APPENDIX H

COMPARISON OF FUTURE NOISE BARRIER OPTIONS

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FOR INFORMATION PURPOSES ONLY

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Mr. Hunton,

Re.: Holly Acres to Moodie Drive Transitway Extension
Comparison of Future Noise Barrier Options
GmE File # 09-004

1. Introduction

Gradient Microclimate Engineering Inc. (*GmE*) was retained by McCormick Rankin Corporation (MRC) to conduct environmental noise, air quality and ground vibration studies for the proposed West Transitway expansion from Holly Acres Road to Moodie Drive. As part of an effort to determine the most appropriate location for a noise attenuation barrier, *GmE* has performed comparative calculations for multiple barrier scenarios. This document contains that comparison. For additional project details and noise calculation methodology, please refer to *GmE* report # 09-004-Existing, dated February 3, 2010.

2. Terms of Reference

The preferred Transitway route was selected, according to previous studies, to be that running immediately north and parallel to Highway 417. In an effort to determine the preferred long-term barrier configuration, six scenarios have been assessed and compared that include:

(i) Existing Conditions (base year of 2010).

(ii) Future Do Nothing (FDN – horizon year of 2031). This scenario assumes that the Transitway is not built, and that traffic volumes on all studied roadways increases by 3% per year up to 2031. This scenario also assumes that the number of buses expected to use the Transitway continue to travel along Highway 417.

(iii) FDN with MTO Barrier. This scenario considers that the Transitway is not built, and a retrofit noise wall is constructed by the Ministry of Transportation of Ontario (MTO) on the north side of the Highway 417 west right-of-way.

(iv) Transitway Constructed – No Barriers. This scenario represents the worst case for the horizon year of 2031 in which the Transitway is constructed with no barriers, and there is also no MTO barrier constructed along Highway 417.

(v) Transitway Constructed (year 2031) – With a Highway Barrier only. The Highway Barrier is located between Highway 417 and the Transitway. In this case, the residents would see the Transitway buses and the barrier.

(vi) Transitway Constructed (year 2031) – With a Transitway Barrier only. The Transitway Barrier is located immediately north of the Transitway. In this case, the residents would see the barrier, but not the Transitway buses or Highway 417.

Since previous noise studies performed by the MTO considered a barrier height of 5 meters, this height has been used in all current barrier related calculations. This height may not represent the optimal future height, and is used only to form a basis for comparison, all other factors remaining the same. The results and comparison of noise levels produced by these scenarios are presented in the following section.

3. Results

The following Table 1 provides a summary of the total noise levels produced for each scenario.

TABLE 1: SUMMARY OF TOTAL NOISE LEVELS (LEQ, DBA)

Scenario	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Receptor	Existing Condition	Future Do Nothing (FDN)	FDN With MTO Highway Barrier	Transitway Constructed - No Barriers	Transitway Constructed - With Highway Barrier	Transitway Constructed - With Transitway Barrier
5	57.2	59.3	56.3	59.2	56.6	58.0
7	57.1	59.1	56.6	59.1	56.7	59.0
10	58.1	60.0	56.6	59.9	56.7	58.7
12	58.2	60.1	57.9	60.1	58.0	60.0
14	63.0	64.3	56.1	64.2	57.9	57.3
15	60.1	62.3	55.5	62.0	57.5	56.3
18	60.5	62.4	55.6	62.4	56.9	56.6
20	58.8	61.1	55.1	60.6	56.1	55.9
23	57.7	59.6	52.4	59.5	52.3	52.5
25	62.5	64.8	61.9	65.5	62.0	62.0

Based on the noise levels presented in the last two columns of Table 1, and given that humans cannot perceive noise level changes less than 3 dBA, the location of the barrier is inconsequential (with respect to L_{EQ}, which is based on daily averaging) with respect to noise attenuation performance. For scenario (v), the improved acoustical attenuation performance of the Highway 417 barrier is negated by the reflection of Transitway noise back into the community.

The following Table 2 summarizes the noise levels produced only by the Transitway, and its contribution to environmental noise levels for multiple future scenarios.

TABLE 2: SUMMARY OF TRANSITWAY NOISE LEVELS (L_{EQ} DBA) WITHOUT HIGHWAY CONTRIBUTION

Receptor	Transitway Constructed - No Barriers		Transitway Constructed - With Highway Barrier		Transitway Constructed - With Transitway Barrier	
	Transitway Noise	Transitway Contribution To Total Noise In Table 1	Transitway Noise	Transitway Contribution To Total Noise In Table 1	Transitway Noise	Transitway Contribution To Total Noise In Table 1
5	40.5	0.1	43.1	0.2	37.1	0.0
7	44.3	0.1	46.2	0.4	39.2	0.0
10	44.0	0.1	46.6	0.5	42.6	0.1
12	44.2	0.1	46.7	0.3	41.2	0.1
14	50.8	0.2	53.5	2.5	37.6	0.0
15	48.6	0.2	53.6	3.0	37.8	0.1
18	48.6	0.2	51.3	1.7	35.3	0.0
20	47.1	0.2	49.9	1.4	33.6	0.0
23	45.6	0.2	47.4	2.0	29.9	0.0
25	51.1	0.2	52.9	0.6	36.3	0.0

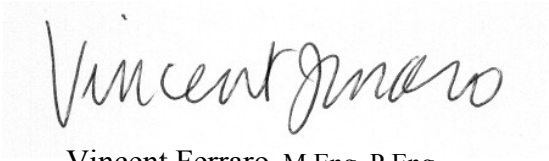
A review of Table 2 indicates that a barrier constructed along Highway 417 (i.e. the Highway Barrier option) would result in Transitway noise levels that contribute most to local environmental noise. This effect occurs as a result of unmitigated bus noise, and the reflection of bus noise from the noise barrier back into the community. Due to the performance of the highway barrier, noise levels produced by the unmitigated transitway will have a greater impact on the overall level from the Transitway and Highway 417. The influence of the Transitway may be perceptible to the vast majority of the population near receptors 14, 15 and 23 where the contribution of the Transitway approaches 3 dBA.

In summary, in terms of total noise exposure based on the weighted hourly average L_{EQ}, there is no significant benefit to the Highway barrier versus the Transitway barrier. However, the Transitway barrier is preferable to the Highway barrier, since it would result in buses having a lower contribution to noise levels in the adjacent community.

Yours truly,

Gradient Microclimate Engineering Inc.

Adam Welburn, Technologist



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