

APPENDIX G: HIGHWAY 416 AND BARNSDALE ROAD INTERCHANGE ENVIRONMENTAL NOISE ASSESSMENT

HIGHWAY 416 AND BARNSDALE ROAD INTERCHANGE

OTTAWA, ONTARIO

ENVIRONMENTAL NOISE ASSESSMENT

RWDI #2003291 / MTO #4019-E-0023

August 28, 2023

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EXECUTIVE SUMMARY

Morrison Hershfield retained RWDI to complete an environmental noise assessment for the proposed new interchange of Highway 416 and Barsndale Road in Barrhaven, Ontario. The undertaking covers the roadway segment from Bankfield Road to Cambrian Road.

The objective of the study is to predict operational sound levels as it relates to the Project and provide mitigation measures to minimize the potential for noise impacts, along with an economic feasibility assessment for any mitigation recommendations, if necessary. Construction sound levels were also investigated, and high-level, conceptual mitigation measures were recommended.

The relative increase in future sound levels due to the undertaking was not significant, i.e. less than 5 dB as per MTO, at any of the noise-sensitive receivers. Additionally, future ambient absolute sound levels with the undertaking did not exceed 65 dBA. Thus, noise mitigation was not considered.

Construction sound is temporary in nature but will be noticeable at times at existing noise sensitive areas in proximity to the activity. The estimated maximum sound level of the construction noise is approximately 77 dBA at locations nearest to the construction activity. This estimated sound level has the potential to be an annoyance to receptors within the study limits of this project. For receptors with a larger separation distance, the anticipated sound level due to construction will be lower. It is expected that mitigation measures based on best practices be written into the contract documentation for the contractor as part of a Construction Noise Mitigation Plan.



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1 INTRODUCTION

Morrison Hershfield retained RWDI to complete an environmental noise assessment for the proposed interchange around the intersection of Highway 416 and Barnsdale Road in Barrhaven, Ontario. The project is under the Ontario Ministry of Transportation (MTO) assignment GWP 4019-E-0023. The undertaking covers the roadway segment from Bankfield Road to Cambrian Road.

The objective of the assessment is to predict sound levels as related to the project and assess mitigation measures to minimize any potential impacts, if necessary.

A plain language description of the terminology and relationships between everyday sounds to aid the non-technical reader is provided in **Appendix A**.

1.1 Project Description

The Project involves a proposed new interchange at Highway 416 and Barnsdale Road. The intent of the Project is to accommodate future traffic demand. The Study Area covers the interchange around the intersection of Highway 416 and Barnsdale Road as shown in **Figure 1**. There are no existing noise walls, therefore no noise walls were included in the assessment. The future traffic volumes for both the Future build (i.e. new interchange implemented) and Future No-build (i.e. do nothing) scenarios were based on the data provided by MTO.

Noise sensitive areas were identified within the Study Area. The noise sensitive areas expected to have worst-case sound levels have been presented in detail.

2 APPLICABLE GUIDELINES

A number of guidelines and documents related to assessing road traffic and construction noise impacts have been reviewed that are applicable to this project and are presented herein.

2.1 Operational Noise Guidelines and Policies

The MTO has two current guidelines and documents related to assessing MTO highway road traffic noise impacts. These documents and policies are:

- Ontario MTO, Environmental Guide for Noise (MTO February 2022)
- Ontario MTO, Environmental Reference for Highway Design (MTO 2009)

These guidelines apply to construction of new provincial highways, and reconstruction of existing provincial highways. The Environmental Guide for Noise includes guidance on roadway construction activities.



Sound impacts are assessed by comparing the future sound levels with and without the proposed undertaking. Sound levels are evaluated as 24-hour equivalent sound level based on the Average Annual Daily Traffic (AADT). If the predicted changes are equal or greater than 5 dBA, or if the future sound levels with the undertaking are equal or greater than 65 dBA, noise mitigation is investigated. Noise control measures have to be technically, economically and administratively feasible.

2.2 Construction Noise Guidelines

2.2.1 Local Noise Control By-laws

MTO has reviewed and updated its practices related to obtaining noise bylaw exemption permits. Given that MTO is legally exempt from the requirements of municipal noise bylaws, MTO will no longer be applying for these permits. MTO recognizes the impacts construction related noise can have on a community, and MTO will ensure clear and frequent communication with the municipality to work within the spirit of the municipal noise bylaw. All reasonable attempts will be made including as appropriate, public notification and mitigation measures to reduce noise.

2.2.2 MOE Model Municipal Noise Control Bylaw

The Ministry of the Environment, Conservation and Parks (MECP) stipulates limits on sound levels from individual items 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 checked to ensure that they meet the specified limits contained in MOE Publication NPC-115 - "Construction Equipment", as noted in Table 1 (MOE, 1977b).

Table 1: NPC-115 Maximum Noise Emission Levels for Typical Construction Equipment

Type of Unit	Maximum Sound Level ^[1] (dBA)	Distance (m)	Power Rating (kW)
Excavation Equipment^[2]	83	15	Less than 75 kW
	85	15	75 kW or Greater
Pneumatic Equipment^[3]	85	7	-
Portable Compressors	76	7	-

Notes:

- [1] Maximum permissible sound levels presented here are for equipment manufactured after Jan. 1, 1981.
- [2] Excavation equipment includes bulldozers, backhoes, front end loaders, graders, excavators, steam rollers and other equipment capable of being used for similar applications.
- [3] Pneumatic equipment includes pavement breakers.

3 NOISE SENSITIVE AREAS

3.1 Definition of Noise Sensitive Areas

A Noise Sensitive Area (NSA) is defined as the area where the MTO sound objectives apply and should be considered when investigating the sound levels associated with the operational noise of a roadway. The NSAs are the areas that may eventually qualify to receive noise mitigation in the form of noise barriers if the sound levels exceeded the MTO criteria and if the barriers are deemed technically, economically, and administratively feasible

Under the Environmental Guide for Noise, traditional NSAs include the following land uses, provided they have an outdoor area associated with them (MTO, 2022):

- Private homes (single family units and townhouses)
- Multiple unit buildings such as apartments, provided they have a communal outdoor living area associated with them
- Hospitals and nursing homes for the aged, provided they have an outdoor living area for use by patients

The following land uses are generally not considered NSAs by either the MTO or the MECP:

- Apartment balconies
- Cemeteries
- All commercial
- All industrial

3.2 Receptors within the Area of Investigation

The location of the three identified receptors within the area of Investigation for the project are shown in **Figure 1**. For this project, the receptors are analogous to NSAs, as they are few and spread out. The identified receptors are residential dwellings located on the west and east sides of Highway 416. The maximum area of investigation as defined in the MTO's Environmental Guide for Noise, is 600 m perpendicular from the closest edge of pavement. The list of receivers within the Study Area is as follows:

- **NPR1:** Two-storey dwelling west of Highway 416 on Barnsdale Drive
- **NPR2:** Two-storey dwelling west of Highway 416 on William McEwen Drive
- **NPR3:** Two-storey dwelling west of Highway 416 on William McEwen Drive

4 OPERATIONAL NOISE IMPACTS

4.1 Analysis

Current and future road traffic data were provided for Highway 416 and its main intersecting roads in the traffic study for the Study Area. Ramp traffic data were not provided, however, ramp traffic is not expected to have a large contribution to the overall sound levels. The provided future data were for year 2041 represents the future horizon.



The highest of AM/PM non-summer weekday peak hour and summer weekend peak hour was used to determine the AADT. The AADT is assumed to be 10 times the peak hour volume which aligns with the Institute of Transportation Engineers hourly traffic distribution (ITE, 2010) and was an approved approach upon communication with MTO. Guidance from MTO's Environmental Guide for Noise was used to estimate the truck and vehicle breakdown percentages in lieu of actual estimates. A summary of the traffic data is provided in **Table 2** with the raw traffic data included in **Appendix C**.

The implementation of the United States Federal Highway Administration Traffic Noise Model (TNM) version 2.5 (FHWA, 1998) by Cadna/A was used in the current assessment. The global ground absorption coefficient for Cadna/A is 0.8 which is predominately grassy areas separating the receivers from the highway. Sound levels at the identified receptors, with and without the undertaking, were predicted and summarized in **Table 3**. The relative increase in the future sound levels as a result of the undertaking as compared with the no-built scenario did not trigger the 5 dBA criteria. The absolute future sound levels did not exceed 65 dBA at any of the receptors. Thus, noise mitigation was not considered.

5 CONSTRUCTION NOISE IMPACTS

Construction activities are temporary in nature, and largely unavoidable. With adequate controls, impacts can be minimized. However, for some periods of time and types of work, construction noise will be noticeable. Sound 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.

A high-level analysis of potential worst-case construction sound levels has been conducted based on generic data (equipment types and activities). All construction activities will be confined within the existing right-of-way. The list of equipment used for roadway construction, their locations and the anticipated sound levels are summarized in **Appendix D**. The closest receivers to roadway construction are residential homes located on Barnsdale Road approximately 30 meters from the edge of the road. The sound levels at these receivers resulting from roadway construction are predicted to be approximately 77 dBA. The analysis shows that construction sound levels generally decrease as distance to the receiver increases. Moreover, the construction noise is temporary in nature and will vary based on the activities that take place. The presented sound levels are for the parallel operation of all the equipment, with the duty cycles and equipment distribution, provided in **Appendix D**.

The estimated sound levels have the potential to be an annoyance to homes within the study limits of this project. A comparative chart of sound pressure levels and human perception to aid the reader is found in **Appendix A**. There are presently no receptor-based limits for roadway construction noise impacts. MOE NPC-115 should be followed and actions are required if noise sensitive receptors create complaints. Conceptual noise mitigation measures have been provided in the next section to minimize the potential for noise impacts.

5.1 Conceptual Noise Mitigation

Based on the anticipated construction sound levels, mitigation measures are provided below to minimize the potential for construction noise impacts. It is expected that these be written into the contract documentation for the contractor as part of a Construction Noise Mitigation Plan.

- There should be explicit indication that Contractors are expected to comply with all applicable requirements of the contract and local noise by-laws. Enforcement of noise control by-laws is the responsibility of the Municipality for all work done by Contractors.
- All 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.
- Monitor and maintain haul routes to minimize movement over rough ground and potholes which in turn can generate noise.
- All equipment shall be kept in good working order as deterioration may increase equipment sound levels. A documented, regular inspection and maintenance program must be implemented.
- Vehicle on-site speed limits must be met and will be enforced.
- Idling vehicles will be kept to a minimum.
- In the presence of persistent noise complaints, all construction equipment should be verified to comply with MOE NPC-115 guidelines.
- 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.

6 CONCLUSIONS

An environmental noise assessment of the proposed interchange at Highway 416 and Barnsdale Road in Barrhaven, Ontario has been completed by RWDI.

The relative increase in the future sound levels as a result of the undertaking as compared with the no-built scenario did not trigger the 5 dBA criteria. The absolute future sound levels did not exceed 65 dBA at any of the receptors. Thus, noise mitigation was not considered.

Construction sound is temporary in nature but will be noticeable at times at existing receptors in proximity to the activity. The estimated construction sound levels have the potential to be an annoyance to receptors within the study limits of this project. It is expected that mitigation measures based on best practices be written into the contract documentation for the contractor as part of a Construction Noise Mitigation Plan.



7 REFERENCES

1. Institute of Transportation Engineers (ITE), 2010, Traffic Engineering Handbook, 6th Edition.
2. City of Ottawa, 2022, By-law 2017-255, Noise By-Law.
3. Ontario Ministry of Transportation (MTO), 2006, Environmental Guide for Noise updated July 2008
4. Ontario Ministry of Transportation (MTO), 2009, Environmental Reference for Highway Design
5. Ontario Ministry of the Environment (MOE), 1977b, Model Municipal Noise Control Bylaw, which includes Publication NPC-115 – Construction Equipment
6. TNM - FHWA Federal Highway Administration Model (<http://www.trafficnoise-model.org>) TNM Version 2.5, McTrans Center University of Florida, 2088 Northeast Waldo Road, Gainesville, FL 32609, <http://mctrans.ce.ufl.edu>

8 STATEMENT OF LIMITATIONS

This report entitled Environmental Noise Assessment - Highway 416 and Barnsdale Road Interchange was prepared by RWDI AIR Inc. ("RWDI") for Morrison Hershfield ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

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

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

**ENVIRONMENTAL NOISE ASSESSMENT
HIGHWAY 416 AND BARNSDALE ROAD INTERCHANGE**

RWDI #2003291 / MTO #4019-E-0023
August 28, 2023



Table 2: Summary of Traffic Data

Roadway	Segment	NB/EB		SB/WB		Current AADT (2018)	Future AADT (2041)	% Trucks	Speed Limit (km/h)
		AM	PM	AM	PM				
Highway 416	Bankfield to Fallowfield	2078	1240	775	2301	22590	23010	11.5	100
Barnsdale	Moodie Dr to Trail Rd	268	97	139	229	2690	2680	11.5	100
Barnsdale	Trail Rd to Borrisokane	280	112	157	272	3460	2800	11.5	100
Barnsdale	Borrisokane to Viewbank Rd	241	153	147	226	3370	2410	11.5	100

Table 3: Predicted Road Traffic Sound Levels at Worst-Case Noise-Sensitive Receivers and Comparison with Sound Objectives of the MTO

Receiver ID	Future No Built (FNB)	Future Built (FB)	"FB" Increase Over "FNB"	FB ≥ 65 dBA ^[1]	Significant Relative Future Increase ^[2]
NR1	59	59	0	No	No
NR2	61	61	0	No	No
NR3	63	63	0	No	No

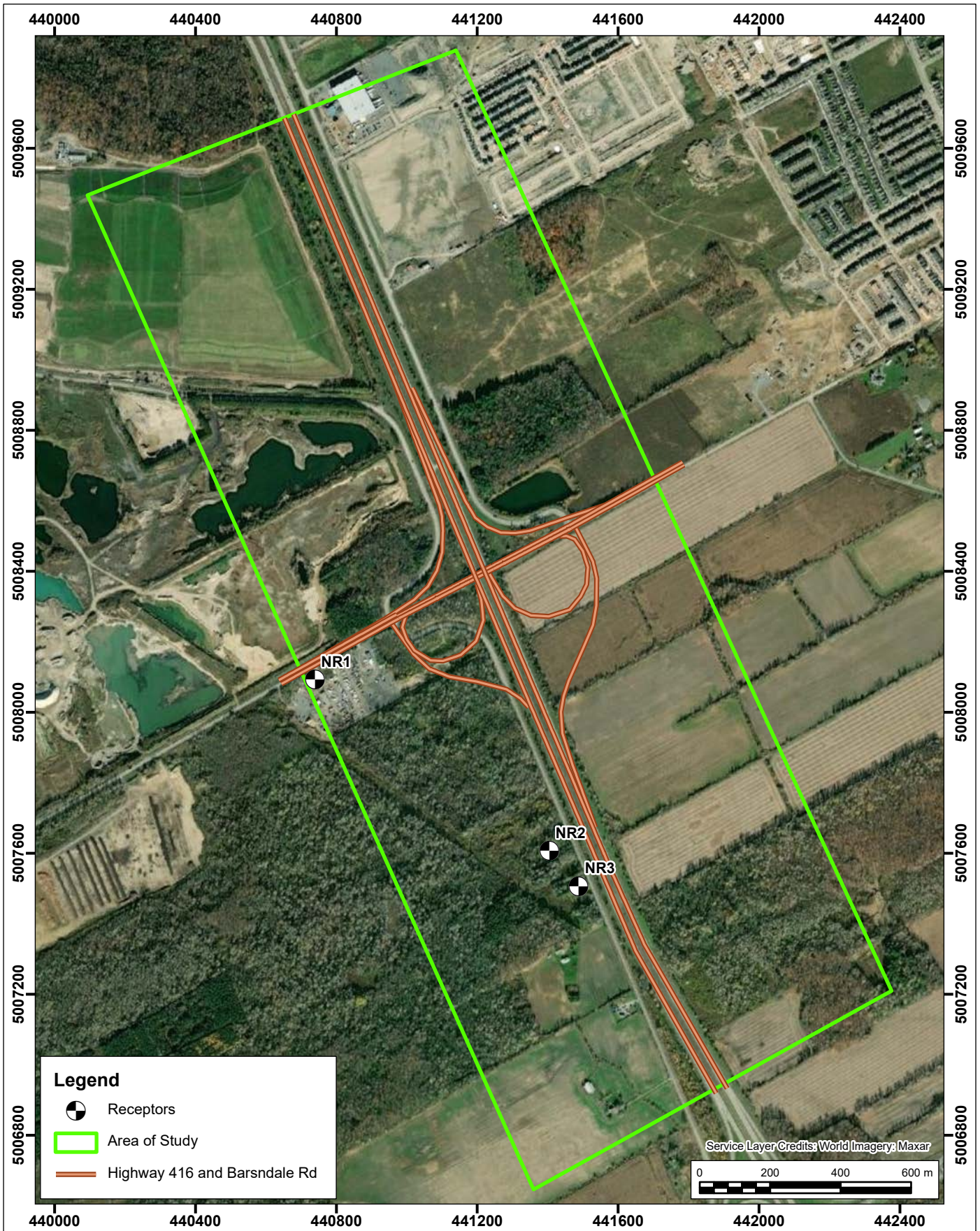
Notes:

[1] MTO absolute future sound level objective of 65 dBA.

[2] MTO relative significant increase of 5 dB or higher.

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FIGURE



Legend

- Receptors
- Area of Study
- Highway 416 and Barsndale Rd

Service Layer Credits: World Imagery: Maxar

Map Document: C:\Users\Krislana.DalBelle\OneDrive - RWID\Desktop\Hwy416\MyProject\MyProject.aprx

Study Area Extent and Noise Sensitive Receivers



Drawn by: KD	Figure: 1
Approx. Scale: 1:15,000	
Date Revised: Dec 23, 2022	



Map Projection: NAD 1983 UTM Zone 18N
 Highway 416 and Barnsdale Interchange - Ottawa, Ontario

Project #: 2003291

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APPENDIX A



TRANSPORTATION SOUND BASICS

Sound Levels

Sound is, in its simplest form, a dynamic, fluctuating pressure, in a fluid medium. That medium can be air, other gases, or liquids such as water. These fluctuations are transmitted by pressure waves through the medium from the source to the receiver. For the majority of transportation engineering purposes, the primary interest is with sound waves in air, with human beings as the receptor. Noise is defined as unwanted sound. The standard practice within the acoustical industry is to use these two terms interchangeably.

Decibels

A decibel (dB) is a logarithmic ratio of a value to a reference level. The general mathematical format is:

$$\text{Level in dB} = 10 \log (\text{Value} / \text{Reference})$$

Any value can be expressed in decibels. Decibels are very useful in performing comparisons where there are huge ranges in levels. For example, an acoustical engineer can expect to deal with acoustical energy values ranging from 0.00001 W to 100 W (sound power), and pressures ranging from 0.002 Pa to 200 Pa (sound pressure).¹ For completeness, decibels should always be stated with their reference level (e.g., 20 dB re: 20 μ Pa). However, in practice the reference level is often left out.

Sound Pressure Level

Sound pressure level is what humans experience as sound. Sound waves create small fluctuations around the normal atmospheric pressure. These pressure fluctuations come into contact with eardrums and create the sensation of sound. Sound pressure is measured in decibels, according to the following equation:

$$\text{Sound Pressure Level, dB} = 10 \log (p^2 / p_0^2)$$

Where: p = root mean square (r.m.s.) sound pressure, in Pa
 p_0 = reference sound pressure, 20 μ Pa

The reference pressure represents the faintest sound that a “typical” human being can hear. The typical abbreviation for sound pressure level is SPL, although L_p is also often used in equations. “Sound level” or “noise level” are also sometimes used.

¹ Equivalent to Sound Power Levels ranging from 70 to 140 dB and Sound Pressure Levels ranging from 20 dB to 140 dB



Octave Bands

Sounds are composed of varying frequencies or pitches. Human sensitivity to noise varies by frequency, with a greater sensitivity to higher frequency sounds. The propagation of sound also varies by frequency. The unit of frequency is Hertz (Hz), which refers the number of cycles per second (number of wave peaks per second of the propagating sound wave). The typical human hearing response runs from 20 Hz to 20,000 Hz. Frequencies below 20 Hz are generally inaudible, although response is variable, and some individuals may be able to hear or perceive them.

Sound is typically analysed in octave bands or 1/3-octave bands. An octave band is defined as a band or range of sound frequencies where the frequency range doubles for succeeding octave (alternately, the highest frequency in the range is twice the value of the lowest frequency). Octave band and 1/3-octave band frequencies of interest frequencies of interest are shown in the table on the following page. Road and rail transportation noise sources tend to be broadband in nature, having roughly equal sound energy in many octave bands. Heavy rail traffic and heavy truck traffic may produce significant noise in lower frequencies < 200 Hz.

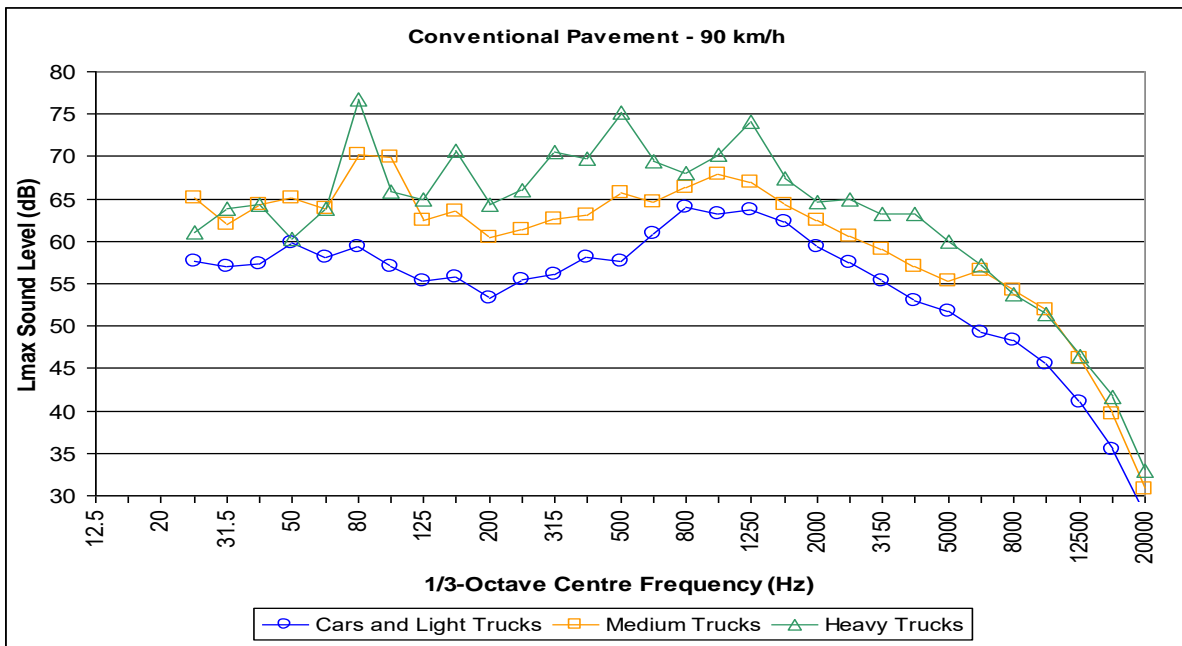
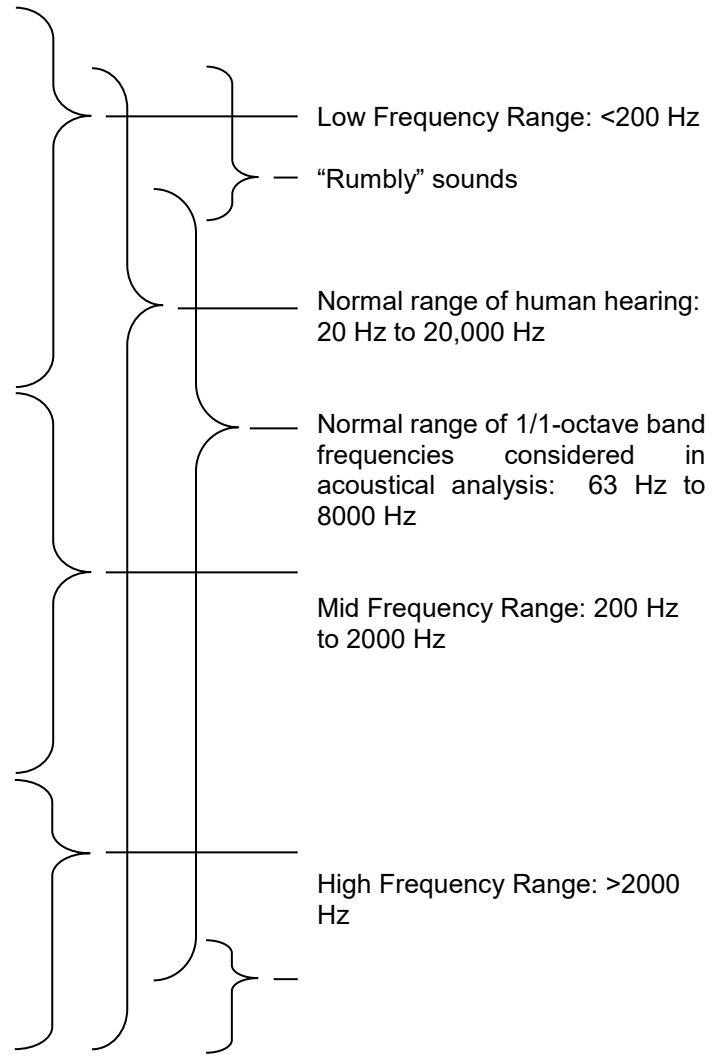


Figure 1: Typical Frequency Spectra of Traffic Noise - Vehicle Pass-bys at 90 km/h



Table 1: Octave Band Frequencies of Interest

Centre-Frequency (Hz)		Band No.	Frequency Range (Hz)
1/3-Octave	1/1-Octave		
12.5	16	N/A	11 to 22
16			
20			
25	31.5	0	22 to 45
31.5			
40			
50			
63	63	1	45 to 89
80			
100			
125	125	2	89 to 177
160			
200			
250			
315	250	3	177 to 345
400			
500			
630	500	4	345 to 707
800			
1,000			
1,250			
1,600	2,000	6	1,414 to 2,828
2,000			
2,500			
3,150	4,000	7	2,828 to 5,657
4,000			
5,000			
6,300			
8,000	8,000	8	5,657 to 11,314
10,000			
12,500			
16,000			
20,000	16,000	N/A	11,314 to 22,627



Note: Per ISO 266-1975



A-Weighting

When the overall sound pressure level is expressed as a single value (i.e., not expressed in frequency band levels) the variation in human frequency response must be accounted for. People do not hear low frequency noise as well as noise in mid or high frequencies. To account for this, frequency-weighting networks have been developed to better account for human hearing response. The most frequently used networks are the A-Weighting and C-Weighting.

The A-Weighting network was developed to correspond to how humans hear low to medium levels of noise. The A-Weighting is the most frequently used scheme, and the majority of noise guidelines are expressed in A-Weighted decibel values, denoted as “dBA” levels. C-Weighted “dBC” values are sometimes used in assessing low-frequency noise impacts, which are generally not of concern in transportation noise impact assessment. The A-Weighting and C-Weighting values are shown in the following table and figure.

Table 2: A- and C-Weighting Values

1/1-Octave Frequency (Hz)	A-Weighting Value (dB)	C-Weighting Value (dB)
31.5	-39.4	-3.0
63	-26.2	-0.8
125	-16.1	-0.2
250	-8.6	0
500	-3.2	0
1,000	0	0
2,000	1.2	-0.2
4,000	1.0	-0.8
8,000	-1.1	-3.0

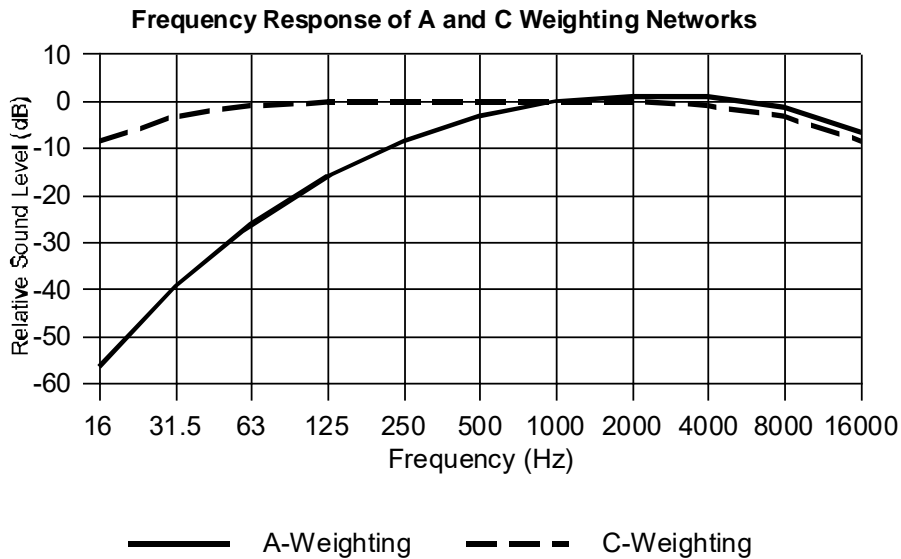


Figure 2: A-Weighting and C-Weighting Networks



Ranges of Sound Levels

People experience a wide range of sound levels in their daily activities. The table below presents a graphical comparison of “typical” noise levels which might be encountered, and the general human perception of the level.

Table 3: Ranges of Sound Levels

Sound Levels		Sources of Noise
Human Perception	SPL, in dBA	
Deafening	125	Sonic booms
	120	Threshold of Feeling / Pain
	115	Maximum level, hard rock band concert
	110	Accelerating Motorcycle at a few feet away
Very Loud	105	Loud auto horn at 3 m (10 ft) away
	100	Dance club / maximum human vocal output at 1 m (3 ft) distance
	95	Jack hammer at 15 m (50 ft) distance
	90	Indoors in a noisy factory
Loud	85	Heavy truck pass-by at 15 m (50 ft) distance
	80	School cafeteria / noisy bar; Vacuum Cleaner at 1.5 m (5 ft)
	75	Near edge of major Highway
	70	Inside automobile at 60 km/h
	65	Normal human speech (unraised voice) at 1 m (3 ft) distance
Moderate	60	Typical background noise levels in a large department store
	55	General objective for outdoor sound levels; typical urban sound level
	50	Typical suburban / semi-rural sound level (24h)
	45	Typical noise levels in an office due to HVAC; typical rural levels (24h)
Faint	40	Typical background noise levels in a library
	35	
	30	Broadcast Studio
	25	Average whisper
Very Faint	20	Deep woods on a very calm day
	15	
	10	
	5	Human breathing
	0	Quietest sound that can be heard

Sound levels from 40 to 65 dBA are in the faint to moderate range. The vast majority of the outdoor noise environment, even within the busiest city cores, will lie within this area. Sound levels from 65 to 90 are perceived as loud. This area includes very noisy commercial and industrial spaces. Sound levels greater than 90 dB are very loud to deafening, and may result in hearing damage.



Transportation noise events, which vary with time, can also be considered in terms of their maximum noise level (L_{max}) during a vehicle pass-by, as shown in the following table:

Table 4: Typical Pass-By Noise Levels at 15 m from Noise Source

Event	Range of Noise Levels (dBA) at 15 m
Semi-Trailer Trucks	75 - 85
Aircraft	69 - 85 ^[1]
Conventional Light Rapid Transit (Streetcars)	72 - 80 ^[2]
Large Trucks	71 - 78
Street Motorcycle	76
Diesel or Natural Gas Bus	70 - 78
Trolley Bus	69 - 73
Small Motorcycle	67
General Busy Auto Traffic	66 - 70
Individual Automobiles	63 - 69

Notes: Source: BKL Consultants Ltd.

[1] Aircraft flyover not at 15 m distance

[2] Based on data provided for the Calgary, Edmonton and Portland LRT systems.

Noise Descriptors – Leq Values

At this time, the best available research indicates that long-term human responses to noise are best evaluated using energy equivalent sound exposure levels (L_{eq} values), in A-Weighted decibels (L_{eq} values in dBA)^{2,3} including adjustments to account for particularly annoying characteristics of the sounds being analyzed.

Sound levels in the ambient environment vary each instant. In a downtown urban environment, the background noise is formed by an “urban hum”, composed of noise from distant road traffic and from commercial sources. As traffic passes near a noise receptor, the instantaneous sound level may increase as a vehicle approaches, and then decrease as it passes and travels farther away. The energy equivalent sound exposure level L_{eq} is the average sound level over the same period of time with same acoustical energy as the actual environment (i.e., it is the average of the sound energy measured over a time period T). As a time-average, all L_{eq} values must have a time period associated with them. This is typically placed in brackets beside the L_{eq} tag. For example, a thirty-minute L_{eq} measurement would be reported as an L_{eq} (30 min) value.

The L_{eq} concept is illustrated in Figure 3, showing noise levels beside a small roadway, over a 100 second time period, with two vehicle pass-bys:

² Berglund and Lindvall, Community Noise, 1995.

³ ISO 1996:2003(E), *Acoustics – Description, measurement and assessment of environmental noise – Part 1: Basic quantities and assessment procedures*.

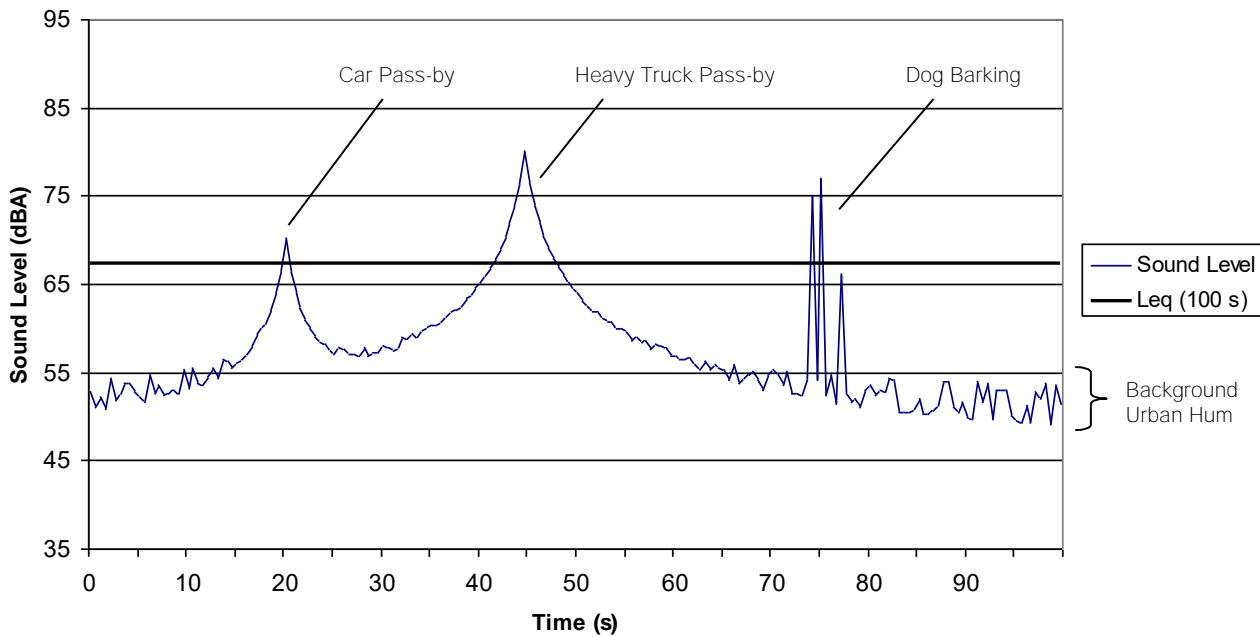


Figure 3: Example of the L_{eq} Concept

In this example, the background “urban hum” is between 47 and 53 dBA. A car passes by at 20 seconds. As it approaches, the noise level increases to a maximum, and then decreases as it speeds away. At 45 seconds, a heavy truck passes by. Near 75 seconds, a dog barks three times. The maximum sound level (L_{max}) over the period is 80 dBA and the minimum is 47 dBA. For almost 50% of the time, the sound level is lower than 55 dBA.

The L_{eq} (100s) for the above example is 67 dBA, which is much higher than the statistical mean sound level of 55 dBA. This illustrates that the L_{eq} value is very sensitive to loud noise events, which contain much more sound energy (as sound is ranked on a logarithmic scale) than the normal background. It is also sensitive to the number of events during the time period, and the duration of those events. If only the truck had passed by during the measurement (no car and no dog barks), the L_{eq} (100s) would be 66 dBA. If only the car and dog barks had occurred, the L_{eq} (100s) would have been 61 dBA. This shows that the truck pass-by is the dominant event in our example, due to its level and duration.

The ability of the L_{eq} metric to account for the three factors of level, duration and frequency of events makes it a robust predictor of human response to noise. It is for this reason that the vast majority of noise standards are based on L_{eq} values.



Typical Durations for Leq Analyses

For transportation noise impact analyses, the following durations are typically used:

- Leq (24h) - The sound exposure level over the entire 24-hour day
- Leq Day - Either: Leq (15h), from 7am to 10 pm; or
Leq (16h), from 7am to 11 am
- Leq Night - Either: Leq (9h), from 10 pm to 7 am; or
Leq (8h), from 11 pm to 7 am
- L_{dn} - A special Leq (24h) value with a 10 dB night-time penalty applied to overnight sound levels (10pm to 7am)
- Leq (1-h) - The sound exposure over a 1-hour time period

Leq (24h) values are appropriate for examining impacts of transportation noise sources with small changes in sound exposure levels over the 24-hour day. For example, freeway noise levels are generally consistent over the 24-hour day. Therefore, for freeways, there is little difference between Leq (24h) values and the corresponding Leq Day and Leq Night values.

Leq Day values, covering off the AM-peak and PM-peak travel periods, are generally appropriate for examining the impacts of non-freeway highways and municipal arterial roadways. The vast majority of noise associated with these sources is concentrated in the daytime hours, where typically, 85% to 90% of the daily road traffic will occur.⁴ Thus, if reasonable sound levels occur during the daytime (and appropriate guideline limits are met), they will also occur (and be met) at night.

To account for increased annoyance with noise overnight in a single value, the U.S. Environmental Protection Agency (U.S. EPA) developed the L_{dn} metric. It is a special form of the Leq (24h) with a +10 dB night-time penalty. L_{dn} values and a related metric, the day-evening-night level (L_{den}) are also used in some European guidelines. L_{dn} values are not used in Canadian Provincial jurisdictions in evaluating transportation noise. Instead, guideline limits for separate Leq Day and Leq Night periods are generally used.

Leq (1-h) values are the average sound levels over a one-hour time period. These tend to fluctuate more over the day, as traffic levels can fluctuate significantly hour to hour. Leq (1-h) values are useful in assessing the impact of transportation sources which also vary hourly, and which may vary in a different manner than the background traffic. These values are often used to assess haul route noise impacts, for example.

⁴ Based on research conducted by Ontario Ministry of Transportation, and provided in the *MTO Environmental Office Manual Technical Areas - Noise*. Daytime refers to a 16 hour day from 7am to 11 pm.



Some transportation noise sources may have significant traffic levels occurring over-night. For example, freight rail traffic in heavily used corridors can be shifted to over-night periods, with daytime track use being reserved for freight switcher traffic and passenger traffic. In situations such as this, an assessment of both daytime and night-time noise impacts may be appropriate.

Decibel Addition

Decibels are logarithmic numbers, and therefore have special properties of addition. Decibel values must be added logarithmically. If two sources, each emitting the same amount of sound energy, are placed side-by-side, then the total increase in sound level will only be 3 dB. If the difference in sound energy emitted is greater than 10 dB, then effectively the sound level will be the same as for the loudest unit (i.e., the increase in noise will be less than a decibel). This is shown in Table 5.

Table 5: Decibel Addition Chart

dB Difference Of	dB Value to Add to Highest Number
0	3.0
1	2.5
2	2.1
3	1.8
4	1.5
5	1.2
6	1.0
7	0.8
8	0.6
9	0.5
10	0.4

This affects transportation noise from projects, as noise emission is logarithmically related to traffic volume. Doubling the traffic volume (essentially the same as adding a source with the same sound emission) will only result in a 3 dB increase over the original levels. The decibel increase in noise due to the increase in traffic volume, assuming all other factors remain the same, can be estimated by:

$$\text{dB increase} = 10 \log (\text{new volume} / \text{original volume}).$$



Human Response to Changes in Sound Levels

The human ear does not interpret changes in sound level in a linear manner. The general subjective human perception of changes in sound level is shown in the following table.

Table 6: Subjective Human Perception of Changes in Sound Level ^{5,6}

Change in Broadband Sound Level (dB)	Human Perception of Change
< 3	Imperceptible change
3	Just-perceptible change
4 to 5	Clearly noticeable change
6 to 9	Substantial change
> 10 and more	Very substantial change (half or twice as loud)
> 20 and more	Very substantial change (much quieter or louder)

Notes: Adapted from Bies and Hansen, p53, and MOE Noise Guidelines for Landfill Sites, 1998. Applies to changes in broadband noise sources only (i.e., increases or decreases in the same noise or same type of noise only). Changes in frequency content or the addition of tonal or temporal changes would affect the perception of the change.

The above table is directly applicable to changes in sound level where the noise sources are of the same general character. For example, existing road traffic noise levels can be directly compared to future road traffic noise levels, using the above relationships. In comparing road traffic noise to road plus rail traffic noise, the different frequency and temporal nature of the noise means that the rail noise may be more noticeable. Adjustments for the nature of the new sound can be applied to better account for temporal and frequency differences.

For transportation noise sources, research conducted by the U.S. Environmental Protection Agency indicates that a 5 dB change in sound levels is required to trigger a change in large-scale community response to noise. This correlates to a clearly noticeable increase in noise levels.

⁵ Bies, D.A., and C.H. Hansen 1988. *Engineering Noise Control – Theory and Practice, 2nd Ed.* E & FN Spon, London, p 53.

⁶ Ontario Ministry of the Environment 1998. [Noise Guidelines for Landfill Sites](#). Queen’s Printer for Ontario.



Decay of Noise with Distance

Noise levels decrease with increasing distance from a source of noise. The rate of decay is partially dependent on the nature of the ground between the source: whether it is hard (acoustically reflective) or soft (acoustically absorptive). Transportation noise sources in general act as *line sources* of sound. For line sources, the rate of decay is approximately:

- Hard ground: 3 dB for each doubling of distance from the source
- Soft ground: 5 dB for each doubling of distance from the source

This is shown graphically in Figure 6, based on a reference distance of 15 m from the source:

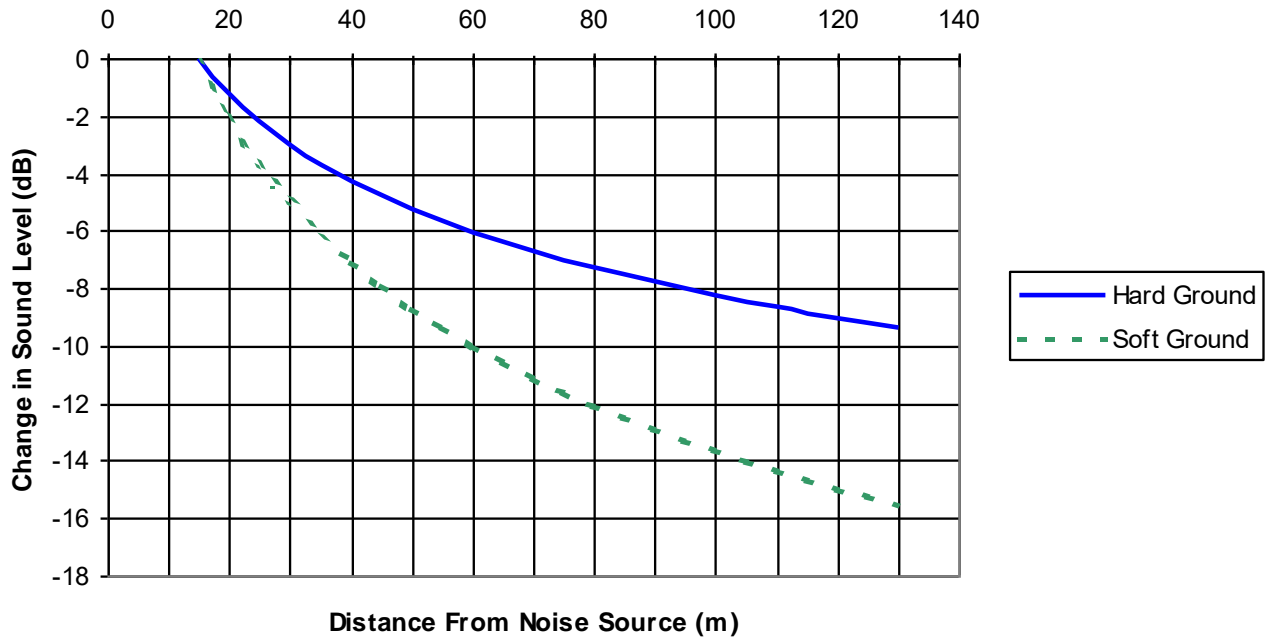


Figure 4: Decay of Noise Versus Distance for Line Sources

The page features a decorative background with a large, light grey curved shape on the right side and a blue curved shape on the left side, separated by a white border.

APPENDIX B

[Home](#) > [Living in Ottawa](#) > [By-laws, licences and permits](#) > [By-laws](#) > [By-law A-Z](#) > **Noise (By-law No. 2017-255)**

Noise (By-law No. 2017-255)

Disclaimer

By-laws contained in this section have been prepared for reference purposes only. Every effort is made to ensure the accuracy of this information; however it is not to be used in place of actual by-laws.

Actual by-laws can be obtained at the following locations:

City Archives

James Bartleman Centre

100 Tallwood Dr. (Corner of Woodroffe)

Ottawa, Ontario

tel.: 613-580-2857

fax : 613-580-2614

e-mail: archives@ottawa.ca 

Ottawa Public Library

120 Metcalfe, Ottawa Room

613-580-2940

Amendments

- 2019-171
- 2020-199
- 2022-127
- 2022-227
- 2022-355
- 2022-391



Introduction

A by-law of the City of Ottawa respecting noises.

WHEREAS it is in the public interest to reduce the noise level in the City of Ottawa, so as to preserve, protect and promote public health, safety, welfare and peace and quiet of the inhabitants of the City;

THEREFORE, the Council of the City of Ottawa enacts as follows:

Highlights

- Ringing a bell, blowing a horn or shouting or causing unusual noise in a manner that disturbs inhabitants of the City is an offence. This does not apply to the ringing of bells in connection with a religious service.
- Fines range from \$400 to \$10,000 per offence.
- Snow Removal and Snow Clearing are exempt from the [Noise By-law \(2017-255\)](#)  . The provisions of this by-law shall not apply to snow clearing or snow removal activities. This includes plowing, salting, and removing snow banks. This means that snow removal/clearing may take place 24/7 on private or public property by residents or contractors.

Section 1 – Definitions

In this by-law;

“**agricultural operation**” means an agricultural, aquacultural, horticultural or silvicultural operation that is carried on in the expectation of gain or monetary reward;

“agricultural processing” includes sawing, cleaning, treating, grading and packaging to the extent that these activities relate to products primarily from and are conducted as a part of an agricultural operation;

“bass noise” means any low frequency sound which may be audible or otherwise felt as vibration;

“By-law Officer” means a person appointed by the Council of the City of Ottawa as a Municipal Law Enforcement Officer to enforce the provisions of this by-law;

“car alarm” means any audible device installed in any form of vehicle for the purposes of deterring theft of, or from, the vehicle;

“Chief of Police” means the Chief of Police of the Ottawa Police Service or authorized representative;

“City” means the municipal corporation of the City of Ottawa or the geographic area of the City of Ottawa as the context requires;

“City Construction Project” means a significant construction project undertaken by the City or on behalf of the City which involves or affects City highways, City property or other property, or City services, and from which noise will be created that requires an exemption from the provisions of this by-law;

“Confederation Line Project” means those sections of the existing or future right-of-way between the Tunney’s Pasture and Blair Rapid Transit Stations that are to be utilised, or are utilised, for light rail transit as approved by City Council, and includes the following components:

- (1) railway tracks;
- (2) guideways;
- (3) overhead catenary system;
- (4) underground tunnel;
- (5) access shafts;
- (6) maintenance and storage facilities (MSF);
- (7) associated access tracks;
- (8) staging areas;
- (9) stations; and
- (10) all associated infrastructure and facilities required for its construction;

“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;

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

“containerized waste” means waste deposited in a front-end loading container for collection;

“dB(A)” means the sound level in decibels obtained when using a sound level meter with the A-weighting;

“effective muffler” means a muffler in good working order and in constant operation to prevent excessive or unusual noise and excessive smoke, but it does not include a cut-out muffler, straight exhaust, gutted muffler, Hollywood muffler, by-pass or similar device.

“equivalent sound level”, sometimes denoted as L_{eq} , means the value of the constant sound level which would result in exposure to the same total A-weighted energy as would the specified time-varying sound, if the constant sound level persisted over an equal time interval and is measured in dB(A);

“highway” means a common and public highway and includes any bridge, trestle, viaduct or other structure forming part of the highway and, except as otherwise provided, includes a portion of the highway;

“infill housing” means a development that occurs on a single lot, or a consolidated number of small lots or sites that are vacant or underdeveloped;

“Manager of By-law & Regulatory Services” means the person occupying the position of the Manager of By-law & Regulatory Services in the Emergency and Protective Services Department of the City of Ottawa or authorized representative;

“motor assisted bicycle” means a bicycle,

(1) that is fitted with pedals that are operable at all times to propel the bicycle

(2) that weighs not more than fifty-five (55) kilograms;

(3) that has no hand or foot operated clutch or gearbox driven by the motor and transferring power to the driven wheel;

(4) that has an attached motor driven by electricity or having a piston displacement of not more than fifty (50) cubic centimetres; and

(5) that does not have sufficient power to enable the bicycle to attain a speed greater than fifty (50) kilometres per hour on level ground within a distance of two (2) kilometres from a standing start;

“motorcycle” means a self-propelled vehicle having a seat or saddle for the use of the driver and designed to travel on not more than three (3) wheels in contact with the ground, and includes a motor scooter, but does not include a motor assisted bicycle;

“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 a streetcar 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;

“municipal waste collection” means the collection, transportation and disposal of refuse as undertaken by the City of Ottawa or its sub-contractors;

“noise level in dB(A) units” means the reading of any precision sound level meter which meets the International Electrotechnical Commission Publication 651 or the American National Standards Institute S1.4-1983 or any successor thereto;

“person” includes an individual, a corporation, a partnership, an association, or other legal entity;

“point of reception” means any point on the premises of a person where sound or vibration originating from other than those premises are received;

“refuse compacting equipment” means a vehicle fitted in order to compact and transport refuse;

“solid waste bulk lift equipment” means a vehicle designed to load, unload and transport containers for handling refuse;

“sound amplifying system” means any system of loudspeakers, amplifiers, microphones or reproducers or any combination of such equipment, including electronic devices or electro-mechanical transducers, used in the reproduction or amplification of music, speech or other sounds;

“sound reproduction device” means a device intended primarily for the production or reproduction of sound, including, but not limited to, any musical instrument, radio receiver, television receiver, tape recorder, phonograph or sound amplifying system;

“special event” includes a demonstration, parade, sports event, festival, carnival, donation station, street dance, residential block party, sidewalk sale, outdoor mass and other like events;

“vehicle” includes a motor vehicle, trailer, traction engine, farm tractor, road building machine, motorcycle, bicycle and any vehicle drawn, propelled or driven by any kind of power, including muscular power, but does not include a motorized snow vehicle, or the cars of electric or steam railways running only upon rails.

Section 2 – Unusual noise, noise likely to disturb

No person shall cause or permit any bass noise, unusual noise or noise likely to disturb the inhabitants of the City.

Section 3 – Bells, horns, shouting

No person shall cause or permit the ringing of any bell, sounding of any horn, or shouting in a manner likely to disturb the inhabitants of the City provided that nothing herein contained shall prevent,

- (1) the ringing of bells in connection with any church, chapel, meeting house or religious service
- (2) the ringing of bells in connection with City Hall between 0900 hours and 2100 hours of the same day;
- (3) the ringing of fire bells or fire alarms or the making of any other noise for the purpose of giving notice of fire or any other danger or any unlawful act, other than a car alarm, for a continuous period of time of twenty (20) minutes or less.
- (4) the sounding of a car alarm for a continuous period of time of five (5) minutes or less.

Section 4 – Sound reproduction or amplification devices

- (1) No person shall operate or use or cause to be operated or used any sound reproduction device between 2300 hours of one day and 0700 hours of the next day so as to disturb the peace and comfort of,
 - (a) any person in any dwelling house, apartment house, hotel or other type of residence; or
 - (b) any owner or operator of a business in his or her place of business.
- (2) Despite subsection (1), no person shall operate or use or cause to be operated or used any sound reproduction device so as to disturb the peace and comfort of:
 - (a) any person in any dwelling house, apartment house, hotel or other type of residence before 0900 hours on any Saturday; or
 - (b) any person in any dwelling house, apartment house, hotel or other type of residence before 1200 hours on any Sunday or statutory or public holiday; or
 - (c) any owner or operator of a business in his or her place of business before 0900 hours on any Saturday; or
 - (d) any owner or operator of a business in his or her place of business before 1200 hours on any Sunday or statutory or public holiday.
- (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 and 2300 hours of the same day, the noise from which sound reproduction device:
 - (a) is clearly audible in another dwelling within the said residence; and
 - (b) has an equivalent sound level (Leq) greater than 45 dB(A) when measured in another dwelling within the said residence.
- (4) On any Sunday or statutory or public holiday, the provisions of subsection (3) shall not come into effect until after 1200 hours.
- (5) No person shall operate or use or cause to be operated or used any sound reproduction device on any highway or other public place.
- (6) 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 and 2300 hours of the same day, the noise from which sound reproduction device when measured in any business, dwelling house, apartment house, hotel or any other type of residence has an equivalent sound level (Leq) greater than 45 dB(A).
- (7) No person shall operate or cause to be operated or used any sound reproduction device between 0700 hours and 2300 hours of the same day, the noise from which sound reproduction device has an equivalent sound level (Leq) greater

than 55 dB(A) when measured outside of the business, dwelling house, apartment house, hotel or other residence, at or inside the property line of the business owner or person whose peace and comfort has been disturbed.

(8) The provisions of subsections (6) or (7) shall not apply where circumstances are such that an infraction is covered by subsections (1), (2), (3) or (4) and those subsections shall prevail.

(9) Subsections (5), (6) or (7) do not apply to prevent,

(a) the use of sound reproduction devices in the City's parks provided that the user has a permit from or the written permission of the City to do so and the user otherwise complies with the provisions of this by-law;

(b) the amplification of the sound of the ringing of bells or the playing of chimes in connection with:

(i) any church, chapel, meeting house or religious service, or

(ii) City Hall between 0900 hours and 2100 hours of the same day;

(c) the use of sound reproduction devices in a reasonable manner for parades or special events carried on under the authority of a permit pursuant to By-law No. 2001-260, the Special Events By-law or any successor thereto, or in accordance with the law;

(d) the use of sound reproduction devices in a reasonable manner for any social, recreational, community or athletic activity approved on a highway pursuant to the provisions of By-law No. 2003-530, the Traffic and Parking By-law, or any successor thereto; or

(e) the use of musical instruments by street musicians on the highway or other public place, provided that the use is not liable to disturb the peace, enjoyment and comfort or convenience of individuals or the public.

(10) Assessment of noise complaints may be undertaken at the point of reception of the noise for the purposes of confirming a violation.

Section 5 – Air conditioners, heat pumps, compressors, condensers, chillers, cooling towers and similar devices

No person shall use or operate or cause to be used or operated any air conditioner, heat pump, compressor, condenser, chiller, cooling tower or similar device, the noise from which has a level greater than 50 dB(A) when measured at the point of reception.

Section 6 – Exhaust fan, exhaust system, intake fan generators, commercial dryer or similar device

(1) No person shall use or operate or cause to be used or operated any exhaust fan, exhaust system, intake fan, generators, dryer in a commercial car wash or similar device which includes combustion exhaust of a high efficiency furnace, the noise from which has a level greater than 50 dB(A) when measured at the point of reception.

(2) Subsection (1) does not apply to a person using or operating a portable generator in a residential area in an emergency situation.

Section 7 – Pump or filtration systems

No person shall use or operate or cause to be used or operated any pump, filtration system or similar device for an outdoor swimming pool, hot tub, spa fountain or water feature, the noise from which has a level greater than 50 dB(A) when measured at the point of reception.

Section 8 – Power equipment

(1) No person shall operate or cause to be operated any power equipment such as chainsaws, power lawnmowers, leaf blowers, power tools or other similar devices, between 2100 hours of one day and 0700 hours of the next day, the noise from which disturbs or tends to disturb the inhabitants of the neighbourhood, or persons in the vicinity.

(2) Despite subsection (1), no person shall operate or cause to be operated any power equipment before 0900 hours on any Saturday, Sunday, statutory or public holiday.

- (3) Subsections (1) and (2) do not apply to a person operating power equipment used for the purpose of maintaining a golf course.

Section 9 – Heavy-duty equipment

- (1) No person shall use or operate or cause to be used or operated high vacuum (H-Vac) devices, street sweeping equipment or other similar devices between 2300 hours of one day and 0700 hours of the next day, the noise from which disturbs or tends to disturb the inhabitants of the neighbourhood, or persons in the vicinity.
- (2) Despite subsection (1), no person shall use or operate high vacuum (H-Vac) devices, street sweeping equipment or other similar devices before 0900 on any Sunday or statutory or public holiday.

Section 10 – Refuse collection

- (1) No person shall cause or permit the operation of:
- (a) refuse compacting equipment; or
 - (b) solid waste bulk lift equipment, between 2300 hours of one day and 0700 hours of the next day so as to make or cause noises that disturb, or tend to disturb, the inhabitants of the neighbourhood, or persons in the vicinity.
- (2) Despite subsection (1), no person shall cause or permit the loading or unloading of containerized waste before 0900 hours on any Sunday or statutory or public holiday.
- (3) The provisions of subsections (1) and (2) shall not apply to:
- (a) municipal waste collection; and
 - (b) the Central Area of the City as described in Schedule “B” attached hereto.

Section 11 – Deliveries

1. No person shall cause or permit the delivery of any goods, wares, merchandise or commodities from any vehicle to the owner, lessee, tenant or occupier of any premises between the hours of 2300 hours of one day and 0700 hours of the next day and which delivery disturbs or tends to disturb the quiet, peace, rest, enjoyment, comfort or convenience of the neighbourhood or of persons in the vicinity.
2. The provisions of subsection (1) shall not apply to all that area of the City bounded on the east by the east limit of Dalhousie Street, on the south by the south limit of Rideau Street, on the west by the west limit of Sussex Drive and on the north by the south limit of Murray Street.

Section 12 – Loading and unloading

- (1) No person shall cause or permit the loading or unloading of any transport truck, moving van or motor vehicle between 2300 hours of one day and 0700 hours of the next day so as to make or cause noises that disturb, or tend to disturb the quiet, peace, rest, enjoyment, comfort or convenience of the neighbourhood or of persons in the vicinity.
- (2) The provisions of subsection (1) shall not apply to all that area of the City bounded on the east by the east limit of Dalhousie Street, on the south by the south limit of Rideau Street, on the west by the west limit of Sussex Drive and on the north by the south limit of Murray Street.

Section 13 – General construction

- (1) No person shall, between 2200 hours of one day and 0700 hours of the next day, operate or cause to be operated any construction vehicle or construction equipment in connection with the construction of any building or structure, highway, motor car, steam boiler or other engine or machine.
- (2) Despite subsection (1), no person shall operate or cause to be operated any construction vehicle or construction equipment before 0900 hours on any Sunday or statutory or public holiday.
- (3) Despite subsections (1) and (2), no person shall operate or cause to be operated any construction vehicle or construction equipment between 1000 hours and 1200 hours of the same day on the 11th day of November in the area within the boundaries described as follows:

COMMENCING at the intersection of Wellington Street and O'Connor Street and proceeding in an easterly direction on Wellington Street and Rideau Street to MacKenzie Avenue;

THENCE proceeding in a northerly direction on MacKenzie Avenue a distance of 201 metres;

THENCE easterly to and along York Street to William Street;

THENCE southerly on William Street to Rideau Street;

THENCE easterly on Rideau Street to Nicholas Street;

THENCE southerly on Nicholas Street to Laurier Avenue;

THENCE westerly on Laurier Avenue to O'Connor Street;

THENCE northerly on O'Connor Street to the said point of commencement.

Section 14 – Infill housing construction

- (1) Section 13 does not apply to construction in connection with infill housing, and the following subsections shall apply.
- (2) No person shall, between 2000 hours of one day and 0700 hours of the next day, operate or cause to be operated any construction vehicle or construction equipment in connection with infill housing.
- (3) No person shall, between 1900 hours of one day and 0900 hours of the next day on any Saturday, Sunday or statutory or public holiday, operate or cause to be operated any construction vehicle or construction equipment in connection with infill housing.

Section 14A – Confederation line project – construction and maintenance

- (1)
 - (a) Despite subsection 13(1), tunnel construction work for the Confederation Line Project occurring three (3) metres and deeper below the immediate ground surface using tunneling, sequential excavation or other similar tunnel construction techniques is permitted between 2200 hours of one day and 0700 hours of the next day.
 - (b) No person shall perform or cause to be performed the tunnel construction work referred to in clause (a) if the noise from such construction has a level greater than 60 dBA when measured at the point of reception.
- (2)
 - (a) Despite subsection 13(2), construction vehicles or construction equipment used for construction of the Confederation Line Project shall be permitted to operate before 0900 hours on any Sunday or statutory or public holiday for work performed three (3) metres or below the immediate ground surface using tunneling, sequential excavation, or other similar tunnel construction techniques.
 - (b) No person shall operate or use, or permit to be operated or used, any construction vehicle or construction equipment as described in clause (a) if the noise from such operation or use has a level greater than 60 dBA when measured at the point of reception.
- (3)
 - (a) Despite subsection 12(1), transport trucks or vehicles may be used the between 2300 hours of one day and 0700 hours of the next day to haul, load or unload material in support of the tunnel construction for the Confederation Line Project.
 - (b) No person shall operate or use, or permit to be operated or used, any transport trucks or vehicles as described in clause (a) if the noise from such operation or use has a level greater than 60 dBA when measured at the point of reception.
- (4)
 - (a) Despite subsection 8(1), power equipment for the Confederation Line Project shall be permitted to operate between 2100 hours of one day and 0700 hours of the next day to support tunnel excavation work performed three (3) metres and deeper below the immediate ground surface using tunneling, sequential excavation or other similar tunnel construction techniques.

(b) No person shall operate or use, or permit to be operated or used, any power equipment as described in clause (a) if the noise from such operation or use has a level greater than 60 dBA when measured at the point of reception.

(5)

(a) Despite subsection 8(2), power equipment for the Confederation Line Project shall be permitted to operate before 0900 hours on any Saturday, Sunday or statutory or public holiday, to support tunnel excavation work performed three (3) metres and deeper below the immediate ground surface using tunneling, sequential excavation or other similar tunnel construction techniques.

(b) No person shall operate or use, or permit to be operated or used, any power equipment as described in clause (a) if the noise from such operation or use has a level greater than 60 dBA when measured at the point of reception.

Section 15 – Unnecessary motor vehicle noise

No person shall cause or permit unnecessary motor vehicle noise such as the sounding of the horn, revving of engine and the squealing of tires of any motor vehicle on any property other than a highway.

Section 16 – Idling motor vehicles

(1) No person shall operate or permit 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 (5) minutes while such vehicle is stationary, unless,

(a) the vehicles are operated by OC Transpo, Société de transport de l'Outaouais (STO), and Para Transpo in the course of providing transit service;

(b) the vehicles are operated by a private bus transportation company in the course of providing transportation services, and the vehicles are carrying passengers;

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

(d) 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 actively loading or unloading.

(2) Subsection (1) shall not apply to occupied motor vehicles when the temperature outside the motor vehicle is greater than twenty-seven degrees Celsius (27°C) including the humidex calculation or less than five degrees Celsius (5°C) including the wind chill value as determined by the Environment Canada temperature readings.

Section 17 – Mufflers

No person shall discharge into the open air, on any property other than a highway, the exhaust of any motor vehicle except through a muffler or other device which effectively prevents loud or explosive noises.

Section 18 – Motor sports

(1) No person shall operate or permit the operation of racing competitions between motor vehicles on a property other than a highway within the City, whether or not an admission fee is charged, unless,

(a) the competitions are held at a permanent facility;

(b) all motor vehicles are properly equipped with effective mufflers;

(c) such competitions are not carried out between 2300 hours of one day and 1000 hours of the next day.

(2) Subsection (1) shall not apply to permanent go-kart operations on a property other than a highway.

Section 19 – Go-kart activities

No person shall operate or permit the operation of go-kart activities on a property other than a highway within the City, whether or not an admission fee is charged, unless,

(1) the activities are held at a permanent go-kart facility;

- (2) all go-karts are equipped with effective mufflers; and
- (3) such activities are not carried out between 2300 hours of one day and 0700 hours of the next day.

Section 20 – General exemptions

- (1) The provisions of this by-law shall not apply to the City or any local board thereof, the Province of Ontario, the Government of Canada or any of their agents when the emission of sound is in connection with work undertaken for the immediate health, safety or welfare of the inhabitants of the City.
- (2) The provisions of this by-law shall not apply to preclude musicians or performers providing outdoor entertainment involving sound reproduction devices during the events staged by the National Capital Commission including Winterlude or Canada Day celebrations.
- (3) The provisions of this by-law shall not apply to agricultural operations and agricultural processing activities.
- (4) The provisions of this by-law shall not apply to snow clearing or snow removal activities.
- (5) The provisions of this by-law shall not apply to the operation of exterior announcements on buses or other authorized vehicles under the jurisdiction and control of OC Transpo, where the announcements notify users of the route and destination, or any other information, in both official languages.

Section 21 – Exemption – City construction projects

- (1) The Manager of By-law & Regulatory Services is delegated the authority to grant an exemption in relation to any Section of this by-law, subject to the following conditions:
 - (a) the exemption is in respect of a City Construction Project;
 - (b) a requirement that during the exemption period, the noise caused by the particular project for which the exemption is sought does not exceed 85 dB(A) when measured at the point of reception;
 - (c) public notification of the particulars of the exemption is provided to affected parties by the appropriate General Manager of the City Construction Project; and
 - (d) the Manager of By-law & Regulatory Services, has notified the Councillor of the Ward or Wards in which the work is to occur of the application for the exemption and, within fourteen (14) days following such notification, no Ward Councillor has communicated an objection to the application.
- (2) In the event of an objection by any Ward Councillor pursuant to subsection (1), paragraph (d):
 - (a) the Manager of By-law & Regulatory Services shall not approve the exemption; and
 - (b) the City staff representative for the project for which the application is sought shall forward the application to the appropriate Standing Committee of Council and Council for determination.
- (3) An application for an exemption under subsection (1) shall be made in writing to the Manager of By-law & Regulatory Services at least sixty (60) days prior to the commencement of the activity for which the exemption is sought, and shall include the following:
 - (a) the name and contact information of the City staff representative associated with the project;
 - (b) the source of the sound or vibration in respect of which the exemption is sought;
 - (c) the provision or provisions of this by-law for which the exemption is sought;
 - (d) the rationale for the exemption;
 - (e) the date and time of commencement of the activity for which the exemption is sought;
 - (f) the time of conclusion for each day for the activity for which the 16 exemption is sought;
 - (g) the duration of activity for which the exemption is sought;
 - (h) the location of the activity for which the exemption is sought;

- (i) the name and contact information of the contact person or persons who will be supervising the activities for which the exemption is sought; and
 - (j) any other information requested by the Manager of By-law & Regulatory Services.
- (4) The Manager of By-law & Regulatory Services may require the applicant to provide proof confirming that public notification has been provided to affected parties as required in subsection (1), which may include but are not limited to community associations, business improvement areas and adjacent residents and businesses.
- (5)
- (a) A noise exemption granted under this Section is subject to review and termination jointly by the Manager of By-law & Regulatory Services and the General Manager, Planning, Infrastructure and Economic Development based on complaints received, and on a review of compliance by the contractor with the project requirements, the terms of the contract, or the Noise By-law, and any other relevant consideration relating to the public health and safety and to the public interest.
 - (b) An automatic review will take place ninety (90) days into a project for which a noise exemption has been granted under this Section.
 - (c) The termination of an exemption granted under this Section shall be preceded by notification to the Councillor of the Ward or Wards in which the work is to occur.

Section 22 – Exemption – Construction equipment

- (1) The Manager of By-law & Regulatory Services is delegated the authority to grant an exemption to subsection 13(1) for construction equipment subject to the following conditions:
- (a) the use of construction equipment shall not create noise likely to cause a nuisance or disturb the inhabitants or exceed 85 dB(A) when measured at the point of reception;
 - (b) the use of the construction equipment shall not continue for more than eight (8) hours on any one day;
 - (c) the duration of the exemption requested shall not exceed eleven (11) calendar days in length; and
 - (d) the Councillor of the Ward or Wards in which the work is to occur shall be in agreement with granting the exemption.
- (2) An application for exemption from the provisions of the Noise By-law for construction equipment shall be made in writing to the Manager of By-law & Regulatory Services at least sixty (60) days prior to the commencement of the use of the construction equipment for which the exemption is sought and shall include the following:
- (a) the name and address of the applicant;
 - (b) the name and address of the business represented by the applicant, if applicable;
 - (c) the source of the sound or vibration in respect of which the exemption is sought;
 - (d) the provision of this by-law from which the exemption is sought;
 - (e) the date and time of commencement of the construction for which the exemption is sought;
 - (f) the time of conclusion for each day for the use of the construction equipment for which the exemption is sought;
 - (g) the duration of the use of the construction equipment for which the exemption is sought;
 - (h) the location of the construction for which the exemption is sought;
 - (i) rationale for granting an exemption;
 - (j) the name of the contact person or persons who will be supervising the use of the construction equipment; and
 - (k) payment of the application fee as described on Schedule "A".

- (3) The Manager of By-law & Regulatory Services may require the applicant to provide documentation confirming that notification of the use of construction equipment has been given to the affected parties including but not limited to community associations, business improvement areas and adjacent residents and businesses.
- (4) Where the Manager of By-law & Regulatory Services requires monitoring of sound levels resulting from the construction, the monitoring shall be conducted at the applicant's expense as outlined in Schedule "A" attached hereto.

Section 23 – Exemption – Sound reproduction devices used in a special event

- (1) The Manager of By-law & Regulatory Services is delegated the authority to grant an exemption for an event subject to the following conditions:
 - (a) the event relates to live or recorded music or involves the use of a sound amplifying system or sound reproduction device operated in a reasonable manner in the context of the special event;
 - (b) the event shall not create noise likely to cause a nuisance or disturb the inhabitants or exceed 65 dB(A) when measured at the point of reception;
 - (c) the event shall not exceed eleven (11) calendar days in length;
 - (d) the time at which the event is to be terminated shall be agreed to by the Councillor of the Ward or Wards in which the event is to occur, the Manager of By-law & Regulatory Services and the applicant, and the event shall not continue beyond 0100 hours on Friday and Saturday and on Sunday only if the following Monday is a statutory holiday;
 - (e) an event shall not continue beyond 2300 hours on Sunday through Thursday; and
 - (f) the Councillor of the Ward or Wards in which the event is to occur shall be in agreement with granting the exemption.
- (2) An application for exemption from the provisions of the Noise By-law shall be made in writing to the Manager of By-law & Regulatory Services at least sixty (60) days prior to the event for which the exemption is sought and shall include the following:
 - (a) the name and address of the applicant;
 - (b) the name and address of the organization represented by the applicant, if applicable;
 - (c) the source of the sound or vibration in respect of which the exemption is sought;
 - (d) the provision of this by-law from which the exemption is sought;
 - (e) the date and time of commencement of the event for which the exemption is sought;
 - (f) the time of conclusion for each day of the event for which the exemption is sought;
 - (g) the duration of the event for which the exemption is sought;
 - (h) the location of the event for which the exemption is sought;
 - (i) rationale for granting an exemption, the name of the contact person or persons who will be supervising the event; and
 - (j) payment of the application fee as described on Schedule "A".
- (3) The Manager of By-law & Regulatory Services may require the applicant to provide documentation confirming that notification of the event has been given to the affected parties including but not limited to community associations, business improvement areas and adjacent residents and businesses.
- (4) Where the Manager of By-law & Regulatory Services requires monitoring of sound levels resulting from the event or activity, the monitoring shall be conducted at the applicant's expense as outlined in Schedule "A" attached hereto.
- (5) Clause (j) of subsection (2) does not apply in respect of an event held by or on behalf of a registered not-for-profit organization or a registered charity, where the event is solely for cultural or religious goals, social welfare, civic

improvement, recreation, amateur sport, education, or any other similar community enhancement initiative for any purpose except profit, and where the event is open to the public and no admission is charged.

Section 24 – Exemption – Temporary motor racing competition

- (1) The Manager of By-law & Regulatory Services is delegated the authority to grant an exemption for motor racing competitions at temporary venues subject to the following conditions:
 - (a) the competition does not exceed three (3) days in length;
 - (b) the Councillor of the Ward or Wards in which the competition is to occur shall be in agreement with granting the exemption which will include the time of day at which the competition will commence and terminate; and
 - (c) the motor vehicles shall be equipped with effective mufflers.
- (2) An application for exemption from the provisions of the Noise By-law for motor racing competition at temporary venues shall be made in writing to the Manager of By-law & Regulatory Services at least sixty (60) days prior to the commencement of the competition for which the exemption is sought and shall include the following:
 - (a) the name and address of the applicant;
 - (b) the name and address of the business represented by the applicant, if applicable;
 - (c) the provision of this by-law from which the exemption is sought;
 - (d) the date and time of commencement of the competition for which the exemption is sought;
 - (e) the time of conclusion for each day of the competition;
 - (f) the duration of the competition for which the exemption is sought;
 - (g) the location of the competition for which the exemption is sought;
 - (h) rationale for granting an exemption;
 - (i) the name of the contact person or persons who will be supervising the competition; and
 - (j) payment of the application fee as described on Schedule “A”.
- (3) The Manager of By-law & Regulatory Services may require the applicant to provide documentation confirming that notification of the motor racing competition at a temporary venue has been given to the affected parties including but not limited to community associations, business improvement areas and adjacent residents and businesses.
- (4) Where the Manager of By-law & Regulatory Services requires monitoring of sound levels resulting from the event or activity, the monitoring shall be conducted at the applicant’s expense as outlined in Schedule “A” attached hereto.

Section 24A - Exemption - 933 Gladstone and 1030 Somerset

There is no violation of this by-law where the noise levels at the properties municipally known as 933 Gladstone and 1030 Somerset as at October 5, 2022, and successor addresses, resulting from stationary noise sources at the property bounded by Gladstone Avenue, Breezehill Avenue, Laurel Avenue and Loretta Avenue, municipally known as 975 Gladstone as at October 5, 2022, do not exceed the noise levels permitted by the Class 4 designation of 933 Gladstone/1030 Somerset, which noise levels set forth in Schedule “C”. **(By-law No. 2022-355)**

Section 24B - Exemption - 951 Gladstone and 145 Loretta Avenue North

In respect of the property known as 975 Gladstone, in any instance of noise levels on the property known as 951 Gladstone and 145 Loretta Avenue North, or successor addresses, a violation of this by-law will not be held to have occurred in any instance where this by-law sets a limit of 45 dB(A) or 50 dB(A) and the noise levels at the 951 Gladstone and 145 Loretta Avenue North site resulting from stationary noise sources at 975 Gladstone do not exceed those permitted by the Class 4 designation of 951 Gladstone and 145 Loretta Avenue North. **(By-law 2022-391)**

Section 25 – Ambient sound level measurement

- (1) When a standard sound equivalent level (dB(A)) test cannot be used because ambient noise exceeds the maximum noise limit established for the device, vehicle or equipment to be measured, a differential reading may be used to isolate the level of noise contributed by the device, vehicle or equipment in question as follows:
 - (a) a noise level reading shall be taken when the device, vehicle or equipment is not in operation;
 - (b) a noise level reading shall be taken when the device, vehicle or equipment is in operation; and
 - (c) where the noise level reading calculated in paragraph (b) exceeds the noise level reading calculated in paragraph (a) by 5 dB(A) or more, a noise violation exists.
- (2) No person shall use or operate or cause to be used or operated any device, vehicle or equipment, the noise from which has a level greater than 5 dB(A) above ambient noise levels, provided that the ambient noise levels are greater than the specified maximum level for the device, vehicle or equipment in question.

Section 26 – Enforcement

This by-law shall be enforced by the Chief of Police or by the By-law Officers of the City.

Section 27 – Offence and penalties

- (1) Every person who contravenes any provision of this by-law is guilty of an offence as provided for in subsection 429(1) of the Municipal Act, 2001, and all such offences are designated as continuing offences as provided for in subsection 429(2)(a) of the Municipal Act, 2001.
- (2) A person who is convicted of an offence under this by-law is liable, for each day or part of a day that the offence continues, to a minimum fine of \$500.00 and a maximum fine of \$10,000.00, and the total of all daily fines for the offence is not limited to \$100,000.00 as provided for in subsection 429(3)2 of the Municipal Act, 2001.
- (3) When a person has been convicted of an offence under this by-law, the Superior Court of Justice or any court of competent jurisdiction thereafter may, in addition to any penalty imposed on the person convicted, issue an order
 - (a) prohibiting the continuation or repetition of the offence by the person convicted; and
 - (b) requiring the person convicted to correct the contravention in the manner and within the period that the court considers appropriate.

Section 28 – Interpretation

- (1) It is declared that if any section, subsection or part or parts thereof be declared by any Court of Law to be bad, illegal or ultra vires, such section, subsection or part or parts shall be deemed to be severable, and all parts hereof are declared to be separate and independent and enacted as such.
- (2) In this by-law, a word interpreted in the singular number has a corresponding meaning when used in the plural.
- (3) Schedules “A” and “B” annexed hereto are hereby declared to form part of this by-law.

Section 29 – Repeal

By-law No. 2004-253, the Noise By-law, is repealed.

Section 30 – Short title

This by-law may be referred to as the Noise By-law.

Section 31 – Effective date

This by-law shall come into effect on the 30th day of September, 2017.

Enacted and passed this 12th day of July, 2017.

Schedule A – Fees

Application Fee \$75.00

Inspection/Monitoring Fee \$75.00/hour/Officer

(amended by 2022-127)

Schedule B

[Map of Central Area - Amended by By-law 2022-227](#) 

Schedule C

Exclusion limit by time and assessment location

Assessment Location	Time Period	Class 4 Exclusion Limit (1hr Leq)
Outdoor Point of Reception	7 am to 7 pm	55 dBA
Outdoor Point of Reception	7 pm to 11 pm	55 dBA
Outdoor Point of Reception	11 pm to 7 am	n/a
Plane of Window of noise sensitive space	7 am to 7 pm	60 dBA
Plane of Window of noise sensitive space	7 pm to 11 pm	60 dBA
Plane of Window of noise sensitive space	11 pm to 7 am	55 dBA

(By-law 2022-355)

Noise By-law exemption application

- [Noise exemption types](#)
- [When to apply](#)
- [Application requirements and conditions](#)
- [How to apply](#)
- [Fees and method of payment](#)
- [For more information](#)

Report noise complaints

- [Loud noise or shouting](#)
- [Barking dogs](#)
- [Construction sites or machinery](#)
- [Alarms](#)
- [Garbage or delivery vehicles](#)
- [Aircraft noise](#)
- [Discharge of fireworks](#)

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APPENDIX C

Highway 416 No-Build (Existing)	Year 2021				Year 2041			
	NB		SB		NB		SB	
	AM	PM	AM	PM	AM	PM	AM	PM
416 Roger Stevens to Bankfield	1557	724	724	1923	1729	1068	780	2209
416 Bankfield to Fallowfield	1946	896	699	1943	2078	1240	775	2301
416 Fallowfield to West Hunt club	3364	1504	1108	2955	3571	1874	1260	3367

Barnsdale No-Build (Existing)	Year 2021				Year 2041			
	EB		WB		EB		WB	
	AM	PM	AM	PM	AM	PM	AM	PM
Twin Elm Rd to Moodie Dr	118	199	84	87	260	102	126	185
Moodie Dr to Trail Rd	148	246	124	135	268	97	139	229
Trail Rd to Borrisokane	172	258	137	151	280	112	157	272
Borrisokane to Viewbank Rd	155	193	131	135	241	153	147	226
Viewbank Rd to Kilbirnie Dr	155	193	114	92	241	153	105	161
Kilbirnie Dr to Greenbank RD	137	98	114	92	159	141	105	160
Greenbank Rd to Prince of Wales Dr	221	136	103	84	251	203	184	276

Highway 416 Build (Alt 5)	Year 2041			
	NB		SB	
	AM	PM	AM	PM
416 Roger Stevens to Bankfield	1733	1070	791	2190
416 Bankfield to Barnsdale	2124	1255	796	2339
416 Barnsdale to Fallowfield	2090	1250	781	2259
416 Fallowfield to West Hunt club	3604	1851	1259	3370

Barnsdale Build (Alt 5)	Year 2041			
	EB		WB	
	AM	PM	AM	PM
Twin Elm Rd to Moodie Dr	261	102	118	181
Moodie Dr to Trail Rd	269	117	135	226
Trail Rd to Borrisokane	317	147	230	346
Borrisokane to Viewbank Rd	290	229	278	337
Viewbank Rd to Kilbirnie Dr	290	229	237	273
Kilbirnie Dr to Greenbank RD	216	212	238	271
Greenbank Rd to Prince of Wales Dr	259	229	256	326

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APPENDIX D



Highway Construction Noise Assessment - Roadway Construction

Job No: 2003291
Job Name: Highway 416 and Barnsdale Interchange

1. Shaving

Amt	Act. PWL ¹	Equipment
1	120	Pavement Milling Machines (scarafier)
2	107	Haul truck (Typical 3-axle)
1	107	Backhoes / Wheeled Loaders
4	120	

2. Paving

Amt	Act. PWL ¹	Equipment
1	107	Backhoes / Wheeled Loaders
3	108	Haul truck (Typical 3-axle)
1	105	Asphalt Spreader
1	98	Road Roller
6	112	

Notes:

-- All values in dBA

1. Equivalent Activity PWL, including duty cycle and penalty adjustments

Predicted Construction Noise Levels

Distance to Centre-line R (m)	Approximate Screening (dBA)	L _{eq} (1h) ^{1.}	L _{dn} ^{2.}
30	0	83	80
50	0	79	76
100	0	73	70
150	0	69	66
200	0	67	64
250	0	65	62
300	0	63	60
350	0	62	59
400	0	61	58
450	0	60	57
500	0	59	56
600	0	57	54

Notes:

- All values are in dBA unless otherwise noted

1. Equivalent Activity PWL for the group (includes duty cycle, penalties and no of vehicle adjustments) + 10 log (2 / (4*3.14* S-R dist²))

2. Based on L_{eq} (1 h) values and construction hours, includes a 10 dB penalty for night-time operations (10 pm to 7 am)