

NOISE FEASIBILITY STUDY

420 LAKESHORE ROAD EAST

Mississauga, Ontario

Prepared for:

Stellarcop Developments 420 Inc.
1918 Avenue Road
Toronto, Ontario M5M 4A1

Prepared by



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March 5, 2021

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VERSION CONTROL

Ver.	Date	Version Description
0	June 10, 2020	Zoning Bylaw Amendment
1	March 5, 2021	Zoning Bylaw Amendment Resubmission <ul style="list-style-type: none">• Updated modelling to reflect changes to proposed built form• Updated text of report to respond to circulation comments



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1 INTRODUCTION AND SUMMARY

HGC Engineering was retained by Stellarcop Developments 420 Inc. to undertake a Noise Feasibility Study for a proposed redevelopment of 420 Lakeshore Road East in Mississauga, to support an application for a zoning by-law amendment (ZBA).

The site is located at the southwest corner of Lakeshore Road East and Enola Avenue in Mississauga. The development proposal includes for the construction of an 11-storey mixed-use building.

The subject area is in an urbanized part of Mississauga, where road traffic on Lakeshore Road East, as well as rail traffic on GO Transit's Lakeshore West line to the north, are the primary sources of environmental noise with potential impact on the proposed development. Future traffic volumes for the roadway and rail line were obtained from the relevant authorities. This data was used to estimate future sound levels (L_{eq}) at the proposed building facades and outdoor amenity areas. The estimated sound levels were evaluated with respect to the guidelines of the Ministry of the Environment, Conservation, and Parks (MECP). The appropriate sound insulation properties of the building facades, and other recommended noise control measures and warning clauses are discussed in the body of the report. The results of the study indicate that the proposed development is feasible in terms of the expected noise impacts from transportation sources, with the inclusion of the noise controls discussed herein.

A preliminary assessment of potential noise impact from stationary sources associated with the Metro grocery store to the west of the site was also conducted. Predicted sound levels exceed the criteria established by the MECP at some locations, but are similar to, or in some cases lower than, the predicted levels at adjacent existing single-family residences. Further, noise from the facility appears to be in compliance with the current noise by-law of the City of Mississauga. No other stationary sources in area having potentially significant noise impacts on the development site were identified.



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2 SITE DESCRIPTION AND SOURCES

The proposed development will include an 11-storey residential building above 2 underground levels. The building will step back several times above the ground floor to allow for south-facing terraces. This study is based on architectural plans dated February 5, 2021, by Turner Fleischer Architects Inc. The ground floor will include five townhouse style suites, as well as indoor and outdoor amenity space, loading bay and garbage rooms, and retail space along Lakeshore Road. The 2nd-11th floors will consist of residential suites and locker rooms, and a mechanical penthouse will be located above the 11th floor.

A site visit was conducted by HGC Engineering on May 20, 2020, in order to conduct sound level measurements, as well as to make note of the surrounding acoustical environment. The primary source of sound emissions in the area is road traffic on Lakeshore Road East, as well as rail traffic on the GO Transit line to the north of the site. Road traffic on several other side streets (Enola Avenue, Shaw Drive) did not have a significant contribution to the acoustical environment. The site and surrounding area are best described as Class 1 (urban) in terms of the MECF guideline.

Currently existing on the site is a retail store (The Beer Store), and surface parking. Areas surrounding the site are generally residential, but there are low-rise commercial plazas located to the north and west of the subject property. A one-storey grocery store (Metro) is located directly west of the proposed development; a preliminary assessment of noise impact from trucking activities and rooftop equipment was conducted, and the results of that assessment are presented herein.

Other commercial buildings or facilities in the area are well-separated from the proposed development, and/or do not include major rooftop mechanical equipment (aerial imagery indicates some typical small exhaust fans and air conditioning units only). These facilities may generate sporadic audible noise at the proposed building, but no specific sources were identified during our site visit. Similarly, no significant noise sources are associated with the single-family homes to the south of the site.

The site is located approximately 380 m south of the rail line to the north. Noise from the rail line has been considered. Consideration of ground-borne vibration from this source is not required, due to the large intervening distance.



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3 NOISE CRITERIA

Guidelines for acceptable levels of road and rail traffic noise impacting residential developments are contained in the MECP publication NPC-300, “Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning,” August, 2013 (release date October 21, 2013), and are listed in Table 1 below. The values in Table 1 are energy equivalent (average) sound levels [LEQ] in units of A-weighted deciBels [dBA].

Table 1: MECP Road/Rail Traffic Noise Criteria

Space	Daytime LEQ(16 hour) Road/Rail [dBA]	Nighttime LEQ(8 hour) Road/Rail [dBA]
Outdoor Living Areas	55	--
Inside Living/Dining Rooms	45/40	45/40
Inside Bedrooms	45/40	40/35

Daytime refers to the period between 07:00 and 23:00. Nighttime refers to the period between 23:00 and 07:00. Corridors and washrooms are usually not considered to be noise-sensitive areas.

The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace, a playground, or common areas associated with high-rise multi-unit buildings where passive outdoor recreation is expected to occur. Balconies with a depth of less than 4 metres (measured perpendicular to the building façade) are not considered OLAs under MECP guidelines, and accordingly the noise criteria are not applicable there. Balconies and terraces with a minimum depth of 4 metres are only considered OLAs under MECP guidelines if they are the sole OLA for the occupant; generally, common outdoor amenity spaces are the only spaces that require consideration for high-rise buildings under MECP guidelines.

In cases where a minor excess (up to 5 dBA) over the sound level limit in an OLA is anticipated, MECP guidelines allow the excess to be addressed by including a warning clause in the titles, deeds or tenancy agreements for the affected dwellings. Where OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to below 60 dBA, and as close to 55 dBA as may be feasible.

With respect to the building envelope, no controls are required where levels are under 50 dBA. Where the noise level (L_{EQ}) is greater than 60 dBA at night or greater than 65 dBA during the daytime, windows must be designed to achieve the indoor sound level criteria listed above. Otherwise, any glazing meeting the Ontario Building Code is considered adequate under MECP guidelines. Where the predicted night time and/or daytime sound levels exceed these thresholds, central air conditioning or some other heating and cooling system that will allow windows to remain closed is required.

Note that the indoor sound level limits for rail sources are 5 dBA more stringent than for road sources, to account for the additional low-frequency (rumble) components of locomotives. Hence the façade sound insulation requirements are calculated separately and then combined.

4 TRAFFIC NOISE ASSESSMENT

4.1 Road Traffic Data

Road traffic volume was obtained for Lakeshore Road East from the City of Mississauga. Data was provided in the form of Ultimate AADT, and is attached as Appendix A. The day/night split, as well as truck percentages and heavy/medium truck ratios were obtained from the Ultimate data.

Other roadways surrounding the site (Enola Avenue, Shaw Drive), are minor, and traffic data was not available; it was confirmed during the site visit that their contribution to the acoustical environment is negligible.

The resulting Ultimate traffic volumes and speed limit used in this assessment are listed in Table 2 below.

Table 2: Ultimate Road Traffic Data

Road	Daytime Traffic Volume			Night Time Traffic Volume			Speed Limit (km/h)
	Cars	MT	HT	Cars	MT	HT	
Lakeshore Road East	28301	819	670	3145	91	74	50

4.2 Rail Traffic Data

Traffic data for typical future (2030) rail operations on the Lakeshore West line was obtained from Metrolinx, and projected to 2031 at a growth rate of 2.5%; CN Rail no longer operates trains on this rail segment. Rail data is attached as Appendix B, and is summarized in Table 3. Per the comments provided on the data by Metrolinx, all trains have been modelled as having diesel locomotives.

Table 3: Rail Traffic Data (Projected to 2031)

Type of Train	Number of Trains Day/Night	Maximum Number of locomotives	Maximum Number of cars	Max Speed (kph)
GO	197/47	1	12	150

4.3 Prediction Results

To assess the levels of road and rail traffic noise that will impact the site, an acoustical model of the proposed building was developed using a numerical modeling package (*Cadna-A version 2021*). The model was used to predict traffic noise levels at each of the building façades and at the proposed outdoor amenity areas.

The road noise source was included in the model as a line source, with a sound power level equivalent to that predicted by STAMSON 5.04, an algorithm developed by the MECP (STAMSON output used for comparison purposes is included as Appendix C, showing close correspondence of 1-2 dB at selected receptors). The rail line was also modelled as a line source, with a sound power level equivalent to that published by the Department of Transportation (United States of America) Federal Transit Administration (FTA) in the publication entitled “Transit Noise and Vibration Assessment”.

The predicted traffic sound levels at the façades of the proposed development are summarized in Table 3 below, and are shown graphically in Figures 3-5. The results represent the maximum predicted sound levels at the residential building façades. For the purpose of this study, the façade fronting Lakeshore Road is taken to be the north façade, and the south façade is assumed to run from the southeast corner of the building to the southwest corner (i.e., including the return to the north).

Table 4: Predicted Future Sound Levels (Road/Rail/Total) from Traffic Noise – Façades

Façade	Day (16hr avg) (7:00 – 23:00)	Night (8hr avg) (23:00 – 7:00)
N	69/64/70	63/61/64
E	63/61/65	57/57/59
S	55/51/55	47/48/50
W	65/62/66	59/59/61

The site plan indicates a single outdoor amenity area at grade, at the west side of the building. The predicted daytime traffic sound level at this location is 55 dBA.

4.4 Traffic Noise Recommendations

The following sections outline preliminary recommendations for building façade constructions and ventilation requirements to achieve the noise criteria discussed in Section 3.

4.4.1 Minimum Building Façade Constructions

Given the projected future sound levels at the building facades, MECP guidelines recommend that the building envelope be designed so that the indoor sound levels comply with the noise criteria in NPC-300.

Floor plans and building elevations have not yet sufficiently developed in order to conduct a detailed acoustical specification of the building envelope. Sound insulation calculations were performed based on the predicted sound levels at the building facades, and typical window-to-floor area ratios of 80% (60% fixed, 20% operable windows, including glazed sliding patio doors for residential suites).

Table 5 below lists the minimum installed sound transmission class (STC) rating of fixed window glazing required to achieve the target indoor sound level criteria, considering the highest predicted sound levels on the façades of the proposed development.

Table 5: Minimum STC Requirements

Façade	Fixed Windows
North	STC-35
East	STC-33
South	STC-33
West	STC-33

The maximum required rating is STC-35, for the north façade. Other facades which are more shielded have lower requirements; however, in an urban environment such as the subject site, we typically do not recommend glazing less than STC-33, which can be achieved using properly selected standard glazing assemblies.

Different window-to-floor area ratios may result in different STC rating requirements; acoustical criteria for the building facades can be optimized as part of the detailed design of the building envelope when the plans have sufficiently advanced, if required.

Exterior wall assemblies are assumed to have sufficient sound insulation such that sound transmitted through them is negligible in comparison with the glazing. Precast or masonry exterior walls are expected to meet these requirements, as should spandrel or metal panels backed by an independent drywall assembly.

4.4.2 Ventilation Requirements

The predicted night time sound levels at most residential facades are equal to or exceed 60 dBA, therefore central air conditioning systems are required so that windows may remain closed, although such systems are expected to be included regardless.

4.4.3 Outdoor Living Areas

The predicted daytime total traffic sound level at the centre of the proposed outdoor amenity area is 55 dBA, meeting the MECP’s target criteria; additional noise mitigation measures are not required.

5 STATIONARY NOISE SOURCE ASSESSMENT

A retail grocery store (Metro) is located just the southwest of the proposed building, and a preliminary assessment of its potential noise impacts has been conducted as part of this study. As discussed above, no significant sources of noise associated with other surrounding commercial facilities or residential houses have been identified.

5.1 Criteria for Acceptable Sound Levels

In addition to sound level criteria from traffic noise sources, criteria for acceptable sound levels from stationary sources are published in the MECP guideline NPC-300. A commercial facility such as the Metro is classified in the guideline as a stationary source of sound (as compared to sources such as traffic or construction, for example) for noise assessment purposes. A stationary noise source encompasses the noise from all the activities and equipment within the property boundary of a facility including regular on-site heavy vehicular traffic, material handling, and mechanical equipment.

NPC-300 states that the sound level limit for a non-impulsive (steady) stationary noise source operating in a Class 1 environment is the greater of the one-hour energy equivalent ambient sound level (L_{EQ}) at any potentially impacted noise-sensitive point of reception, and the exclusionary minimum sound level limits of 45 dBA during night time hours (23:00-07:00) and 50 dBA during daytime hours (07:00-23:00). At outdoor points of reception, only the daytime limit applies.

NPC-300 provides additional criteria for sounds that are impulsive in nature, but no such impulsive sources are associated with the retail grocery store.

While an assessment under NPC-300 is consistent with the City of Mississauga's terms of reference for noise studies provided in support of development applications, it is not consistent with the City's Noise Control By-law (360-79), which is currently being revised. The existing noise by-law is qualitative in nature, and prohibits sound from certain acts or equipment from being audible in residential areas at any time (Schedule 1), or at certain times of day or night (Schedule 2). It is unclear if any of the specific prohibitions of the by-law apply to the noise sources at Metro; even sounds related to loading/unloading are exempt if considered "necessary for the maintenance of essential services", and sounds related to the operation of an engine within a residential zone are



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permitted to exceed 5 minutes if “weather conditions justify the use of heating or refrigerating systems powered by the motor or engine for the safety and welfare of the operator, passengers or animals, or the preservation of perishable cargo, and the vehicle is stationary for purposes of delivery or loading”. For the purposes of this assessment, it is assumed that sources at Metro comply with the existing noise by-law.

5.2 Description of the Facility

HGC Engineering visited the site on May 20, 2020 to observe the operations of the grocery store and to conduct sound level measurements of a full-size refrigerated delivery truck in the loading bay on the east side of the store. Based on these measurements, an estimate of the sound power for the refrigeration unit mounted on the front of the trailer was determined, and is listed in Table 6 below. This estimate is consistent with data in our files from other facilities. Sound data from tractors accelerating was obtained from HGC Engineering’s project files for similar past projects, and is also listed in Table 6. For the purposes of this screening assessment, it was assumed that during a worst-case daytime hour, one refrigerated tractor-trailer similar to the one measured arrives at the store, the refrigeration unit runs continuously while the truck sits in the loading bay, and the truck then departs the store.

Information on the mechanical equipment on the rooftop of the grocery store was obtained through aerial imagery; the roof includes two banks of refrigeration condenser fans, with 6 and 12 fans respectively. Additional equipment includes a large mushroom-hood type roof exhauster fan and a makeup air unit, assumed to serve office or back-of-house spaces. Sound power data for similar mechanical equipment was obtained from past project files or manufacturer’s published sound data for equipment of this nature, and is listed in Table 6 below. It was assumed that the rooftop mechanical equipment operates continuously during a daytime hour, but only for 30 minutes (or at 50% capacity) during a worst-case night time hour.



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Table 6: Stationary Source Sound Power Levels

Octave Band Center Frequency [Hz]	63	125	250	500	1000	2000	4000	8000	A
Condensing Unit (12 Fans)	92	99	94	94	92	90	83	78	97
Condensing Unit (6 Fans)	89	96	91	91	89	87	80	75	94
Mushroom Hood Exhaust Fan	92	88	84	87	82	76	69	59	87
Makeup Air Unit	61	71	68	67	72	66	61	54	74
Truck Refrigeration Unit	101	106	107	89	86	86	82	76	100
Tractor-Trailer Accelerating	101	100	94	96	97	95	91	96	101

5.3 Minimum-Hour Traffic Sound Levels

An estimate of the minimum-hour future traffic data for Lakeshore Road was obtained from the provided Ultimate AADT data and a typical hourly distribution curve. Similar to the traffic noise assessment, minimum-hour road traffic sound levels were predicted using line sources calibrated to those predicted by STAMSON. Resulting minimum-hour estimated volumes are shown in Table 7 below.

Table 7: Minimum Hour Traffic Volumes

Road	Daytime Hour			Night Time Hour			Speed Limit (km/h)
	Cars	MT	HT	Cars	MT	HT	
Lakeshore Road	1006	29	24	189	5	4	50

5.4 Prediction Results

Predictions using the minimum-hour traffic data indicate that criteria above the minimum exclusionary limits would apply at some receptor locations on the north, east and west facades. At facades shielded from Lakeshore Road, the exclusionary minima (50 dBA daytime / 45 dBA night time) would apply. These prediction results are shown graphically in Figure 6.

The predicted sound levels from the Metro-related sources at the facades of the proposed building and outdoor amenity area, as well as at the surrounding existing single-family houses, are shown graphically in Figures 7-9. The predictions indicate that the overall impacts from noise sources

associated with Metro will be similar to impacts at the existing houses. Examining these impacts further, the rooftop mechanical equipment is indicated to have significantly greater impact on the houses south of Metro than on the new proposed building, where predicted impacts are in compliance with the criteria. Truck-related sources (primarily the refrigeration unit above the cab) are expected to have impacts on the new building which are generally equivalent to those at several surrounding homes; while these impacts are moderately (7-8 dB) above the criteria for daytime deliveries, given that these excesses only occur for short periods when a refrigerated truck is parked in the loading bay, and that such noises are generally exempt under the City's current noise by-law, this is not a significant concern. An appropriate warning clause is recommended below.

6 IMPACT OF THE DEVELOPMENT ON THE ENVIRONMENT

It is expected that any increase in local traffic associated with the development will not be substantial enough to affect noise levels significantly. Sound levels from stationary (non-traffic) sources of noise associated with the development such as rooftop air-conditioners, cooling towers, exhaust fans, etc. should not exceed the minimum one-hour L_{EQ} ambient (background) sound level from road traffic, at any potentially impacted residential point of reception, to comply with NPC-300 and/or the City of Mississauga's Noise Control By-Law (360-79), where applicable.

Based on observations during our site visit, the typical minimum ambient sound levels on the most shielded facades of the new building and surrounding areas are expected to be in the range of the exclusionary minimum criteria suggested by NPC-300. The design of the building's mechanical and electrical systems are not yet advanced sufficiently to conduct a quantitative assessment of the impact of the proposed development on surrounding noise sensitive uses; equipment and noise control measures should be selected during the detail design phase of the project, such that noise from the development results in sound levels within the appropriate criteria at surrounding noise-sensitive receptors.



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7 IMPACT OF THE DEVELOPMENT ON ITSELF

Section 5.9.1 of the Ontario Building Code (OBC) specifies the minimum required sound insulation characteristics for demising partitions, in terms of Sound Transmission Class (STC) values. In order to maintain adequate acoustical privacy between separate suites in a multi-tenant building, inter-suite walls should meet or exceed STC-50. Walls separating a suite from a noisy space such as a refuse chute, or elevator shaft, should meet or exceed STC-55. In addition, it is recommended that the floor/ceiling constructions separating suites from any amenity or commercial spaces also meet or exceed STC-55. Tables 1 and 2 in Section SB-3 of the Supplementary Guideline to the OBC provide a comprehensive list of constructions that will meet the above requirements.

Tarion's Builder Bulletin B19R requires the internal design of condominium projects to integrate suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the buildings on its residents. If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself is maintained within acceptable levels.

8 RECOMMENDED WARNING CLAUSES

MECP guidelines recommend that appropriate warning clauses be used in the Development Agreements and in purchase, sale and lease agreements (typically by reference to the Development Agreements), to inform future owners and occupants about noise concerns from transportation sources in the area. The following clauses are recommended:

- (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/or rail traffic may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Ministry of the Environment, Conservation and Parks.
- (b) This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Ministry of the Environment, Conservation and Parks.



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- (c) Purchasers/tenants are advised that due to the proximity of this development to an adjacent Metro grocery store and to other nearby retail and commercial facilities, sound levels from the facilities may at times be audible.

These sample clauses are provided by the MECP as examples and can be modified by the owner's legal representative, in consultation with the City, as required.

9 SUMMARY OF RECOMMENDATIONS

The following list summarizes the recommendations made in this report. The reader is referred to the previous sections of the report where these recommendations are discussed in more detail.

1. Central air conditioning systems are required in the residential units under MECP guidelines, although such systems are expected to be included regardless, as discussed in Section 4.4.2.
2. Minimum building and glazing constructions will be required for the residential suites, and preliminary acoustical requirements for these assemblies are outlined in Section 4.4.1. When detailed floor plans and building elevations are available, a review should be conducted to verify acoustical requirements for glazing and building façade constructions based on actual window to floor area ratios.
3. Noise warning clauses should be included in the property and tenancy agreements and offers of purchase and sale for the residential suites to inform future residents of potential noise intrusions from the roads and railway corridor in the area. Recommended wording for these clauses is provided in Section 8. Such clauses are often included by reference to the Development Agreements in which they are contained.
4. Predicted noise levels from an adjacent grocery store are in excess of the criteria established by the MECP at the proposed building, but are on the same order or lower than predicted impacts at surrounding existing single-family homes, and may be exempt from consideration under the City's noise by-law. Warning clauses should be implemented in the property and/or tenancy agreements to address noise from these sources.
5. Demising assemblies must be selected to meet the minimum requirements of the Ontario Building Code (OBC). If B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself are maintained within acceptable levels. Outdoor sound emissions should also be checked, when the detail design of the associated systems is being completed, to ensure compliance with NPC-300 and/or the City's noise by-law (where applicable).

10 CONCLUSION

The results of this study indicate that the proposed development is feasible on this site from a noise impact perspective.



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Figure 1: Key Plan

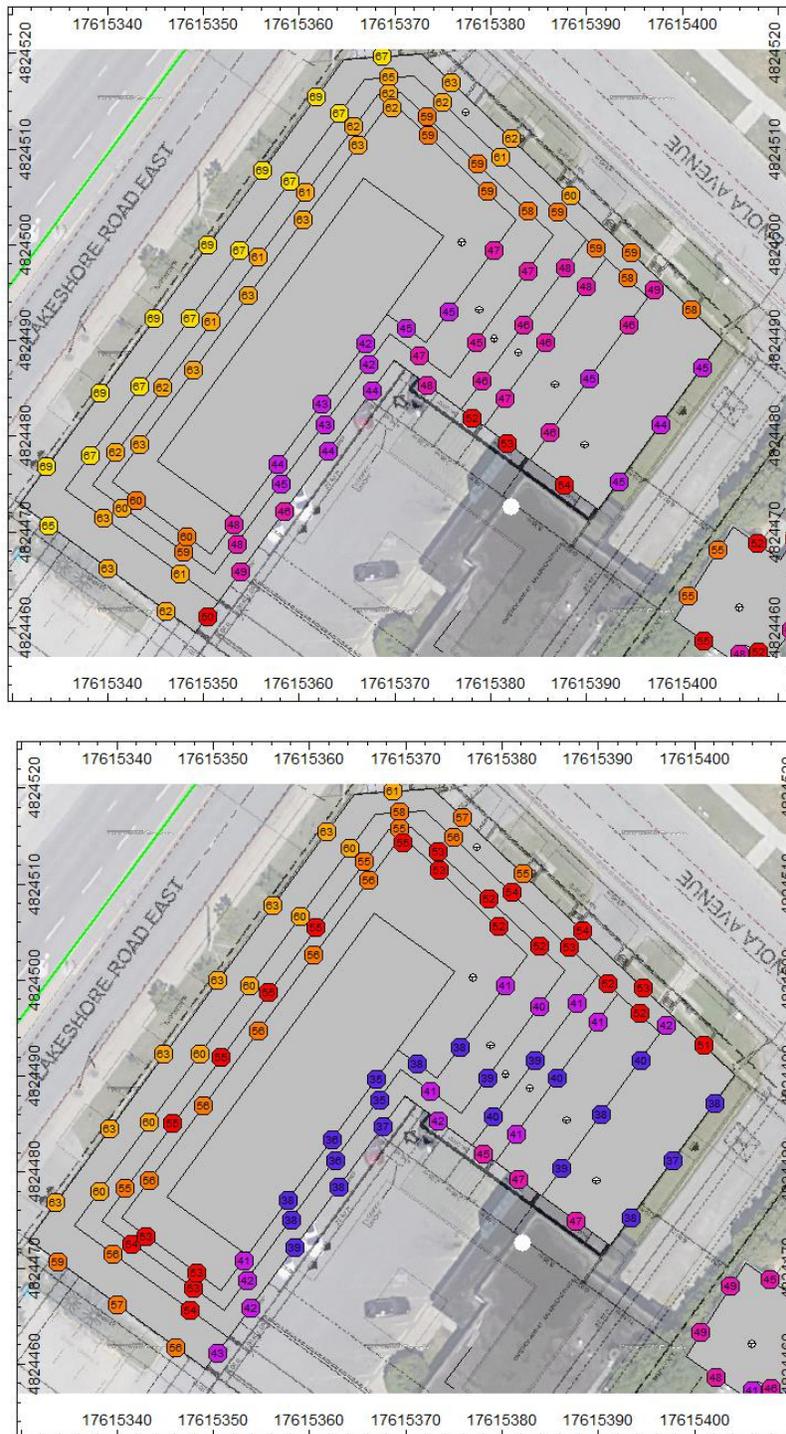


Figure 3: Predicted Road Traffic Sound Levels, daytime (top) and night time (bottom)

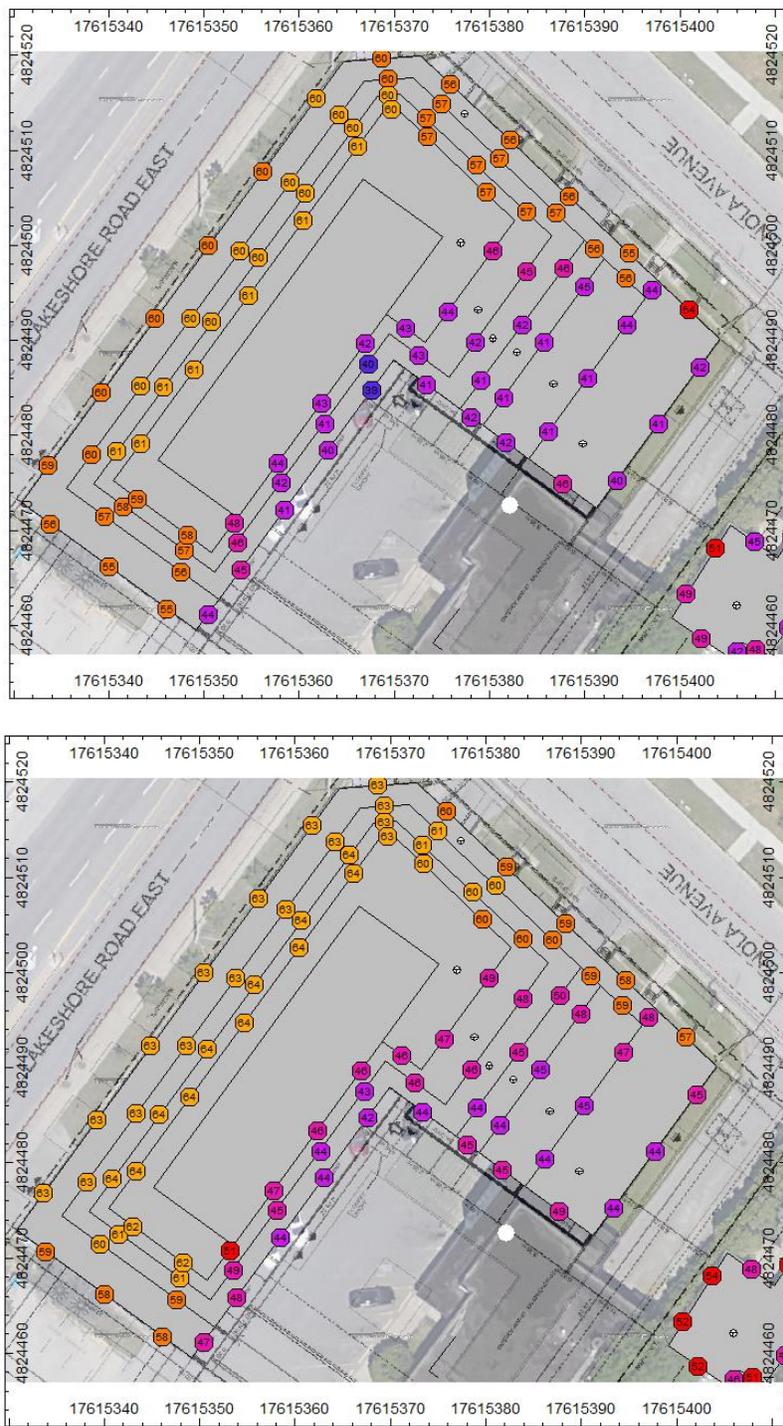


Figure 4: Predicted Rail Traffic Sound Levels, daytime (top) and night time (bottom)

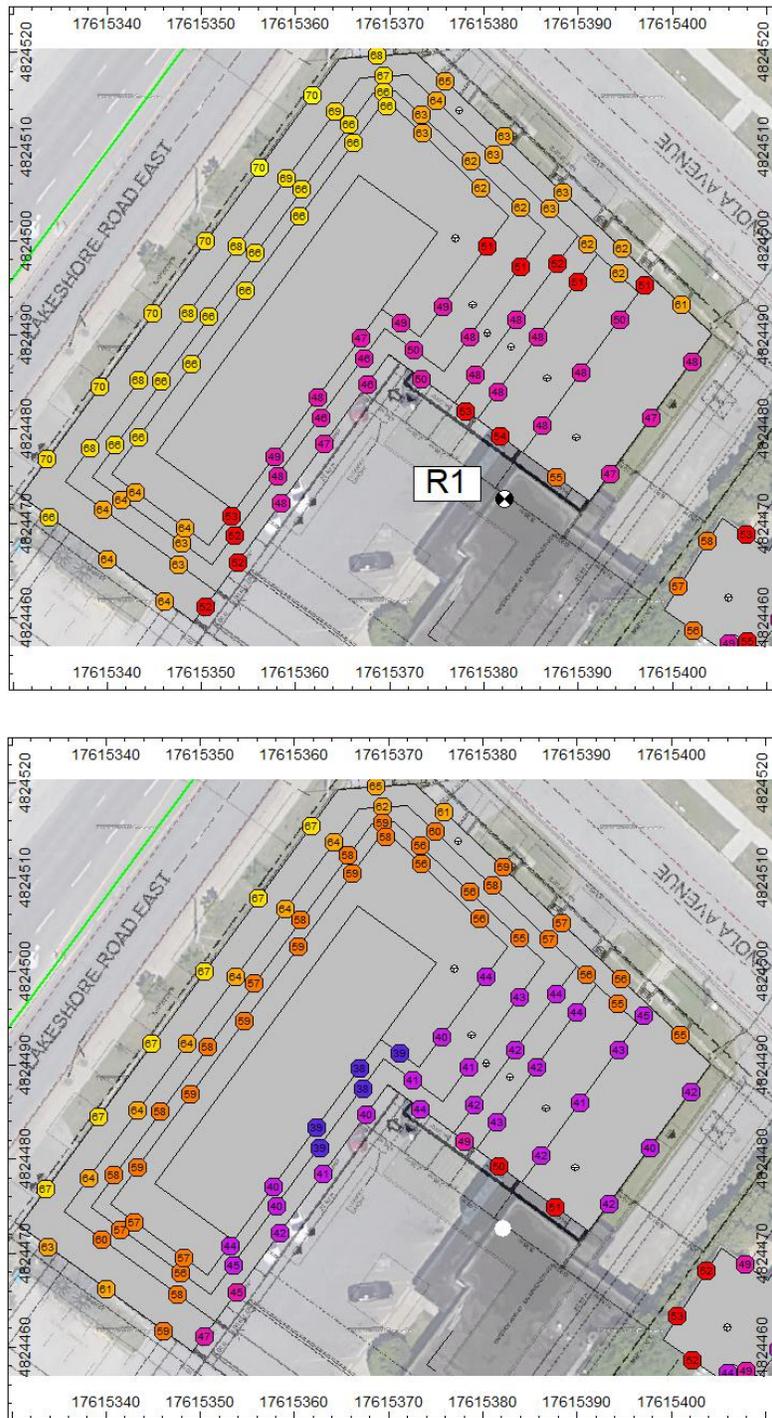


Figure 5: Predicted Total Sound Levels, daytime (top), night time (bottom)

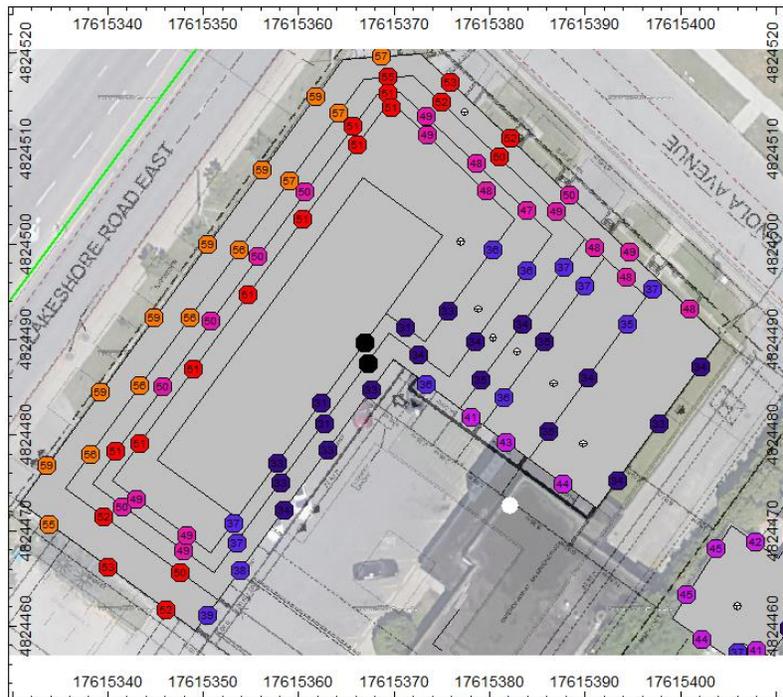
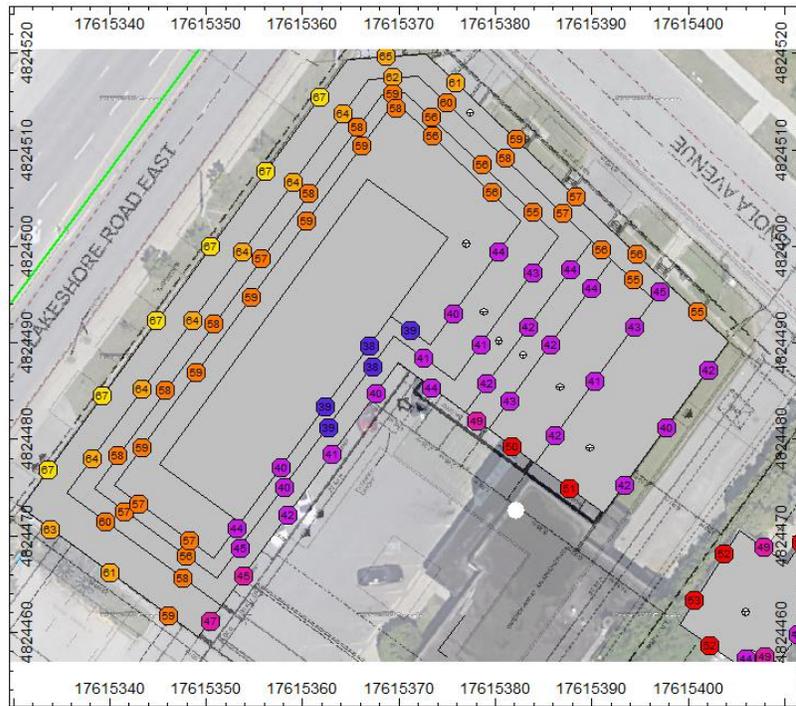


Figure 6: Predicted Minimum-Hour Sound Levels from Road Traffic, daytime (top), night time (bottom)

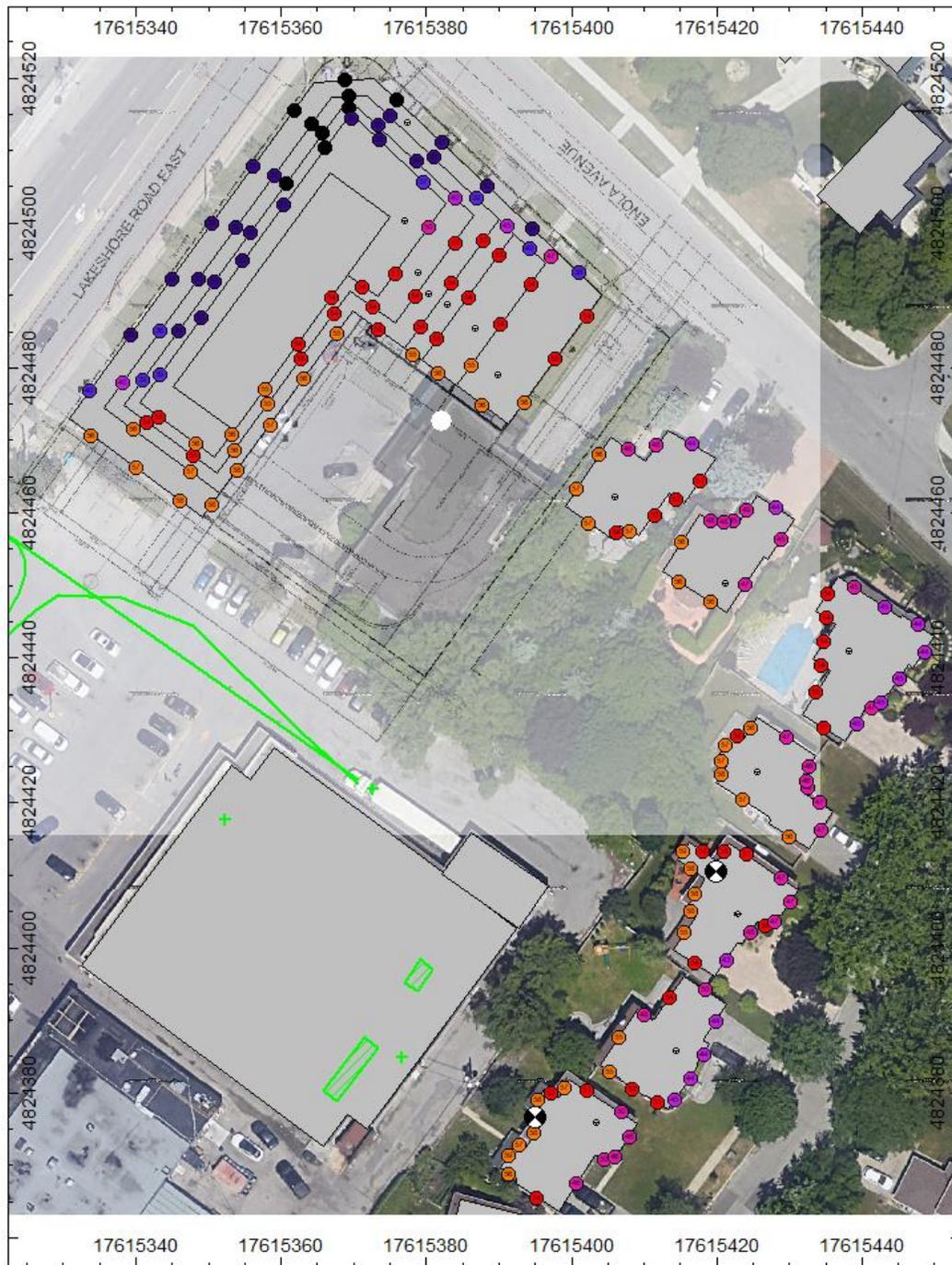


Figure 7: Predicted Daytime Sound Levels from All Metro Sources

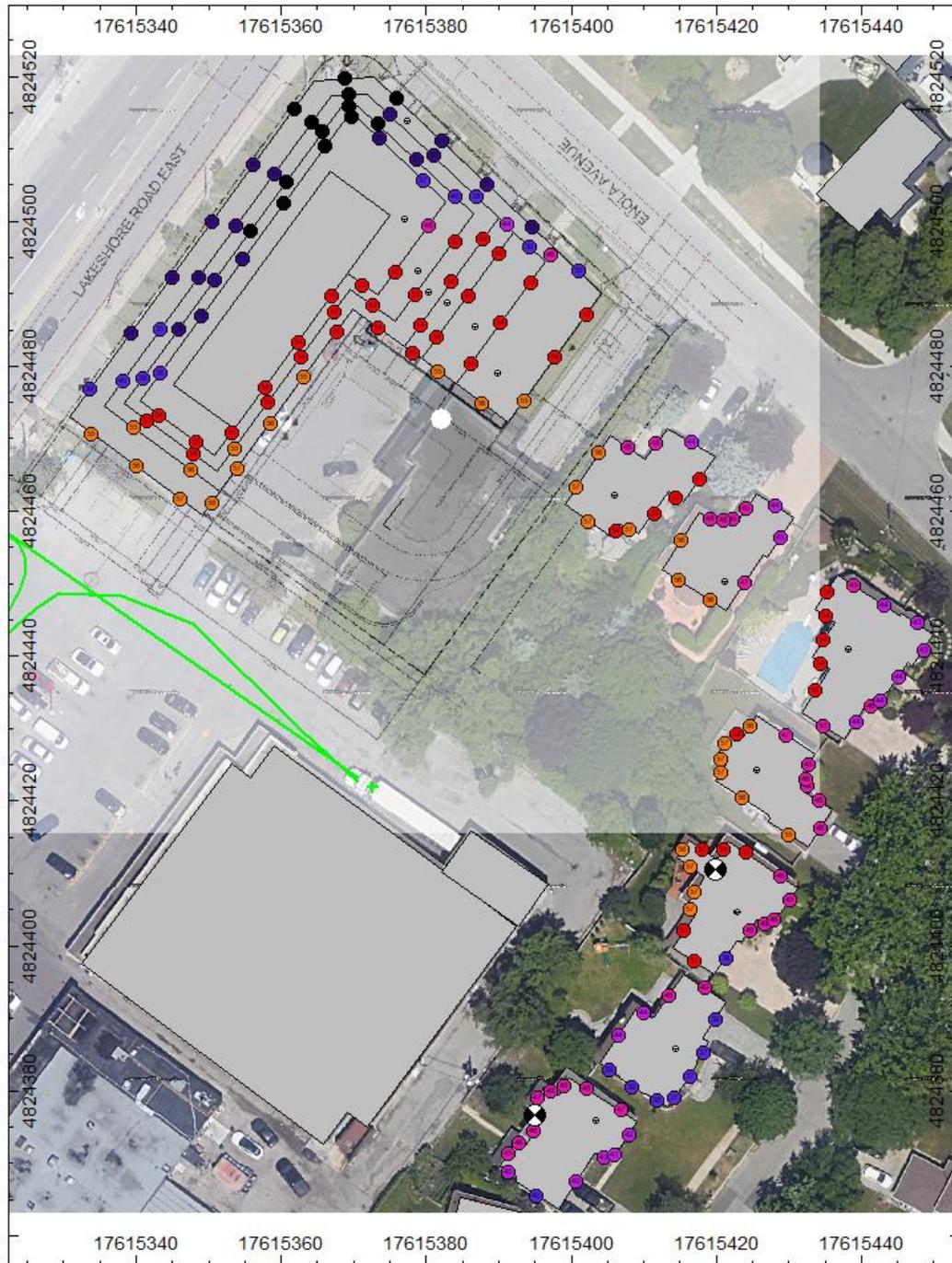


Figure 8: Predicted Daytime Sound Levels at Proposed/Existing Receptors from Trucks

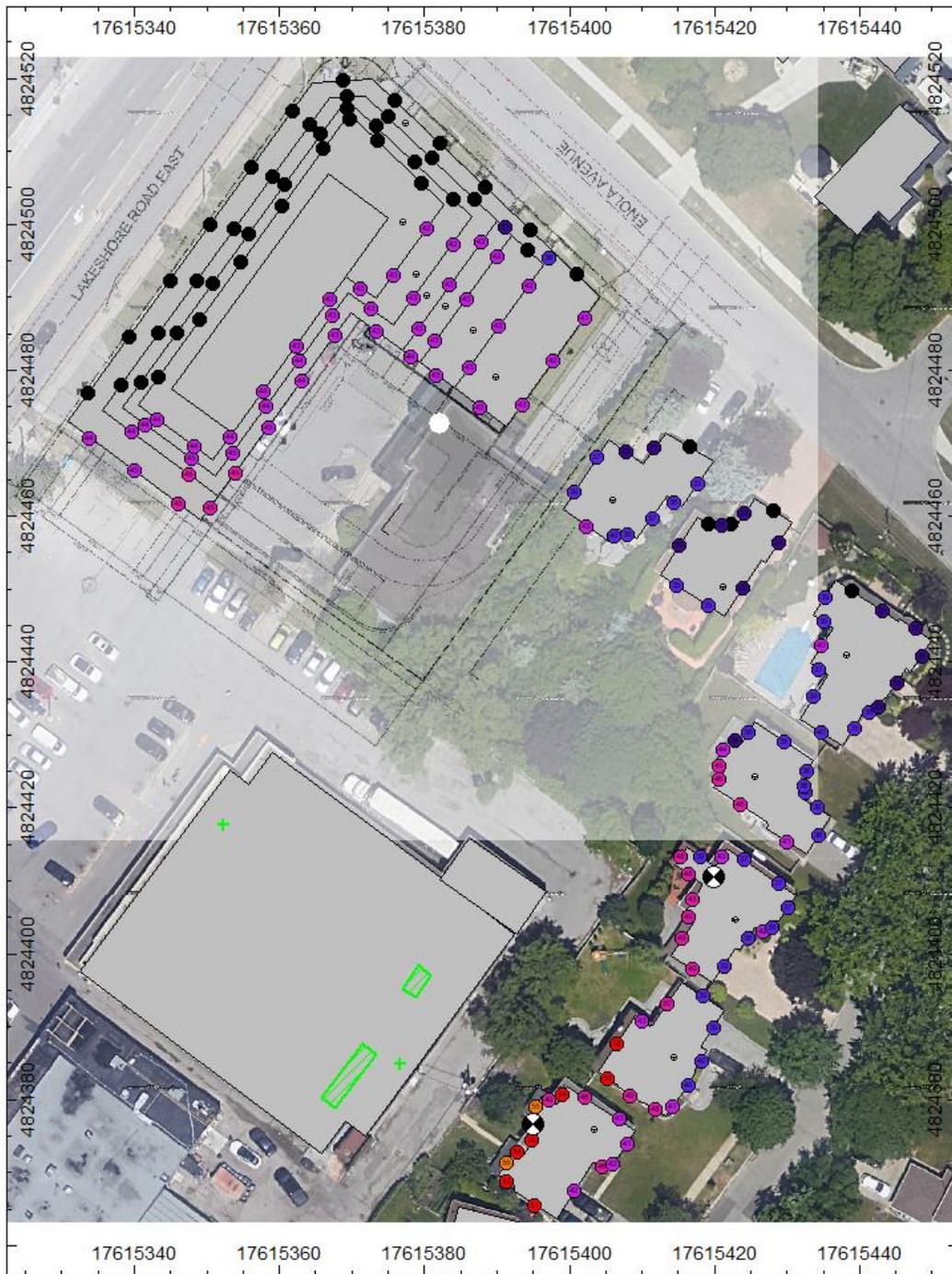


Figure 9: Predicted Night Time Sound Levels from Rooftop Mechanical Sources at Metro

APPENDIX A

Road Traffic Data



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Date: 12-May-20

NOISE REPORT FOR PROPOSED DEVELOPMENT

REQUESTED BY:



Name: Adam Doiron

Company: HGC Engineering

Location: Lakeshore Road East between Seneca Avenue and Cawthra

PREPARED BY:

Name: Bertuen Mickle

Tel#: (905) 615-3200

ID#: 469

ON SITE TRAFFIC DATA

Specific	Street Names			
	Lakeshore Road East			
AADT:	33,100			
# of Lanes:	4 Lanes			
% Trucks:	5%			
Medium/Heavy Trucks Ratio:	55/45			
Day/Night Traffic Split:	90/10			
Posted Speed Limit:	50 km/h			
Gradient of Road:	<2%			
Ultimate R O W:	30m			

Comments:

Ultimate Traffic Only

APPENDIX B

Rail Traffic Data



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Adam Doiron

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: Monday, May 25, 2020 2:54 PM
To: Adam Doiron
Cc: Brandon Gaffoor
Subject: RE: Rail Data Request - 420 Lakeshore Road East, Mississauga

Good Afternoon Adam,

Further to your request dated May 12th, 2020, the subject property 420 Lakeshore Road East, Mississauga is located in proximity to Metrolinx's Oakville Subdivision which carries Lakeshore West GO Train Service.

It's anticipated that GO service on this line will be comprised of a mix of both diesel and electric trains within (at least) a 10-year time horizon. The combined preliminary midterm weekday train volume forecast at this location, including both revenue and equipment trips is in the order of 238 trains – (54 diesel: 45 day, 9 night; 184 electric: 147 day, 37 night). Trains will be comprised of a single locomotive and up to 12 passenger cars.

The maximum track design speed at this location on this corridor is 95 mph (153 km/h).

Currently, anti-whistling is in effect at Revus Avenue.

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO and UP Express rail network and we are currently working towards the next phase. Metrolinx has not made a final decision regarding the electric train technology or technologies to be deployed. We can, however, provide the following interim information which may be helpful;

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

Given the above considerations, it would be prudent, for the purposes of acoustical analyses, 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.

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 is only as it pertains to Metrolinx trains. It would be prudent to contact other rail operators in the area directly for their rail traffic information.

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

Thank you,

Terri Cowan

Third Party Projects Officer

Third Party Projects Review | Capital Projects Group

Metrolinx | 20 Bay Street, Suite 600 | Toronto, Ontario | M5J 2W3

T: 416-202-3903 C: 416-358-1595

From: Brandon Gaffoor
Sent: May-12-20 5:41 PM
To: Adam Doiron; Rail Data Requests
Cc: Terri Cowan
Subject: RE: Rail Data Request - 420 Lakeshore Road East, Mississauga

Hi Adam – we will look into your inquiry and provide a response shortly. In future, please send these requests to our general mailbox RailDataRequests@Metrolinx.com.

Thanks,
Brandon

BRANDON GAFFOOR

Third Party Projects Officer
Third Party Projects Review, Capital Projects Group
Metrolinx | 20 Bay Street | Suite 600 | Toronto | Ontario | M5J 2W3
T: 416.202.7294 C: 647.289.1958



From: Adam Doiron [mailto:adoiron@hgcengineering.com]
Sent: May-12-20 10:03 AM
To: Brandon Gaffoor
Subject: Rail Data Request - 420 Lakeshore Road East, Mississauga

Hi Brandon,

HGC is conducting a noise study at [420 Lakeshore Road](#) East in Mississauga, and I am inquiring if the attached data could be considered current, or if you have updated data available for the GO Line to the north.

Best Regards,
Adam Doiron, EIT
Project Consultant

HGC Engineering [NOISE](#) | [VIBRATION](#) | [ACOUSTICS](#)

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APPENDIX C

Sample STAMSON Output



ACOUSTICS



NOISE



VIBRATION

Sample STAMSON output for A receiver on the north façade on the 2nd floor

STAMSON 5.0 NORMAL REPORT Date: 22-02-2021 16:33:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ls_sam.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 28301/3145 veh/TimePeriod
Medium STAMSON 5.0 NORMAL REPORT Date: 22-02-2021 16:54:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ls_sam.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 28301/3145 veh/TimePeriod
Medium truck volume : 819/91 veh/TimePeriod
Heavy truck volume : 670/74 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 6.00 / 6.00 m
Topography : 0 (Define your own alpha.)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 0.00 m
Barrier receiver distance : 10.00 / 10.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Alpha : 0.20
Reference angle : 0.00



ACOUSTICS



NOISE



VIBRATION

Results segment # 1: Lakeshore (day)

Source height = 1.22 m

ROAD (0.00 + 68.67 + 0.00) = 68.67 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.20 69.21 0.00 0.00 -0.54 0.00 0.00 0.00 68.67

Segment Leq : 68.67 dBA

Total Leq All Segments: 68.67 dBA

Results segment # 1: Lakeshore (night)

Source height = 1.22 m

ROAD (0.00 + 62.13 + 0.00) = 62.13 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.20 62.67 0.00 0.00 -0.54 0.00 0.00 0.00 62.13

Segment Leq : 62.13 dBA

Total Leq All Segments: 62.13 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.67
(NIGHT): 62.13



ACOUSTICS



NOISE



VIBRATION

Sample STAMSON output for a receiver at location of OLA

STAMSON 5.0 NORMAL REPORT Date: 23-02-2021 11:36:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ola_sam.te Time Period: Day/Night 16/8 hours
Description:

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

Car traffic volume : 28301/3145 veh/TimePeriod
Medium truck volume : 819/91 veh/TimePeriod
Heavy truck volume : 670/74 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 55.00 / 55.00 m
Receiver height : 1.50 / 1.50 m
Topography : 0 (Define your own alpha.)
Barrier angle1 : -31.00 deg Angle2 : 90.00 deg
Barrier height : 35.20 m
Barrier receiver distance : 18.00 / 18.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Alpha : 0.20
Reference angle : 0.00



ACOUSTICS



NOISE



VIBRATION

Results segment # 1: Lakeshore (day)

Source height = 1.22 m

Barrier height for grazing incidence

Source ! Receiver ! Barrier ! Elevation of
 Height (m) ! Height (m) ! Height (m) ! Barrier Top (m)

-----+-----+-----+-----

1.22 ! 1.50 ! 1.41 ! 1.41

ROAD (56.77 + 40.60 + 0.00) = 56.88 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 -31 0.20 69.21 0.00 -6.77 -5.67 0.00 0.00 0.00 56.77

-31 90 0.20 69.21 0.00 -6.77 -2.13 0.00 0.00 -19.71 40.60

Segment Leq : 56.88 dBA

Total Leq All Segments: 56.88 dBA



ACOUSTICS



NOISE



VIBRATION