Noise Impact Assessment Report

Highway 401 East Brockville, From 0.75 km East of North Augusta Road to 3.3 km West of Maitland Road (GWP 4111-22-00)

May 4, 2026

Prepared for:
Ministry of Transportation, Ontario
Design and Engineering Branch
Engineering Program Delivery East
1355 John Counter Boulevard
Kingston ON K7L 5A3

Prepared by:
Stantec Consulting Ltd.
200 – 835 Paramount Drive
Stoney Creek ON L8J 0B4

Project/File:
165001328

Stantec

Limitations and Sign-off

The conclusions in the Report titled Noise Impact Assessment Report are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from the Ontario Ministry of Transportation (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

Prepared by Ho, Kingson Digitally signed by Ho, Kingson Date: 2026.05.05 14:49:52 -04'00' _____
(signature)

Kingson Ho, B.Sc.
Acoustics, Noise & Vibration Specialist

Reviewed by Digitally signed by Salim, Mohammed Date: 2026.05.05 19:38:16 -04'00' _____
(signature)

Mohammed Salim, MBA, P.Eng.
Associate, Senior Acoustical Engineer

Reviewed by Babic, Frank Digitally signed by Babic, Frank Date: 2026.05.06 10:30:55 -04'00' _____
(signature)

Frank Babic, INCE, P.Eng.
Principal, Acoustics Ontario Practice Leader

Executive Summary

Stantec Consulting Ltd. was retained by the Ontario Ministry of Transportation (MTO) to undertake a Preliminary Design and Class Environmental Assessment (Class EA) Study for Highway 401. The study involves the replacement and rehabilitation of a bridge and culvert, as well as identifying the future Highway 401 footprint to accommodate an interim six-lane and an ultimate eight-lane configuration (GWP 4111-22-00) east of Brockville in the Township of Elizabethtown-Kitley, Ontario (the Project). The project limits extend from 0.75 km east of North Augusta Road to 3.3 km west of Maitland Road (a total length of approximately 2.6 km).

This noise study is to support the preliminary design and Class EA for the proposed improvements to Highway 401, which include widening the highway from four to eight lanes, and the replacement and rehabilitation of the bridge and culvert within the project limits. The assessment establishes the footprint for the interim six-lane and ultimate eight-lane configurations of Highway 401. This noise impact assessment report was prepared to evaluate the potential changes in traffic noise associated with the future highway footprint. The purpose of the assessment is to determine potential noise impacts at nearby noise-sensitive areas (NSAs) resulting from the project and to assess the feasibility of noise mitigation measures, if required, in accordance with the MTO Environmental Guide for Noise (MTO, 2022).

The following two scenarios were considered for this noise assessment:

1. Interim Project Footprint: Highway 401 upgrades from four lanes to six lanes. Noise modeling for this scenario is based on projected traffic volumes for the horizon year 2044.
2. Ultimate Project Footprint: Highway 401 upgrades from six lanes to eight lanes, including the reconfiguration of Sharpe’s Lane. Noise modeling for this scenario is based on projected traffic volumes for the horizon year 2054.

The approximate horizon years 2044 (interim) and 2054 (ultimate) were selected for the purpose of the analysis and do not represent the actual timing of highway improvements.

To assess the Project's noise impact, predicted future noise levels with the Project (Future Build) were compared to those without the Project (Future No-Build) for both the interim and ultimate footprint scenarios. Noise mitigation was investigated where the predicted Future Build noise levels increased by more than 5 dB over the Future No-Build scenario and/or where Future Build noise levels were equal to or exceeded 65 dBA, based on technical, economic, and administrative feasibility criteria.

Six (6) NSAs were identified based on a review of aerial imagery and the Air Quality Assessment Report for the Project (Stantec 2025). A site visit was conducted and confirmed that there are no proposed developments within the Project area. Inquiries were also made with the City of Brockville and the Township of Elizabethtown–Kitley, which confirmed that there are no approved developments in the area. Therefore, no future developments were included in this assessment.

Thirty-three (33) representative receptors were selected from these NSAs for this noise assessment. Only receptors with outdoor living areas (OLAs) were included. Receptors identified in the Air Quality Assessment that fell outside the noise study area or did not have an OLA were excluded. Additional receptors were added to represent second- and third-row residences. Consistent with the MTO Guide, OLA receptors were modelled at 1.5 m above existing ground and 3 m from the dwelling façade, typically within the backyard.

For this road traffic noise impact assessment, the Traffic Noise Model (TNM, version 3.2) developed by the United States Federal Highway Administration (FHWA) was used, as recommended in the MTO guidelines.

Predicted future noise levels from the Project exceed the MTO threshold of 65 dBA, the level above which mitigation feasibility is evaluated, at three receptors (R07, R08 and

R09) for the future interim build scenario and at four receptors (R07, R08, R09 and R19) for ultimate future build scenario. Noise mitigation measures were therefore investigated for these receptors.

Given the nature of the Project, alignment adjustments were not considered as a noise mitigation option. Similarly, changes to pavement type were not evaluated, as asphalt is the designated pavement for the Project. Therefore, only noise barriers were considered as a potential mitigation measure for the Project.

The existing noise barrier (ENB1) located west of the study area, between North Augusta Road and Oxford Avenue, is considered in this assessment. The existing noise barrier height at this location varies from approximately 4 m to 5 m from east to west. Based on field observations, the barrier appears to be constructed of composite material.

One (1) noise barrier (NB1) was evaluated as potential noise mitigation measures for the Project. The barrier was modelled within the Project right-of-way with a maximum height of 5 m, in accordance with MTO requirements. While the noise barrier met the technical feasibility criteria, the economic assessment found that its cost marginally exceeded the typical threshold per receptor; however, it may still be considered acceptable based on engineering judgment. Therefore, noise barrier NB1 is recommended for the Project.

Although MTO is exempt from compliance with municipal noise by-law time restrictions, construction noise for the Project was assessed in accordance with the Ministry of the Environment, Conservation and Parks (MECP) Publication NPC-115 (MECP 1977) and NPC-118 (MECP 1982), as well as the City of Brockville Noise By-Law (No. 076-2-21), a By-Law to Control Noise in the City of Brockville (Brockville 2021). No noise by-law currently exists for the Township of Elizabethtown-Kitley.

The typical sound levels for most of the construction equipment are within the MECP noise limits. However, there is potential for higher sound levels than the permissible

limits for some equipment (e.g., paving machine, hoe ram and pile driver). Once equipment and construction schedules are finalized, the equipment noise data should be reviewed to confirm that noise emissions are within the applicable limits. If the sound levels are higher than the limits, noise control options may be required. Methods to minimize construction noise impacts should be included in the Construction Code of Practice.

Table of Contents

1 Introduction 1
2 Project Description 5
3 Applicable Guidelines 6
3.1 Operational Noise Guidelines 6
3.2 Construction Noise Guidelines 7
3.2.1 Local Noise Control By-Law 8
3.2.2 MECP Construction Noise Guideline 8
4 Noise Sensitive Areas and Receptors 10
5 Road Traffic Data 15
6 Operation Noise Assessment 17
6.1 Assessment Methodology 17
6.2 Future Noise Impacts 18
6.3 Investigation of Noise Mitigation 26
7 Construction Noise Assessment 34
7.1 Analysis Methods 34
7.2 Expected Construction Activities 34
7.3 Construction Noise Levels 34
7.4 Construction Code of Practice 37
8 Conclusion and Closure 39
9 References 41

List of Tables

Table 3.1 Construction Noise Emission Limits (NPC-115 and NPC-118) 9
Table 4.1 Representative Receptors 12
Table 5.1 Traffic Data 16
Table 6.1 Predicted Future Sound Levels for Interim Project Footprint (2044) 19
Table 6.2 Predicted Future Sound Levels for Ultimate Project Footprint (2054) 22
Table 6.3 Ranking of Noise Levels for Ultimate Project Footprint 25
Table 6.4 Evaluation of Noise Barrier NB1 for Technical Feasibility 31
Table 6.5 Evaluation of Noise Barrier for Economic Feasibility 33
Table 7.1 Construction Equipment Sound Level Assessment – MECP 36

List of Figures

Figure 1.1 Project Location, Study Area and Receptors 3
Figure 1.2 Project Location, Study Area and Receptors 4
Figure 6.1 Location of Existing and Investigated Noise Barriers 28
Figure 6.2 Location of Investigated and Recommended Noise Barriers 29

List of Appendices

Appendix A Preferred Design Plan
Appendix B Information Request to Township Brockville and of Elizabethtown-Kitley
Appendix C Sample Calculations

Acronyms / Abbreviations

AADT	Annual Average Daily Traffic
dB	decibel
dBA	decibel, A-weighted
DFC	Dense Friction Course Pavement
EA	Environmental Assessment
ENB	Existing Noise Barrier
Km	Kilometre
km/h	kilometres per hour
m	metres
m^2	square metres
MECP	Ontario Ministry of the Environment, Conservation and Parks
MTO	Ontario Ministry of Transportation
NB	Noise Barrier
NPC	Noise Pollution Control
NSAs	Noise Sensitive Areas
OLA	Outdoor Living Area
SADT	Summer Annual Daily Traffic
TNM	Traffic Noise Model
US FSHA	United States Federal Highway Administration

Glossary

Term	Definition
A-weighting	The weighting network used to account for changes in level sensitivity as a function of frequency. The A-weighting network de-emphasizes the high (i.e., 6.3 kHz and above) and low (i.e., below 1 kHz) frequencies and emphasizes the frequencies between 1 kHz and 6.3 kHz, to simulate the relative response of the human ear. See also: frequency weighting.
Decibel (dB)	A logarithmic quantity of any measured physical parameter and commonly used in the measurement of sound. The decibel (dB) provides the possibility of representing a large span of sound levels in a simplified manner. The difference between the sound pressures for virtual silence versus a loud sound is a factor of 1:1,000,000 or more, therefore, it is less cumbersome to use a small range of equivalent values: 0 to 130 dB. It is used for both sound pressure level as well as sound power level.
Energy equivalent sound level	An energy-average sound level (L_{eq}) over a specified period that would have the same sound energy as the actual (i.e., time varying) sound over the same period. It represents the average sound pressure level encountered for the period. The period is often added as a suffix to the label (i.e., L_{eq} (24) for the 24-hour equivalent sound level).
Frequency	The number of times per second that the sine wave of sound repeats itself. It can be expressed in cycles per second, or Hertz (Hz). Frequency equals speed of sound/wavelength.

Term	Definition
Frequency weighting (A, B, and C-Weighting)	A method used to account for changes in sensitivity as a function of frequency. Three standard weighting networks, A, B, and C are used to account for different responses to sound pressure levels. Note: The absence of frequency weighting is referred to as linear response or unweighted response. Most commonly used weighting is A-Weighting (see also A-weighting).
Noise	Unwanted sound.
Point of Reception or Receptor	A noise-sensitive receptor (also referred as noise sensitive area in this report) such as a residence, campground, daycare, school, church, or hospital as defined in Ontario Ministry of the Environment, Conservation and Parks Publication NPC-300.
Sound level	Generally, sound level refers to the weighted sound pressure level obtained by frequency weighting, usually A-weighted for the purpose of approval in Ontario and expressed in decibels.
Sound power level	The total sound energy radiated by a source per unit time. The unit of measurement is the watt. The acoustical power radiated from a given sound source as related to a reference power level (i.e., typically 1E -12 watts, or 1 picowatt) and expressed as decibels. A sound power level of 1 watt = 120 decibels relative to a reference level of 1 picowatt.
Sound pressure level	Logarithmic ratio of the root-mean-square of the sound pressure to the sound pressure at the threshold of human hearing (i.e., 20 micro-pascals).
Sound spectrum	The amplitude of sound within a range of frequencies/frequency bands and usually referred to by the center frequency of that band. It is given by a set of numbers that describe the amplitude of sound at each frequency band.
Study area	The spatial extent where there is potential for noise and vibration effects on the environment due to the Project.

1 Introduction

Stantec Consulting Ltd. was retained by the Ontario Ministry of Transportation (MTO) to undertake a Preliminary Design and Class Environmental Assessment (Class EA) Study for Highway 401. The study involves the replacement and rehabilitation of a bridge and culvert, as well as identifying the future Highway 401 footprint to accommodate an interim six-lane and an ultimate eight-lane configuration (GWP 4111-22-00) east of Brockville in the Township of Elizabethtown-Kitley, Ontario (the Project). The project limits extend from 0.75 km east of North Augusta Road to 3.3 km west of Maitland Road (a total length of approximately 2.6 km).

This noise study is to support the preliminary design and Class EA for the proposed improvements to Highway 401, which include widening the highway from four to eight lanes, and the replacement and rehabilitation of the bridge and culvert within the project limits. The assessment establishes the footprint for the interim six-lane and ultimate eight-lane configurations of Highway 401. This noise impact assessment report was prepared to evaluate the potential changes in traffic noise associated with the future highway footprint. The purpose of the assessment is to determine potential noise impacts at nearby noise-sensitive areas (NSAs) resulting from the project and to assess the feasibility of noise mitigation measures, if required, in accordance with the MTO Environmental Guide for Noise (MTO, 2022). Noise impacts were assessed by comparing predicted future noise levels with the Project (Future Build) and without the Project (Future No-Build) for both the interim and ultimate Project footprint scenarios.

The following two scenarios are considered for this noise assessment:

1. Interim Project Footprint: Highway 401 upgrades from four lanes to six lanes. Noise modeling for this scenario is based on projected traffic volumes for the horizon year 2044.

2. Ultimate Project Footprint: Highway 401 upgrades from six lanes to eight lanes, including the reconfiguration of Sharpe's Lane. Noise modeling for this scenario is based on projected traffic volumes for the horizon year 2054.

The approximate horizon years 2044 (interim) and 2054 (ultimate) were selected for the purpose of the analysis and do not represent the actual timing of highway improvements.

The Study Area encompasses areas where noise sensitive areas may be impacted from the Project. In accordance with the MTO Environmental Guide for Noise (MTO Guide), the Study Area for this noise impact assessment was determined using a perpendicular distance of 600 m from the closest edge of the Project pavement and a 100 m distance from the ends of the Project pavement. A map of the Study Area along with the Project location is shown in Figure 1.1 and Figure 1.2.

Stantec

Legend

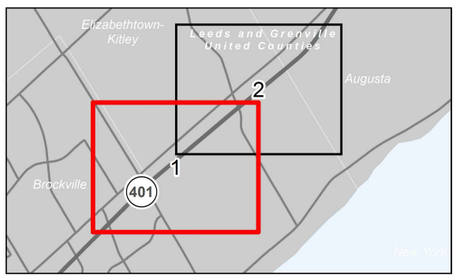
- Receptor
- Noise Study Area
- Noise Sensitive Area

0 0.25 0.5 km

1:7,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2023.
3. Orthoimagery licensed under the Open Government License - Ontario. Imagery Date 2024.



Project Location
United Counties of Leeds and Grenville

165001328
Prepared by cfandrich on 2026-04-30

Client/Project
MINISTRY OF TRANSPORTATION
HIGHWAY 401 PLANNING STUDY EAST OF BROCKVILLE (GWP 4111-22-00)

Figure No.
1.1

Title
Project Location, Study Area and Receptors

Stantec

Legend

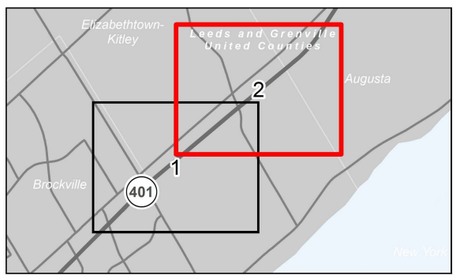
- Receptor
- Noise Study Area
- Noise Sensitive Area

0 0.25 0.5 km

1:7,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2023.
3. Orthoimagery licensed under the Open Government License - Ontario. Imagery Date 2024.



Project Location
United Counties of Leeds and Grenville

165001328
Prepared by cfandrich on 2026-04-30

Client/Project
MINISTRY OF TRANSPORTATION
HIGHWAY 401 PLANNING STUDY EAST OF BROCKVILLE (GWP 4111-22-00)

Figure No.
1.2

Title
Project Location, Study Area and Receptors

\\cd0224-sgfs01\work_group\01450.ocfiles\165001328\preliminary\gis\Maps\Noise\Report\figures\165001328_4111_NoiseReport.aprx\165001328_4111_Noise_Fig1_1_Studyarea Revised: 2026-04-30 By: cfandrich

2 Project Description

The existing footprint of Highway 401, from 0.75 km east of North Augusta Road to 3.3 km west of Maitland Road, currently have a total of four travelled lanes (two in each travel direction). The Project will include an interim roadway expansion from four travel lanes to six lanes (three lanes in each travel direction) and to ultimately eight lanes (four lanes in each travel direction).

The Project also includes a reconfiguration of Sharpe's Lane consisting of a replacement bridge (4 lanes, 2 in each travel direction) and rehabilitation of culvert east of Sharpe's Lane.

The existing noise barrier (ENB1), located east of North Augusta Road (between North Augusta Road and Oxford Avenue), is considered in this assessment. The existing noise barrier height at this location varies from approximately 4 m to 5 m from east to west. Based on field observations, the barrier appears to be constructed of composite material.

The preferred design for the Project is provided in Appendix A.

3 Applicable Guidelines

The applicable noise guidelines for Project operations (road traffic) and construction are discussed in the following subsections.

3.1 Operational Noise Guidelines

The applicable noise guidelines for Project operations are the MTO Environmental Guide for Noise (MTO 2022). In accordance with the MTO Guide, the Project noise impact is assessed by making a comparison of the predicted future noise level with the Project (Future Build) and without the Project (Future No-build). Where predicted Future Build noise levels increase more than 5 dB over Future No-build, mitigation measures are to be investigated. Additionally, mitigation measures are to be investigated where Future Build noise levels equal or exceed 65 dBA.

According to the MTO Guide requirements, mitigation measures should be restricted to within the MTO lands. For the mitigation to be implemented, it must be technically, economically, and administratively feasible. For the noise mitigation measure(s) to be considered technically feasible, it (they) must provide a minimum 5 dB noise level reduction averaged over the first row of receptors[1].

Once a mitigation option is deemed technically feasible, it must then be evaluated for economic feasibility. For the noise mitigation measure(s) to be considered economically feasible, its cost-benefit ratio should fall within the cost the MTO typically spends per benefitted receptor. For the purposes of this assessment, the cost-benefit ratio limit of $125,000 per residence is used for the Project. The cost-benefit ratio is calculated as the estimated cost of the noise mitigation divided by the number of benefitted receptors,

[1] First Row Receptors, as defined in the MTO Guide means the line of adjacent receptors closest to the highway, usually running parallel to each other. In some cases where the first-row receptors do not run parallel to a highway, first-row receptors are interpreted to be adjacent receptors where noise level differences are imperceptible (within 3 dB) from the receptor experiencing the highest noise levels.

where a benefitted receptor is defined as one that receives at least a 5 dB noise reduction from the mitigation.

Administrative feasibility is assessed by determining the ability to locate the noise mitigation on lands within public ownership (e.g., provincial or municipal right-of-way), within project constraints.

Noise assessments should be based on a minimum 10-year future horizon year traffic data from the date of completion of the project, per MTO Guide

As per the MTO Guide, $L_{eq\ (24h)}$ sound levels are used to assess impacts from freeways (400-series major highways).

3.2 Construction Noise Guidelines

The MTO is legally exempt from the requirements of municipal noise by-laws and will not be required to apply for by-law exemptions and permits. However, MTO recognizes that construction noise can have impacts on communities and will frequently communicate with the municipalities to work within the spirit of the municipal noise by-laws. MTO will make reasonable attempts, including public notification and mitigation measures, to reduce construction noise impact.

The relevant local noise by-laws and applicable criteria are discussed in the following subsections.

3.2.1 Local Noise Control By-Law

The proposed Project is located under the City of Brockville and Township of Elizabethtown-Kitley. The City of Brockville Noise By-Law (No. 076-2-21) is considered for the Project construction assessment. The City By-Law prohibits the operation of any construction equipment in connection with construction from 19:00 hours one day to 07:00 hours next day, except until 09:00 hours on Saturdays, and all day on Sundays and statutory holidays. The By-Law also restricts construction equipment sound level at the point of reception to 85 dBA. No noise by-law currently exists for the Township of Elizabethtown-Kitley.

3.2.2 MECP Construction Noise Guideline

The Ministry of the Environment, Conservation, Parks (MECP) stipulates limits on noise emissions from individual pieces of equipment, rather than for overall construction noise. In the presence of persistent noise complaints, sound emission standards for the various types of construction equipment used on the project should be verified. The specified limits contained in MECP Publication NPC-115 (MECP 1977) and NPC-118 (MECP 1982) are summarized in Table 3.1.

Table 3.1 Construction Noise Emission Limits (NPC-115 and NPC-118)

Type of Unit	Maximum Allowed Sound Pressure Level [a] (dBA)	Distance at Which Sound Levels are Measured (m)
Excavation Equipment Under 75 kW Capacity [b]	83	15
Excavation Equipment with 75 kW or Greater Capacity [b]	85	15
Pneumatic Equipment [c]	85	7
Portable Compressors	76	7
Track Drills	100	15
Heavy Vehicles with Governed Diesel Engines	95	15

Notes:

[a] Maximum permissible sound levels presented here are for equipment manufactured after Jan 1, 1981

[b] Excavation equipment includes bulldozers, backhoes, front end loaders, graders, excavators, steam rollers and other equipment capable of being used for similar applications

[c] Pneumatic equipment includes pavement breakers

4 Noise Sensitive Areas and Receptors

As per the MTO Guide, there are two types of noise sensitive areas (NSAs) considered for the noise impact assessment: Traditional NSAs and Special Land Use NSAs.

Traditional NSAs include the following land uses, with an outdoor living area[2] (OLA) associated with them:

- Private homes
- Townhouses
- Multiple unit buildings (e.g., such as apartments with OLAs for use by all occupants)
- Hospitals, nursing homes for the aged, where there are OLAs for the patients/residents

Special Land Use NSAs include the following land use areas:

- Educational facilities and day care centres, where there are OLAs for students
- Campgrounds that provide overnight accommodation
- Hotels/motels where there are OLAs for visitors (e.g., swimming pool area)
- Community centres with OLAs (e.g., outdoor basketball courts)
- Municipal parks (excluding golf courses and trails)
- Places of worship with OLA

Where a freeway/highway improvement is planned, Special Land Use NSAs are only considered if they are located next to a Traditional NSA.

[2] Outdoor Living Area (OLA) means an area at ground level, adjacent to an NSA, intended and designed for the enjoyment of the outdoor environment.

Six (6) NSAs were identified based on a review of aerial imagery and the Air Quality Assessment Report for the Project (Stantec 2025). A site visit was conducted and confirmed that there are no proposed developments within the Project area. Inquiries were also made with the City of Brockville and the Township of Elizabethtown–Kitley, which confirmed that there are no approved developments in the area. As such, no future developments are considered in this assessment. Confirmations from the City of Brockville and the Township of Elizabethtown-Kitley are provided in Appendix B.

Thirty-three (33) representative receptors were selected from these NSAs for this noise assessment. Only receptors with outdoor living areas (OLAs) were included. Receptors identified in the Air Quality Assessment that fell outside the noise study area or did not have an OLA were excluded. Additional receptors were added to represent second- and third-row residences. Consistent with the MTO Guide, OLA receptors were modelled at 1.5 m above existing ground and 3 m from the dwelling façade, typically within the backyard.

The receptors considered for the assessment are listed in Table 4-1 and are also shown in Figure 1.1 and Figure 1.2.

Table 4.1 Representative Receptors

Receptor ID	Description	UTM Coordinates Zone 18		NSA ID
		Easting (m)	Northing (m)	
NSA01_R001	Residence on Concession 2 Road	446520	4941027	NSA01
NSA01_R002	Residence on Concession 2 Road	446666	4941150	NSA01
NSA01_R003	Residence on Concession 2 Road	446815	4941282	NSA01
NSA01_R004	Residence on Concession 2 Road	446941	4941411	NSA01
NSA01_R005	Residence on Concession 2 Road	447025	4941474	NSA01
NSA02_R006	Residence on Concession 2 Road 6	447144	4941499	NSA02
NSA02_R006a	Second-Row Residence on Concession 2 Road	447098	4941533	NSA02
NSA02_R007	Residence on Applewood Circle	447219	4941522	NSA02
NSA02_R007a	Second-Row Residence on Applewood Circle	447177	4941537	NSA02
NSA02_R007b	Third-Row Residence on Applewood Circle	447177	4941587	NSA02
NSA02_R008	Residence on Applewood Circle	447260	4941570	NSA02
NSA02_R008a	Second-Row Residence on Applewood Circle	447239	4941610	NSA02

Receptor ID	Description	UTM Coordinates Zone 18		NSA ID
		Easting (m)	Northing (m)	
NSA02_R008b	Third-Row Residence on Applewood Circle	447213	4941643	NSA02
NSA02_R009	Residence on Old Sharpe's Lane	447357	4941622	NSA02
NSA02_R009a	Second-Row Residence on Old Sharpe's Lane	447342	4941649	NSA02
NSA02_R009b	Third-Row Residence on Old Sharpe's Lane	447325	4941678	NSA02
NSA02_R009c	Fourth-Row Residence on Old Sharpe's Lane	447325	4941678	NSA02
NSA03_R010	Residence on Old Sharpe's Lane	447458	4941479	NSA03
NSA03_R011	Second-Row Residence on Old Sharpe's Lane	447472	4941446	NSA03
NSA03_R012	Residence on Sharpe's Lane	447549	4941501	NSA03
NSA04_R013	Residence on Concession 2 Road	447515	4941911	NSA04
NSA04_R014	Residence on Concession 2 Road	447657	4942012	NSA04
NSA04_R015	Residence on Concession 2 Road	447830	4942143	NSA04
NSA04_R016	Residence on Concession 2 Road	448027	4942333	NSA04
NSA04_R017	Residence on Concession 2 Road	448179	4942472	NSA04

Receptor ID	Description	UTM Coordinates Zone 18		NSA ID
		Easting (m)	Northing (m)	
NSA05_R018	Residence on Concession 2 Road	446211	4940765	NSA05
NSA05_R019	Residence on Oxford Road Avenue	446142	4940621	NSA05
NSA05_R020	Second-Row Residence on Oxford Road Avenue	446116	4940652	NSA05
NSA05_R021	Third-Row Residence on Oxford Road Avenue	446105	4940672	NSA05
NSA01_R022	Residence on Concession 2 Road	446420	4940932	NSA01
NSA06_R023	Residence on Waverly Drive	446156	4940411	NSA06
NSA06_R024	Residence on Oxford Crescent	446208	4940475	NSA06
NSA06_R025	Residence on Oxford Crescent	446381	4940629	NSA06

5 Road Traffic Data

This section of the report discusses the road traffic considered for assessing noise impacts from the proposed future interim and ultimate footprints for Highway 401.

The future Annual Average Daily Traffic (AADT) and Summer Annual Daily Traffic (SADT) for Highway 401 and Sharpe's Lane were provided by the traffic team (CIMA+ 2025) for the horizon years 2044 for interim footprint and 2054 for ultimate footprint. The higher of AADT and SADT were considered for this assessment, as required by the guidelines. The traffic data used in the assessment for highway and Sharpe's Lane are summarized in Table 5.1.

Table 5.1 Traffic Data

Road and Segment	Direction [a]	2044 AADT [b]	2054 AADT [b]	Heavy / Medium Truck %	Traffic Speed Limit (km/h)
Highway 401 – North Augusta Road to Maitland Road [c, d, e]	EB	33,311	41,006	18/3	110
Highway 401 – North Augusta Road to Maitland Road [c, d, e]	WB	32,004	39,397	19/7	110
Sharpe's Lane	NB and SB combined	No-Build: 9,380 Build: 9,230	No-Build: 10,200 Build: 10,230	0/2	60

Notes:

[a] EB – Eastbound, WB – Westbound, NB – Northbound and SB – Southbound.

[b] No difference in Highway 401 EB and WB traffic between no-build and future-build scenarios.

[c] Four lanes are considered for Highway 401 interim No-Build scenario.

[d] Six lanes are considered for Highway 401 interim Build and ultimate No-Build scenarios.

[e] Eight lanes are considered for Highway 401 ultimate Build scenario.

6 Operation Noise Assessment

The methodology and noise model used for the assessment are discussed under this section. The modelling results are also summarized and the investigation of mitigation where needed are discussed under this section.

6.1 Assessment Methodology

The assessment predicts road traffic noise levels for the Future No-Build and Future Build scenarios for the 2044 horizon year (interim Project footprint) and for the 2054 horizon year (ultimate Project footprint). For the interim footprint, Highway 401 is upgraded from four lanes to six lanes, and future traffic data for 2044 is used in the assessment. For the ultimate footprint, the highway is upgraded from six lanes to eight lanes, using future traffic data for 2054. The traffic data presented in Section 5 and summarized in Table 5.1 form the basis of this assessment.

The MTO Environmental Guide for Noise (MTO 2022) recommends using the latest version of the U.S. FHWA Traffic Noise Model (FHWA TNM©).

The most current version of the FHWA Traffic Noise Model (TNM v3.2) was used for this noise impact assessment. The road traffic noise model considers the following inputs:

- Annual Average Daily Traffic (AADT)
- Commercial vehicle percentages including heavy and medium trucks
- Vehicle speed
- Shielding from intervening ground
- Pavement type
- Elevation profiles for the existing and new/modified roadways

Existing noise barrier ENB1 south of Highway 401, between North Augusta Road and Oxford Avenue, was included in the modelling. The existing noise barrier height at this location varies from approximately 4 m to 5 m from east to west. The location of the existing noise barrier is shown in Figure 6.1.

6.2 Future Noise Impacts

As per the MTO Guide, $L_{eq\ (24h)}$ sound levels are used to assess impacts from the highway. The noise impact from the Project was assessed by comparing “Future Build” noise impact (with the Project) with “Future No-Build” impact (without the Project). The assessment was completed for the interim and ultimate scenarios with the traffic data for the horizon years 2044 and 2054 respectively. The Project noise assessment was conducted by comparing “Future Build” sound levels with “Future No-Build” sound levels and is presented in Table 6-1 and Table 6-1 for both scenarios. These tables also identify the need for noise mitigation.

Table 6.1 Predicted Future Sound Levels for Interim Project Footprint (2044)

Receptor ID	Number of Receptors Represented	Future No-Build Sound Levels (dBA)	Future Build Sound Levels (dBA)	Is Future Build Sound Level ≥ 65dBA?	Increase in Sound Levels (dB) [a]	Predicted Increase Greater than 5 dB?	Should Mitigation be Investigated?
NSA01_R001	1	62	62	No	0	No	No
NSA01_R002	3	62	62	No	0	No	No
NSA01_R003	4	62	62	No	-1	No	No
NSA01_R004	2	60	60	No	0	No	No
NSA01_R005	4	61	60	No	-1	No	No
NSA02_R006	1	64	63	No	-1	No	No
NSA02_R006a	2	59	59	No	0	No	No
NSA02_R007	1	66	66	Yes	0	No	Yes[b]
NSA02_R007a	1	62	62	No	0	No	No
NSA02_R007b	1	56	57	No	1	No	No
NSA02_R008	1	66	65	Yes	-1	No	Yes[b]
NSA02_R008a	2	59	59	No	0	No	No
NSA02_R008b	2	56	56	No	0	No	No
NSA02_R009	1	67	67	Yes	0	No	Yes[b]
NSA02_R009a	1	62	62	No	0	No	No

Receptor ID	Number of Receptors Represented	Future No-Build Sound Levels (dBA)	Future Build Sound Levels (dBA)	Is Future Build Sound Level ≥ 65dBA?	Increase in Sound Levels (dB) [a]	Predicted Increase Greater than 5 dB?	Should Mitigation be Investigated?
NSA02_R009b	1	58	59	No	1	No	No
NSA02_R009c	3	60	60	No	0	No	No
NSA03_R010	1	60	60	No	0	No	No
NSA03_R011	1	59	58	No	-1	No	No
NSA03_R012	1	57	56	No	-1	No	No
NSA04_R013	2	58	57	No	-1	No	No
NSA04_R014	4	60	59	No	-1	No	No
NSA04_R015	3	61	61	No	0	No	No
NSA04_R016	3	61	61	No	0	No	No
NSA04_R017	3	59	59	No	0	No	No
NSA05_R018	2	60	61	No	1	No	No
NSA05_R019	1	63	64	No	1	No	No
NSA05_R020	1	60	60	No	0	No	No
NSA05_R021	2	58	59	No	1	No	No
NSA01_R022	3	63	63	No	0	No	No
NSA06_R023	20	52	52	No	0	No	No

Receptor ID	Number of Receptors Represented	Future No-Build Sound Levels (dBA)	Future Build Sound Levels (dBA)	Is Future Build Sound Level ≥ 65dBA?	Increase in Sound Levels (dB) [a]	Predicted Increase Greater than 5 dB?	Should Mitigation be Investigated?
NSA06_R024	10	58	57	No	-1	No	No
NSA06_R025	2	62	61	No	-1	No	No

Notes:

[a] Discrepancies in the reported increases in predicted sound levels at certain receptors, including negative changes, are attributable to rounding effects and/or the change in geometry due to the highway realignment.

[b] Mitigation is investigated for these receptors.

Table 6.2 Predicted Future Sound Levels for Ultimate Project Footprint (2054)

Receptor ID	Number of Receptors Represented	Future No-Build Sound Levels (dBA)	Future Build Sound Levels (dBA)	Is Future Build Sound Level ≥ 65dBA?	Increase in Sound Levels (dB) [a]	Predicted Increase Greater than 5 dB?	Should Mitigation be Investigated ?
NSA01_R001	1	63	63	No	0	No	No
NSA01_R002	3	63	63	No	0	No	No
NSA01_R003	4	62	63	No	1	No	No
NSA01_R004	2	61	61	No	0	No	No
NSA01_R005	4	61	61	No	0	No	No
NSA02_R006	1	64	64	No	0	No	No
NSA02_R006a	2	60	60	No	0	No	No
NSA02_R007	1	67	67	Yes	0	No	Yes[b]
NSA02_R007a	1	63	63	No	0	No	No
NSA02_R007b	1	58	58	No	0	No	No
NSA02_R008	1	66	67	Yes	1	No	Yes[b]
NSA02_R008a	2	60	60	No	0	No	No
NSA02_R008b	2	57	57	No	0	No	No
NSA02_R009	1	68	69	Yes	1	No	Yes[b]
NSA02_R009a	1	63	63	No	0	No	No
NSA02_R009b	1	61	62	No	2	No	No

Receptor ID	Number of Receptors Represented	Future No-Build Sound Levels (dBA)	Future Build Sound Levels (dBA)	Is Future Build Sound Level ≥ 65dBA?	Increase in Sound Levels (dB) [a]	Predicted Increase Greater than 5 dB?	Should Mitigation be Investigated ?
NSA02_R009c	3	60	60	No	0	No	No
NSA03_R010	1	61	61	No	0	No	No
NSA03_R011	1	59	59	No	0	No	No
NSA03_R012	1	57	57	No	0	No	No
NSA04_R013	2	58	58	No	0	No	No
NSA04_R014	4	60	60	No	0	No	No
NSA04_R015	3	62	62	No	0	No	No
NSA04_R016	3	62	62	No	0	No	No
NSA04_R017	3	60	60	No	0	No	No
NSA05_R018	2	61	62	No	1	No	No
NSA05_R019	1	65	65	Yes	0	No	Yes[b]
NSA05_R020	1	61	61	No	0	No	No
NSA05_R021	2	59	60	No	1	No	No
NSA01_R022	3	64	64	No	0	No	No
NSA06_R023	20	53	53	No	0	No	No

Receptor ID	Number of Receptors Represented	Future No-Build Sound Levels (dBA)	Future Build Sound Levels (dBA)	Is Future Build Sound Level ≥ 65dBA?	Increase in Sound Levels (dB) [a]	Predicted Increase Greater than 5 dB?	Should Mitigation be Investigated ?
NSA06_R024	10	58	58	No	0	No	No
NSA06_R025	2	62	63	No	1	No	No

Notes:

[a] Discrepancies in the reported increases in predicted sound levels at certain receptors, including negative changes, are attributable to rounding effects and/or the change in geometry due to the highway realignment.

[b] Mitigation is investigated for these receptors.

A sound level increase of up to 1 dB with the Project is predicted at R007b, R009b, R018, R019, and R021 for the interim footprint. For the ultimate footprint, a sound level increase of up to 1 dB with the Project is predicted at R003, R008, R009, R018, R021, and R025, and up to 2 dB at R009b. The assessment predicts that Future Build noise levels are expected to exceed 65 dBA, the sound level above which mitigation feasibility is investigated, at three (3) receptors (R07, R08 and R09) for the future interim Project footprint, and at four (4) receptors (R07, R08, R09 and R19) for the ultimate Project footprint. Noise mitigation was therefore investigated for these receptors and is discussed in the next section.

Table 6.3 illustrates the predicted impacts ranked in terms of increasing sound level for the ultimate footprint as per MTO requirements. Sample calculations are included in Appendix C.

Table 6.3 Ranking of Noise Levels for Ultimate Project Footprint

Future Build Sound Level	Receptors	No. of Affected Receptors
51 to 55 dBA	R023	20
56 to 60 dBA	R006a, R007b, R008a, R008b, R009c, R011 thru R014, R017, R021 and R024	33
61 to 65 dBA	R001 thru R006, R007a, R009a, R009b, R010, R015, R016, R018 thru R020, R022 and R025	37
66 to 70 dBA	R007, R008 and R009	3

6.3 Investigation of Noise Mitigation

Based on the predicted noise levels for the Future Build and Future No-build scenarios, noise mitigation was investigated for receptors R07, R08, R09 and R19.

The MTO Guide provides the following guidelines for the mitigation consideration:

- Investigate noise control measures within MTO right-of-way.
- Noise control measures, where introduced, should achieve a minimum of 5 dB noise reduction averaged over the first row of receptors.
- Noise control measures, where introduced, must be technically, economically, and administratively feasible.

The following noise mitigation options are typically considered for road traffic noise:

- Horizontal and vertical alignment adjustments
- Pavement type modifications
- Installation of noise Barriers

Considering the nature of the Project, alignment adjustments were not considered as a mitigation option. Changes to pavement type were also not considered, as asphalt is the planned pavement for the Project. Therefore, noise barriers were the only mitigation measure assessed.

Noise barriers reduce noise levels at protected receptors by blocking the direct path of sound waves from the source to the receiver and by absorbing or reflecting the incident sound energy away. To be effective, a noise barrier must at least break the line-of-sight between the source (the roadway) and the receptor (i.e., the ground-level OLA of the NSA under investigation).

Where noise walls are used, they should be free of gaps and cracks and have a minimum surface density (mass per unit of face area) of 20 kg/m^2 (4 lb/ft^2). It is preferable that barriers are absorptive at least on the roadway side, particularly in cases where parallel walls (e.g., walls on both sides of a roadway) are proposed.

For noise barriers to be considered as mitigation for the Project, they should meet the following MTO requirements:

- Be located within the right-of-way
- Achieve at least 5 dB attenuation over the first row of affected receivers

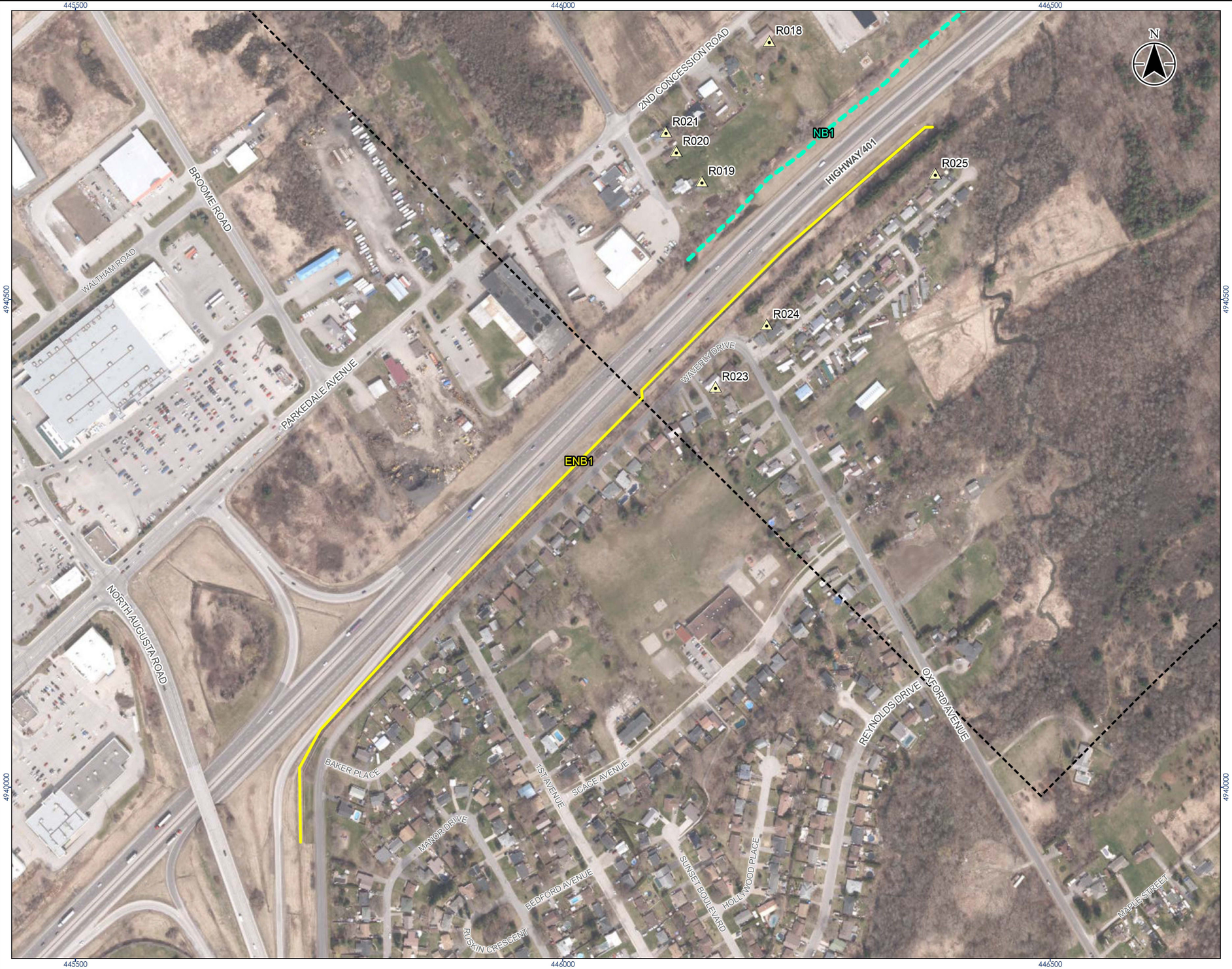
MTO limits noise barriers to a maximum height of 5 m (barrier alone). However, greater effective heights can be achieved when combined with a berm, and such configurations have been modelled taking the existing grading into account. All noise barriers for the Project are modelled 5 m above the ground within the right-of-way.

For a barrier to be considered a viable mitigation measure, the investigated noise barriers should be administratively, technically, and economically feasible.

The following noise barrier mitigation option was investigated for the Project:

- 5 m high noise barrier (NB1) extending westerly from the Sharp's Lane approach fill to slightly west of Oxford Avenue, providing coverage for receptors R001 through R009 and R018 through R021 within NSAs 01, 02 and 05.

A map showing the investigated noise barrier locations is provided in Figure 6.1 and Figure 6.2.



Stantec

Legend

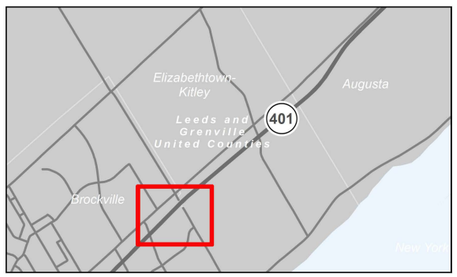
- Receptor
- Noise Study Area
- Existing Noise Barrier
- Investigated/Recommended Noise Barrier

0 100 200 Metres

1:4,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2023.
3. Orthoimagery licensed under the Open Government License - Ontario. Imagery Date 2024.



Project Location
United Counties of Leeds and Grenville

165001328
Prepared by cfandrich on 2026-04-30

Client/Project
MINISTRY OF TRANSPORTATION
HIGHWAY 401 PLANNING STUDY EAST OF BROCKVILLE (GWP 4111-22-00)

Figure No.
6.1

Title
Location of Existing and Investigated Noise Barriers

\\ca0224-prfs01\work_group\01405\active\165001328\preliminary\gis\Mxds\Noise\ReportFigures\165001328_4111_NoiseReport.aprx\165001328_4111_Noise_Fig6_1 Revised: 2026-04-30 By: cfandrich

Stantec

Legend

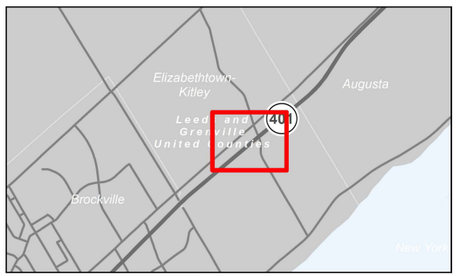
- Receptor
- Noise Study Area
- Investigated/Recommended Noise Barrier

0 100 200 Metres

1:4,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © King's Printer for Ontario, 2023.
3. Orthoimagery licensed under the Open Government License - Ontario. Imagery Date 2024.



Project Location
United Counties of Leeds and Grenville

165001328
Prepared by cfandrich on 2026-04-30

Client/Project
MINISTRY OF TRANSPORTATION
HIGHWAY 401 PLANNING STUDY EAST OF BROCKVILLE (GWP 4111-22-00)

Figure No.
6.2

Title
Location of Investigated and Recommended Noise Barriers

Table 6.4 summarizes the technical feasibility evaluation for the investigated noise barrier NB1, while evaluates economic feasibility. Noise barrier NB1 was modelled within the Project right-of-way at a maximum height of 5 m, in accordance with MTO requirements. The technical feasibility assessment shows that NB1 achieve the minimum average 5 dB reduction over the first-row receptors. As a result, it was further evaluated for economic feasibility.

The economic feasibility assessment found that NB1 has a cost of $127,500 per receptor, slightly over the threshold considered for this assessment. However, it may still be considered acceptable based on engineering judgment. Therefore, noise barrier NB1 is recommended for the Project.

Table 6.4 Evaluation of Noise Barrier NB1 for Technical Feasibility

Barrier ID	Benefited Receptors	No. of Residences Represented	Ultimate Future Build Sound Level (dBA)		Reduction (dB)	Average Noise Reduction (dB)	Technically Feasible? [a]
			Without Barrier	With Barrier			
NB1	NSA01_R001	1	63	56	7	7	Yes
	NSA01_R002	3	63	57	6		
	NSA01_R003	4	63	55	8		
	NSA01_R004	2	61	55	6		
	NSA01_R005	4	61	54	7		
	NSA02_R006	1	64	58	6		
	NSA02_R006a	2	60	56	4		
	NSA02_R007	1	67	60	7		
	NSA02_R007a	1	63	57	6		
	NSA02_R007b	1	58	52	6		
	NSA02_R008	1	67	59	8		
	NSA02_R008a	2	60	54	6		
	NSA02_R008b	2	57	51	6		
	NSA02_R009	1	69	61	8		
	NSA02_R009a	1	63	56	7		

Barrier ID	Benefited Receptors	No. of Residences Represented	Ultimate Future Build Sound Level (dBA)		Reduction (dB)	Average Noise Reduction (dB)	Technically Feasible? [a]
			Without Barrier	With Barrier			
	NSA02_R009b	1	62	55	7		
	NSA02_R009c	3	60	55	5		
	NSA05_R018	2	62	55	7		
	NSA05_R019	1	65	58	7		
	NSA05_R020	1	61	56	5		
	NSA05_R021	2	60	53	7		
	NSA01_R022	2	64	57	7		

Table 6.5 Evaluation of Noise Barrier for Economic Feasibility

Barrier ID	Benefited Receptors	No. of Benefited Residences	Average Noise Reduction (dB)	Technically Feasible? [a]	Barrier Height (m)	Barrier Length (m)	Approx. Barrier Cost ($) [b]	Approx. Barrier Cost Per Receptor ($) [c]	Economically Feasible? [d]
NB1	R001 through R009, R018 through R021	40	7	Yes	5	1700	5,100,000	127,500	Yes [e]

Notes:

[a] "Yes" if the barrier provides minimum 5 dB noise reduction; else, "No."

[b] Based on an approximate barrier cost of $600 per m^2 of face area.

[c] Total cost divided by the number of benefited residences.

[d] "Yes" if the estimated barrier cost is less than $125,000 per receptor. Otherwise, "No."

[e] Costs marginally exceeding the threshold and it may be considered acceptable based on engineering judgment.

7 Construction Noise Assessment

Construction noise impacts are temporary in nature, and largely unavoidable. With adequate controls, impacts can be reduced. However, for some periods of time and types of work, construction noise will be noticeable at some receptor locations. This section of the report provides an evaluation of construction equipment noise and discusses guideline and Code of Practice to reduce construction impacts.

7.1 Analysis Methods

The construction noise impact assessment considered effects of various types of construction equipment. As part of assessing the noise effects due to the use of construction equipment, the maximum sound levels resulting from operation of construction equipment was determined and compared with the applicable criteria limits.

7.2 Expected Construction Activities

The following construction activities are expected as part of the Project:

- Improvement of Highway 401 and realignment of Sharpe’s Lane
- Construction of new bridge at Sharpe’s Lane and rehabilitation of culvert east of Sharpe’s Lane
- Paving/repaving of roadway surfaces

7.3 Construction Noise Levels

Construction activities will vary temporally and spatially as the Project progresses. Noise levels from construction at a given receptor location will also vary over time as different activities take place, and as those activities change location within the right-of-way.

Table 7.1 lists the construction equipment considered for the assessment and a comparison of their noise emissions to the applicable NPC-115 and NPC-118 noise limits. A detailed construction plan or equipment list is not currently available. Therefore, the construction equipment list in Table 7.1 represents typical equipment expected to be used for this type of construction. The listed construction equipment noise emissions are based on Stantec's database of field measurements of construction equipment.

Table 7.1 Construction Equipment Sound Level Assessment – MECP

Type of Equipment	Typical Range of Maximum Sound Levels at 15 m (dBA)	NPC-115/118 Sound Level at 15 m (dBA)	Meets NPC-115/118 Sound Level? (Y/N)
Front-End Loader	77 – 85	85	Y
Backhoe	66 – 80	85	Y
Auger	76 – 84	85	Y
Dump Truck	76 – 88	95[b]	Y
Concrete Truck	77 – 85	85	Y
Concrete Pump and Boom	77 – 82	85	Y
Vibratory Compactor	79 – 83	85	Y
Paving Machine [a]	77 – 89	85	N
Pile Driver [a]	95 - 101	85	N
Crane	73 – 83	85	Y
Grader	79 – 85	85	Y
Hoe Ram [a]	90	85	N

Notes:

a These equipment units have potential to exceed the applicable MECP limits and precautions/noise control feasibility should be investigated if they are used near sensitive receptors.

b Refers to the NPC-118 Sound Level at 15 m.

The typical sound levels presented in Table 7.1 shows that most equipment can be operated in compliance with the MECP NPC-115/118 limits. The list also shows that there is the potential for higher sound levels than permissible limits for paving machines.

The City of Brockville Noise By-Law (No. 076-2-21) limits the noise impact of construction equipment at receptors to 85 dBA. None of the receptors or NSAs are within 15 m of the Project footprint, therefore, construction equipment noise levels at the receptors are expected to be within the City limit when they comply with the MECP limits. Once the equipment and construction schedule are finalized, the equipment noise level should be reviewed during detailed design to confirm that noise emissions are within 85 dBA at 15 m. If the sound levels are higher than the limit, noise control options shall be explored.

7.4 Construction Code of Practice

To minimize the potential for construction noise impacts, it is recommended that provisions shall be written into the contract documentation for the contractor and the following best practices be considered:

- All construction equipment should be properly maintained to limit noise emissions. As such, all construction equipment should be operated with effective muffling devices that are in good working order.
- There should be explicit indication that Contractors are expected to comply with all applicable requirements of the contract.
- The Contract documents should contain a provision that any initial noise complaint will trigger verification of construction noise and typical noise control measures.
- In the presence of persistent noise complaints, all construction equipment should be verified to comply with the applicable limits.

- 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 should be given to the technical, administrative, and economic feasibility of the various alternatives.

8 Conclusion and Closure

The potential environmental noise impacts from the future interim and ultimate footprints for Highway 401 was assessed. Both traffic (operational) and construction noise impacts were considered in this assessment.

A sound level increase of up to 1 dB with the Project is predicted at R007b, R009b, R018, R019, and R021 for the interim footprint. For the ultimate footprint, a sound level increase of up to 1 dB with the Project is predicted at R003, R008, R009, R018, and R021, and up to 2 dB at R009b. The assessment predicts that Future Build noise levels are expected to exceed 65 dBA, the sound level above which mitigation feasibility is investigated, at four (4) receptors (R07, R08, R09 and R19) for the future interim and ultimate Project footprint. Noise mitigation was therefore investigated for these receptors.

Considering the nature of the Project, alignment and pavement-based noise mitigation options were not investigated. Only noise barrier was considered as a mitigation measure for this Project.

One (1) noise barrier (NB1) was evaluated as potential noise mitigation measures for the Project. The barrier was modelled within the Project right-of-way at a maximum height of 5 m, in accordance with MTO requirements. While the noise barrier NB1 met the technical feasibility criteria, the economic feasibility assessment found that its cost marginally exceeded the threshold per receptor. However, it may still be considered acceptable based on engineering judgment. Therefore, noise barrier NB1 is recommended for the Project.

Although MTO is exempt from compliance with municipal noise by-law time restrictions, construction noise was assessed in accordance with the MECP Publications NPC-115 (MECP 1977) and NPC-118 (MECP 1982), as well as the City of Brockville Noise By-Law (No. 076-2-21). Typical sound levels from most construction equipment are

expected to remain within the limits. However, some equipment may generate noise levels above the permissible limits. Once the equipment types and construction schedules are finalized, equipment noise data should be reviewed during the detailed design stage to confirm compliance with noise limits. If noise levels exceed the limits, additional noise control measures may be implemented. Methods to minimize construction noise impacts should be included in the Construction Code of Practice, as outlined in Section 7.4.

9 References

City of Brockville, Noise By-Law No. 076-2-21 “A By-Law to Control Noise in the City of Brockville.” September 28, 2021. (Brockville 2021).

Ontario Ministry of the Environment, Conservation and Parks. 1977. “Model Municipal Noise Control By-law - Publication NPC - 115, Construction Equipment.” (MECP 1977).

Ontario Ministry of the Environment, Conservation and Parks. 1982. “Publication NPC-118 for Motorized Conveyances.” (MECP 1982).

Ontario Ministry of Transportation. 2022. “Environmental Guide for Noise, Version 2.0.” (MTO 2022).

Stantec (Stantec Consulting Ltd.) Air Quality Assessment Report for Highway 401 East Brockville, From 0.75 km East of North Augusta Road to 3.3 km West of Maitland Road (GWP 4111-22-00), dated October 2025. (Stantec 2025).

Appendices

Appendix A Preferred Design Plan

HIGHWAY 401 PLANNING STUDY, EAST OF BROCKVILLE

from 0.75 km east of North Augusta Rd Interchange
to 3.3 km west of Maitland Rd Interchange
Preliminary Design & Class Environmental Assessment
GWP 4111-22-00

Stantec

- Limit of existing MTO right of way
- New Roadway - Initial (6-Lane Highway 401)
- New Roadway - Ultimate (8-Lane Highway 401)
- Property Required - Ultimate (8-Lane Highway 401)
- Driveway Modification
- Existing Culvert
- New Culvert / Extension
- Existing Noise Barrier
- New Noise Barrier
- New Storm Sewer

Figure 1

Recommended Plan

Highway 401
Elizabethtown-Kitley Township

SCALE 1:5000

Appendix B Information Request to City of Brockville and Township of Elizabethtown-Kitley

Ho, Kingson

From: Andrew McGinnis <amcginnis@brockville.com>
Sent: Tuesday, January 27, 2026 8:49 AM
To: Ho, Kingson
Cc: Salim, Mohammed
Subject: RE: New Contact Form Submission: Request for information - East Brockville proposed development

There is nothing currently planned in those areas; however, Toniata School is most likely soon up for sale and may produce a subdivision.

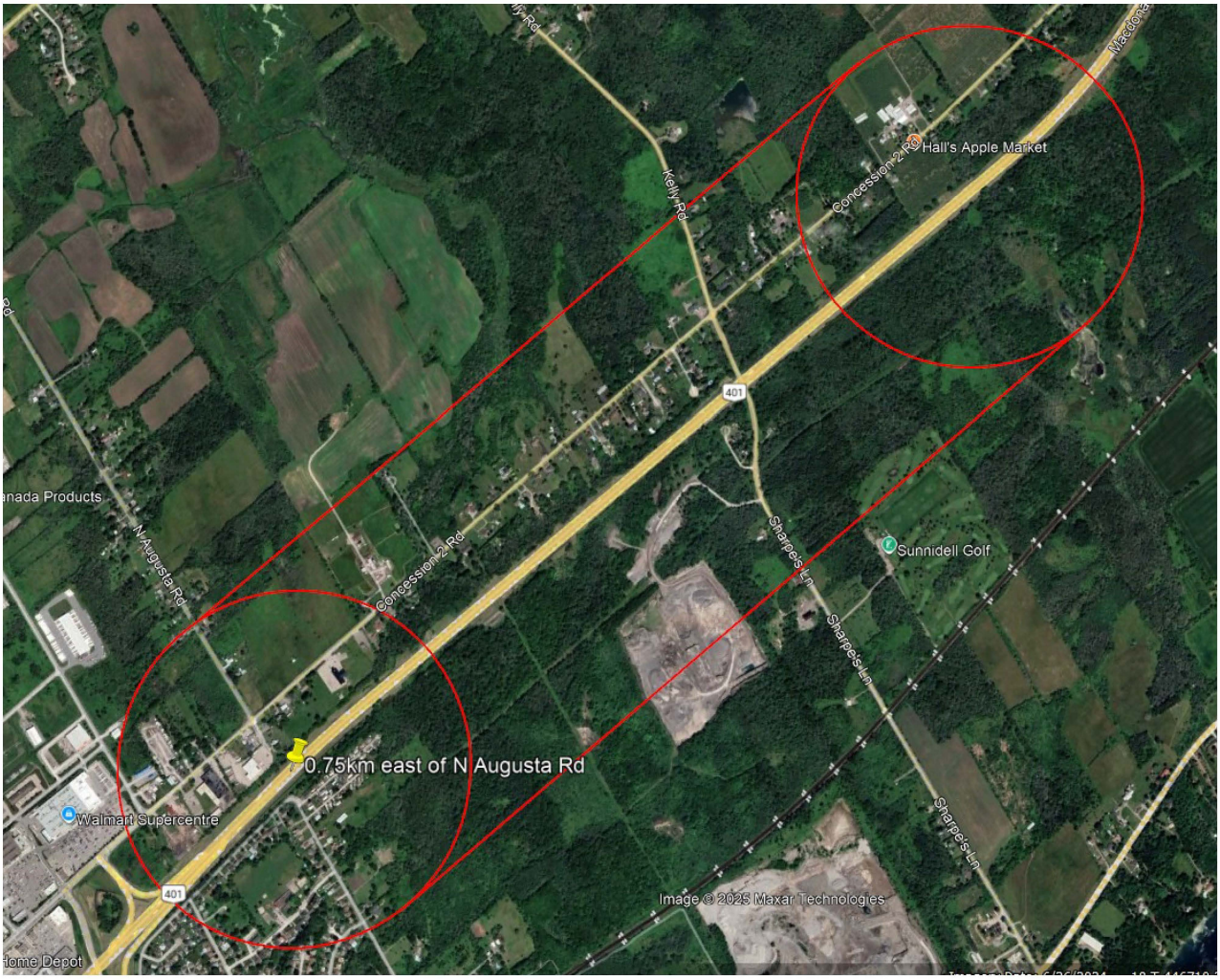
Andrew

Andrew H. McGinnis, MCIP, RPP, Dipl.M.M.
Supervisor of Planning/Chief Planning Officer
City of Brockville
1 King Street West, Brockville, ON, K6V 7A5
613-342-8772 ext. 4421
amcginnis@brockville.com
www.brockville.com

From: Ho, Kingson <Kingson.Ho@stantec.com>
Sent: Monday, January 26, 2026 3:06 PM
To: Andrew McGinnis <amcginnis@brockville.com>
Cc: Salim, Mohammed <Mohammed.Salim@stantec.com>
Subject: RE: New Contact Form Submission: Request for information - East Brockville proposed development

Hi Andrew,

Thank you for getting back to me regarding my information request. For reference, the study area is shown below. Could you please confirm whether there are no proposed developments planned for the area west of North Augusta Road (Within City of Brockville's Boundary)? I will contact the Township of Elizabethtown-Kitley for information on the remaining portion. Thanks!



Regards,

King Sun Ho (Kingson)
Acoustics, Noise & Vibration Specialist
kingson.ho@stantec.com
Stantec

Stantec

From: Andrew McGinnis <amcginnis@brockville.com>
Sent: Monday, January 26, 2026 1:25 PM
To: Ho, Kingson <Kingson.Ho@stantec.com>
Subject: RE: New Contact Form Submission: Request for information - East Brockville proposed development

> You don't often get email from amcginnis@brockville.com. Learn why this is important

Kingston,

The City of Brockville boundary actually ends at North Augusta Road (north of the 401) and Oxford Avenue (south of the 401).

If you are going all the way to Sharpes Lane, I suggest that you contact the township of Elizabethtown Kitley.

Andrew

Andrew H. McGinnis, MCIP, RPP, Dipl.M.M.
Supervisor of Planning/Chief Planning Officer
City of Brockville
1 King Street West, Brockville, ON, K6V 7A5
613-342-8772 ext. 4421
amcginnis@brockville.com
www.brockville.com

From: Brockville City Website Request <contact@brockville.com>
Sent: Monday, January 26, 2026 12:04 PM
To: Andrew McGinnis <amcginnis@brockville.com>
Subject: New Contact Form Submission: Request for information - East Brockville proposed development

Name
Kingson Ho
Email
kingson.ho@stantec.com
Phone
(437) 848-4037
Contact Department
Economic & Development Services - Andrew McGinnis (Supervisor of Planning/Chief Planning Officer)
Are you a Brockville taxpayer?
No
Subject
Request for information - East Brockville proposed development
Message
Hi Andrew, Hope you are doing well. I am Kingson from Stantec, and I am writing to enquire about a potential approved residential development in the East Brockville area. We are conducting a traffic noise assessment for MTO and would like to request information on any proposed developments from North Augusta Road to Sharpes Lane along Highway 401. I was not able to attach our study area through this form, but I can share it with you if we continue the conversation by email. Thanks! Regards, King Sun Ho (Kingson) Acoustics, Noise & Vibration Specialist kingson.ho@stantec.com Stantec

The content of this email is confidential and intended for the recipient specified in message only. It is strictly forbidden to share any part of this message with any third party, without a written consent of the sender. If you received this message by mistake, please reply to this message and follow with its deletion, so that we can ensure such a mistake does not occur in the future.

Caution: This email originated from outside of Stantec. Please take extra precaution.

Attention: Ce courriel provient de l'extérieur de Stantec. Veuillez prendre des précautions supplémentaires.

Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

Ho, Kingson

From: Sarah Hagen <planning@ektwp.ca>
Sent: Monday, February 2, 2026 11:57 AM
To: Ho, Kingson
Subject: Re: Information Request - Proposed Development

Hi Kingson,

I apologize for the delayed response to this.

Currently we have one zoning by-law amendment for 2872 2nd Concession Rd. The property is currently split zoned Rural (RU) and Rural Commercial (CR) and the application is to rezone the entire property to General Commercial (CG). The owners are proposing a denture clinic/lab in the existing building, and the rezoning is to also allow for a self-storage storage facility as a permitted use.

Other than this application, we do not have any active planning applications within the area.

Please let me know if you have any questions.

Thank you,

Sarah Hagen
Planning Administrative Assistant
Township of Elizabethtown-Kitley

Phone: 613-345-7480 ext.217
Email: planning@ektwp.ca
Fax: 613-345-7235
6544 New Dublin Rd
Addison, ON, K0E 1A0
www.ektwp.ca

From: Ho, Kingson <Kingson.Ho@stantec.com>
Sent: Monday, January 26, 2026 3:48 PM
To: Sarah Hagen <planning@ektwp.ca>; Jim Hutton <jhutton@ektwp.ca>
Cc: Salim, Mohammed <Mohammed.Salim@stantec.com>
Subject: Information Request - Proposed Development

Hi Planning Officers of Township of Elizabethtown Kitley,

Hope you are doing well. I am Kingson from Stantec, and I am writing to enquire about potential approved residential development in the Township of Elizabethtown Kitley area. We are conducting a traffic noise assessment for MTO and

would like to request information on any proposed developments from North Augusta Road to Sharpes Lane along Highway 401. Could you confirm if there are any proposed developments in the study area shown in red below? Thanks!

Regards,

King Sun Ho (Kingson)
Acoustics, Noise & Vibration Specialist
kingson.ho@stantec.com
Stantec

Appendix C Sample Calculations

REPORT:	**Results: Sound Levels - Input Heights**		
TNM VERSION:	3.2.8741.34338	REPORT DATE:	29 April 2026
CALCULATED WITH:	TNM v3.2.8741.34338	CALCULATION DATE:	4/29/2026 4:14:23 PM
CASE:	FutureUltimateBuild 8 Lanes Daytime	ORGANIZATION:	Stantec
ANALYSIS BY:	KH	PROJECT/CONTRACT:	MTO East Brockville
DEFAULT GROUND TYPE:	Lawn		
ATMOSPHERICS:	20°C, 50%	Average pavement type shall be used unless a state highway agency	
PAVEMENT TYPE(S) USED:	Average	substantiates the use of a different type with approval of FHWA.	

			Noise Reduction			Barrier Cost			
			Min	Avg	Max	Area / Volume	Lineal	Total	Total/DUs
Results for:		DUs	dB	dB	dB	$	$	$	$
Receivers in the Barrier Design:	All	36	-0.0	4.1	7.8	0	0	0	0
	All Impacted	36	-0.0	4.1	7.8	0	0	0	0
Meeting Noise Reduction Goal:	All	0	---	---	---	0	0	0	---
	All Impacted	0	---	---	---	0	0	0	---

Receiver				Modeled Traffic Noise Levels								
				All Abatement Barriers at Zero Height					With Abatement Barriers			
				LAeq		Increase over Existing				Noise Reduction		Calc.
Name	No.	DUs	Existing LAeq	Calc.	Absolute Criterion	Calc.	Relative Criterion	Type of Impact	Calc. LAeq	Calc.	Goal	Minus Goal
			dBA	dBA	dBA	dBA	dBA		dBA	dBA	dBA	dBA
R001	1	1	---	63.1	0.0	---	---	Sound Level	56.3	6.8	5.0	1.8
R002	2	1	---	63.1	0.0	---	---	Sound Level	57.2	5.9	5.0	0.9
R003	3	1	---	62.9	0.0	---	---	Sound Level	54.9	8.0	5.0	3.0
R004	4	1	---	61.1	0.0	---	---	Sound Level	54.6	6.5	5.0	1.5
R005	5	1	---	61.1	0.0	---	---	Sound Level	54.4	6.7	5.0	1.7
R006	6	1	---	64.3	0.0	---	---	Sound Level	57.8	6.5	5.0	1.5
R006a	7	1	---	59.9	0.0	---	---	Sound Level	55.8	4.1	5.0	-0.9
R007	8	1	---	67.4	0.0	---	---	Sound Level	59.6	7.8	5.0	2.8
R007a	9	1	---	62.9	0.0	---	---	Sound Level	56.7	6.2	5.0	1.2
R007b	10	1	---	58.0	0.0	---	---	Sound Level	51.8	6.1	5.0	1.1
R008	11	1	---	66.6	0.0	---	---	Sound Level	59.5	7.2	5.0	2.2
R008a	12	1	---	60.2	0.0	---	---	Sound Level	53.6	6.6	5.0	1.6
R008b	13	1	---	57.4	0.0	---	---	Sound Level	51.2	6.1	5.0	1.1
R009	14	1	---	68.7	0.0	---	---	Sound Level	61.2	7.5	5.0	2.5
R009a	15	1	---	63.3	0.0	---	---	Sound Level	56.3	7.0	5.0	2.0
R009b	33	1	---	61.5	0.0	---	---	Sound Level	55.1	6.4	5.0	1.4
R009c	16	1	---	59.8	0.0	---	---	Sound Level	54.5	5.3	5.0	0.3
R010	17	1	---	60.9	0.0	---	---	Sound Level	60.9	0.0	5.0	-5.0
R011	19	1	---	59.2	0.0	---	---	Sound Level	59.2	0.0	5.0	-5.0
R012	20	1	---	57.1	0.0	---	---	Sound Level	57.1	0.0	5.0	-5.0
R013	21	1	---	58.4	0.0	---	---	Sound Level	58.5	-0.0	5.0	-5.0
R014	22	1	---	60.2	0.0	---	---	Sound Level	60.2	-0.0	5.0	-5.0
R015	23	1	---	62.1	0.0	---	---	Sound Level	62.1	-0.0	5.0	-5.0
R016	24	1	---	61.6	0.0	---	---	Sound Level	61.6	-0.0	5.0	-5.0
R017	25	1	---	59.7	0.0	---	---	Sound Level	59.7	-0.0	5.0	-5.0
R018*	26	1	---	62.2	0.0	---	---	Sound Level	55.4	6.8	5.0	1.8
R019*	27	1	---	65.0	0.0	---	---	Sound Level	57.5	7.5	5.0	2.5
R020*	28	1	---	61.4	0.0	---	---	Sound Level	55.5	5.9	5.0	0.9
R021*	29	1	---	59.8	0.0	---	---	Sound Level	53.5	6.4	5.0	1.4
R022*	30	1	---	63.7	0.0	---	---	Sound Level	57.3	6.5	5.0	1.5
R023*	31	1	---	52.6	0.0	---	---	Sound Level	52.6	0.0	5.0	-5.0
R024	31	1	---	57.9	0.0	---	---	Sound Level	57.9	0.0	5.0	-5.0
R025*	32	1	---	62.5	0.0	---	---	Sound Level	62.5	0.0	5.0	-5.0