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ENVIRONMENTAL NOISE REPORT

PROPOSED RESIDENTIAL DEVELOPMENT
750 MAPLEVIEW DRIVE EAST
CITY OF BARRIE

JADE ACOUSTICS

PREPARED FOR
Mapleview Developments Ltd.
c/o S.C. Land Management

September 15, 2021
File: 17-066-03

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SUMMARY

The proposed development is located at 750 Mapleview Drive East, in the City of Barrie. It is subject to road traffic noise from Mapleview Drive East and new internal roads, Lane A and Lane B, as well as rail traffic noise from the Metrolinx operations on the nearby CN Newmarket Subdivision rail corridor, to the west of the subject site.

The proposed development represents an infill development relative to the overall adjacent development located at 700 Mapleview Drive East (Plan 51M-1193), to the west, north and east of the subject site.

The environmental noise guidelines of the City of Barrie, the County of Simcoe, the Ontario Ministry of the Environment, Conservation and Parks (MOE), and Canadian National Railway Company (CN)/GO Transit/Metrolinx set out sound level limits for both indoor and outdoor space. Sound levels due to Mapleview Drive East and the rail line were determined using ORNAMENT, the MOE noise prediction model for road traffic and STEAM, the MOE noise predicting model for rail traffic.

Using the road traffic data obtained from the City of Barrie, and the rail traffic data obtained from Metrolinx and CN, the sound levels for various locations within the proposed residential development were determined.

With appropriate mitigative measures, all blocks (units) in the development are predicted to meet the noise guidelines.

All units within Blocks 1, 2 and 5 require provision for adding central air conditioning and a warning clause due to road traffic.

Although not required for Blocks 6 and 7, it is recommended that all units within both blocks be provided with mandatory central air conditioning and a warning clause due to their proximity to Mapleview Drive East.

All units within Blocks 1 to 3 and 7 require a warning clause due to the blocks' location within 300 m of the rail line right-of-way. Table 3 and Figure 2 show the central air conditioning requirements.

Due to a separation distance of over 250 m, railway ground-borne vibration will be insignificant at the proposed residential blocks (units); therefore, vibration assessment of the railway in this report is not warranted and vibration mitigation measures are not required.

Based on the analysis, standard exterior wall and window construction is predicted to be acoustically acceptable for all proposed blocks (units). Prior to issuance of building permits, the acoustical requirements should be reviewed to ensure compliance with the applicable guidelines. Prior to final occupancy, the blocks (units) with acoustic requirements should be inspected by an acoustical consultant to ensure the required mitigative measures have been incorporated.

Sound barriers are not required for any blocks (units) within the proposed development.

Where minor excesses exist or mitigation is required, future occupants will be advised through the use of warning clauses.

An institutional block is proposed to be located to the east of the subject site. The institutional block is shown as Block 11 on the plan for the overall/adjacent development located at 700 Mapleview Drive East (Plan 51M-1193). Preliminary information regarding the institutional block was provided at the time of the preparation of this report and has been considered.

A mixed-use block is proposed to be located to the west of the subject site within the overall mixed-use development at 700 Mapleview Drive East. The mixed-use block is expected to be acoustically insignificant at the subject site.

1.0 INTRODUCTION

Jade Acoustics Inc. was retained to prepare an Environmental Noise Report to investigate the potential impact of noise on the proposed development area to the satisfaction of the City of Barrie, the County of Simcoe and CN/GO Transit/Metrolinx.

A Preliminary Environmental Noise and Vibration Report dated January 16, 2018, last revised August 6, 2021, prepared by Jade Acoustics Inc. has been prepared for the overall development located at 700 Mapleview Drive East and has been submitted under separate cover. The subject site is located at 750 Mapleview Drive East which previously consisted of a stand-alone residential dwelling. The proposed development on this site will continue to be residential and is proposed to join to the overall mixed-use residential development at 700 Mapleview Drive East; therefore, relevant information from the above noted Preliminary Environmental Noise and Vibration Report has been carried over to this report, as applicable.

The proposed site is identified as:

Part of Lot 16, Concession 12
750 Mapleview Drive East
City of Barrie
County of Simcoe

The site is bounded by a proposed mixed-use residential development to the west, east and north, and Mapleview Drive East to the south. Across the roadway, on the south side of Mapleview Drive East, there is a residential subdivision currently under construction.

Surrounding land uses include existing and future residential developments and the Barrie South GO Station (at a distance). A Key Plan is attached as Figure 1.

An institutional block is proposed to be located to the east of the subject site. Preliminary information regarding the design of this block was provided at the time of the preparation of this report. Upon review of the preliminary information, it shows the potential for mixed-use residential development; however, the plans have not been finalized. Based on the information provided, there are no significant sources of stationary noise anticipated to be included in the development that would warrant acoustical investigation. Should the institutional block be developed for uses other than the preliminary information indicated, a noise report should be completed by the proponent of the use to ensure the applicable sound level limits are met at the subject site. Additionally, there are no stationary noise sources associated with the subject development; therefore, there will be no adverse impact as a result on the proposed institutional block.

A mixed-use block is proposed to be located to the west of the subject site, within the overall development at 700 Mapleview Drive East. There are proposed residential dwellings between the subject site and the mixed-use block, where the applicable sound limits will need to be met. As a result, the sound level limits will also be met at the subject site.

The analysis was based on the following:

- Grading Base Plan provided by Schaeffers Consulting Engineers on July 5, 2021;
- Conceptual design information for the institutional block development (Block 11, 51M-1193) at 700 Mapleview Drive East, provided by S.C. Land Management on July 5, 2021;
- Road traffic information provided by the City of Barrie on December 8, 2020 (re-confirmed June 22, 2021);
- Rail traffic information provided by Metrolinx on June 9, 2021;
- Rail traffic information provided by CN on December 8, 2020 and verified to be applicable on June 22, 2021;
- Preliminary Environmental Noise and Vibration Report dated January 16, 2018, last revised August 6, 2021, prepared by Jade Acoustics Inc., for the proposed mixed-use residential development at 700 Mapleview Drive East; and
- Site visit conducted by Jade Acoustic Inc. staff on June 23, 2021.

Figure 2 shows the plan of the proposed residential development.

2.0 NOISE SOURCES

2.1 Transportation Sources

The road traffic on Mapleview Drive East, Lane A and Lane B and the rail traffic on the CN/Metrolinx rail corridor are the noise sources with a potential impact on the proposed development.

Traffic volumes for Mapleview Drive East were provided by the City of Barrie and projected to volumes for a horizon year of 2031 with a 6.3% annual growth rate. The road traffic data was originally provided in December, 2020 and reconfirmed to be valid in preparation of this report. See Appendix A for details.

The forecasted rail traffic data used for the analysis was provided by Metrolinx. Metrolinx has indicated that anti-whistling by-laws are in effect at Mile 59.29, where an at-grade crossing is currently located. Therefore, whistle noise was not included in the analysis of the architectural requirements.

CN Rail has indicated that they do not operate trains at Mile 59.29 of the Newmarket Subdivision.

The Barrie South GO Station is located in the vicinity of the proposed development. For all trains stopping at the station, increased sound levels can be expected due to the acceleration/deceleration of the trains entering and leaving the station, when considering diesel locomotives. Since these conditions are not specifically included in the MOE prediction model used in the analysis, it is our opinion that by using the maximum operating speed, the actual train acceleration and deceleration operations would be indirectly addressed. No other adjustments have been used in the analysis to address the acceleration/deceleration of the trains.

Road and rail traffic information is summarized in Table 1. Correspondence regarding the road and rail traffic information is included in Appendix A.

All proposed internal roads will be local roads with low traffic volumes, and therefore, having insignificant acoustical impact on the proposed residential units. As such, these roads were not considered further in this report.

The site is not affected by aircraft traffic.

2.2 Stationary Sources

Barrie South GO Station

The existing Barrie South GO Station is located on the west side of the rail corridor, northwest of the proposed development. There will be residential dwellings located between the GO station and the subject site, as part of the overall proposed 700 Mapleview development. As achieving the applicable noise guidelines at the future intervening residential receptor locations addresses the proposed residential development, further noise assessment of the Barrie South GO Station in this report is not warranted. The Barrie South GO Station was therefore not considered further in this report.

Future Institutional Block (Block 11, Plan 51M-1193)

As noted above, there is a future institutional block located within the overall 700 Mapleview proposed development. The conceptual information provided regarding these lands indicate that the proposed use may be mixed-use residential or strictly residential, and would therefore not be expected to include significantly adverse stationary sources of noise. Once detailed design information for the institutional block is prepared, the information should be reviewed to establish the need for a separate environmental noise report.

3.0 ENVIRONMENTAL NOISE CRITERIA

The most recent environmental noise guidelines (NPC-300) of the Ontario Ministry of the Environment, Conservation and Parks (MOE) titled "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", dated August, 2013, released October 21, 2013 (updated final version # 22), were used for the analysis. A brief summary of the NPC-300 guidelines is given in Appendix B. The guidelines are also summarized below.

3.1 Transportation Sources

3.1.1 Indoors

If the nighttime (11:00 p.m. to 7:00 a.m.) sound level in terms of Leq at the exterior face of a bedroom or living/dining room window is greater than 60 dBA or if the daytime (7:00 a.m. to 11:00 p.m.) sound level in terms of Leq at the exterior face of a bedroom or living/dining room 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 nighttime sound levels (LeqNight) greater than 50 dBA to less than or equal to 60 dBA on the exterior face of a bedroom or living/dining room window or daytime sound levels (LeqDay) greater than 55 dBA to less than or equal to 65 dBA on the exterior face of a bedroom or living/dining room window, there need only be the provision for adding central air conditioning by the occupant at a later date. This typically involves a ducted heating system sized to accommodate the addition of central air conditioning by the occupant at a later date. A warning clause advising the occupant of the potential interference with some activities is also required.

In all cases, the air cooled condenser units must not exceed an AHRI rating of 7.6 bels. The air cooled condenser units must be sited in accordance with the zoning by-laws with respect to setbacks as well as location.

As required by the MOE, the indoor noise criteria for road traffic noise is 40 dBA (Leq8hour) for the bedrooms during nighttime hours, 45 dBA (Leq8hour) for the living/dining rooms during nighttime hours and 45 dBA (Leq16hour) for the living/dining rooms and bedrooms during daytime hours. The MOE guidelines for rail noise are 5 dB more stringent to account for the special character of rail noise. These criteria are used to determine the architectural requirements.

3.1.2 Outdoors

For the outdoor amenity areas, a design goal of 55 dBA for the daytime period between 7:00 a.m. to 11:00 p.m. is used for road and rail traffic. In some cases an excess not exceeding 5 dBA is considered acceptable. Where the unmitigated sound levels during the day exceed 55 dBA (Leq16hour, daytime) but are less than 60 dBA (Leq16hours, daytime), a warning clause is required and mitigation should be considered. Where the unmitigated daytime sound levels exceeds 60 dBA, sound barriers and warning clauses are generally required to achieve as close to 55 dBA as is technically, economically and administratively feasible.

The definition of outdoor amenity area as defined by the MOE is given below.

"Outdoor Living Area (OLA)

> (applies to impact assessments of transportation sources) means that part of a noise sensitive land use that is:
>
> - intended and designed for the quiet enjoyment of the outdoor environment; and
> - readily accessible from the building.

The OLA includes:

- backyards, front yards, gardens, terraces or patios;
- balconies and elevated terraces (e.g. rooftops), with a minimum depth of 4 metres, that are not enclosed, provided they are the only outdoor living area (OLA) for the occupant; or
- common outdoor living areas (OLAs) associated with high-rise multi-unit buildings."

For both indoor and outdoor conditions where the acoustic criteria are exceeded, warning clauses must be placed in offers of purchase and sale or lease agreements and included in the subdivision agreement.

3.1.3 Railway Guidelines

The railways have guidelines which apply to residential developments adjacent to their rights-of-way. In general, the railway guidelines follow the MOE guidelines for the indoor and outdoor sound level limits. The GO Transit/Metrolinx guidelines are similar to the CN guidelines.

In addition, the railways require that for a principal main line:

- a minimum setback of 30 m from the right-of-way be maintained;
- a safety berm/sound barrier be constructed along the rail right-of-way;
- regardless of whether the noise level exceeds the 60 dBA level set by MOE, as a minimum, brick veneer or acoustically equivalent masonry construction for the first row of dwellings facing the railway right-of-way;
- vibration mitigation be incorporated in the building design for all residential units within 75 m of the right-of-way, or alternatively, on-site vibration measurements be conducted to determine if an excess exists; and
- all residential units within 300 m of the right-of-way have a warning clause placed in offers of purchase and sale, in lease agreements and in the subdivision agreement, making future residents aware of the existence of the railway.

3.2 City of Barrie Noise By-law

The City of Barrie has By-law No. 2006-140 (as amended) which regulates noise likely to disturb the inhabitants of the City of Barrie. It provides mainly qualitative information with some quantitative information with respect to noise sources. Prohibitions by time and place are included in the by-law.

3.3 Stationary Sources

The guidelines of the Ontario Ministry of the Environment, Conservation and Parks (MOE) for stationary sources are to be used for the commercial facilities.

The MOE has published the document NPC-300 titled, “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”.

The MOE also has vibration guidelines with respect to stationary sources, NPC-207. These guidelines require that the peak vibration velocities not exceed 0.3 mm/s at the point of reception during the day or night.

The MOE recognizes the need for back-up beepers/alarms as safety devices and as such does not have any guidelines or criteria to address these sources.

It should be noted that the MOE guidelines do not require that the source be inaudible, but rather that specific sound level limits be achieved.

With respect to stationary sources of noise in urban areas, the MOE guidelines require that the sound level due to the stationary source at the building façade and outdoor amenity spaces not exceed the sound level due to road traffic and in certain situations due to rail traffic in any hour of source operation, subject to specific exclusions. Tables C-5, C-6, C-7 and C-8 of NPC-300, included in Appendix B, provide the exclusion limit values of one-hour equivalent sound level (Leq,dBA) and impulsive sound level (L_{lm},dBAI).

In general, if the criteria for a stationary source of noise are exceeded, the MOE recommends that control be implemented at the source rather than at the receiver. Alternatively, if the receiver is set back from the source or if a physical barrier is constructed so that the criteria can be met at the receiver, no additional mitigative measures are required. In addition, a warning clause in offers of purchase and sale and/or lease agreement noting the proximity of houses to such a source should be considered. Treatment of the receptor building by the use of suitable wall and window construction and central air conditioning to keep windows closed is not an acceptable solution to the MOE in Class 1 and 2 areas (urban).

4.0 NOISE IMPACT ASSESSMENT

4.1 Transportation Sources

For road and rail traffic noise, the sound level in terms of Leq, the energy equivalent continuous sound levels for both day (Leq16hour, daytime) and night (Leq8hour, nighttime) were determined using the MOE Traffic Noise Prediction Models, ORNAMENT (road traffic) and STEAM (rail traffic).

The topography between the source and the receiver has been taken into account. Shielding provided by the proposed buildings has also been accounted for in the analysis.

Where applicable, the sound levels were calculated using an absorption coefficient of 0.33 to account for the reduced absorption of the ground. This absorption coefficient is often used where there is a combination of acoustically reflective and absorptive areas of ground.

As discussed in Section 1.0, information from the overall development at 700 Mapleview Drive East will be carried over into this report if applicable.

It is expected that balconies/terraces associated with the proposed dwelling units will be less than 4.0 m deep. Therefore, no noise sensitive outdoor living areas that require mitigation are proposed for the proposed dwelling units. As such, no further analysis of the sound barrier requirements for these blocks was included in the report.

For Block 7, immediately adjacent to Mapleview Drive East, the unmitigated sound levels at the building facades were predicted to be up to 65 dBA during daytime hours and 59 dBA during nighttime hours.

Table 2 provides a summary of the predicted sound levels outdoors due to road and rail traffic at specific locations without any mitigative measures. Appendix C gives sample calculations.

Where the sound level limits are expected to be exceeded, mitigative measures and warning clauses are required.

4.2 Stationary Sources

Barrie South GO Station

As discussed in Section 2.2, noise assessment of the Barrie South GO Station is not warranted in this report since there will be intervening residential uses between the station and the subject site, at which the applicable sound level limits are required to be met. As

such, compliance with the applicable sound level limits will also be achieved at the proposed dwellings within the subject site.

Future Institutional Block (Block 11, Plan 51M-1193)

As noted in Section 2.2, there is a future institutional block located within the overall 700 Mapleview proposed development, to the east of the subject site. The conceptual information provided regarding these lands indicate that the proposed use may be mixed-use residential or strictly residential; and would therefore, not be expected to include significantly adverse stationary sources of noise. Once detailed design information for the institutional block is prepared, the information should be reviewed to establish the need for a separate Environmental Noise Report by the proponent of the block.

Future Mixed-Use Block

A mixed-use block is proposed to be located to the west of the subject site, within the overall development at 700 Mapleview Drive East. There are proposed residential dwellings located between the subject site and the mixed-use block, where the applicable sound limits will need to be met. As a result, the sound level limits will also be met at the subject site; therefore, the mixed-use block within the 700 Mapleview Drive East lands has not been considered further in this report.

5.0 NOISE ABATEMENT REQUIREMENTS

The noise mitigation requirements for the indoor locations are detailed below. Table 3 and Figure 2 provide a summary of the acoustical mitigative requirements for the blocks (units) in this development.

5.1 Transportation Sources

5.1.1 Indoors

Architectural Requirements

The indoor sound level criteria for road and rail traffic can be achieved in all cases by using appropriate architectural elements for external walls, windows, exterior doors, and roof construction. The indoor sound level limit for road traffic noise is 40 dBA (Leq8hour) for the bedrooms during nighttime hours, 45 dBA (Leq8hour) for the living/dining rooms during nighttime hours and 45 dBA (Leq16hour) for the living/dining rooms and bedrooms during daytime hours. These criteria have been used in this analysis. For rail traffic, the indoor sound level limits are 5 dB lower when compared with the indoor sound level limits for road traffic. The characteristic spectra for road and rail traffic have been accounted for in the determination of the architectural components. Appendix D contains a sample calculation of the architectural component selection.

In determining the architectural requirements, it is assumed that bedrooms will be located on the upper level of a three-storey townhouse and the worst case would involve a corner bedroom. Architectural plans were not yet available; therefore, a preliminary analysis using assumed window and wall percentages has been conducted to provide an indication of the architectural requirements. The exterior walls would be 55% of the associated floor area for both the wall perpendicular to the noise source and the wall parallel to the noise source. The windows would be 25% of the associated floor area and located on the wall parallel and perpendicular to the noise source.

The worst case locations are Blocks 6 and 7 that are immediately adjacent to Mapleview Drive East with exposure to the rail line. Based on the analysis of Block 7, windows and glass exterior doors (or glass inserts) need to be up to STC 27 and exterior walls need to be up to STC 36. Therefore, standard window, exterior door and exterior wall construction which satisfies the minimum structural and safety requirements of standard construction is expected to be satisfactory for all proposed residential blocks (units).

The acoustical performance of a window as a whole depends on glass configuration/thickness, air space, material used for frames, and construction details

including seals. Therefore, the acoustical performance of the glass configuration alone expressed as a sound transmission class (STC) rating, generally available in the literature, does not address the STC rating of the whole window. Same glass configurations with different frame materials and/or construction details often produce different STC ratings. Therefore, it is recommended that prior to installation, the window manufacturers provide proof (STC test results of window configuration from an accredited laboratory) that their windows meet the required STC ratings.

An STC 54 rating for the roof, normally met by most residential roof constructions with ventilated attic space, would be acoustically acceptable for all proposed dwellings.

Since final house plans are not yet available, the final architectural choices cannot be made. Once final house plans are available, the architectural noise control requirements should be re-evaluated.

Ventilation Requirements

Where the sound level from road and rail traffic is greater than 60 dBA (LeqNight) or greater than 65 dBA (LeqDay) on the outside face of a bedroom or living/dining room window, the indoor sound level criteria would not be met with open windows and provisions must be met to permit the windows to remain closed. The MOE guidelines require central air conditioning.

Based on the analysis of transportation noise sources, all units within Blocks 1, 2 and 5 require the provision for adding central air conditioning and a warning clause.

Although not required for Blocks 6 and 7, it is recommended that all units within both blocks be provided with mandatory central air conditioning and a warning clause due to their proximity to the roadway right-of-way.

All units within Blocks 1 to 3 and 7 which are within 300 m of the rail line right-of-way require a warning clause due to the rail traffic.

See Table 3 and Figure 2 for details.

Warning clauses will also be required to be placed in offers of purchase and sale, lease agreements, and in the subdivision agreement for all relevant blocks (units) to make future occupants are aware of the potential noise situation. See Table 3 for details.

5.1.2 Outdoors

As noted in Section 4.1, acoustic barriers are not required for any proposed blocks (units).

5.2 Stationary Sources

Barrie South GO Station

As discussed in Section 4.2, noise assessment of the Barrie South GO Station is not warranted in this report due to the requirement for compliance with the applicable sound level limits at the proposed intervening residential uses between the station and the subject site.

All blocks (units) within 300 m of the Barrie South GO Station will be advised through a warning clause that the dwelling unit is in proximity to the Barrie South GO Station whose activities may at time be audible. This includes all units of Blocks 1 to 3 and 7.

6.0 CONCLUSIONS

With the incorporation of the items discussed (see Table 3, Notes to Table 3 and Figure 2), the sound levels within the proposed development will be within the appropriate MOE, County of Simcoe, City of Barrie and CN/GO Transit/Metrolinx environmental noise criteria. In accordance with City, Ministry and CN implementation guidelines, where mitigation is required, future occupants will be advised through the use of warning clauses.

An environmental noise report will need to be prepared for the proposed institutional block, located to the east of the subject site within the 700 Mapleview development, if the block is to be developed for uses other than the preliminary information indicated.

Prior to issuance of building permits, the acoustical requirements should be reviewed by an acoustical consultant to ensure compliance with the applicable guidelines.

Prior to issuance of occupancy permits, an acoustical consultant shall confirm that the acoustical requirements are in compliance with the acoustical report.

Respectfully submitted,

JADE ACOUSTICS INC.

Per: _____
Jake Chong, B.Eng., E.I.T.

Per: _____
Chris B. Kellar, P.Eng.

JC/MB/CK/jg
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7.0 REFERENCES

1. "Model Municipal Noise Control By-Law" Final Report, Ontario Ministry of the Environment, August, 1978.

2. "ORNAMENT – Ontario Road Noise Analysis Method for Environment and Transportation", Ontario Ministry of the Environment, October, 1989.

3. "STEAM – Sound from Trains Environmental Analysis Method", Ontario Ministry of the Environment, July, 1990.

4. "Building Practice Note No. 56: Controlling Sound Transmission into Buildings", J.D. Quirt, Division of Building Research, National Research Council of Canada, September, 1985.

5. "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", Ontario Ministry of the Environment, Publication NPC-300, August, 2013, released October 21, 2013 (updated final version # 22).

6. "Impulse Vibration in Residential Buildings", Ontario Ministry of the Environment, Publication NPC-207 (Draft), November, 1983.

7. City of Barrie By-law Number 2006-140, June 12, 2006.

8. "Preliminary Environmental Noise and Vibration Report", Jade Acoustics Inc., revised August 6, 2021.

TABLE 1

PROPOSED RESIDENTIAL DEVELOPMENT

750 MAPLEVIEW DRIVE EAST

CITY OF BARRIE

SUMMARY OF TRAFFIC DATA

A. Road Traffic

ROAD	MAPLEVIEW DRIVE EAST
AADT*	22,520
Day/Night Split (%) **	90/10
Medium Trucks (%)	1
Heavy Trucks (%)	3
No. of Lanes	2
Posted Speed	60

* AADT: Annual Average Daily Traffic. 2031 AADT for Mapleview Drive East.

** Assumed day/night split.

TABLE 1 - Continued

PROPOSED RESIDENTIAL DEVELOPMENT

750 MAPLEVIEW DRIVE EAST

CITY OF BARRIE

SUMMARY OF TRAFFIC DATA

B. Rail Traffic[#]

GO TRANSIT	COMMUTER TRAINS			
	DAY (7:00 a.m. to 11:00 p.m.)		NIGHT (11:00 p.m. to 7:00 a.m.)	
No. of Trains	60	8	12	2
Maximum No. of Cars	12	12	12	12
Maximum No. of Locomotives	1	2	1	2
Maximum Speed (km/hr.)	80	80	80	80

[#] Forecasted data provided by Metrolinx.

Note: No CN trains operate at this section of the corridor.

TABLE 2

PROPOSED RESIDENTIAL DEVELOPMENT

750 MAPLEVIEW DRIVE EAST

CITY OF BARRIE

SAMPLE OF PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS DUE TO ROAD AND RAIL TRAFFIC

Blocks (Units)*	Location**	Source	Distance (m)	Leq (dBA)			
				Day 7:00 a.m. to 11:00 p.m.		Night 11:00 p.m. to 7:00 a.m.	
				Separate	Combined	Separate	Combined
Block 6 (South Unit)	Side Wall	GO Trains	317	52	64	48	58
		Mapleview Drive East	28	64		58	
Block 7 (West Unit)	Front Wall	GO Trains	248	53	65	49	59
		Mapleview Drive East	27	65		58	

* See Figure 2 for blocks (units) locations.

** Wall locations were taken at 8.0 m above ground for daytime and nighttime.

TABLE 3

PROPOSED RESIDENTIAL DEVELOPMENT

750 MAPLEVIEW DRIVE EAST

CITY OF BARRIE

SUMMARY OF MINIMUM NOISE ABATEMENT MEASURES

Blocks (Units)*	Air Conditioning[1]	Exterior Wall[2]	Window STC Rating[3]	Sound Barrier	Warning Clause[4]
Blocks 1 and 2 (all units)	Provision for Adding	Standard	Standard	No	A, C, D, E
Block 5 (all units)	Provision for Adding	Standard	Standard	No	A, C
Block 6 (all units)	Recommended**	Standard	Standard	No	A, B
Block 7 (all units)	Recommended**	Standard	Standard	No	A, B, D, E
Block 3 (all units)	No Acoustical Requirements				D, E
Block 4 (all units)	No Acoustical Requirements				

Standard – Denotes exterior wall window and door construction meeting the minimum structural and safety requirements provided by standard construction practices.

* Block (unit) numbering is as per the grading plan outlined in Section 1.0 and as shown on Figure 2.

** Recommend mandatory central air conditioning. See Section 5.1.1 for details.

See Notes to Table 3 on following pages.

NOTES TO TABLE 3

1. Means must be provided to allow windows to remain closed for noise control purposes. For air cooled condenser units, the AHRI sound rating must not exceed 7.6 bels. The air cooled condenser units should be placed in a noise insensitive location which complies with municipal by-laws.

   Provision for adding central air conditioning would involve a ducted heating system sized to accommodate the addition of central air conditioning by the occupant at a later date. The air cooled condenser unit should be placed in a noise insensitive location which complies with municipal by-laws. It is recommended that the air cooled condenser unit AHRI sound rating does not exceed 7.6 bels.

2. STC – Sound Transmission Class Rating (Reference ASTM-E413). See Section 5.1.1 for details.

3. STC – Sound Transmission Class Rating (Reference ASTM-E413). See Section 5.1.1 for details.

4. Suggested Warning Clauses to be placed in the subdivision agreement and to be included in offers of purchase and sale or lease agreements on designated blocks (units):

   A. "Purchasers and/or tenants are advised that despite the inclusion of noise control features in this development area and within the dwelling units, noise due to increasing road and rail traffic may continue to be of concern, occasionally interfering with the activities of the dwelling occupants as the noise levels may exceed the noise criteria of the Municipality and the Ontario Ministry of the Environment, Conservation and Parks."

   B. "Purchasers and/or tenants are advised that the dwelling unit has been or will be fitted with a central air conditioning system which will enable occupants to keep windows and exterior doors closed if road or rail traffic noise interferes with their indoor activities (Note: locate air cooled condenser unit in a noise insensitive area and ensure that the unit has an AHRI sound rating not exceeding 7.6 bels)."

   C. "Purchasers and/or tenants are advised that this dwelling unit was fitted with a forced air heating systems and ducting etc. sized to accommodate a central air conditioning unit. Air conditioning can be installed at the purchasers' option and cost.

(Note: locate air cooled condenser unit in a noise insensitive area and ensure that the unit has an AHRI sound rating not exceeding 7.6 bels.)"

D. "Warning: Metrolinx, carrying on business as GO Transit, and its assigns and successors in interest has or have a right-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the rail facilities on such right-of-way in the future including the possibility that GO Transit or any railway entering into an agreement with GO Transit to use the right-of-way or their assigns or successors as aforesaid may expand their operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). Metrolinx 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."

E. "Purchasers and/or tenants are advised that this residential dwelling is in proximity to the Barrie South GO Station whose activities may at time be audible."

5. Conventional ventilated attic roof construction meeting typical construction practices is satisfactory in all cases.

N.T.S.

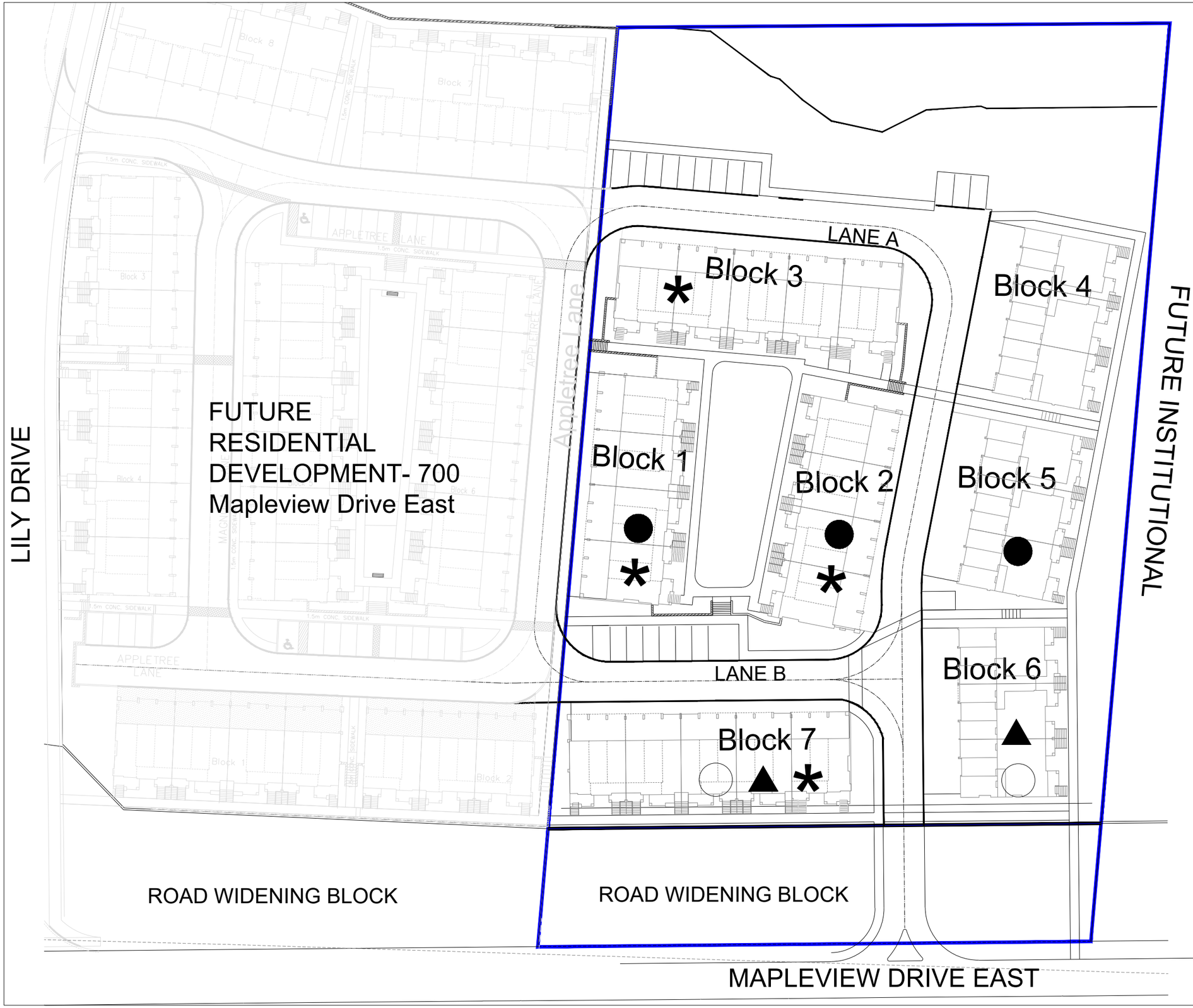
Proposed Residential Development
750 Mapleview Drive East
City of Barrie

Date: September 2021 **File: 17-066-03**

KEY PLAN

FIGURE 1

JADE ACOUSTICS



Legend:

- * Warning Clause D and E (See Table 3 and Notes to Table 3 for details)
- ▲ Recommended Mandatory Central Air Conditioning and Warning Clause (See text, Table 3 and Notes to Table 3 for details)
- ● Provision for Adding Central Air Conditioning and Warning Clause (See text, Table 3 and Notes to Table 3 for details)
- ○ Analyzed Blocks

N.T.S.

Proposed Residential Development
750 Mapleview Drive
City of Barrie

Date: September 2021 Our File: 17-066-03

JADE ACOUSTICS

SITE PLAN OF DEVELOPMENT SHOWING NOISE ABATEMENT MEASURES

FIGURE 2

APPENDIX A

CORRESPONDENCE REGARDING TRAFFIC

Jake Chong

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: June 9, 2021 12:16 PM
To: Chris Kellar
Cc: Michael Bechbache
Subject: RE: Rail Traffic Data Request- Northeast corner of Mapleview Dr E and Metrolinx rail line, Barrie

Hi Chris

Further to your request dated June 8, 2021, the subject lands (Northeast corner of Mapleview Dr E and Metrolinx rail line, Barrie) are located within 300 metres of the Metrolinx Newmarket Subdivision (which carries Barrie GO rail service).

It's anticipated that GO rail service on this Subdivision will be comprised of electric trains. The GO rail fleet combination on this Subdivision will consist of up to 2 locomotives and 12 passenger cars. The typical GO rail weekday train volume forecast near the subject lands, including both revenue and equipment trips is in the order of 82 trains. The planned detailed trip breakdown is listed below:

	1 Electric Locomotive	2 Electric Locomotives		1 Electric Locomotive	2 Electric Locomotives
Day (0700-2300)	60	8	Night (2300-0700)	12	2

The current track design speed near the subject lands is 50 mph (80 km/h).

There are *anti-whistling by-laws* in affect at Mapleview Dr. E. at-grade crossing.

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network and we are currently working towards the next phase.

Options have been studied as part of the Transit Project Assessment Process (TPAP) for the GO Expansion program, currently in the procurement phase. The successful proponent team will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion. The contract is in a multi-year procurement process and teams are currently completing the bids that will close in 2021. GO Expansion construction will get underway in 2022.

However, we can advise that train noise is dominated by the powertrain at lower speeds and by the wheel- track interaction at higher speeds. Hence, the noise level and spectrum of electric trains is expected to be very similar at higher speeds, if not identical, to those of equivalent diesel trains.

Given the above considerations, it would be prudent at this time, for the purposes of acoustical analyses for development in proximity to Metrolinx corridors, to assume that the acoustical characteristics of electrified and diesel trains are equivalent. In light of the aforementioned information, acoustical models should employ diesel train parameters as the basis for analyses. We anticipate that additional information regarding specific operational parameters for electrified trains will become available in the future once the proponent team is selected.

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

It should be noted that this information only pertains to Metrolinx rail service. It would be prudent to contact other rail operators in the area directly for rail traffic information pertaining to non-Metrolinx rail service.

I trust this information is useful. Should you have any questions or concerns, please do not hesitate to contact me.

Regards,

Lyndsy You, B.Eng.
Project Manager
Third Party Projects Review, Capital Projects Group
Metrolinx|30 Wellington St. W |Toronto, Ontario|M5J 2N8
C: 416.399.8284
METROLINX

From: Chris Kellar <chris@jadeacoustics.com>
Sent: June 8, 2021 3:53 PM
To: Rail Data Requests <RailDataRequests@metrolinx.com>
Cc: Michael Bechbache <michael@jadeacoustics.com>
Subject: Rail Traffic Data Request- 310 Blue Forest Cres (Jade File: 17-066)

Hello,

We have been requested by Alexandra Goldstein, project manager in the Third Party Projects Review, Capital Projects Group of Metrolinx to update the rail traffic data used in our Environmental Noise Report

The proposed residential development located on the north east corner of Mapleview Drive east and the Metrolinx rail line in the City of Barrie. The site is across the tracks from the Barrie South GO Station.

I kindly request the following information (existing and ultimate) with the day/night split for the rail operations on the subject rail corridor:

- number of trains;
- number of locomotives per train;
- number of cars per train;
- train speed;
- track gradient;
- whistle locations;
- right-of-way width (R.O.W.);
- track alignment on R.O.W.; and
- if no ultimate data is available, then annual percent increase and number of years of growth.

Please reply at your earliest convenience. If there are any questions, please do not hesitate to call.

Regards

Chris B. Kellar, P.Eng.
Jade Acoustics Inc.
411 Confederation Parkway, Unit 19
Concord, Ontario
L4K 0A8

Cell: 416-788-7436
Office: 905-660-2444
Fax: 905-660-4110
Email: chris@jadeacoustics.com
Website: www.jadeacoustics.com

Jake Chong

From: Justin MacDonald <Justin.MacDonald@barrie.ca>
Sent: June 22, 2021 11:31 AM
To: Jake Chong
Cc: Michael Bechbache
Subject: RE: Traffic Data Request - 750 Mapleview Drive east - City of Barrier (Jade File: # 17-066-03)

Good morning Jake,

Yes, the information previously provided in 2020 is still valid.

Thanks,

Justin MacDonald.

From: Jake Chong <jake@jadeacoustics.com>
Sent: Monday, June 21, 2021 11:29 AM
To: Justin MacDonald <Justin.MacDonald@barrie.ca>
Cc: Michael Bechbache <michael@jadeacoustics.com>
Subject: Traffic Data Request - 750 Mapleview Drive east - City of Barrier (Jade File: #17-066-03)

Hello Justin,

I hope this email finds you well.

I have attached the road information provided by your office for the residential development near the intersection of of Mapleview Drive East and Yonge Street in the City of Barrie. I've attached a figure of the site for your convenience.

I kindly request your confirmation that this information remains valid for use in our study. If not, please provide the most current data.

Thank you in advance.

Regards,

Jake Chong, B.Eng.

Jade Acoustics Inc.
411 Confederation Parkway, Unit 19
Concord, Ontario
L4K 0A8
T: 905-660-2444
F: 905-660-4110
Email: jake@jadeacoustics.com
Website: www.jadeacoustics.com

Jake Chong

From: Justin MacDonald <Justin.MacDonald@barrie.ca>
Sent: December 8, 2020 9:06 AM
To: James Wang
Cc: Michael Bechbache; Chris Kellar
Subject: Re: Barrie Mapleview Traffic Data Request - 700 Mapleview Drive East - City of Barrie (Jade File: #17-066-02)

Good morning James,

Please see below:

1. Current AADT (Average Annual Daily Traffic volume); - 11,500 vehicles per day
2. projected growth if available; 6.3% per year to a horizon year of 2031. A 1.7% growth rate per year from 2031 to 2041
3. number of lanes; current cross section - in design for 5 lanes.
4. percentage of trucks; - 4% medium and heavy
5. ratio of medium trucks to heavy trucks; assume 1% medium and 3% heavy
6. day/night traffic split; N/A
7. posted speed limit; 60km/h
8. gradient of the road; N/A
9. right-of-way width (R.O.W.) Ultimate ROW is 41m

From: James Wang <james@jadeacoustics.com>
Sent: Monday, December 7, 2020 12:10 PM
To: Justin MacDonald <Justin.MacDonald@barrie.ca>
Cc: Michael Bechbache <michael@jadeacoustics.com>; Chris Kellar <chris@jadeacoustics.com>
Subject: Barrie Mapleview Traffic Data Request - 700 Mapleview Drive East - City of Barrie (Jade File: #17-066-02)

Good afternoon,

Jade Acoustics Inc. has been retained to prepare an Environmental Noise and Vibration Report for the proposed subject line noted residential development near the intersection of Mapleview Drive East and Yonge Street in the City of Barrie. I've attached a figure of the site for your convenience.

In 2017, we have requested traffic data from City of Barrie for the same intersection, please see the traffic data request email received November 1, 2017 attached above, it will be appreciated if you could confirm the validity of previous road traffic data on Mapleview Drive East to see if they are still applicable to the current operations.

If those data are outdated and are no longer applicable, I kindly request your assistance in providing the updated data (existing and ultimate) for the following information:

1. ultimate AADT (Average Annual Daily Traffic volume);
2. projected growth if available;
3. number of lanes;
4. percentage of trucks;
5. ratio of medium trucks to heavy trucks;

6. day/night traffic split;
7. posted speed limit;
8. gradient of the road;
9. right-of-way width (R.O.W.); and
10. any other pertinent information.

Should you have any questions, please call.

James Wang, B.A.Sc, E.I.T.
Jade Acoustics Inc.
411 Confederation Parkway, Unit 19
Concord, Ontario
L4K0A8
T: 905-660-2444
Cell: 647-901-7778
F: 905-660-4110
Email: james@jadeacoustics.com
Website: www.jadeacoustics.com

Jake Chong

From: Umair Naveed <Umair.Naveed@cn.ca> on behalf of GLD-Permits <permits.gld@cn.ca>
Sent: June 23, 2021 1:54 PM
To: Jake Chong
Cc: Michael Bechbache
Subject: RE: Rail Traffic Data Request (Jade File: 17-066-03)

The statement is still valid that we don't have any operation at this location.

Thanks,

GLD Team

From: Jake Chong <jake@jadeacoustics.com>
Sent: Tuesday, June 22, 2021 9:09 AM
To: GLD-Permits <permits.gld@cn.ca>
Cc: Michael Bechbache <michael@jadeacoustics.com>
Subject: Rail Traffic Data Request (Jade File: 17-066-03)

Hello,

I hope this email finds you well. Previously in November 2017, we requested the traffic data for the rail operations at Mile 59.29 of the Newmarket Subdivision (please see the attached email from us on November 1, 2017).

Mr. Derek Basso indicated CN does not operate at this section of the rail. Could you kindly confirm if this is still the case?

If not, I kindly request your assistance in providing the information listed in the attached email on November 1, 2017. Please reply at your earliest convenience. I have attached the satellite image showing the subject site location for your convenience.

Should you have any questions, please feel free to contact me at any time. Thank you!

Regards,

Jake Chong, B.Eng.
Jade Acoustics Inc.
411 Confederation Parkway, Unit 19
Concord, Ontario
L4K 0A8
T: 905-660-2444
F: 905-660-4110
Email: jake@jadeacoustics.com
Website: www.jadeacoustics.com

Jake Chong

From: Michael Bechbache
Sent: June 17, 2021 9:15 AM
To: Michael Bechbache
Subject: FW: Rail Traffic Data Request (Jade File: 17-066)

From: Derek Basso [mailto:Derek.Basso@cn.ca]
Sent: Wednesday, November 15, 2017 9:05 AM
To: Chris Kellar
Subject: RE: Rail Traffic Data Request (Jade File: 17-066)

CN does not run trains on the Newmarket at mile 59.29.

Thanks
Derek

Derek Basso
Public Works Officer | Eastern Canada Division of Engineering
Design and Construction

1 Administration Road, Concord, ON, L4K 1B9
O - 905-669-3373
F - 905-760-3406
E - Derek.Basso@cn.ca

From: Chris Kellar [mailto:chris@jadeacoustics.com]
Sent: Tuesday, November 14, 2017 10:01 AM
To: Derek Basso <Derek.Basso@cn.ca>
Subject: FW: Rail Traffic Data Request (Jade File: 17-066)

Derek,

My co-worker indicated to me that I should now be emailing Megan about rail traffic requests and not you. I have emailed and left a voicemail for Megan to confirm if she received the below noted request without answer.

Could you please pass this request onto her as I fear the contact information I was given for her may have been incorrect.

Thank you,

Chris B. Kellar, P.Eng.
Jade Acoustics Inc.
411 Confederation Parkway, Unit 19
Concord, Ontario
L4K0A8
T: 905-660-2444
F: 905-660-4110

Email: chris@jadeacoustics.com
Website: www.jadeacoustics.com

From: Chris Kellar [mailto:chris@jadeacoustics.com]
Sent: Wednesday, November 1, 2017 10:31 AM
To: 'Megan.Whalen@cn.ca'
Subject: Rail Traffic Data Request (Jade File: 17-066)

Megan,

We have been requested to prepare a Preliminary Environmental Noise and Vibration Report for the proposed residential development at the northeast corner of Mapleview Drive and the Newmarket Subdivision in the City of Barrie. I kindly request the following information (existing and ultimate) with the day/night split for the rail operations at Mile 59.29 of the Newmarket Subdivision. We have been in contact with Metrolinx about GO train service at this location.

- Number of trains by type (passenger, freight, commuter, switcher, etc.);
- Number of locomotives per train;
- Number of cars per train;
- Train speed;
- Track gradient;
- Elevation of tracks;
- Whistle locations;
- Right-of-way width (R.O.W.);
- Track alignment on R.O.W.; and
- If no ultimate data is available, then annual percent increase and number of years of growth.

Please confirm the classification of this rail line, such as principal or secondary main line, or branch line etc.

Please reply at your earliest convenience. If there are any questions, please do not hesitate to call.

Should you have any questions, please call.

Regards,

Chris B. Kellar, P.Eng.
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L4K0A8
T: 905-660-2444
F: 905-660-4110
Email: chris@jadeacoustics.com
Website: www.jadeacoustics.com

APPENDIX B

ENVIRONMENTAL NOISE CRITERIA

ONTARIO MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MOE)

Reference: "Environmental Noise Guidelines Stationary and Transportation Sources – Approval and Planning", Publication NPC-300, August, 2013, released October 21, 2013 (updated final version # 22).

SOUND LEVEL CRITERIA FOR ROAD AND RAIL NOISE

TABLE C-1

Sound Level Limit for Outdoor Living Areas

Road and Rail

Time Period	Leq (16) (dBA)
16 hr., 07:00 - 23:00	55

TABLE C-2

Indoor Sound Level Limits
Road and Rail

Type of Space	Time Period	Leq (dBA)	
		Road	Rail
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	07:00 – 23:00	45	40
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	23:00 – 07:00	45	40
Sleeping quarters	07:00 – 23:00	45	40
	23:00 – 07:00	40	35

SOUND LEVEL CRITERIA FOR AIRCRAFT NOISE

TABLE C-3

Outdoor Aircraft Noise Limit

Time Period	NEF/NEP
24-hour	30

TABLE C-4

Indoor Aircraft Noise Limit
(Applicable over 24-hour period)

Type of Space	Indoor NEF/NEP*
Living/dining/den areas of residences, hospitals, nursing/retirement homes, schools, daycare centres, etc.	5
Sleeping Quarters	0

* The indoor NEF/NEP values in Table C-4 are used to determine acoustical insulation requirements based on the NEF/NEP contour maps.

SOUND LEVEL CRITERIA FOR STATIONARY SOURCES

TABLE C-5

Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA)
Outdoor Points of Reception

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	55
19:00 – 23:00	50	45	40	55

TABLE C-6

Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq, dBA)
Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	60
19:00 – 23:00	50	50	40	60
23:00 – 07:00	45	45	40	55

TABLE C-7

Exclusion Limit Values for Impulsive Sound Level (LLM, dBAI)
Outdoor Points of Reception

Time of Day	Actual Number of Impulses in Period of One Hour	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 23:00	9 or more	50	50	45	55
	7 to 8	55	55	50	60
	5 to 6	60	60	55	65
	4	65	65	60	70
	3	70	70	65	75
	2	75	75	70	80
	1	80	80	75	85

TABLE C-8

Exclusion Limit Values of Impulsive Sound Level (LLM, dBAI)
Plane of Window - Noise Sensitive Spaces (Day/Night)

Actual Number of Impulses in Period of One Hour	Class 1 Area (07:00-23:00)/ (23:00-07:00)	Class 2 Area (07:00-23:00)/ (23:00-07:00)	Class 3 Area (07:00-19:00)/ (19:00-07:00)	Class 4 Area (07:00-23:00)/ (23:00-07:00)
9 or more	50/45	50/45	45/40	60/55
7 to 8	55/50	55/50	50/45	65/60
5 to 6	60/55	60/55	55/50	70/65
4	65/60	65/60	60/55	75/70
3	70/65	70/65	65/60	80/75
2	75/70	75/70	70/65	85/80
1	80/75	80/75	75/70	90/85

SUPPLEMENTARY SOUND LEVEL LIMITS

Indoor limits for transportation sources applicable to noise sensitive land uses are specified in Table C-2 and Table C-4. Table C-9 and Table C-10 are expanded versions of Table C-2 and Table C-4, and present guidelines for acceptable indoor sound levels that are extended to land uses and developments which are not normally considered noise sensitive. The specified values are maximum sound levels and apply to the indicated indoor spaces with the windows and doors closed. The sound level limits in Table C-9 and Table C-10 are presented as information, for good-practice design objectives.

TABLE C-9

Supplementary Indoor Sound Level Limits
Road and Rail

Type of Space	Time Period	Leq (Time Period) (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	16 hours between 07:00 – 23:00	50	45
Living/dining areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	16 hours between 07:00 – 23:00	45	40
Sleeping quarters of hotels/motels	8 hours between 23:00 – 07:00	45	40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	8 hours between 23:00 – 07:00	40	35

TABLE C-10

Supplementary Indoor Aircraft Noise Limit
(Applicable over 24-hour period)

Type of Space	Indoor NEF/NEP*
General offices, reception areas, retail stores, etc.	15
Individual or semi-private offices, conference rooms, etc.	10
Living/dining areas of residences, sleeping quarters of hotels/motels, theatres, libraries, schools, daycare centres, places of worship, etc.	5
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	0

* The indoor NEF/NEP values in Table C-10 are not obtained from NEF/NEP contour maps. The values are representative of the indoor sound levels and are used as assessment criteria for the evaluation of acoustical insulation requirements.

APPENDIX C

SAMPLE CALCULATION OF PREDICTED UNMITIGATED SOUND LEVELS

APPENDIX C-1
SAMPLE CALCULATION OF PREDICTED SOUND LEVELS

FILE: 17-066-03
NAME: 750 Mapleview Drive East
REFERENCE DRAWINGS: Grading Plan
LOCATION: Block 7 (West Unit), front wall

Noise Source:	GO Trains		Mapleview
	Locomotive	Wheel	Drive East
Time Period:	16 hr. (day)	16 hr. (day)	16 hr. (day)
Distance (m):	248	248	27

CALCULATION OF PREDICTED SOUND LEVELS*

Reference Leq (dBA)*:	72.09	64.24	69.44
Height and/or Distance Correction (dBA):	-16.21	-16.21	-3.66
Finite Element Correction (dBA):	-3.35	-3.35	-1.12
Allowance for Screening (dBA):	0.00	0.00	0.00
Allowance for Future Growth (dBA):	incl.	incl.	incl.
LeqDay (dBA):	52.52	44.68	64.66
Combined LeqDay (dBA)		64.96	

* Leq determined using the computerized model of the Ontario Ministry of the Environment Noise Assessment Guidelines, STAMSON Version 5.04 (ORNAMENT and STEAM). See attached printouts.

APPENDIX C-2
SAMPLE CALCULATION OF PREDICTED SOUND LEVELS

FILE: 17-066-03
NAME: 750 Mapleview Drive East
REFERENCE DRAWINGS: Grading Plan
LOCATION: Block 7 (West Unit), front wall

Noise Source:	GO Trains		Mapleview
	Locomotive	Wheel	Drive East
Time Period:	8 hr. (night)	8 hr. (night)	8 hr. (night)
Distance (m):	248	248	27

CALCULATION OF PREDICTED SOUND LEVELS*

Reference Leq (dBA)*:	68.30	60.40	62.93
Height and/or Distance Correction (dBA):	-16.21	-16.21	-3.66
Finite Element Correction (dBA):	-3.35	-3.35	-1.12
Allowance for Screening (dBA):	0.00	0.00	0.00
Allowance for Future Growth (dBA):	incl.	incl.	incl.
LeqNight (dBA):	48.73	40.84	58.15
Combined LeqNight (dBA)		58.69	

* Leq determined using the computerized model of the Ontario Ministry of the Environment Noise Assessment Guidelines, STAMSON Version 5.04 (ORNAMENT and STEAM). See attached printouts.

STAMSON 5.0 NORMAL REPORT Date: 07-07-2021 14:44:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: blk7br.te Time Period: Day/Night 16/8 hours
Description: Block 7 Building Requirement Westernmost Unit

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

Train Type	Trains	Speed (km/h)	# loc /Train	# Cars /Train	Eng type	Cont weld
1. 1 Loco	60.0/12.0	80.0	1.0	12.0	Diesel	Yes
2. 2 Locos	8.0/2.0	80.0	2.0	12.0	Diesel	Yes

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

Angle1 Angle2	-90.00 deg	9.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	248.40 / 248.40 m	
Receiver height	8.00 / 8.00 m	
Topography	0	(Define your own alpha.)
No Whistle		
Barrier angle1	-90.00 deg	Angle2 : 9.00 deg
Barrier height	0.00 m	
Barrier receiver distance	0.01 / 0.01 m	
Source elevation	260.50 m	
Receiver elevation	252.20 m	
Barrier elevation	252.20 m	
Alpha	0.33	
Reference angle	0.00	

Results segment # 1: Metrolinx (day)

LOCOMOTIVE (0.00 + 52.52 + 0.00) = 52.52 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	9	0.33	72.09	-16.21	-3.35	0.00	0.00	0.00	52.52

WHEEL (0.00 + 44.68 + 0.00) = 44.68 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	9	0.33	64.24	-16.21	-3.35	0.00	0.00	0.00	44.68

Segment Leq : 53.18 dBA

Total Leq All Segments: 53.18 dBA

Results segment # 1: Metrolinx (night)

LOCOMOTIVE (0.00 + 48.73 + 0.00) = 48.73 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	9	0.33	68.30	-16.21	-3.35	0.00	0.00	0.00	48.73

WHEEL (0.00 + 40.84 + 0.00) = 40.84 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	9	0.33	60.40	-16.21	-3.35	0.00	0.00	0.00	40.84

Segment Leq : 49.38 dBA

```
Total Leq All Segments: 49.38 dBA

Road data, segment # 1: Mapleview (day/night)
-----------------------------------------
Car traffic volume  : 19457/2162  veh/TimePeriod  *
Medium truck volume :   203/23    veh/TimePeriod  *
Heavy truck volume  :   608/68    veh/TimePeriod  *
Posted speed limit  :    60 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):  22520
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   1.00
    Heavy Truck  % of Total Volume     :   3.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Mapleview (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  :  26.60 / 26.60  m
Receiver height           :   8.00 / 8.00   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Mapleview (day)
------------------------------------

Source height = 1.32 m

ROAD (0.00 + 64.66 + 0.00) = 64.66 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.47  69.44   0.00  -3.66  -1.12   0.00   0.00   0.00  64.66
-------------------------------------------------------------------------------

Segment Leq : 64.66 dBA

Total Leq All Segments: 64.66 dBA


Results segment # 1: Mapleview (night)
--------------------------------------

Source height = 1.32 m

ROAD (0.00 + 58.15 + 0.00) = 58.15 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.47  62.93   0.00  -3.66  -1.12   0.00   0.00   0.00  58.15
-------------------------------------------------------------------------------

Segment Leq : 58.15 dBA

Total Leq All Segments: 58.15 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 64.96
                           (NIGHT): 58.69
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APPENDIX D

SAMPLE CALCULATION OF ARCHITECTURAL COMPONENT SELECTION

APPENDIX D-1
SAMPLE CALCULATION OF ARCHITECTURAL COMPONENT SELECTION*

FILE: 17-066-03
NAME: 750 Mapleview Drive East
REFERENCE DRAWINGS: Grading Plan
LOCATION: Block 7 (West Unit), third storey corner bedroom, daytime

ROAD

Wall area as a percentage of floor area:	Front:	55%
	Side:	55%
Window area as a percentage of floor area:	Front:	25%
	Side:	25%
Number of components:	4	
Outdoor Leq:	Front:	65 (+3 for reflections) = 68 dBA
	Side:	62 (+3 for reflections) = 65 dBA
Indoor Leq:	45	
Noise Reduction (dBA):	Front:	23
	Side:	20
Noise Spectrum:	Road or Distant Aircraft	
Absorption:	Medium	

APPROPRIATE ELEMENTS

		STC Rating
Wall	Front	STC 34
	Side	STC 31
Window	Front	STC 26
	Side	STC 23

* Based upon "Controlling Sound Transmission into Buildings", Building Practice Note 56 by National Research Council of Canada, September, 1985.

APPENDIX D-2
SAMPLE CALCULATION OF ARCHITECTURAL COMPONENT SELECTION*

FILE: 17-066-03
NAME: 750 Mapleview Drive East
REFERENCE DRAWINGS: Grading Plan
LOCATION: Block 7 (West Unit), third storey corner bedroom, daytime

RAIL

Wall area as a percentage of floor area:	Front:	55%
	Side:	55%
Window area as a percentage of floor area:	Front:	25%
	Side:	25%
Number of components:	4	
Outdoor Leq:	Front:	53 (+3 for reflections) = 56 dBA
	Side:	50 (+3 for reflections) = 53 dBA
Indoor Leq:	40	
Noise Reduction (dBA):	Front:	16
	Side:	13
Noise Spectrum:	Diesel Locomotive	
Absorption:	Medium	

APPROPRIATE ELEMENTS

		STC Rating
Wall	Front	STC 30
	Side	STC 27
Window	Front	STC 20
	Side	STC 17

* Based upon “Controlling Sound Transmission into Buildings”, Building Practice Note 56 by National Research Council of Canada, September, 1985.

APPENDIX D-3

PROPOSED RESIDENTIAL DEVELOPMENT

750 MAPLEVIEW DRIVE EAST

CITY OF BARRIE

SUMMARY OF COMBINED STC RATING REQUIREMENTS

CORNER BEDROOM

COMBINED	REQUIRED STC BASED ON ROAD TRAFFIC ONLY	REQUIRED STC BASED ON RAIL TRAFFIC ONLY	COMBINED REQUIRED STC RATING*
Side Wall	31	27	33
Front Wall	34	30	36
Side Window	23	17	24
Front Window	26	20	27

* An STC 36 rating for exterior walls and an STC 27 rating for windows and exterior doors (or glass inserts) are satisfied by construction which complies with the minimum structural and safety requirements of standard construction.

An STC 54 rating for the roof construction is considered standard and is normally met by most residential roof construction with ventilated attic space.