Regional Group

S-4 Leitrim West of Bank Lands

Noise Control Feasibility Study

August 1, 2025

Noise Control Feasibility Study

S-4 Leitrim West of Bank Lands

August 2025

Prepared By:
Arcadis Professional Services (Canada) Inc.
333 Preston Street, Suite 500
Ottawa, Ontario K1S 5N4
Canada
Phone: 613 241 3300

Our Ref:
145172-6.04.01

Prepared For:
Evan Garfinkel, Manager, Land Development
Regional Group
1737 Woodward Drive
Ottawa, Ontario K2C 0P8
Canada

Ben Pascolo-Neveu, P.Eng.
Transportation Engineer

Table of Contents

Figures

Tables

Appendices

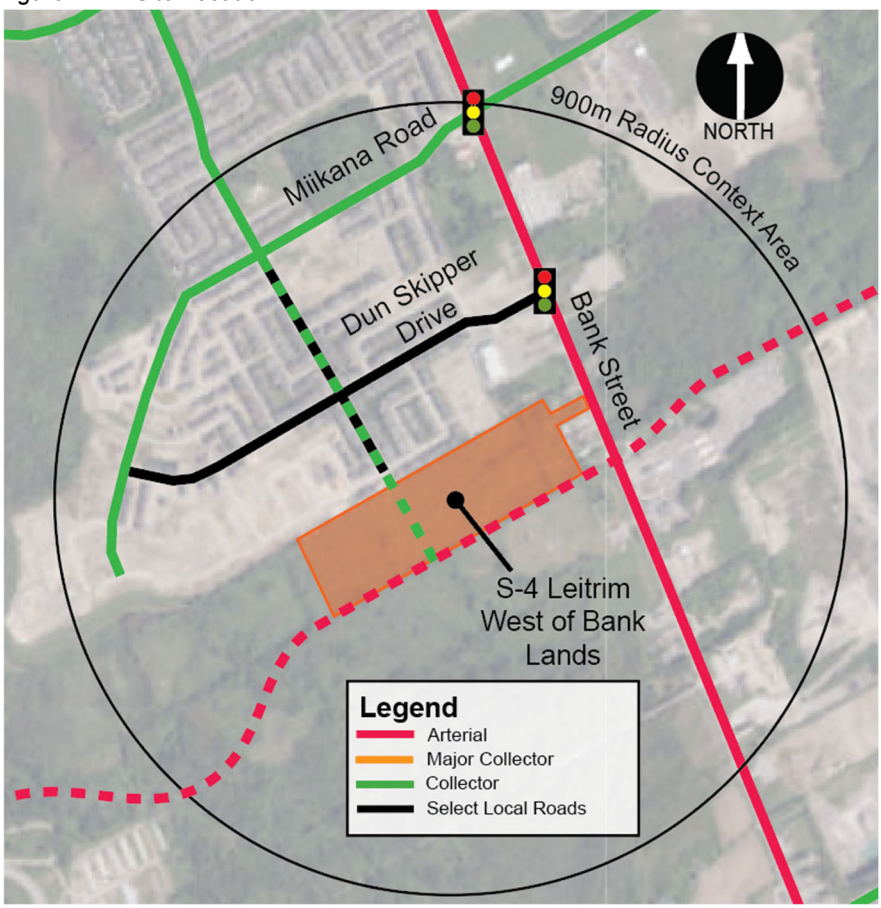
1 Introduction

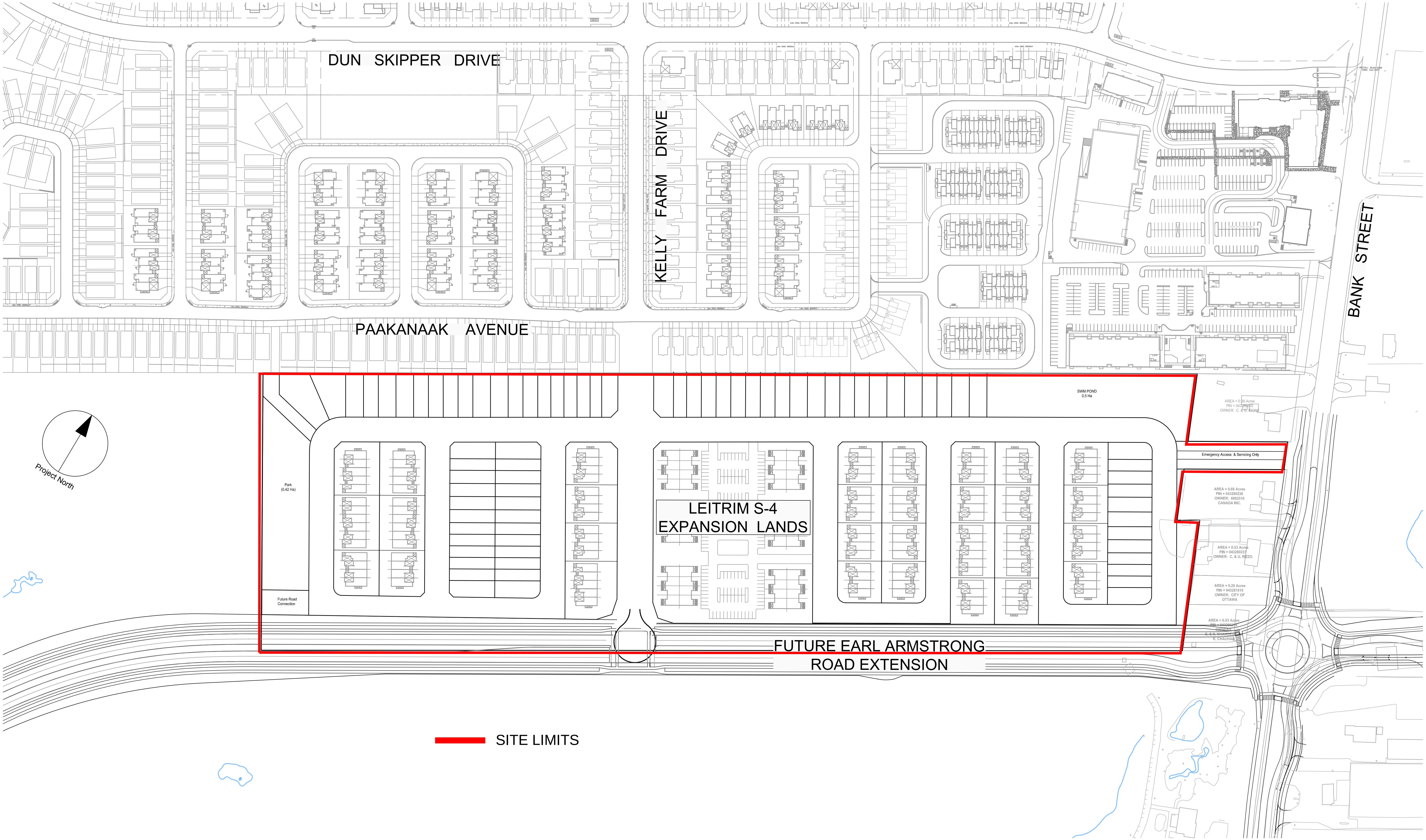
Arcadis was retained by Regional Group to undertake a Noise Control Feasibility Study in support of Zoning By-law Amendment and Draft Plan of Subdivision applications for a proposed development to be located at the southern edge of the Leitrim community west of Bank Street.

The objective of this study is to conduct a preliminary review of the internal and external transportation noise impacts on the subject property through the use of noise contour lines. This evaluation will consider road, rail and aircraft noise impacts, as applicable, to help inform preliminary recommendations regarding the potential need for noise control measures or warning clauses in the Agreement of Purchase and Sale or Tenancy Agreement for any 'noise-sensitive' land uses either proposed within or impacted by the subject development. It is expected that any preliminary recommendations from the study will be investigated further as part of more detailed Environmental Noise Impact Assessments (ENIAs) during the detailed design stage, if required.

The site location plan and its surround context are illustrated in **Figure 1-1**, while the proposed development is presented in **Figure 1-2** below.

Figure 1-1 – Site Location





J:\145172_Cattizone_Pa\7.0_Production\7.03_Design\04_Civil_Land\Serviceability Report\Noise Figure.dwg Last Saved By: milnem4626 Last Saved At: Jul. 30, 25

Project Title

Drawing Title

ARCADIS

Figure 1-2 Proposed Development

2 Background

2.1 Noise Sources

The proposed development will be subject to traffic noise externally from its collector or higher-order boundary streets, including the future Earl Armstrong Road extension and Bank Street.

The internal road network within the proposed development will consist most of local roads which are generally not expected to generate sufficient traffic noise to warrant inclusion in the noise modelling analysis. The exception is Kelly Farm Drive, a collector road, which will bisect the proposed development and has been evaluated for noise impacts to adjacent 'noise sensitive' uses as part of this study, along with Earl Armstrong Road and Bank Street.

Based on a desktop review of the subject lands and its surrounding context, there are no rail lines located within 500 metres of the site which would require consideration as part of the noise modelling exercise conducted for this study.

According to Schedule C14 of the 2022 Official Plan, the subject site is located within the Airport Vicinity Development Zone (AVDZ), therefore aircraft noise will be considered in this study.

2.2 Sound Level limits for Road Traffic

Sound level criteria for road traffic is referenced from the City of Ottawa Environmental Noise Control Guidelines (ENC) Guidelines published in January 2016 and the *Ministry of the Environment Publication NPC-300 (August 2013)*, hereafter referred to as NPC-300. Noise levels are expressed in the form Leq (T) which refers to a weighted level of a steady sound carrying the same total energy in the time period T (in hours) as the observed fluctuation sound.

2.2.1 Indoor Sound Level Criterion

For 'noise-sensitive' land uses, the sound level limits for Indoor Living Areas from Table 2.2b (NPC-300, Table C-2) of the ENC Guidelines are as follows:

- Nighttime – sleeping quarters – 23:00 to 07:00 – 40 dBA Leq (8)
- Daytime – living areas, den areas, hospitals, nursing homes (excludes schools or daycares) – 07:00 to 23:00 – 45 dBA Leq (16)

The sound levels are based on the windows and doors to an indoor space being closed.

The noise calculations were undertaken with standard daytime noise receptor heights of 1.5 metres (daytime) and 4.5 metres (night-time). During the detailed design stages, when the built form for each resulting block is better defined, more specific noise calculations will be undertaken to recommend specific warning clauses or physical mitigation measures for specific dwelling units, as required.

As per NPC-300 C7.1.2.1 and C7.1.2.2, when the outdoor noise levels at the plane of the window are greater than 55 dBA and less than or equal to 65 dBA (daytime) and/or greater than 50 dBA and less than or equal to 60 dBA (nighttime), then a warning clause is required along with forced air heating and a provision for central air conditioning.

Should the outdoor noise levels exceed 65 dBA at the living room and/or exceed 60 dBA at the bedroom, then central air conditioning is mandatory and a warning clause is required.

2.2.2 Outdoor Sound Level Criterion

As per Table 2.2a of NPC-300, the sound level criteria for the outdoor living area (OLA) during the daytime period between 07:00 and 23:00 hours is 55 dBA Leq (16). Sound levels for the OLA are typically calculated 3 metres from the building face at the centre of the façade or within the centre of the OLA at a height of 1.5 metres above the ground.

If the Leq sound level is less than or equal to the above criteria, then no further action is required by the proponent. Should the sound level exceeds the criteria by less than 5 dBA then the proponent may, with City approval, either provide a warning clause to prospective purchasers/tenants or install physical attenuation. For sound levels greater than 5 dBA above the criteria, control measures are required to reduce the noise levels as close to 55 dBA as technically, economically and administratively possible. Should the sound levels with the barrier in place exceed 55 dBA, a warning clause is also required.

2.2.3 Indoor Sound Level Criterion – Building Components

As per NPC-300 C7.1.3, when the outdoor sound levels are less than or equal to 65 dBA at the ‘daytime’ window and/or less than or equal to 60 dBA at the ‘nighttime’ window, then the building must be compliant with the Ontario Building Code. Should the outdoor sound levels exceed this criteria, then the building component (walls, windows etc.) must be designed to achieve indoor sound level criteria.

3 Roadway Noise

3.1 Road Traffic Data

Road Traffic Data

As discussed previously, the following collector or higher-order roads will have an impact on road noise within the vicinity of the subject site:

- **Earl Armstrong Road:** This four-lane divided arterial road is planned to be extended from its current terminus at High Road further east to Hawthorne Road. The Earl Armstrong Road extension would define the southern boundary of the site in accordance with the Recommended Plan established through the Earl Armstrong Road Extension Environmental Assessment Study (Parsons, 2019) process. The Transportation Master Plan (TMP) Capital Infrastructure Plan identifies this as a Phase 1 project and it is therefore it is expected that construction of this facility may be completed within the next 10 years.
- **Bank Street** is currently being widened from two to four lanes between Leitrim Road and Miikana Road/Blais Road as part of a City-funded capital project which is anticipated to be complete by 2026[1]. Further widening between Miikana Road/Blais Road and the future Earl Armstrong Road extension is expected to be completed by 2046. It is assumed that the segment of Bank Street within the site's frontage will have a four-lane, divided cross-section with a 37.5m ROW and a posted speed limit of 60km/h, carrying forward a similar cross-section that is currently being implemented further north through the remainder of the Leitrim Community.
- **Kelly Farm Drive** presently exists as a two-lane, urban undivided collector street from Leitrim Road to the northern boundary of the site with a 26-metre right-of-way. This collector street will be extended further south through the subject site and, for the purposes of this study, is assumed to have a posted speed limit of 50km/h.

Summary of Noise Parameters

Based on the four-lane, divided arterial road cross-sections of both Earl Armstrong Road and Bank Street, the collector road designation Kelly Farm Drive bisecting the subject site, the noise parameters were established from Appendix B of the ENC Guidelines.

A summary of the road study parameters carried forward for use in this study is provided in **Table 3-1** below.

[1] https://ottawa.ca/en/city-hall/public-engagement/projects/bank-street-widening-and-reconstruction-south-leitrim-road-south-blais-road#

Table 3-1 – Road Study Parameters

Parameter	Earl Armstrong Road (4-UAD 80km/h)	Bank Street (4-UAD 60km/h)	Kelly Farm Drive (2-UCU 50km/h)
Annual Average Daily Traffic (AADT)	35,000	35,000	8,000
Posted Speed Limit (km/h)	80	60	50
% Medium Trucks	7%	7%	7%
% Heavy Trucks	5%	5%	5%
% Daytime Traffic	92%	92%	92%
% Nighttime Traffic	8%	8%	8%

3.2 Calculation Methods

The road noise analysis for this study was conducted using STAMSON v5.04, an industry-standard software program developed by the Ontario Ministry of the Environment, Conservation and Parks (MECP). Road noise was modelled using the ORNAMENT methodology, while rail noise is modelled using the STEAM methodology, as required.

The STAMSON noise output results are provided in **Appendix A**. Separate divergence calculations are provided for any source-receiver distances less than 15 metres and are found in **Appendix B**, as these results cannot be processed directly using STAMSON.

Details pertaining to the noise criteria of interest are outlined below:

- The limits of requirements pertaining to a building component review, mandatory air conditioning and a Type 'D' warning clause, the 65 dBA (daytime) and 60 dBA (nighttime) noise contours were analysed at the building face. Similarly, the limits of forced air heating, provision for central air-conditioning and a Type 'C' warning clause, the 55 dBA (daytime) and 50 dBA (nighttime) noise contours were evaluated at the building face.
- The noise criteria limits for the outdoor living areas (OLAs) at 60 dBA and 55 dBA were evaluated under daytime conditions only at a receiver height of 1.5m.

The off-set distances presented in **Table 3-2** below were measured from the right-of-way centreline or from the centre of the right-of-way protection for each roadway identified for inclusion in the noise analysis, as discussed in the preceding section.

Table 3-2 – Noise Contour Offsets

Noise Criteria		Distance from Centreline (m)		
		Earl Armstrong Road (4-UAD 80km/h)	Bank Street (4-UAD 60km/h)	Kelly Farm Drive (2-UCU 50km/h)
Indoor Daytime	65 dBA	57.69	40.81	12.73[1]
	55 dBA	230.98	163.50	54.43
Indoor Nighttime	60 dBA	43.54	30.22	7.27[1]
	50 dBA	188.80	131.00	40.99
Outdoor Living Area - OLA (Daytime Only) [3]	60 dBA	115.41	81.66	27.20
	55 dBA	230.98	163.50	54.43

*Note: [1] Outside of the STAMSON Source-Receiver distance range. Determined using divergence calculations (see **Appendix B**).*

Based on **Table 3-2** above for the indoor noise evaluation, the daytime contours for all of the above noted corridors are further from centreline than the nighttime levels for each criterion. As such, only the daytime levels will be considered in the noise analysis for this study. Noise contours for both indoor (daytime only) and outdoor noise evaluation are shown in **Figure 3-1** below. These contours have not been adjusted to reflect screening from proposed buildings. For clarity purposes, the noise contours have not been extended beyond the contours of an intersecting road.

DUN SKIPPER DRIVE

KELLY FARM DRIVE

BANK STREET

PAKANAAK AVENUE

FUTURE EARL ARMSTRONG ROAD EXTENSION

LEITRIM S-4 EXPANSION LANDS

SWM POND 0.5 Ha

Park (0.2 Ha)

Future Road Connection

Emergency Access & Servicing Only

Project North

SITE LIMITS

POTENTIAL NOISE BARRIER

65 dBA INDOOR (DAY)
60 dBA INDOOR (DAY)
55 dBA INDOOR/OLA (DAY)

CENTRELINE OFFSETS (metres)

Earl Armstrong Rd 4-UAD 80km/h	Bank Street 4-UAD 60km/h	Kelly Farm Drive 2-UCU 50km/h
57.7	40.8	12.7
115.4	81.7	27.2
231.0	163.5	54.4

Project Title

Drawing Title

ARCADIS

Figure 3-1 Noise Plan

4 Results

4.1 Indoor Sound Levels

The 55 dBA (daytime) contours shown on **Figure 3-1** represent the limit in which a Type 'C' warning clause and forced air heating with provision for central air conditioning are required for 'noise-sensitive' indoor uses. Similarly, the 65 dBA (daytime) contours represent the limit in which a Type 'D' warning clause, central air conditioning and an acoustical review/design of the building components are required. As noted in Section 3.2, the noise contours have not been adjusted to account for screening by the proposed buildings. The exact number of units that exceed either the 65 dBA or 55 dBA thresholds will be determined during the detailed design for each phase sub-phase of the development, following the successful completion of the overall rezoning and Draft Plan of Subdivision applications for the proposed development.

A summary of the results of each roadway is as follows:

Earl Armstrong Road (4-UAD 80km/h) – For this future 4-lane, divided arterial road with an assumed posted speed limit of 80km/h, the 65 dBA noise contour will extend approximately 57.7 metres from the right-of-way centreline. The subject site's lack of direct frontage and separation of dwelling units from Earl Armstrong Road by local window streets serving the subject development is anticipated to limit the number of dwelling units which will require warning clause Type 'D'.

The 55 dBA noise contour extends approximately 231.0 metres beyond the right-of-way centreline, covering the entirety of the subject property, therefore all dwelling units may require warning clause Type 'C'. It should be noted, however, that this analysis does not take into consideration screening from any future buildings on the subject site which can reasonably be expected to reduce the receptor noise levels for the inner-most residential dwelling units to within the acceptable 55 dBA (daytime) threshold limit.

Bank Street (4-UAD 60km/h) – As show on **Figure 3-1** above, the retention of existing commercial properties on Bank Street helps to buffer the subject site from traffic noise on this north-south arterial road. The nearest dwelling units are located more than 100 metres from the Bank Street ROW centreline and therefore well beyond the approximate 40.8-metre 65 dBA noise contour. As such, it is not anticipated that any dwelling units will require a Type 'D' warning clause as a direct result of traffic noise from Bank Street.

The 55 dBA noise contour, extending about 162.5 metres beyond the right-of-way centreline encroaches further into the subject property, therefore dwelling units within this range may experience indirect noise impacts from Bank Street and some are expected to require warning clause Type 'C'. It should be noted, however, that this analysis does not take into consideration any screening from any future buildings on the subject site which can reasonably be expected to reduce the receptor noise levels for the inner-most residential dwelling units to within the acceptable 55 dBA (daytime) threshold limits.

As discussed previously, given that the 55 dBA (daytime) noise contours from Earl Armstrong Road cover the entire site, a significant number of dwelling units within the proposed development are expected to require warning clause Type 'C'.

Kelly Farm Drive (2-UCU 50km/h) – As shown on **Figure 3-1**, the 65 dBA contour falls within the road ROW and therefore would not impact any dwelling units adjacent to this collector street. All units directly fronting, backing onto or flanking Kelly Farm Drive will experience noise levels above 55 dBA, requiring alternative means of ventilation

and a Type 'C' warning clause. The exact number of units that exceed 55 dBA will be determined during detailed design stage.

Warning clauses for indoor noise are as follows:

Type 'C'

"This dwelling unit has been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's, Conservation and Parks (MECP) noise criteria. (Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property."

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 City's and the Ministry of the Environment's, Conservation and Parks (MECP) noise criteria."

4.1.1 Sound Transmission Class (STC) Ratings

All dwelling units requiring a Type 'D' warning clause shall have mandatory central air conditioning and acoustical review of building components. Sound Transmission Class (STC) ratings for windows and glazed doors will be required for any 'noise sensitive' uses with the highest exposure to either the Earl Armstrong Road extension or Bank Street adjacent to the site.

Dwelling units that are located directly adjacent to Kelly Farm Drive (2-UCU 50km/h) are not anticipated to trigger a Type 'D' warning clause, unless the noise levels from another nearby corridor identified above encroach on these lands as well.

4.2 Outdoor Sound Levels

The outdoor 60 dBA contour on **Figure 3-1** represents the limit in which physical attenuation is required in the outdoor living areas (OLAs) for 'noise-sensitive' uses. For OLA receptor locations between the 60 dBA and 55 dBA contours, physical attenuation may not be required but should be considered as stated in Part 4, Section 3.4 of the ENC Guidelines. As noted in Section 3.2 of this study, noise contours have not been adjusted to account for screening by the proposed buildings. The location and limits of any Outdoor Living Areas (OLAs) within the resulting property parcels of the subject site will be defined during the detailed design or as part of the future Site Plan Control (SPC) application process and, at that time, the need for any specific noise mitigation measures (i.e. noise barriers or berm combinations) for these amenity areas will be identified.

A summary of the results for each roadway is as follows:

Earl Armstrong Road (4-UAD 80km/h) – The 60 dBA noise criteria was determined to be approximately 115.4 metres from the roadway centreline, therefore any outdoor living areas (OLAs) in this range may require physical attenuation.

Similar to the indoor noise analysis, the 55 dBA noise contour extends approximately 231.0 metres beyond the right-of-way centreline, encompassing an approximate two-fold distance in comparison with the 60 dBA contour and a range of housing types. As such, any 'noise-sensitive' OLAs beyond the 60 dBA threshold may still require the application of warning clause Type 'A'.

Bank Street (4-UAD 60km/h) – The 60 dBA noise criteria was determined to be approximately 81.7 metres from the roadway centreline. Given the significant buffer of more than 100 metres created by existing commercial properties fronting onto Bank Street, it is not anticipated that any outdoor living areas (OLAs) associated with the proposed development will require physical attenuation specifically as a result of traffic noise on Bank Street.

Similar to the indoor noise analysis, the 55 dBA noise contour extends approximately 163.5 metres beyond the right-of-way centreline, encompassing the easternmost block of single-family and stacked townhome dwelling units. As such, any 'noise-sensitive' OLAs beyond the 60 dBA threshold may still require the application of warning clause Type 'A'.

Kelly Farm Drive (2-UCU 50km/h) – As the 60 dBA outdoor contour is located approximately 14.2 metres from the property limits, all outdoor living areas (OLAs) in this range will require further evaluation to determine the need for physical attenuation. At locations where the noise level is below 60 dBA but above 55 dBA, warning clause Type 'A' could be considered in lieu of a barrier.

Dwelling units flanking or backing onto Kelly Farm Drive may require physical attenuation; therefore, potential noise barriers are identified in **Figure 3-1** above.

More compact housing typologies, including or stacked townhomes within the proposed development may have shared amenity spaces that require physical noise attenuation, especially if these locations have direct exposure to either Earl Armstrong Road. The need for noise barriers, however, will be confirmed during the detailed design stages for each block as part of subsequent detailed design stages for individual blocks.

Warning clauses for outdoor noise are as follows:

Type 'A'

"Purchasers/tenants are advised that sound levels due to increasing Earl Armstrong Road (future extension), Bank Street and Kelly Farm Drive, traffic volumes may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the City's and the Ministry of the Environment, Conservation and Park's (MECP's) noise criteria."

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 Earl Armstrong Road (future extension), Bank Street and Kelly Farm Drive may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the City's and the Ministry of the Environment, Conservation and Park's (MECP's) noise criteria."

4.3 Aircraft Noise

Given that the site is entirely located within the Airport Vicinity Development Zone (ADVZ), the following warning clause will apply to Indoor or Outdoor Living Areas which conform to the City's criteria for 'noise-sensitive' land uses, as prescribed in the ENC Guidelines.

The standard warning clause for aircraft noise is as follows:

"Purchasers/tenants are advised that due to the proximity of the Ottawa Macdonald-Cartier International Airport, noise from the airport and individual aircraft may at times interfere with indoor or outdoor activities".

5 Conclusion

Arcadis was retained by Regional Group to undertake a Noise Control Feasibility Study in support of Zoning By-law Amendment and Draft Plan of Subdivision applications for a proposed development to be located at the southern edge of the Leitrim community, west of Bank Street.

Through preliminary noise investigations conducted as part of this study, contour lines were established to define the limits of the noise criteria for road aircraft noise and identify any potential constraints which may exist for 'noise-sensitive' land uses through the site's future development.

It is anticipated that a more fulsome analysis will be required in the form of Environmental Noise Impact Assessment(s) to inform specific recommendations for appropriate warning clauses or other mitigation strategies, with respect to road, rail or aircraft traffic noise following the successful completion of the Zoning By-law Amendment and Draft Plan of Subdivision (DPS) approvals process.

6 Professional Authorization

Prepared By:

Ben Pascolo-Neveu, P.Eng

Appendix A

STAMSON Output Reports

STAMSON 5.0 NORMAL REPORT Date: 27-08-2020 11:35:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 4-UAD.te Time Period: Day/Night 16/8 hours
Description: 4-UAD 65 dBA (day)/ 60 dBA (night)

Road data, segment # 1: 4-UAD (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: 4-UAD (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 : 57.69 / 43.54 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: 4-UAD (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: 4-UAD (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  :  57.69 / 43.54  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: 4-UAD (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.99 + 0.00) = 61.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  73.16   0.00  -9.71  -1.46   0.00   0.00   0.00  61.99
-------------------------------------------------------------------------------

Segment Leq : 61.99 dBA


Results segment # 2: 4-UAD (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.99 + 0.00) = 61.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  73.16   0.00  -9.71  -1.46   0.00   0.00   0.00  61.99
-------------------------------------------------------------------------------

Segment Leq : 61.99 dBA

Total Leq All Segments: 65.00 dBA


Results segment # 1: 4-UAD (night)
---------------------------------
```

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	65.56	0.00	-7.27	-1.30	0.00	0.00	0.00	56.99

Segment Leq : 56.99 dBA

Results segment # 2: 4-UAD (night)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	65.56	0.00	-7.27	-1.30	0.00	0.00	0.00	56.99

Segment Leq : 56.99 dBA

Total Leq All Segments: 60.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.00
(NIGHT): 60.00

STAMSON 5.0 NORMAL REPORT Date: 06-05-2022 17:15:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 4uad80.te Time Period: Day/Night 16/8 hours
Description: 4uad 80 dba (day) / 50 dba (night)

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: (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 : 115.41 / 188.80 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

FF
Road data, segment # 2: (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 2: (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 : 115.41 / 188.80 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

FF
Results segment # 1: (day)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	73.16	0.00	-14.71	-1.46	0.00	0.00	0.00	56.99

Segment Leq : 56.99 dBA

FF
Results segment # 2: (day)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	73.16	0.00	-14.71	-1.46	0.00	0.00	0.00	56.99

Segment Leq : 56.99 dBA

Total Leq All Segments: 60.00 dBA

FF
Results segment # 1: (night)

Source height = 1.50 m

ROAD (0.00 + 46.99 + 0.00) = 46.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	65.56	0.00	-17.27	-1.30	0.00	0.00	0.00	46.99

Segment Leq : 46.99 dBA

FF
Results segment # 2: (night)

Source height = 1.50 m

ROAD (0.00 + 46.99 + 0.00) = 46.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	65.56	0.00	-17.27	-1.30	0.00	0.00	0.00	46.99

Segment Leq : 46.99 dBA

Total Leq All Segments: 50.00 dBA

FF

TOTAL Leq FROM ALL SOURCES (DAY): 60.00
(NIGHT): 50.00

STAMSON 5.0 NORMAL REPORT Date: 27-08-2020 11:39:17
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 4-UAD80.te Time Period: Day/Night 16/8 hours
Description: 4-UAD 80 55 dBA (day)/ 60 dBA
(night)

Road data, segment # 1: 4-UAD (day/night)
Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: 4-UAD (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 : 230.98 / 43.54 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: 4-UAD (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 80 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: 4-UAD (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  : 230.98 / 43.54  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: 4-UAD (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 51.99 + 0.00) = 51.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  73.16   0.00 -19.71  -1.46   0.00   0.00   0.00  51.99
-------------------------------------------------------------------------------

Segment Leq : 51.99 dBA


Results segment # 2: 4-UAD (day)
---------------------------------

Source height = 1.50 m

ROAD (0.00 + 51.99 + 0.00) = 51.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  73.16   0.00 -19.71  -1.46   0.00   0.00   0.00  51.99
-------------------------------------------------------------------------------

Segment Leq : 51.99 dBA

Total Leq All Segments: 55.00 dBA


Results segment # 1: 4-UAD (night)
---------------------------------
```

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	65.56	0.00	-7.27	-1.30	0.00	0.00	0.00	56.99

Segment Leq : 56.99 dBA

Results segment # 2: 4-UAD (night)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	65.56	0.00	-7.27	-1.30	0.00	0.00	0.00	56.99

Segment Leq : 56.99 dBA

Total Leq All Segments: 60.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 60.00

STAMSON 5.0 NORMAL REPORT Date: 26-08-2020 17:38:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 4UAD60.te Time Period: Day/Night 16/8 hours
Description: 4UAD 60 - 65/60 dBA Indoor (Day/Night)

Road data, segment # 1: 4UAD60 (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: 4UAD60 (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 : 40.81 / 30.22 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: 4UAD60 (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: 4UAD60 (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  :  40.81 / 30.22  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: 4UAD (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.99 + 0.00) = 61.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  70.67   0.00  -7.22  -1.46   0.00   0.00   0.00  61.99
-------------------------------------------------------------------------------

Segment Leq : 61.99 dBA


Results segment # 2: RG South (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 61.99 + 0.00) = 61.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  70.67   0.00  -7.22  -1.46   0.00   0.00   0.00  61.99
-------------------------------------------------------------------------------

Segment Leq : 61.99 dBA

Total Leq All Segments: 65.00 dBA


Results segment # 1: RG North (night)
-----------------------------------
```

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-4.78	-1.30	0.00	0.00	0.00	56.99

Segment Leq : 56.99 dBA

Results segment # 2: RG South (night)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-4.78	-1.30	0.00	0.00	0.00	56.99

Segment Leq : 56.99 dBA

Total Leq All Segments: 60.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.00
(NIGHT): 60.00

STAMSON 5.0 NORMAL REPORT Date: 30-07-2025 16:20:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: Time Period: Day/Night 16/8 hours
Description: 4uad 80km/h 60 dbA / 50 dBA

Road data, segment # 1: 4UAD60NB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: 4UAD60NB (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 : 81.66 / 131.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Road data, segment # 2: 4UAD60NB (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data for Segment # 2: 4UAD60NB (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  :  81.66 / 131.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

↟
Results segment # 1: 4UAD60NB (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  70.67   0.00 -12.22  -1.46   0.00   0.00   0.00  56.99
-------------------------------------------------------------------------------

Segment Leq : 56.99 dBA

↟
Results segment # 2: 4UAD60NB (day)
-----------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  70.67   0.00 -12.22  -1.46   0.00   0.00   0.00  56.99
-------------------------------------------------------------------------------

Segment Leq : 56.99 dBA

Total Leq All Segments: 60.00 dBA

↟
Results segment # 1: 4UAD60NB (night)
-------------------------------------
```

Source height = 1.50 m

ROAD (0.00 + 46.99 + 0.00) = 46.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-14.78	-1.30	0.00	0.00	0.00	46.99

Segment Leq : 46.99 dBA

Results segment # 2: 4UAD60NB (night)

Source height = 1.50 m

ROAD (0.00 + 46.99 + 0.00) = 46.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-14.78	-1.30	0.00	0.00	0.00	46.99

Segment Leq : 46.99 dBA

Total Leq All Segments: 50.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.00
(NIGHT): 50.00

STAMSON 5.0 NORMAL REPORT Date: 26-08-2020 17:44:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 4uad60.te Time Period: Day/Night 16/8 hours
Description: 4uad60 - 55/60 dBA Indoor (Day/Night)

Road data, segment # 1: 4UAD60 (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: 4UAD60 (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 : 163.50 / 30.22 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: 4UAD60 (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 17500
Percentage of Annual Growth : 0.00

```
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   7.00
    Heavy Truck  % of Total Volume     :   5.00
    Day (16 hrs) % of Total Volume     :  92.00

Data  for  Segment  #  2:  4UAD60  (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  : 163.50 / 30.22  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Results segment # 1: 4UAD60 (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 51.99 + 0.00) = 51.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  70.67   0.00 -17.22  -1.46   0.00   0.00   0.00  51.99
-------------------------------------------------------------------------------

Segment Leq : 51.99 dBA


Results segment # 2: 4UAD60 (day)
----------------------------------

Source height = 1.50 m

ROAD (0.00 + 51.99 + 0.00) = 51.99 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  70.67   0.00 -17.22  -1.46   0.00   0.00   0.00  51.99
-------------------------------------------------------------------------------

Segment Leq : 51.99 dBA

Total Leq All Segments: 55.00 dBA


Results  segment  #  1:  4UAD60  (night)
----------------------------------
```

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-4.78	-1.30	0.00	0.00	0.00	56.99

Segment Leq : 56.99 dBA

Results segment # 2: 4UAD60 (night)

Source height = 1.50 m

ROAD (0.00 + 56.99 + 0.00) = 56.99 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	63.07	0.00	-4.78	-1.30	0.00	0.00	0.00	56.99

Segment Leq : 56.99 dBA

Total Leq All Segments: 60.00 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 60.00

STAMSON 5.0 NORMAL REPORT Date: 09-07-2020 11:11:38
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 2ucu.te Time Period: Day/Night 16/8 hours
Description: 2-UCU 60 dBA Daytime

Road data, segment # 1: 2-UCU (day/night)

Car traffic volume	:	6477/563	veh/TimePeriod *
Medium truck volume	:	515/45	veh/TimePeriod *
Heavy truck volume	:	368/32	veh/TimePeriod *
Posted speed limit	:	50 km/h	
Road gradient	:	1 %	
Road pavement	:	1 (Typical asphalt or concrete)	

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT)	:	8000
Percentage of Annual Growth	:	0.00
Number of Years of Growth	:	0.00
Medium Truck % of Total Volume	:	7.00
Heavy Truck % of Total Volume	:	5.00
Day (16 hrs) % of Total Volume	:	92.00

Data for Segment # 1: 2-UCU (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	:	27.20 / 53.01	m
Receiver height	:	1.50 / 4.50	m
Topography	:	1	(Flat/gentle slope; no barrier)
Reference angle	:	0.00	

Results segment # 1: 2-UCU (day)

Source height = 1.50 m

ROAD (0.00 + 60.00 + 0.00) = 60.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.75	0.00	-4.29	-1.46	0.00	0.00	0.00	60.00

Segment Leq : 60.00 dBA

Total Leq All Segments: 60.00 dBA

Results segment # 1: 2-UCU (night)

Source height = 1.50 m

ROAD (0.00 + 48.25 + 0.00) = 48.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	58.16	0.00	-8.61	-1.30	0.00	0.00	0.00	48.25

Segment Leq : 48.25 dBA

Total Leq All Segments: 48.25 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.00
(NIGHT): 48.25

STAMSON 5.0 NORMAL REPORT Date: 09-07-2020 11:13:52
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 2ucu.te Time Period: Day/Night 16/8 hours
Description: 2-UCU 55 dBA Daytime, 50 dBA Nighttime

Road data, segment # 1: 2-UCU (day/night)

Car traffic volume	6477/563	veh/TimePeriod *
Medium truck volume	515/45	veh/TimePeriod *
Heavy truck volume	368/32	veh/TimePeriod *
Posted speed limit	50 km/h	
Road gradient	1 %	
Road pavement	1 (Typical asphalt or concrete)	

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT)	8000
Percentage of Annual Growth	0.00
Number of Years of Growth	0.00
Medium Truck % of Total Volume	7.00
Heavy Truck % of Total Volume	5.00
Day (16 hrs) % of Total Volume	92.00

Data for Segment # 1: 2-UCU (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	54.43 / 40.99	m
Receiver height	1.50 / 4.50	m
Topography	1	(Flat/gentle slope; no barrier)
Reference angle	0.00	

Results segment # 1: 2-UCU (day)

Source height = 1.50 m

ROAD (0.00 + 55.00 + 0.00) = 55.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.75	0.00	-9.29	-1.46	0.00	0.00	0.00	55.00

Segment Leq : 55.00 dBA

Total Leq All Segments: 55.00 dBA

↟

Results segment # 1: 2-UCU (night)

Source height = 1.50 m

ROAD (0.00 + 50.00 + 0.00) = 50.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	58.16	0.00	-6.86	-1.30	0.00	0.00	0.00	50.00

Segment Leq : 50.00 dBA

Total Leq All Segments: 50.00 dBA

↟

TOTAL Leq FROM ALL SOURCES (DAY): 55.00
(NIGHT): 50.00

↟

↟

2-UCU6560 day night (divergence req'd)
STAMSON 5.0 NORMAL REPORT Date: 09-07-2020 11:32:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 2ucu.te Time Period: Day/Night 16/8 hours
Description: 2-UMCU 65 dBA Daytime, 60 dBA Nighttime

Road data, segment # 1: 2-UCU (day/night)

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 1 %
Road pavement : 1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 8000
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 7.00
Heavy Truck % of Total Volume : 5.00
Day (16 hrs) % of Total Volume : 92.00

Data for Segment # 1: 2-UCU (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 15.00 / 15.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: 2-UCU (day)

Source height = 1.50 m

ROAD (0.00 + 64.29 + 0.00) = 64.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.75	0.00	0.00	-1.46	0.00	0.00	0.00	64.29

2-UCU6560 day night (divergence req'd)

Segment Leq : 64.29 dBA

Total Leq All Segments: 64.29 dBA

Results segment # 1: 2-UCU (night)

Source height = 1.50 m

ROAD (0.00 + 56.85 + 0.00) = 56.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.57	58.16	0.00	0.00	-1.30	0.00	0.00	0.00	56.85

Segment Leq : 56.85 dBA

Total Leq All Segments: 56.85 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.29
(NIGHT): 56.85

Appendix B

Divergence Calculations

Divergence Calculations - For Source-Receiver Distances < 15m Apart

Divergence - Line Source - 65 dBA (Daytime) - Kelly Farm Drive - 2-UCU 50km/h

Origin	Distance	d1	15	m
	Noise	n1	64.29	dBA
Receiver	Noise	n2	65	dBA
Distance (est)		d2	12.737707	

Note: Distance (est) = d1 / (10^((n2-n1)/10))
*When n2>n1

Divergence - Line Source - 60 dBA (Nighttime) - Kelly Farm Drive - 2-UCU 50km/h

Origin	Distance	d1	15	m
	Noise	n1	56.85	dBA
Receiver	Noise	n2	60	dBA
Distance (est)		d2	7.2625855	

Note: Distance (est) = d1 / (10^((n2-n1)/10))
*When n2>n1

Arcadis Canada Inc.
333 Preston Street, Suite 500
Ottawa, Ontario K1S 5N4
Canada
Phone: 613 721 0555
www.arcadis.com