it is effective and may contain such terms and conditions as the Designated Official sees fit.

(6) In determining whether to grant an exemption in subsection (5), the Designated Official shall consider the following, if applicable:

(a) whether the Councillors of any Ward where the event or activity for which the exemption is sought is to be held, or where the event or activity is to be held on a boundary street between Wards, the Councillors of the adjoining Wards have any objection to the exemption being approved on the basis that it would be contrary to the general intent and purpose of this by-law;

(c) whether the applicant has complied with all terms and conditions of approval of any previous permit issued to the applicant under this section, if any, and

(d) whether the applicant has provided all of the information required by subsection (1).

(7) A permit issued under subsection (5) shall be, at minimum, subject to the following terms and conditions:

(a) the sound emitted from any equipment shall not exceed an Leq of 85 dBA when measured 20 metres from the source over a five-minute period;

(b) where the sound level exceeds 85 dBA, the applicant shall comply with any request from any person empowered under section 9 of this By-law with respect to the volume of sound from the equipment to ensure compliance with clause (a);

(c) no sound or construction equipment other than the equipment approved under the permit shall be used by the applicant;

(d) the event or activity shall be restricted to the approved location set out in the permit;

(e) the permission granted is only for the date(s) and time(s) for the event or activity as set out in the permit, and

(f) a permit issued to the applicant is not transferable.

(8) Where the Designated Official refuses to grant a permit under subsection (5), the Designated Official shall notify the applicant in writing advising the applicant that they may appeal the Designated Official's decision to Council within 21 days of the date of the notice. The Appeal shall be presented to the appropriate standing committee for recommendation to Council. Council's decision to issue a permit, refuse to issue a permit or to set terms and conditions for a permit is final.

(9) Breach by the applicant of any of the terms or conditions of the exemption shall render the exemption null and void.

(10) The Designated Official shall provide an annual report to Council summarizing the noise exemption permits issued.

8. Exemption of Traditional, Festive or Religious Activities

Notwithstanding any other provision of the this By-law, this By-law does not apply to a person who emits or causes or permits the emission of sound in connection with any religious or charitable activities, including without limitation the following:

(a) the Oakville Waterfront Festival;

(b) the Oakville Santa Claus Parade;

(c) the Remembrance Day Parade;

(d) any parade activity authorized by Council;

(e) the Oakville Jazz Festival;

(f) Oakville Midnight Madness;

(g) any fair, exhibition, celebration, concert, or event authorized by Council, and

(h) any Business Improvement Area activity or event approved by its Board of Directors, unless Council determines that the activity would not be in the greater public interest.

9. Enforcement and Administration

(1) The Designated Official shall administer and enforce this By-law.

(2) Municipal law enforcement officers employed by the Town and police constables who are members of the Halton Regional Police Services are hereby authorized to enforce this By-law.

10. Penalty

(1) Every person who contravenes any of the provisions of this By-law is guilty of an offence and pursuant to section 429(2)(a) of the *Municipal Act, 2001*, S.O. 2001, c. 25, all contraventions of this by-law are designated as continuing offences.

(2) Every person who is convicted of an offence is liable to a minimum fine of $400 and a maximum fine of $25,000 for a first offence and a maximum fine of $50,000 for a subsequent offence.

(3) Every corporation who is convicted of an offence is liable to a maximum fine of $50,000 for a first offence and $100,000 for a subsequent offence.

(4) In addition to the fine amounts set out in subsection (2) and (3), for each day or part of a day that an offence continues, the minimum fine shall be $400 and the maximum fine shall be $10,000. The total of all daily fines for the offence is not limited to $100,000.

11. Alternative Response

Where the Designated Official or other person authorized by Council to enforce this By-law issues a notice of violation to any person, the person who is alleged to have violated this By-law may respond to the notice within 45 days of the issuance of the notice with the submission to the Town of a noise study report by a professionally licensed engineer with extensive experience in acoustics and noise, which must include, but is not limited to, the following information:

(a) the description of the equipment/facility/operation and operating hours;

(b) land use zoning designation of the surrounding area;

(c) location and distance to points of reception;

(d) relevant architectural and mechanical drawings, and

(e) details of proposed noise and vibration control measures.

Where the noise study report proposes a solution to the alleged violation of this By-law which is acceptable to the Town in the absolute discretion of Council, then the person who is alleged to have violated this By-law may implement the proposal contemplated in the noise study report in resolution of the alleged violation and if the person does so implement the proposed solution, then no prosecution under this By-law will be pursued as a result of the alleged violation. If, however, the noise study report does not propose a solution to the alleged violation which is acceptable to the Town in the absolute discretion of the Council, or if the person does not implement the proposed solution within the timeframe specified within the noise study report, or if the proposed solution when implemented continues to result in violations of this By-law, then the person who is alleged to have violated this By-law will remain subject to the penalty or penalties under section 10 if convicted of the offence.

12. Severability

If a court of competent jurisdiction should declare any section or part of a section of this By-law to be invalid, such section or part of a section shall not be construed as having persuaded or influenced Council to pass the remainder of the By-law and the remainder of the By-law shall be valid and shall remain in force.

13. Title

This By-law may be cited as the “Noise By-law”.

14. Repeal

By-law 2006-001 is hereby repealed.

PASSED this 7th day of July, 2008.

_____		_____	
Rob Burton	MAYOR	Cathie Best	CLERK

SCHEDULE 1

PROHIBITIONS

1. The operation of any combustion engine or pneumatic device without an effective exhaust or intake muffling device in good working order and in constant operation.

2. The operation of any item of construction equipment in a Controlled Area or Residential Area without effective muffling devices in good working order and in constant operation.

SCHEDULE 2

PROHIBITIONS BY TIME AND PLACE

Column 1	**Column 2 -** Prohibited Period of Time	
	Residential Area	Controlled Area
1.The detonation of fireworks or explosive device not used in construction.	At all times other than those permitted by other Town By-laws	At all times other than those permitted by other Town By-laws
2.The discharge of firearms (except by police).	At all times	At all times
3.The operation of a combustion engine which, (i) is, or (ii) is used in, or (iii) is intended for use in, a toy or a model or replica of any device, which model or replica has no function other than amusement and which is not a conveyance.	1900 hrs one day to 0900 hrs next day	1900 hrs one day to 0900 hrs next day
4. The operation of any electronic device or group of connected electronic devices incorporating one or more loudspeakers or other electro-mechanical transducers, and intended for the production, reproduction or amplification of sound.	1700 hrs one day to 0700 hrs next day (0900 hrs on Sundays)	1900 hrs one day to 0700 hrs next day (0900 hrs on Sundays)
5.The operation of any auditory signaling device, including but not limited to the ringing of bells or gongs and the blowing of horns or sirens or whistles, or the production, reproduction or amplification of any similar sounds by electronic means except where required or authorized by law or in accordance with good safety practices.	All day Sundays and Statutory Holidays. 1900 hrs one day to 0700 hrs next day otherwise	All day Sundays and Statutory Holidays. 1900 hrs one day to 0700 hrs next day otherwise
6. The operation of any powered rail car including but not limited to refrigeration cars, locomotives or self-propelled passengers cars, while stationary on property not owned or controlled by a railway governed by the *Canada Railway Act*.	1900 hrs one day to 0700 hrs next day (0900 hrs on Sundays)	1900 hrs one day to 0700 hrs next day (0900 hrs on Sundays)
7. The operation of any motorized conveyance other than on a highway or other place intended for its operation.	1900 hrs one day to 0700 hrs next day (0900 hrs on Sundays)	1900 hrs one day to 0700 hrs next day (0900 hrs on Sundays)
8.Persistent barking, calling or whining or other similar persistent noise making by any domestic pet or any other animal kept or used for any purpose other than agriculture.	At all times	At all times
9. Persistent or repetitive yelling, shouting, hooting, whistling or singing.	At all times	At all times

10. Yelling, shouting, hooting, whistling, singing, or unamplified playing of musical instruments.	2300 hrs one day to 0700 hrs next day (0900 hrs on Sundays)	2300 hrs one day to 0700 hrs next day (0900 hrs on Sundays)
11. All selling or advertising by shouting or outcry or amplified sound.	All day Sundays and Statutory Holidays. 1900 hrs one day to 0700 hrs next day otherwise	1900 hrs one day to 0700 hrs next day (0900 hrs on Sundays)
12. Loading, unloading, delivering, packing, unpacking, or otherwise handling any equipment, containers, products, materials, or refuse (other than as contemplated by 15 below), whatsoever, unless necessary for the maintenance of essential services or the moving of private household effects.	All day Sundays and Statutory Holidays. 1900 hrs one day to 0700 hrs next day otherwise	All day Sundays and Statutory Holidays. 1900 hrs one day to 0700 hrs next day otherwise
13. The operation of any construction equipment other than in connection with Residential Renovation.	All day Sundays and Statutory Holidays. 1900 hrs one day to 0700 hrs next day otherwise	All day Sundays and Statutory Holidays. 1900 hrs one day to 0700 hrs next day otherwise
14. The operation or use of any tool for domestic purposes other than snow removal.	2100 hrs one day to 0700 hrs next day (0900 hrs on Sundays)	2100 hrs one day to 0700 hrs next day (0900 hrs on Sundays)
15. The operation of solid waste bulk lift or refuse compacting equipment.	2100 hrs one day to 0700 hrs next day (0900 hrs on Sundays)	2100 hrs one day to 0700 hrs next day (0900 hrs on Sundays)
16. The operation of any construction equipment in connection with Residential Renovation.	2100 hrs one day to 0700 hrs next day (0900 hrs on Sundays)	2100 hrs one day to 0700 hrs next day (0900 hrs on Sundays)

SCHEDULE 3

EXEMPT ACTIVITIES

1. Operation of authorized emergency vehicles.

2. Operation of bells or other alarms utilized as traffic control devices, including the following:
   (a) bells and other devices at traffic signal locations, and
   (b) bells at railway crossings

3. Operation of machines and equipment by or on behalf of the Town, including the following:
   (a) painting machines for crosswalks and highways;
   (b) tree and shrub pruning and mulching equipment;
   (c) grass cutting or field maintenance equipment;
   (d) Town owned or contracted street cleaners and flushers; and
   (e) construction equipment and machinery, including snow removal equipment, used by or on behalf of the Town while carrying on or engaged in the performance of public works, including but not limited the following, capital projects and maintenance operations.

4. Operation of bells, chimes, carillons and clocks in religious or public buildings.

5. Operation of machinery by or on behalf of a public utility where the work needs to be done on week-ends or overnight to minimize service interruptions.

6. Operation of construction equipment where the Town has issued a road use permit and in issuing such permit the Town mandates that the work be done on week-ends or overnight to minimize traffic impacts.

7. Noises normally incidental to activities taking place pursuant to a Town issued permit for outdoor recreational facilities, subject to any conditions applicable to such permit.

APPENDIX D: TOWN OF MILTON NOISE BY-LAW

THE CORPORATION OF THE TOWN OF MILTON

BY-LAW NO. 133-2012

BEING A BY-LAW TO PROHIBIT AND REGULATE NOISE WITHIN THE TOWN OF MILTON AND TO REPEAL BY LAW 16-84 AND ALL OF ITS AMENDING BY-LAWS IN THEIR ENTIRETY

WHEREAS sections 8, 9 and 11 of the *Municipal Act, 2001* authorize the Town of Milton to pass by-laws necessary or desirable for municipal purposes, and in particular paragraphs 5, 6 and 8 of subsection 11(2) and in particular paragraph 9 of subsection 11(3) authorize by-laws respecting the economic, social and environmental well-being of the municipality; the health, safety and well-being of persons; the protection of persons and property; and animals;

AND WHEREAS section 128 of the *Municipal Act, 2001* authorizes the Town of Milton to prohibit and regulate with respect to public nuisances, including matters that, in the opinion of the Council of the Town of Milton are or could become public nuisances;

AND WHEREAS in the opinion of the Council of the Town of Milton certain kinds of noise are or could become a public nuisance;

AND WHEREAS section 129 of the *Municipal Act, 2001* authorizes the Town of Milton to prohibit and regulate with respect to noise and, in particular, to prohibit noise unless a permit is obtained from the Town of Milton and to impose conditions for obtaining, continuing to hold and renewing the permit, including requiring the submission of plans;

AND WHEREAS section 425 of the *Municipal Act, 2001* authorizes the Town of Milton to pass by-laws providing that a person who contravenes a by-law of Town of Milton passed under that Act is guilty of an offence;

AND WHEREAS the *Municipal Act, 2001* further authorizes the Town of Milton, amongst other things, to delegate its authority,, to impose fees or charges on persons for services or activities provided or done by or on behalf of it, to provide for inspections and inspection orders, and to make orders to discontinue activity or to do work;

AND WHEREAS Section 23.1 of the Municipal Act, S.O. 2001, c. 25, as amended, authorizes a municipality to delegate its powers and duties to a person;

AND WHEREAS the Council of the Corporation of the Town of Milton deems it appropriate and expedient to delegate authority to the Supervisor, Licencing and Enforcement to exempt upon application and paying a fee, any person, including special event, from the by-law;

AND WHEREAS section 444 of the *Municipal Act, 2001* provides that the municipality may make an order requiring the person who contravened the by-law or who caused or permitted the contravention or the owner or occupier of the land on which the contravention occurred to discontinue the contravening activity, and any person who contravenes such an order is guilty of an offence;

NOW THEREFORE, THE COUNCIL OF THE CORPORATION OF THE TOWN OF MILTON HEREBY ENACTS AS FOLLOWS:

1 SHORT TITLE

1.1. This by-law may be cited as the "Noise By-law".

2 DEFINITIONS

In this by-law, all words shall carry their customary meaning except as hereinafter stated.

2.1. "Authorized Emergency Vehicle" includes any ambulance or hearse, any vehicle of the fire department, any vehicle of the local, provincial or federal police, any vehicle (including a snow plough) operated by or for the Town or a public utility company while actively engaged in the construction, maintenance or repair of any highway, or any equipment or facilities thereon, or a snow plough or other maintenance vehicle operated by or for the Ministry of Transportation or the Regional Municipality of Halton;

2.2. "Construction" includes erection, alteration, repair, dismantling, demolition, structural maintenance, painting, moving, land clearing, earth moving, grading, excavating, the laying of pipe and conduit whether above or below ground level, street and highway building, concreting, equipment installation and alteration and the structural installation of construction components and materials in any form or for any purpose, and includes any work in connection therewith; "construction" excludes activities associated with the operation at waste and snow disposal sites

2.3. "Construction Equipment" means any equipment or device designed and intended for use in construction, or material handling including but not limited to, air compressors, pile drivers, pneumatic or hydraulic tools, bulldozers, tractors, excavators, trenchers, cranes, derricks, loaders, scrapers, pavers, generators, off-highway haulers or trucks, ditchers, compactors and rollers, pumps, concrete mixers, graders, or other material handling equipment;

2.4. "Conveyance" means the operation of any Motor Vehicle, Off road vehicle and any other vehicle used to transport a person or goods from place to place and includes any operation on the same property.

2.5. "Council" means the Council of The Corporation of the Town of Milton

2.6. "Dwelling Unit" means a room or rooms in which a kitchen, living quarters and sanitary conveniences are provided for the exclusive use of the residents and with a private entrance from outside the building or from a common hallway or stairway inside.

2.7. "Highway" includes a common and public highway, street, avenue, parkway, driveway, square, place, bridge, viaduct or trestle designed and intended for or used by the public for the passage of vehicles and includes the area between the lateral property lines thereof;

2.8. "Motor Vehicle" means any vehicle and includes an automobile, motorcycle and any other vehicle propelled or driven otherwise than by muscular power, but does not include the cars of electric or steam railways, or other motor vehicle running only upon rails, or a motorized snow vehicle, farm tractor, self-propelled implement of husbandry or road building machine;

2.9. "Noise" means any unwanted sound;

2.10. "Off road vehicle" means a vehicle propelled or driven otherwise than by muscular power or wind and designed to travel:

(a) on not more than three wheels, or
(b) on more than three wheels and being of a class of vehicle prescribed by the regulations under the Off-Road Vehicles Act, R.S.O. 1990, c. O.4, as amended from time to time;
(c) and includes, but is not limited to, trail bikes, dirt bikes, dune buggies, all terrain vehicles, motorized snow vehicles and *motor vehicles* used during a demolition derby or intended to be used for a demolition derby.

2.11. "Person" or any expression referring to a person, means an individual, sole proprietorship, partnership, limited partnership, trust, corporate body, organization, charity and/or an individual in his or her capacity as a trustee, executor, administrator or other legal representative.

2.12. "Point of Reception" means any point on a Premises where sound or vibration originating from other than that Premises is received;

2.13. "Premises" includes the area of a building and/or parcel of property or in a multiple unit building occupied by more than one (1) business, each business area shall be considered a separate premises and each dwelling unit shall also be considered a separate premises.

2.14. "Publication - N.P.C." means a specified publication of the Ministry of the Environment as follows, and attached hereto as Schedule "A", which Schedule forms part of this By-law:

Publication - N.P.C. 101	-	Technical Definitions
Publication - N.P.C. 102	-	Instrumentation
Publication - N.P.C. 103	-	Procedures
Publication - N.P.C. 104	-	Sound Level Adjustments
Publication - N.P.C. 205	-	Sound Level Limits for Stationary Sources in Class 1 and 2 Areas (Urban)
Publication - N.P.C. 216	-	Residential Air Conditioning Devices
Publication - N.P.C. 206	-	Sound Levels of Road Traffic
Publication - N.P.C. 232	-	Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)

2.15. "Quiet Area" means Premises at the following location:

Milton District Hospital

2.16. "Residential Area" means the following zones within the Town of Milton Zoning By-law Residential Low Density (RLD), Residential Medium Density 1 (RMD1), Residential Medium Density 2 (RMD2), Residential High Density (RHD), Residential Office Estate (RO), Rural Estate (RE), Village Rural (RV) and any residential use permitted within a commercial zone or any other zone permitting a residential use.

2.17. "Source of Sound" means an activity, matter, thing, or tangible personal property or real property, from which sound or vibration is emitted;

2.18. "Supervisor" means the Supervisor, Licensing & Enforcement

2.19. "Town" means the Town of Milton.

3 GENERAL PROHIBITIONS

3.1. If not otherwise provided for in this by-law, no *person* shall emit or cause or permit the emission of sound likely to disturb another between 9:00 p.m. and 7:00 a.m. of the following day.

3.2. No *person* shall emit or cause or permit the emission of sound resulting from the following which sound is clearly audible at a *Point of Reception*:

(a) The operation of any electronic device or group of connected electronic devices incorporating one or more loudspeakers or other electro-mechanical transducers, and intended for the production, reproduction or amplification of sound.
(b) Racing of any *Motor Vehicle* other than in a racing event regulated by law.
(c) The operation of a *Motor Vehicle* in such a way that the tires squeal.
(d) The operation of any combustion engine without an effective exhaust-muffling device in good working order;.

(e) The operation of a *Motor Vehicle* or a *Motor Vehicle* with a trailer resulting in banging, clanking, squealing or other like *noise* due to improperly secured load or equipment, or inadequate maintenance.

(f) The operation of an engine or motor in, or on, any *Motor Vehicle* or item of attached auxiliary equipment for a continuous period exceeding five minutes, while such *Motor Vehicle* is stationary and the *Point of Reception* is in a *Residential Area* or a *Quiet Area*, unless,

(i) The *Motor Vehicle* is in an enclosed structure constructed so as to effectively prevent excessive sound emission; or,

(ii) The original equipment manufacturer specifically recommends a longer idling period for normal and efficient operation of the *Motor Vehicle* in which case such recommended period shall not be exceeded; or,

(iii) Operation of such engine or motor is essential to a basic function of the *Motor Vehicle* or equipment, including but not limited to, operation of ready-mixed concrete trucks, lift platforms or refuse compactors and heat exchange systems; or,

(iv) Weather conditions justify the use of heating or refrigerating systems powered by the motor or engine for the safety and welfare of the operator, passengers or animals, or the preservation of perishable cargo; or,

(v) Prevailing low temperatures make longer idling periods necessary, immediately after starting the motor or engine; or,

(vi) The idling is for the purpose of cleaning and flushing the radiator and associated circulation system for seasonal change of antifreeze, cleaning of the fuel system, carburetor or the like, when such work is performed other than for profit.

(g) The operation of a *Motor Vehicle* horn or other warning device except where required or authorized by law or in accordance with good safety practices.

(h) The operation of any item of *Construction Equipment* in a *Quiet Area* without effective muffling devices which is in good working order.

(i) The persistent barking, calling, whining or other similar persistent sound made by any domestic pet or any other animal kept or used for any purpose other than agriculture which sound(s) is clearly audible at a *Point of Reception*.

4 PROHIBITIONS BY TIME AND PLACE

4.1. No *person* shall emit or cause or permit the emission of sound resulting from the following which sound is clearly audible at a Point of Reception between 9:00 p.m. - 7:00 a.m.

(a) The operation of any auditory signaling device, including but not limited to the ringing of bells or gongs and the blowing of horns or sirens or whistles, or the production, reproduction or amplification of any similar sounds by electronic means except where required or authorized by law or in accordance with good safety practices.
(b) The operation of a combustion engine which is used or is intended for use in a toy or a model or replica of a larger device, which model or replica has no function other than amusement and which is not a Conveyance.
(c) The operation of any *Motor Vehicle* other than on a Highway or other place intended for its operation.
(d) All selling or advertising by shouting out, cry or amplified sound.
(e) The venting, release or pressure relief of air, steam, or other gaseous material, product or compound from any autoclave, boiler, pressure vessel, pipe, valve, machine, device or system.
(f) The operation of a power assisted hang glider or a parafoil.
(g) The operation of a commercial car wash with air drying equipment.
(h) The operation of *Construction Equipment*.
(i) The operation of any powered or non-powered tool for purposes other than snow removal.

4.2. No *person* shall emit or cause or permit the emission of Noise resulting from the detonation of fireworks or explosive devices which sound is clearly audible at a *Point of Reception* between II:00 p.m. - 7:00 a.m.

4.3. No *person* shall emit or cause or permit the emission of sound resulting from the loading, unloading, delivering, packing, unpacking, or otherwise handling any containers, produce, materials, or refuse whatsoever which sound is clearly audible at a *Point of Reception* between II:00 p.m. - 7:00 a.m.

4.4. No *person* shall emit or cause or permit the emission of sound resulting from the operation of a sound emitting pest control device between dusk and dawn.

4.5. No *person* shall emit or cause or permit emission of sound resulting from the operation of any off road vehicle other than on a Highway which sound is clearly audible at a *Point of Reception* between 9:00 p.m. - 7:00 a.m.

4.6. No *person* shall emit or cause or permit emission of sound resulting from yelling, shouting, hooting, whistling or singing which sound is clearly audible at a *Point of Reception* between 11:00 p.m. - 7:00 a.m.

4.7. No *person* shall emit or cause or permit emission of sound resulting from the banging of drums or production of sound by any other unamplified musical instrument which sound is clearly audible at a *Point of Reception* between 9:00 p.m. - 7:00 a.m.

5 MEASURED NOISE PROHIBITIONS

5.1. This section does not apply to the emission of sound prohibited during the specific times prescribed for in section 4 of this by-law.

5.2. No *person* shall emit or cause or permit the emission of sound resulting from a Stationary Source such that the level of resultant sound at a *Point of Reception* exceeds the applicable sound level limit prescribed in:

(a) *Publication - N.P.C.* 205 - Sound Level Limits for Stationary Sources in Class 1 and 2 Areas (Urban) attached hereto as Schedule "A", which Schedule forms part of this By-law.
(b) *Publication - N.P.C.* 216 - Residential Air Conditioning Devices attached hereto as Schedule "A", which Schedule forms part of this By-law.
(c) *Publication - N.P.C.* 232 - Sound Level Limits for Stationary Sources in Class 3 Areas (Rural), attached hereto as Schedule "A", which Schedule forms part of this By-law.

6 EXEMPTIONS

6.1. Notwithstanding any other provision of this by-law, this by-law shall not apply to a *person* who emits or causes or permits the emission of sound in connection with any of the following activities:

(a) Operation of Authorized Emergency Vehicles;
(b) Undertaking emergency measures for the immediate health, safety or welfare of any *person* or the preservation or restoration of property;
(c) Undertaking repairs so ordered by an emergency Property Standards order pursuant to the Milton Property Maintenance and Occupancy Standards By-law 141-2001;
(d) Operation of machines or equipment by or on behalf of the *Town* for emergency purposes;
(e) Operation of bells, tones or whistles utilized as traffic control devices including those at traffic signal locations and railway crossings;
(f) Operation of snow removal equipment while in the operation of snow removal;
(g) A normal farm practice carried on as part of an agricultural operation under the Farming and Food Productions Protection Act, 1998, S.O. 1998, c-l or any successor legislation thereto.
(h) Operation of bells, chimes, carillons and clocks in religious or public buildings.

6.2. Notwithstanding any other provision of this by-law, the *Supervisor*, Licensing & Enforcement, may, upon application by any *person* for an

exemption from a provision or provisions under this by-law and the payment of the applicable application fee,

(a) exempt the applicant from any provision or provisions of this by-law on such terms and conditions as he/she may determine; or
(b) refuse to grant any exemption from any provision of this by-law.

6.3. The *Supervisor*, Licensing & Enforcement, may cancel, revoke or suspend any exemption granted in section 6.2 on the grounds that:

(a) it is in the public interest to do so, including, but not limited to, for public health and safety reasons;
(b) the applicant has misrepresented or omitted a material fact in his or her application for the exemption being applied for; and/or.
(c) the applicant has not complied with the terms and conditions as provided for in the exemption.

6.4. Where a *person* has been granted an exemption by the *Supervisor*, Licensing & Enforcement, under Section 6.2 and the exemption is subject to any conditions, the exemption shall immediately be revoked, without further process, in the event that there is any contravention of any of the conditions of the exemption

6.5. In considering an application for an exemption in this by-law, the *Supervisor*, Licensing & Enforcement, shall have regard to:

(a) Any negative effects the issuance of the exemption permit may have on neighbouring properties or on the *Town*;
(b) Any benefits the issuance of the exemption permit may have on neighbouring properties or on the *Town*;
(c) Any previous violations of this By-law or an exemption permit by the applicant; and
(d) Anything the *Supervisor*, Licensing & Enforcement, considers relevant, acting reasonably.

6.6. The conditions that the *Supervisor*, Licensing & Enforcement, or designate may impose on an exemption under section 6.2 of this by-law may include but are not limited to:

(a) The type and volume of the sound;
(b) The days during which the exemption is in effect
(c) The times during which the exemption is in effect;
(d) That the surrounding neighbourhood be notified by the *person* making the application, to the satisfaction of the *Supervisor*, Licensing & Enforcement.
(e) That the Halton Region Police Service be notified by the *person* making the application, of the event and exemption.
(f) That a qualified individual or qualified individuals, as determined by the *Supervisor*, Licensing & Enforcement, monitor the sound and file

a report with the *Supervisor*, Licensing & Enforcement, at the applicant's expense.

(g) That any sound created by a special event, as recognized by the Special Events Review Team, shall not begin before II:00 a.m. and shall end at 11:00 p.m. on all days of the week, except Sunday, when the sound shall not begin before 12:00 noon and shall end at I0:00 p.m.; and

(h) That any sound created by a special event, as recognized by the Special Events Review Team, shall not exceed 90 dba to be determined 10 metres from the *Source of Sound*.

(i) That a Municipal Law Enforcement Officer monitor a special event, as recognized by the Special Events Review Team, at the expense of the Special Event organization or organizer, if deemed appropriate by the *Supervisor*, Licensing & Enforcement,

7 ENFORCEMENT AND ADMINISTRATION

7.1. This by-law may be enforced by a Municipal Law Enforcement Officer or a police officer.

7.2. If a Municipal Law Enforcement Officer or a police officer is satisfied that this by-law has been contravened, the officer may make an order, known as an "Order to Discontinue Activity", requiring the *person* who contravened the by-law, or who caused or permitted the contravention, or the owner or occupier of the land on which the contravention occurred, to discontinue the contravention.

7.3. An "Order to Discontinue Activity" shall set out:

(a) The municipal address of the property on which the contravention occurred;
(b) The date of the contravention;
(c) The reasonable particulars of the contravention of the by-law; and
(d) The date and time by which there must be compliance with the Order.

7.4. The "Order to Discontinue Activity" may be served personally on the *person* to whom it is directed or by regular mail to the last known address of that *person*, in which case it shall be deemed to have been served on the third day after it is mailed. Service on a corporation can be affected by registered mail to the corporate mailing address and will be deemed to have been served on the third day after it is mailed by registered mail.

7.5. No *person* shall contravene an "Order to Discontinue Activity".

7.6. Every *person* other than a corporation who fails to comply with any provision of this bylaw or an Order or other direction made under this by-law is guilty of an offence and, upon conviction, is liable to a fine of:

(a) Not more than $10,000 for a first offence and
(b) Not more than $25,000 for a second or subsequent offence.

7.7. Every corporation that fails to comply with any provision of this by-law or an Order or other direction made under this By-law is guilty of an offence and, upon conviction, is liable to a fine of:

(a) Not more than $50,000 for a first offence and
(b) Not more than $100,000 for a second or subsequent offence.

7.8. If this by-law is contravened and a conviction entered, in addition to any other remedy and to any penalty imposed by the by-law, the court in which the conviction has been entered and any court of competent jurisdiction thereafter may make an Order prohibiting the continuation or repetition of the offence by the *person* convicted.

7.9. No *person* shall hinder or obstruct, or attempt to hinder or obstruct, any *person* who is exercising a power or performing a duty under this By-law, including carrying out an inspection.

8 INSPECTION FEE

8.1. In addition to any fines that may be imposed as a result of a conviction where the Municipal Law Enforcement Officer determines that an activity producing noise or sound is not in compliance with this by-law or with an Order to Discontinue Activity, a noise inspection fee or charge set out in the applicable User Fee By-law for inspection may be imposed on the owner, *person* responsible for the noise or sound, or temporary noise permit holder.

8.2. The fees imposed constitute a debt of the person to the Town. The Town Treasurer may add such debt or fees to the tax roll and collect them in the same manner as municipal taxes on any property for which all the owners are responsible for paying the fees.

9 SEVERABILITY

9.1. Should any section, clause or provision of this by-law be declared by a court of competent jurisdiction to be invalid, the same shall not affect the validity of the by-law as a whole or any part thereof, other than the part which was declared to be invalid.

10 REPEAL

10.1. By-law 16-84 and all of its amending by-laws are hereby repealed in its entirety.

11 ENACTMENT

This By-law shall come into full force and effect on the date it is passed.

READ A FIRST, SECOND AND THIRD TIME AND FINALLY PASSED this 29th day of October, 2012.

Mayor
Gordon A. Krantz

Town Clerk
Troy McHarg

APPENDIX E: CITY OF MISSISSAUGA NOISE BY-LAW

THE CORPORATION OF THE CITY OF MISSISSAUGA
NOISE CONTROL BY-LAW 360-79

(Amended by 77-85, 1298-86, 755-87, 62-92, 230-94, 303-00, 495-03, 124-05, 110-06, 92-07, 120-07, 127-07, 248-07, 73-08, 99-08, 299-08)

WHEREAS the Council of a local municipality is empowered under The Environmental Protection Act, 1971, as amended, to pass by-laws, subject to the approval of the Minister of the Environment, for regulating or prohibiting the emission of sounds or vibrations;

AND WHEREAS it is the policy of the Council to reduce and control unusual or unnecessary sounds or vibrations which may degrade the quality and tranquillity of the lives of the inhabitants of the City of Mississauga or cause nuisance.

NOW THEREFORE the Council of the Corporation of the City of Mississauga ENACTS as follows:

INTERPRETATION

1. In this by-law,

***"City"* means the City of Mississauga in the Regional Municipality of Peel**

***"Commissioner"* means the Commissioner of Transportation and Works for the City or his or her designate; (299-08)**

***"construction"* includes erection, alteration, repair, dismantling, demolition, structural maintenance, painting, moving, land clearing, earth moving, grading, excavating, the laying of pipe and conduit whether above or below ground level, street and highway building, concreting, equipment installation and alteration and the structural installation of construction components and materials in any form or for any purpose, and includes any work in connection therewith;**

***"construction equipment"* means any equipment or device designed and intended for use in construction or material handling, including but not limited to, air compressors, pile drivers, pneumatic or hydraulic tools, bulldozers, tractors, excavators, trenchers, cranes, derricks, loaders, scrapers, pavers, generators, off-highway haulers or trucks, ditchers, compactors and rollers, pumps, concrete mixers, graders or other material handling equipment;**

"*Council*" means the Council of the Corporation of the City of Mississauga;

***"Minister"* means the Minister of the Environment;**

***"Ministry"* means the Ministry of the Environment;**

***"motor vehicle"* includes an automobile, motorcycle, motor assisted bicycle unless otherwise indicated in The Highway Traffic Act, and any other vehicle propelled or driven otherwise than by muscular power, but does not include the cars of electric or steam railways, or other motor vehicles running only upon rails, or a motorized snow vehicle, traction engine, farm tractor, self-propelled implement of husbandry or road-building machine within the meaning of The Highway Traffic Act.**

***"motorized conveyance"* includes a vehicle and any other device employed to transport a person or persons or goods from place to place, but does not include any such device or vehicle if operated only within the premises of a person or if propelled or driven only by muscular, gravitational or wind power;**

***"noise"* means unwanted sound;**

***"Noise Control Officer"* means a person designated by the Commissioner for the City as a noise control officer; (By-law 755-87, 299-08)**

"*point of reception*" means any point on the premises of a person where sound or vibration originating from other than those premises is received;

***"Quiet Zone"* means those areas of the City where quiet is of particular importance and as more particularly designated in Schedule 4 to this By-law.**

***"Residential Area"* means any area containing dwellings which are normally used for human habitation.**

ADMINISTRATION

2. The Commissioner shall be responsible for the administration and enforcement of this by-law. (By-law 755-87, 495-03, 299-08)

GENERAL PROHIBITION

3. No person shall emit or cause or permit the emission of sound resulting from an act listed in Schedule 1 to this by-law and which sound is clearly audible at a point of reception.

PROHIBITION BY TIME AND PLACE

4. No person shall emit or cause or permit the emission of sound resulting from any act listed in Column 1 to Schedule 2 to this by-law if clearly audible at a point of reception located in a residential area or quiet zone within a prohibited period of time for such an area as set out in Column 2 to Schedule 2 to this By-law.

PUBLIC SAFETY EXEMPTION

5. The provisions of Section 3 and 4 do not apply to the emission of a sound or vibration in connection with emergency measures undertaken:

(a) for the immediate health, safety or welfare of the inhabitants of the City or any of them; or

(b) for the preservation or restoration of property.

EXEMPTION OF TRADITIONAL FESTIVE OR RELIGIOUS ACTIVITIES

6. The provisions of Section 3 and 4 do not apply to the emission of sounds or vibrations made by persons in connection with any of the traditional, festive, religious or other activities set out in Schedule 3 to this by-law.

GRANT OF EXEMPTION BY COUNCIL

7. (1) Any person may apply for an exemption from the provisions of Sections 3 and 4 of this By-law, with respect to any source of sound or vibration. (299-08)

(2) An application for exemption under Subsection (1) shall be in writing and shall contain:

(a) the name and address of the applicant,

(b) a description of the source of sound or vibration in respect of which exemption is being sought,

(c) a statement of the section of the by-law from which exemption is sought,

(d) the period of time (not in excess of six (6) months) for which the exemption is sought,

(e) the reasons why the exemption is being sought,

(f) proof of publication for two consecutive days within the preceding ten (10) days in a newspaper of general circulation within the City, of a notice of intention to apply for any exemption to this by-law, received or by the distribution of a flyer as prescribed by the City to all residences within a 500 meter radius of the subject property containing the information required by Clauses (a) through (e) hereof, stating the date upon which objections may be submitted to City staff. (299-08)

(g) the application fee. (299-08)

(3) An application for an exemption completed in accordance with section 7(2) shall be delivered to the Commissioner. (299-08)

(4) The Commissioner may grant an exemption, in whole or in part, with terms and conditions, subject to the provisions of this By-law. (299-08)

(5) In considering the completed application for any exemption, the Commissioner shall take into account the following: (299-08)

(a) If an exemption is granted, a time limit shall be specified, and an exemption shall not exceed six months.

(b) The Commissioner shall consult with the affected Ward Councillor on an application for an exemption and the consultation shall include any terms and conditions that may be attached to an exemption.

(c) Any correspondence received regarding the application as a result of the distribution of the Notice or newspaper advertisement referred to in Section 7(2)(f).

(d) The proximity of the sound to a Residential Area and the likelihood that the sound for which an exemption is requested may negatively affect persons in a Residential Area.

(e) Whether any negative impacts under clauses (c) or (d) can be reduced with the use of mitigation measures including limiting the sound to certain days or times of the day.

(6) A breach by the applicant of any of the terms or conditions imposed by the Commissioner in granting an exemption shall immediately render the exemption null and void. (299-08)

(7) Notwithstanding that the authority to grant an exemption is delegated to the Commissioner, and that he or she may have already exercised the delegated power, Council shall retain the right to exercise the authority to grant or deny an exemption in accordance with the conditions set out in section 7 (5) of this By-law. (299-08)

SEVERABILITY

8. If a court of competent jurisdiction declares any section or part of a section of this by-law invalid, such section or part of a section shall not be construed as having persuaded or influenced Council to pass the reminder of the by-law and it is hereby declared that the remainder of the by-law shall be valid and shall remain in force.

PENALTY

9. (1) Every person who contravenes any provision of this by-law is guilty of an offence. Pursuant to the provisions of the Provincial Offences Act, R. S. O. 1990, c.P. 33 upon conviction a person is liable to a fine of not more than $5,000, exclusive of costs. (by-law 63-92)

(2) In addition to the provisions of Subsection (1), the Court in which the information is first laid and any court of competent jurisdiction thereafter, may issue an order prohibiting the contravention and repetition of the offence by the person convicted, and such order shall be in addition to any penalty imposed on the person convicted.

10. (1) By-law Number 7364 enacted by the former Town of Mississauga and any other by-law passed by the former Town of Mississauga to control noise is hereby repealed.

(2) By-law Number 957, enacted by the former Village of Port Credit and any other by-law passed by the former Village of Port Credit to control noise is hereby repealed.

(3) By-law Number 66-36, enacted by the former Town of Streetsville and any other by-law passed by the former Town of Streetsville to control noise is hereby repealed.

(4) By-law 2370 enacted by the former Township of Toronto and any other by-law passed by the former Township of Toronto to control noise is hereby repealed.

(5) Any Noise Control By-law, enacted by the Town of Oakville in that part of Oakville which was annexed by the City of Mississauga, and more particularly described in Section 2(1)(a) of The Regional Municipality of Peel Act, 1973, S.O. 1973, c. 60, is hereby repealed.

READ A FIRST AND SECOND TIME THIS 28TH DAY OF MAY, 1979.
READ A THIRD TIME AND FINALLY PASSED THIS 28TH DAY OF JANUARY 1980.
Signed by: "Hazel McCallion", Mayor "Terence L. Julian", Clerk
This by-law is approved pursuant to the provisions of The Environmental Protection Act, 1971, as amended, at Toronto, this 9th day of April, 1980.
Signed by: "Harry Parrott", Minister of the Environment

THE CORPORATION OF THE CITY OF MISSISSAUGA
NOISE CONTROL BY-LAW 360-79

SCHEDULE 1 TO BY-LAW NUMBER 360-79
GENERAL PROHIBITIONS

1. **The racing of any motorized conveyance other than in a racing event regulated by law.**

2. **The operation of a motor vehicle at a speed and in a manner which causes its tires to squeal.**

3. **The operation of any combustion engine or pneumatic device without an effective exhaust or intake muffling device in good working order and in constant operation.**

4. **The operation of a vehicle or a vehicle with a trailer resulting in banging, clanking, squealing or other like sounds due to improperly secured load or equipment, or inadequate maintenance.**

5. **The operation of an engine or motor in, or on, any motor vehicle or item of attached auxiliary equipment for a continuous period exceeding five minutes, while such vehicle is stationary in a Residential Area or a Quiet Zone unless:**

   (a) the original equipment manufacturer specifically recommends a longer idling period for normal and efficient operation of the motor vehicle in which case such recommended period shall not be exceeded; or,

   (b) operation of such engine or motor is essential to a basic function of the vehicle or equipment, including but not limited to, operation of ready-mixed concrete trucks, lift platforms and refuse compactors; or,

   (c) weather conditions justify the use of heating or refrigerating systems powered by the motor or engine for the safety and welfare of the operator, passengers or animals, or the preservation of perishable cargo, and the vehicle is stationary for purposes of delivery or loading; or,

   (d) prevailing low temperatures make longer idling periods necessary immediately after starting the motor or engine; or,

   (e) the idling is for the purpose of cleaning and flushing the radiator and associated circulation system for seasonal change of antifreeze, cleaning of the fuel system, carburettor or the like, when such work is performed other than for profit.

THE CORPORATION OF THE CITY OF MISSISSAUGA
NOISE CONTROL BY-LAW 360-79

SCHEDULE 1 TO BY-LAW NUMBER 360-79
GENERAL PROHIBITIONS

6. **The operation of a motor vehicle horn or other warning device except when required or authorized by law or in accordance with good safety practices.**

7. **The operation of any item of construction equipment in a Quiet Zone or Residential Area without effective muffling devices in good working order and in constant operation.**

THE CORPORATION OF THE CITY OF MISSISSAUGA
NOISE CONTROL BY-LAW 360-79

SCHEDULE 2 TO BY-LAW NUMBER 360-79
PROHIBITED PERIODS OF TIME:

A - 23:00 hrs. of one day to 07:00 hrs. next day (09:00 hrs. Sundays)

B - 19:00 hrs. of one day to 07:00 hrs. next day (09:00 hrs. Sundays)

C - 17:00 hrs. of one day to 07:00 hrs. next day (09:00 hrs. Sundays)

D - All Day Sundays and Statutory Holidays

E - 17:00 hrs. of one day to 07:00 hrs. next day

F - 19:00 hrs. of one day to 07:00 hrs. next day

THE CORPORATION OF THE CITY OF MISSISSAUGA
NOISE CONTROL BY-LAW 360-79

SCHEDULE 2 TO BY-LAW NUMBER 360-79
PROHIBITED PERIODS OF TIME:

COLUMN 1		COLUMN 2 PROHIBITED PERIOD OF TIME	
		QUIET ZONE	RESIDENTIAL AREA
1.	The operation of any auditory signalling device, including but not limited to the ringing of bells or gongs and the blowing of horns or sirens or whistles, or the production, reproduction or amplification of any similar sounds by electronic means except where required or authorized by law or in accordance with good safety practices.	At Any Time	B & D
2.	The operation of any electronic device or group of connected devices incorporating one or more loudspeakers or other electro-mechanical transducers, and intended for the production, reproduction or amplification of sound.	At Any Time	C
3.	All selling or advertising by shouting or outcry or amplified sound.	At Any Time	B & D
4.	Loading, unloading, delivering, packing, unpacking, or otherwise handling any containers, products, materials, or refuse, whatsoever, unless necessary for the maintenance of essential services or the moving of private household effects.	B	B & D
5.	The operation of any construction equipment in connection with construction.	E & D	F & D

THE CORPORATION OF THE CITY OF MISSISSAUGA
NOISE CONTROL BY-LAW 360-79

SCHEDULE 2 TO BY-LAW NUMBER 360-79
PROHIBITED PERIODS OF TIME:

	COLUMN 1	COLUMN 2 PROHIBITED PERIOD OF TIME QUIET ZONE	 RESIDENTIAL AREA
6.	The detonation of fireworks or explosive devices not used in construction.	At Any Time	A - unless otherwise permitted in accordance with the provisions of By-law 160-74 or its successors
7.	The discharge of firearms.	At Any Time	At Any time- unless in accordance with the provisions of By-law 331-77 or its successors.
8.	The operation of a combustion engine which (i) is, or (ii) is used in, or (iii) is intended to be used in, a toy, or a model or replica of any device, which model or replica has no function other than amusement and which is not a conveyance.	At Any Time	A
9.	The operation of any powered rail car including but not limited to refrigeration cars, locomotives or self-propelled passenger cars, while stationary on property not owned or controlled by a railway governed by The Canada Railway Act	At Any Time	A

THE CORPORATION OF THE CITY OF MISSISSAUGA
NOISE CONTROL BY-LAW 360-79

SCHEDULE 2 TO BY-LAW NUMBER 360-79
PROHIBITED PERIODS OF TIME:

	COLUMN 1	**COLUMN 2** PROHIBITED PERIOD OF TIME	
		QUIET ZONE	**RESIDENTIAL AREA**
10.	**The operation of any motorized conveyance other than on a highway or other place intended for its operation.**	**At Any Time**	**B**
11.	**The venting, release or pressure relief of air, steam or other gaseous material, product or compound from any autoclave, boiler, pressure vessel, pipe, valve, machine, device or system.**	**At Any Time**	**A**
12.	**Persistent barking, calling or whining or other persistent noise making by any domestic pet.**	**At Any Time**	**At Any Time**
13.	**The operation of any powered or nonpowered tool for domestic purposes other than snow removal.**	**A**	**A**
14.	**The operation of solid waste bulk lift or refuse compacting equipment.**	**B**	**A**
15.	**The operation of a commercial car wash with air drying equipment.**	**B**	**B**
16.	**Yelling, shouting, hooting, whistling or singing.**	**At Any Time**	**A**

THE CORPORATION OF THE CITY OF MISSISSAUGA
NOISE CONTROL BY-LAW 360-79

SCHEDULE 3 TO BY-LAW 360-79
ACTIVITIES TO WHICH THE BY-LAW DOES NOT APPLY

(amended by By-law 495-03, 124-05, 110-06, 92-07, 120-07, 127-07, 248-07, 73-08, 99-08)

ACTIVITIES TO WHICH THE BY-LAW DOES NOT APPLY	LOCATION
Airport Taxi Limousine Sports Tournament & Picnic	Wildwood Park 3430 Derry Road West
Ashworth Square Co-operative Multicultural Day	Ashworth Square Co-operative Complex 3180 Kirwin Avenue
BOT Construction Group construction of Mclaughlin Road at Highway 401 between March 1, 2008 and December 31, 2008	Mclaughlin Road at Highway 401
Can-Sikh Festival	Wildwood Park 3430 Derry Road West
Canadian Cancer Society – Relay for Life	John Fraser Secondary School 2665 Erin Centre Boulevard
Carolling in the Park	Port Credit Memorial Park 22 Stavebank Road North
Celebrate the Season	Civic Square 300 City Centre Drive
Desh Bhagat	Wildwood Park 3430 Derry Road West
Fall Fair and Folk Festival	Bradley Museum 1620 Orr Road
Graham Bros. Construction of Confederation Parkway from Rathburn Road West to the Hydro Corridor north of Highway 403 between July 5, 2007 and September 30, 2008	Confederation Parkway from Rathburn Road West to Hydro Corridor
Historic Halloween Fun	Benares Museum 1507 Clarkson Road North
Kalayaan Festival	Mississauga Valley Park 1275 Mississauga Valley Boulevard
Meadow-Wood Rattray Ratepayers Picnic	Bradley Museum 1620 Orr Road
Ministry of Transportation of Ontario reconstruction of the median, a median barrier, and the installation of a high mast lighting system on the Queen Elizabeth Way (QEW) between September 1, 2007 to August 31, 2010	Queen Elizabeth Way (QEW) between Mississauga Road and Winston Churchill Boulevard
Ministry of Transportation of Ontario construction related to the Queen Elizabeth Way (QEW)/Hurontario Street Interchange Improvements project between August 1, 2007 to November 30, 2009.	Queen Elizabeth Way (QEW) and Hurontario Street Interchange
Mississauga Canada Day Celebration	300 City Centre Drive
Mississauga Corporate Challenge	J.C. Saddington Park 53 Lake Street

THE CORPORATION OF THE CITY OF MISSISSAUGA
NOISE CONTROL BY-LAW 360-79

SCHEDULE 3 TO BY-LAW 360-79
ACTIVITIES TO WHICH THE BY-LAW DOES NOT APPLY

Mississauga Marathon	**Civic Square** **300 City Centre Drive,** **Lakefront Promenade Park** **800 Lakefront Promenade**
Mississauga Rotary Ribfest	**Civic Square** **300 City Centre Drive**
Mississauga Waterfront Festival	**Port Credit Memorial Park** **22 Stavebank Road North**
Mount Zion Apostolic Church Picnic	**Wildwood Park** **3430 Derry Road West**
My Mississauga	**Civic Square** **300 City Centre Drive**
On the Verandah Concert Series	**Benares Museum** **1507 Clarkson Road North**
Port Credit Paint the Town Red	**Port Credit Memorial Park** **22 Stavebank Road North**
Salmon Derby	**J.C. Saddington Park** **53 Lake Street**
San Salvidor Del Mundo Festival	**Fred Halliday Park** **2187 Stir Crescent**
Shakespeare Under the Stars	**Bradley Museum** **1620 Orr Road**
Sherwood Forrest Family Fun Day	**Sherwood Green Park** **1864 Deer's Wold**
Streetsville Canada Celebration	**Streetsville Memorial Park** **335 Church Street**
Streetsville Founders Bread & Honey Festival	**Streetsville Memorial Park** **335 Church Street**
Sunset Concert Series	**Civic Square** **300 City Centre Drive,** **St. Lawrence Park** **141 Lakeshore Road East**
Southside Shuffle	**Port Credit Memorial Park** **22 Stavebank Road North**
Teddy Bears' Picnic	**Benares Museum** **1507 Clarkson Road North**
University of Santos Thomas Alumni Annual Picnic	**Mississauga Valley Park** **1275 Mississauga Valley Boulevard**

THE CORPORATION OF THE CITY OF MISSISSAUGA
NOISE CONTROL BY-LAW 360-79
SCHEDULE 4 TO BY-LAW NUMBER 360-79
QUIET ZONES

The Quiet Zones are those areas contained within the dotted lines on Maps A, B, C and D which are attached to By-law 360-79

THE CORPORATION OF THE CITY OF MISSISSAUGA
THE NOISE CONTROL BY–LAW 360–79

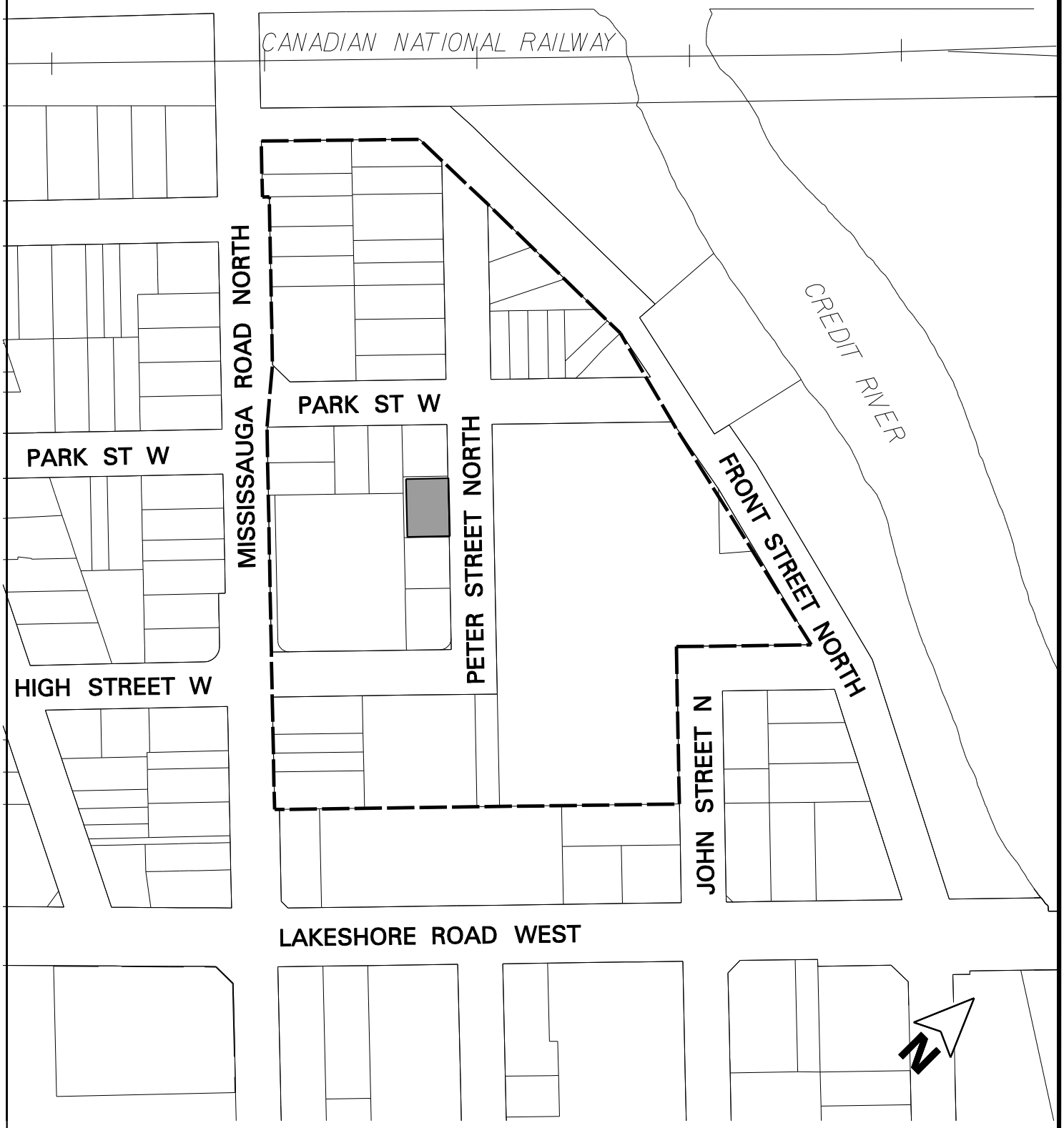
① TRILLIUM HEALTH CARE
100 THE QUEENSWAY WEST

② CHELSEY PARK NURSING HOME
2250 HURONTARIO STREET

③ EXTENDICARE NURSING HOME
55 THE QUEENSWAY WEST

MAP A– BY–LAW 360–79

THE CORPORATION OF THE CITYOF MISSISSAUGA
THE NOISE CONTROL BY–LAW 360–79

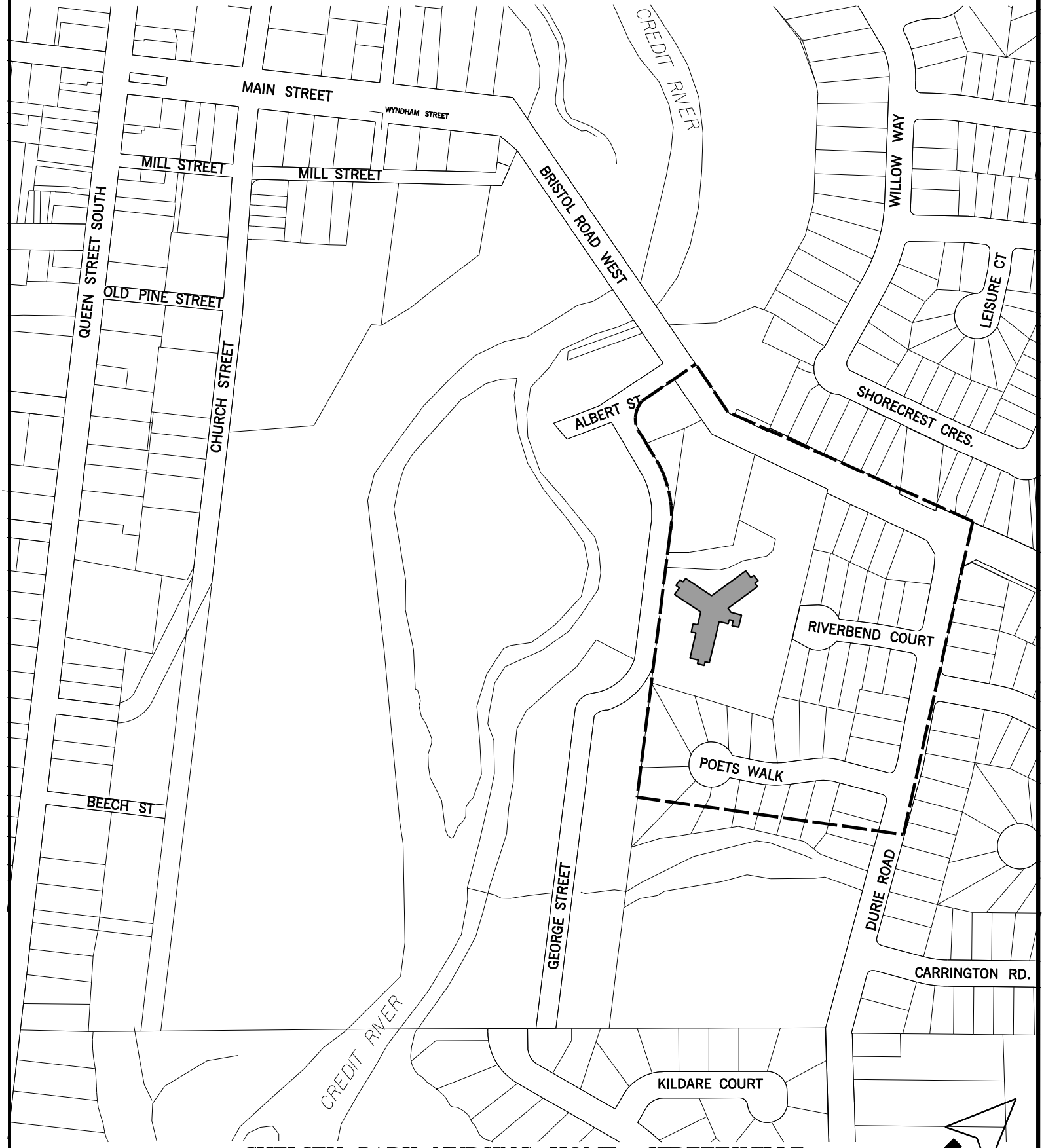


TAARA NURSING HOME
26 PETER STREET NORTH

MAP B– BY–LAW 360–79

THE CORPORATION OF THE CITY OF MISSISSAUGA

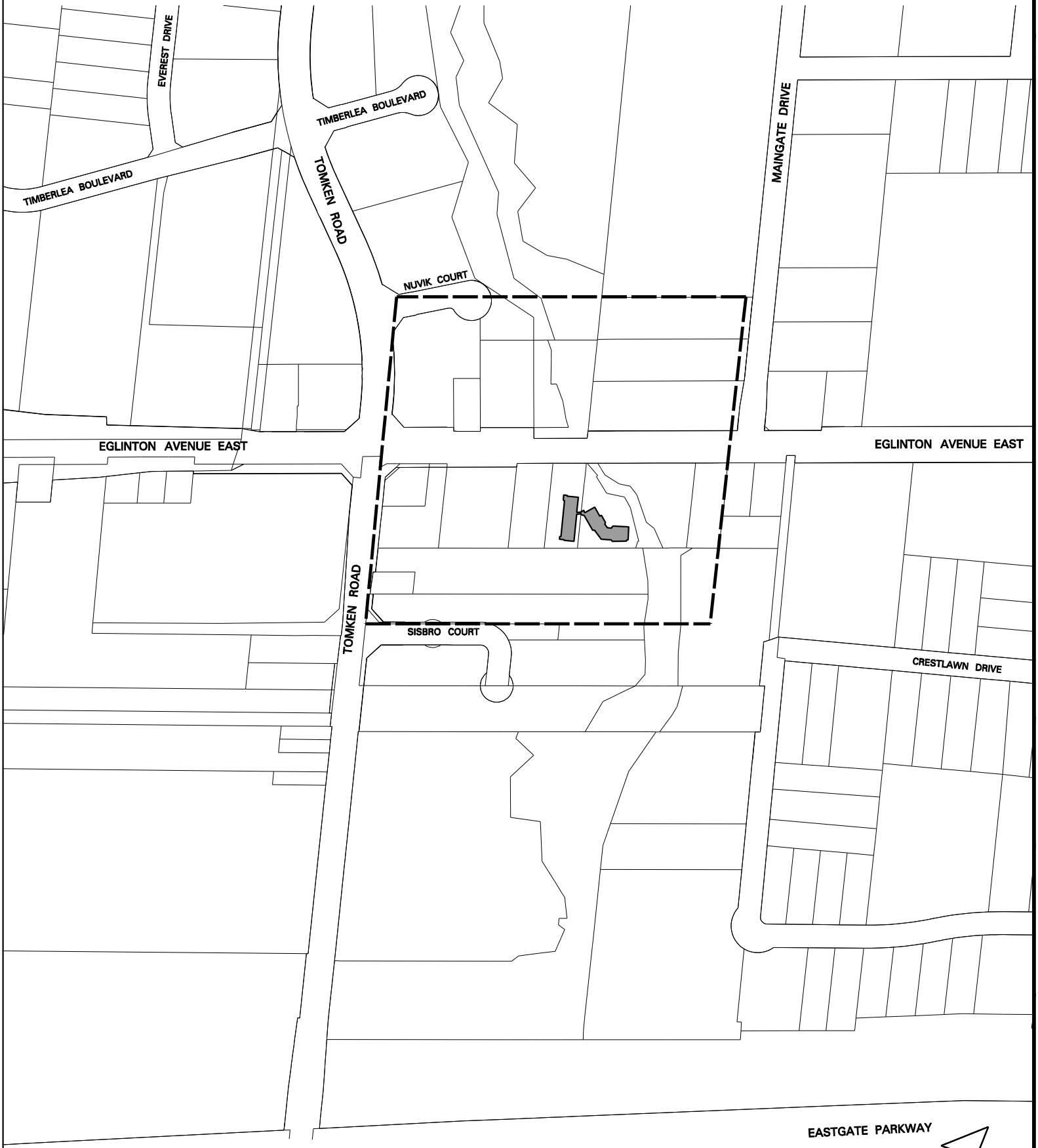
THE NOISE CONTROL BY–LAW 360–79



CHELSEY PARK NURSING HOME STREETSVILLE
87 MAIN STREET

MAP C– BY–LAW 360–79

THE CORPORATION OF THE CITY OF MISSISSAUGA
THE NOISE CONTROL BY-LAW 360-79



TYDALL NURSING HOME
1060 EGLINTON AVENUE EAST

MAP D- BY LAW 360-79

APPENDIX F: TOWN OF HALTON HILLS NOISE BY-LAW

TOWN OF HALTON HILLS
Working Together Working for You!

BY-LAW NO. 2010-0030

A By-law to prohibit or regulate noise in the Town of Halton Hills

WHEREAS Section 9 of the Municipal Act, 2001, S.O. 2001, c.25, as amended, provides that a municipality has the capacity, rights, powers and privileges of a natural person for the purpose of exercising its authority under that or any other Act;

AND WHEREAS Section 11 of the Municipal Act, 2001, S.O. 2001, c.25, as amended, provides that municipalities may provide any service or thing that the municipality considers necessary or desirable for the public, and authorizes municipalities to pass by-laws within their respective spheres of jurisdiction;

AND WHEREAS Sections 23.1, 23.2, 23.3 and 23.5 of the Municipal Act, 2001, S.O. 2001, c.25, as amended, authorize a municipality to delegate certain powers and duties;

AND WHEREAS Section 128 of the *Municipal Act, 2001*, S.O. 2001, c.25, as amended, authorizes a local municipality to prohibit and regulate with respect to public nuisances, including matters that, in the opinion of Council, are or could become or cause public nuisances;

AND WHEREAS excessive Sound and inadequately controlled Noise may impair public health, safety and welfare, and may become a nuisance;

AND WHEREAS Section 129 of the *Municipal Act, 2001*, S.O. 2001, c.25, as amended, authorizes a local municipality to prohibit and regulate with respect to noise, vibration, odour, dust and outdoor illumination;

AND WHEREAS the present technical and scientific knowledge on the subjects of acoustics, Sound and Noise control is at an advanced stage, through which Sound may be reasonably and accurately measured, predicted, assessed and substantially reduced;

AND WHEREAS Section 425 of the *Municipal Act, 2001*, S.O. 2001, c.25, as amended, authorizes a municipality to pass by-laws providing that a Person who contravenes a by-law of the municipality passed under that *Act* is guilty of an offence;

AND WHEREAS Section 429 of the *Municipal Act, 2001*, S.O. 2001, c.25, as amended, authorizes a municipality to establish a system of fines for offences under a by-law passed under that *Act*;

AND WHEREAS Section 436 of the *Municipal Act, 2001*, S.O. 2001, c.25, as amended, authorizes a municipality to pass by-laws providing that the municipality may enter on land for the purpose of carrying out inspections, to determine compliance with a by-law, direction, order, or condition of a license passed or made under that *Act*;

AND WHEREAS Sections 444 and 445 of the *Municipal Act, 2001*, S.O. 2001, c.25, as amended, provide that, where a municipality is satisfied that a contravention of a by-law has occurred, the municipality may make an order to discontinue or correct the contravention of the by-law;

AND WHEREAS Section 446 of the *Municipal Act, 2001*, S.O. 2001, c.25, as amended, provides that, where a municipality has authority to direct or require that a matter or

thing be done, in default of it being done by the person directed or required to do it, such matter or thing may be done at the person's expense, and that the municipality may recover the cost of doing such thing or matter by action or by adding the costs to the tax roll and collecting them in the same manner as property taxes;

NOW, THEREFORE, BE IT RESOLVED THAT THE COUNCIL OF THE CORPORATION OF THE TOWN OF HALTON HILLS ENACTS AS FOLLOWS:

SHORT TITLE
The short title of this By-law is the *Noise By-law.*

Purpose

(1) Council has determined that the quantitative and qualitative provisions of this By-law provide for the reasonable control of all sources of Sound within the municipality, in consideration of the number of people, the size of the geographic area and the time period affected by the provisions of this By-law to protect against Noise pollution.

Interpretation

(1) It is the intent of this By-law that the provisions shall be interpreted to reasonably control the level and quality of Noise that is likely to disturb the peace, enjoyment, quiet, rest, comfort or convenience of the inhabitants of the Town.

(2) Where an Officer appointed to enforce this By-law is not satisfied that a contravention of this By-law has occurred, the Officer shall not enforce the provisions of the By-law.

PART 1 DEFINITIONS

1. In this By-law:

1.1 Acoustic Calibrator
is an electro-mechanical or mechanical device which produces Sound of a known Frequency and which, when coupled to a Sound Level Meter, produces a predictable response in the Sound Level Meter if the Sound Level Meter is operating properly at the calibration Frequency. For the purpose of this By-law, the Acoustic Calibrator used shall conform to the applicable international standard specified in the International Electrotechnical Commission (IEC) standards for use with a Class 1 Sound Level Meter.

1.2 A-Weighted Sound Pressure Level

is the Sound pressure level modified by application of A-Weighting. It is measured in decibels, A-Weighted, and denoted dBA.

1.3 A-Weighting
is the most commonly used measurement of perceived loudness as specified in the International Electrotechnical Commission (IEC) standard for Sound Level Meters.

1.4 Background Sound Level
is the Sound Level that is present in the environment, produced by Noise sources other than the source under impact assessment. Highly intrusive short duration Noise caused by a source such as an aircraft fly-over or a train pass-by is excluded from the determination of the Background Sound Level. Background Sound Level is also referred to as ambient Sound Level.

1.5 Construction
includes erection, alteration, repair, dismantling, demolition, structural maintenance, painting, moving, land clearing, earth moving, grading, excavating, the laying of pipes and conduit whether above or below ground level, street and highway building, concreting, equipment installation and alteration and the structural installation of construction components and materials in any form or for any purpose, and includes any work in connection therewith.

1.6 Construction Equipment
means any equipment or device designed and intended for use in Construction or material handling, including but not limited to: hand tools, power tools, air compressors, pile drivers, pneumatic or hydraulic tools, bulldozers, tractors, excavators, trenchers, cranes, derricks, loaders, scrapers, pavers, generators, off-highway trucks or haulers, ditchers, compactors and rollers, pumps, concrete mixers, graders or other material-handling equipment.

1.7 Council
means the Council of the Corporation of the Town of Halton Hills.

1.8 dBA
means the A-Weighted Sound pressure level.

1.9 dBAi
means the A-Weighted Sound pressure level of a Sound that exhibits impulsive characteristics and is measured with a “Sound Level Meter” set to “impulse” response using the “A-Weighting” Frequency characteristics.

1.10 Decibel (dB)
is a dimensionless measure of Sound Level or Sound pressure level denoted as dB.

1.11 Designated Official
means the Clerk of the Town of Halton Hills, or any successor to this position, and the designate or designates of this individual including a municipal law enforcement Officer.

1.12 Frequency
means the number of times that a quantity repeats itself in a unit interval of time, such as cycles per second, and is denoted as hertz (Hz) as a unit of measurement.

1.13 Heavy Equipment
includes but is not limited to; forklifts, cranes, bulldozers, loaders, off-

highway trucks or haulers, compactors, graders, or other material handling equipment.

1.14 Impulsive Sound
is a single pressure pulse or a single burst of pressure pulses.

1.15 L_{eq}
is the one hour equivalent Sound Level.

1.16 L_{LM}
means logarithmic mean Impulse Sound Level.

1.17 Noise
is Sound that exceeds the level and/or quality set out in the quantitative provisions of this By-law or contravenes the qualitative provisions of this By-law.

1.18 Normal Farm Practice
means a practice that is conducted in a manner consistent with proper and acceptable customs and standards as established and followed by similar agricultural operations under similar circumstances, or makes use of innovative technology in a manner consistent with proper advanced farm management practices.

1.19 Officer
means a municipal law enforcement Officer, police Officer, or other Person appointed by law to enforce the provisions of this By-law.

1.20 Owner
includes with respect to land or Property, the registered Owner, occupant, tenant, or the Person for the time being managing or receiving the rent of the Property whether on his own account or on account of an agent or trustee of any other Person, or any of the aforesaid.

1.21 Person
includes an individual, an Owner, corporation, partnership, company, firm, association, or party and includes the successors, assigns, heirs, executors, administrators, or other legal representatives of a Person to whom the context can apply according to law and the singular shall include the plural.

1.22 Point of Reception
means a point on the premises of a Person within 30m of a building, where Sound originating from other premises is received.

1.23 Private Property
means land or Property that is privately owned and is not Town Property or Property of a local board, or Property of the Regional Municipality of Halton, or Property of any of the Crown in Right of Ontario, the Crown in Right of Canada or any emanations thereof.

1.24 Property
means a Building or Structure or part of a Building or Structure, and includes the lands and any premises appurtenant thereto and all mobile homes, mobile Buildings, mobile structures, outbuildings, Fences, and erections thereon and includes vacant Property.

1.25 Public Event
is a cultural, recreational or educational event including public fairs to which

the public is invited and requiring the approval of more than one agency or authority including but not limited to: matters respecting health, parking, Noise, building, lottery licensing, LCBO, TSSA, fire, police, and traffic.

1.26 Quasi-Steady Impulsive Sound
is a sequence of Impulsive Sounds emitted from the same source, having a time interval of less than 0.5 seconds between successive Impulsive Sounds.

1.27 Residential Area
means those areas zoned residential or in which residential use is permitted by Town Zoning By-laws, and any amendments thereto, passed pursuant to Section 34 of the *Planning Act*, R.S.O. 1990, c.P.13, or those areas subject to development control on Niagara Escarpment Plan lands which provide for residential use.

1.28 Rural Class 2 Area
The area shown as Rural Class 2 in Schedule “C” to By-law 2010-0030.

1.29 Sound
is an oscillation in pressure, stress, particle displacement or particle velocity, in a medium with internal forces (i.e., elastic, viscous), or the superposition of such propagated oscillations, which may cause an auditory sensation.

1.30 Sound Level
is the A-Weighted Sound pressure level (dBA).

1.31 Sound Level Meter
is an instrument which is sensitive to and calibrated with an Acoustic Calibrator for the measurement of Sound. For the purpose of this By-law, the Sound Level Meter used shall conform to the international standard specified in the International Electrotechnical Commission (IEC) standards for a Class 1 instrument.

1.32 Sound Pressure
is the instantaneous difference between the actual pressure and the average or barometric pressure at a given location. The unit of measurement is the micro pascal (µPa);

1.33 Stationary Source
means a source of Sound, or a combined source of Sound, whether fixed or mobile, that exists or operates on the premises, Property or facility, the Sound Level, or combined Sound Levels (as the case may be), of which are emitted beyond the Property boundary of the premises, Property or facility, excluding a source that is due to, or caused by, Construction, road maintenance, emergency operations or other activities authorized by law. Stationary Source also includes the Sound generated by back-up/reverse alarms mounted on vehicles when engaged in activities within a Property, excluding those back-up/reverse alarms operated in connection with Construction sites, road maintenance, emergency operations and other activities authorized by law. A Stationary Source includes individual sources of Noise or a group of Noise sources all located within the premises, Property or facility emitting the Noise. Stationary Source excludes Noise sources addressed in a qualitative manner that are clearly audible at a Point of Reception.

1.34 Town
means the Corporation of the Town of Halton Hills.

1.35 Urban Class 1 Area

The area shown as Urban Class 1 in Schedule “C” to By-law 2010-0030.

PART 2 QUALITATIVE: PROHIBITIONS BY TIME AND PLACE

2.1 No Person shall emit or cause or permit the emission of, Sound resulting from any act listed under the heading “Type of Sound” in Schedule “A” – Noise Prohibitions by Time and Place, if the Sound is clearly audible at a Point of Reception located in an area of the Town specified under the heading “Prohibited Area” in Schedule “A” within a prohibited time shown for such an area as set out under the heading “Prohibited Time of Day” in Schedule “A”.

PART 3 QUANTITATIVE: REGULATING NOISE WITH THE USE OF SOUND LEVEL(S)

3.1 LIMITATIONS ON SOUND LEVELS OF ANY AIR CONDITIONING DEVICES

No Person shall emit, or cause or permit the emission of, Sound from the operation of any air conditioning device used in a residential application resulting in a Sound Level at a Point of Reception in excess of the specified Sound Level limits. Either the general Sound Level limit in Table 1 or the specific Sound Level limit in Table 2 shall apply to an air conditioning device. The less restrictive of these two limits shall prevail.

3.1.1 General Sound Level Limit

The general Sound Level limit is outlined in Table 1. The specific hour is to be determined by the Officer.

3.1.2 The general Sound Level limit shall be established through measurements or calculation of the one hour equivalent Sound Level L_{eq} caused by road traffic at the Point of Reception.

TABLE 1
GENERAL SOUND LEVEL LIMIT

All Air Conditioning Devices	
Area Type	**L_{eq} (dBA)**
Urban Class 1 and Rural Class 2	One Hour Equivalent Sound Level (Leq) of road traffic plus 5 dBA measured during the period of 07:00 to 21:00 hours

3.1.3 Specific Sound Level Limits

The Specific Sound Level limits identified in Table 2, measured at the Point of Reception, are maximum Sound Level limits, for two types of air conditioning devices used in a residential application.

TABLE 2
SPECIFIC SOUND LEVEL LIMITS

Central Air Conditioning Devices and Window or Through-the-Wall Air Conditioning Devices	
Area Type	**One Hour Leq (dBA)**
Urban Class 1	50
Rural Class 2	45

3.1.4 No other Sound Level limits in this By-law other than Section 3.1 of this By-law shall apply to any air conditioning device used in a residential application.

3.1.5 Part 3 of this By-law does not apply to air conditioners used in connection with institutional, commercial and industrial applications or to multi-family dwellings sharing a common air conditioner.

3.2 LIMITATIONS ON SOUND LEVELS FROM STATIONARY SOURCES

No Person shall emit, or cause or permit the emission of Sound from a Stationary Source such that the one hour equivalent Sound Level (Leq) or the logarithmic mean Impulse Sound Level (L_{LM}) of Sound from that source at a Point of Reception exceeds the applicable Sound Level limits in this part of the By-law and in accordance with the following sub-sections:

3.2.1.1 ESTABLISHMENT OF LIMITS - OBJECTIVE

In general, the limit is given by the Background Sound Level at the Point of Reception. The Sound Level limit must represent the minimum Background Sound Level that occurs or is likely to occur during the operation of the Stationary Source under investigation.

3.2.1.2 The time interval between the Background Sound Level measurement and the measurement of the Sound Level produced by the Stationary Source under impact assessment should be minimized as much as possible. Preferably, the two measurements should be carried out within one hour of each other.

3.2.2 SOUND LEVEL LIMITS – GENERAL

3.2.2.1 For Impulsive Sound from a Stationary Source, other than Quasi-Steady Impulsive Sound, the Sound Level limit expressed in terms of the logarithmic mean impulse Sound Level (L_{LM}) is the Background one hour equivalent Sound Level (Leq) typically caused by road traffic for that Point of Reception.

3.2.2.2 For Quasi-Steady Impulsive Sound from a Stationary Source, the Sound Level limit expressed in terms of the one hour equivalent Sound Level (Leq) is the Background one hour equivalent Sound Level (Leq) typically caused by road traffic for that Point of Reception.

3.2.3 SOUND LEVEL LIMITS - SPECIFIC IMPULSIVE SOUNDS

3.2.3.1 For Impulsive Sound from a Stationary Source (other than Quasi-Steady Impulsive Sound) which is an industrial metal working operation (including but not limited to; forging, hammering, punching, stamping, cutting, forming and moulding), the Sound Level limit at a Point of Reception expressed in terms of the logarithmic mean Impulse Sound Level (L_{LM}) is 60 dBAi if the Stationary Source has been operating since before January 1, 1980, and otherwise is 50 dBAi.

3.2.3.2 For Impulsive Sound from a Stationary Source (other than Quasi-Steady Impulsive Sound) which is the discharge of firearms on the premises of a licensed gun club, the Sound Level limit at a Point of Reception expressed in terms of the logarithmic mean impulse Sound Level (L_{LM}) is:

(a) 70 dBAi if the gun club has been operating since before January 1, 1980; or

(b) 50 dBAi if the gun club began to operate after January 1, 1980; or

(c) the L_{LM} prior to any expansion, alteration or conversion of the gun club.

3.2.3.3 For Impulsive Sound from a Stationary Source (other than Quasi-Steady Impulsive Sound) which is an operation in a surface mine or quarry other than a blasting operation, characterized by impulses which are so infrequent that they cannot normally be measured using the procedure for frequent impulses, the Sound Level limit at a Point of Reception expressed in terms of the logarithmic mean impulse Sound Level is 100 dBAi.

3.2.4 SOUND LEVEL LIMITS - PEST CONTROL DEVICES

3.2.4.1 For Impulsive Sound, other than Quasi-Steady Impulsive Sound, from a pest control device employed solely to protect growing crops, the Sound Level limit at a Point of Reception expressed in terms of the logarithmic mean Impulse Sound Level (L_{LM}) is 70 dBAi.

3.2.4.2 For Quasi-Steady Impulsive Sound from a pest control device employed solely to protect growing crops, the Sound Level limit at a Point of Reception expressed in terms of the one hour equivalent Sound Level (Leq) is 60 dBA.

3.2.5 PROHIBITION - PEST CONTROL DEVICES

The operation of a pest control device employed solely to protect growing crops outdoors during the hours of darkness, sunset to sunrise, is prohibited.

3.2.6 EXCLUSION

No restrictions apply to a Stationary Source resulting in a one hour equivalent Sound Level (Leq) or a logarithmic mean impulse Sound Level (L_{LM}) lower than the minimum values for that time period specified in Table 3 for Class 1 and 2 Areas.

TABLE 3
Minimum Values of One Hour Leq or L_{LM} by Time of Day

	One Hour Leq (dBA) or L_{LM} (dBAi)	
Time of Day	Urban Class 1 Area	Rural Class 2 Area
0700 - 1900	50	45
1900 - 2300	47	40
2300 - 0700	45	40

3.3 LIMITATIONS ON INTERIOR SOUND LEVELS THROUGH PARTY WALLS BETWEEN OWNER-OCCUPIED SEMI-DETACHED AND TOWNHOUSE DWELLINGS

No Person shall operate or use or cause to be operated or used any Sound reproduction device in any owner-occupied dwelling that forms part of a semi-detached, or townhouse building, the Noise from which Sound reproduction device, is clearly audible in another dwelling within the said building, and has Sound Levels greater than the levels specified in Table 4 when measured in the other dwelling within the said building:

TABLE 4
Limitations on Interior Sound Levels through Party Walls between Owner – Occupied Semi-Detached and Townhouse Dwellings

	Maximum Leq Sound Level in any Consecutive 20 Minutes	
Time of Day	Leq $_{20\ minutes}$ in dBA	Leq $_{20\ minutes}$ in dB
0700 – Weekdays and 1700 Saturdays	45 dBA	53 dB
0900 – 1700 Sundays and Statutory Holidays	45 dBA	53 dB
1700 – 2400 All days	40 dBA	48 dB
2400 – 0700 Weekdays and Saturdays	Not Clearly Audible (must use qualitative provisions of this Noise By-law)	
2400 – 0900 Sundays and Statutory Holidays	Not Clearly Audible (must use qualitative provisions of this Noise By-law)	

3.4 LIMITATION ON INTERIOR SOUND LEVELS THROUGH PARTY WALLS EMITTED BY COMMERCIAL ESTABLISHMENTS

No Person shall operate or use or cause to be operated or used any Sound reproduction device originating from or in connection with the operation of any commercial establishment, the Noise from which Sound reproduction device when measured from an adjoining business within the same building has Sound Levels greater than the following scheduled levels specified in Table 5:

Table 5
Limitation on Interior Sound Levels through Party Walls
Emitted by Commercial Establishments

	Maximum Leq Sound Level in any Consecutive 20 Minutes	
Time of Day	Leq $_{20\ minutes}$ in dBA	Leq $_{20\ minutes}$ in dB
0700 – Weekdays and 1700 Saturdays	45 dBA	53 dB
0900 – 1700 Sundays and Statutory Holidays	45 dBA	53 dB
1700 – 2400 All days	40 dBA	48 dB
2400 – 0700 Weekdays and Saturdays	Not Clearly Audible (must use qualitative provisions of this Noise By-law)	
2400 – 0900 Sundays and Statutory Holidays	Not Clearly Audible (must use qualitative provisions of this Noise By-law)	

3.5 LIMITATION ON EXTERIOR SOUND LEVELS DUE TO A SOUND REPRODUCTION DEVICE

No Person shall operate or cause to be operated or used any Sound reproduction device, the Noise from which Sound reproduction device has Sound levels greater than the following scheduled levels specified in Table 6 when measured outside of the business, dwelling house, apartment house, hotel or other residence inside the Property of another Person.

TABLE 6

Limitation on Exterior Sound Levels Due to a Sound Reproduction Device

	Maximum Leq Sound Level in any Consecutive 20 Minutes	
Time of Day	Leq $_{20\ minutes}$ in dBA	Leq $_{20\ minutes}$ in dB
0700 – 1700 Weekdays Saturdays	55 dBA	63 dB
0900 – 1700 Sundays and Statutory Holidays	55 dBA	63 dB
1700 – 2400 All days	50 dBA	50 dB
2400 – 0700 Weekdays and Saturdays	Not Clearly Audible (must use qualitative provisions of this Noise By-law)	
2400 – 0900 Sundays and Statutory Holidays	Not Clearly Audible (must use qualitative provisions of this Noise By-law)	

3.6 LIMITATION ON EXTERIOR SOUND LEVELS DUE TO OPERATION OF SNOW REMOVAL EQUIPMENT

No Person shall operate or cause to be operated or used any snow removal equipment, the Noise from which Sound has a Leq greater than 73 dBA when measured from a minimum distance of 7.5 metres from the source of Sound.

3.7 LIMITATION ON EXTERIOR SOUND LEVELS DUE TO BLASTING OPERATIONS

No Person shall emit or cause or permit the emission of Sound (concussion) from a blasting operation in a mine or quarry, such that the peak pressure level at a Point of Reception located in a Residential Area, exceeds 120 dB measured from a location out-of-doors within 7 metres from a building.

3.8 LIMITATION ON EXTERIOR SOUND LEVELS DUE TO CONSTRUCTION EQUIPMENT

No Person shall emit or cause or permit the emission of any Sound from any item of Construction Equipment of a type referred to in or that exceeds the Sound Levels specified in Table 7 at a Construction site, any part of which, is located in or within 600 m of a Residential Area.

TABLE 7

Limitation on Exterior Sound Levels Due to Construction Equipment

Type of Equipment (manufactured after January 1, 1981)	**Maximum Sound Level (dBA)**	
	Power Rating Less than 75 kW	Power Rating 75 kW and Larger
Excavation Equipment, Bulldozers, Loaders, Backhoes, or other equipment capable of being used for similar application.	83 dBA	85 dBA
Pneumatic Pavement Breakers	85 dBA	
Portable Air Compressors	76 dBA	
Tracked Drills	100 dBA	

3.9 PREEMPTION

3.9.1 Despite the compliance of any Noise with the provisions of the specified Sound Level limits contained in Part 3 of this By-Law, the provisions of this By-Law respecting prohibitions by time and place contained in Part 2 shall still apply.

3.9.2 In the event of a conflict between the Prohibitions contained in Part 2 of this By-law and the Regulations contained in Part 3, the more restrictive provisions shall apply.

PART 4 EXEMPTIONS

4.1 This By-law does not apply:

4.1.1 during an emergency involving the health, safety or welfare of the public;

4.1.2 where the Town or the Region of Halton, its servants, employees, contractors or agents are carrying out emergency work for the Town or Regional operations or are operating, maintaining or installing Municipally or Regionally owned infrastructure, facilities, or the like, including but not limited to, the removal of waste and snow for the purpose of preserving the health, safety or welfare of the public;

4.1.3 to any activity or Public Event listed in the attached Schedule “B”.

4.1.4 to a Normal Farm Practice as defined by the *Farming and Food Production Protection Act, 1998,* S.O. 1998, c.1. The Town may however, request mediation or intervention of the Normal Farm Practices Board as regulated by the said Act.

4.1.5 to the extent that any Person is granted an exemption to Part 2 or Part 3 of this By-law by Council pursuant to Part 5 of this By-law, provided all terms and conditions set by Council are met for the period of time set out in the exemption granted; and

4.1.6 where reversing alarms (beepers) are required or authorized by law or in accordance with good safety practices as deemed necessary.

PART 5 GRANT OF NOISE EXEMPTION BY COUNCIL

5.1 Council may, by resolution upon receipt of a written application, grant an exemption from the provisions of Part 2 or Part 3 in connection with an event or activity, to any Person, with respect to any source of Sound for which a Person might otherwise be prosecuted, for such period of time and subject to such terms and conditions as Council deems advisable, and Council may refuse to grant any exemption or may grant an exemption of lesser effect than applied for and any exemption granted shall specify the time period during which it is effective.

5.2 An application for an exemption under Part 5.1 shall be filed with the Designated Official and submitted on an application in the form prescribed by the Designated Official and shall provide:

5.2.1 The applicant's name, address, and telephone number;

5.2.2 The date, time, and location of the event or activity for which the exemption is sought and where applicable, the number of people expected to attend;

5.2.3 A description of the source of the Sound and/or vibration in respect of which the exemption is being sought;

5.2.4 The section of the By-law from which exemption is sought;

5.2.5 The period of time for which exemption is sought;

5.2.6 The purpose or reasons why the exemption is being sought;

5.2.7 The name, address and telephone number of at least one contact Person who will supervise the event or activity;

5.2.8 A written undertaking that one or more contact Persons responsible for supervising the event or activity will be on-site during the entire event or activity to ensure compliance with any terms and conditions imposed by Council;

5.2.9 No less than ten (10) days before the day of the hearing of the application for an exemption, notification must be sent to owners of neighbouring properties who may be impacted by the Noise by way of delivery of a written notice; by personal service or prepaid first class mail;

5.2.9.1 within an Urban Class 1 Area within 60 metres of the area to which the application applies.

5.2.9.2 within a Rural Class 2 Area within 500 metres of the area to which the application applies

5.2.10 Service by prepaid first class mail shall be deemed to be effective on the fifth (5) day after the order is mailed.

5.2.11 Proof of publication for two consecutive days no less than ten (10) days before the day of the hearing of the application, in a newspaper of general circulation within the Town, of a notice of intention to apply for an exemption to the Noise provisions of this By-law, containing the information required in Part 5, Section 5.2 thereof, and stating the date upon which application to Council is intended to be made.

5.3 A copy of the application for exemption shall be delivered to a Designated Official who shall investigate the feasibility of the location with respect to the adjacent neighbouring properties, and prepare a report to Council, which report shall contain the Official's opinion on the merits of the application and recommendations as to terms and conditions, if any.

5.4 In deciding whether to grant the exemption, Council shall consider the application, the report of the Designated Official, and any written submissions then received by Council, and shall give the applicant and any Person opposed to the application an opportunity to be heard and may consider such other matters as it sees fit.

5.5 A breach by the applicant of any of the terms or conditions imposed by Council in granting an exemption shall immediately render the exemption null and void.

5.6 Any exemption granted by Council hereunder is specific to the applicant, event, Sound source, location and time identified in the approved application, and any attempt to alter any provisions thereof, or to assign the benefit thereof to another Person, is invalid and shall immediately thereupon render the exemption null and void.

PART 6 PENALTIES AND ENFORCEMENT

6.1 Every Person who contravenes any of the provisions of this By-law, and every director or officer of a corporation who knowingly concurs in the contravention by the corporation is guilty of an offence and upon conviction is liable to a fine not exceeding Fifty Thousand Dollars ($50,000.00) as provided for in the *Municipal Act, 2001*, as amended.

6.2 Where a corporation is convicted of an offence under this By-law, the maximum penalty that may be imposed on the corporation is One Hundred Thousand Dollars ($100,000.00) as provided for in the Municipal Act, 2001, as amended.

6.3 Not withstanding Subsection 6.1, every Person who is guilty of a continuing offence, on conviction is liable to a fine of no less than five hundred dollars ($500.00), and no more than ten thousand dollars ($10,000.00) for each day or part of a day that each offence continues, and the total of all fines for each offence is not limited to one hundred thousand dollars ($100,000.00) as provided for in the Municipal Act, 2001, as amended

6.4 An Officer may enter on land at any reasonable time for the purpose of carrying out an inspection to determine whether or not the provisions of this By-law are complied with and to enforce and carry out or put into effect the provisions of this By-law or any direction or order issued pursuant to the *Municipal Act, 2001,* S.O. 2001, c.25 or this By-law.

6.5 For the purposes of an inspection under section 6.4 the Officer may,

6.5.1 require the production for inspection of documents or things relevant to the inspection;

6.5.2 inspect and remove documents or things relevant to the inspection for the purpose of making copies or extracts;

6.5.3 require information from any Person concerning a matter related to the inspection; and

6.5.4 alone or in conjunction with a Person possessing special or expert knowledge, make examinations or take tests, samples or photographs necessary for the purposes of the inspection.

6.6 A sample taken under subsection 6.5.4 shall be divided into two parts, and one part shall be delivered to the Person from whom the sample is taken, if the Person so requests at the time the sample is taken and provides the necessary facilities.

6.7 If a sample is taken under subsection 6.5.4 and the sample has not been divided into two parts, a copy of any report on the sample shall be given to the Person from whom the sample was taken.

6.8 A receipt shall be provided for any document or thing removed under subsection 6.5.2 and the document or thing shall be promptly returned after the copies or extracts are made.

6.9 No Person shall hinder or obstruct, or attempt to hinder or obstruct, an Officer who is exercising a power or performing a duty under this By-law.

6.10 If the Officer is satisfied that a contravention of this By-law has occurred, the Officer may make an order requiring the Person who contravened the By-law or who caused or permitted the contravention or the Owner or occupier of the land on which the contravention occurred to:

6.10.1 discontinue the contravening activity, and/or

6.10.2 do work to correct the contravention.

6.11 Any Person who contravenes an order under section 6.10 is guilty of an offence.

6.12 An order under section 6.10 shall set out,

6.12.1 reasonable particulars of the contravention adequate to identify the contravention and the location of the land on which the contravention occurred; and

6.12.2 the date by which there must be compliance with the order.

6.13 An order under section 6.10 shall be served upon the Person to whom it is directed by personal service or by mailing a copy of the order by prepaid

first class mail or registered mail to the last known address noted on the tax assessment roll.

6.14 Service by prepaid first class mail or registered mail shall be deemed to be effective on the fifth day after the order is mailed.

6.15 In default of any work directed or required by an order under this Part being done by the Person directed or required to do it, the matter or thing shall be done at the Person's expense.

6.16 Where the Town or any authorized agent on behalf of the Town has performed the work required to bring about compliance with the By-law, the Town may recover the costs of doing any thing or matter under section 6.15 by action or by adding the costs to the tax roll respecting the Property of the Person named in the order and collecting same in like manner as property taxes.

6.17 The costs in section 6.16 shall include interest calculated at a rate of 15 per cent, calculated for the period commencing on the day the Town incurs the costs and ending on the day the costs, including the interest, are paid in full.

6.18 For the purposes of section 6.16, the Town or any authorized agent on behalf of the Town may enter upon land at any reasonable time and complete the work set out in the order.

6.19 ALTERNATIVE RESPONSE

Where the Designated Official or other Person authorized by Council to enforce this By-law issues an order under this Part to any Person, the Person who is alleged to have violated this By-law may respond to the order within 5 days of the issuance of the order with the submission to the Town of the name of a professionally licensed engineer with extensive experience in acoustics and Noise, who will prepare a Noise study report which must include, but is not limited to, the following information:

6.19.1 the description of the equipment/facility/operation and operating hours;

6.19.2 land use zoning designation of the surrounding area;

6.19.3 location and distance to Points of Reception;

6.19.4 relevant architectural and mechanical drawings, and

6.19.5 details of proposed Noise and vibration control measures.

6.20 Where the Noise study report proposes a solution to the alleged violation of this By-law which is acceptable to the Town in the absolute discretion of Council, then the Person who is alleged to have violated this By-law shall implement the proposal contemplated in the Noise study report in resolution of the alleged violation within 14 days or an appropriate length of time determined by the Designated Official, and if the Person does so implement the proposed solution, then no prosecution under this By-law will be pursued as a result of the alleged violation, subject to Section 6.21.

6.21 If, however, the Noise study report does not propose a solution to the alleged violation acceptable to the Town, or if the Person does not implement the proposed solution within the timeframe specified, or if the proposed solution when implemented continues to result in violations of this By-law, then the Person will remain subject to enforcement and, if convicted of the offence, penalties, under Part 6 of this By-law,.

PART 7 ADMINISTRATION OF THE BY-LAW

7.1 The Designated Official of the Town shall administer and enforce this By-law.

7.2 Municipal law enforcement Officers employed by the Town and police constables who are members of the Halton Regional Police Services are hereby authorized to enforce this By-law.

7.3 If a court of competent jurisdiction should declare any section or a part of this By-law to be invalid, the remainder of this By-law shall continue in force unless the court makes an order to the contrary.

7.4 Where the singular is used it shall also mean or stand for the plural.

7.5 Schedules A, B and C attached hereto form and are part of this By-law.

7.6 This By-law shall come into force and take effect upon the passage of this By-law except for Part 2 and Schedule A of this By-law which shall come into force and take effect on October 1, 2010.

7.7 That Town of Halton Hills By-law No. 1993-0177 respecting noise is hereby repealed on October 1, 2010.

7.8 If there is a conflict between the Town of Halton Hills By-law No. 1993-0177 and this By-law, this By-law shall prevail to the extent of the conflict.

BY-LAW read and passed by the Council for the Town of Halton Hills this day of May, 2010.

_____
MAYOR

_____
TOWN CLERK

SCHEDULE “A” TO By-law No. 2010-0030

NOISE Prohibitions by Time and Place

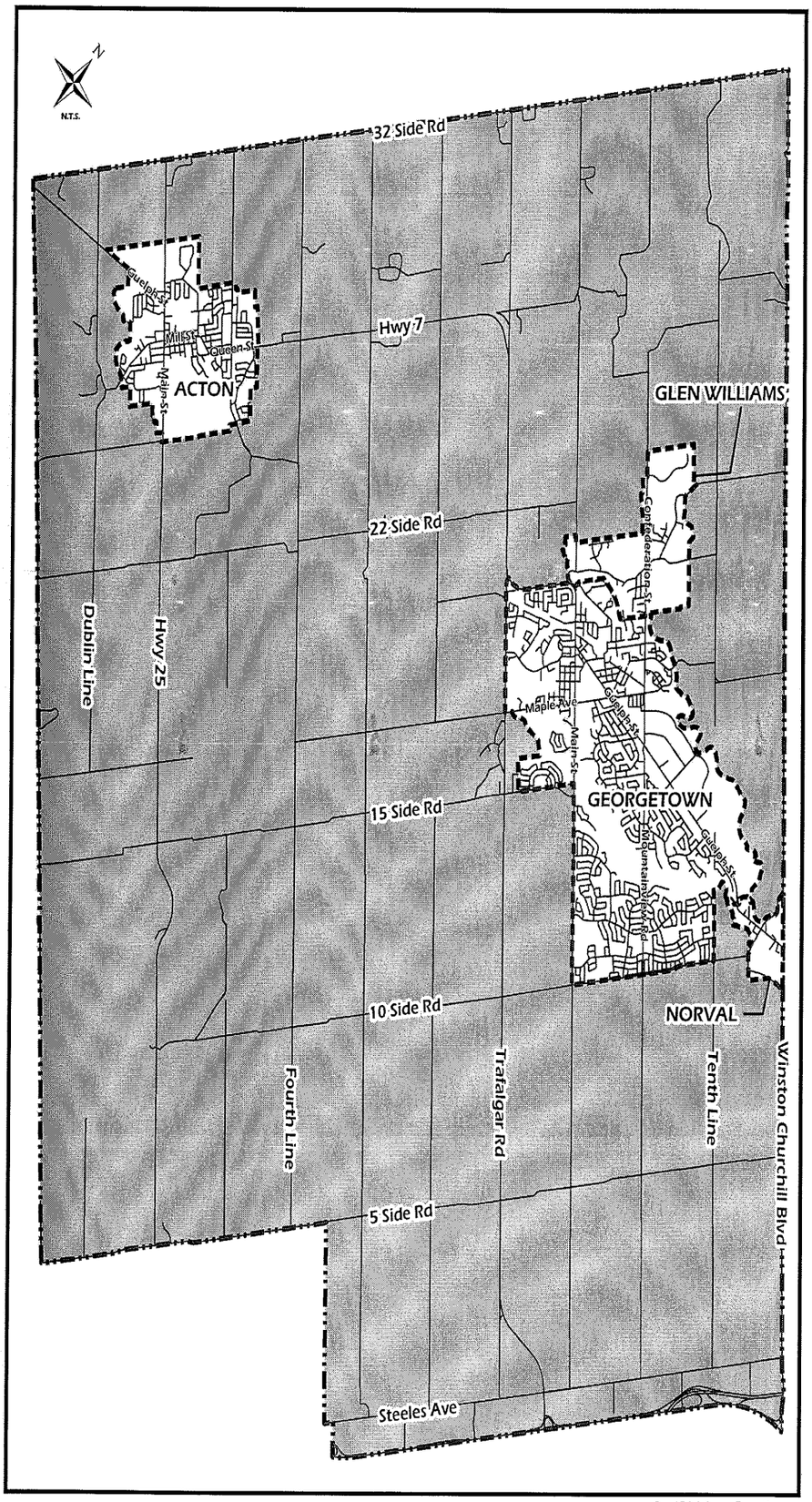
Type of Sound	**Prohibited Time of Day**	**Prohibited Area**
1. Persistent or repetitive barking, whining, or other similar persistent Noise-making of any domestic pet or any other animal kept or used for any purpose other than agriculture.	At any time.	Residential Area
2. The operation, loading, or unloading of any Construction equipment at any Construction site or in connection with Construction.	7:00 pm one day to 7:00 am the next day Monday to Thursday 7:00 pm Friday to 8:00 am Saturday 6:00 pm Saturday to 7:00 am Monday and on any statutory holiday in accordance with the *Retail Business Holidays Act.*	Residential Area
3. The emission of Noise from the operation or use of any tool or device for customary domestic purposes including the servicing, repair, or maintenance of the Property other than snow removal.	9:00 pm one day to 7:00 am the next day Monday to Saturday (9:00 am on Sundays and Statutory holidays in accordance with the *Retail Business Holidays Act*)	Residential Area
4. The operation of any electronic device or group of connected electronic devices incorporating one or more loudspeakers or other electro-mechanical transducers intended for the production, reproduction or amplification of Sound other than from an outdoor patio or in an open-air area of a restaurant, bar, tavern, pub, café, or similar establishment.	11:00 pm one day to 9:00 am the next day.	Residential Area
5. The operation of any electronic device or group of connected electronic devices incorporating one or more loudspeakers or other electro-mechanical transducers intended for the production, reproduction or amplification of Sound on an outdoor patio or in an open-air area of a restaurant, bar, tavern, pub, café, or similar establishment.	11:00 pm Friday to 9:00 am Saturday and from 11:00 pm Saturday to 9:00 am Friday and on any statutory holiday in accordance with the *Retail Business Holidays Act*.	Within 100 metres (328 feet) of a Residential Area
6. Persistent or repetitive yelling, shouting, hooting, whistling or singing.	11:00 pm one day to 7:00 am next day (9:00 am on Sundays)	All Areas
7. All selling or advertising by shouting or outcry or by amplified Sound.	At any time	All Areas
8. The emission of Noise from the loading, unloading, packing, unpacking, delivering or otherwise	9:00 pm one day to 7:00 am the next day Monday to Saturday All day Sunday and on any	Residential Area

handling of any containers, products, materials, or refuse whatsoever.	holiday in accordance with the *Retail Business Holidays Act*.	
9. The operation of any combustion engine and any associated devices without an effective exhaust or in-take muffling device which is in good working order and in constant operation.	At any time	Residential Area
10. The operation of a dirt bike, trail bike, moped, snowmobile, miniature motorcycle, all terrain cycle, go-cart, dune buggy or any like motorized conveyance other than on a highway or provincially licensed race track.	At any time	Within 500 m of a Residential Area
11. The Sound of any private radio or electronic device incorporating one or more loudspeakers or other electro-mechanical transducers intended for the production, reproduction or amplification of Sound in a motor vehicle installed for the sole benefit or entertainment of the operator or occupants of such vehicle.	At any time.	Beyond 10 m (30 feet) from the vehicle.
12. The operation of a combustion engine or an electric motor which is used in or is intended for use in a model or replica of any device, which model or replica has no function other than amusement if clearly audible at the Point of Reception.	At any time	Residential Area
13. The emission of Noise from any operation including but not limited to; the venting or the release of any media, the operation of a power electric generator (except during a power failure), air filtration system, Noise from grinding, milling or the operation of any industrial equipment or machinery.	11:00 pm one day to 7:00 am the next day	Residential Area
14. Any blasting operations in connection with the removal, manufacturing or processing of any material within the Town.	6:00 pm one day to 7:00 am the next day Monday to Saturday. All day Sunday and on any holiday in accordance with the *Retail Business Holidays Act*	All Areas
15. The operation of Heavy Equipment including or in connection with a salvage yard or other recycling operation.	5:00 pm one day to 8:00 am the next day Monday to Friday 3:00 pm on Saturday to 8:00 am on Monday and on any statutory holiday in accordance with the *Retail Business Holidays Act*.	Residential Area
16. Farming operation that emits Noise that is not considered a Normal Farm Practice.	At any time	Residential Area

SCHEDULE “B” to By-law No. 2010-0030

	PUBLIC EVENTS		
1.	Acton Canada Day Concert & Fireworks	July	Fairy Lake
2.	Acton Fall Fair	September	Fairgrounds
3.	Acton Leathertown Festival	August	Mill St. Acton
4.	Acton Santa Claus Parade	November	
5.	A Taste of Acton	June	BIA area
6.	Bang O’Rama - Georgetown	May	Fairgrounds
7.	Classics Against Cancer - Georgetown	June	Cedarvale
8.	Festival on Main - Georgetown	July	BIA area
9.	Georgetown Fall Fair	September	Fairgrounds
10.	Georgetown Farmers Market	June	Main St.
11.	Georgetown Highland Games	June	Fairgrounds
12.	Georgetown Santa Claus Parade	November	Guelph St.
13.	Glen Williams Canada Day Celebration	July	
14.	Remembrance Day Parade- Acton	November	
15.	Remembrance Day Parade- Georgetown	November	
16.	Remembrance Day Parade- Glen Williams	November	
17.	Rock N’ Roll Classics-Georgetown	August	Main St.
18.	Warrior’s Day Parade-Georgetown	August	Remembrance

SCHEDULE "C" TO BY-LAW 2010-0030

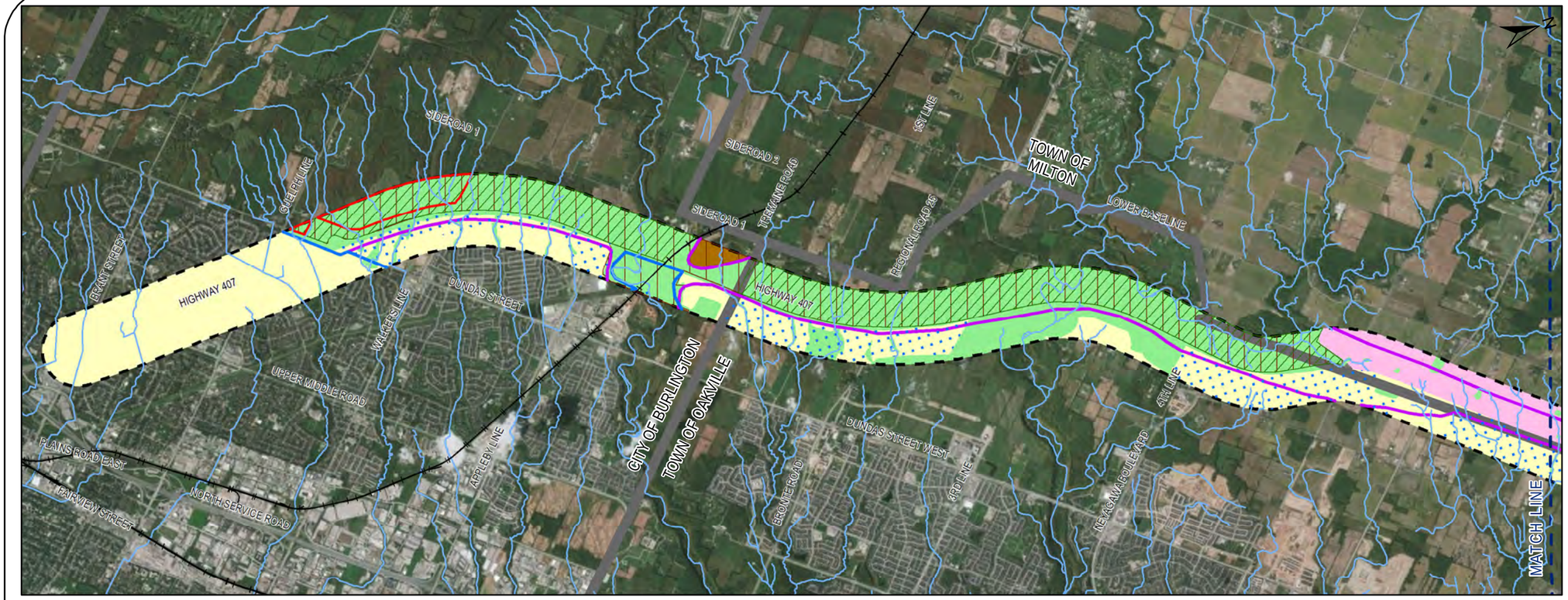


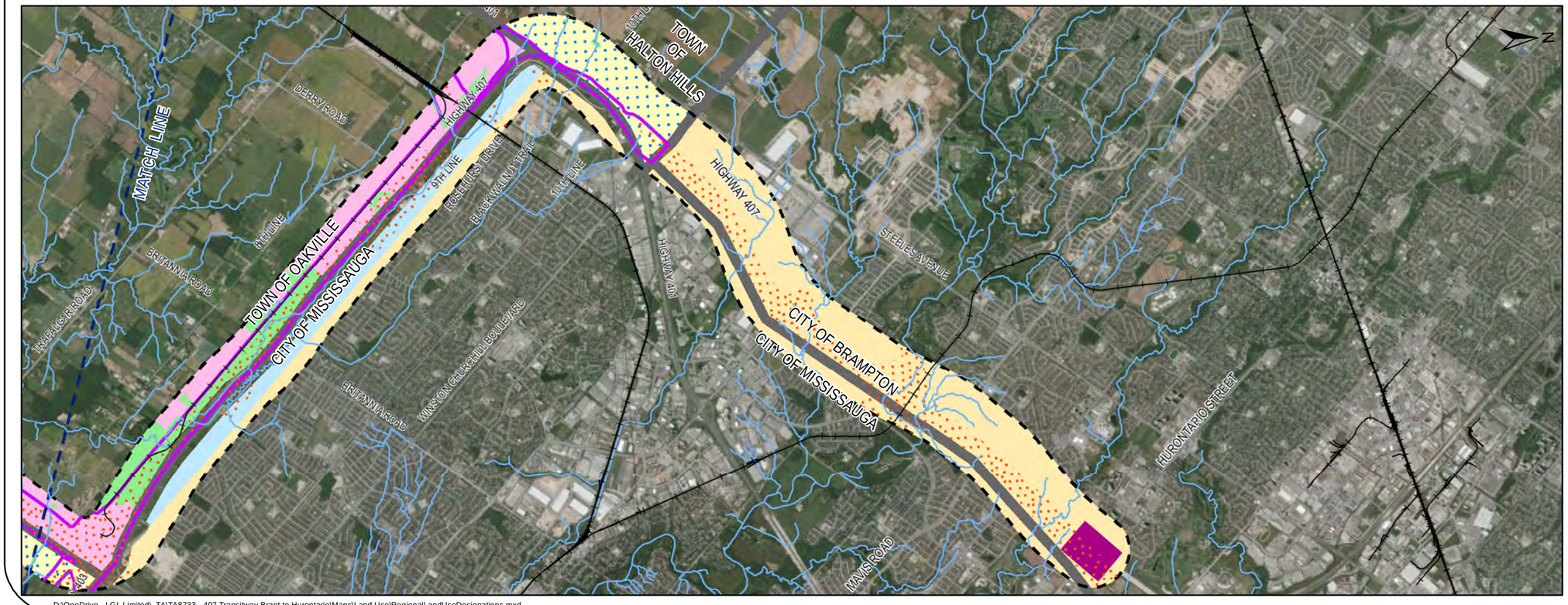
Parcel Fabric Source: Teranet Inc.

Urban Class 1 Area

Rural Class 2 Area

APPENDIX G: LAND USE DESIGNATIONS





LEGEND

- Study Area
- Municipal Boundary
- Watercourse
- Railway

Halton Region Regional Structure

- Urban Area
- Agricultural Area
- Regional Natural Heritage System
- Mineral Resource Extraction Area
- Greenbelt Natural Heritage System
- Greenbelt Plan Protected Countryside Boundary
- Niagara Escarpment Plan Boundary
- Parkway Belt West Plan Boundary
- Built Boundary
- Employment Area

Peel Region Regional Structure

- Urban System
- Regional Intensification Corridor
- Ninth Line Lands
- Area With Special Policies

Data Sources: Halton Region, Peel Region

0 750 1,500 2,250 3,000 m

407 TRANSITWAY WEST REGIONAL LAND USE DESIGNATIONS

LGL LIMITED environmental research associates

Project:	TA8733	**Figure:**	3
Date:	September, 2019	**Prepared By:**	JJP
Scale:	1 : 50,000	**Checked By:**	SK

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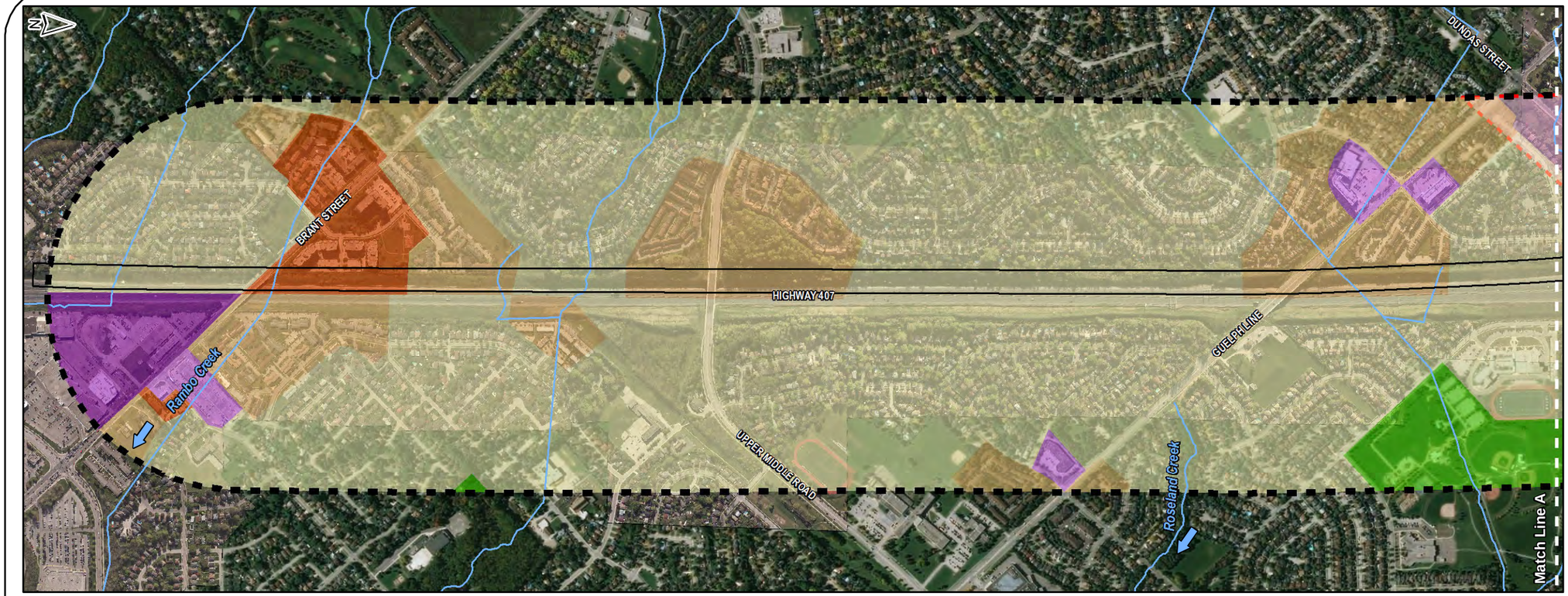

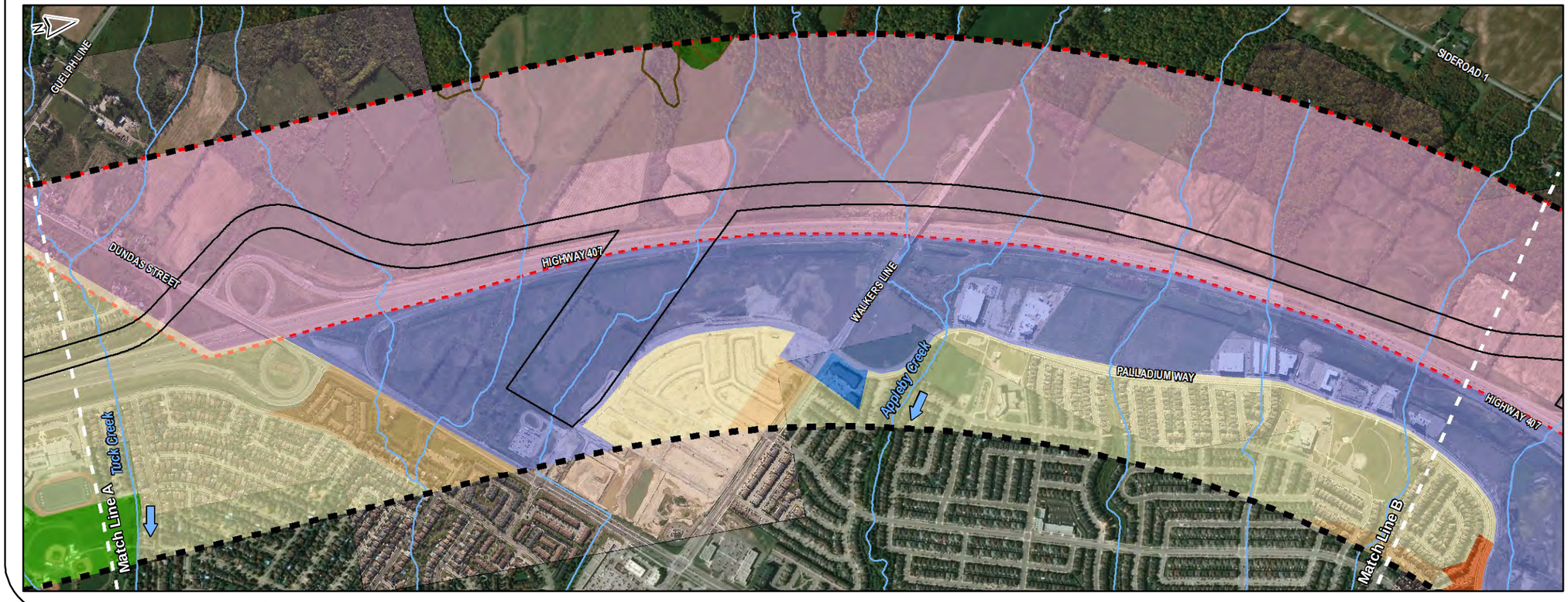

LEGEND

- Study Area
- 407 Transitway West Running Way
- Municipal Boundary
- Watercourse
- Railway

Land Use - Burlington

- Residential - Low Density
- Residential - Medium Density
- Residential - High Density
- General Employment
- Business Corridor
- Regional Commercial
- Neighbourhood Commercial
- Mixed Use Corridor - General
- Greenlands
- Major Parks and Open Space
- Environmentally Sensitive Area
- Parkway Belt Plan Area
- Land Use Designation to be Determined
- Greenlands (Non-Escarpment Plan Area)
- Greenlands (Escarpment Plan Area)
- Agricultural Rural Area
- Mineral Resource Extraction Area
- Referral Area R9

Data Sources: City of Burlington, Town of Oakville, Town of Milton, City of Mississauga, Town of Halton Hills, City of Brampton and Ministry of Natural Resources and Forestry (LIO).

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407 TRANSITWAY WEST
LOWER TIER MUNICIPAL LAND USE DESIGNATIONS

LGL LIMITED
environmental research associates

Project:	TA8733	**Figure:**	4a
Date:	November, 2019	**Prepared By:**	JJP
Scale:	1 : 12,000	**Checked By:**	SK

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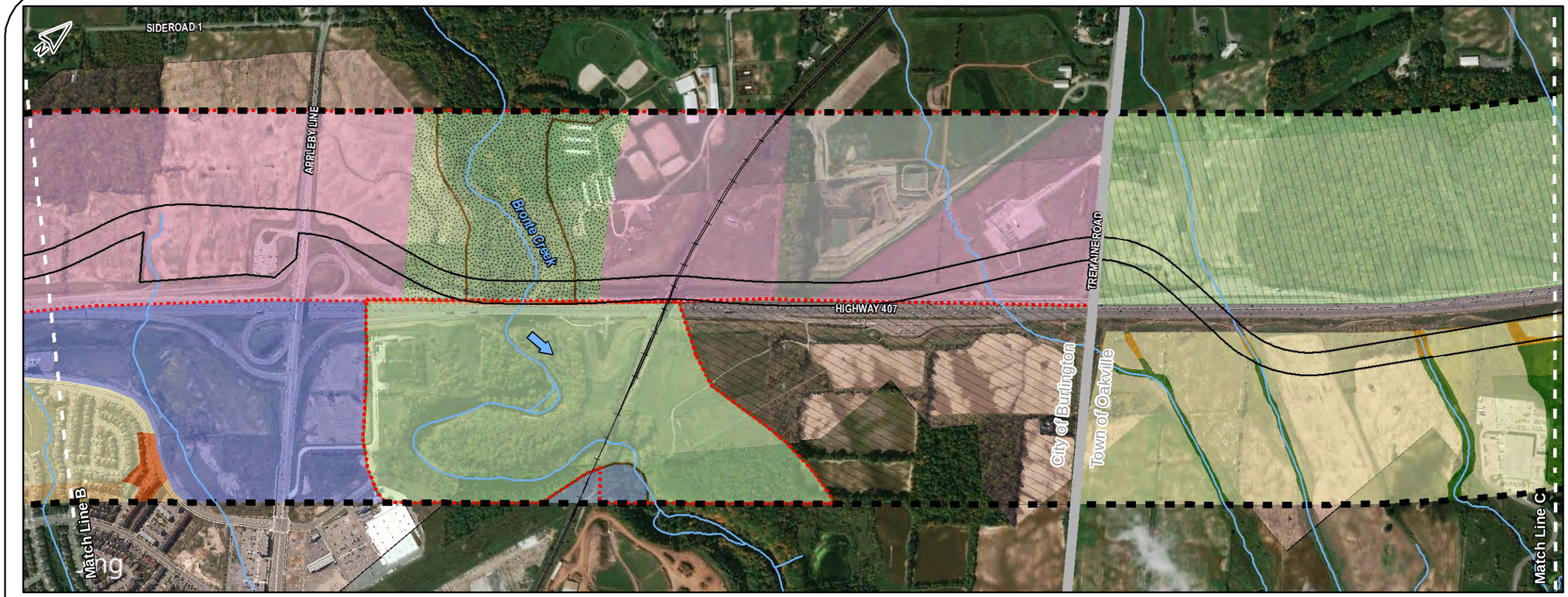

LEGEND

- Study Area
- 407 Transitway West Running Way
- Municipal Boundary
- Watercourse
- Railway

Land Use - Burlington

- Residential - Low Density
- Residential - Medium Density
- Residential - High Density
- General Employment
- Business Corridor
- Regional Commercial
- Neighbourhood Commercial
- Mixed Use Corridor - General
- Greenlands
- Major Parks and Open Space
- Environmentally Sensitive Area
- Parkway Belt Plan Area
- Land Use Designation to be Determined
- Greenlands (Non-Escarpment Plan Area)
- Greenlands (Escarpment Plan Area)
- Agricultural Rural Lands
- Mineral Resource Extraction Area
- Referral Area R9

Land Use - Oakville

- Transitway
- Neyagawa Blvd. Urban Core Area
- Trafalgar Road Urban Core Area
- Transitional Area
- Employment Area
- Natural Heritage System Area
- Stormwater Managment Facility
- Utility Corridor
- General Urban Area
- Sub Urban Area
- Parkway Belt
- Greenbelt
- Employment District
- Subject Lands Under Appeal

Data Sources: City of Burlington, Town of Oakville, Town of Milton, City of Mississauga, Town of Halton Hills, City of Brampton and Ministry of Natural Resources and Forestry (LIO).

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407 TRANSITWAY WEST
LOWER TIER MUNICIPAL LAND USE DESIGNATIONS

LGL LIMITED
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Project:	TA8733	**Figure:**	4b
Date:	November, 2019	**Prepared By:**	JJP
Scale:	1 : 12,000	**Checked By:**	SK

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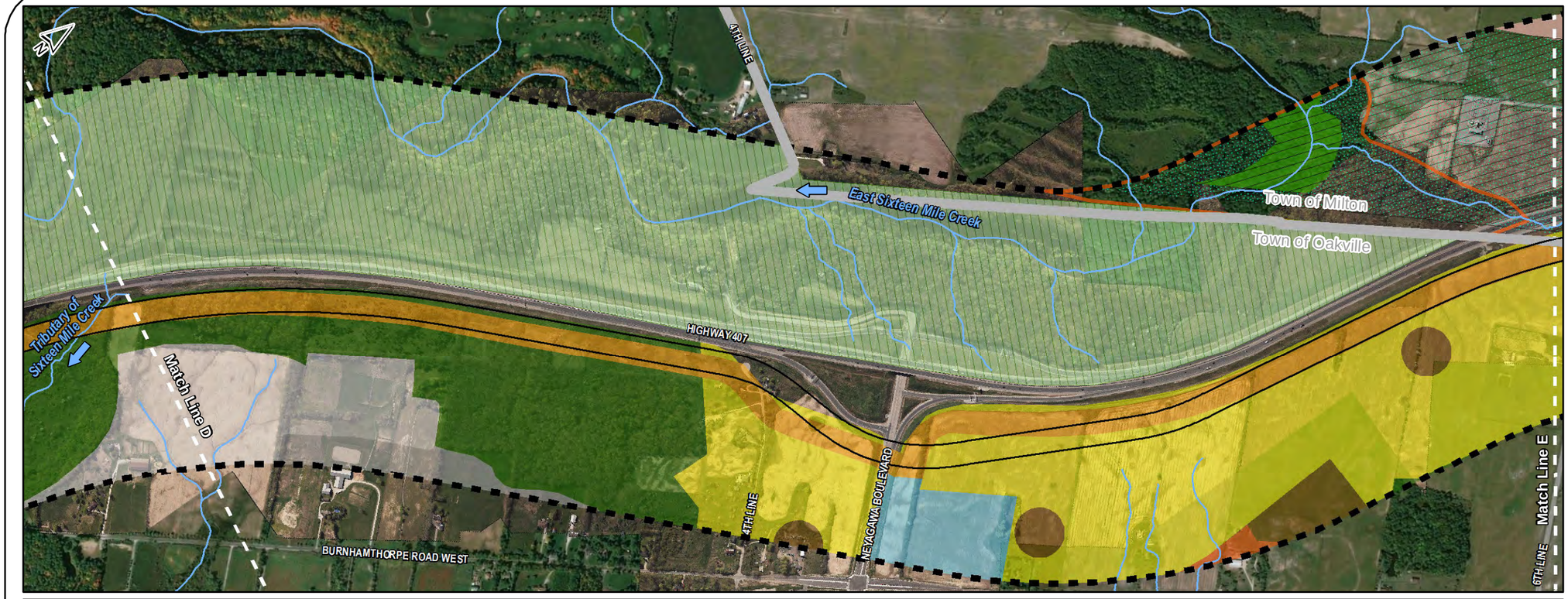

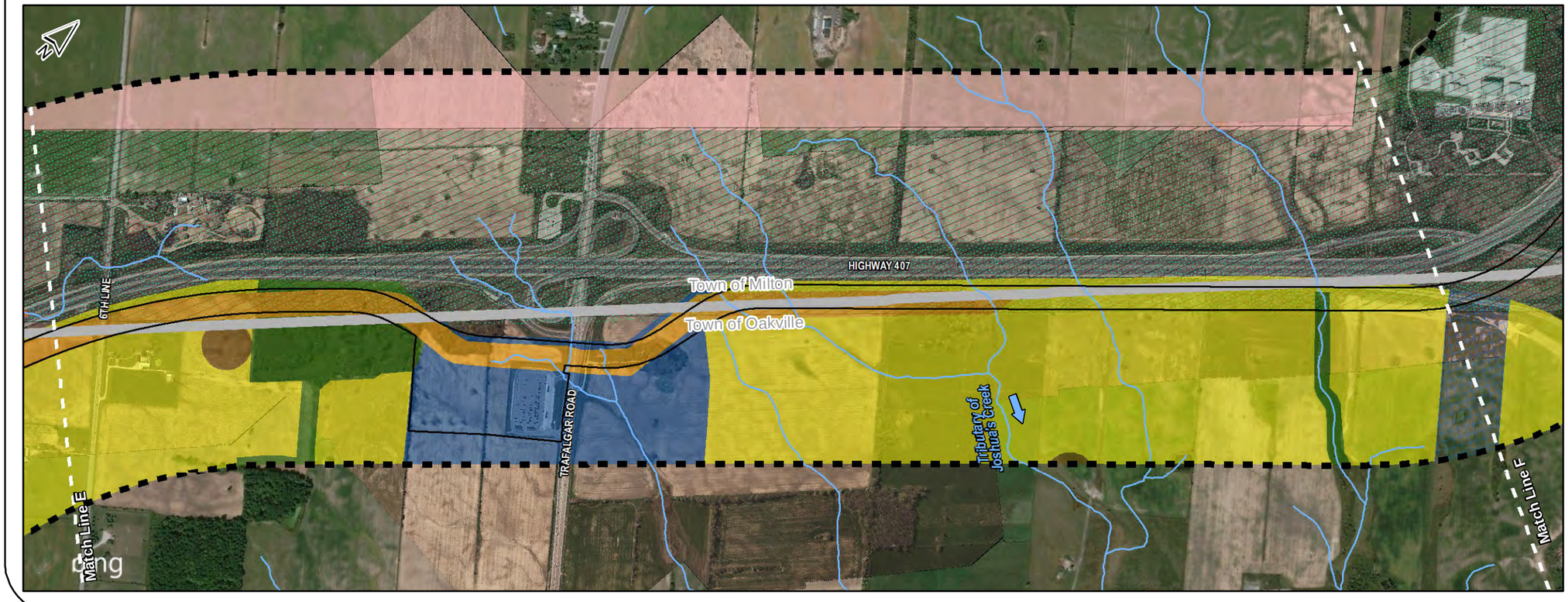

LEGEND

- Study Area
- 407 Transitway West Running Way
- Municipal Boundary
- Watercourse
- Railway

Land Use - Oakville

- Transitway
- Neyagawa Blvd. Urban Core Area
- Trafalgar Road Urban Core Area
- Transitional Area
- Employment Area
- Natural Heritage System Area
- Stormwater Managment Facility
- Utility Corridor
- General Urban Area
- Sub Urban Area
- Parkway Belt
- Greenbelt
- Employment District
- Subject Lands Under Appeal

Land Use - Milton

- Agricultural Area
- Deferred and Appealed Areas
- Environmentally Sensitive Area
- Parkway Belt West Plan Area
- Greenlands A Area
- Greenlands B Area

Data Sources: City of Burlington, Town of Oakville, Town of Milton, City of Mississauga, Town of Halton Hills, City of Brampton and Ministry of Natural Resources and Forestry (LIO).

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407 TRANSITWAY WEST LOWER TIER MUNICIPAL LAND USE DESIGNATIONS

LGL LIMITED
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Project:	TA8733	**Figure:**	4c
Date:	November, 2019	**Prepared By:**	JJP
Scale:	1 : 12,000	**Checked By:**	SK

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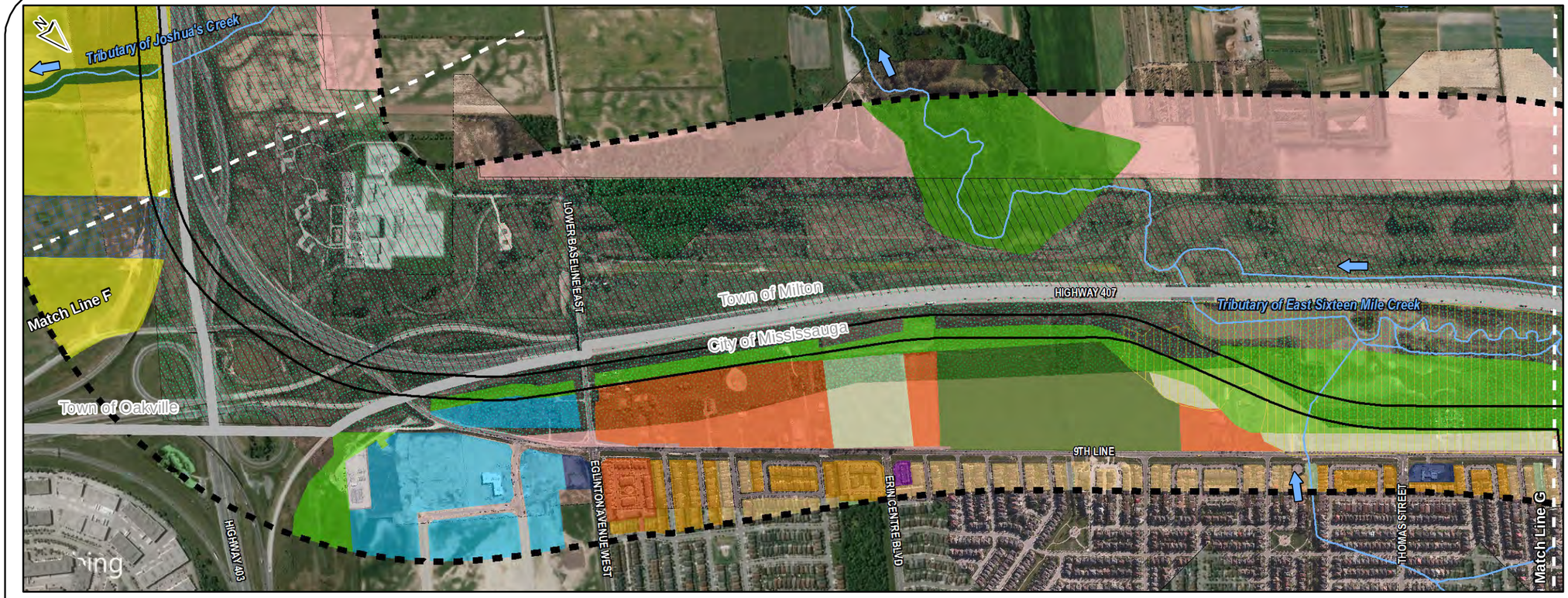

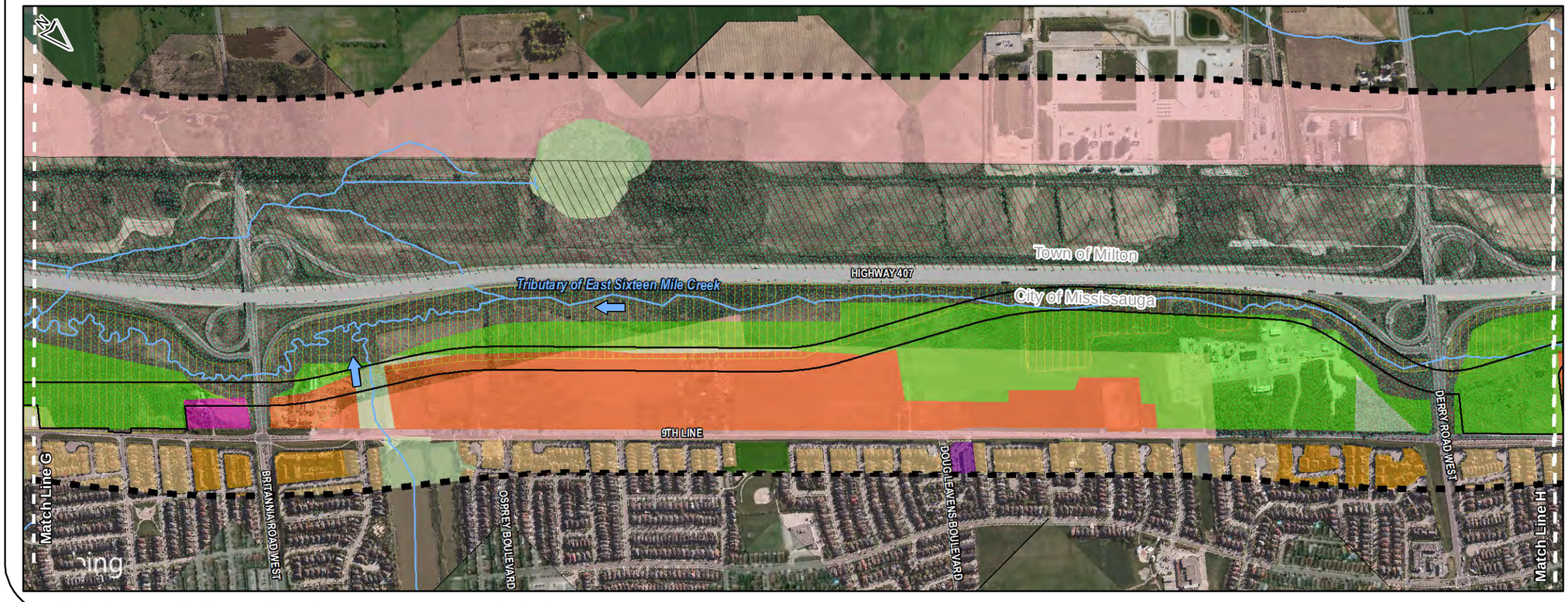

LEGEND

- Study Area
- 407 Transitway West Running Way
- Municipal Boundary
- Watercourse
- Railway

Land Use - Oakville

- Transitway
- Neyagawa Blvd. Urban Core Area
- Trafalgar Road Urban Core Area
- Transitional Area
- Employment Area
- Natural Heritage System Area
- Stormwater Managment Facility
- Utility Corridor
- General Urban Area
- Sub Urban Area
- Parkway Belt
- Greenbelt
- Employment District
- Subject Lands Under Appeal

Land Use - Milton

- Agricultural Area
- Deferred and Appealed Areas
- Environmentally Sensitive Area
- Parkway Belt West Plan Area
- Greenlands A Area
- Greenlands B Area

Land Use - Mississauga

- Residential Low Density II
- Residential Medium Density
- Residential High Density
- Mixed Use
- Convenience Commercial
- Motor Vehicle Commercial
- Business Employment
- Public Open Space
- Greenlands
- Parkway Belt West
- Utility
- Office
- Corporate Boundary
- Employment Area Boundary
- Natural Hazard Area

Data Sources: City of Burlington, Town of Oakville, Town of Milton, City of Mississauga, Town of Halton Hills, City of Brampton and Ministry of Natural Resources and Forestry (LIO).

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407 TRANSITWAY WEST LOWER TIER MUNICIPAL LAND USE DESIGNATIONS

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Project:	TA8733	**Figure:**	4d
Date:	November, 2019	**Prepared By:**	JJP
Scale:	1 : 12,000	**Checked By:**	SK

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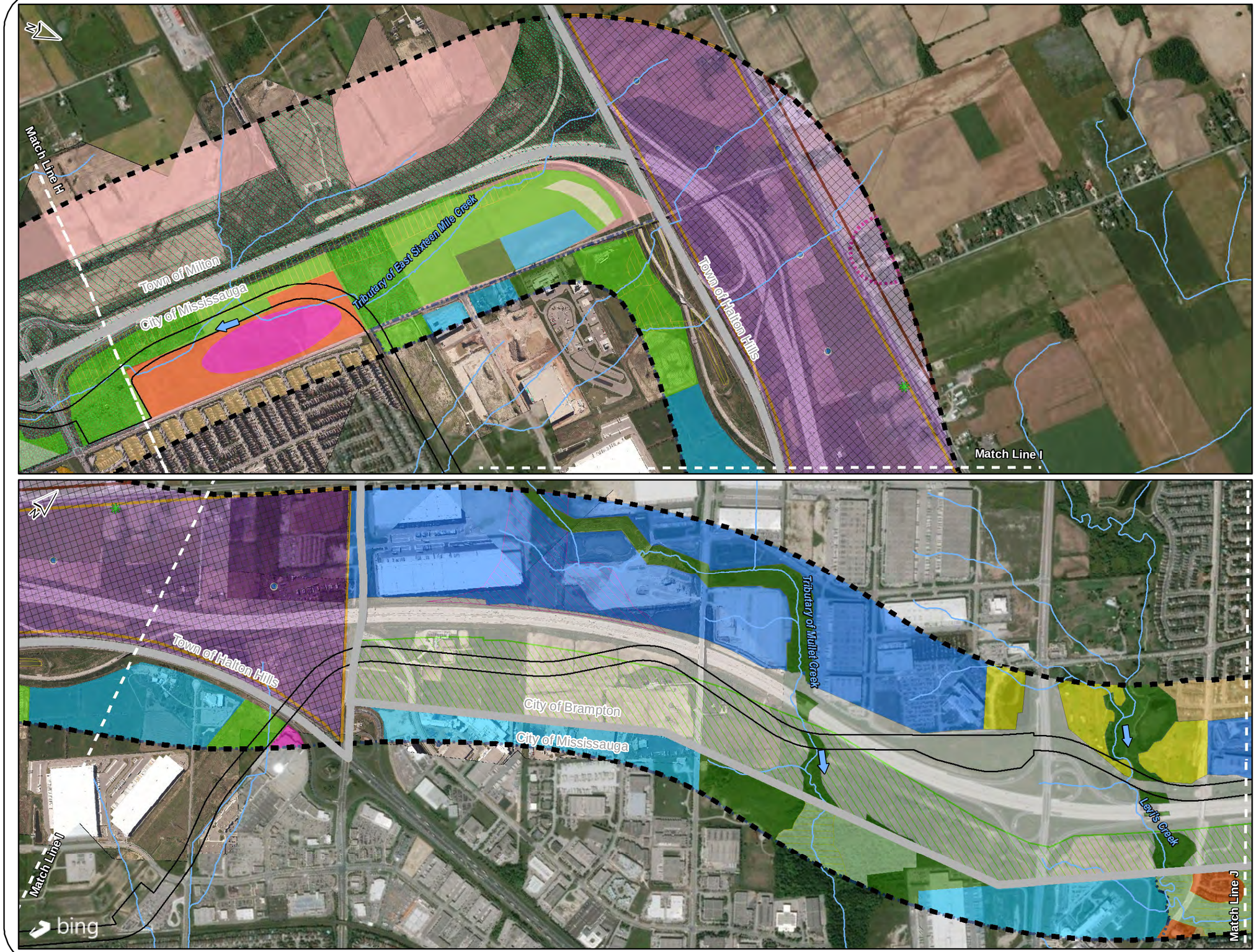

LEGEND

- Study Area
- 407 Transitway West Running Way
- Municipal Boundary
- Watercourse
- Railway

Land Use - Milton
- Agricultural Area
- Deferred and Appealed Areas
- Environmentally Sensitive Area
- Parkway Belt West Plan Area
- Greenlands A Area
- Greenlands B Area

Land Use - Mississauga
- Residential Low Density II
- Residential Medium Density
- Residential High Density
- Mixed Use
- Convenience Commercial
- Motor Vehicle Commercial
- Business Employment
- Public Open Space
- Greenlands
- Parkway Belt West
- Utility
- Office
- Corporate Boundary
- Employment Area Boundary
- Natural Hazard Area

Land Use - Halton Hills
- Phase 2b Employment Area
- Prestige Industrial Area
- Gateway Area
- Greenlands
- Employment Phase 2A
- Employment Phase 2B
- Existing Rural Residential Concentration
- HPBATS/GTA West Corridor Protection Area
- Building With Historic Significance
- Stormwater Management Pond

Land Use - Brampton
- Industrial
- Corridor Protection Area
- Parkway Belt West
- Provincial Highways
- Open Space
- Residential
- Village Residential
- Office
- L.B.P.I.A Operating Area

Data Sources: City of Burlington, Town of Oakville, Town of Milton, City of Mississauga, Town of Halton Hills, City of Brampton and Ministry of Natural Resources and Forestry (LIO).

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407 TRANSITWAY WEST
LOWER TIER MUNICIPAL LAND USE DESIGNATIONS

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Project:	TA8733	**Figure:**	4e
Date:	November, 2019	**Prepared By:**	JJP
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LEGEND

- Study Area
- 407 Transitway West Running Way
- Municipal Boundary
- Watercourse
- Railway

Land Use - Mississauga

- Residential Low Density II
- Residential Medium Density
- Residential High Density
- Mixed Use
- Convenience Commercial
- Motor Vehicle Commercial
- Business Employment
- Public Open Space
- Greenlands
- Parkway Belt West
- Utility
- Office
- Corporate Boundary
- Employment Area Boundary
- Natural Hazard Area

Land Use - Brampton

- Industrial
- Corridor Protection Area
- Parkway Belt West
- Provincial Highways
- Open Space
- Residential
- Village Residential
- Office
- L.B.P.I.A Operating Area

Data Sources: City of Burlington, Town of Oakville, Town of Milton, City of Mississauga, Town of Halton Hills, City of Brampton and Ministry of Natural Resources and Forestry (LIO).

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407 TRANSITWAY WEST
LOWER TIER MUNICIPAL LAND USE DESIGNATIONS

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Project:	TA8733	**Figure:**	4f
Date:	February, 2020	**Prepared By:**	JJP
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