

Environmental Noise Feasibility Study

70 Mississauga Road South & 181 Lakeshore Road West

Proposed Mixed-Use and Master-Planned Community
City of Mississauga

August 25, 2017
Project: 117-0373

Prepared for

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VALCOUSTICS

Canada Ltd.

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Environmental Noise Feasibility Study

70 Mississauga Road South & 181 Lakeshore Road West

Proposed Mixed-Use and Master-Planned Community City of Mississauga

EXECUTIVE SUMMARY

Valcoustics Canada Ltd. (VCL) was retained to prepare an Environmental Noise Feasibility Study to support the Official Plan Amendment (OPA), Re-zoning application, and Draft Plan of Subdivision submissions to the City of Mississauga, addressing the potential noise impact from the existing environment onto the proposed development. The proposed development will consist of a combination of residential, commercial, retail, campus uses and open space, located at the southwest corner of Lakeshore Road West and Mississauga Road South in the City of Mississauga.

The transportation noise sources in the vicinity include road traffic on Lakeshore Road West, Mississauga Road South, and future internal roadways within the development, as well as rail traffic on the Canadian National Railway (CN/GO) Oakville Subdivision. The stationary noise sources on the north side of Lakeshore Road West are not expected to create significant noise impact onto the proposed development.

The sound levels on site have been determined and compared with the applicable Ministry of the Environment and Climate Change (MOE) and Region of Peel noise guideline limits to determine the need for noise mitigation.

To meet the applicable transportation noise source guideline limits:

- All the residential towers require mandatory central air conditioning. It is understood that central air conditioning will be part of the building design and thus, meets the ventilation requirement.
- The first row of low rise residential dwellings adjacent to Mississauga Road and future Avenue A (also known as Street 'B') require only the provision for adding air conditioning.
- For all residential towers, since the building design is still at the conceptual and preliminary stage, typical assumptions have been used to determine the building component

requirements. Based on the predicted sound levels at all residential towers, upgraded wall and window construction may be required.

- The applicable indoor noise guidelines at all other residential blocks are predicted to be met without any special wall and window upgrades beyond the minimum non-acoustical requirements stated in the Ontario Building Code (OBC).
- Exterior wall and window requirements should be checked once building plans are finalized. This is typically required by the City at the time of building permit application.

1.0 INTRODUCTION

VCL was retained to prepare an Environmental Noise Feasibility Study to support the OPA, Re-zoning application and Draft Plan of Subdivision submissions to the City of Mississauga. The potential sound levels and noise mitigation measures needed for the proposed development to comply with the MOE and the Region of Peel noise guideline requirements are outlined herein.

1.1 THE SITE AND SURROUNDING AREA

The site is located at the southwest corner of the intersection of Lakeshore Road West and Mississauga Road South in the City of Mississauga.

The site is bounded by:

- Lakeshore Road West, with existing and future residential, as well as existing commercial development beyond, to the north;
- Mississauga Road South, with a mix of residential and commercial development beyond, to the east;
- lands not subject to this application, with Lake Ontario beyond, to the south; and
- existing residential development, with Pine Avenue South beyond, to the west.

A Key Plan is included as Figure 1.

This report is based on the Master Plan prepared by Giannone Petricone Associates Inc. Architects, dated August 25, 2017, and Draft Plan of Subdivision prepared by J.D. Barnes Limited, dated August 25, 2017. It is understood that the Master Plan is still in conceptual stage and may change at a later stage of the approval process. The Draft Plan of Subdivision is included as Appendix A and the Site Plan is shown as Figure 2.

For ease of description, the block numbers were taken from the Draft Plan of Subdivision.

1.2 THE PROPOSED DEVELOPMENT

The proposed development will consist of a mix of residential, commercial/ retail and campus uses, as well as parks. It is understood that all blocks immediately adjacent to Lakeshore Road West are

anticipated to be commercial/retail uses and all residential dwellings are fronting onto Mississauga Road South.

2.0 NOISE SOURCES

2.1 TRANSPORTATION NOISE SOURCES

The transportation noise source with potential to impact the proposed development is road traffic on Lakeshore Road West, Mississauga Road South, and internal roadways within the development, as well as rail traffic on the CN Oakville Subdivision rail line.

Tables 1A and 1B summarize the traffic data used in the assessment. Appendix B contains the correspondence regarding the road and rail traffic data.

2.1.1 Road Traffic

Ultimate road traffic data for Lakeshore Road West and Mississauga Road were obtained from the City of Mississauga.

Ultimate road traffic data for main internal roads, such as Lake Street (Street 'A'), Promenade (Street 'B') and Port Street (Street 'C') were provided by BA Group.

Traffic volumes on the other roadways (existing and future) are anticipated to be minor and no significant noise impact is expected. Thus, these other surrounding roadways have not been considered further in this assessment.

2.1.2 Rail Traffic

It should be noted that CN Oakville Subdivision is approximately 400 m to the north of the site with multiple rows dwellings and commercial land uses intervening between the site and the rail corridor. The proposed development will benefit from the screening effect provided by these intervening developments, except for the proposed high rise developments which would still be fully exposed to the rail corridor.

The rail traffic volumes were escalated to the year 2027 using a growth rate of 2.5%, compounded annually. This growth rate is recommended by MOE and rail authorities in preparing environmental noise studies.

2.1.2.1 CN

Rail traffic data, applicable for the year 2017, for CN Oakville Subdivision was directly obtained from CN.

2.1.2.2 GO Transit

GO train volumes in the area of the study were not available at the time of the preparation of the noise report. The rail traffic volumes (for the year 2026) used in this assessment were taken from a noise study previously completed by VCL on the same rail corridor located in the area of downtown Toronto.

Since the beginning of 2016, Metrolinx has made significant revisions to its forecasts. The most significant changes from the noise perspective are:

- Service is being intensified along all Metrolinx corridors as part of its Regional Express Rail service.
- It is anticipated that GO services on the CN Oakville Subdivision will be comprised by a mix of diesel and electric trains within (at least) a 10-year time horizon.

Metrolinx has not yet made final decisions regarding the electric train technology to be used. In the interim, for the purposes of environmental noise studies, Metrolinx is recommending that the noise level and spectrum of a diesel train be used to model the impact from the electric trains. However, it is likely that this is conservative, since the reference sound levels for electric trains are not expected to be as high as for diesel trains. As the information on the specific train technology to be used has not yet been finalized and the reference sound level data for the electric trains has not been verified, the use of this modelling method should not be considered precedent setting for other sites in the vicinity.

2.2 STATIONARY NOISE SOURCES

Existing retail and commercial uses located to the north of the site (on the north side of Lakeshore Road West) are not expected to create significant noise impact on the proposed development. This was confirmed during a site visit on August 1, 2017, where noise from these facilities was not audible over the ambient road traffic noise at the subject site. Thus, these commercial uses have not been considered further in the assessment.

3.0 ENVIRONMENTAL NOISE GUIDELINES

3.1 MOE PUBLICATION NPC-300

The applicable noise guidelines for new residential development are those in MOE Publication NPC-300, *“Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning”*.

The environmental noise guidelines of the MOE, as provided in Publication NPC-300, are discussed briefly below and summarized in Appendix C.

3.1.1 Transportation Noise Sources

3.1.1.1 Architectural Elements

In the daytime, the indoor criterion for road noise is $L_{eq\ Day}^{(1)}$ of 45 dBA for sensitive spaces such as living/dining rooms, dens and bedrooms. At night, the indoor criterion for road noise is $L_{eq\ Night}^{(2)}$ of 45 dBA for sensitive spaces such as living/dining rooms and dens and 40 dBA for bedrooms. The indoor criteria for rail noise are 5 dBA more stringent than those for the road; that is 40 dBA

(1) $L_{eq\ Day}$ - 16 hour energy equivalent continuous sound level (0700-2300 hours).

(2) $L_{eq\ Night}$ - 8 hour energy equivalent continuous sound level (2300-0700 hours).

for living/dining rooms, dens and bedrooms during the daytime and nighttime periods except for bedrooms where the nighttime indoor criterion is 35 dBA.

The architectural design of the building envelope (walls, windows, etc.) must provide adequate sound isolation to achieve these indoor sound level limits, based on the applicable outdoor sound levels on the exterior building facades.

3.1.1.2 Ventilation

In accordance with the MOE noise guideline for road and rail traffic sources, if the daytime sound energy level, $L_{eq Day}$, at the exterior face of a noise sensitive window is greater than 65 dBA, means must be provided so that windows can be kept closed for noise control purposes and central air conditioning is required. For daytime sound levels between 56 dBA and 65 dBA inclusive, there need only be the provision for adding air conditioning at a later date. A warning clause advising the occupant of the potential interference with some activities is also required. At nighttime, air conditioning would be required when the sound level exceeds 60 dBA ($L_{eq Night}$) at a noise sensitive window (provision for adding air conditioning is required when greater than 50 dBA).

3.1.1.3 Outdoors

For outdoor amenity areas (“Outdoor Living Areas” - OLA’s), the guideline is 55 dBA $L_{eq Day}$, with an excess not exceeding 5 dBA considered acceptable if it is not feasible to achieve the 55 dBA objective for technical, economic or administrative reasons, provided warning clauses are registered on title.

Note that for road traffic sources, a balcony/elevated terrace is not considered an OLA, unless it is the only OLA for the occupant and it is:

- at least 4 m in depth; and
- unenclosed.

3.2 REGION OF PEEL GUIDELINES

The Region of Peel guidelines are essentially the same as the MOE guidelines except that the nighttime level for triggering the air conditioning requirement is 1 dBA more stringent (i.e., lower) than the levels specified by the MOE – i.e., mandatory air conditioning for nighttime sound levels of 60 dBA or greater, and the provision for adding air conditioning for levels between 51 to 59 dBA inclusive.

4.0 NOISE IMPACT ASSESSMENT

The sound energy levels, in terms of $L_{eq Day}$ and $L_{eq Night}$, were determined using STAMSON V5.04, the computerized road and rail traffic noise prediction software of the MOE. This software implements MOE’s noise prediction models, Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) and Sound from Trains Environmental Analysis Method (STEAM).

Table 2 summarizes the predicted sound levels outdoors at select locations. A sample sound level calculation is contained in Appendix D.

4.1 SOUND LEVELS AT THE BUILDING FACADES

The daytime and nighttime sound levels at the building facades of the residential buildings were calculated at the heights of the top floor bedroom windows, representing as the worst-case locations.

Inherent screening of the building due to its orientation to the noise source was taken into account. To be conservative, screening from existing development in the vicinity of the site was not included in the assessment for the residential buildings higher than 3-storey.

The highest unmitigated daytime/nighttime sound levels of 68 dBA/64 dBA are predicted to occur on the exterior plane of windows of north facade on the 8-storey tower in Block 2, facing Lakeshore Road West.

4.2 SOUND LEVELS AT THE OUTDOOR LIVING AREAS

The daytime sound level at these OLAs were calculated at a standing height of 1.5 m above grade, at the centre of the amenity area.

The unmitigated daytime OLA sound levels within the proposed development are predicted to be 55 dBA and below.

It is understood that all residential blocks adjacent to Mississauga Road are fronting onto Mississauga Road.

5.0 NOISE ABATEMENT REQUIREMENTS

The noise control measures can generally be classified into two categories which are interrelated, but which the designer can treat separately for the most part:

- (a) Architectural elements to achieve acceptable indoor noise guidelines.
- (b) Design features to protect the OLA's.

Noise abatement requirements are summarized on Figure 2 and in Table 3 along with the notes to Table 3.

5.1 INDOORS

5.1.1 Architectural Elements

The indoor noise guidelines can be achieved by using appropriate construction for exterior walls, windows and doors.

5.1.1.1 Low Rise Residential Buildings

In determining the worst-case architectural requirements for low rise residential buildings, wall and window areas were assumed to be 80% and 30% of the associated floor area, respectively, on the facade of one to three storey dwelling buildings, directly exposed to the noise source and on the

facade perpendicular to the noise source.

Based on the above assumptions, all the residential townhouse blocks are predicted to meet the applicable indoor noise guidelines without any special wall and window upgrades beyond the minimum non-acoustical requirements stated in the OBC.

5.1.1.2 Mid to High Rise Buildings

It is understood that the building design is still at the conceptual and preliminary stage. Thus, typical assumptions have been used to determine the building component requirements.

In determining the worst-case architectural requirements for mid to high rise buildings, wall and window areas were assumed to be 50% and 50% of the associated floor area, respectively. Bedrooms were assumed to be on the top floor, the worst-case location.

Based on the predicted sound levels at all residential towers, upgraded wall and window construction may be required.

5.1.1.3 General Notes

The final sound isolation requirements should be reviewed when architectural plans are developed. Wall and window constructions should also be reviewed at this point to ensure that they will meet the required sound isolation performance. This is typically required by the City at the time of building permit application.

5.1.2 **Ventilation Requirements**

Based on the predicted sound levels:

- All the residential towers require mandatory central air conditioning. It is understood that central air conditioning will be part of the building design and thus, meets the ventilation requirement.
- The first row of low rise residential dwellings adjacent to Mississauga Road and future Avenue A (also known as Street 'B') require only the provision for adding air conditioning at a future date by the occupant. This typically takes the form of a ducted, forced air heating system, suitably sized to accommodate central air conditioning.

5.2 **OUTDOORS**

The unmitigated daytime OLA sound levels at the rear yards within the development are predicted to be within the 55 dBA design objective and thus, sound barriers are not required for noise control purposes.

5.3 **WARNING CLAUSES**

Warning clauses are a tool to inform prospective owners/occupants of potential annoyance due to existing noise sources. Where the sound level guidelines are exceeded, warning clauses should be registered on title or included in the development agreement that is registered on title. The

warning clauses should also be included in agreements of Offers of Purchase and Sale and/or lease/rental agreements.

6.0 FUTURE COMMERCIAL, CAMPUS AND HIGH RISE DEVELOPMENTS

The future commercial, campus and high rise residential towers within the development have also the potential to generate noise which may impact the surrounding (future and existing) residential development. These uses will have to be designed to comply with NPC-300, recognizing the surrounding noise sensitive uses. This is typically addressed at the site plan approval stage of each block.

7.0 CONCLUSIONS

The findings of this study indicate that the applicable noise guideline limits can be met and a suitable acoustical environment can be provided for the future occupants. Thus, the proposed development is feasible in terms of environmental noise.

In summary, to meet the applicable noise guideline limits and provide guidelines for subsequent design, preliminary recommendations/requirements are summarized below:

- Mandatory central air conditioning for all residential towers. It is understood that all residential towers will be provided with central air conditioning and thus, meeting the ventilation requirement.
- Provision for adding air conditioning for the first row of low-rise residential dwellings adjacent to Mississauga Road and future Avenue A (Street 'B').
- Upgraded wall and window construction may be required for all residential towers.
- For all other residential blocks, the applicable indoor noise guidelines are predicted to be met without any special wall and window upgrades beyond the minimum non-acoustical requirements stated in the OBC.
- Exterior wall and window requirements should be checked once building plans are finalized. This is typically required by the City at the time of building permit application.

8.0 REFERENCES

1. PC STAMSON 5.04, "Computer Program for Road Traffic Noise Assessment", Ontario Ministry of the Environment.
2. Building Practice Note No. 56: "Controlling Sound Transmission into Buildings", by J. D. Quirt, Division of Building Research, National Council of Canada, September 1985.
3. "Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning", MOE Publication NPC-300, August 2013.

TABLE 1A
ULTIMATE ROAD TRAFFIC DATA

Roadway	AADT ⁽¹⁾	% Trucks		Day/Night Split (%)	Speed Limit (kph)
		Medium	Heavy		
Lakeshore Road West ⁽²⁾	52 507	1.65	1.35	90/10	50
Mississauga Road South ⁽²⁾	12 880	1.1	0.9	90/10	50
Promenade (north of Port Street) ⁽³⁾	9 100	1.1	0.9	89/11	40
Lake Street (north of Port Street) ⁽³⁾	1 900	1.1	0.9	89/11	40
Lake Street (west of Mississauga Street) ⁽³⁾	3 900	1.1	0.9	90/10	40
Port Street (west of Mississauga Street) ⁽³⁾	3 900	1.1	0.9	90/10	40

Notes:

- (1) Annual Average Daily Traffic.
- (2) Ultimate road traffic data obtained from the City of Mississauga.
- (3) Provided by BA Group. Truck split was assumed to be the same as Mississauga Road South.

TABLE 1B
RAIL TRAFFIC DATA⁽¹⁾ – CN/GO OAKVILLE SUBDIVISION

Source of Rail Traffic	Period	Train Type	# of Trains ⁽²⁾	Max # of Cars/Train	Max # of Locos/Train	Maximum Speed (kph)
CN Year 2017	Daytime (07:00–23:00)	VIA Passenger (Diesel)	14 (17.9)	10	2	137
	Nighttime (23:00–07:00)		0	–	–	–
GO Year 2026	Daytime (07:00–23:00)	GO Commuter (Diesel)	105 (107.6)	12	1	105
	Nighttime (23:00–07:00)		11 (11.3)			
	Daytime (07:00–23:00)	GO Commuter (Electric)	130 (133.2)			
	Nighttime (23:00–07:00)		58 (59.5)			

Notes:

- (1) Obtained from CN and Metrolinx for a noise study completed by VCL on the same corridor..
- (2) The data shown in brackets is projected to the year 2027 with a 2.5% growth rate, compounded annually.

TABLE 2
PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS⁽¹⁾

Location ⁽¹⁾	Source	Distance (m) ⁽²⁾	L _{eq} Day (dBA)	L _{eq} Night (dBA)
Block 2 Tower North Face	Lakeshore Road W	61	63	57
	Promenade	31	53	47
	CN Oakville	456	65	62
	TOTAL	–	68	64
Block 2 Tower East Face	Lakeshore Road W	61	60	54
	Promenade	31	56	50
	CN Oakville	456	62	59
	TOTAL	–	65	61
Block 4, East Face	Mississauga Road	14	63	56
Block 7 East Face	Lakeshore Road W	61	53	47
	Lake Street	19	50	44
	TOTAL	–	55	48
Block 7 OLA	Lakeshore Road W	92	47	–
	Lake Street	22	47	–
	TOTAL	–	50	–
Block 5 Tower North Face	Lakeshore Road W	102	61	55
	Promenade	46	51	45
	CN Oakville	497	65	62
	TOTAL	–	67	63
Block 5 Tower West Face	Lakeshore Road W	137	57	50
	Promenade	21	55	49
	CN Oakville	532	62	59
	TOTAL	–	63	60
Block 9, NE Unit East Face	Port Street	14	52	46
	Promenade	15	58	52
	TOTAL	–	59	53
Block 10 OLA	Port Street	17	52	–
	Promenade	46	44	–
	TOTAL	–	53	–
Block 14 Tower North Face	Lakeshore Road W	308	56	50
	Promenade	19	55	49
	CN Oakville	704	63	60
	TOTAL	–	65	61
Block 14 Tower West Face	Lakeshore Road W	308	53	47
	Promenade	19	58	52
	CN Oakville	704	60	57
	TOTAL	–	63	59

.../cont'd

TABLE 2 (continued)

PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS⁽¹⁾

Location⁽¹⁾	Source	Distance (m)⁽²⁾	L_{eq} Day (dBA)	L_{eq} Night (dBA)
Block 15 12-Storey Tower North Face	Lakeshore Road W	337	56	50
	Promenade	60	50	44
	CN Oakville	732	63	60
	TOTAL	–	64	61
Block 15 Tower 12-Storey Tower East Face	Lakeshore Road W	337	53	47
	Promenade	60	53	47
	Mississauga Road	273	50	44
	CN Oakville	732	60	57
	TOTAL	–	62	58
Block 15 26-storey Tower North Face	Lakeshore Road W	388	56	49
	Mississauga Road	231	48	42
	Promenade	33	53	47
	CN Oakville	783	63	60
	TOTAL	–	64	61
Block 15 26-storey Tower East Face	Lakeshore Road W	384	53	46
	Mississauga Road	231	51	45
	Promenade	33	56	50
	CN Oakville	783	60	57
	TOTAL	–	62	58
Block 17 Tower North Face	Lakeshore Road W	484	55	48
	Mississauga Road	397	46	39
	Promenade	221	45	38
	CN Oakville	878	63	60
	TOTAL	–	63	60
Block 17 Tower East Face	Lakeshore Road W	484	52	45
	Mississauga Road	397	49	42
	Promenade	221	48	42
	CN Oakville	878	60	57
	TOTAL	–	61	57

Notes:

- (1) See Figure 2.
- (2) Distance indicated is taken from the centreline of the noise source to the point of reception.

TABLE 3
MINIMUM NOISE ABATEMENT MEASURES

Location	Air Conditioning ⁽¹⁾	Exterior Wall ⁽²⁾	Exterior Window ⁽³⁾	Sound Barrier ⁽⁴⁾	Warning Clauses ⁽⁵⁾
Residential towers in Blocks 2, 5 and 6	Mandatory	Upgraded wall may be required.	Upgraded window may be required.	None	A + B + D
Residential towers in Blocks 14, 15 and 16	Mandatory			None	A + B + E
Residential towers in Block 17	Mandatory			None	A + B
First row of townhouse blocks adjacent to Promenade and Mississauga Road South	Provision for adding	No special acoustical requirements		None	A + C
Blocks 4, Northern Units in Townhouse Blocks 2 and 7	No special acoustical requirements				D
Townhouse blocks in Blocks 13 and 14 adjacent to Lake Street	No special acoustical requirements				E
All remaining blocks	No special acoustical requirements				

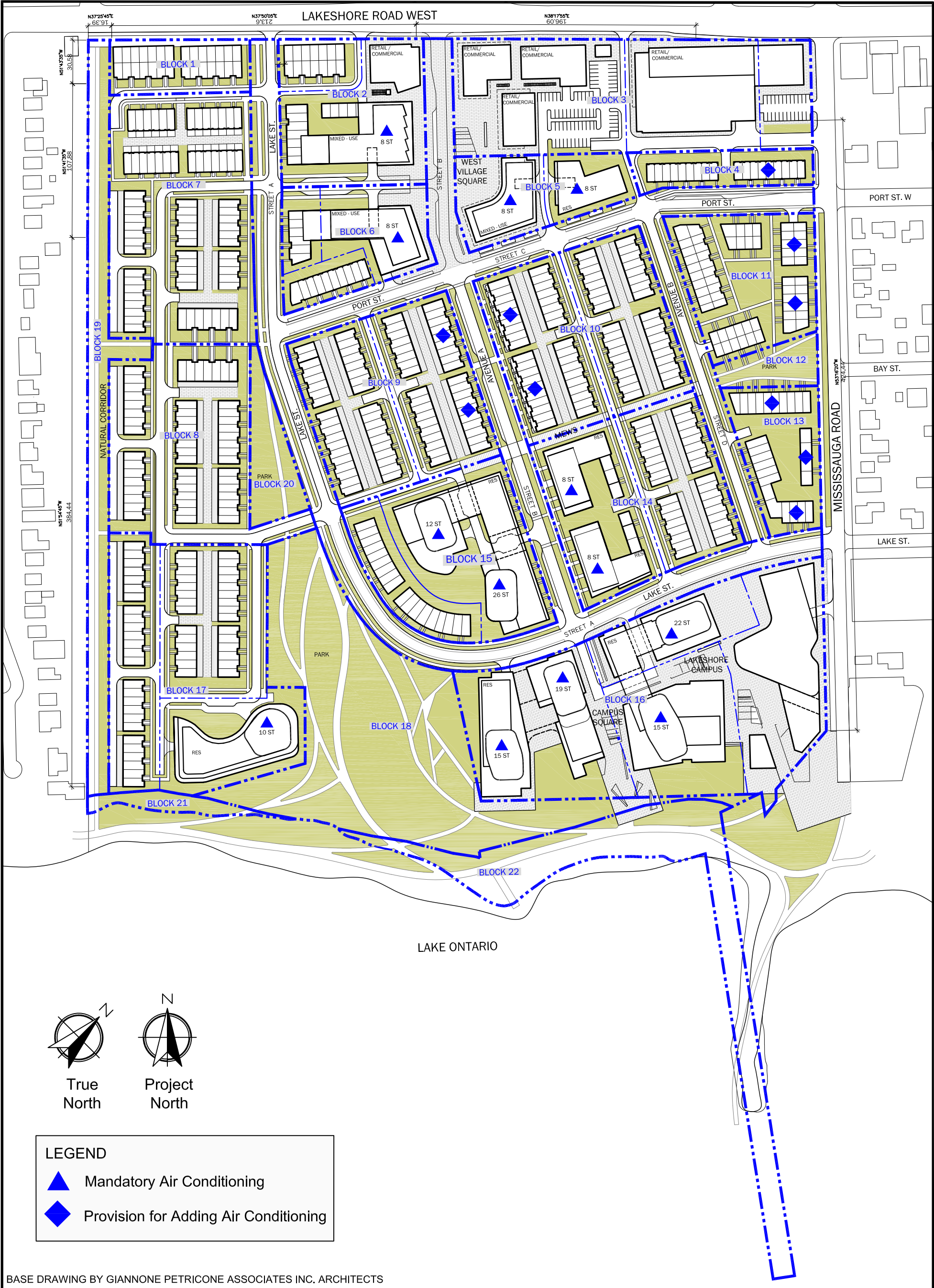
For notes to this table, see following page.

Notes to Table 3

- (1) Where means must be provided to allow windows to remain closed for road noise control purposes, a commonly used technique is that of air central conditioning.
- (2) The requirements are based on assumed percentages of wall and window area to associated floor area and should be checked once building plans are finalized.
- (3) A sliding glass walkout door should be considered as a window and be included in the percentage of glazing. The requirements are based on assumed percentages of wall and window area to associated floor area and should be checked once building plans are finalized.
- (4) Sound barriers must be of solid construction having a minimum face density of 20 kg/m² with no gaps, cracks or holes. Earthen berms, solid fences or combinations of berms/fences are acceptable.
- (5) Warning clauses to be included in Occupancy Agreements:
 - A. "Purchasers are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound level may exceed the noise guidelines of the Municipality and the Ministry of the Environment and Climate Change."
 - B. "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment and Climate Change."
 - C. "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of Environment and Climate Change."
 - D. "Purchasers/tenants are advised that due to the proximity of the existing and future commercial development, noise from these uses may at times be audible."
 - E. "Purchasers/tenants are advised that due to the proximity of the future school, noise from this facility may at times be audible."
- (6) Conventional ventilated attic roof construction meeting OBC requirements is satisfactory in all cases.
- (7) All exterior doors shall be fully weatherstripped.



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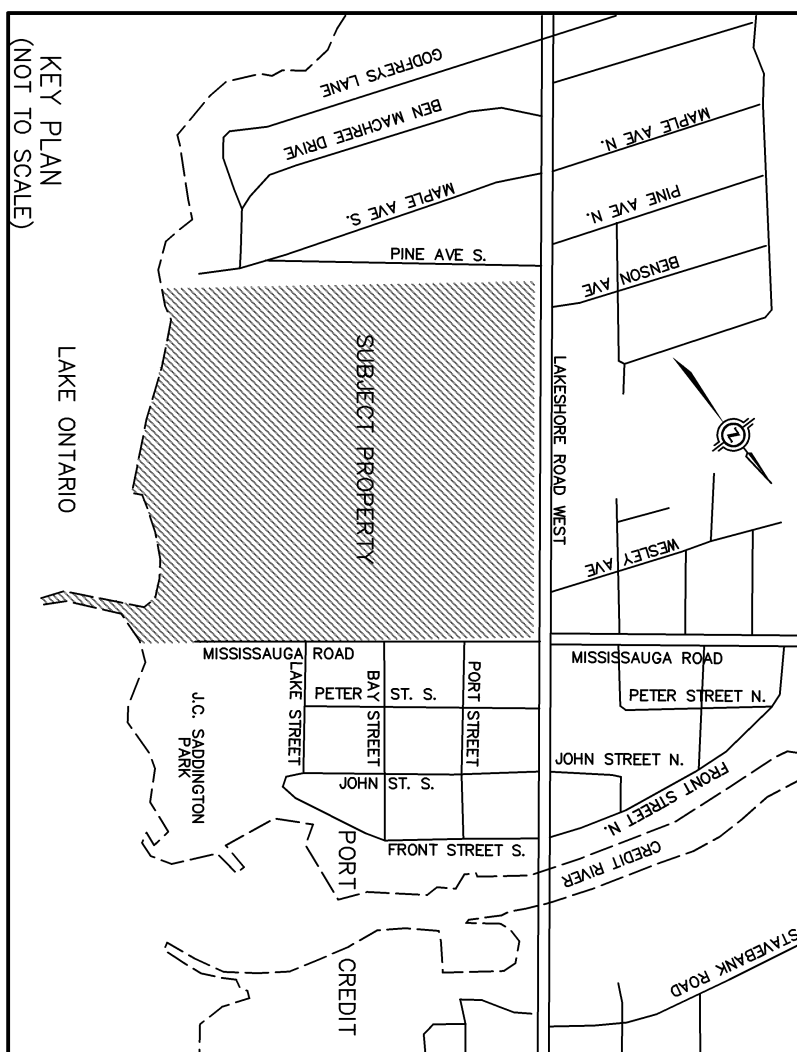


BASE DRAWING BY GIANNONE PETRICONE ASSOCIATES INC. ARCHITECTS

			 30 Wertheim Court, Unit 25 Richmond Hill, Ontario Canada L4B 1B9 Tel: 905-764-5223 Fax: 905-764-6813 solutions@valcoustics.com	Title Master Plan		Project No. 117-0339	Date August 25, 2017
No.	Revision/Issue	Date		Project Name 70 Mississauga Rd South & 181 Lakeshore Road West Mississauga		Scale N.T.S.	Figure 2

APPENDIX A

DRAFT PLAN OF SUBDIVISION



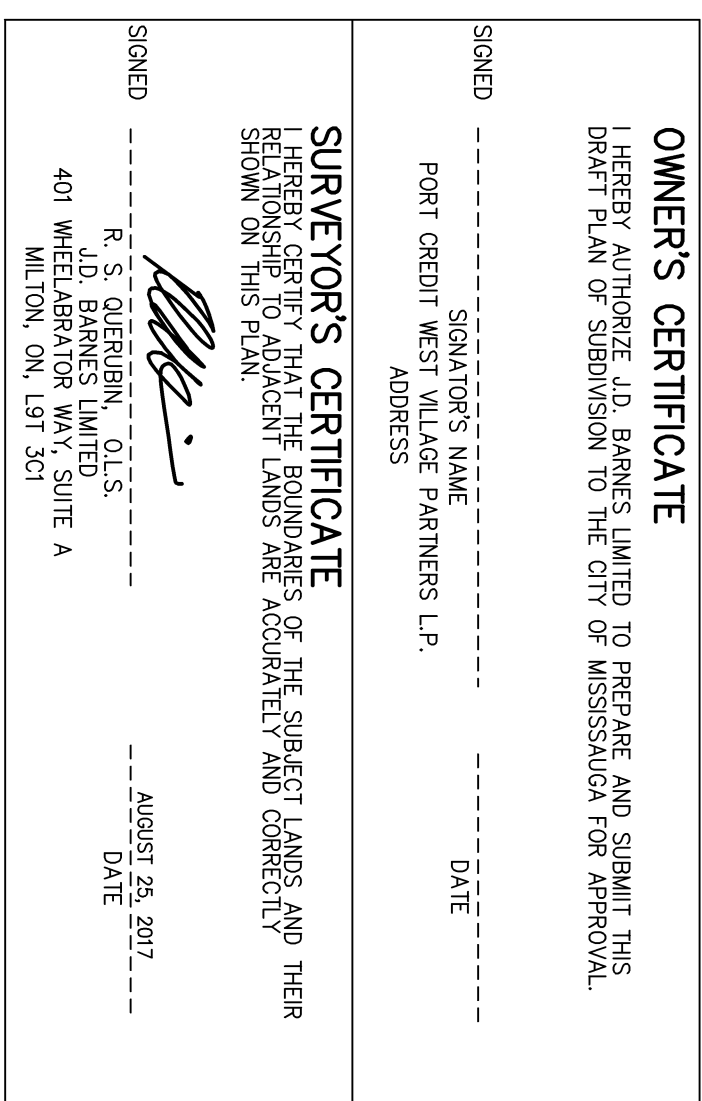
ALL OF LOT 10
PART OF LOTS 9 AND 11
AND WATER LOT LOCATION IN
FRONT OF LOT 9
BROKEN FRONT RANGE
CREDIT INDIAN RESERVE
(GEOGRAPHIC TOWNSHIP OF TORONTO)
IN THE
CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEELE

© J.D. BARNES LIMITED

SCALE 1 : 1000

20 0 20 40 60 metres

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048



SCHEDULE OF LAND USE			
PROPOSED LAND USE	BLOCKS	AREA (sqm)	AREA (ac)
MEDIAL DENSITY-COMM-FIVE	1, 4, 7, 8, 9, 10, 11, 13	5,070.32	13.1514
HIGH DENSITY-TOWER	5, 16	37,790.82	9.3264
MIXED USE RESIDENTIAL	2, 6, 14, 15, 17	69,746.6	16.5654
COMMERCIAL	3	198,866	4.9162
PARK	12, 18, 19, 20, 21, 22	50,546.4	12.4612
STREET WIDE 20.0m A, B, C	250.72	8,665.3	
TOTALS		281,979.2	72,042.3

SCHEDULE OF LAND USE			
PROPOSED LAND USE	BLOCKS	AREA (sqm)	AREA (ac)
MEDIAL DENSITY-COMM-FIVE	1, 4, 7, 8, 9, 10, 11, 13	5,070.32	13.1514
HIGH DENSITY-TOWER	5, 16	37,790.82	9.3264
MIXED USE RESIDENTIAL	2, 6, 14, 15, 17	69,746.6	16.5654
COMMERCIAL	3	198,866	4.9162
PARK	12, 18, 19, 20, 21, 22	50,546.4	12.4612
STREET WIDE 20.0m A, B, C	250.72	8,665.3	
TOTALS		281,979.2	72,042.3

DATE	NOTES AND REVISIONS
09/01/2017	<ul style="list-style-type: none"> ① ELIMINATE STREET A AND REORGANIZE HALF INTO BLOCK B AND THE OTHER HALF INTO BLOCK C. ② ELIMINATE STREET E SOUTH OF STREET A AND REORGANIZE HALF OF NORTH SOUTH STREET INTO BLOCK F AND THE OTHER HALF OF NORTH SOUTH STREET INTO BLOCK G. ③ ELIMINATE BLOCK D AND REORGANIZE INTO BLOCKS H AND I. ④ STREET B BETWEEN STREETS A AND C MADE INTO 200 METERS BY NARROWING THE WIDTH OF BLOCKS L AND Q BY 4.0 METERS. ⑤ ELIMINATE SUB-BLOCKS. ⑥ NARROWER VERSION OF STREET A MADE INTO 200 METERS BY NARROWING INTO THE NORTHEAST LIMIT OF STREET J AND ADDING THE SURPLUS INTO BLOCKS A AND F.



APPENDIX B

ROAD AND RAIL TRAFFIC DATA

Date: 26-Jul-17

NOISE REPORT FOR PROPOSED DEVELOPMENT

REQUESTED BY:

Name: Cris delos Santos

Company: Valcoustics Canada Ltd



PREPARED BY:

Name: J. Hunter

Tel#: (905) 615-3200

Location: Mississauga Road / Lakeshore Road W

Look Up ID#: 379

ON SITE TRAFFIC DATA

Specific	Street Names			
	Mississauga Road	Lakeshore Road W		
AADT:	12,880	52,507		
# of Lanes:	2 lanes	4 lanes		
% Trucks:	2%	3%		
Medium/Heavy Trucks Ratio:	55/45	55/45		
Day/Night Traffic Split:	90/10	90/10		
Posted Speed Limit:	50 km/h	50 km/h		
Gradient of Road:	<2%	<2%		
Ultimate R O W:	26m	26m		

Comments:

Ultimate Traffic Only (2041 ADT)

Dear Adam:

Re: Train Traffic Data – CN Oakville Subdivision near Stavebank Road in Mississauga, ON

The following is provided in response to Adam Simkin's 2017/07/10 request for information regarding rail traffic in the vicinity of Stavebank Road in Mississauga at approximately Mile 13.11 on CN's Oakville Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary. For the purpose of noise and vibration reports, train volumes must be escalated by 2.5% per annum for a 10-year period.

Typical daily traffic volumes at this site location are as follows:

***Maximum train speed is given in Miles per Hour**

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	0	140	60	4
Way Freight	0	25	60	4
Passenger	14	10	85	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	0	140	60	4
Way Freight	0	25	60	4
Passenger	0	10	85	2

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN's Oakville Subdivision.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There is one at-grade crossing in the immediate vicinity of the study area at Mile 12.02 (Revus Ave). Anti-whistling bylaws are not in effect at this crossing. Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 286,000 lbs.

The triple mainline track is considered to be continuously welded rail throughout the study area. The presence of 8 switches located at Mile 13.56, 13.63, 13.66, 13.74, 13.76, 13.82, 13.83, and 13.89 may exacerbate the noise and vibration caused by train movements.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Nadia El Dabee, Canadian National Railway Properties at 514-399-7627 should be contacted directly.

I trust the above information will satisfy your current request.

Sincerely,

A handwritten signature in black ink, appearing to read 'Michael Vallins', with a long horizontal flourish extending to the right.

Michael Vallins P.Eng
Manager of Public Works
public_works_gld@cn.ca

From: Adam Snow
To: [Seema Nagaraj](#)
Subject: RE: Rail traffic data request (VCL File: 116-0413)
Date: Friday, November 18, 2016 10:34:34 AM
Attachments: [image001.jpg](#)

Hi Seema – Further to your request below, it is anticipated that GO Service on the adjacent Lakeshore West corridor will be comprised by a mix of diesel and electric trains within (at least) a 10 year time horizon. The preliminary midterm (2026) weekday train volume forecast at this location, including both revenue and equipment trips, is as follows:

Diesel: 116 trains (105 day, 11 night)
Electric: 188 trains (130 day, 58 night)

Trains will be comprised of a single locomotive and up to 12 passenger cars.

It should also be noted that some UP Express trains will pass through this area travelling to/from the Willowbrook Maintenance Facility (equipment moves). The preliminary midterm (2025) weekday train volume forecast at this location is 6 electrified trains during the night time period. These trains are comprised of up to 3 passenger cars.

The maximum design speed on the tracks adjacent to the subject site is 105 kph (65 mph).

Given the close proximity of Exhibition GO Station, the analysis should consider the noise implications of train accelerations and decelerations. Train bells and whistles will be used as per normal procedures at the station and in the event of emergencies on the line.

This information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability and passenger demand.

With respect to future electrified rail service, it should be noted that Metrolinx has not made a final decision regarding the electric train technology or technologies to be deployed. Similarly, we are only beginning to understand potential noise and vibration implications associated with electrification. We can, however, provide the following interim information which may be helpful:

1. At lower speeds, train noise is dominated by the powertrain. At higher speeds, train noise is dominated by the wheel- track interaction. Hence, at higher speeds, the noise level and spectrum of electric trains is expected to be very similar, if not identical, to those of equivalent diesel trains.
2. Along with electrification, Metrolinx will intensify service levels along all of its corridors to deliver the promised Regional Express Rail (RER) service. Everything else being equal, this will likely result in an overall increase in train noise emissions.

Given the above considerations, it would be prudent, at this time, to not expect any improvement in noise impacts due to electrification. We anticipate that additional information regarding specific operational parameters will become available in the near future.

Please feel free to contact me should you have any additional questions.

Adam

Adam Snow

Third Party Projects Officer, Rail Corridor Management Office, Rail Corridors, GO Transit
Metrolinx | 335 Judson Street | Toronto | Ontario | M8Z 1B2

***NEW* T: 416-202-0134** C: 416-528-4864 F: 416-354-7731

From: Seema Nagaraj [mailto:seema@valcoustics.com]

Sent: October-06-16 3:19 PM

To: Adam Snow

Subject: Rail traffic data request (VCL File: 116-0413)

Hi Adam,

We are preparing an environmental noise study for a proposed development at 7 Fraser Avenue in Toronto (please see attached image for location). We are looking for GO rail data for the Lakeshore west line in the vicinity of Fraser Avenue.

Please provide:

Future day/night train volumes

Number of locomotives per train

Number of cars per train

Speed

Whistle blowing locations (at grade crossing)

Thank you,

Seema Nagaraj, Ph.D., P.Eng.

Acoustical Engineer



30 Wertheim Court, Unit 25

Richmond Hill, Ontario

Canada L4B 1B9

Tel: 905-764-5223 ext. 243

Fax: 905-764-6813

solutions@valcoustics.com

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APPENDIX C

ENVIRONMENTAL NOISE GUIDELINES

APPENDIX C

ENVIRONMENTAL NOISE GUIDELINES

MINISTRY OF THE ENVIRONMENT (MOE)

Reference: MOE Publication NPC-300, October 2013: "Environmental Noise Guideline, Stationary and Transportation Source - Approval and Planning".

SPACE	SOURCE	TIME PERIOD	CRITERION
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	Road	23:00 to 07:00	45 dBA
	Rail	23:00 to 07:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Sleeping quarters	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 0
Sleeping quarters	Road	23:00 to 07:00	40 dBA
	Rail	23:00 to 07:00	35 dBA
	Aircraft	24-hour period	NEF/NEP 0
Outdoor Living Areas	Road and Rail	07:00 to 23:00	55 dBA up to 60 dBA allowed in some cases
Outdoor Point of Reception	Aircraft	24-hour period	NEF/NEP 30 [#]
	Stationary Source		
	Class 1 Area	07:00 to 19:00 ⁽¹⁾ 19:00 to 23:00 ⁽¹⁾	50 ⁺ dBA 50 ⁺ dBA
	Class 2 Area	07:00 to 19:00 ⁽²⁾ 19:00 to 23:00 ⁽²⁾	50 ⁺ dBA 45 ⁺ dBA
	Class 3 Area	07:00 to 19:00 ⁽³⁾ 19:00 to 23:00 ⁽³⁾	45 ⁺ dBA 40 ⁺ dBA
	Class 4 Area	07:00 to 19:00 ⁽⁴⁾ 19:00 to 23:00 ⁽⁴⁾	55 ⁺ dBA 55 ⁺ dBA

...../cont'd

SPACE	SOURCE	TIME PERIOD	CRITERION
Plane of a Window of Noise Sensitive Spaces	Stationary Source Class 1 Area	07:00 to 19:00 ⁽¹⁾	50 ⁺ dBA
		19:00 to 23:00 ⁽¹⁾	50 ⁺ dBA
		23:00 to 07:00 ⁽¹⁾	45 ⁺ dBA
	Class 2 Area	07:00 to 19:00 ⁽²⁾	50 ⁺ dBA
		19:00 to 23:00 ⁽²⁾	50 ⁺ dBA
		23:00 to 07:00 ⁽²⁾	45 ⁺ dBA
	Class 3 Area	07:00 to 19:00 ⁽³⁾	45 ⁺ dBA
		19:00 to 23:00 ⁽³⁾	45 ⁺ dBA
		23:00 to 07:00 ⁽³⁾	40 ⁺ dBA
	Class 4 Area	07:00 to 19:00 ⁽⁴⁾	60 ⁺ dBA
		19:00 to 23:00 ⁽⁴⁾	60 ⁺ dBA
		23:00 to 07:00 ⁽⁴⁾	55 ⁺ dBA

- # may not apply to in-fill or re-development.
 * or the minimum hourly background sound level $L_{eq}(1)$, due to road traffic, if higher.
 (1) Class 1 Area : Urban
 (2) Class 2 Area : Urban during day; rural-like evening and night
 (3) Class 3 Area : Rural
 (4) Class 4 Area: Subject to land use planning authority's approval

Reference: MOE Publication ISBN 0-7729-2804-5, 1987: "Environmental Noise Assessment in Land-Use Planning".

EXCESS ABOVE RECOMMENDED SOUND LEVEL LIMITS (dBA)	CHANGE IN SUBJECTIVE LOUDNESS ABOVE	MAGNITUDE OF THE NOISE PROBLEM	NOISE CONTROL MEASURES (OR ACTION TO BE TAKEN)
No excess (<55 dBA)	—	No expected noise problem	None
1 to 5 inclusive (56 to 60 dBA)	Noticeably louder	Slight noise impact	If no physical measures are taken, then prospective purchasers or tenants should be made aware by suitable warning clauses.
6 to 10 inclusive (61 - 65 dBA)	Almost twice as loud	Definite noise impact	Recommended.
11 to 15 inclusive (66 - 70 dBA)	Almost three times as loud	Serious noise impact	Strongly Recommended.
16 and over (>70 dBA)	Almost four times as loud	Very serious noise impact	Strongly Recommended (may be mandatory).

APPENDIX D

SAMPLE STAMSON CALCULATION

STAMSON 5.04 NORMAL REPORT Date: 21-08-2017 17:37:15
 MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE / NOISE ASSESSMENT

Filename: b2_8st n.te Time Period: Day/Night 16/8 hours
Description: Block 2, 8-Storey, North Face

Rail data, segment # 1: CN Oakville (day/night)

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	!Cont weld
* 1. VIA	17.9/0.0	137.0	2.0	10.0	Diesel	Yes
* 2. GO Diesel	107.6/11.3	105.0	1.0	12.0	Diesel	Yes
* 3. GO Electric	133.2/59.5	105.0	1.0	12.0	Diesel	Yes

* The identified number of trains have been adjusted for future growth using the following parameters:

Train type: No Name	Unadj. Trains	Annual % Increase	Years of Growth
1. VIA	14.0/0.0	2.50	10.00
2. GO Diesel	105.0/11.0	2.50	1.00
3. GO Electric	130.0/58.0	2.50	1.00

Data for Segment # 1: CN Oakville (day/night)

Angle1	Angle2	: -90.00 deg	90.00 deg
Wood depth	:	0	(No woods.)
No of house rows	:	0 / 0	
Surface	:	1	(Absorptive ground surface)
Receiver source distance	:	456.00 / 456.00 m	
Receiver height	:	22.50 / 22.50 m	
Topography	:	1	(Flat/gentle slope; no barrier)
No Whistle	:		
Reference angle	:	0.00	

Results segment # 1: CN Oakville (day)

LOCOMOTIVE (0.00 + 64.71 + 0.00) = 64.71 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	79.53	-14.83	0.00	0.00	0.00	0.00	64.71

WHEEL (0.00 + 56.09 + 0.00) = 56.09 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.06	71.98	-15.72	-0.17	0.00	0.00	0.00	56.09

Segment Leq : 65.27 dBA

Total Leq All Segments: 65.27 dBA

Results segment # 1: CN Oakville (night)

LOCOMOTIVE (0.00 + 61.73 + 0.00) = 61.73 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	76.56	-14.83	0.00	0.00	0.00	0.00	61.73

WHEEL (0.00 + 53.35 + 0.00) = 53.35 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.06	69.24	-15.72	-0.17	0.00	0.00	0.00	53.35

Segment Leq : 62.32 dBA

Total Leq All Segments: 62.32 dBA

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

Car traffic volume : 45839/5093 veh/TimePeriod *

Medium truck volume : 780/87 veh/TimePeriod *

Heavy truck volume : 638/71 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 52507

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 1.65

Heavy Truck % of Total Volume : 1.35

Day (16 hrs) % of Total Volume : 90.00

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

Angle1 Angle2 : -90.00 deg 90.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)

Receiver source distance : 61.00 / 61.00 m

Receiver height : 22.50 / 22.50 m

Topography : 1 (Flat/gentle slope; no barrier)

Reference angle : 0.00

Road data, segment # 2: Mississauga (day/night)

Car traffic volume : 11360/1262 veh/TimePeriod *

Medium truck volume : 128/14 veh/TimePeriod *

Heavy truck volume : 104/12 veh/TimePeriod *

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT) : 12880

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 1.10

Heavy Truck % of Total Volume : 0.90

Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Mississauga (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 1 (Absorptive ground surface)

Receiver source distance : 300.00 / 300.00 m

Receiver height : 22.50 / 22.50 m

Topography : 1 (Flat/gentle slope; no barrier)

Reference angle : 0.00

Road data, segment # 3: Promenade (day/night)

Car traffic volume : 7937/981 veh/TimePeriod *

Medium truck volume : 89/11 veh/TimePeriod *

Heavy truck volume : 73/9 veh/TimePeriod *

Posted speed limit : 40 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 9100
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 1.10
 Heavy Truck % of Total Volume : 0.90
 Day (16 hrs) % of Total Volume : 89.00

Data for Segment # 3: Promenade (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
 Wood depth : 0 (No woods.)
 No of house rows : 0 / 0
 Surface : 1 (Absorptive ground surface)
 Receiver source distance : 31.00 / 31.00 m
 Receiver height : 22.50 / 22.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Lakeshore (day)

Source height = 1.08 m

ROAD (0.00 + 63.46 + 0.00) = 63.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.04	69.94	0.00	-6.35	-0.12	0.00	0.00	0.00	63.46

Segment Leq : 63.46 dBA

Results segment # 2: Mississauga (day)

Source height = 0.97 m

ROAD (0.00 + 46.27 + 0.00) = 46.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.05	63.02	0.00	-13.61	-3.14	0.00	0.00	0.00	46.27

Segment Leq : 46.27 dBA

Results segment # 3: Promenade (day)

Source height = 0.97 m

ROAD (0.00 + 52.81 + 0.00) = 52.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.05	59.25	0.00	-3.30	-3.14	0.00	0.00	0.00	52.81

Segment Leq : 52.81 dBA

Total Leq All Segments: 63.89 dBA

Results segment # 1: Lakeshore (night)

Source height = 1.08 m

ROAD (0.00 + 56.93 + 0.00) = 56.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.04	63.41	0.00	-6.35	-0.12	0.00	0.00	0.00	56.93

Segment Leq : 56.93 dBA

Results segment # 2: Mississauga (night)

Source height = 0.98 m

ROAD (0.00 + 39.79 + 0.00) = 39.79 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.05	56.53	0.00	-13.60	-3.14	0.00	0.00	0.00	39.79

Segment Leq : 39.79 dBA

Results segment # 3: Promenade (night)

Source height = 0.97 m

ROAD (0.00 + 46.74 + 0.00) = 46.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.05	53.18	0.00	-3.30	-3.14	0.00	0.00	0.00	46.74

Segment Leq : 46.74 dBA

Total Leq All Segments: 57.40 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.65
(NIGHT): 63.53