Noise Feasibility Study

Proposed Residential Development

1511 Old Plains Road

Burlington, ON

January 8, 2025
HGC Project #: 02401031



Prepared for:

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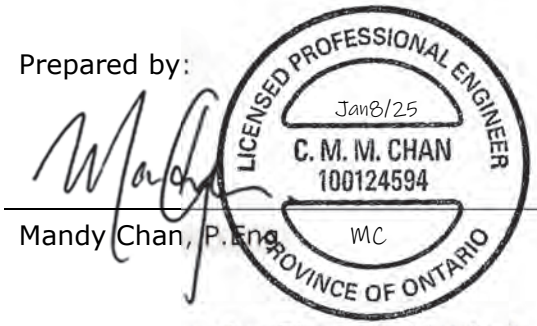
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NOISE | VIBRATION | ACOUSTICS

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Noise Feasibility Study
Proposed Residential Development
1511 Old Plains Road
Burlington, ON

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Table of Contents

1 INTRODUCTION & SUMMARY 1

2 SITE DESCRIPTION AND NOISE SOURCES 2

3 CRITERIA 3

4 ROAD TRAFFIC NOISE ASSESSMENT 4

4.1 Road Traffic Data 4

4.2 Traffic Noise Predictions 5

4.3 Traffic Noise Recommendations 6

4.3.1 Outdoor Living Areas 6

4.3.2 Indoor Living Areas 7

4.3.3 Building Façade Constructions 8

4.3.4 Warning Clauses 8

5 SUMMARY OF RECOMMENDATIONS 11

6 REFERENCES 13

Figure 1 – Aerial Plan
Figure 2a – Site Plan, Phase 1 Only
Figure 2b – Site Plan including Phase 2, Showing Prediction Locations
Figure 3 – Plan Showing Noise Barrier Requirements

APPENDIX A – Traffic Data
APPENDIX B – Sample Stamson Outputs

1 INTRODUCTION & SUMMARY

HGC Noise Vibration Acoustics (HGC) was retained by 1511 Old Plains Road West Inc. to conduct a Noise Feasibility Study for a proposed residential development located at 1511 Old Plains Road West in Burlington, Ontario. The proposed development will consist of ten blocks of 3-storey townhouses. This study is required by the City as part of the planning and approvals process.

The primary sources of noise are road traffic on Plains Road West and Highway 6. Future traffic sound levels at the development were predicted using road traffic data obtained from the City and the Ministry of Transportation, supplemented by the Transportation Impact Study. The predicted sound levels were compared to the guidelines of the Ministry of Environment, Conservation and Parks (MECP) and the City to develop noise control recommendations.

The results of this study indicate that with suitable noise control measures integrated into the design of proposed residential development, it is feasible to achieve the MECP guideline sound levels. Central air conditioning and upgraded glazing constructions will be required for all units. Noise barriers are required for the common amenity space. Noise warning clauses are recommended to inform future residents of the traffic noise impacts and presence of the nearby commercial uses.

2 SITE DESCRIPTION AND NOISE SOURCES

2.1 Site Description

Figure 1 is an aerial imagery of the area, showing the proposed development and surrounding uses. The proposed development is located at the northwest corner of Old Plains Road West and Plains Road West in Burlington, Ontario. The site plan showing Phase 1 only prepared by Graziani + Corazza Architects dated January 6, 2025 is attached as Figure 2a. Figure 2b is the Site Plan including the Phase 2 development. In total, ten blocks of 3-storey townhouses with two outdoor amenity areas are proposed.

There are existing residential uses to the east and southwest. To the north of the site is a carpool parking lot. Further south is an RV sales centres. The background sound is dominated by road traffic noise and significant stationary noise sources impacting the subject site were not observed. Commuter parking lots are also not considered stationary sources per MECP guidelines. A warning clause is recommended to inform future residents of the presence of the nearby commercial uses and that sounds from these uses may be audible on occasions, as provided in Section 4.3.4.

2.2 Noise Sources

A site visit was conducted by HGC personnel in December 2024 to investigate the acoustic environment. The acoustic environment is dominated by road traffic on Highway 6 to the west and Plains Road West to the east. Approximately 420 m to the northwest is the CPKC Hamilton subdivision. Due to the large distance and intervening uses between the site and the railway, rail traffic is not considered significant to warrant assessment. Similarly, Highway 403 is approximately 450 to 500 m to the south of the site, and due to the distance, intervening uses and beneficial topography, traffic noise from Highway 403 was found to be insignificant compared to traffic noise from Highway 6 and Plains Road West and thus not considered further.

3 CRITERIA

Guidelines for acceptable levels of road traffic noise impacting residential developments are given in the MECP publication NPC-300, "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", Part C release date October 21, 2013 [1] and are listed in Table 1 below. The values in Table 1 are energy equivalent (average) sound levels [L_{EQ}] in units of A weighted decibels [dBA].

Table 1: Road Traffic Noise Criteria

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

Daytime refers to the period between 07:00 and 23:00, while nighttime refers to the period between 23:00 and 07:00. The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace or other area where passive recreation is expected to occur. Balconies/elevated terraces that are less than 4 m in depth are not considered to be outdoor living areas under MECP guidelines.

The guidelines in the MECP publication allow the sound level in an Outdoor Living Area to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. 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 technically, economically and administratively feasible.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom and living/dining room windows exceed 60 dBA or daytime sound levels outside

bedroom/living/dining room windows exceed 65 dBA. Forced air ventilation with ducts sized to accommodate the future installation of air conditioning is required when nighttime sound levels at bedroom/living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom and living/dining room windows are in the range of 56 to 65 dBA. The location and installation of the outdoor air conditioning device should be done so as to minimize the noise impacts and comply with criteria of MECP publication NPC-216, Residential Air Conditioning Devices, within NPC-300.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of bedroom window sound levels are greater than 60 dBA or the daytime sound levels are greater than 65 dBA due to road traffic noise. Warning clauses are required to notify future residents of the possible noise excesses when nighttime sound levels exceed 50 dBA at the plane of the bedroom/living/dining room window and daytime sound levels exceed 55 dBA in the outdoor living area and at the plane of the bedroom/living/dining room window due to road traffic.

4 ROAD TRAFFIC NOISE ASSESSMENT

4.1 Road Traffic Data

Traffic data for Highway 6 was provided by the Ministry of Transportation personnel including the commercial vehicle percentages. The volume would have included the volumes of the on- and off-ramps at Highway 403 since Highway 6 ends at Highway 403 and thus the ramps are not assessed separately. The day/night splits for the highway were calculated from the hourly traffic volumes. The higher of the SADT or AADT and commercial percentages from the provided data were used. The AADT volume for Plains Road West was obtained from the City of Burlington open data website. A truck percentage of 4%, split evenly between medium and heavy trucks, was assumed based on information from the Transportation Impact Study (TIS) prepared by C.F. Crozier & Associates Inc. dated December 2024 .

The traffic volumes were projected to the year 2035 using a growth rate of 2.6% for Highway 6 per TIS. A 2.0% growth rate was applied for Plains Road West as a conservative growth rate. Traffic data is attached as Appendix A. Table 2 summarizes the traffic data used in the analysis.

Table 2: Project Road Traffic Data Used in Assessment

Roadway	AADT	Day / Night Split [%]	Trucks Percentage (%)		Speed Limit [km/h]
			Medium	Heavy	
Highway 6	84 798	88 / 12	3.0	5.0	80
Plains Road West	9 503	90 / 10	2.0	2.0	50

4.2 Traffic Noise Predictions

To assess the levels of road traffic noise which would impact the site in the future, predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix B. Highway 403 is more than 500 m from the subject site with intervening uses and topography. Calculations indicate that traffic from Highway 403 was not a significant noise source as traffic on Plains Road and Highway 6 was dominant and therefore, not considered further in the analysis.

Predictions of the traffic sound levels were made at various locations around the development as shown on Figure 2b. The units are dual frontage homes. The predictions were performed at the top storey of the during the daytime hours and nighttime hours to investigate noise mitigation requirements. The results of these predictions are summarized in Table 3. The acoustic requirements may be subject to modifications if the site plan is changed significantly.

Table 3: Predicted Future Traffic Sound Levels, [dBA], Without Mitigation

Prediction Location	Daytime at Façade $L_{EQ(16\ hour)}$	Nighttime at Façade $L_{EQ(8\ hour)}$
[A]	70	65
[B]	64	59
[C]	61	56
[D]	62	55
[E]	63	59
[F]	65	60
[G]	66	61
[H]	60	--
[I]	62	--

4.3 Traffic Noise Recommendations

The predictions indicate that the future traffic sound levels at all dwelling units will exceed MECP guidelines. Recommendations to address these excesses are discussed below.

4.3.1 Outdoor Living Areas

There are two common outdoor amenity areas proposed, northeast amenity space and southern amenity space.

Northeast Amenity Space

The predicted sound levels at the northeast amenity space, prediction location [H] is 60 dBA. The MECP permits up to 60 dBA in the Outdoor Living Area (OLA) without requiring physical mitigation.

South Amenity Space

The predicted sound levels at the southern amenity space, prediction location [I] is 62 dBA. Physical mitigation is required. Refer to Table 4 for barrier heights that would be required to reduce the sound levels.

Preliminary noise barrier location is shown on Figure 3. Noise barriers can be a combination of an earth berm with a noise wall on top. The wall component of the barrier should be of a solid construction with a surface density of no less than 20 kg/m2. The walls may be constructed from a variety of materials such as glass, wood, brick, pre-cast concrete or other concrete/wood composite systems provided that it is free of gaps or cracks. The heights and extents of the barriers should be chosen to reduce the sound levels in the OLA's to below 60 dBA and as close to 55 dBA as is technically, administratively and economically feasible, subject to the approval of the municipality respecting any applicable fence height by-laws.

Table 4: Acoustic Barrier Heights Required to achieve various Sound Levels, [m]

Location	55 dBA	56 dBA	57 dBA	58 dBA	59 dBA	60 dBA
South Amenity	4.0	3.5	3.0	2.5	2.0	--

The dwelling units in the proposed development may have balconies/elevated terraces that are less than 4 m in depth. These areas are not considered to be outdoor amenity areas under MECP guidelines, and therefore are exempt from traffic noise assessment.

Further Review

When grading plans are available, the noise barrier heights and extents should be refined.

4.3.2 Indoor Living Areas

Central A/C

For most of the dwelling units in the development, the daytime sound levels are greater than 65 dBA and the nighttime sound levels are greater than 60 dBA. As such, central air conditioning is recommended for all dwelling units in the development. The location, installation and sound ratings of the outdoor air

conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-216, within NPC-300, as applicable.

4.3.3 Building Façade Constructions

Future road traffic sound levels at the proposed building will exceed 60 dBA at night and will exceed 65 dBA during the daytime hours. Accordingly, MECP guidelines recommend that the windows, walls and doors be designed so that the indoor sound levels comply with MECP noise criteria.

The building plans were not yet available for review by HGC at the time of this report, but preliminary calculations have been performed to determine the building envelope constructions likely to be required to maintain indoor sound levels within MECP guidelines. The calculation methods were developed by the National Research Council (NRC). They are based on the predicted future sound levels at the building facades, and the anticipated areas of the facade components (walls, windows and doors) relative to the floor area of the adjacent room.

Exterior Wall Constructions

Detailed elevation drawings are not yet available. Exterior walls that are not glazed should have sufficient acoustical insulation value such that the noise transmitted through is negligible in comparison with the windows. Further input regarding the design of the walls can be provided during design development if required.

Acoustical Requirements for Glazing

For the purposes of this preliminary analysis, typical window-to-floor areas were assumed to be 40% for living/dining rooms (i.e., 20% fixed, 20% operable relative to floor area) and bedrooms. Based upon this assumption, the glazing for residential suites with direct exposure to the highway and roadway should achieve the sound transmission class ratings shown in Table 5. The table

indicates the basic window glazing, including glass in fixed sections and operable windows.

Table 5: Preliminary Minimum Glazing Requirements

Building	Minimum STC Requirements for Glazing[1]
All Buildings	STC-32
	STC-32
	STC-32
	STC-32

Note: Based on assumed window to floor area ratios of 40% for living/dining rooms and bedrooms. When detailed floor plans and building elevations are available, the window glazing requirements should be refined.
[1] Requirements are for fixed glazing units, operable elements (windows/doors) can be up to 3 points lower without affecting these recommendations

Since the proposed development is located in an urban environment with high background sound levels from the adjacent highway and roadway, the minimum acoustical requirement for the glazing is recommended to be STC-32 to also address spurious environmental noises that have not been specifically modelled.

The glazing requirements can be met using standard sealed units for the proposed dwelling units. Operable sections, including doors and operable windows, must be well-fitted and weather-stripped in order to achieve the target STC values stated in the above table. Acoustical test data for the selected assemblies should be requested from the suppliers, to ensure that the stated acoustic performance levels will be achieved by their assemblies.

Further Review

When detailed floor plans and building elevations are available for the proposed buildings the glazing requirements should be refined based on actual window to floor area ratios.

4.3.4 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements for all the dwellings with anticipated traffic

noise sound level excesses. The following noise warning clauses are required for the proposed development. The warning clause Type labels follow the same lettering system outlined MECP NPC-300.

A suggested wording for future dwellings with sound level excesses of the MECP criteria but do not require physical mitigation measures is given below.

Type A:

> Purchasers/tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment.

Suggested wording for future dwellings with daytime OLA sound levels exceeding the MECP criteria by 6 dB or more, for which physical mitigation has been provided is given below.

Type B:

> 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 traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment.

A suggested wording for future dwellings requiring central air conditioning systems is given below.

Type D:

> 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 Municipality and the Ministry of the Environment.

A suggested wording for dwellings adjacent to nearby commercial uses where sounds from these uses may at times be audible is given below.

Type E:

> Purchasers/tenants are advised that due to the proximity of the nearby commercial uses, noise from these uses may at times be audible.

These sample clauses are provided by the MECP as examples and can be modified by the Municipality as required.

5 SUMMARY OF RECOMMENDATIONS

The following recommendations are provided in regard to noise mitigation.

1. Central air conditioning and upgraded glazing constructions are recommended for all dwellings units.
2. A noise barrier is required for the southern amenity space.
3. Warning clauses should be included in the property and tenancy agreements and offers of purchase and sale to inform the future owners/residents of the presence of the roadways and the nearby commercial uses.

The reader is referred to the previous sections of the report where these recommendations are discussed in more detail.

Table 9: Summary of Noise Control Requirements and Noise Warning Clauses

Buildings	Acoustic Barrier[1]	Ventilation Requirements*	Type of Warning Clause	Minimum Glazing Constructions
All Units	--	Central A/C	A, B, D, E	STC-32
Northeast Amenity Space	--	--	--	--
South Amenity Space	Min 2.5 m	--	--	--

Note:
-- no specific requirement
* The location, installation and sound rating of the air conditioning condensers must be compliant with MECP Guideline NPC-216 (within NPC-300).
1 Minimum barrier heights to meet 58 dBA, subject to approval of City, refer to Table 4 for full barrier heights table

5.1 Implementation

To ensure that noise control recommendations outlined above are fully implemented, it is recommended:

1. A Professional Engineer qualified to perform acoustical engineer services in the Province of Ontario should review the grading plan and the architectural plans and building elevations to confirm that the noise barrier heights and extent and the building façade including wall and glazing constructions will provide sufficient sound insulation in accordance with the assumptions outlined in the approved noise study.

2. After construction, a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should certify that the noise control measures where required have been implemented and constructed in accordance with the detailed noise studies, where required.

6 REFERENCES

1. *Ontario Ministry of the Environment, Conservation and Parks, Publication NPC-300, Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning, August 2013.*

2. *Google Maps Aerial Imagery, Internet application: maps.google.com.*

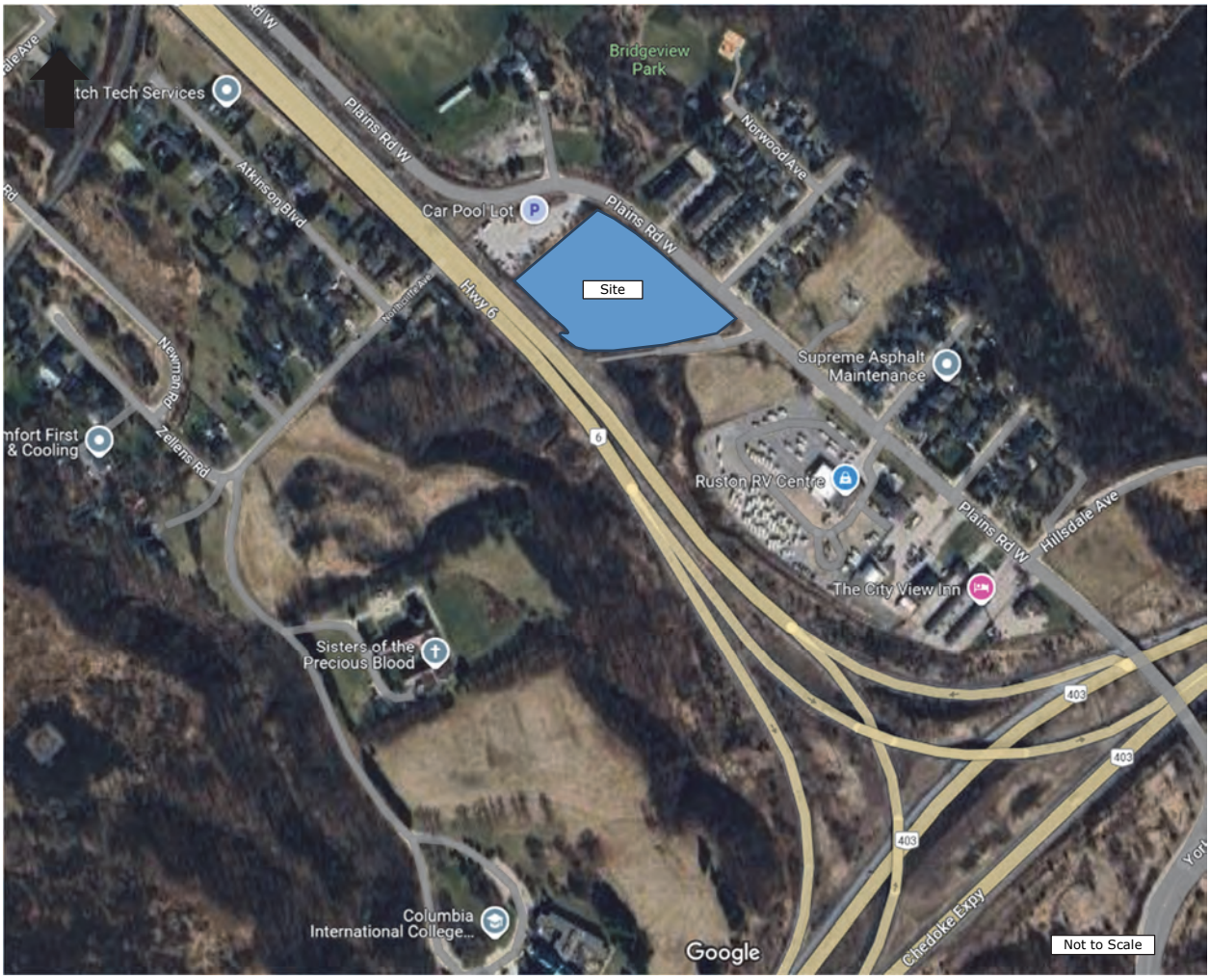


Figure 1: Aerial Plan



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ISSUED FOR REVISIONS:

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PROPOSED RESIDENTIAL DEVELOPMENT

1511 OLD PLAINS ROAD

address

BURLINGTON	ON
PROJECT ARCHITECT:	B.GRAZIANI
ASSISTANT DESIGNER:	C.KOTVA
DRAWN BY:	C.KOTVA/ RALANI
CHECKED BY:	—
PLOT DATE:	JAN.06.2025
JOB #	2079.22

SITE PLAN - PHASE 1

1:250

A102

TITLEBLOCK SIZE: 610 x 900

Figure 2a: Site Plan for Phase 1



Figure 2b: Site Plan for Phase 2 Showing Traffic Noise Prediction Locations

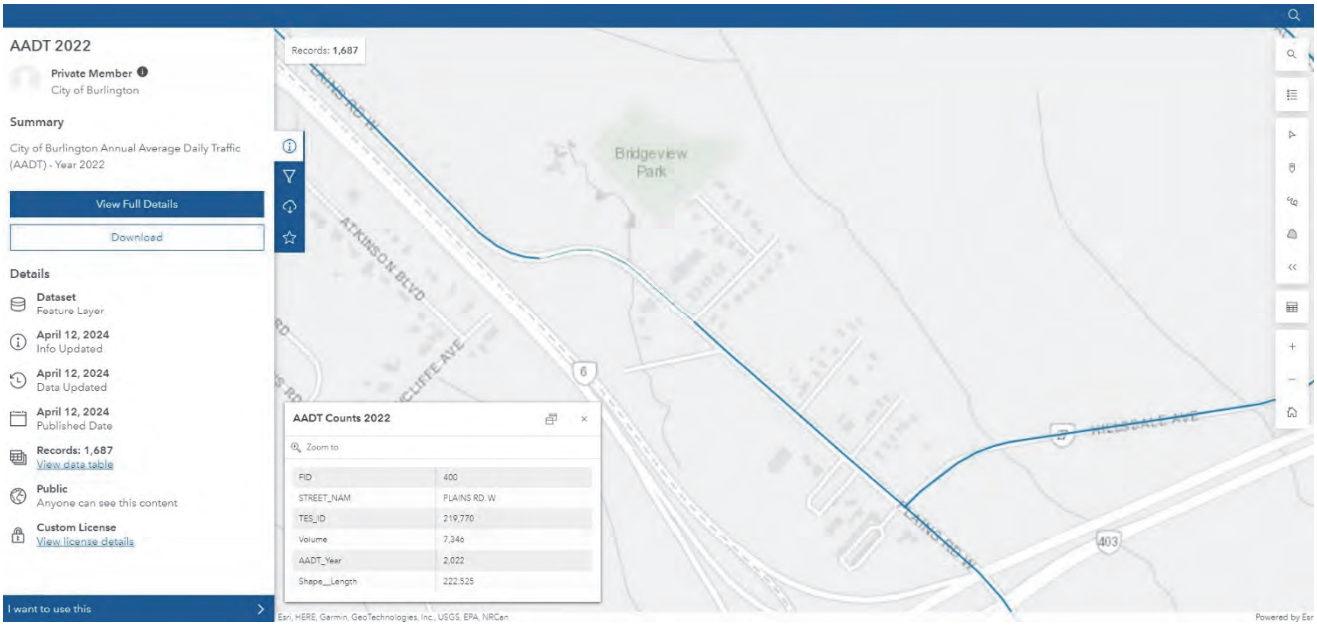


Figure 3: Plan Showing Noise Barrier Requirements

Appendix A
Traffic Data

Year	Highway	Location Description	Dist (KM)	Pattern Type	AADT	SADT	SWADT	WADT	Truck AADT	Total Collisions	Total CR	Trucks Collisions	Truck CR
2014	6			IC	9,250	10,200	10,200	8,200	1,200	6	0.6	2	0.2
2015	6			CTR	9,300	11,300	11,400	7,900	810	5	0.5	0	0.0
2016	6			CTR	9,300	11,300	11,400	7,900	810	1	0.1	0	0.0
2017	6			CTR	9,700	13,000	12,900	7,900	840	2	0.2	0	0.0
2018	6			CTR	10,100	13,500	13,400	8,250	880	4	0.4	0	0.0
2019	6			CTR	10,200	13,600	13,500	8,300	890	6	0.6	2	0.2
2021	6			CTR	9,950	13,000	12,900	8,100	900	5	0.5	0	0.0
2005	6	BUTTER RD UP	2.0	UC	9,500	10,100	11,100	8,900	0	4	0.6	0	0.0
2006	6			UC	9,900	10,500	11,600	9,300	0	6	0.8	0	0.0
2007	6			UC	10,200	10,800	11,800	9,550	0	5	0.7	1	0.1
2008	6			UC	10,500	11,100	10,400	9,800	0	4	0.5	0	0.0
2009	6			UC	9,900	10,500	11,600	9,300	0	5	0.7	2	0.3
2010	6			UC	11,600	12,300	13,500	10,900	0	2	0.2	1	0.1
2011	6			UC	11,800	11,800	12,200	11,200	0	3	0.3	0	0.0
2012	6			UC	11,900	12,000	12,700	11,300	0	3	0.3	1	0.1
2013	6			UC	12,900	12,900	13,000	12,200	0	5	0.5	2	0.2
2014	6			UC	12,500	12,500	12,000	11,900	0	3	0.3	0	0.0
2015	6			UC	13,100	13,100	12,600	12,400	0	3	0.3	0	0.0
2016	6			UC	13,500	13,500	13,000	12,800	0	4	0.4	0	0.0
2017	6			UC	13,900	13,800	13,900	13,300	0	10	1.0	4	0.4
2018	6			UC	14,300	14,200	14,400	13,700	0	7	0.7	1	0.1
2019	6			UC	14,600	14,400	14,600	14,100	0	6	0.6	1	0.1
2021	6			UC	15,400	15,400	15,600	14,800	0	1	0.1	0	0.0
2005	6	BOOK RD	2.7	C	9,200	10,200	10,300	8,250	1,000	2	0.2	0	0.0
2006	6			C	9,500	10,600	10,600	8,550	1,050	2	0.2	0	0.0
2007	6			C	10,900	12,100	12,300	9,800	1,200	3	0.3	0	0.0
2008	6			C	11,400	12,600	12,400	10,200	1,250	2	0.2	0	0.0
2009	6			C	11,500	12,700	12,800	10,400	1,250	4	0.3	0	0.0
2010	6			C	12,500	13,800	13,900	11,300	1,400	1	0.1	0	0.0
2011	6			C	12,900	14,200	14,300	11,600	1,400	6	0.5	0	0.0
2012	6			C	13,600	15,000	14,700	12,200	1,500	9	0.7	1	0.1
2013	6			C	14,400	15,900	15,700	13,000	1,450	3	0.2	0	0.0
2014	6			C	14,900	16,400	15,900	13,400	1,500	2	0.1	0	0.0
2015	6			C	14,200	15,600	15,200	12,800	1,400	10	0.7	0	0.0
2016	6			C	15,700	17,300	16,800	14,100	1,550	6	0.4	1	0.1
2017	6			C	16,300	17,800	17,800	14,800	1,600	3	0.2	0	0.0
2018	6			C	16,900	18,500	18,400	15,300	1,650	6	0.4	0	0.0
2019	6			C	17,400	19,000	18,900	15,700	1,700	3	0.2	0	0.0
2021	6			C	18,600	20,200	20,100	16,900	1,850	11	0.6	1	0.1
2021	6	LINC. AX PKY/ ROUSSEAUX ST IC	12.8										
2004	6	E JCT HWY 403 IC	0.7	IC	48,200	53,900	54,100	42,600	4,350	17	1.3	3	0.2

Year	Highway	Location Description	Dist (KM)	Pattern Type	AADT	SADT	SWADT	WADT	Truck AADT	Total Collisions	Total CR	Trucks Collisions	Truck CR
2005	6			IC	43,200	48,000	48,500	38,100	3,900	22	1.9	6	0.5
2006	6			IR	42,400	51,100	46,300	36,000	3,800	17	1.5	6	0.5
2007	6			IR	40,400	48,900	48,800	34,200	3,650	37	3.4	15	1.4
2008	6			IR	44,600	54,000	53,000	38,100	4,000	35	2.9	20	1.7
2009	6			IR	45,700	54,800	49,800	38,800	4,100	15	1.2	1	0.1
2010	6			IC	48,000	53,100	53,600	42,600	4,300	7	0.5	2	0.2
2011	6			IC	45,600	50,100	52,000	40,900	4,100	47	3.9	15	1.2
2012	6			IC	45,500	50,400	48,900	40,400	4,100	36	3.0	8	0.7
2013	6			IC	48,000	53,100	52,800	42,600	4,300	5	0.4	0	0.0
2014	6			IC	50,000	55,300	55,100	44,300	4,500	21	1.6	4	0.3
2015	6			IC	49,200	54,500	54,200	43,600	4,450	13	1.0	2	0.2
2016	6			IC	49,700	55,000	54,800	44,100	4,450	14	1.1	0	0.0
2017	6			IR	51,700	58,400	58,800	44,600	4,650	10	0.7	0	0.0
2018	6			IR	50,900	57,600	58,100	44,100	4,600	18	1.3	3	0.2
2019	6			IR	51,400	58,200	58,700	44,700	4,650	22	1.6	2	0.1
2021	6			IR	52,600	59,200	59,700	46,400	4,750	11	0.8	3	0.2
1988	6	PLAINS RD (E) NORTHCLIFFE AV (W)	2.3	IC	31,000	36,000	35,000	27,300	4,650	30	1.2	6	0.2
1989	6			IC	33,000	38,000	37,300	29,400	4,950	48	1.8	11	0.4
1990	6			C	33,900	37,600	37,600	30,500	5,100	55	2.0	7	0.2
1991	6			C	34,500	38,000	38,300	31,400	3,100	56	2.0	6	0.2
1992	6			C	35,000	37,800	38,800	32,200	3,500	45	1.6	13	0.4
1993	6			C	35,500	38,700	39,300	32,700	3,550	31	1.1	5	0.2
1994	6			C	35,200	38,500	39,200	31,900	4,200	39	1.3	6	0.2
1995	6			C	36,000	39,300	40,300	32,900	4,300	44	1.5	7	0.2
1996	6			C	33,600	38,100	38,200	30,300	4,050	46	1.7	2	0.1
1997	6			C	37,700	42,600	43,000	33,900	6,050	40	1.3	5	0.2
1998	6			C	38,500	43,500	43,500	34,600	6,150	29	0.9	7	0.2
1999	6			C	38,500	43,100	43,500	34,600	6,150	30	0.9	13	0.4
2000	6			IC	39,200	43,900	43,900	34,900	5,100	45	1.4	12	0.4
2001	6			IC	40,100	44,800	45,000	35,500	5,200	42	1.3	9	0.3
2002	6			IC	40,900	45,600	45,900	36,000	4,100	48	1.4	12	0.4
2003	6			IC	41,700	46,500	46,900	36,900	4,150	47	1.4	13	0.4
2004	6			IC	42,500	47,500	47,700	37,600	5,100	45	1.3	10	0.3
2005	6			IC	43,300	48,100	48,600	38,200	5,200	46	1.3	18	0.5
2006	6			IC	44,100	49,000	49,500	39,100	5,750	42	1.2	12	0.3
2007	6			IC	44,900	49,900	51,400	39,700	5,850	30	0.8	11	0.3
2008	6			IC	45,600	50,500	48,900	40,200	5,950	30	0.8	10	0.3
2009	6			IC	46,400	51,500	52,000	41,300	6,050	32	0.8	8	0.2
2010	6			IC	47,200	52,200	52,700	41,900	6,150	17	0.4	5	0.1
2011	6			IC	48,000	52,800	54,800	43,100	6,250	15	0.4	6	0.2
2012	6			UC	43,300	43,600	46,400	41,100	5,650	19	0.5	7	0.2



Traffic Volume from City of Burlington Open Data

2.4 Traffic Growth Rates

The City of Burlington and MTO provided growth rates to be used within the study network, the growth rates used are provided in **Table 5** below. The correspondence with the City and Region can be found in **Appendix D.**

Table 5: Background Growth Rates

Roadway	Growth Rates	
	A.M.	P.M.
Highway 6 (MTO)	2.6%	2.6%
York Boulevard	1.0%	1.0%
Plains Road West	1.0%	1.0%
Old Plains Road	1.0%	1.0%
Old York Road	1.0%	1.0%
York Road	1.0%	1.0%

2.5 Traffic Data

In accordance with the City and Region Terms of Reference, new turning movement counts for the 2024 existing condition were collected at the following intersections by Spectrum Traffic Inc. at the associated timeframes as summarized in **Table 6.**

Signal timing plans for the study intersection were provided by City of Burlington staff for modelling purposes.

Table 6: Traffic Data

Intersection	TMC Date	Timing Plan Date Obtained
Plains Road West and York Boulevard	July 12, 2023	December 13, 2024
Plains Road West at York Road/ Old York Road	July 12, 2023	N/A
Highway 6 Southbound On/Off-Ramp at York Road	July 12, 2023	N/A
Highway 6 Northbound On/Off-Ramp at Old York Road	July 12, 2023	N/A

The traffic count data and signal timing plans are provided in **Appendix C.** The 2023 Turning Movement Counts were grown to the 2024 existing condition based on the growth rates shown in **Section 2.4,** the 2024 Existing Traffic Volumes are illustrated in **Figure 4.**

Signal Timing Plans were requested from the City of Burlington at the study intersection of Plains Road West and York Boulevard and were applied to the existing conditions operational analysis. Additionally, these signal timing plans were maintained through the 2026, 2031 and 2036 study horizon years. Provided Signal Timing Plans are included in **Appendix C.**

Appendix B
Sample Stamson Outputs

```
STAMSON 5.0        NORMAL REPORT        Date: 08-01-2025 13:52:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: a.te                 Time Period: Day/Night 16/8 hours
Description: Predicted Daytime & Nighttime Sound Levels at the upper storey windows of the west
façade, facing Hwy 6, typical of sound levels at Buildings 6, 7 and 10


Road data, segment # 1: Plains (day/night)
-------------------------------------------
Car traffic volume  :  8210/912   veh/TimePeriod  *
Medium truck volume :   171/19    veh/TimePeriod  *
Heavy truck volume  :   171/19    veh/TimePeriod  *
Posted speed limit  :    50 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):   7346
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Plains (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  :  80.00 / 80.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  12.00 m
Barrier receiver distance :   0.50 / 0.50   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 2: Hwy6 (day/night)
-----------------------------------------
Car traffic volume  : 68652/9362  veh/TimePeriod  *
Medium truck volume :  2239/305   veh/TimePeriod  *
Heavy truck volume  :  3731/509   veh/TimePeriod  *
Posted speed limit  :    80 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):  59200
    Percentage of Annual Growth        :   2.60
    Number of Years of Growth          :  14.00
    Medium Truck % of Total Volume     :   3.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  88.00

Data for Segment # 2: Hwy6 (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  :  50.00 / 50.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Plains (day)
---------------------------------
Source height = 1.19 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.19 !        7.50 !        7.46 !         7.46

ROAD (0.00 + 38.41 + 0.00) = 38.41 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  63.37   0.00  -7.27   0.00   0.00   0.00 -17.69  38.41
-------------------------------------------------------------------------------

Segment Leq : 38.41 dBA

Results segment # 2: Hwy6 (day)
-------------------------------

Source height = 1.50 m

ROAD (0.00 + 70.33 + 0.00) = 70.33 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.48  79.21   0.00  -7.74  -1.14   0.00   0.00   0.00  70.33
-------------------------------------------------------------------------------

Segment Leq : 70.33 dBA

Total Leq All Segments: 70.33 dBA

Results segment # 1: Plains (night)
-----------------------------------
Source height = 1.19 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.19 !        7.50 !        7.46 !         7.46

ROAD (0.00 + 31.88 + 0.00) = 31.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  56.84   0.00  -7.27   0.00   0.00   0.00 -17.69  31.88
-------------------------------------------------------------------------------

Segment Leq : 31.88 dBA

Results segment # 2: Hwy6 (night)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.69 + 0.00) = 64.69 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.48  73.57   0.00  -7.74  -1.14   0.00   0.00   0.00  64.69
-------------------------------------------------------------------------------

Segment Leq : 64.69 dBA

Total Leq All Segments: 64.69 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.33
                           (NIGHT): 64.69
```

```
STAMSON 5.0         NORMAL REPORT         Date: 08-01-2025 13:54:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: b.te                  Time Period: Day/Night 16/8 hours
Description: Predicted Daytime & Nighttime Sound Levels at the upper storey windows of the north
façade, second row of units, Location [B]


Road data, segment # 1: Plains (day/night)
-----------------------------------------
Car traffic volume  :  8210/912   veh/TimePeriod  *
Medium truck volume :   171/19    veh/TimePeriod  *
Heavy truck volume  :   171/19    veh/TimePeriod  *
Posted speed limit  :    50 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):   7346
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Plains (day/night)
---------------------------------------
Angle1   Angle2           : -20.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  81.00 / 81.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: Hwy6 (day/night)
---------------------------------------
Car traffic volume  : 68652/9362  veh/TimePeriod  *
Medium truck volume :  2239/305   veh/TimePeriod  *
Heavy truck volume  :  3731/509   veh/TimePeriod  *
Posted speed limit  :    80 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):  59200
    Percentage of Annual Growth        :   2.60
    Number of Years of Growth          :  14.00
    Medium Truck % of Total Volume     :   3.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  88.00

Data for Segment # 2: Hwy6 (day/night)
---------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  80.00 / 80.00  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: Plains (day)
---------------------------------

Source height = 1.19 m

ROAD (0.00 + 49.39 + 0.00) = 49.39 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -20     90   0.49  63.37   0.00 -10.91  -3.07   0.00   0.00   0.00  49.39
-------------------------------------------------------------------------------

Segment Leq : 49.39 dBA

Results segment # 2: Hwy6 (day)
-------------------------------

Source height = 1.50 m

ROAD (0.00 + 64.30 + 0.00) = 64.30 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.48  79.21   0.00 -10.76  -4.15   0.00   0.00   0.00  64.30
-------------------------------------------------------------------------------

Segment Leq : 64.30 dBA

Total Leq All Segments: 64.44 dBA

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

Source height = 1.19 m

ROAD (0.00 + 42.86 + 0.00) = 42.86 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -20     90   0.49  56.84   0.00 -10.91  -3.07   0.00   0.00   0.00  42.86
-------------------------------------------------------------------------------

Segment Leq : 42.86 dBA

Results segment # 2: Hwy6 (night)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.66 + 0.00) = 58.66 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.48  73.57   0.00 -10.76  -4.15   0.00   0.00   0.00  58.66
-------------------------------------------------------------------------------

Segment Leq : 58.66 dBA

Total Leq All Segments: 58.77 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.44
                           (NIGHT): 58.77
```

```
STAMSON 5.0        NORMAL REPORT        Date: 08-01-2025 13:54:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: d.te                 Time Period: Day/Night 16/8 hours
Description: Predicted Daytime & Nighttime Sound Levels at the upper storey windows of the east
façade, typical of first row of units adjacent to Plains Road, Location [D]


Road data, segment # 1: Plains (day/night)
-------------------------------------------
Car traffic volume  :  8210/912   veh/TimePeriod  *
Medium truck volume :   171/19    veh/TimePeriod  *
Heavy truck volume  :   171/19    veh/TimePeriod  *
Posted speed limit  :    50 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):   7346
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  13.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Plains (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  :  17.50 / 17.50  m
Receiver height           :   7.50 / 7.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: Hwy6 (day/night)
-----------------------------------------
Car traffic volume  : 68652/9362  veh/TimePeriod  *
Medium truck volume :  2239/305   veh/TimePeriod  *
Heavy truck volume  :  3731/509   veh/TimePeriod  *
Posted speed limit  :    80 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):  59200
    Percentage of Annual Growth        :   2.60
    Number of Years of Growth          :  14.00
    Medium Truck % of Total Volume     :   3.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  88.00

Data for Segment # 2: Hwy6 (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  : 140.00 / 140.00 m
Receiver height           :   7.50 / 7.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  13.00 m
Barrier receiver distance :   0.50 / 0.50   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

```
Results segment # 1: Plains (day)
---------------------------------
Source height = 1.19 m

ROAD (0.00 + 61.22 + 0.00) = 61.22 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.49  63.37   0.00  -1.00  -1.15   0.00   0.00   0.00  61.22
-------------------------------------------------------------------------------

Segment Leq : 61.22 dBA

Results segment # 2: Hwy6 (day)
-------------------------------
Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        7.50 !        7.48 !         7.48

ROAD (0.00 + 51.52 + 0.00) = 51.52 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  79.21   0.00  -9.70   0.00   0.00   0.00 -17.99  51.52
-------------------------------------------------------------------------------

Segment Leq : 51.52 dBA

Total Leq All Segments: 61.66 dBA

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

Source height = 1.19 m

ROAD (0.00 + 54.68 + 0.00) = 54.68 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.49  56.84   0.00  -1.00  -1.15   0.00   0.00   0.00  54.68
-------------------------------------------------------------------------------

Segment Leq : 54.68 dBA

Results segment # 2: Hwy6 (night)
---------------------------------
Source height = 1.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        7.50 !        7.48 !         7.48

ROAD (0.00 + 45.88 + 0.00) = 45.88 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  73.57   0.00  -9.70   0.00   0.00   0.00 -17.99  45.88
-------------------------------------------------------------------------------

Segment Leq : 45.88 dBA

Total Leq All Segments: 55.22 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.66
                           (NIGHT): 55.22
```

```
STAMSON 5.0        NORMAL REPORT        Date: 08-01-2025 14:21:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ola1.te              Time Period: 16 hours
Description: Predicted daytime sound level at the Northeast Amenity space, Location [H]

Road data, segment # 1: Plains
------------------------------
Car traffic volume  :  8210 veh/TimePeriod  *
Medium truck volume :   171 veh/TimePeriod  *
Heavy truck volume  :   171 veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Plains
----------------------------
Angle1   Angle2           : -90.00 deg   75.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  21.50 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: Hwy6
----------------------------
Car traffic volume  : 68652 veh/TimePeriod  *
Medium truck volume :  2239 veh/TimePeriod  *
Heavy truck volume  :  3731 veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: Hwy6
--------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      3
House density             :     80 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 150.00 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Plains
---------------------------
Source height = 1.19 m

ROAD (0.00 + 59.19 + 0.00) = 59.19 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     75   0.66  63.37   0.00  -2.60  -1.58   0.00   0.00   0.00  59.19
-------------------------------------------------------------------------------
Segment Leq : 59.19 dBA

Results segment # 2: Hwy6
-------------------------
Source height = 1.50 m

ROAD (0.00 + 52.63 + 0.00) = 52.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  79.21   0.00 -16.60  -1.46   0.00  -8.52   0.00  52.63
-------------------------------------------------------------------------------
Segment Leq : 52.63 dBA

Total Leq All Segments: 60.06 dBA
TOTAL Leq FROM ALL SOURCES:       60.06
```

```
STAMSON 5.0        NORMAL REPORT        Date: 08-01-2025 13:55:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ola2.te              Time Period: 16 hours
Description: Predicted daytime sound level in the southern amenity space with a 2.5m high noise
barrier, predication location [I]

Road data, segment # 1: Plains
------------------------------
Car traffic volume  :  8210 veh/TimePeriod  *
Medium truck volume :   171 veh/TimePeriod  *
Heavy truck volume  :   171 veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 1: Plains
----------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1
House density             :     70 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  65.00 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: Hwy6
----------------------------
Car traffic volume  : 68652 veh/TimePeriod  *
Medium truck volume :  2239 veh/TimePeriod  *
Heavy truck volume  :  3731 veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 2: Hwy6
--------------------------
Angle1   Angle2           : -30.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  90.00 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -30.00 deg   Angle2 : 90.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :  10.00 m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: Plains
---------------------------

Source height = 1.19 m

ROAD (0.00 + 46.76 + 0.00) = 46.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  63.37   0.00 -10.57  -1.46   0.00  -4.58   0.00  46.76
-------------------------------------------------------------------------------

Segment Leq : 46.76 dBA

Results segment # 2: Hwy6
-------------------------

Source height = 1.50 m
```

```
Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.50 !        1.50 !        1.50 !         1.50

ROAD (0.00 + 58.07 + 0.00) = 58.07 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -30     90   0.51  79.21   0.00 -11.75  -2.66   0.00   0.00  -6.73  58.07
-------------------------------------------------------------------------------

Segment Leq : 58.07 dBA

Total Leq All Segments: 58.38 dBA

TOTAL Leq FROM ALL SOURCES:       58.38
```