MISSISSAUGA ROAD
CLASS ENVIRONMENTAL ASSESSMENT

BOVAIRD DRIVE WEST TO
ADAMSVILLE ROAD

ROAD TRAFFIC NOISE IMPACT STUDY

Final Report

Submitted to:

The Regional Municipality of Peel
10 Peel Centre Drive
Suite A and B
Brampton, ON L6T 4B9

Submitted by:

Amec Foster Wheeler Environment & Infrastructure
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August 31, 2017

TP115085

August 31, 2017

Ref: TP115085

Gino Dela Cruz, Project Manager
The Regional Municipality of Peel
10 Peel Centre Drive, Suite A and B
Brampton, ON L6T 4B9

Dear Mr. Dela Cruz,

Re: Road Traffic Noise Impact Assessment in Support of a Municipal Class Environmental Assessment for Mississauga Road between Bovaird Drive West and Adamsville Road

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler), is pleased to provide the attached Road Traffic Noise Impact Study to be used in support of a Municipal Class Environmental Assessment for the proposed improvements and widening of Mississauga Road between Bovaird Drive and Adamsville Road.

Should you have any questions regarding the study or its findings, please do not hesitate to contact us.

Yours truly,

Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited

Buddy Ledger, P.Eng., M.A.Sc., INCE
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EXECUTIVE SUMMARY

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler) was retained by The Regional Municipality of Peel (Peel Region) to complete a Road Traffic Noise Impact Study for improvements and widening of Mississauga Road between Bovaird Drive West and Adamsville Road. This work was completed in support of a Municipal Class Environmental Assessment (EA) for the proposed improvements along Mississauga Road in the city of Brampton, Ontario.

The noise guidelines applicable are the MOEE/MTO joint protocol, The Region of Peel corporate policy W30-04, and The City of Brampton document “Noise Attenuation – Retrofit Policy and Road Widenings”. The project was assessed using the limits provided by these sources.

The results of the noise impact study indicated that the maximum noise impacts along Mississauga Road are predicted be 3 dB or less when comparing the Future “build” and Future “no-build” scenarios. Therefore, in accordance with the MOEE/MTO protocol consideration of noise mitigation is not a requirement under that guideline.

The predicted Future “build” levels are predicted to be above the Peel Region and City of Brampton 60 dBA criterion at three locations (R10, R11 and R28). However, these locations are frontage lots and therefore the Peel Region and City of Brampton Noise Attenuation Policies do not apply.

Therefore consideration for noise mitigation is not required for proposed improvements and widening of Mississauga Road between Bovaird Drive and Adamsville Road.

Construction noise impacts are temporary and largely unavoidable. However, the contract documents should identify the contractor’s responsibilities with respect to controlling noise as well as recording, investigating and if possible addressing complaints. The contract documents should also explicitly state that compliance with all applicable law is an expectation of the contract including adherence to the Brampton Noise By-Law 93-84.

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1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler) was retained by The Regional Municipality of Peel (Peel Region) to complete a Road Traffic Noise Impact Study (Noise Impact Study) for improvements and widening of Mississauga Road between Bovaird Drive West and Adamsville Road. This work was completed in support of a Municipal Class Environmental Assessment (EA) for the proposed improvements along Mississauga Road in the City of Brampton, Ontario.

RWDI has completed an "Environmental Noise Impact Assessment" in 2006 for Mississauga Road between Bovaird Drive and Queen Street [1]. The current study supersedes that work from Bovaird Drive to Adamsville Road but does not address the segment between Adamsville Road to Queen Street since this segment has already been built out to the ultimate 6-lane configuration.

1.1 Definition of Study Area

The study area was comprised of approximately 1.1 kilometers of Mississauga Road. The western extent of the study area was Bovaird Drive West, and the eastern extent was the intersection of Adamsville Road. The study area is presented in Appendix A.

1.2 Description of Scenarios

Three scenarios were considered as part of this noise impact study:

1. Existing (2017);
2. Future "no-build" (2031); and,
3. Future "build" (2031).

Existing (2017): Consists of a 2-lane cross-section from Bovaird Drive to Royal West Drive. A 2-lane cross-section starting at Royal West Drive transitioning to a 4-lane cross-section at Williams Parkway. A 4-lane cross-section from Williams Parkway to Beacon Hill Drive. A 4-lane cross-section starting at Beacon Hill Drive and transitioning to a 6-lane cross-section at Adamsville Road. There are also existing additional turning lanes throughout the study area.

Future "no-build" (2031): Consists of the same lane configurations as Existing (2017) but with increased traffic volumes due to local population growth.

Future "build" (2031): Consists of a 6-lane cross-section from Bovaird Drive to Adamsville Road with additional turning lanes.

2.0 ENVIRONMENTAL NOISE GUIDELINES

Environmental noise is typically assessed based on noise or sound levels. The term “noise level” in this context typically refers to the equivalent continuous sound pressure level (L_{EQ}) expressed in A-weighted decibels (dBA referenced to 20µPa) having the same total sound energy as a time-varying sound pressure level over a specified time period. It is important to note that, although environmental noise is reported in A-weighted decibels (dBA), the difference between two A-weighted values is reported in decibels (dB).

Road traffic noise impact assessments for road widenings (under the Municipal Class EA process) typically consider outdoor noise levels only. This limitation is a result of the fact that the only practical noise mitigation measure under such circumstances are retrofit noise barriers as alterations to existing residential building envelopes is not considered practical or feasible. Therefore, this road traffic noise assessment is limited to the assessment of Outdoor Living Areas (OLA).

2.1 Perception of Increases in Sound Level

Increases in noise level can be ranked as shown in Table 2.1 below. This ranking information is based on general practice and is documented within the draft MOEE/GO Transit noise and vibration protocol [2].

Table 2.1: Perception of Changes in Noise Level

Change in Noise Level (dB)	Perception of Change
0 to less than 3	Insignificant
3 to less than 5	Noticeable
5 to less than 10	Significant
Over 10	Very Significant

2.2 Noise Guidelines which are Applicable to the Project

The following sections describe the noise guidelines which are both applicable within the projects geographical area and appropriate for a project of this type.

2.2.1 Provincial – MOEE/MTO Protocol

The Ontario Ministry of the Environment and Climate Change (MOECC), formerly the Ministry of Environment (MOE) and before that the Ministry of Environment and Energy (MOEE), does not have a specific noise guideline for the assessment of regional or municipal road improvements, widenings or expansions. However, the MOECC does have a protocol which was developed with the Ontario Ministry of Transportation (MTO) which relates to road traffic noise assessments of provincial highway improvements. Although not specifically intended for this

purpose this guideline is typically adopted within Ontario to assess regional and municipal road improvement projects.

The MOEE/MTO joint protocol "A Protocol for Dealing with Noise Concerns during the Preparation, Review and Evaluation of Provincial Highway's Environmental Assessments" [3] states that if the expected noise impact of implementing the roadway improvements is 5 dB or less, then noise mitigation need not be considered. Conversely if the noise impact is expected to be greater than 5 dB, an investigation into possible noise mitigation measures is required. Noise impact is defined as the difference between the future "build" noise level with the proposed improvements and the future "no-build" noise level without the proposed improvements. To be economically feasible (cost effective), the protocol states that noise control measures should achieve a minimum attenuation of 5 dB at the OLAs when averaged over the first row of receivers. The objective noise level is stated to be 55 dBA and thus an impact of greater than 5 dB but resulting in an overall noise level of less than or equal to 55 dBA would not require consideration of noise mitigation since the objective level is already met. Therefore, if the noise impact is greater than 5 dB and the overall sound level is greater than 55 dBA, investigation of noise mitigation is required.

The MOEE/MTO protocol does not outline the detailed requirements of the noise assessment. However, the protocol does refer to the Ontario Ministry of Transportation and Communication (MTC) Directive A-1 [4], which does outline the specific requirements of noise assessment.

According to Directive A-1 the noise assessment should be based on the 24-hour L_{eq} noise level. This is appropriate for provincial highways since the day-time (07:00 to 23:00) traffic volume typically accounts for roughly 66 percent of the total daily traffic with the remainder of the traffic occurring during night-time (23:00 to 07:00). However, for regional and municipal roads the majority of the traffic occurs during day-time hours. Thus it is more appropriate to assess regional and municipal roads based on the day-time 16-hour L_{eq} (07:00 to 23:00).

2.2.2 Peel Region – Noise Attenuation Barriers

The Region of Peel corporate policy W30-04 [5] outlines the specific circumstances under which the Region will consider the construction of noise barriers for existing reverse frontage dwellings. According to this document, noise attenuation will be considered for OLAs for existing residential properties when the noise levels are predicted to be above 60 dBA (16-hour LEQ) and only if a reduction of 5 dB or more can be achieved for the 16 hour period between 07:00 and 23:00.

2.2.3 City of Brampton – Noise Attenuation Policy

The City of Brampton document "Noise Attenuation – Retrofit Policy and Road Widenings" [6] specifically addresses the noise levels calculated from proposed road widening within the City. According to this document, noise attenuation will be considered for OLAs for existing residential properties when the noise levels are predicted to be above 60 dBA (16-hour L_{EQ}) and

only if a reduction of 5 dB or more can be achieved for the 16 hour period between 07:00 and 23:00.

In the event that a noise wall is proposed to attenuate traffic noise levels at the residential properties adjacent to the road widening, the funding would be provided as part of the Capital Road project (per the City's six-lane widening policy).

2.3 Noise Guidelines which are not Applicable to the Project

The following sections describe the noise guidelines which are applicable within the projects geographical area but which are not appropriate for a project of this type. These are discussed here to acknowledge their existence, briefly describe them and ultimately provide a rational for their exclusion from consideration in the context of this project. This section should not be regarded as exhaustive or complete but instead only discusses the most commonly known guidance sources applicable to this geography but which are not applicable to this project.

2.3.1 Provincial - MTO Environmental Noise Guide

The Ontario Ministry of Transportation (MTO) "Environmental Noise Guide" [7] (MTO Noise Guide) states that it was developed to provide guidance for MTO personnel and consultants in the analysis of highway noise and its effects. The MTO noise guide establishes that if predicted noise impact is less than 5 dB and the overall sound level is less than 65 dBA, then noise mitigation need not be considered. Conversely if the noise impact is found to be greater than or equal to 5 dB or the overall sound level is greater than or equal to 65 dBA, then noise mitigation must be considered. Noise impact is defined as the difference between the future noise level with and without the proposed roadway improvements. To be economically feasible (cost effective), the guide states that noise control measures should achieve a minimum attenuation of 5 dB when averaged over the first row of receivers.

The MTO Noise Guide applies only to provincial highways and freeways under MTO jurisdiction and therefore does not apply to this project.

2.3.2 Provincial – NPC-300

The MOECC publication NPC-300 "Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning" [8] Part C "Land Use Planning" provides guidelines and criteria for the assessment of road traffic noise in the context of the municipal land use planning process. The acceptable noise level for an OLA as defined in this document is 55 dBA (day-time, 16-hour L_{eq}), which is consistent with the goal of the MOEE/MTO joint protocol [3]. The MOECC guidelines allow an exceedance of up to 5 dB without any mitigation required provided that prospective purchasers or tenants are informed via an appropriate title warning clause. When the OLA sound levels exceed 60 dBA (day-time, 16-hour L_{eq}), physical mitigation is required to reduce the sound levels.

There are no night-time sound level criteria for the OLA, as the MOECC considers the OLA to be used during the daytime only.

NPC-300 Part C is intended to provide guidance with respect to the municipal land-use planning process and is relevant when assessing proposed developments adjacent to existing roadways. It is not applicable to Municipal Class Environmental Assessments of new or upgraded road transportation infrastructure and thus is not applicable to this project.

2.3.3 Peel Region – Guidelines for Acoustical Reports

The Region of Peel "Guidelines for Acoustical Reports" [9] (Peel Guideline) specifies a sound level limit at OLA between the hours of 07:00 and 23:00 (16-hour L_{eq}) of 55 dBA. The sound level limit may be exceeded by up to 5 dB as noise mitigation costs for reductions less than 5 dB are not considered economically feasible. However, when designing noise barrier walls, the design criteria is 55 dBA and the design should provide the maximum amount of attenuation that is aesthetically, technically, administratively and economically practical.

The Peel Guideline is intended to provide guidance with respect to the municipal land-use planning process and is relevant when assessing proposed developments adjacent to existing roadways. It is not applicable to Municipal Class Environmental Assessments of new or upgraded road transportation infrastructure and thus is not applicable to this project.

3.0 PROJECT NOISE CRITERIA

This section outlines the specific noise criteria drawn from the documents discussed in Section 2.2 which apply to this project. Table 3.1 provides a summary of the criteria consideration of noise mitigation which are applicable to this project.

Table 3.1: Project Noise Criteria

Daytime $L_{eq-16hr}$ (dBA)	**Noise Impact (dB)**	**Mitigation Effort Required**
> 55 dBA	> 5 dB	• Mitigation in accordance with the MOEE/MTO Noise Protocol; • Investigate noise mitigation measures within the Right-of-Way; • Noise mitigation measures, where introduced, should achieve a minimum of 5 dB attenuation, over first row receivers.
> 60 dBA	-	• If reverse frontage investigate mitigation in accordance with the Region of Peel and City of Brampton retrofit policies; • Noise mitigation measures, where introduced, should achieve a minimum of 5 dB attenuation, over first row receivers; • The Region of Peel and City of Brampton policies have further non-technical, including financial, requirements which must be met to warrant mitigation effort.
All other cases		• None.

4.0 NOISE IMPACT ASSESSMENT METHODOLOGY

This section outlines the noise impact methodology which was applied to the assessment of this project.

4.1 Road Traffic Data

A detailed “Transportation and Traffic Analysis Report” was completed for the project by Paradigm Transportation Solutions Limited [10] (Traffic Study). The Traffic Study provided figures showing the AM peak hour and PM peak hour traffic volumes. Three scenarios were provided Balanced Existing (2017), Future (2031) Traffic Growth and Future (2031) Total Traffic these scenarios correspond to Existing, Future “no-build” and Future “build” scenarios respectively. The southbound Annual Average Daily Traffic (AADT) value was estimated by assuming that the AM peak hour volume represented 10% of the daily southbound traffic. Whereas the northbound AADT value was estimated by assuming that the PM peak hour volume represented 10% of the daily northbound traffic. This was consistent with the predominant traffic flow trend consisting of heavy morning southbound traffic and heavy evening northbound traffic.

The day night traffic splits and percentages of heavy and medium trucks were not provided in the Traffic Study. Therefore, the values from the 2006 Class EA noise assessment for this section of Mississauga Road [1]. The day night split was therefore assumed to be 89% day-time and 11% night-time which is within the typical range for non-highway roads. Heavy and medium trucks were assumed to be 8% and 2%, respectively, of total traffic volume. The posted speed within the study area is 80 kph.

A summary of the traffic data used for the Noise Impact Study is provided in Appendix B.

4.2 Noise Modelling

STAMSON V5.04 (2000) is a computerized implementation of the road and rail traffic noise prediction methods described in ORNAMENT [11] (Ontario Road Noise Analysis Method for Environment and Transportation) and STEAM [12] (Sound from Trains Environmental Analysis Method). Older modelling software and models such as STAMSON/ORNAMENT are limited to assessing idealized two dimensional vertical slices. This limitation is primarily due to the limited computer resources available at the time of their development 1993 and 1989 for STAMSON and ORNAMENT, respectively (Although STAMSON V5.04 was released in 2000 the original STAMSON program was released in 1993). The use and application of STAMSON is further limited by the fact that it is a 16-bit DOS program and thus will not run on modern computers without the aid of specialist virtualization as modern computer processors no longer include native 16-bit instructions sets.

To take advantage of modern computing capabilities the road traffic noise levels for this project were calculated using the CadnaA implementation of TNM 2.5. Cadna/A is a modern noise

prediction and modelling software suite which implements many internationally recognized calculation models and standards for noise propagation and prediction from industrial, rail and road traffic sources. CadnaA was selected for its ability to utilize the available CAD and GIS data to model complex terrain and barrier configurations to account for the various resulting vantage points, in three dimensions, from sources to points of reception which occur in the natural and built physical environments. The TNM 2.5 noise model is published by the United States Federal Highway Administration and represents the most recently acquired and standardized database of North American vehicle fleet noise emissions.

Based on the traffic data, daytime noise levels were calculated at the OLAs. The OLA location was selected in the rear yard in accordance with the guideline requirements. Reverse frontage and side-frontage exposures to Mississauga Road were assessed. Existing noise barriers and those currently proposed along Mississauga Road for the new developments were included in the noise predictions. The digital terrain model of the area was obtained from the City of Brampton and this was used to model the terrain within the study area. Two areas within the study area are currently under development. The noise reports supporting these developments ([13], [14]) were reviewed to determine the proposed grading and barrier configurations. These details were reproduced in the modelling in key receptor areas to accurately assess noise impacts at these locations. It is worth mentioning that the grading plans for these developments did not always match with the elevation data used within the associated noise reports. It would be advisable in cases where barriers have not yet been constructed to request confirmation of the noise study conclusions when taking into account the most recent grading plans.

Mississauga Road was the dominant source of noise considered in the traffic noise impact study. The noise level contributions from roads crossing Mississauga Road were neglected. This is a conservative approach as these secondary noise sources would reduce the significance of noise level changes (impact) due to the widening of Mississauga Road. Mississauga Road has the greatest future traffic volume and traffic speed when compared to the roads which cross it. As a further justification of this approach note that since the Mississauga Road crossings are at grade, traffic can only flow at speed on one of the crossing roadways at any given time.

4.3 Location of Noise Sensitive Areas

The focus of this assessment was to predict the noise levels at properties that back onto or side onto Mississauga Road between Bovaird Drive and Adamsville Road.

Twenty-eight representative receptors were selected to predict the future noise levels as a result of the proposed Mississauga Road widening. These locations are expected to be the most affected by the noise associated with the roadway improvements. Predicted noise levels were assessed in the OLA of each receptor location. The OLA locations were modelled at 1.5 metres (m) high and 3 m horizontally from the rear wall of the residence. Other residences with similar setback and orientation to the noise source will receive similar sound exposure and noise

impacts. Table 4.1 summarizes the receptor numbers and their locations and illustrations of their locations are provided in Appendix A.

Table 4.1: Receptor Locations and Elevations

Location	Coordinates[1] (m)		Elevations[2] (m)	
	Northing	Easting	Receptor	Ground
R01	594584.30	4835618.70	242.20	240.70
R02	594852.80	4835119.80	237.40	235.90
R03	594863.40	4835108.70	237.40	235.90
R04	594876.30	4835095.90	237.70	236.20
R05	594890.10	4835090.20	237.70	236.20
R06	594942.50	4835042.90	237.40	235.90
R07	594943.20	4835033.80	237.20	235.70
R08	595036.00	4834939.00	239.20	237.70
R09	595043.70	4834931.90	239.40	237.90
R10	594808.00	4834879.50	240.00	238.50
R11	595220.40	4834786.60	240.90	239.40
R12	595696.50	4834277.60	232.20	230.70
R13	595649.90	4834213.80	232.00	230.50
R14	595800.60	4834185.70	230.90	229.40
R15	595805.90	4834181.90	230.70	229.20
R16	595863.00	4834127.80	229.60	228.10
R17	595752.00	4834121.60	230.00	228.50
R18	595865.50	4834118.10	229.70	228.20
R19	595751.00	4834109.40	229.70	228.20
R20	595813.80	4834057.20	229.10	227.60
R21	595818.00	4834053.60	229.10	227.60
R22	595969.30	4834016.70	228.00	226.50
R23	595975.10	4834011.10	227.70	226.20
R24	595861.60	4833992.90	228.00	226.50
R25	595911.60	4833927.50	225.20	223.70
R26	596139.80	4833854.50	220.50	219.00
R27	596154.20	4833838.20	219.40	217.90
R28	596038.00	4833815.00	221.10	219.60

Notes:

1. Northing and Easting coordinates are provided in the UTM coordinate projection using datum NAD83 zone 17N.
2. The receptor and ground elevations provided are the elevations above sea level. All receptors were modeled at a relative elevation of 1.5 m above ground.

5.0 RESULTS

The following sections describe the noise prediction results, noise impact assessment results and the resulting noise mitigation recommendations.

5.1 Noise Modelling Results

The predicted average sound levels for the Existing, Future "no-build" and Future "build" scenarios are summarized in Table 5.1.

Table 5.1: Noise Level Predictions

Location	Existing Daytime (16-hr) L_{eq} (dBA)	Future "no-build" Daytime (16-hr) L_{eq} (dBA)	Future "build" Daytime (16-hr) L_{eq} (dBA)	Noise Impact[1] (dB)	5 dB or Greater Impact? (Yes/No)	Above 60 dBA Criterion?[1] (Yes/No)
R01	49.8	53.3	55.5	2.3	No	No
R02	53.1	55.3	58.5	3.1	No	No
R03	53.8	56.2	58.6	2.4	No	No
R04	54.4	56.8	59.8	3.0	No	No
R05	52.4	54.8	57.2	2.4	No	No
R06	50.6	52.0	55.3	3.3	No	No
R07	52.0	53.6	56.8	3.2	No	No
R08	54.5	56.6	59.8	3.2	No	No
R09	55.0	57.0	59.9	2.9	No	No
R10	56.8	59.1	61.4	2.3	No	**Yes**
R11	56.2	58.5	60.9	2.4	No	**Yes**
R12	56.8	58.0	59.9	1.9	No	No
R13	53.9	55.9	57.3	1.4	No	No
R14	53.8	55.5	57.3	1.8	No	No
R15	52.9	54.7	56.3	1.7	No	No
R16	52.2	53.9	55.3	1.3	No	No
R17	55.4	56.9	59.5	2.6	No	No
R18	55.3	57.0	58.7	1.6	No	No
R19	53.3	55.0	56.9	1.9	No	No
R20	55.1	56.3	58.6	2.2	No	No
R21	55.6	57.0	59.1	2.0	No	No
R22	54.7	55.3	57.3	2.0	No	No
R23	54.5	55.1	56.5	1.5	No	No
R24	56.7	57.1	59.8	2.7	No	No
R25	53.9	53.8	57.1	3.3	No	No
R26	56.4	58.4	60.4	2.0	No	No
R27	55.6	57.3	59.3	2.0	No	No

Location	Existing Daytime (16-hr) L_{eq} (dBA)	Future "no-build" Daytime (16-hr) L_{eq} (dBA)	Future "build" Daytime (16-hr) L_{eq} (dBA)	Noise Impact[1] (dB)	5 dB or Greater Impact? (Yes/No)	Above 60 dBA Criterion?[1] (Yes/No)
R28	56.5	58.2	60.7	2.5	No	**Yes**

Notes:
1. The noise impact is defined as the Future "build" noise level minus the Future "no-build" noise level.

The maximum predicted noise impact from Table 5.1, when rounded to the nearest whole decibel is 3 dB. Therefore, in accordance with the MOEE/MTO protocol consideration of noise mitigation is not a required under that guideline.

The predicted Future "build" levels are predicted to be above the 60 dBA criterion, when rounded to the nearest whole decibel, at three locations (R10, R11 and R28). However, these locations are frontage lots and therefore the Peel Region and City of Brampton Noise Attenuation Policies do not apply.

5.2 Mitigation Recommendations

Based on the noise modelling results presented in Table 5.1 consideration for noise mitigation is not a requirement for the project.

6.0 CONSTRUCTION NOISE

The following sections describe policies to consider with respect to the generation and mitigation of construction noise related to the project.

6.1 Local By-Laws

The Brampton Noise By-Law 93-84 [15] of the Corporation of the City of Brampton states that any sound arising from road work and road improvements undertaken by or on behalf of the Ministry of Transportation (Ontario) or the Region of Peel (202-2006) are specifically permitted and the presence of these sounds and noises is not to be considered a contravention of the By-Law.

6.2 MOECC Sound Emission Standards

MOECC Publication NPC-115 provides sound emission standards for various types of construction equipment. Due to the temporary and unavoidable nature of construction, these MOECC guidelines stipulate limits on individual pieces of equipment instead of a site limit. Table 6.1 illustrates maximum noise emission levels which should be adhered to for typical construction equipment per NPC-115.

Table 6.1: NPC-115 Noise Emission Limits for Construction Equipment

Type of Equipment	Maximum Sound Level (dBA)(1)	Power Rating (kW)
Excavation equipment, bulldozers, loaders, backhoes or other equipment	**83**	**Less than 75**
	85	**75 and greater**
Pneumatic Pavement Breakers	**85**	**-**
Portable Air Compressors	**70**	**-**

(1) Maximum Sound Level (dBA) as determined using Publication NPC – 103 – Procedures, Section 6

6.3 Contract Documentation

The construction contract should include provisions relating to the adequate control of noise, compliance with related laws, establishment of a complaints process and outline the responsibilities with respect to investigations of noise up to and including remedial measures.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The results of the noise impact study indicated that the noise impacts along Mississauga Road are predicted be less than 5 dB when comparing the Future “build” and Future “no-build” scenarios. Therefore, in accordance with the MOEE/MTO protocol consideration of noise mitigation is not required. Further the predicted change in noise levels would result in a ‘noticeable’ (see Table 2.1) change between the Future “no-build” and Future “build” scenarios.

The predicted Future “build” levels are above the 60 dBA criterion at three locations (R10, R11 and R28). However, these locations are frontage lots and therefore the Peel Region and City of Brampton Noise Attenuation Policies do not apply.

Therefore consideration for noise mitigation is not required for proposed improvements and widening of Mississauga Road between Bovaird Drive and Adamsville Road.

Construction noise impacts are temporary and largely unavoidable. However, the contract documents should identify the contractor’s responsibilities with respect to controlling noise, as well as recording, investigating and if possible addressing complaints. The contract documents should also explicitly state that compliance with all applicable law is an expectation of the contract including adherence to the Brampton Noise By-Law 93-84.

8.0 REFERENCES

[1] RWDI, "Environmental Noise Impact Assessment Mississauga Road, Brampton, Ontario," November 14, 2006.

[2] MOEE/GO Transit, "Noise and Vibration Protocol," January 1995 (Draft #9).

[3] MTO/MOEE, "A Protocol for Dealing with Noise Concerns during the Preparation, Review and Evaluation of Provincial Highways Environmental Assessments," The Queen's Printer for Ontario, 1986.

[4] Ontario Ministry of Transportation, "Directive A-1: Noise Policy and Acoustic Standards Provincial Highways," February 1992.

[5] The Regional Municipality of Peel, "Noise Attenuation Barriers. Policy No.:W30-04," June 1996.

[6] The Corporation of the City of Brampton, "Noise Attenuation - Retrofit Policy and Road Widenings," October 2007.

[7] Ontario Ministry of Transporation, "Environmental Guide for Noise," October 2006 (Version 1.1 updated July 2008).

[8] Ontario Ministry of the Environment and Climate Change, *Environmental Noise Guideline NPC-300,* (updated final version #22) ed., Ontario: © Queen's Printer for Ontario, 2013, 2013, p. 65.

[9] The Regional Municiapality or Peel, "General Guidelines for the Preparation of Acoustical Reports in the Region of Peel," December 2002.

[10] Paradigm Transportation Solutions Limited, "Mississauga Road Class EA Study - Transportation and Traffic Analysis Report," February 2017.

[11] Ontario Ministry of the Environment and Climate Change, "Ontario Road Noise Analysis Method for Environment and Transportation, ORNAMENT.," October 1989.

[12] Ontario Ministry of the Environment and Climate Change, "Sound from Trains Environment Analysis Method, STEAM," July 1990.

[13] Valcoustics Canada Limited, "Environmental Noise Feasibility Study Bluegrass Valley," February 13, 2014.

[14] Jade Acoustics, "Detailed Environmental Noise Report Four X Developments," April 16, 2015.

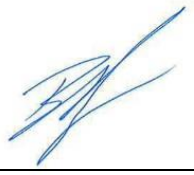
[15] The Corporation of the City of Brampton, "Noise By-Law 93-84," April 25, 1984.

9.0 CLOSURE

This road traffic noise impact study was completed by Amec Foster Wheeler for the sole benefit of the Region of Peel, and is based on information available at the time of this study. We have relied on information provided to us by others and therefore are not liable or responsible for incomplete, incorrect and inadequate information. The material in it reflects Amec Foster Wheeler's judgment in light of the information available to us at the time of preparation

Yours truly,
Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited

Written by: Buddy Ledger, P.Eng., M.A.Sc., INCE
Senior Acoustics Engineer / Group Lead

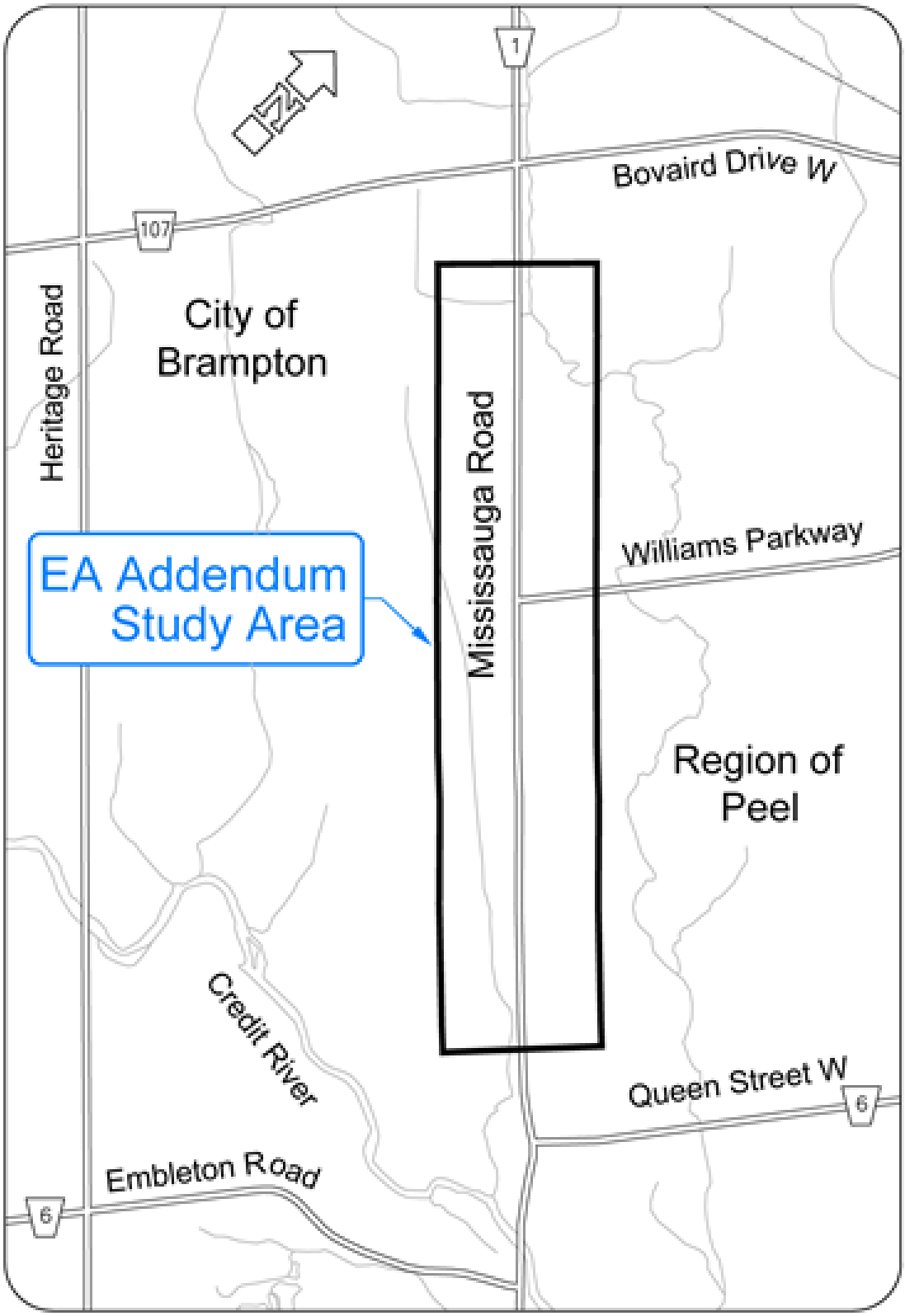
Signature:  Date: August 31, 2017

Reviewed by: Mohammed Salim, P.Eng.
Senior Acoustics Engineer

Signature:  Date: August 31, 2017

APPENDIX A

STUDY AREA AND RECEPTOR MAPS


N
1
Bovaird Drive W
107
Heritage Road
City of
Brampton
Mississauga Road
Williams Parkway
EA Addendum
Study Area
Region of
Peel
Credit River
Queen Street W
6
Embleton Road
6


R01
R02
R03
R04
R05
Receptor Map 1
Road
Building
Barrier
Ground Absorption
Height Point
Contour Line
Receiver
Calculation Area
594200
594250
594300
594350
594400
594450
594500
594550
594600
594650
594700
594750
594800
594850
594900
594950
4835550
4835500
4835450
4835400
4835350
4835300
4835250
4835200
4835150


594700
594750
594800
594850
594900
594950
595000
595050
595100
595150
595200
595250
595300
595350
595400
595450
4835100
4835050
4835000
4834950
4834900
4834850
4834800
4834750
4834700
R02
R03
R04
R05
R06
R07
R08
R09
R10
R11
Receptor Map 2
Road
Building
Barrier
Ground Absorption
Height Point
Contour Line
Receiver
Calculation Area

595050 595100 595150 595200 595250 595300 595350 595400 595450 595500 595550 595600 595650 595700 595750 595800

4834700
4834650
4834600
4834550
4834500
4834450
4834400
4834350
4834300
4834250

R11
R12
R13

Receptor Map 3

- Road
- Building
- Barrier
- Ground Absorption
- Height Point
- Contour Line
- Receiver
- Calculation Area

595550 595600 595650 595700 595750 595800 595850 595900 595950 596000 596050 596100 596150 596200 596250 596300

4834250
4834200
4834150
4834100
4834050
4834000
4833950
4833900
4833850

R12 R14 R15 R16 R18 R22 R23 R26 R27

R13 R17 R19 R20 R21 R24 R25 R28

Receptor Map 4

- Road
- Building
- Barrier
- Ground Absorption
- Height Point
- Contour Line
- Receiver
- Calculation Area

595550 595600 595650 595700 595750 595800 595850 595900 595950 596000 596050 596100 596150 596200 596250 596300

APPENDIX B

SUMMARY OF TRAFFIC DATA

Summary Traffic Data Table

Road Segment	AADT Existing (2017)		AADT Future "no-build" (2031)		AADT Future "build" (2031)		Traffic Split[3]		Truck Percentages[3]		Posted Speed Limit
	SB[1]	NB[2]	SB[1]	NB[2]	SB[1]	NB[2]	Day	Night	Heavy	Medium	
Bovaird Drive to Royal West Drive	10,310	7,470	16,540	11,980	29,060	27,710	89%	11%	8%	2%	80
Royal West Drive to Williams Parkway	10,310	7,470	16,550	11,990	29,710	27,820	89%	11%	8%	2%	80
Williams Parkway to Commercial Driveway	14,970	12,980	22,950	20,600	35,700	35,390	89%	11%	8%	2%	80
Commercial Driveway to Beacon Hill	15,210	16,020	24,400	25,690	36,820	39,360	89%	11%	8%	2%	80
Beacon Hill to Adamsville Rd	15,840	16,160	25,350	25,910	39,050	41,140	89%	11%	8%	2%	80

Notes:

1. SB denotes Southbound and these volumes were estimated by assuming that the AM peak hour volume represents 10% of the total daily southbound traffic.
2. NB denotes Northbound and these volumes were estimated by assuming that the PM peak hour volume represents 10% of the total daily northbound traffic.
3. The traffic splits and truck percentages were taken from the 2006 noise study conducted by RWDI for this section of Mississauga Road [1].