



2660430 Ontario Inc.

# VIBRATION IMPACT STUDY

6710 HURONTARIO STREET  
**CITY OF MISSISSAUGA**

May 2019

19310

## Disclaimer

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**LEA Consulting Ltd.**  
425 University Avenue, Suite 400  
Toronto, ON, M5G 1T6 Canada  
T | 905 470 0015 F | 905 470 0030  
WWW.LEA.CA

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Reference Number: 19310/250

**Mr. Shakir Rehmatullah**  
2660430 Ontario Inc.  
3621 Highway 7 East, Suite 503  
Markham, ON  
L3R 0G6

**RE: Vibration Impact Study**  
**Proposed Mixed-Use Development at 6710 Hurontario Street, City of Mississauga**

Dear Mr. Rehmatullah:


LEA Consulting Ltd. is pleased to present the findings of this Vibration Impact Study (VIS) for the proposed mixed-use development at 6710 Hurontario Street in the City of Mississauga.


The report concludes that vibration levels related to the future Hurontario-Main LRT will be below the applicable vibration criteria. As such, vibration mitigation will not be required for the proposed development.

Should you have any questions regarding this VIS, please do not hesitate to contact us.

Yours truly,

**LEA CONSULTING LTD.**

  
FELIPE VERNAZA, P.Eng.  
Senior Project Engineer  
Noise and Vibration Engineering



  
Tony Chiu, P.Eng.  
Noise and Vibration Engineering



Encl.

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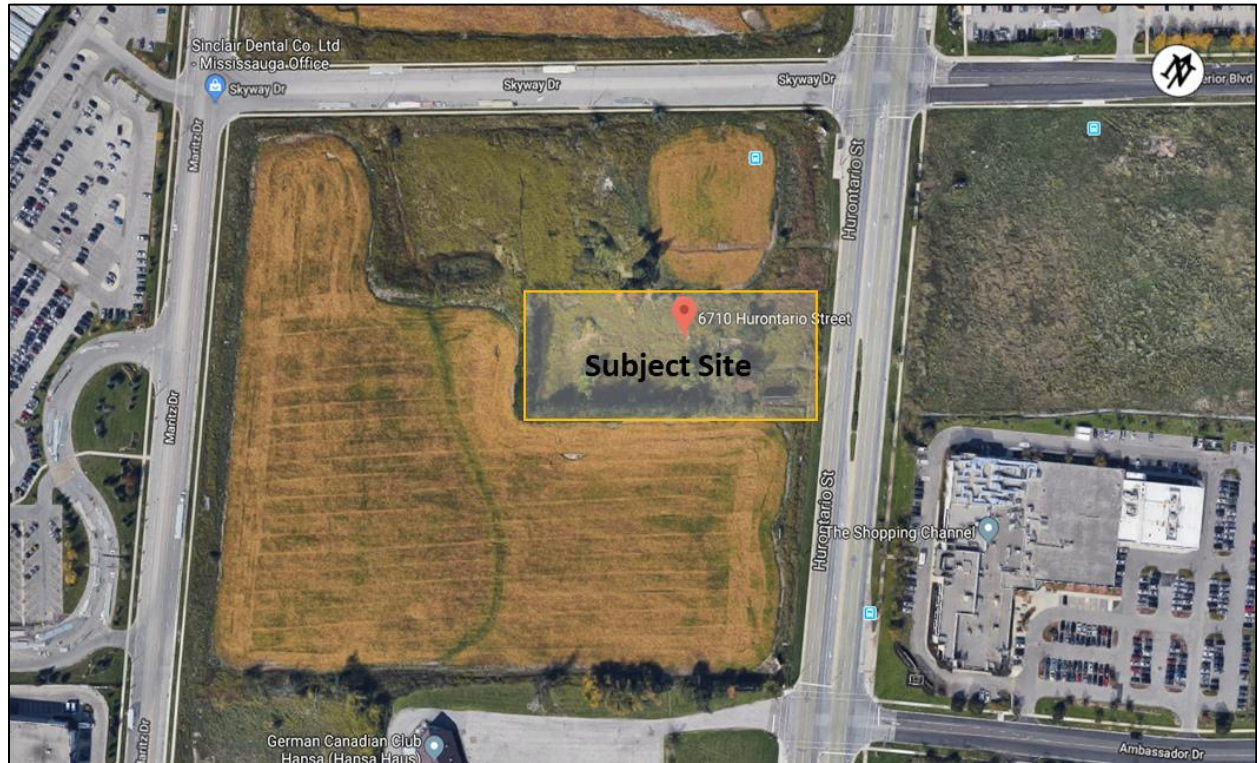
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### APPENDIX A                      Vibration Assessment Calculations

# 1 INTRODUCTION

LEA Consulting Ltd. (LEA) was retained by 2660730 Ontario Inc. to prepare a Vibration Impact Study (VIS) for the proposed mixed-use development located at 6710 Hurontario Street in the City of Mississauga. The subject site is located on the west side of Hurontario Street, approximately 90 metres to the south of Skyway Drive and Hurontario Street intersection. **Figure 1-1** illustrates the site location.



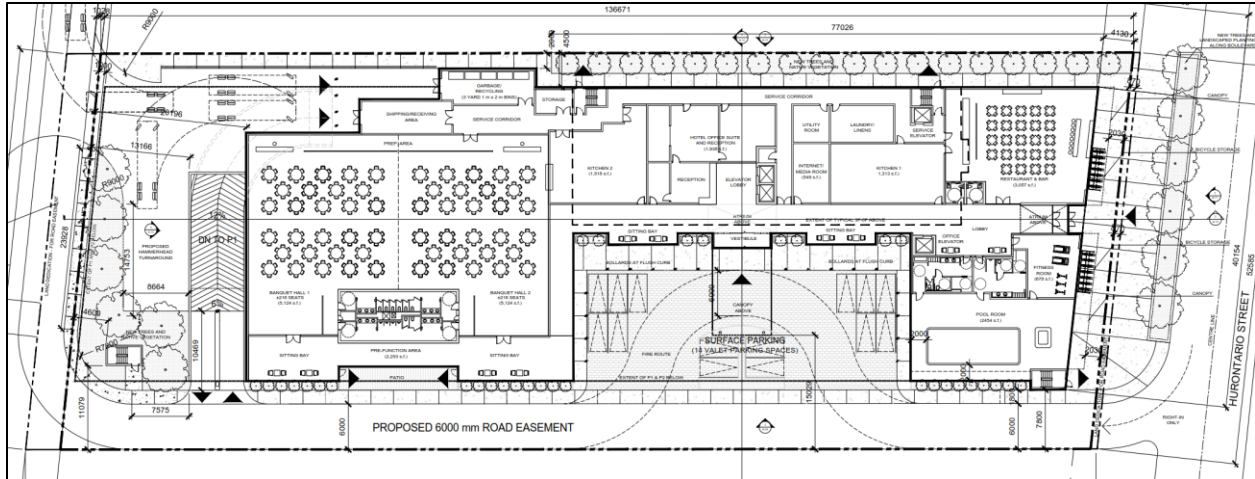
**Figure 1-1 Site Location (Source: Google Maps)**

Source: Google Maps

The development proposal will consist of a 9-storey building consisting of office, hotel, and banquet hall uses, as well as some shared facilities. **Figure 1-2** shows the proposed site plan.

Based on discussions with the City, a Vibration Impact Study is required to evaluate the vibration impacts of the future Hurontario Light Rail Transit (LRT) on the subject site. The objective of the vibration study is to assess the potential vibration impacts on the proposed sensitive land uses due to the introduction of the new LRT tracks along Hurontario Street.





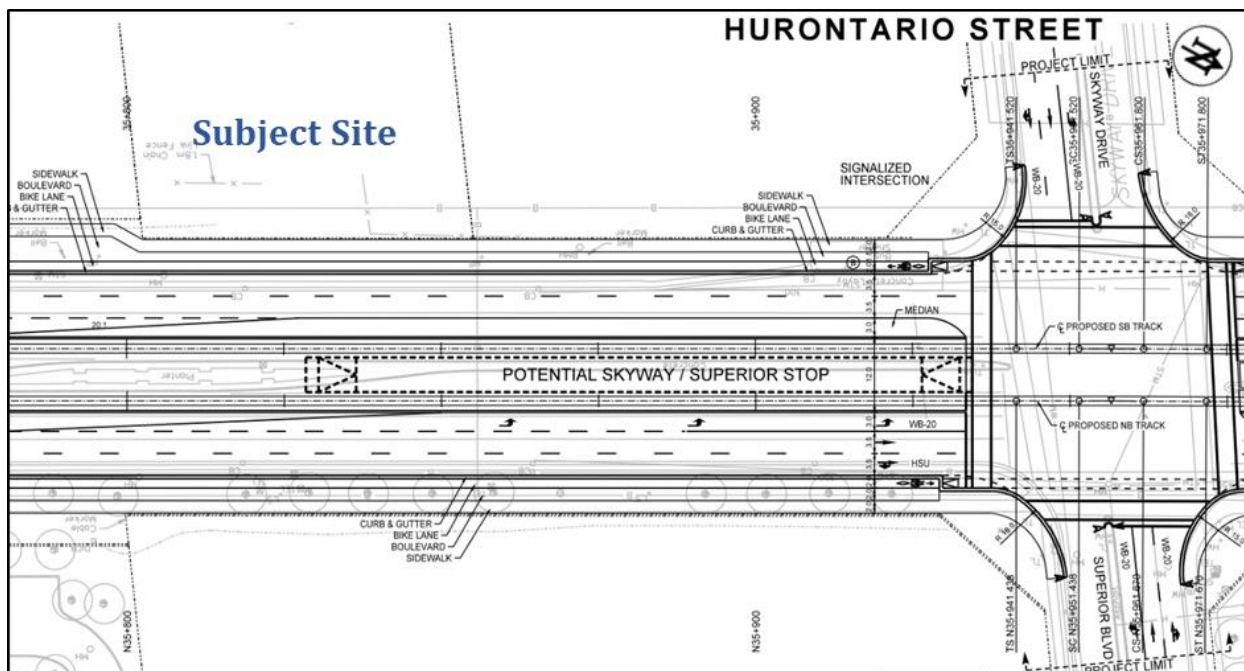
**Figure 1-2: Proposed Site Plan**

Source: IBI Group

## 2 VIBRATION SOURCES

The future Hurontario LRT was identified as the dominant vibration source in the proximity of the subject site. The closest LRT track related to the future Hurontario LRT is located approximately 16 metres to the east of the subject site from the easterly property line. The closest distance from the tracks to the nearest sensitive use of the subject development is approximately 33 metres. No other significant vibration sources have been identified in the vicinity of the subject site.

**Figure 2-1** shows the preferred alignment and potential Skyway stop location of the HMLRT in the proximity of the subject site.



**Figure 2-1 Preferred Alignment of the Hurontario LRT Tracks**

Source: Hurontario/Main Street LRT Preliminary Engineering & TPAP

### 3 VIBRATION ASSESSMENT CRITERIA

The vibration assessment criteria are based on a set of draft protocols developed by the Ministry of Environment (MOE) and the Toronto Transit Commission (TTC) during the 90s. The draft protocols related to the Proposed Waterfront West Light Rail as well as the Proposed Scarborough Rapid Transit Extension were reviewed. For the purposes of the current assessment, the vibration limit of 0.1 mm/s RMS from the Scarborough Rapid Transit Extension was used. This criterion is more conservative when compared to the 0.14 mm/s limit outlined in the draft protocol for the Waterfront West Light Rail project. This is also consistent with the methodology used in the vibration study related to the Transit Project Assessment Process (TPAP) for the proposed Hurontario-Main LRT (HMLRT).

The assessment criteria are summarized in **Table 3-1**

Future Vibration Velocity	Requirements
< 0.10 mm/sec	No mitigation is required
> 0.10 mm/sec	Mitigation methods shall be applied during the detailed design to meet this criterion to the extent of technological, economical and administrative feasibility.

**Table 3-1 Ground-Borne Vibration Criteria based on MOEE/TTC Draft Protocol**

### 4 VIBRATION ASSESSMENT

#### 4.1 METHODOLOGY

The future vibration levels were predicted on the basis of the General Vibration Assessment methodology presented in the US Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual. This methodology consists of predicting vibration levels for Rapid Transit/Light Rail Vehicles based on the curves of vibration level versus distance from the track centerline. Further adjustments were applied to account for vehicle speed, vehicle parameters, track treatments, ground-borne propagation effects, as well as other factors that could potentially affect the vibration levels at the receiver.

#### 4.2 ASSUMPTIONS

**Table 4-1** summarizes our assumptions in the prediction of the future LRT ground-borne vibration levels. For further details please refer to **Appendix A**.

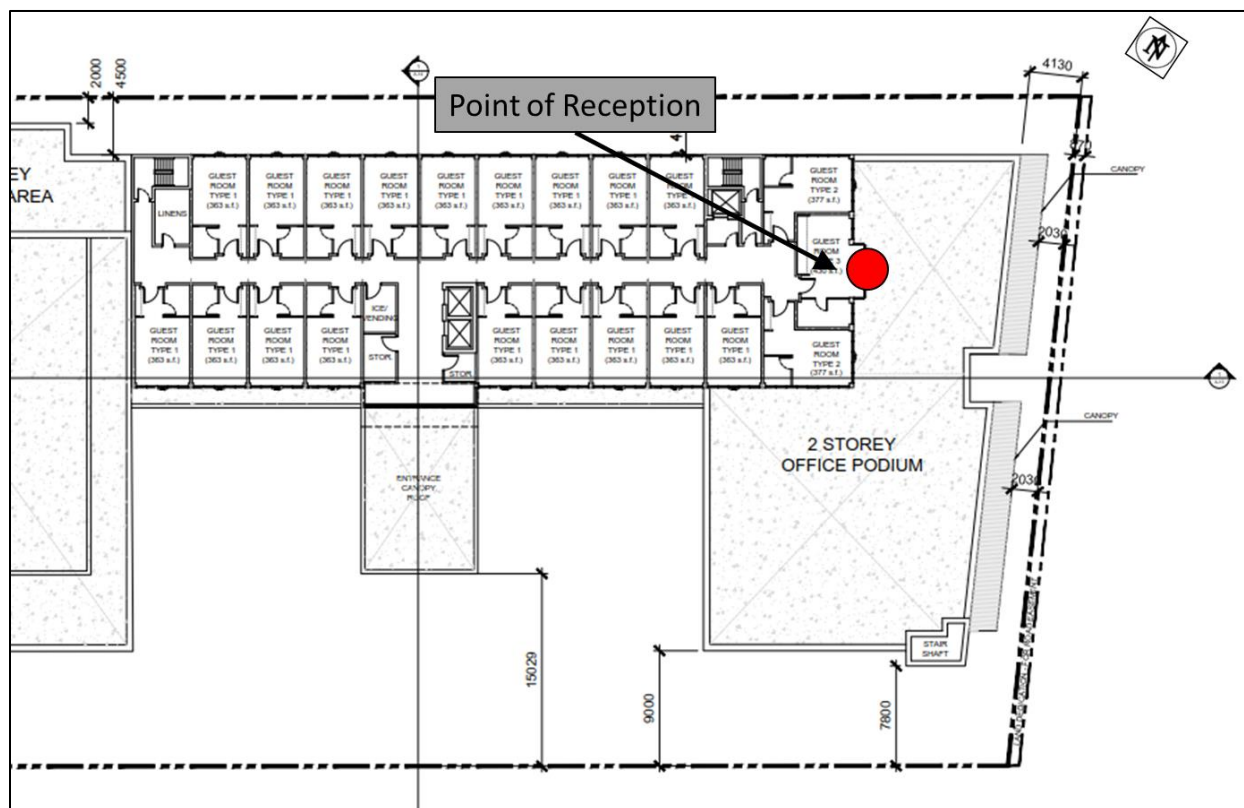
Parameter	Assumption	Basis
Vehicle Speed	80 km/h	As per the Hurontario LRT Environmental Project Report (June 2014) Appendix B12 (Preliminary System Operations Plan), the LRVs are expected to travel at up to 80 km/h in proximity of the subject site.
Vehicle Parameter	No stiff primary suspension, no worn wheels or wheels with flats	New LRVs are typically designed to minimize noise and vibration. As the vehicles and tracks will be new, no corrugation, worn/flat wheels are expected.

Track Conditions	Tangent track near site, with no special work, jointed track segments, or uneven surfaces	Based on our review of Sheet No. LRT-RD-NC049 Appendix A1 of the Hurontario LRT Environmental Project Report (June 2014), the track near of the site will not feature any special track work and will be tangential.
Track Treatments	None	Based on Figure 30 (from Appendix B6 of the of the Hurontario LRT Environmental Project Report (June 2014), no vibration isolation measures are recommended for the LRT tracks near the subject site.
Ground-borne Propagation Effects	Efficient	Efficient ground propagation characteristics were conservatively assumed as the effects of soil composition are not clearly understood in the literature.
Type of Building	Masonry on Spread Footings	Based on discussions with the Architect.

**Table 4-1 Vibration Assessment Assumptions**

### 4.3 OPERATIONAL VIBRATION ASSESSMENT

The predicted vibration levels due to the future Hurontario LRT were assessed at the nearest sensitive use (i.e. nearest hotel room) to the future LRT tracks, located on the second level of the building. This location is illustrated in **Figure 4-1**.



**Figure 4-1 Vibration Assessment Point of Reception**

Source: IBI Group



The predicted vibration levels at the critical receptor location associated with the LRT pass-bys are summarized in **Table 4-1**.

Predicted Vibration Levels	Objective Vibration Levels	Exceeds Objective?
0.04 mm/s	0.10 mm/s	No

**Figure 4-2 Predicted Vibration Levels at the Critical Point of Reception**

As noted in Table 4-1, the predicted vibration levels for the critical point of reception are well below the applicable vibration criteria.

## 5 CONCLUSIONS

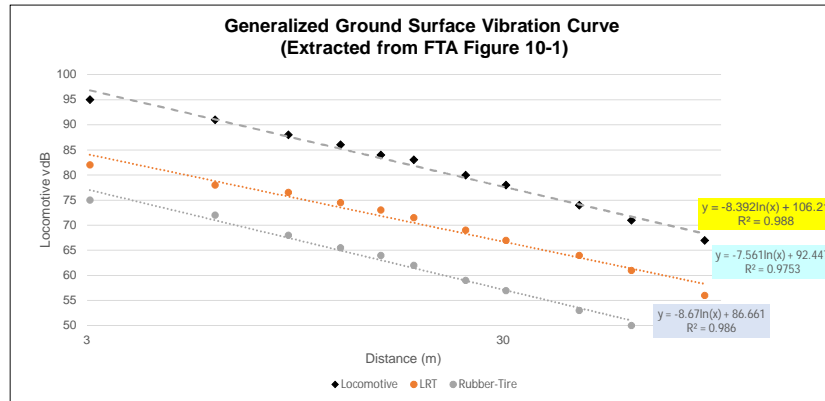
As noted, the predicted vibration levels for the critical point of reception are well below the applicable vibration criteria. This is consistent with the findings from the vibration assessment undertaken for the TPAP for the HMLRT project.

Thus, vibration control measures for the proposed development are not required.

# APPENDIX A

## Vibration Assessment Calculations





From vibration level versus distance from the track centerline curve below (33 metres):

Lv =	66 vdB
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Adjustments:

Vehicle speed to 80 km/h	0 vdB	Curves based on 50 mph (80km/h) speeds
Vehicle Parameters	0 vdB	New LRVs are typically designed to minimize noise and vibration. As the vehicles and tracks will be new, no corrugation, worn/flat wheels are expected.
Track Conditions	0 vdB	Based on our review of Sheet No. LRT-RD-NC049 Appendix A1 of the Hurontario LRT Environmental Project Report (June 2014), the track near of the site will not feature any special track work and will be tangential.
Track Treatments	0 vdB	Based on Figure 30 (from Appendix B6 of the of the Hurontario LRT Environmental Project Report (June 2014), no vibration isolation measures are recommended for the LRT tracks near the subject site.
Ground-borne		
Propagation Effects	10 vdB	Efficient ground propagation characteristics were conservatively assumed as the effects of soil composition are not clearly understood in the literature.
Type of Building	-13 vdB	Masonry on Spread Footings based on discussions with the Architect
Total Adjustments	-3 vdB	

Lv, Adj =	63 vdB	or	0.036 mm/s
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