

Environmental Noise Feasibility Study

1558 Green Road

Proposed Residential Development Bowmanville, Municipality of Clarington

May 3, 2021
Project: 120-0454

Prepared for

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VALCOUSTICS

Canada Ltd.

Version History

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Environmental Noise Feasibility Study

1558 Green Road

Proposed Residential Development Bowmanville, Municipality of Clarington

EXECUTIVE SUMMARY

Valcoustics Canada Ltd. (VCL) was retained to prepare an Environmental Noise Feasibility Study addressing the potential noise impact from the existing environment onto the proposed residential development. The proposed development will consist of three lots for 3-storey semi-detached dwellings.

The significant environmental noise sources in the vicinity are road traffic on Green Road and Prince William Boulevard as well as rail traffic on the CPR Belleville Subdivision.

The sound levels on site have been determined and compared with the applicable Ministry of the Environment, Conservation and Parks (MECP) noise guideline limits to determine the need for noise mitigation.

To meet the applicable transportation noise source guideline limits:

- All dwelling units require the provision for adding air conditioning at a later date at the occupants' discretion; and
- exterior wall and window construction meeting the minimum non-acoustical requirements of the Ontario Building Code (OBC) will be sufficient for meeting the indoor noise guideline limits of the MECP.

There are no stationary sources in the vicinity with the potential to impact the site.

1.0 INTRODUCTION

Valcoustics Canada Ltd. (VCL) was retained to prepare an Environmental Noise Feasibility Study in support of the Zoning By-Law Amendment (ZBA) application submission to the Municipality of Clarington.

The potential sound levels from the nearby transportation sources have been predicted on site and compared to the applicable MECP noise guideline limits. Where sound level excesses above these guideline limits occur, noise mitigation measures have been recommended.

1.1 THE SITE AND SURROUNDING AREA

The site is located at 1558 Green Road, northwest of the intersection of Green Road and Boswell Drive, in the Municipality of Clarington. The site is bounded by:

- Existing single-family dwellings to the north, west and south; and
- Green Road, with existing townhouse blocks beyond, to the east.

The site is currently occupied by a single-family dwelling that will be demolished as part of the development.

A Key Plan is included as Figure 1.

This report was prepared using the architectural drawing set, prepared by Caricari Lee Architects, dated March 22, 2021. The Site Plan from the drawing set is included as Figure 2.

1.2 THE PROPOSED DEVELOPMENT

The proposed development consists of three lots for 3-storey semi-detached dwellings (six dwellings in all). All dwelling units will be provided with grade-level rear yard amenity space as well as private balconies and terraces that will be less than 4 m in depth.

2.0 NOISE GUIDELINES – TRANSPORTATION SOURCES

2.1 MECP PUBLICATION NPC-300

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

The environmental noise guidelines of the MECP (Publication NPC-300) are discussed briefly below and summarized in Appendix A.

2.1.1 Transportation Noise Sources

2.1.1.1 Architectural Elements

In the daytime (0700 to 2300 hours), 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 nighttime (2300 to 0700 hours), 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 lower than those for road noise; that is, 40 dBA for living/dining rooms, dens and bedrooms during the daytime and nighttime periods except for bedrooms where the nighttime indoor criterion is 35 dBA.

(1) $L_{eq,Day}$ = 16-hour daytime (0700-2300) equivalent continuous sound level.

(2) $L_{eq,Night}$ = 8-hour nighttime (2300-0700) equivalent continuous sound level

The architectural design of the building envelope (walls, windows, etc.) must provide adequate sound isolation to achieve the above indoor sound level limits.

2.1.1.2 Ventilation

In accordance with the MECP noise guideline for road and rail traffic sources, if the daytime sound 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. This means a forced air heating system. 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).

2.1.1.3 Outdoors

For outdoor amenity areas (“Outdoor Living Areas” – OLA’s), the guideline objective 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 that warning clauses are registered on title.

The point of assessment for a rear yard OLA is 1.5 m above grade, 3 m from the rear facade aligned with the midpoint of the relevant façade. Note that for transportation sources, a balcony is not considered an OLA requiring compliance with the noise limits of NPC-300 unless it is:

- The only OLA for the occupant;
- at least 4 m in depth; and
- unenclosed.

2.2 FEDERATION OF CANADIAN MUNICIPALITIES/RAILWAY ASSOCIATION OF CANADA

The standard noise mitigation measures required jointly by the Federation of Canadian Municipalities and the Railway Association of Canada (FCM/RAC) are:

- a minimum setback of 30 m from the edge of the railway right-of-way to the closest dwelling facade;
- a safety berm at least 2.5 m above grade at the property line;
- an approximately 3.0 m high acoustic fence atop the safety berm (to achieve a total height of 5.5 m above the top of the rail);
- brick veneer exterior wall construction; and
- warning clauses specific to the railway for all dwellings within 300 m of the right-of-way.

Aside from the “standard” requirements regarding the setback of dwellings and safety berm/sound barrier configuration, the sound level design objectives of FCM/RAC are similar to those of the MECP. See Appendix A. Note that the FCM/RAC also permit modifications to their standard requirements where substantiated by a detailed noise impact assessment.

3.0 NOISE SOURCES

3.1 TRANSPORTATION SOURCES

The significant transportation noise sources in the vicinity are road traffic on Green Road and Prince William Boulevard as well as rail traffic on the CPR Belleville Subdivision.

Appendix B contains the relevant road and rail traffic data correspondence.

3.1.1 Road Traffic

Current (year 2021) traffic data for Green Road was provided by the Municipality of Clarington. The data includes the percentage of trucks and average vehicle speeds. The ratio of medium trucks to heavy trucks was assumed to be 60%/40%. The average vehicle speed of 54 km/h is higher than the posted speed limit of 50 km/h. To be conservative, the average vehicle speed was used in this assessment. A day/night split of 90%/10% was used as is typical for well-travelled roadways.

Road traffic volumes for Prince William Boulevard were obtained from the Municipality of Clarington in the form of a Turning Movement Count (TMC) for the intersection of Prince William Boulevard and Clarington Boulevard, dated November 21, 2017. The turning movement count was done over an 8-hour time period. Daily (24-hour) volumes were extrapolated from the 8-hour turning movement count by multiplying the turning movement count data by a factor of 2.2 (that is, the 8-hour period consists of 45% of the total daily traffic volume). A growth rate of 2%, compounded annually, was used to obtain future (year 2031) traffic volumes.

Overall truck percentages were obtained from the turning movement counts. The ratio of medium trucks to heavy trucks was assumed to be 60%/40%. The speed limit on Prince William Boulevard is not posted and was assumed to be 50 km/h. A day/night split of 90%/10% was used as is typical for well-travelled roadways.

The 24-hour volume for Clarington Boulevard was calculated to be 376 vehicles per day from the above mentioned turning movement count. This is considered acoustically insignificant. Thus, Clarington Boulevard was not included in this assessment.

Highway 2 is approximately 400 m from the subject site and is not expected to have a significant impact on the subject site. Thus, Highway 2 was not included in this assessment.

Traffic volumes on other nearby roadways are low and are not expected to have a significant noise impact at the subject site and have not been considered further.

Table 1A summarizes the road traffic volumes.

TABLE 1A: ROAD TRAFFIC DATA

Roadway	Year	AADT ⁽¹⁾	% Trucks ⁽²⁾		Day/Night Split (%) ⁽³⁾	Speed (km/hr)
			Medium	Heavy		
Green Road ⁽⁴⁾	2021 (2031)	3672 (4476)	1.0	0.7	90/10	54
Prince William Boulevard ⁽⁵⁾	2017 (2031)	1074 (1417)	2.4	1.6	90/10	50

Notes:

- (1) AADT – Annual Average Daily Traffic. Values shown in brackets are the future (year 2031) volumes.
- (2) Medium and heavy trucks were assumed to be 60% and 40%, respectively of the total provided truck volumes for both roads.
- (3) Day/night split was assumed.
- (4) Obtained from the Municipality of Clarington. The provided AADT was extrapolated to the year 2031 design condition using a 2% growth rate compounded annually. The average speed was used in the assessment.
- (5) Obtained from the Municipality of Clarington in the form of a Turning Movement Count. The calculated 24-hour volume was extrapolated to the year 2031 design condition using a 2% growth rate compounded annually. The speed limit is assumed.

3.1.2 Rail Traffic

Current (year 2018) rail volumes for the CPR Belleville Subdivision (Mileage 164.22) were obtained from CPR. The volumes were projected to the future (year 2031) design condition using a 2.5% growth rate compounded annually. This escalation rate is suggested by the railway authorities when preparing environmental noise studies.

Table 1B summarizes the rail traffic volumes.

TABLE 1B: RAIL TRAFFIC DATA – CP BELLEVILLE SUBDIVISION

Time Period	# of Trains		# of Cars per Train	# of Locomotives per Train	Speed (km/hr)
	Current (2018)	Future (2031)			
Daytime (0700-2300)	5	6.9	234	4	97
Nighttime (2300-0700)	3	4.1	234	4	97

Notes:

- (1) Current volumes obtained from CPR for the year 2018.
- (2) Future volumes calculated using a 2.5% growth rate, compounded annually.

3.2 STATIONARY SOURCES

There is an existing Tim Horton’s restaurant approximately 100 m to the northeast of the site, at the northeast corner of Green Road and Prince William Boulevard. The main noise sources at this facility are anticipated to be the rooftop mechanical units and activities at the drive-through, such as vehicle idling and loudspeakers at the ordering boards. Due to the distance separation, ambient road traffic noise from the intervening roadway (Green Road) and the presence of existing residential dwellings at a closer setback distance, noise from this facility is not expected

to have a significant noise impact at the subject site and has therefore not been considered further in this assessment.

There is an existing multi-tenant commercial plaza approximately 150 m to the northeast of the site, at the northeast corner of Green Road and Prince William Boulevard. Tenants at the plaza include restaurants, grocery stores, banks and general retail. The main noise sources at the commercial plaza are anticipated to be the rooftop mechanical units and delivery truck activities around the site, such as truck movements and idling at the loading docks. Due to the distance separation, ambient road traffic noise from the intervening roadway (Green Road) and the presence of existing residential dwellings at a closer setback distance, the commercial plaza is not expected to have a significant noise impact at the subject site and has therefore not been considered further in this assessment.

4.0 NOISE IMPACT ASSESSMENT

Using the road and rail traffic data in Tables 1A and 1B, the sound levels (in terms of $L_{eq\ Day}$ and $L_{eq\ Night}$) were calculated using STAMSON V5.04 – ORNAMENT/STEAM, the computerized road and rail traffic noise prediction models of the MECP.

The daytime and nighttime sound levels at the building facades were assessed at a height of 7.8 m, representing the worst-case top (3rd) floor windows as calculated from the elevation drawing.

The daytime sound levels in the rear yard OLA's were assessed at a standing height of 1.5 m above grade, 3 m from the dwelling, at a point aligned with the midpoint of the rear facade.

All private balconies and terraces in the development will be less than 4 m in depth and therefore, do not qualify as OLA's under MECP guidelines and are not required to meet the NPC-300 noise limits.

Table 2 summarizes the predicted sound levels.

The highest unmitigated daytime/nighttime sound levels of 55 dBA/53 dBA are predicted to occur at the east facades of the dwellings, the facades closest to Green Road. The highest unmitigated daytime OLA sound level of 41 dBA is predicted to occur at the rear yard of Lot 1A.

TABLE 2: PREDICTED EXTERIOR SOUND LEVELS⁽¹⁾

Location ⁽²⁾	Source	Distance (m) ⁽³⁾	Leq Day (dBA)	Leq Night (dBA)
Lot 1A (East Facade)	Green Road	31	53	46
	Prince William Boulevard	69	38	31
	CPR Belleville Subdivision	302	51	51
	TOTAL	—	55	53
Lot 3B (East Facade)	Green Road	32	53	46
	Prince William Boulevard	105	35	28
	CPR Belleville Subdivision	270	51	52
	TOTAL	—	55	53

.../cont'd

TABLE 2: PREDICTED EXTERIOR SOUND LEVELS⁽¹⁾ (continued)

Location ⁽²⁾	Source	Distance (m) ⁽³⁾	Leq Day (dBA)	Leq Night (dBA)
Lot 3B (South Facade)	Green Road	32	50	43
	CPR Belleville Subdivision	270	52	53
	TOTAL	—	54	53
Lot 1A (Rear Yard OLA)	Green Road	50	41	—

Notes:

- (1) Facades were assessed at the top floor windows. OLAs were assessed at 1.5 m above grade.
- (2) See Figure 2.
- (3) Distance indicated is from the centreline of the noise source to the facade or OLA.

Appendix C contains a sample sound level calculation.

5.0 NOISE ABATEMENT REQUIREMENTS

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

- a) Architectural elements to achieve acceptable indoor noise guidelines;
- b) Design features to protect the OLAs.

Figure 2, Table 3 and the Notes to Table 3 summarize the transportation noise abatement measures and are discussed further below.

TABLE 3: NOISE ABATEMENT REQUIREMENTS

Location	Air Conditioning ⁽¹⁾	Exterior Wall ⁽²⁾	Exterior Window ⁽²⁾	Sound Barrier ⁽³⁾	Warning Clauses ⁽⁴⁾
All Dwelling Units	Provision for adding	No special acoustical requirements		None	A + B + C

Notes:

- (1) Where means must be provided to allow windows to remain closed for noise control purposes, a commonly used technique is that of air conditioning
- (2) STC - Sound Transmission Class Rating (Reference ASTM-E413). Analyses were based upon the floor plan and elevation drawings prepared by Caricari Lee Architects, dated March 22, 202. A sliding/swing glass walkout door should be considered as a window and included in the percentage of glazing. Requirements should be checked if the architectural drawings are changed.
- (3) Sound barriers must be of solid construction with no gaps, cracks or holes, and must meet a minimum surface density of 20 kg/m². Suitable material can include wood, concrete metal sandwich panel, glazing or a combination of these.
- (4) Warning clauses to be included in Occupancy Agreements:
 - A. "Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road and rail 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, Conservation and Parks."
 - B. "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 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, Conservation and Parks."
 - C. "Warning" Canadian Pacific Railway or its affiliated railway companies has or have a right-of-way within 300 metres from the land subject hereof. There may be alterations to or expansions of the railway facilities of such right-of-way in the future, including the possibility that Canadian Pacific Limited or its affiliated railway companies as aforesaid, or their assigns or successors may expand their business operations. Such expansion may affect the living and business environment of the residents, tenants and their visitors, notwithstanding the inclusion of any noise and vibration attenuating features in the design of the development. Canadian Pacific Limited, its affiliated railway companies and their successors and assigns will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way".
- (5) Conventional roof construction meeting OBC requirements is satisfactory in all cases.
- (6) All exterior doors shall be fully weatherstripped.

5.1 INDOORS

5.1.1 Architectural Requirements

The indoor noise guidelines can be achieved by using appropriate construction for exterior walls, windows and doors. In determining the worst-case architectural requirements for the dwelling units, wall and window areas were calculated based on Bedroom 3 for Lot 3B (the worst case location).

The front-facing wall and windows were calculated to be 45% and 33%, respectively of the associated floor area. The side-facing wall was calculated to be 100% of the associated floor area. There are no windows on the side façade.

The analysis shows that for all or all dwelling units in this development, exterior wall and window construction meeting the minimum non-acoustical requirements of the OBC will be sufficient to achieve the indoor noise guideline criteria of the MECP.

5.1.2 Ventilation Requirements

Based on the predicted sound levels, the provision for adding air conditioning is required for all dwelling units. 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 of all dwelling units are predicted to be below the 55 dBA objective. Thus, sound barriers are not required for noise control purposes.

6.0 WARNING CLAUSES

Warning clauses are a tool to inform prospective owners/occupants of potential annoyance due to existing environmental noise sources. The warning clauses should be registered on the title or included in the development agreement that is registered on title. The warning clauses should also be included in Offers of Purchase and Sale and lease/rental agreements to make future occupants aware of the potential noise situation.

Table 3 and the notes to Table 3 summarize the warning clauses for the site.

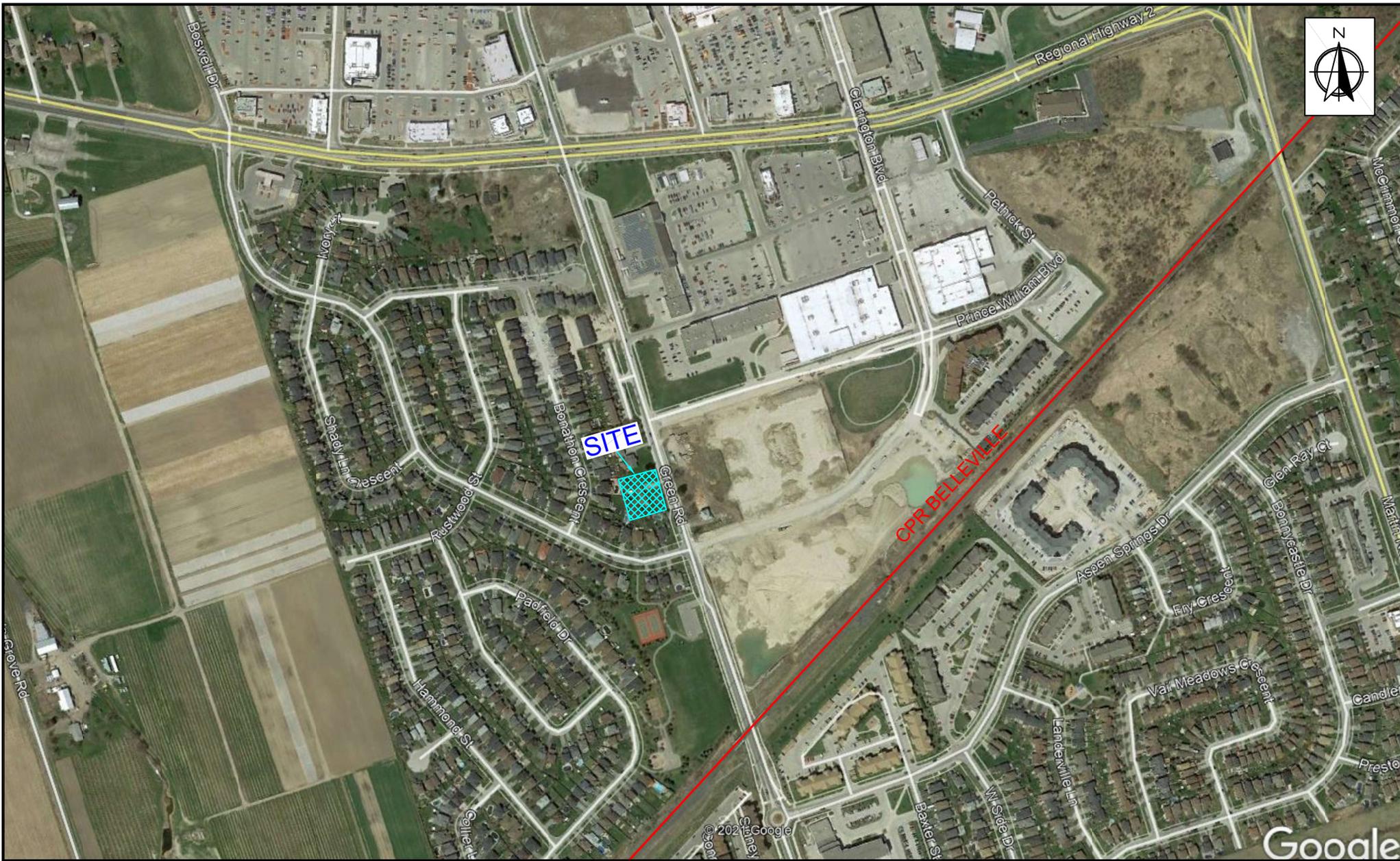
7.0 CONCLUSIONS

With the incorporation of the recommended mitigation measures, a suitable acoustical environment can be provided for the occupants and the applicable MECP noise guideline requirements met.

The approvals and administrative procedures are available to ensure that the noise requirements are implemented.

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) MECP Publication NPC-300, "Stationary and Transportation Sources — Approval and Planning" Ontario Ministry of the Environment, August 2013.
- 4) "Guidelines for New Development in Proximity to Railway Operations", Prepared for The Federation of Canadian Municipalities and the Railway Association of Canada (FCM/RAC), May 2013.



No.	Revision/Issue	Date


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Title
Key Plan

Project Name
1558 Green Road,
Bowmanville

Project No.
120-0454

Scale
N.T.S.

Date
Apr. 22, 2021

Figure
1

Google

APPENDIX A

ENVIRONMENTAL NOISE GUIDELINES

APPENDIX A
ENVIRONMENTAL NOISE GUIDELINES
MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MECP)

Reference: MECP 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
Outdoor Point of Reception	Aircraft	24-hour period	NEF/NEP 30 [#]
	Stationary Source		
	Class 1 Area	07:00 to 19:00 ⁽¹⁾	50 ⁺ dBA
		19:00 to 23:00 ⁽¹⁾	50 ⁺ dBA
	Class 2 Area	07:00 to 19:00 ⁽²⁾	50 ⁺ dBA
		19:00 to 23:00 ⁽²⁾	45 ⁺ dBA
	Class 3 Area	07:00 to 19:00 ⁽³⁾	45 ⁺ dBA
		19:00 to 23:00 ⁽³⁾	40 ⁺ dBA
	Class 4 Area	07:00 to 19:00 ⁽⁴⁾	55 ⁺ dBA
		19:00 to 23:00 ⁽⁴⁾	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 exposure $L_{eq(1)}$, 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: MECP 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 B

TRAFFIC DATA CORRESPONDENCE

For Project: Green Rd South of McBride WSN
 Project Notes:
 Location/Name: Merged
 Report Generated: 2021-02-24 12:34
 Speed Intervals: 1 km/h
 Time Intervals: Instant
 Traffic Report From: 2021-01-21 14:00:00 through 2021-01-26 12:59:59
 85th Percentile Speed: 62 km/h
 85th Percentile Vehicles: 15477
 Max Speed: 109 km/h on 2021-01-22 11:22:36
 Total Vehicles: 18208
 AADT: 3672

Volumes - weekly counts

Time	5 Day	7 Day
Average Daily	2881	3034
AM Peak	11:00 206	205
PM Peak	05:00 382	345

Speed

Speed Limit: 50
 85th Percentile Speed: 62
 Average Speed: 54.28

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Count over limit	2688	837	N/A	1501	3124	2775	2216
% over limit	69.9	69.1	N/A	69.6	72.4	75.3	73.9
Avg Speeder	58.1	58.5	N/A	57.7	58.3	58.3	58.4

Class Counts

	Number	%
VEH_SM	66	0.4
VEH_MED	17843	98
VEH_LG	299	1.6
[VEH_SM=motorcycle,	VEH_MED = sedan,	VEH_LG = truck]

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period

From: 7:00:00
To: 12:00:00

One Hour Peak

From: 7:45:00
To: 8:45:00

Municipality: Bowmanville
Site #: 0000000038
Intersection: Clarington Blvd & Prince William Bl
TFR File #: 1
Count date: 21-Nov-17

Weather conditions:
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Clarington Blvd runs N/S

North Leg Total: 86
North Entering: 56
North Peds: 1
Peds Cross: \times

Cyclists	0	0	0	0
Trucks	3	1	7	11
Cars	38	3	4	45
Totals	41	4	11	



Cyclists 0
Trucks 5
Cars 25
Totals 30

East Leg Total: 32
East Entering: 5
East Peds: 0
Peds Cross: \times

Cyclists	Trucks	Cars	Totals
0	3	39	42



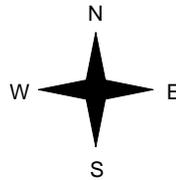
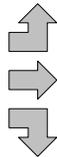
Clarington Blvd

Cars	Trucks	Cyclists	Totals
2	3	0	5
0	0	0	0
0	0	0	0
2	3	0	



Prince William Blvd

Cyclists	Trucks	Cars	Totals
0	1	20	21
0	0	16	16
0	0	2	2
0	1	38	



Clarington Blvd

Cars	Trucks	Cyclists	Totals
20	7	0	27



Peds Cross: \times
West Peds: 0
West Entering: 39
West Leg Total: 81

Cars	5
Trucks	1
Cyclists	0
Totals	6



Cars	1	3	0	4
Trucks	0	1	0	1
Cyclists	0	0	0	0
Totals	1	4	0	

Peds Cross: \times
South Peds: 3
South Entering: 5
South Leg Total: 11

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period

From: 12:00:00

To: 19:00:00

One Hour Peak

From: 15:15:00

To: 16:15:00

Municipality: Bowmanville
Site #: 0000000038
Intersection: Clarington Blvd & Prince William Bl
TFR File #: 1
Count date: 21-Nov-17

Weather conditions:
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Clarington Blvd runs N/S

North Leg Total: 89
 North Entering: 59
 North Peds: 4
 Peds Cross: \bowtie

Cyclists	0	0	0	0
Trucks	2	0	5	7
Cars	33	8	11	52
Totals	35	8	16	



Cyclists 0
 Trucks 2
 Cars 28
 Totals 30

East Leg Total: 45
 East Entering: 17
 East Peds: 1
 Peds Cross: \bowtie

Cyclists	Trucks	Cars	Totals
0	3	45	48

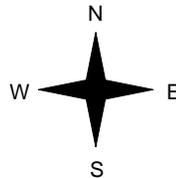


Clarington Blvd

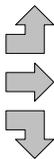
Cars	Trucks	Cyclists	Totals
2	2	0	4
11	1	0	12
1	0	0	1
14	3	0	



Prince William Blvd



Cyclists	Trucks	Cars	Totals
0	0	20	20
0	0	12	12
0	0	3	3
0	0	35	



Prince William Blvd



Cars	Trucks	Cyclists	Totals
23	5	0	28

Peds Cross: \bowtie
 West Peds: 0
 West Entering: 35
 West Leg Total: 83

Cars	12
Trucks	0
Cyclists	0
Totals	12



Cars	1	6	0	7
Trucks	0	0	0	0
Cyclists	0	0	0	0
Totals	1	6	0	

Peds Cross: \bowtie
 South Peds: 4
 South Entering: 7
 South Leg Total: 19

Comments

Ontario Traffic Inc.

Eight Hour Peak Diagram

Eight Hour Peak

From: 7:45:00

To: 15:45:00

Municipality: Bowmanville
Site #: 0000000038
Intersection: Clarington Blvd & Prince William Bl
TFR File #: 1
Count date: 21-Nov-17

Weather conditions:
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Clarington Blvd runs N/S

North Leg Total: 371
 North Entering: 231
 North Peds: 11
 Peds Cross: \bowtie

Cyclists	0	0	0	0
Trucks	10	2	27	39
Cars	115	44	33	192
Totals	125	46	60	



Cyclists	0
Trucks	15
Cars	125
Totals	140

East Leg Total: 173
 East Entering: 56
 East Peds: 7
 Peds Cross: \bowtie

Cyclists	0
Trucks	12
Cars	144
Totals	156



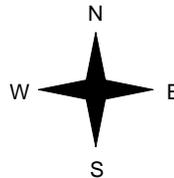
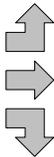
Clarington Blvd

Cars	19	12	0	31
Trucks	21	2	0	23
Cyclists	1	1	0	2
Totals	41	15	0	



Prince William Blvd

Cyclists	0
Trucks	1
Cars	76
Totals	77
Cyclists	0
Trucks	0
Cars	49
Totals	49
Cyclists	0
Trucks	0
Cars	12
Totals	12
Cyclists	0
Trucks	1
Cars	137
Totals	137



Clarington Blvd



Cars	90	27	0	117
Trucks				
Cyclists				
Totals				

Peds Cross: \bowtie
 West Peds: 6
 West Entering: 138
 West Leg Total: 294

Cars	57
Trucks	3
Cyclists	0
Totals	60



Cars	8	30	8	46
Trucks	0	2	0	2
Cyclists	0	0	0	0
Totals	8	32	8	

Peds Cross: \bowtie
 South Peds: 11
 South Entering: 48
 South Leg Total: 108

Comments

Ontario Traffic Inc.

Total Count Diagram

Municipality: Bowmanville
Site #: 0000000038
Intersection: Clarington Blvd & Prince William Bl
TFR File #: 1
Count date: 21-Nov-17

Weather conditions:
Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Clarington Blvd runs N/S

North Leg Total: 572
 North Entering: 362
 North Peds: 16
 Peds Cross: ⚡

Cyclists	0	0	0	0
Trucks	16	2	39	57
Cars	190	67	48	305
Totals	206	69	87	



Cyclists 0
 Trucks 19
 Cars 191
 Totals 210

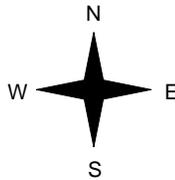
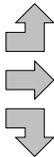
East Leg Total: 265
 East Entering: 89
 East Peds: 8
 Peds Cross: ⚡

Cyclists	Trucks	Cars	Totals
0	18	248	266



Prince William Blvd

Cyclists	Trucks	Cars	Totals
0	2	118	120
0	0	78	78
0	0	24	24
0	2	220	



Clarington Blvd



Cars	Trucks	Cyclists	Totals
25	15	0	40
44	2	0	46
2	1	0	3
71	18	0	



Prince William Blvd



Cars	Trucks	Cyclists	Totals
137	39	0	176

Peds Cross: ⚡
 West Peds: 6
 West Entering: 222
 West Leg Total: 488

Cars	93
Trucks	3
Cyclists	0
Totals	96



Cars	14	48	11	73
Trucks	0	2	0	2
Cyclists	0	0	0	0
Totals	14	50	11	

Peds Cross: ⚡
 South Peds: 17
 South Entering: 75
 South Leg Total: 171

Comments

Ontario Traffic Inc. Traffic Count Summary

Intersection: Clarington Blvd & Prince William B													Count Date: 21-Nov-17		Municipality: Bowmanville	
North Approach Totals						North/South Total Approaches	South Approach Totals									
Includes Cars, Trucks, & Cyclists					Total Peds		Includes Cars, Trucks, & Cyclists					Total Peds				
Hour Ending	Left	Thru	Right	Grand Total			Hour Ending	Left	Thru	Right	Grand Total					
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0				
8:00:00	12	2	19	33	0	38	8:00:00	2	3	0	5	1				
9:00:00	9	7	33	49	2	56	9:00:00	2	5	0	7	3				
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0				
12:00:00	9	9	16	34	2	47	12:00:00	4	7	2	13	2				
13:00:00	10	11	15	36	1	51	13:00:00	2	10	3	15	1				
14:00:00	13	14	22	49	3	56	14:00:00	0	4	3	7	2				
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0				
16:00:00	16	8	31	55	5	62	16:00:00	1	6	0	7	4				
17:00:00	4	12	32	48	3	61	17:00:00	1	10	2	13	4				
18:00:00	14	6	38	58	0	66	18:00:00	2	5	1	8	0				
Totals:	87	69	206	362	16	437		14	50	11	75	17				
East Approach Totals						East/West Total Approaches	West Approach Totals									
Includes Cars, Trucks, & Cyclists					Total Peds		Includes Cars, Trucks, & Cyclists					Total Peds				
Hour Ending	Left	Thru	Right	Grand Total			Hour Ending	Left	Thru	Right	Grand Total					
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0				
8:00:00	0	2	4	6	0	35	8:00:00	15	12	2	29	0				
9:00:00	0	3	3	6	0	39	9:00:00	15	16	2	33	0				
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0				
12:00:00	0	4	4	8	1	31	12:00:00	13	4	6	23	3				
13:00:00	1	4	8	13	2	35	13:00:00	13	9	0	22	1				
14:00:00	1	5	7	13	3	33	14:00:00	9	7	4	20	2				
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0				
16:00:00	1	9	7	17	1	53	16:00:00	22	12	2	36	0				
17:00:00	0	14	4	18	0	49	17:00:00	18	11	2	31	0				
18:00:00	0	5	3	8	1	36	18:00:00	15	7	6	28	0				
Totals:	3	46	40	89	8	311		120	78	24	222	6				
Calculated Values for Traffic Crossing Major Street																
Hours Ending:	8:00	9:00	12:00	13:00				14:00	16:00	17:00	18:00					
Crossing Values:	28	36	21	25				22	44	39	22					



800 - 1290 Central Parkway
West
Mississauga, Ontario
Canada L5C 4R3

T 905 803 3429
E josie_tomei@cpr.ca

September 26, 2018

Via email: anthony@valcoustics.com

Anthony Amarra
Valcoustics
30 Wertheim Court
Unit 25
Richmond Hill, ON L4B 1B9

Dear Sir/Madam:

*Re: Rail Traffic Volumes, CP Mileage 164.22, Belleville Subdivision,
Scugog Street at CP Tracks, Bowmanville*

This is in reference to your request for rail traffic data in the vicinity of Scugog Street at the CP Tracks in the Town of Bowmanville. The study area is located at mile 164.22 of our Belleville Subdivision, which is classified as a Principal Main line.

The information requested is as follows:

1. Number of freight trains between 0700 & 2300: 5
Number of freight trains between 2300 & 0700: 3
2. Maximum cars per train: 234
3. Number of locomotives per train: 2-4
4. Maximum permissible train speed: 60 mph
5. The only public grade crossings in the study area is Scugog Street and to date, the whistle signal is used. The whistle may be sounded if deemed necessary by the train crew for safety reasons at any time in other locations.
6. There is a single mainline track with continuously welded rail.

The information provided is based on recent rail traffic. Variations of the above may exist on a day-to-day basis. Specific measurements may also vary significantly depending on customer needs.

Yours truly,

Josie Tomei SR/WA
Specialist Real Estate Sales & Acquisitions – Ontario

APPENDIX C

SAMPLE CALCULATION

STAMSON 5.04 NORMAL REPORT Date: 28-04-2021 21:38:46
MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS/ NOISE ASSESSMENT

Filename: la_ne_ef.te Time Period: Day/Night 16/8 hours
Description: **Lot 1A - Northeast Corner - East Facade**

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

Train Type	! Trains	! Speed (km/h)	!# loc	!# Cars	! Eng type	!Cont weld
* 1.	! 6.9/4.1	! 97.0	! 4.0	!234.0	!Diesel	! Yes

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

Train No	! Name	! Unadj. Trains	! Annual % Increase	! Years of Growth
1.		! 5.0/3.0	! 2.50	! 13.00

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

Angle1 Angle2 : -90.00 deg 33.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 80 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 302.00 / 302.00 m
Receiver height : 7.80 / 7.80 m
Topography : 1 (Flat/gentle slope; no barrier)
No Whistle
Reference angle : 0.00

Results segment # 1: CPBelleville (day)

LOCOMOTIVE (0.00 + 50.22 + 0.00) = 50.22 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	33	0.40	75.97	-18.20	-2.37	0.00	-5.17	0.00	50.22

WHEEL (0.00 + 40.94 + 0.00) = 40.94 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	33	0.50	68.21	-19.57	-2.52	0.00	-5.17	0.00	40.94

Segment Leq : 50.70 dBA

Total Leq All Segments: 50.70 dBA

Results segment # 1: CPBelleville (night)

LOCOMOTIVE (0.00 + 50.97 + 0.00) = 50.97 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	33	0.40	76.72	-18.20	-2.37	0.00	-5.17	0.00	50.97

WHEEL (0.00 + 41.69 + 0.00) = 41.69 dBA
Angle1 Angle2 Alpha RefLeq D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 33 0.50 68.96 -19.57 -2.52 0.00 -5.17 0.00 41.69

Segment Leq : 51.45 dBA

Total Leq All Segments: 51.45 dBA

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

Car traffic volume : 3960/440 veh/TimePeriod *
Medium truck volume : 40/4 veh/TimePeriod *
Heavy truck volume : 28/3 veh/TimePeriod *
Posted speed limit : 54 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): 3672
Percentage of Annual Growth : 2.00
Number of Years of Growth : 10.00
Medium Truck % of Total Volume : 1.00
Heavy Truck % of Total Volume : 0.70
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Green Rd (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 : 31.00 / 31.00 m
Receiver height : 7.80 / 7.80 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 1224/136 veh/TimePeriod *
Medium truck volume : 31/3 veh/TimePeriod *
Heavy truck volume : 20/2 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): 1074
Percentage of Annual Growth : 2.00
Number of Years of Growth : 14.00
Medium Truck % of Total Volume : 2.40
Heavy Truck % of Total Volume : 1.60
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Prince Will (day/night)

Angle1 Angle2 : 21.00 deg 62.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 69.00 / 69.00 m
Receiver height : 7.80 / 7.80 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Green Rd (day)

Source height = 0.91 m

ROAD (0.00 + 53.01 + 0.00) = 53.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.49	58.86	0.00	-4.69	-1.15	0.00	0.00	0.00	53.01

Segment Leq : 53.01 dBA

Results segment # 2: Prince Will (day)

Source height = 1.12 m

ROAD (0.00 + 37.81 + 0.00) = 37.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
21	62	0.48	54.73	0.00	-9.82	-7.10	0.00	0.00	0.00	37.81

Segment Leq : 37.81 dBA

Total Leq All Segments: 53.14 dBA

Results segment # 1: Green Rd (night)

Source height = 0.91 m

ROAD (0.00 + 46.40 + 0.00) = 46.40 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.49	52.25	0.00	-4.69	-1.15	0.00	0.00	0.00	46.40

Segment Leq : 46.40 dBA

Results segment # 2: Prince Will (night)

Source height = 1.09 m

ROAD (0.00 + 30.99 + 0.00) = 30.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
21	62	0.48	47.92	0.00	-9.83	-7.10	0.00	0.00	0.00	30.99

Segment Leq : 30.99 dBA

Total Leq All Segments: 46.52 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.10
(NIGHT): 52.66