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Minto Communities Inc.
Abbott's Run – Block 13

Noise Impact Assessment

Noise Impact Assessment

Minto Communities Inc.
Abbott's Run – Block 13

Prepared by:

NOVATECH
240 Michael Cowpland Drive, Suite 200
Ottawa, Ontario, K2M 1P6

May 13, 2025

Ref: R-2025-39
Novatech File No. 122039

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May 13, 2025

BY EMAIL

Minto Group
200 – 180 Kent Street
Ottawa, ON K1P 0B6

Attention: **Erin Harrington,**
Land Development, Project Coordinator

Reference: **Minto Communities Inc. – Abbott's Run Block 13**
Noise Impact Assessment
Our File No.: 122039

Enclosed is the 'Noise Impact Assessment' for the proposed development of Abbott's Run – Block 13.

Please contact the undersigned with any questions, or if you require additional information.

Sincerely,

NOVATECH

Lucas Wilson, P.Eng.
Project Engineer

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1.0 INTRODUCTION

The Abbott's Run – Block 13 Lands are located within the Fernbank Community on the north side of Abbott Street, east of Robert Grant Avenue. **Figure 1-1** shows the location of the Fernbank Community, the Minto Lands, and Abbott's Run Block 13.

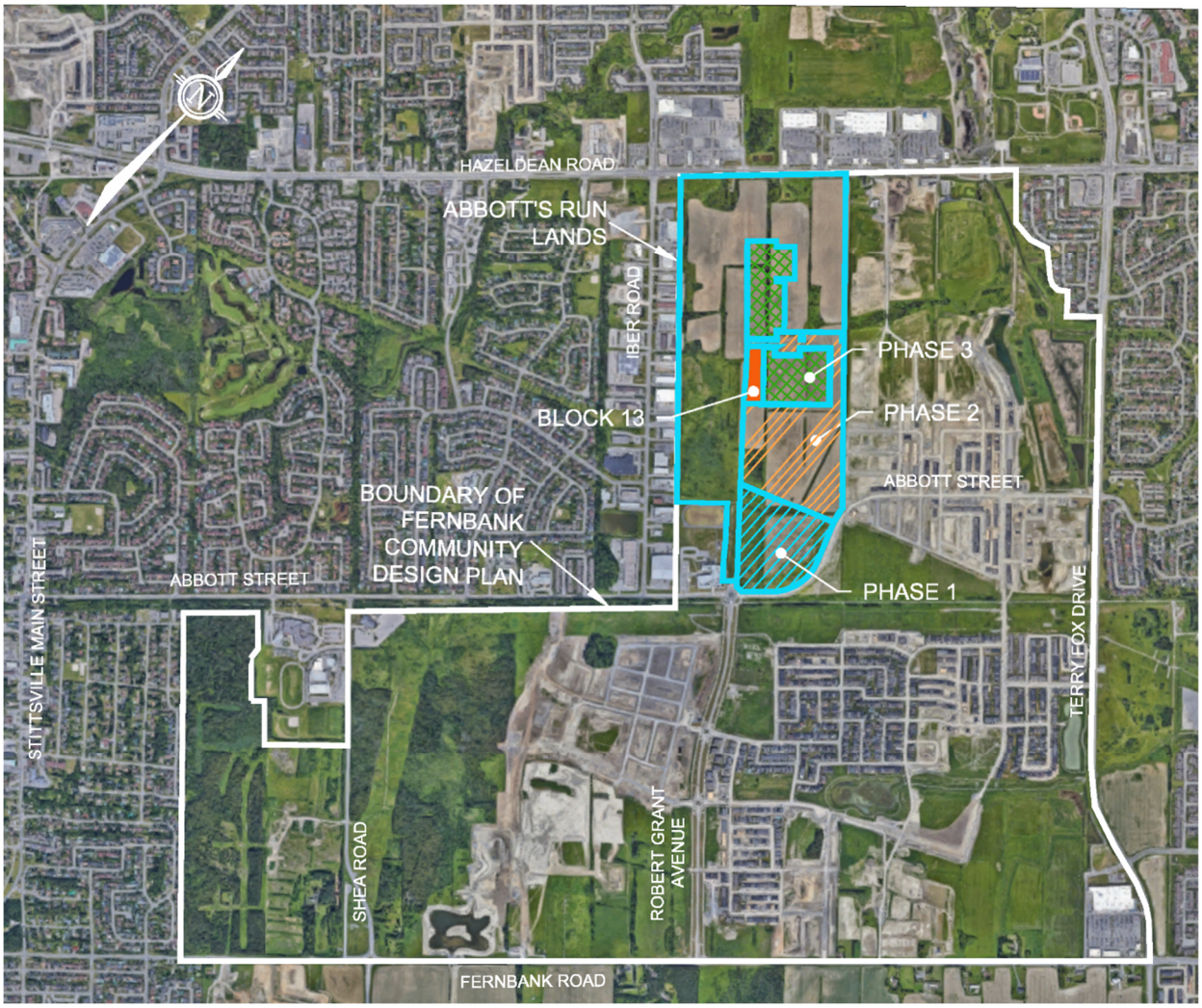


Figure 1-1 Key Plan

Block 13 consists of 124 stacked townhouse units divided among 6 buildings (two 16-unit buildings, one 20 unit building and three 24-unit buildings). The proposed Abbott's Run – Block 13 Site Plan can be found in the attached **Appendix D**.

This report assesses the impacts of sound from vehicular traffic on the proposed development using the Ministry of the Environment (MOE) Stamson 5.0 software and outlines any necessary noise attenuation requirements for compliance with the City of Ottawa Environmental Noise Control Guidelines (ENCG) and the MOE Environmental Noise Guidelines (MOE Publication NPC-300).

2.0 CITY OF OTTAWA ENVIRONMENTAL NOISE CONTROL GUIDELINES

2.1 Sound Level Criteria

The City of Ottawa is concerned with noise from aircraft, roads, railways and transitways as expressed in the City of Ottawa Official Plan (May 2003). These policies are supported by the Environmental Noise Control Guidelines (ENCG) which is a technical document that outlines the specific sound level criteria. The City of Ottawa's *Environmental Noise Control Guidelines (ENCG)*, January, 2016 and the Ministry of Environment's *Environmental Noise Guidelines, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300* have been used for the purpose of this report. As per Section 2.2 of the City of Ottawa Noise Control Guidelines (2016), unless otherwise noted, developments should be consistent with NPC-300 (MOE publication, 2013).

The areas that must be assessed for acoustic protection include the Outdoor Living Area (OLA) and the Outdoor Plane of Window (POW).

These locations are defined as:

- **Outdoor Living Area (OLA):** The Outdoor Living Area is defined as that part of the outdoor amenity area provided for the quiet enjoyment of the outdoor environment during the daytime period. These amenity areas are typically backyards, gardens, terraces, patios and common outdoor living areas. The OLA noise target for traffic noise sources is 55 dBA. This criterion may be exceeded by an amount not greater than 5 dBA, subject to justification and the use of a Warning Clause.

- **Plane of Window (POW):** The plane of window is defined as the indoor living space where the sound levels will affect the living room area during daytime hours and bedrooms during night time hours. The residential Plane of Window noise target for traffic noise sources is 55 dBA during the day and 50 dBA at night. If this criterion is exceeded, the property may be subject to building component analysis and warning clauses. The ground level will be analysed at 1.5m above grade, the second level at 4.5m above grade and the third level at 7.5m above grade. A reflective ground surface has been used for all receiver locations. Due to this surface type, the noise levels remain relatively unchanged from the ground level to the third level.

Table 2-1 City of Ottawa Outdoor Plane of Window Sound Level Criteria

TIME PERIOD	RECEIVER LOCATION	SOUND LEVEL CRITERIA
Daytime (07:00 - 23:00 hrs)	Plane of Living Room Window	55 dBA
Night time (23:00 - 07:00 hrs)	Plane of Bedroom Window	50 dBA

Compliance with the outdoor sound level criteria generally ensures compliance with the indoor sound level criteria which is summarized below in **Table 2-2**.

Table 2-2 Indoor Sound Level Criteria

TIME PERIOD	RECEIVER LOCATION	SOUND LEVEL CRITERIA
Daytime (07:00 - 23:00 hrs)	**Living/Dining Rooms of residential dwelling units**, hospitals, schools, nursing homes, day-care centres, theatres, places of worship, individual or semiprivate offices, conference rooms etc.	45 dBA
Night Time (23:00 - 07:00 hrs)	**Sleeping quarters of residential units**, hospitals, nursing homes, senior citizen homes, etc.	40 dBA

2.2 Noise Attenuation Requirements

When sound levels are predicted to be less than the specified criteria for daytime and night time conditions, no attenuation measures are required on the part of the proponent. As the noise criteria are exceeded, a combination of attenuation measures is recommended by the City of Ottawa and the MOE to modify the development environment.

These attenuation measures may include any or all of the following:

- Distance setback with soft ground;
- Insertion of noise insensitive land uses between the source and sensitive receptor;
- Orientation of building to provide sheltered zone;
- Construction of a noise barrier wall and/or berm;
- Installation of a forced air ventilation system with provision for central air;
- Installation of central air;
- Acoustically selected building façade components

2.2.1 *Noise Barrier*

Noise barriers should only be used when other noise control measures have been considered, and there is no other alternative. For the purpose of this study, when noise levels exceed 60 dBA in the Outdoor Living Area, control measures (barriers) are required to reduce the Leq to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible.

The noise barriers are to be compliant with the City standard for noise barriers and have the following characteristics.

- Minimum height of 2.2m;
- Maximum height of 2.5m (unless approved by the City of Ottawa);
- Situated 0.30m inside the private property;
- A surface mass density not less than 20kg/sq.m; and
- No holes or gaps.

2.2.2 *Ventilation Requirements*

A forced air heating system with provision for a central air conditioning system is required if the daytime noise levels are between 55 dBA and 60 dBA and/or night time noise levels are between 50 dBA and 60 dBA.

The installation of a central air conditioning system is required when the daytime noise level exceeds 65 dBA and/or night time noise levels exceed 60 dBA.

2.2.3 *Building Component Assessment*

When noise levels exceed 65 dBA (daytime) or 60 dBA (night time) the exterior cladding system of the building envelope must be acoustically assessed to ensure the indoor sound criteria is achieved. This includes analysis of the exterior wall, door, and/or glazing system specifications as appropriate.

The NRC research *Acoustic Insulation Factor: A Rating for the Insulation of Buildings against Noise (*June 1980, JD Quirt) is used to assess the building components and the required acoustic insulation factor (AIF). This method is recognized by the City of Ottawa.

The required AIF is based on the Outside L_{eq}, Indoor L_{eq} required, and the number of exterior façade components.

Minimum Required AIF = Outside L_{eq} – Indoor L_{eq} + $10\log_{10}$ (Number of Components) + 2dB

Where, N = Number of components (walls, windows and roof);
L = Sound Level expressed on a common decibel scale.

2.2.4 *Warning Clauses*

When predicted noise levels exceed the specified criteria, the City of Ottawa and the MOE recommend warning clauses be registered as a notice on title and incorporated into the sales agreements to warn potential purchaser/buyers/tenants of the possible elevated noise levels.

The following typical warning clauses are extracted from Section C8.1 of the MOE NPC-300 document.

Warning Clause 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 City's and the Ministry of the Environment's noise criteria."

Warning Clause 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 occasion interfere with some activities of the dwelling occupants as the sound levels exceed the City's and the Ministry of the Environment's noise criteria.'

Warning Clause Type C
"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. 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 noise criteria."

Warning Clause 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 noise criteria."

2.2.5 *Summary of Noise Attenuation Measure Requirements*

Table 2-3 summarizes the noise attenuation measure requirements and warning clauses should sound criteria be exceeded.

Table 2-3 Outdoor, Ventilation and Warning Clause Requirements (NPC-300)

Assessment Location	L_{eq} (dBA)	Outdoor Control Measures	Indoor Control Measures		Warning Clause
			Ventilation Requirements	Building Components	
Outdoor Living Area (OLA)	Less than 55	None required	N/A	N/A	None required
	Between 55 and 60	Control measures (barriers) may not be required but should be considered	N/A	N/A	Required if resultant L_{eq} exceeds 55 dBA Type A
	More than 60	Barriers required	N/A	N/A	Required if resultant L_{eq} exceeds 55 dBA Type B
Plane of Living Room Window (POW)	Less than 55	N/A	None Required	None Required	None Required
	Between55 and 65	N/A	Forced air heating with provision for central air conditioning	None Required	Required Type C
	More Than 65	N/A	Central Air Conditioning	Acoustical performance of the windows and walls should be specified	Required Type D
Plane of Bedroom Window (POW)	Less than 50	N/A	None Required	None Required	None Required
	Between50 and 60	N/A	Forced air heating with provision for central air conditioning	None Required	Required Type C
	More than 60	N/A	Central Air Conditioning	Acoustical performance of the windows and walls should be specified	Required Type D

3.0 NOISE SOURCES

The City of Ottawa Official Plan and Environmental Noise Control Guidelines (ENCG) stipulate that a noise impact assessment is required when a noise sensitive development is within proximity to a surface transportation (road or rail), stationary and aircraft noise sources.

Due to the site location, only roadway noise will be considered. The following distances to roadway noise sources are applicable to the subject site:

- Within 100m from the right-of-way of an existing/proposed arterial/collector;
- Within 100m from the right-of-way of an existing/proposed transitway.

Robert Grant Avenue (Arterial) and Cranesbill Road (Major Collector) are located within 100m of the development.

3.1 Robert Grant Avenue (Arterial)

Robert Grant Avenue is currently classified as a 2-Lane Urban Arterial (2-UAU) Roadway in the 2013 Transportation Master Plan. An Annual Average Daily Traffic (AADT) value of 15,000 is specified for this type of road.

For the ultimate design, Robert Grant Avenue will be classified as a 4-Lane Urban Arterial-Divided (4-UAU) Roadway. An Annual Average Daily Traffic (AADT) value of 35,000 is specified for this type of road. The posted speed limit in the area of the proposed development is 60km/h.

As per Table B1 of Appendix B of the ENCG, **Table 3-1** outlines the traffic parameters used to calculate the sound levels for the development.

Table 3-1 Robert Grant Avenue Noise Parameters

	Interim	Ultimate
Roadway Classification	2-Lane Urban Arterial	4-Lane Urban Arterial-Divided
Annual Average Daily Traffic (AADT)	15,000 veh/day	35,000 veh/day
Day/Night Split (%)	92/8	92/8
Heavy Trucks (%)	5	5
Medium Trucks (%)	7	7
Posted Speed Limit	60 km/h	60 km/h
Road Gradient	1.0%	1.0%

The ultimate design of Robert Grant Avenue includes a Transitway between the north and southbound lanes. An am peak hour bus volume of 40 veh/h is expected as specified in the Delcan Memorandum dated May 17, 2010 (**Appendix A**). Using the expansion factors provided in **Appendix A**, the am peak hour bus volumes were converted to an equivalent AADT of 482 veh/day. The posted speed limit will be 60 km/h in the area of the proposed development. The Transitway noise parameters are summarized below in **Table 3-2**.

Table 3-2 Transitway Noise Parameters

Roadway Classification	Transitway
Annual Average Daily Traffic (AADT)	482 veh/day
Day/Night Split	85/15
Posted Speed Limit	60 km/h
Road Gradient	1.0%

3.2 Cranesbill Road (Major Collector)

Cranesbill Road is classified as a 2-Lane Major Collector (2-UMCU) Roadway in the 2013 Transportation Master Plan. An Annual Average Daily Traffic (AADT) value of 12,000 is specified for this type of road.

As per Table B1 of Appendix B of the ENCG, **Table 3-3** outlines the traffic parameters used to calculate the sound levels for the development.

Table 3-3 Cranesbill Road Noise Parameters

Roadway Classification	2-Lane Major Collector
Annual Average Daily Traffic (AADT)	12,000 veh/day
Day/Night Split (%)	92/8
Heavy Trucks (%)	5
Medium Trucks (%)	7
Posted Speed Limit	50 km/h
Road Gradient	1.0%

4.0 NOISE LEVEL PREDICTIONS

4.1 Modeling

Noise levels are calculated using the STAMSON computer program, version 5.03. Road data is input into the program as applicable, whereupon the program calculates an A-weighted 16 hour L_{eq} noise level for the daytime and an 8 hour L_{eq} noise level for the night time. The results of these computer calculations are presented in **Appendix B** and summarized in **Table 4-1**.

Table 4-1 POW & OLA Noise Level Summary

LOCATION	PLANE OF WINDOW (POW) NOISE LEVEL – L_{eq} - (dBA)		OUTDOOR LIVING AREA (OLA) NOISE LEVEL – L_{eq} - (dBA)
	DAYTIME	NIGHT TIME	DAYTIME (UNATTENUATED)
R1	70.84	63.41	-
R2	70.49	63.07	-
R3	69.79	62.35	-
R4	68.83	61.33	-
R5	66.87	59.31	-
R6	67.39	59.96	-
R7	62.15	54.72	-
R8	59.78	52.35	-
R9	65.15	57.54	-
R10	62.63	55.20	-
R11	62.47	55.05	-
R12	55.24	48.03	-
R13	59.01	51.46	-
R14	56.58	49.32	-
R15	57.24	49.94	-
R16	50.05	43.04	-
R17	52.63	45.37	-
R18	58.07	50.64	-
R19	54.49	47.06	-
R20	-	-	55.68

4.2 Outdoor Control Measures

The site consists of a shared amenity space located directly north of building 6. The OLA noise level at R20 is slightly above 55 dBA (55.68 dBA) with no noise barriers in place. Control measures have been utilized within the development to reduce the OLA noise levels adjacent significant noise sources. The buildings have been oriented such that the shared amenity area is shielded from Robert Grant Avenue and Cranesbill Road. The amenity area has also been situated to provide an increased setback from the noise sources and oriented to minimize the requirements for noise mitigation barriers.

As shown above, mitigation measures have been implemented to reduce noise levels below 60 dBA and as close to 55 dBA as possible. We recommend placing a warning clause (Type A) on title without adding a physical noise barrier, providing a quality public space that outweighs the benefits of an incremental decrease to decibel levels in the OLA.

Typical wording for Type A warning clause: "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 City's and the Ministry of the Environment's noise criteria."

4.3 Indoor Control Measures

Warning clauses are required on title relating to the requirement of forced air heating with provision for central air conditioning and required central air conditioning.

Units requiring forced air heating with provision for central air conditioning and associated warning clause Type C are identified below in **Figure 5-1**.

Typical wording for Type C warning clause: "This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. 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 noise criteria."

Units requiring central air conditioning and associated warning clause Type D are identified below in **Figure 5-1.**

Typical wording for Type D warning clause: "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 noise levels are within the City's and the Ministry of the Environment's noise criteria."

4.4 Building Component Assessment

4.4.1 *Building Components Facing Robert Grant Avenue*

Sound levels at building faces fronting onto Robert Grant Avenue have a maximum daytime noise level of 70.84 dBA and a night-time noise level of 63.41 dBA at receiver location R1. The sound levels are above the 65 dBA (daytime) allowance therefore, an analysis of the cladding system is warranted. To comply with the ENCG policies, the building envelope will require a minimum AIF rating to provide the indoor noise levels as shown above in **Table 2-2**. Compliance at the worst-case receiver points will demonstrate compliance for all locations along Robert Grant Avenue.

The acoustical insulation factor for residential living rooms with two building components are calculated as follows:

R1:
Daytime: AIF = 70.84 dBA – 45 dBA + 10log(2) dBA + 2 dBA = 31

To comply with the ENCG policies, all building components facing Robert Grant will require a minimum AIF rating of 31 to provide the appropriate indoor daytime noise levels. Presented below are recommended building materials that provide the required AIF rating. These building materials are only suggestions and can be substituted with equivalent building materials that meet or exceed the AIF rating.

A wall with type EW1 composition (refer to **Appendix C** for applicable worksheets) has a minimum AIF of 31 with an exterior wall to interior floor area of 100%. A standard residential window section employs 3mm glazing x 13mm air space x 3mm glazing, which has a minimum AIF of 31 with a window to floor area ratio of 20%. The exterior building envelope is shown to comply with the ENCG policy if these minimum ratios are met.

When the building floor plans and exterior façade have been finalized, the tables in Appendix C shall be referenced to ensure that the selected building components exceed the minimum AIF rating.

4.4.2 *Building Components Facing Cranesbill Road*

Sound levels at building faces fronting onto Cranesbill Road have a maximum daytime noise level of 68.83 dBA and a night-time noise level of 61.33 dBA at receiver location R4. The sound levels are above the 65 dBA (daytime) allowance therefore, an analysis of the cladding system is warranted.

The acoustical insulation factor for residential living rooms with two building components are calculated as follows:

Daytime (R4): AIF = 68.83 dBA – 45 dBA + 10log(2) dBA + 2 dBA = 29

To comply with the ENCG policies, the building components facing Cranesbill Road will require a minimum AIF rating of 29 to provide the appropriate indoor daytime noise levels. Presented below are recommended building materials that provide the required AIF rating. These building materials are only suggestions and can be substituted with equivalent building materials that meet or exceed the AIF rating.

A wall with type EW1 composition (refer to **Appendix C** for applicable worksheets) has a minimum AIF of 29 with an exterior wall to interior floor area of 160%. A standard residential window section employs 3mm glazing x 13mm air space x 3mm glazing, which has a minimum AIF of 29 with a window to floor area ration of 32%. The exterior building envelope is shown to comply with the ENCG policy if the minimum ratios are met.

When the exterior facade has been finalized, the tables in **Appendix C** shall be referenced to ensure that the selected building components exceed the minimum AIF rating.

4.4.3 *Building Components Not Facing Significant Noise Source*

Sound levels at building faces that do not front any significant noise sources have a maximum daytime noise level of 67.39 dBA and a night-time noise level of 59.96 dBA at receiver location R6 (Building 5). The sound level is above the 65 dBA (daytime) allowance therefore, an analysis of the cladding system is warranted.

The acoustical insulation factor for residential living rooms with two building components are calculated as follows:

Daytime (R6): AIF = 67.39 dBA – 45 dBA + 10log(2) dBA + 2 dBA = 27

To comply with the ENCG policies, the building components at receiver location R6 will require a minimum AIF rating of 27 to provide the appropriate indoor daytime noise levels. Presented below are recommended building materials that provide the required AIF rating. These building materials are only suggestions and can be substituted with equivalent building materials that meet or exceed the AIF rating.

A wall with type EW1 composition (refer to **Appendix C** for applicable worksheets) has a minimum AIF of 29 with an exterior wall to interior floor area of 160%. A standard residential window section employs 3mm glazing x 13mm air space x 3mm glazing, which has a minimum AIF of 27 with a window to floor area ration of 40%. The exterior building envelope is shown to comply with the ENCG policy if the minimum ratios are met.

When the exterior facade has been finalized, the tables in **Appendix C** shall be referenced to ensure that the selected building components exceed the minimum AIF rating.

5.0 CONCLUSIONS AND RECOMMENDATIONS

To meet the requirements for compliance with the City of Ottawa Environmental Noise Control Guidelines and the MOE Environmental Noise Guideline the following measures are required.

Outdoor Control Measures

All units will require warning clause type A due to the OLA noise level being slightly above 55 dBA.

Indoor Control Measures

All units that require warning clause Type C or Type D are described below and presented in **Figure 5-1**.

- Type C: Building 1 units f to i, Building 2 unit g, Building 3 units g and l, Building 4 units e and h, Building 5 units b to k, Building 6 units a to d (unit number is associated with all levels of stacked units).
- Type D: Building 1 units a to e and unit j, Building 2 unit a to f and unit l, Building 3 units a to f, Building 4 units a to d, Building 5 units a and l (unit number is associated with all levels of stacked units).

Building Component Assessment

- Building components facing Robert Grant Avenue require an AIF of 31 to comply with the ENCG indoor noise policy (Building 1 units a and j, Building 2 unit a to f, Building 3 units a to f, Building 4 units a to d, Building 5 units a and l).
- Building components facing Cranesbill Road Require an AIF of 29 to comply with the ENCG indoor noise policy (Building 1 units b to e).
- Building components located at receiver location R6 (Buidling 6 unit l) require an AIF of 27 to comply with the ENCG indoor noise policy

Warning Clauses

Warning clauses are to be placed on title and in the purchase and sale agreements as indicated above and in **Figure 5-1**. The following typical warning clauses are extracted from Section C8.1 of the MOE NPC-300 document.

Warning Clause 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 City's and the Ministry of the Environment's noise criteria."

Warning Clause Type 'C'
"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. 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 noise criteria."

Warning Clause 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 noise criteria."

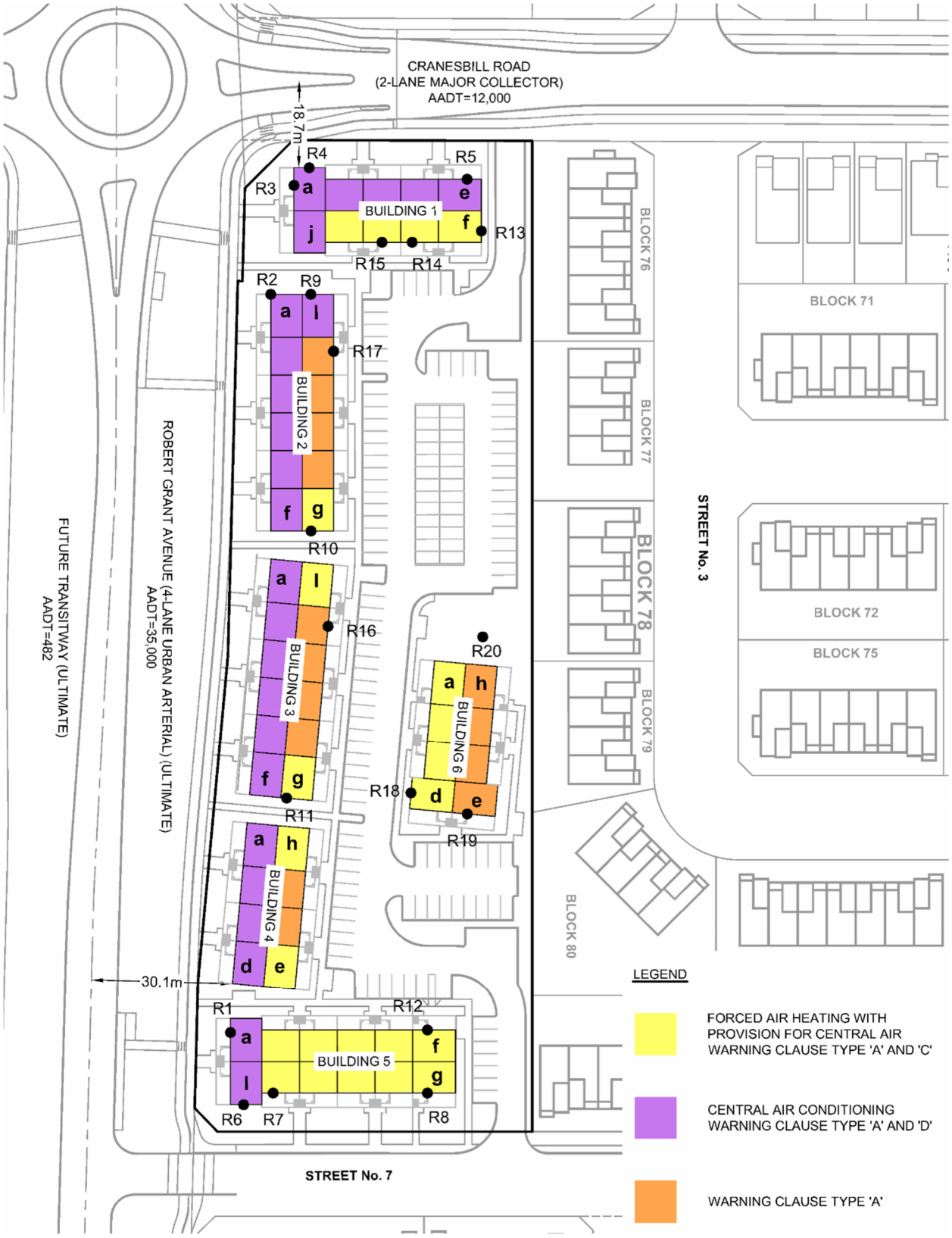


Figure 5-1 Warning Clauses

If you have any questions or comments with regards to this report, please do not hesitate to contact the undersigned.

Respectfully issued,

NOVATECH

Prepared By:

Lucas Wilson, P.Eng.
Project Engineer

Reviewed By:

Mark Bissett, P.Eng.
Senior Project Manager

APPENDIX A

Delcan Memorandum (May 17, 2010)
Expansion Factors

Memorandum

To: File
Project: TO3065TOE00

Date: May 17, 2010
From: Brendan Reid

Re: West Transitway: Terry Fox Drive to Fernbank Road Projected Transit and Traffic Volumes at Hazeldean and Maple Grove/N-S Arterial Intersections

1.0 PURPOSE

The purpose of this memo to file is to provide projected bus volumes for those sections of the West Transitway within Kanata West and the Fernbank Community (Terry Fox Drive to Fernbank Road) as well as projected traffic volumes at the intersections of Hazeldean and Maple Grove Roads with the North-South Arterial.

The combination of peak hour bus and traffic volumes at these two intersections will assist in the decision regarding the need/timing of grade-separation of the transitway at Hazeldean/Maple Grove in conjunction with the phasing of the N-S Arterial and the build-out of the Kanata West and Fernbank Communities up to 2031.

2.0 TRANSIT RIDERSHIP / BUS VOLUME PROJECTIONS

a. Terry Fox Screenline

The Terry Fox Screenline which extends from Richardson Side Road to Flewellyn Road immediately west of Terry Fox Drive can be utilized to provide an estimate of the likely maximum transit ridership/bus volumes on the West Transitway within Kanata West, representing the aggregated ridership from Kanata West, Fernbank and Stittsville.

In conjunction with the 2008 update of the City's Official Plan, the projected peak hour data at the Terry Fox Screenline emanating from the City's TRANS Model was as follows:

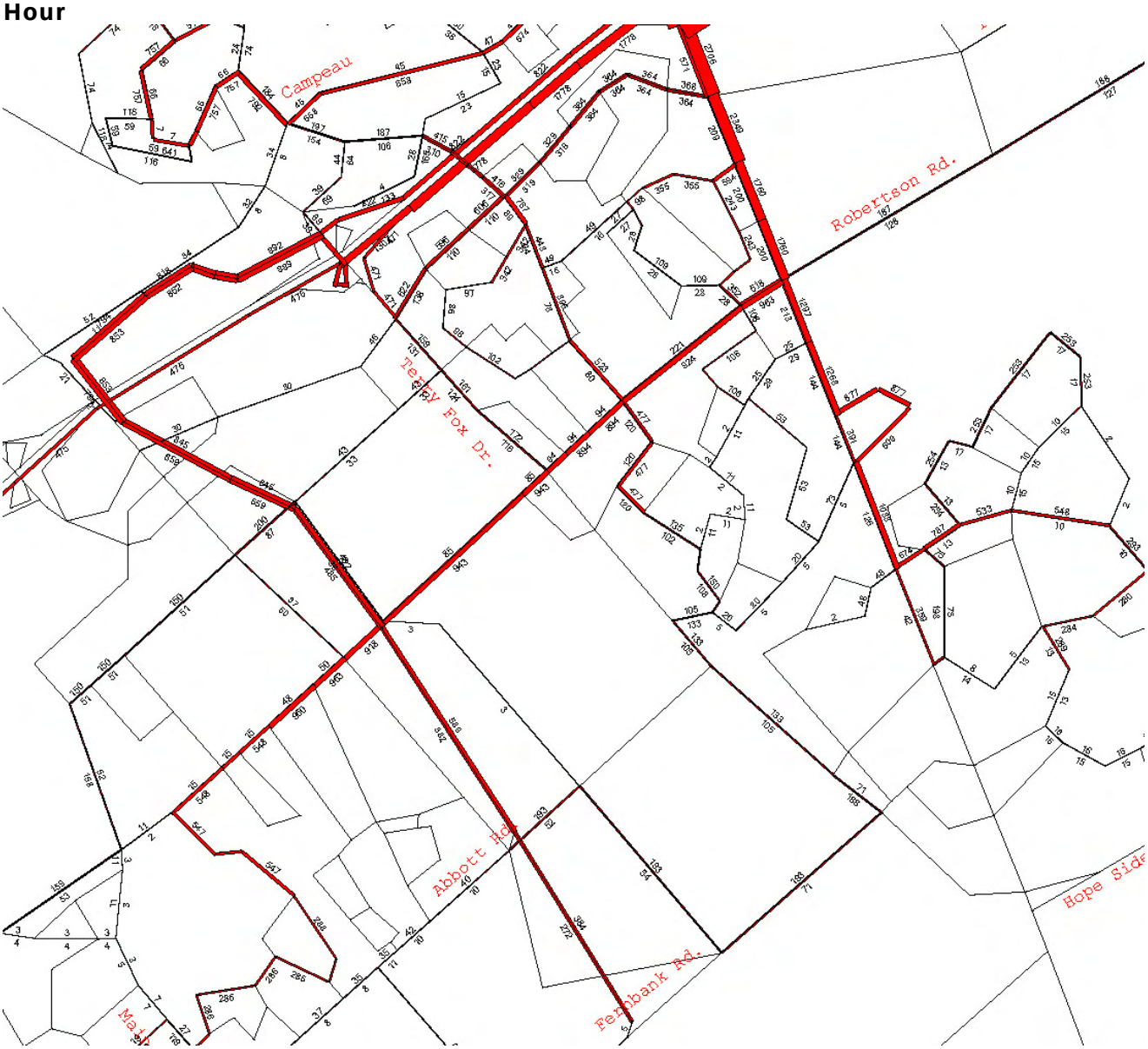
Transit Trips	Auto Trips	Total Trips (peak hour)	Modal Split
2,400	9,300	11,700	21%

As the projected total peak hour transit trips represent the combined transit ridership on both the West Transitway and arterial roads crossing the screenline it can be assumed to represent a maximum likely ridership to be achieved by 2031.

Based on an average bus ridership of 50 ppv, it therefore represents an upper potential limit of approximately 48 buses/hr in the peak direction.

Attached at Figure 1 is a print-out of the transit trip assignment to the assumed network (transitway + arterials) within Kanata West/Fernbank resulting from the TRANS Model at 2031:

Figure 1: West Transitway TRANS Assignment: 2031 Passenger Volumes: AM Peak Hour



A few issues are worthy of note:

- The peak hour ridership on the West Transitway north of Highway 417 is approximately 900 pph in the peak direction;
- More transit riders, approximately 950 pph in the peak direction, have been assigned to Hazeldean Road across the Terry Fox Screenline; and
- Sundry person trip volumes have been assigned during the a.m. peak, to the east-west arterial/collector network including Fernbank Road (±70 pph), Abbott Street (±50 pph), Maple Grove Road (±30 vph) and Campeau Drive (±10 pph).

As it is likely that not all transit routes will join the West Transitway at all the arterial/collector intersections, but will continue to operate on the road network to some extent as assigned, the daily maximum number of potential riders on the West Transitway will likely fall somewhere between 2400 pph and 900 pph, potentially considerably less than 1 bus per minute in the peak direction.

b. Hazeldean South Screenline

The Terry Fox Screenline analysis captures the full impact of the proposed urban development west of Kanata, i.e., Kanata West, Fernbank and Stittsville.

Peak hour ridership can be assumed to increase/decrease during the relevant peaks within Kanata West and the analysis of the likely ridership in the vicinity of Hazeldean Road can be assumed to represent the potential separation of the impact of Kanata West from that of Fernbank/Stittsville. The Hazeldean South Screenline which parallels Hazeldean Road captures trip making by the Fernbank development with some Stittsville influence.

As shown on Figure 1, the projected peak hour transit ridership on the West Transitway south of Hazeldean Road is approximately 600 pph with a greater number, ±950 pph assigned to the Hazeldean Road corridor and with minor east-west transit volumes assigned to Abbott Street and Fernbank Road.

Depending on the eventual routing adopted by OC Transpo, the projected 600 pph, representing bus volumes of approximately 12 to 15, could be assumed to represent a lower limit to potential ridership on the West Transitway in the vicinity of Hazeldean Road.

As it is likely that transit routes serving Stittsville will access the West Transitway by the Fernbank, Abbott and/or Hazeldean corridors, it is reasonable to assume that the potential transit ridership south of Hazeldean could be considerably more than 600 pph.

Assuming that 2/3rd of the Hazeldean/Abbott/Fernbank ridership were to transfer to the West Transitway south of Hazeldean, results in a potential transit ridership of approximately 1300 pph representing a vehicle volume of 25 to 30 buses per hour/direction.

c. West Transitway Ridership Projection at Hazeldean Road: First Principles

The location of the West Transitway south of Hazeldean Road within the Fernbank Community will primarily capture transit riders generated ultimately from the 10,700 dwelling units assumed in the Fernbank CDP.

At build-out (±2031), the 10,700 dwelling units could generate the following range of transit ridership/vehicles crossing the Hazeldean South screenline (immediately south of Hazeldean Road) based on the following assumptions:

- 1.1 person trips/dwelling units during peak hour
- 65%/35% directional split
- 90% trips to/from north/east
- 85% trips out of the Fernbank Community

Applying the above to the 10,700 dwelling units results in a peak hour, peak directional, trip total of 5850 person trips (10,700 x 1.1 x 0.65 x 0.9 x 0.85).

Depending on the resultant transit modal split (TMS), the following potential transitway ridership and vehicle totals result.

TMS	Transit Trips	Transit Vehicles: Peak Direction
15%	880	18 vph
20%	1170	24 vph
25%	1460	29 vph

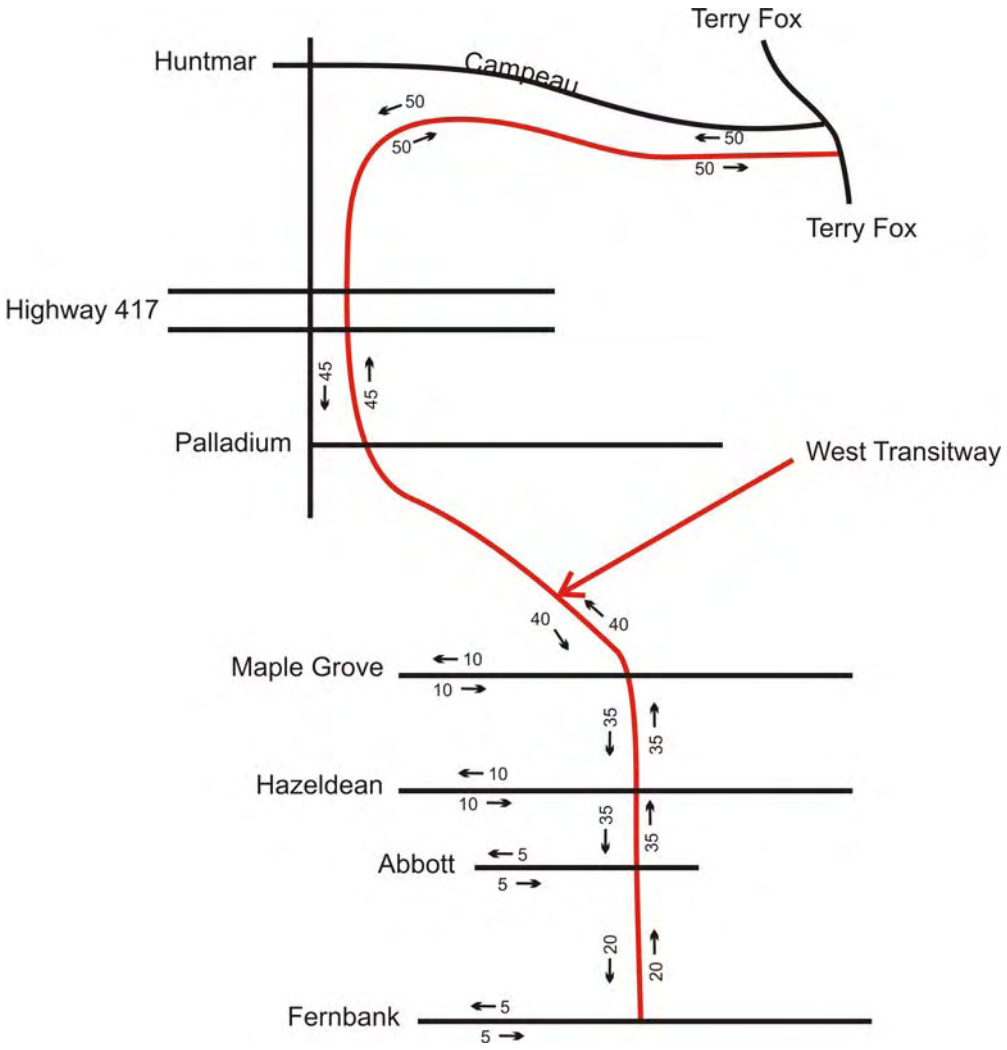
Consequently, based on first principles, the potential number of buses crossing the Hazeldean South screenline within the Fernbank Community would be within the range of 18 vph to 29 vph. To this volume can be added potential routes to/from Stittsville that would operate on Abbott/Fernbank. These ultimate volumes, assumed at 5 buses/hour each, would add a further 10 buses/direction at the Hazeldean South screenline resulting in a potential total within the range 28 to 39 buses/hour.

3.0 RECOMMENDED BUS VOLUME PROJECTIONS

From the above, it would appear that a reasonably safe assumption of likely bus vehicle volumes on the Western Transitway by 2031 would be within the range 35 vph south of Hazeldean Road increasing to 50 vph west of Terry Fox Drive. Based on these assumptions and the possible routing within Kanata West/Fernbank to serve the ultimate development of these communities, depicted on Figure 2 are assumed a.m. peak hour flows on the Western Transitway from Fernbank Road to Terry Fox Drive, by 2031.

Figure 2: Projected Peak Hour Bus Volumes: West Transitway: 2031

Fernbank Road to Terry Fox Drive



4.0 TRAFFIC PROJECTIONS AT HAZELDEAN ROAD / NORTH-SOUTH ARTERIAL

The four-laning of Hazeldean Road from Terry Fox Drive to Carp Road is now underway and the City's TMP has identified the following phasing for the proposed North-South Arterial.

- 2 lanes: Hazeldean to Fernbank: 2016 – 2022
- 4 lanes: Palladium Drive to Fernbank: 2023 – 2031

However, as it has been accepted as a condition of Fernbank development, the construction of a two-lane North-South Arterial from Hazeldean to Fernbank could occur much earlier than 2016. It is also noteworthy that the Fernbank TMP identified the need only for a 2-lane arterial up to 2031, south of Hazeldean Road.

Based on the above arterial road schedule and the possible early implementation of priority transit facilities to serve the ongoing Kanata West/Fernbank development over the next 20 years, it is considered pertinent to address the need/timing of grade separation of the West Transitway with Hazeldean Road within the North-South Arterial corridor, particularly in view of the projected bus volumes well below one per minute.

Therefore, a number of potential phasing scenarios have been analyzed representing the following general assumptions/timing.

Scenario 1:

- Hazeldean Road: 4 lane arterial
- N-S Arterial: 4 lane arterial north/south of Hazeldean
- Transit Priority: Transitway in median of N-S Arterial

This might be assumed to apply post 2031.

Scenario 2:

- Hazeldean Road: 4 lane arterial
- N-S Arterial: 4 lanes north of Hazeldean
  2 lanes south of Hazeldean
- Transit Priority: As with Scenario 1

This might be assumed to apply to ±2031.

Scenario 3:

- Hazeldean Road: 4 lane arterial
- N-S Arterial: 2 lanes north/south of Hazeldean (Palladium to Fernbank)
- Transit Priority: Through the arterial intersection

This might be assumed to apply to ±2023.

Scenario 1:

- Hazeldean Road: 4 lane arterial
- N-S Arterial: 2 lane arterial Hazeldean to Fernbank
  (condition of Fernbank CDP approval)
- Transit Priority: As with Scenario 3

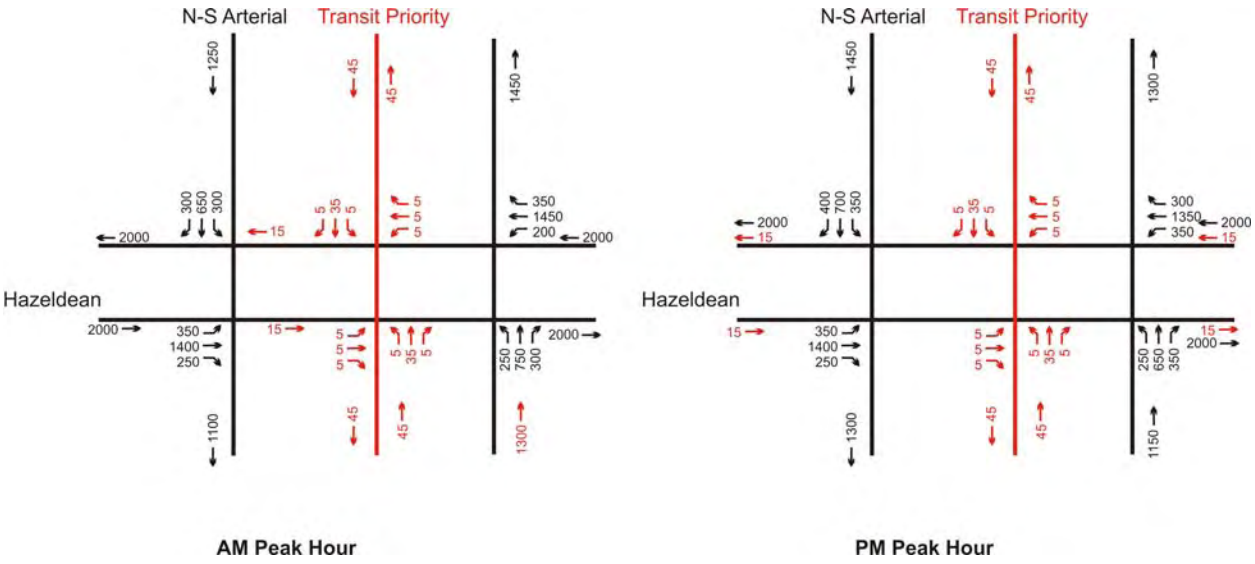
This might be assumed to apply for the next 10 years to approximately 2020.

4.1 Scenario 1

On Figure 3 are depicted the projected peak hour traffic volumes post 2031 when the N-S Arterial is completed as a 4-lane arterial south of Hazeldean Road and further development is occurring within the Fernbank Community.

By this time bus volumes of 45 per hour are assumed operating on the Western Transitway at Hazeldean Road.

Figure 3: Projected Peak Hour Traffic Volumes: Post 2031: pcus/buses

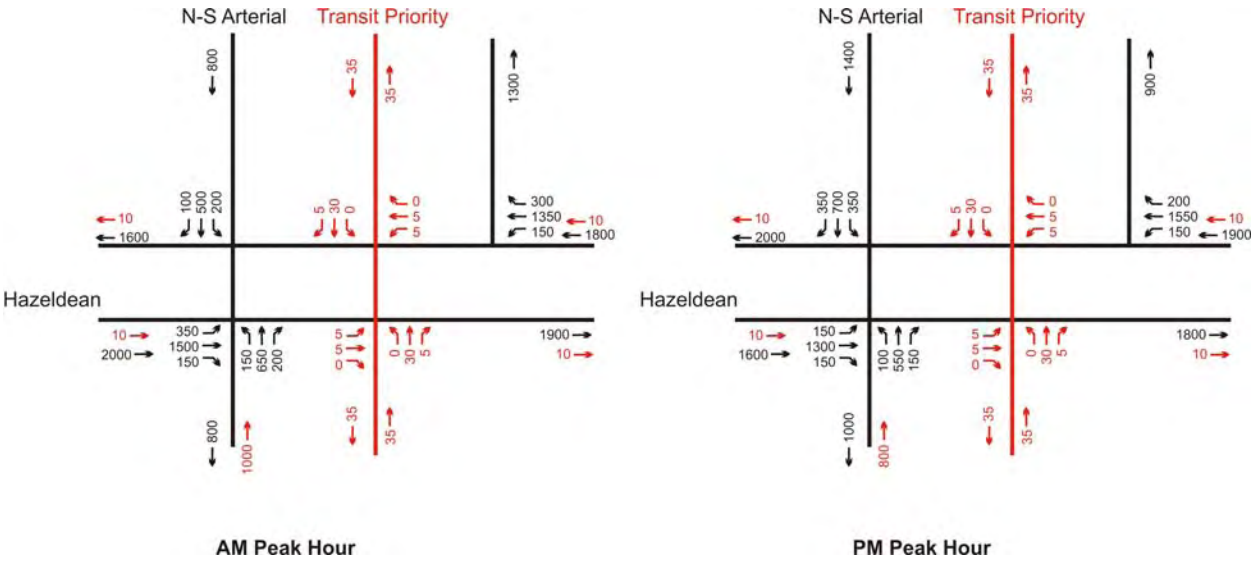


4.2 Scenario 2

Depicted on Figure 4 are the projected peak hour traffic and bus volumes that are assumed to apply up to approximately 2031 following the completion of the 4-laning of the N-S Arterial north of Hazeldean Road, but remaining as a 2-lane roadway south of Hazeldean Road within the Fernbank development. Hazeldean Road is assumed to be operating at capacity as a 4-lane arterial (4 UAD).

By this time, bus volumes are projected to have reached approximately 35 buses/hour in the vicinity of Hazeldean Road as the Fernbank Community approaches build-out.

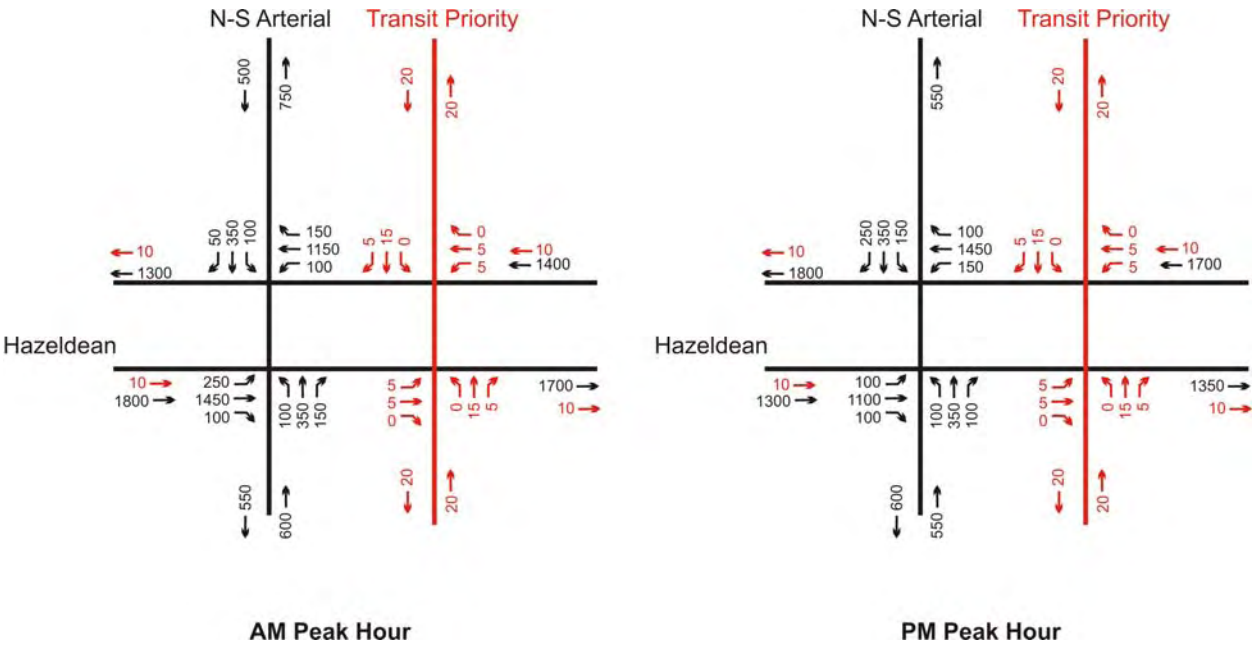
Figure 4: N-S Arterial Projected Peak Hour Traffic: ±2031: pcus/buses



4.3 Scenario 3

Depicted on Figure 5 are the projected peak hour traffic and bus volumes that are assumed to apply up to approximately 2023 following the extension of the N-S Arterial as a 2-lane roadway north of Hazeldean Road to Palladium Drive.

Figure 5: Projected Peak Hour Traffic Volumes: ±2023: pcus/buses



4.4 Scenario 4

The recently completed Trinity TIS has projected afternoon peak hour volumes within the range of 1500 vph to 1700 vph eastbound and 1800 vph to 1600 vph westbound on that part of Hazeldean Road between Iber Road and Terry Fox Drive by the completion of Phase 3 of the Trinity Retail development – 2013.

Based on these projections and the fact that beyond 2013 there will be the addition of the Fernbank Development, both retail and residential, as well as the continuing impact of Kanata West Development, it is considered very likely that by approximately 2020 when Scenario 4 is considered to apply, that Hazeldean Road will be operating at or near the capacity of a 4 UAD, during peak hours.

By this time, a 2-lane N-S Arterial is assumed to be in place between Fernbank Road and Hazeldean Road serving the ongoing Fernbank development.

By 2020, it is also assumed that approximately 50% of the Fernbank development could be in place representing the eastern part of the project with a total of approximately 5000 dwelling units and additional retail/office development along Hazeldean Road.

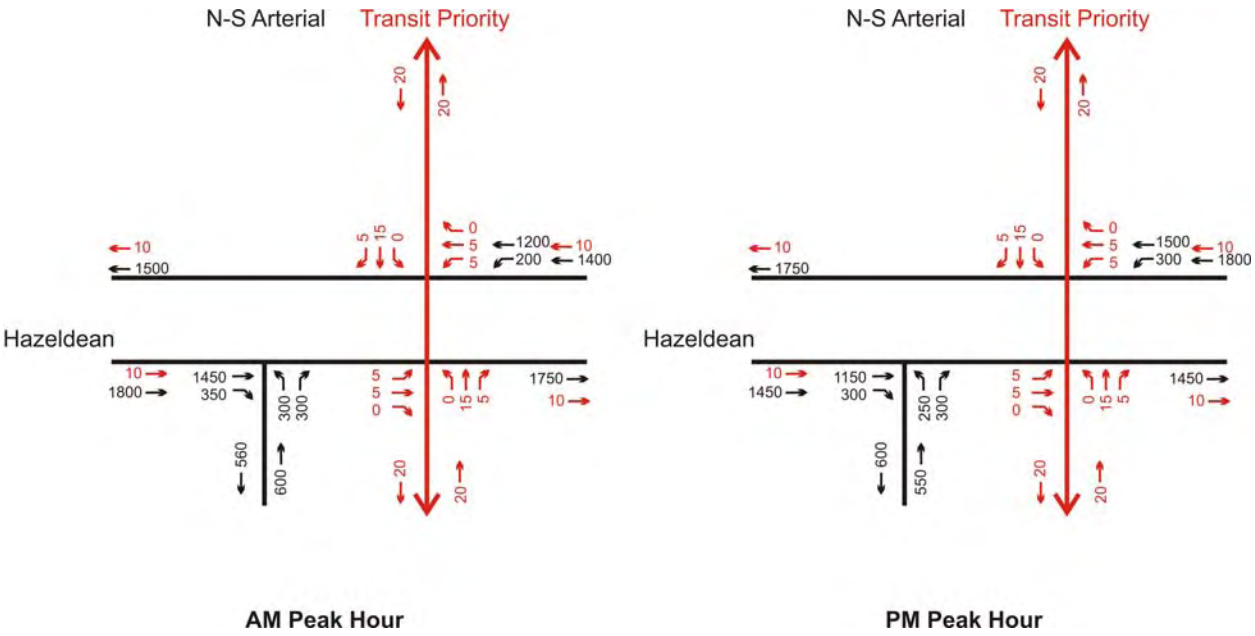
Based on the likely distribution of afternoon peak hour traffic at build-out of Fernbank (Table 8.2 Fernbank CDP), it is assumed that by 2020 the peak hour peak directional

volume on the N-S Arterial south of Hazeldean Road will be approximately 600 pcus/hr generated by approximately half the Fernbank development.

By 2020 it is also assumed that transit volumes south of Hazeldean Road will have reached a total of 20 buses/hr with peak hour routes accessing the transitway at Fernbank Road, Abbott Street and Hazeldean Road.

Depicted on Figure 6 are the projected traffic volumes reflecting the above assumptions.

Figure 6: Peak Hour Traffic/Transit ±2020: pcus/buses



5.0 INTERSECTION OPERATIONS

The peak hour operation of the Hazeldean/N-S Arterial intersection has been evaluated using SYNCHRO, applied to the projected traffic volumes that have been depicted on Figures 3 to 6 above. The intersection has been analyzed to determine if there were any spare capacity (i.e., green time) available that could be given over to transit vehicle volumes in order to have transit operate through the intersection with an acceptable level of priority, without seriously impacting the operation of the intersection for general traffic. Were spare capacity available, it was assumed that an at-grade solution for transit and could be recommended, this avoiding/postponing the cost of a grade separated transit solution.

5.1 Summary of Findings

a. Scenarios 1 and 2

- Both these scenarios, based on the fully developed intersection of two-4 lane divided arterials (4 UAD) would operate at very poor levels of service during both morning and afternoon peaks leaving no opportunity for the operation of at-grade transit with some measure of transit priority;
- Approaching the horizon year of the Official Plan, 2031, it is therefore concluded that grade separation of the transitway would be required;

b. Scenario 3

- Based on the construction of the intersection to its ultimate size to accommodate two 4-lane arterials, the intersection would operate satisfactorily during both morning and afternoon peaks, at approximately 85% and 88% of capacity, and with only the southbound left-turn movement during the afternoon peak operating at LoS 'E';
- This would enable transit vehicles to operate at-grade through the intersection in both directions in mixed traffic with some potential for transit prioritization;
- The location of transit stops would be critical to this operation; and
- Were the enlarged intersection to operate with HOV lanes, the intersection operations would deteriorate to approximately 91% during the morning peak and 94% during the afternoon peak with several movements operating at LoS 'E' during both peaks.

c. Scenario 4

- Based on the provision of a single northbound left-turning lane, the intersection operates at approximately 94% capacity during the morning peak and 88% capacity during the afternoon peak, indicating that there is some spare capacity available for priority transit
- The northbound left turning movement is critical operating at LoS 'F' during both peaks; and
- The intersection operation was tested with the provision of a double northbound left-turn lane, resulting in 85% and 81% capacity utilization during a.m./p.m. peaks respectively, although the northbound left-turn still operated at LoS 'F" during peaks.

d. Overall

- The overall conclusion of the above is that while grade separation of the Western Transitway at Hazeldean Road is inevitably required by 2031, there would appear to be an opportunity to operate buses in the West Transitway corridor, with a measure of priority available for several years thus postponing the major structural investment in grade separation;
- This strategy would require the provision of a northbound double left-turn lane on the first phase of the N-South (south of Hazeldean) and with a single lane shared with buses and general traffic with buses continuing through the intersection and general traffic and buses turning right; and
- Upon the extension of the N-S Arterial as a 2-lane roadway north of Hazeldean Road, the timing of which will be greatly dependent on the rate of development of Kanata West, the completion of the Hazeldean/N-S Arterial intersection to that of the ultimate 4-lane configuration and the operation of north-south lanes for mixed general traffic/transit, but with priority in place for transit, could operate satisfactorily for a further several years before the need to grade-separate the transit corridor at Hazeldean Road.

6.0 TRAFFIC PROJECTIONS AT MAPLE GROVE ROAD / N-S ARTERIAL

6.1 Current Traffic Volumes

The future alignment of the West Transitway within Kanata West will cross the Maple Grove Road corridor adjacent to the future intersection of the N-S Arterial with Maple Grove Road, approximately midway between the intersection with Huntmar Drive (to the west) and the Carp River (to the east).

The latest available peak hour traffic volumes on Maple Grove Road in the vicinity of the future intersection are approximately 500 vph (two-way) during the morning peak and approximately 650 vph (two-way) during the afternoon peak with the peak directional volumes between 300 vph, eastbound in the a.m. and approximately 350 vph westbound in the p.m.

6.2 Future Traffic Volumes

The Urban Road Network of the 2008 TMP has identified Maple Grove Road as a collector (2-lanes) west of Huntmar Drive and as a 4-lane arterial between Huntmar Drive and Terry Fox Drive.

The Kanata West ESR has identified Maple Grove Road as a 4-lane undivided arterial (4 UAU) west of the N-S Arterial and as a 4-lane divided arterial (4 UAD) east of the N-S Arterial as far as Terry Fox Drive.

The N-S Arterial is identified as a 4 UAD in the long-term.

Although designated to be a 4-lane arterial, it is considered very unlikely that Maple Grove Road will operate at full capacity (compared to Hazeldean) within the lifetime of the current City of Ottawa Official Plan for the following reasons.

- its relatively short length as a 4-lane arterial (between Huntmar and Terry Fox);
- its east/west extensions as 2-lane collector/local roads west and east of Huntmar/Terry Fox;
- it will primarily serve residential development along its length within Kanata West;
- there are several other east-west arterials within Kanata West to accept east/west traffic volumes, i.e., Campeau Drive (4 UAD), Highway 417 (6/8 lanes), Palladium Drive (4UAD), and Hazeldean Road (4 UAD);
    - the availability of north-south arterials, Huntmar Drive, the N-S Arterial, and Terry Fox Drive connected to the Palladium and Terry Fox interchanges on Highway 417 will result in a more even distribution of peak traffic along Maple Grove Road; and
- the green-time required to process peak directional volumes on Terry Fox Drive and the N-S Arterial will limit that available for east-west traffic demands on Maple Grove Road.

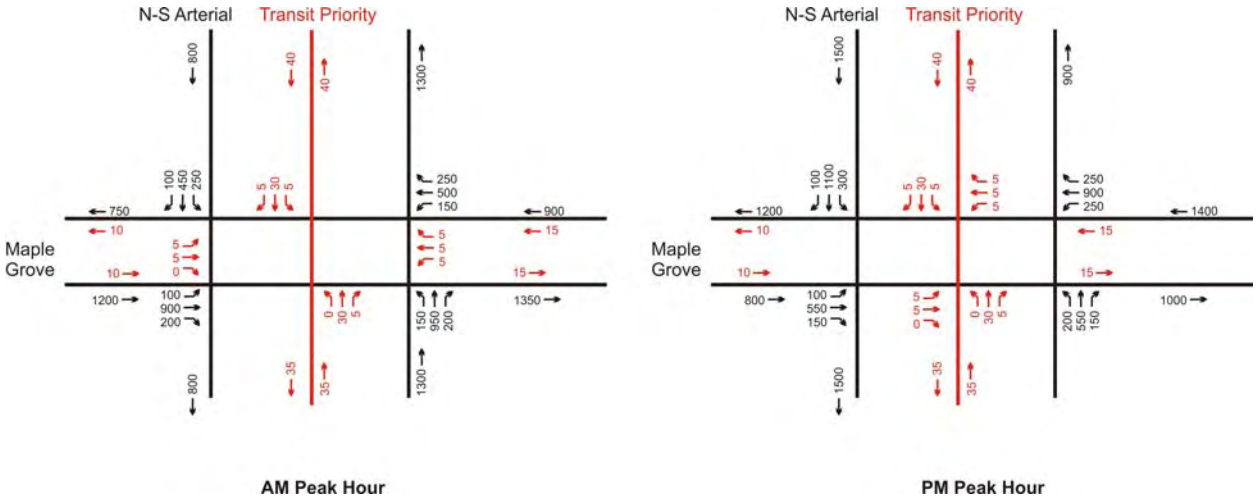
As a result of the above, it is considered most likely that future traffic volumes on Maple Grove Road, although warranting its ultimate widening to 4-lanes to serve the needs of Kanata West, will fall well short of the ultimate capacity of a 4-lane arterial (±2000 vph per direction).

In section 4.0 of this Tech Memo, it was assumed that the likely volumes on the N-S Arterial north of Hazeldean Road by 2031 (Figure 4) would be approximately 1300 vph northbound at Hazeldean Road during the morning peak and 1400 southbound during the afternoon peak.

Transit volume projections north of Hazeldean Road were 35 buses per hour at 2031.

Based on the earlier projections assumed to apply by 2031 at Hazeldean Road and reflecting the above rationale for why Maple Grove Road traffic volumes are likely to be considerably less than the corresponding Hazeldean Road volumes, depicted on Figure 7 are estimated peak hour volumes at the future intersection of Maple Grove Road with the N-S Arterial and the West Transitway.

Figure 7: Peak Hour Traffic/Bus Volumes: Maple Grove/N-S Arterial/West Transitway, 2031



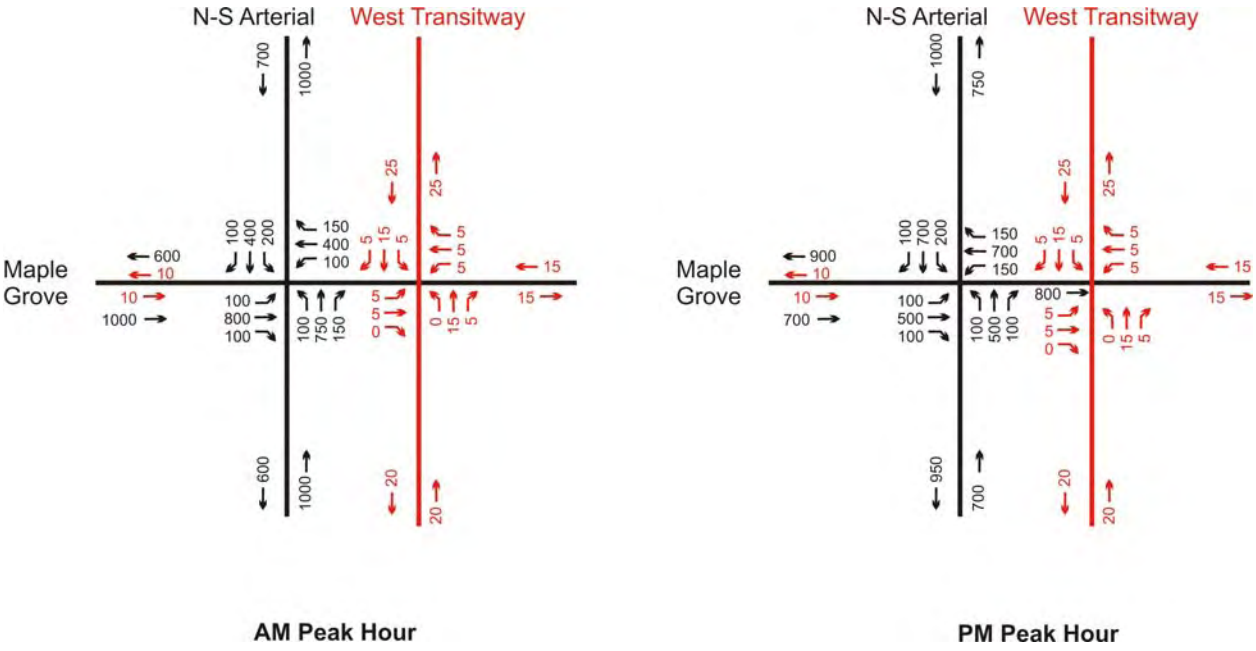
7.0 OPERATIONAL ANALYSIS

Based on the assumption of a fully implemented intersection of two 4-lane arterials with turning lanes, the application of SYNCHRO analysis to the projected peak hour traffic volumes on Figure 7 resulted in a 102% utilization of the intersection capacity during the morning peak and a 97% utilization during the afternoon peak, indicating that there would be no spare green-time available for transit priority were buses to operate in mixed traffic through the intersections at 2031. This leads to the conclusion that, in combination with bus volumes of 35/40 per hour, that grade separation of the transitway at Maple Grove Road would be a requirement by 2031.

8.0 PHASING POTENTIAL AT MAPLE GROVE ROAD

As it is likely that the N-S Arterial will be implemented in stages in conjunction with the phased implementation of the Fernbank and Kanata West developments, it can be assumed that north of Hazeldean Road a 2-lane arterial would be an interim stage for the arterial between Hazeldean Road and Palladium Drive. Thus, reflecting potential peak hour traffic volumes of the intersection of two 2-lane roadways, depicted on Figure 8 are the possible intersection turning volumes that might apply by approximately 2023 at the Maple Grove/N-S Arterial intersection.

Figure 8: Projected Maple Grove Road / N-S Arterial / West Transitway Intersection Volumes: ±2023: pcus / buses



9.0 PHASED INTERSECTION OPERATIONAL ANALYSIS: MAPLE GROVE ROAD

SYNCHRO analysis was applied to the projected phased intersection volumes depicted on Figure 8, which are assumed to reflect the potential peak hour traffic volumes at the Maple Grove Road/N-S Arterial intersection by approximately 2023, when Maple Grove Road is nearing its capacity as a 2-lane arterial and the N-S Arterial has been completed also as a 2-lane arterial to the Palladium Interchange.

Based on the implementation of the ultimate intersection configuration (i.e., intersection of two 4 UAD roadways), the SYNCHRO analysis revealed that there would be ample spare capacity available during peak hours with less than 70% utilization of the intersection for general traffic, thus providing the opportunity for priority measures to be implemented for bus volumes in mixed traffic through the intersection.

10.0 OVERALL CONCLUSION

Based on the above analysis of peak hour operations at both the Maple Grove Road and Hazeldean Road intersections with a phased N-S Arterial, it is concluded that while grade-separation of the West Transitway is recommended by 2031 that at-grade transit with transit priority could operate through both intersections for several years prior to eventual grade separation.

From\To	1 Hour am Pk	1 Hour pm Pk	2 Hour 7-9 am	2 Hour 3:30-5:30 pm	4 Hour 7-9 am 3:30-6:30 pm	6 Hour 7-10 am 3-6 pm	8 Hour 7-9 am 11-1 2-6 pm	12 Hour 7 am - 7 pm	24 Hour
1 Hour am Pk	1.0	1.04	1.79	1.96	3.76	5.12	6.49	9.04	12.05
1 Hour pm Pk	0.96	1.0	1.72	1.88	3.6	4.91	6.22	8.66	11.54
2 Hour 7-9 am	0.56	0.58	1.0	1.1	2.1	2.86	3.62	5.04	6.42
2 Hour 3:30-5:30 pm	0.51	0.53	0.91	1.0	1.91	2.61	3.31	4.61	6.13
4 Hour 7-9 am 3:30-6:30 pm	0.27	0.28	0.48	0.52	1.0	1.36	1.73	2.41	3.21
6 Hour 7-10 am 3-6 pm	0.2	0.2	0.35	0.38	0.73	1.0	1.27	1.77	2.35
8 Hour 7-9 am 11-1 pm 2-6 p	0.15	0.16	0.28	0.3	0.58	0.79	1.0	1.39	1.85
12 Hour 7 am - 7 pm	0.11	0.12	0.2	0.22	0.42	0.57	0.72	1.0	1.31
24 Hours	0.08	0.09	0.15	0.16	0.31	0.43	0.54	0.75	1.0

EXPANSION FACTORS

APPENDIX B

Stamson Model Output

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 21:52:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1.te Time Period: Day/Night 16/8 hours
Description: R1 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 70.67 + 0.00) = 70.67 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	73.68	0.00	-3.01	0.00	0.00	0.00	0.00	70.67

Segment Leq : 70.67 dBA

Total Leq All Segments: 70.67 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 63.07 + 0.00) = 63.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.08	0.00	-3.01	0.00	0.00	0.00	0.00	63.07

Segment Leq : 63.07 dBA

Total Leq All Segments: 63.07 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 56.74 + 0.00) = 56.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.75	-3.01	0.00	0.00	0.00	0.00	56.74

Segment Leq : 56.74 dBA

Total Leq All Segments: 56.74 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 52.19 + 0.00) = 52.19 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	55.20	-3.01	0.00	0.00	0.00	0.00	52.19

Segment Leq : 52.19 dBA

Total Leq All Segments: 52.19 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.84
(NIGHT): 63.41

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 21:53:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te Time Period: Day/Night 16/8 hours
Description: R2 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.00 / 33.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Cranesbill (day/night)

Angle1 Angle2 : -8.00 deg 10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 49.20 / 49.20 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 70.25 + 0.00) = 70.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	73.68	0.00	-3.42	0.00	0.00	0.00	0.00	70.25

Segment Leq : 70.25 dBA

Results segment # 2: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 52.35 + 0.00) = 52.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-8	10	0.00	67.51	0.00	-5.16	-10.00	0.00	0.00	0.00	52.35

Segment Leq : 52.35 dBA

Total Leq All Segments: 70.32 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 62.66 + 0.00) = 62.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.08	0.00	-3.42	0.00	0.00	0.00	0.00	62.66

Segment Leq : 62.66 dBA

Results segment # 2: Cranesbill (night)

Source height = 1.50 m

ROAD (0.00 + 44.75 + 0.00) = 44.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-8	10	0.00	59.91	0.00	-5.16	-10.00	0.00	0.00	0.00	44.75

Segment Leq : 44.75 dBA

Total Leq All Segments: 62.73 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.00 / 33.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 56.32 + 0.00) = 56.32 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.75	-3.42	0.00	0.00	0.00	0.00	56.32

Segment Leq : 56.32 dBA

Total Leq All Segments: 56.32 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 51.78 + 0.00) = 51.78 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	55.20	-3.42	0.00	0.00	0.00	0.00	51.78

Segment Leq : 51.78 dBA

Total Leq All Segments: 51.78 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.49
(NIGHT): 63.07

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 21:54:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3.te Time Period: Day/Night 16/8 hours
Description: R3 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -78.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 37.90 / 37.90 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Cranesbill (day/night)

Angle1 Angle2 : -27.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 22.40 / 22.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 69.35 + 0.00) = 69.35 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-78	90	0.00	73.68	0.00	-4.03	-0.30	0.00	0.00	0.00	69.35

Segment Leq : 69.35 dBA

Results segment # 2: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 57.53 + 0.00) = 57.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-27	0	0.00	67.51	0.00	-1.74	-8.24	0.00	0.00	0.00	57.53

Segment Leq : 57.53 dBA

Total Leq All Segments: 69.63 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 61.75 + 0.00) = 61.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-78	90	0.00	66.08	0.00	-4.03	-0.30	0.00	0.00	0.00	61.75

Segment Leq : 61.75 dBA

Results segment # 2: Cranesbill (night)

Source height = 1.50 m

ROAD (0.00 + 49.93 + 0.00) = 49.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-27	0	0.00	59.91	0.00	-1.74	-8.24	0.00	0.00	0.00	49.93

Segment Leq : 49.93 dBA

Total Leq All Segments: 62.03 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -78.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 37.90 / 37.90 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 55.42 + 0.00) = 55.42 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-78	90	0.00	59.75	-4.03	-0.30	0.00	0.00	0.00	55.42

Segment Leq : 55.42 dBA

Total Leq All Segments: 55.42 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 50.88 + 0.00) = 50.88 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-78	90	0.00	55.20	-4.03	-0.30	0.00	0.00	0.00	50.88

Segment Leq : 50.88 dBA

Total Leq All Segments: 50.88 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.79
(NIGHT): 62.35

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 21:55:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4.te Time Period: Day/Night 16/8 hours
Description: R4 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : 0.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 41.20 / 41.20 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Cranesbill (day/night)

Angle1 Angle2 : -38.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 18.70 / 18.70 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 66.28 + 0.00) = 66.28 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	73.68	0.00	-4.39	-3.01	0.00	0.00	0.00	66.28

Segment Leq : 66.28 dBA

Results segment # 2: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 65.07 + 0.00) = 65.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	90	0.00	67.51	0.00	-0.96	-1.48	0.00	0.00	0.00	65.07

Segment Leq : 65.07 dBA

Total Leq All Segments: 68.73 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 58.68 + 0.00) = 58.68 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	66.08	0.00	-4.39	-3.01	0.00	0.00	0.00	58.68

Segment Leq : 58.68 dBA

Results segment # 2: Cranesbill (night)

Source height = 1.50 m

ROAD (0.00 + 57.47 + 0.00) = 57.47 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	90	0.00	59.91	0.00	-0.96	-1.48	0.00	0.00	0.00	57.47

Segment Leq : 57.47 dBA

Total Leq All Segments: 61.13 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2	:	0.00 deg 90.00 deg
Wood depth	:	0 (No woods.)
No of house rows	:	0 / 0
Surface	:	2 (Reflective ground surface)
Receiver source distance	:	41.20 / 41.20 m
Receiver height	:	1.50 / 4.50 m
Topography	:	1 (Flat/gentle slope; no barrier)
Reference angle	:	0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 52.35 + 0.00) = 52.35 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	59.75	-4.39	-3.01	0.00	0.00	0.00	52.35

Segment Leq : 52.35 dBA

Total Leq All Segments: 52.35 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 47.80 + 0.00) = 47.80 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.00	55.20	-4.39	-3.01	0.00	0.00	0.00	47.80

Segment Leq : 47.80 dBA

Total Leq All Segments: 47.80 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.83
(NIGHT): 61.32

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 21:56:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5.te Time Period: Day/Night 16/8 hours
Description: R5 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : 0.00 deg 50.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 74.90 / 74.90 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Cranesbill (day/night)

Angle1 Angle2 : -67.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 21.00 / 21.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 61.13 + 0.00) = 61.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.00	73.68	0.00	-6.98	-5.56	0.00	0.00	0.00	61.13

Segment Leq : 61.13 dBA

Results segment # 2: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 65.46 + 0.00) = 65.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-67	90	0.00	67.51	0.00	-1.46	-0.59	0.00	0.00	0.00	65.46

Segment Leq : 65.46 dBA

Total Leq All Segments: 66.82 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 53.53 + 0.00) = 53.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.00	66.08	0.00	-6.98	-5.56	0.00	0.00	0.00	53.53

Segment Leq : 53.53 dBA

Results segment # 2: Cranesbill (night)

Source height = 1.50 m

ROAD (0.00 + 57.86 + 0.00) = 57.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-67	90	0.00	59.91	0.00	-1.46	-0.59	0.00	0.00	0.00	57.86

Segment Leq : 57.86 dBA

Total Leq All Segments: 59.22 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2	:	0.00 deg 50.00 deg
Wood depth	:	0 (No woods.)
No of house rows	:	0 / 0
Surface	:	2 (Reflective ground surface)
Receiver source distance	:	74.90 / 74.90 m
Receiver height	:	1.50 / 4.50 m
Topography	:	1 (Flat/gentle slope; no barrier)
Reference angle	:	0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 47.20 + 0.00) = 47.20 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.00	59.75	-6.98	-5.56	0.00	0.00	0.00	47.20

Segment Leq : 47.20 dBA

Total Leq All Segments: 47.20 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 42.65 + 0.00) = 42.65 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.00	55.20	-6.98	-5.56	0.00	0.00	0.00	42.65

Segment Leq : 42.65 dBA

Total Leq All Segments: 42.65 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.87
(NIGHT): 59.32

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 21:56:35
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6.te Time Period: Day/Night 16/8 hours
Description: R6 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.20 / 33.20 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 67.22 + 0.00) = 67.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	73.68	0.00	-3.45	-3.01	0.00	0.00	0.00	67.22

Segment Leq : 67.22 dBA

Total Leq All Segments: 67.22 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 59.62 + 0.00) = 59.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	66.08	0.00	-3.45	-3.01	0.00	0.00	0.00	59.62

Segment Leq : 59.62 dBA

Total Leq All Segments: 59.62 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 33.20 / 33.20 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 53.28 + 0.00) = 53.28 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	59.75	-3.45	-3.01	0.00	0.00	0.00	53.28

Segment Leq : 53.28 dBA

Total Leq All Segments: 53.28 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 48.74 + 0.00) = 48.74 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	55.20	-3.45	-3.01	0.00	0.00	0.00	48.74

Segment Leq : 48.74 dBA

Total Leq All Segments: 48.74 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 67.39
(NIGHT): 59.96

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 21:57:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r7.te Time Period: Day/Night 16/8 hours
Description: R7 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -79.00 deg -47.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 39.40 / 39.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 61.98 + 0.00) = 61.98 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	-47	0.00	73.68	0.00	-4.19	-7.50	0.00	0.00	0.00	61.98

Segment Leq : 61.98 dBA

Total Leq All Segments: 61.98 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 54.38 + 0.00) = 54.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	-47	0.00	66.08	0.00	-4.19	-7.50	0.00	0.00	0.00	54.38

Segment Leq : 54.38 dBA

Total Leq All Segments: 54.38 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---
1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -79.00 deg -47.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 39.40 / 39.40 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 48.05 + 0.00) = 48.05 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	-47	0.00	59.75	-4.19	-7.50	0.00	0.00	0.00	48.05

Segment Leq : 48.05 dBA

Total Leq All Segments: 48.05 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 43.51 + 0.00) = 43.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-79	-47	0.00	55.20	-4.19	-7.50	0.00	0.00	0.00	43.51

Segment Leq : 43.51 dBA

Total Leq All Segments: 43.51 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.15
(NIGHT): 54.72

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 21:57:31
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r8.te Time Period: Day/Night 16/8 hours
Description: R8 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -39.00 deg -5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 72.30 / 72.30 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 59.61 + 0.00) = 59.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-39	-5	0.00	73.68	0.00	-6.83	-7.24	0.00	0.00	0.00	59.61

Segment Leq : 59.61 dBA

Total Leq All Segments: 59.61 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 52.01 + 0.00) = 52.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-39	-5	0.00	66.08	0.00	-6.83	-7.24	0.00	0.00	0.00	52.01

Segment Leq : 52.01 dBA

Total Leq All Segments: 52.01 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -39.00 deg -5.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 72.30 / 72.30 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 45.68 + 0.00) = 45.68 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-39	-5	0.00	59.75	-6.83	-7.24	0.00	0.00	0.00	45.68

Segment Leq : 45.68 dBA

Total Leq All Segments: 45.68 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 41.13 + 0.00) = 41.13 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-39	-5	0.00	55.20	-6.83	-7.24	0.00	0.00	0.00	41.13

Segment Leq : 41.13 dBA

Total Leq All Segments: 41.13 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.78
(NIGHT): 52.35

```
STAMSON 5.0        NORMAL REPORT        Date: 12-05-2025 21:57:59
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r9.te                Time Period: Day/Night 16/8 hours
Description: R9 POW


Road data, segment # 1: Robert Grant (day/night)
----------------------------------------------
Car traffic volume  : 28336/2464  veh/TimePeriod  *
Medium truck volume :  2254/196   veh/TimePeriod  *
Heavy truck volume  :  1610/140   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):  35000
    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: Robert Grant (day/night)
----------------------------------------------
Angle1   Angle2           :   0.00 deg   67.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  41.50 / 41.50  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: Cranesbill (day/night)
----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    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):  12000
    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: Cranesbill (day/night)
----------------------------------------------
Angle1   Angle2           : -18.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  45.80 / 45.80  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -18.00 deg   Angle2 : 90.00 deg
Barrier height            :  11.00 m
Barrier receiver distance :   8.80 / 8.80   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 64.96 + 0.00) = 64.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	67	0.00	73.68	0.00	-4.42	-4.29	0.00	0.00	0.00	64.96

Segment Leq : 64.96 dBA

Results segment # 2: Cranesbill (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.50	1.50

ROAD (0.00 + 42.18 + 0.00) = 42.18 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-18	90	0.00	67.51	0.00	-4.85	-2.22	0.00	0.00	-18.26	42.18

Segment Leq : 42.18 dBA

Total Leq All Segments: 64.98 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 57.37 + 0.00) = 57.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	67	0.00	66.08	0.00	-4.42	-4.29	0.00	0.00	0.00	57.37

Segment Leq : 57.37 dBA

Results segment # 2: Cranesbill (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	3.92	3.92

ROAD (0.00 + 35.44 + 0.00) = 35.44 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-18	90	0.00	59.91	0.00	-4.85	-2.22	0.00	0.00	-17.41	35.44

Segment Leq : 35.44 dBA

Total Leq All Segments: 57.40 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2	:	0.00 deg 67.00 deg
Wood depth	:	0 (No woods.)
No of house rows	:	0 / 0
Surface	:	2 (Reflective ground surface)
Receiver source distance	:	41.50 / 41.50 m
Receiver height	:	1.50 / 4.50 m
Topography	:	1 (Flat/gentle slope; no barrier)
Reference angle	:	0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 51.03 + 0.00) = 51.03 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	67	0.00	59.75	-4.42	-4.29	0.00	0.00	0.00	51.03

Segment Leq : 51.03 dBA

Total Leq All Segments: 51.03 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 46.49 + 0.00) = 46.49 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	67	0.00	55.20	-4.42	-4.29	0.00	0.00	0.00	46.49

Segment Leq : 46.49 dBA

Total Leq All Segments: 46.49 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.15
(NIGHT): 57.74

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 21:59:37
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r10.te Time Period: Day/Night 16/8 hours
Description: R10 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -38.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 42.10 / 42.10 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Cranesbill (day/night)

Angle1 Angle2 : -9.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 96.30 / 96.30 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -9.00 deg Angle2 : 90.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 0.10 / 0.10 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 62.44 + 0.00) = 62.44 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	0	0.00	73.68	0.00	-4.48	-6.75	0.00	0.00	0.00	62.44

Segment Leq : 62.44 dBA

Results segment # 2: Cranesbill (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.50	1.50

ROAD (0.00 + 37.95 + 0.00) = 37.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-9	90	0.00	67.51	0.00	-8.08	-2.60	0.00	0.00	-18.89	37.95

Segment Leq : 37.95 dBA

Total Leq All Segments: 62.46 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 54.84 + 0.00) = 54.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	0	0.00	66.08	0.00	-4.48	-6.75	0.00	0.00	0.00	54.84

Segment Leq : 54.84 dBA

Results segment # 2: Cranesbill (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	4.50	4.50

ROAD (0.00 + 30.77 + 0.00) = 30.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-9	90	0.00	59.91	0.00	-8.08	-2.60	0.00	0.00	-18.47	30.77

Segment Leq : 30.77 dBA

Total Leq All Segments: 54.86 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -38.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 42.10 / 42.10 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 48.51 + 0.00) = 48.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	0	0.00	59.75	-4.48	-6.75	0.00	0.00	0.00	48.51

Segment Leq : 48.51 dBA

Total Leq All Segments: 48.51 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 43.96 + 0.00) = 43.96 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-38	0	0.00	55.20	-4.48	-6.75	0.00	0.00	0.00	43.96

Segment Leq : 43.96 dBA

Total Leq All Segments: 43.96 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.63
(NIGHT): 55.20

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 22:00:02
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r11.te Time Period: Day/Night 16/8 hours
Description: R11 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -35.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 40.00 / 40.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 62.30 + 0.00) = 62.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	0	0.00	73.68	0.00	-4.26	-7.11	0.00	0.00	0.00	62.30

Segment Leq : 62.30 dBA

Total Leq All Segments: 62.30 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 54.71 + 0.00) = 54.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	0	0.00	66.08	0.00	-4.26	-7.11	0.00	0.00	0.00	54.71

Segment Leq : 54.71 dBA

Total Leq All Segments: 54.71 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -35.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 40.00 / 40.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 48.37 + 0.00) = 48.37 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	0	0.00	59.75	-4.26	-7.11	0.00	0.00	0.00	48.37

Segment Leq : 48.37 dBA

Total Leq All Segments: 48.37 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 43.83 + 0.00) = 43.83 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-35	0	0.00	55.20	-4.26	-7.11	0.00	0.00	0.00	43.83

Segment Leq : 43.83 dBA

Total Leq All Segments: 43.83 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.47
(NIGHT): 55.05

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 22:00:27
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r12.te Time Period: Day/Night 16/8 hours
Description: R12 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : 2.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 72.00 / 72.00 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 12.00 deg Angle2 : 90.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 28.60 / 28.60 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.50	1.50

ROAD (54.31 + 47.10 + 0.00) = 55.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
2	12	0.00	73.68	0.00	-6.81	-12.55	0.00	0.00	0.00	54.31
12	90	0.00	73.68	0.00	-6.81	-3.63	0.00	0.00	-16.13	47.10

Segment Leq : 55.07 dBA

Total Leq All Segments: 55.07 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	3.31	3.31

ROAD (46.71 + 40.73 + 0.00) = 47.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
2	12	0.00	66.08	0.00	-6.81	-12.55	0.00	0.00	0.00	46.71
12	90	0.00	66.08	0.00	-6.81	-3.63	0.00	0.00	-14.90	40.73

Segment Leq : 47.69 dBA

Total Leq All Segments: 47.69 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---
1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : 2.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 72.00 / 72.00 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 12.00 deg Angle2 : 90.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 28.60 / 28.60 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	1.50	1.10	1.10

RT/Custom (40.38 + 32.96 + 0.00) = 41.10 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
2	12	0.00	59.75	-6.81	-12.55	0.00	0.00	0.00	40.38
12	90	0.00	59.75	-6.81	-3.63	0.00	0.00	-16.34	32.96

Segment Leq : 41.10 dBA

Total Leq All Segments: 41.10 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	2.91	2.91

RT/Custom (35.84 + 29.53 + 0.00) = 36.75 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
2	12	0.00	55.20	-6.81	-12.55	0.00	0.00	0.00	35.84
12	90	0.00	55.20	-6.81	-3.63	0.00	0.00	-15.22	29.53

Segment Leq : 36.75 dBA

Total Leq All Segments: 36.75 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.24
(NIGHT): 48.03

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 22:00:49
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r13.te Time Period: Day/Night 16/8 hours
Description: R13 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 77.90 / 77.90 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 0.10 / 0.10 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Cranesbill (day/night)

Angle1 Angle2 : 0.00 deg 50.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 32.00 / 32.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.50	1.50

ROAD (0.00 + 47.71 + 0.00) = 47.71 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	73.68	0.00	-7.15	0.00	0.00	0.00	-18.81	47.71

Segment Leq : 47.71 dBA

Results segment # 2: Cranesbill (day)

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	50	0.00	67.51	0.00	-3.29	-5.56	0.00	0.00	0.00	58.66

Segment Leq : 58.66 dBA

Total Leq All Segments: 59.00 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	4.50	4.50

ROAD (0.00 + 40.56 + 0.00) = 40.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.08	0.00	-7.15	0.00	0.00	0.00	-18.37	40.56

Segment Leq : 40.56 dBA

Results segment # 2: Cranesbill (night)

Source height = 1.50 m

ROAD (0.00 + 51.06 + 0.00) = 51.06 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	50	0.00	59.91	0.00	-3.29	-5.56	0.00	0.00	0.00	51.06

Segment Leq : 51.06 dBA

Total Leq All Segments: 51.43 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---
1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 77.90 / 77.90 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 0.10 / 0.10 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	1.50	1.50	1.50

RT/Custom (0.00 + 33.77 + 0.00) = 33.77 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.75	-7.15	0.00	0.00	0.00	-18.82	33.77

Segment Leq : 33.77 dBA

Total Leq All Segments: 33.77 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	4.49	4.49

RT/Custom (0.00 + 29.66 + 0.00) = 29.66 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	55.20	-7.15	0.00	0.00	0.00	-18.38	29.66

Segment Leq : 29.66 dBA

Total Leq All Segments: 29.66 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.01
(NIGHT): 51.46

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 22:01:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r14.te Time Period: Day/Night 16/8 hours
Description: R14 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -90.00 deg -8.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 63.20 / 63.20 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -20.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 16.80 / 16.80 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Cranesbill (day/night)

Angle1 Angle2 : -47.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 34.40 / 34.40 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -47.00 deg Angle2 : 90.00 deg
Barrier height : 11.00 m

Barrier receiver distance : 0.10 / 0.10 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.50	1.50

ROAD (0.00 + 46.71 + 55.67) = 56.19 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-20	0.00	73.68	0.00	-6.25	-4.10	0.00	0.00	-16.62	46.71
-20	-8	0.00	73.68	0.00	-6.25	-11.76	0.00	0.00	0.00	55.67

Segment Leq : 56.19 dBA

Results segment # 2: Cranesbill (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.50	1.50

ROAD (0.00 + 43.49 + 0.00) = 43.49 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-47	90	0.00	67.51	0.00	-3.60	-1.19	0.00	0.00	-19.23	43.49

Segment Leq : 43.49 dBA

Total Leq All Segments: 56.42 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	3.70	3.70

ROAD (0.00 + 40.46 + 48.07) = 48.77 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-20	0.00	66.08	0.00	-6.25	-4.10	0.00	0.00	-15.28	40.46
-20	-8	0.00	66.08	0.00	-6.25	-11.76	0.00	0.00	0.00	48.07

Segment Leq : 48.77 dBA

Results segment # 2: Cranesbill (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	4.49	4.49

ROAD (0.00 + 36.17 + 0.00) = 36.17 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-47	90	0.00	59.91	0.00	-3.60	-1.19	0.00	0.00	-18.95	36.17

Segment Leq : 36.17 dBA

Total Leq All Segments: 49.00 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---
1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -90.00 deg -8.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 63.20 / 63.20 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -20.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 16.80 / 16.80 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	1.50	1.23	1.23

RT/Custom (0.00 + 32.65 + 41.74) = 42.24 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-20	0.00	59.75	-6.25	-4.10	0.00	0.00	-16.75	32.65
-20	-8	0.00	59.75	-6.25	-11.76	0.00	0.00	0.00	41.74

Segment Leq : 42.24 dBA

Total Leq All Segments: 42.24 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	3.44	3.44

RT/Custom (0.00 + 29.37 + 37.19) = 37.86 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-20	0.00	55.20	-6.25	-4.10	0.00	0.00	-15.49	29.37
-20	-8	0.00	55.20	-6.25	-11.76	0.00	0.00	0.00	37.19

Segment Leq : 37.86 dBA

Total Leq All Segments: 37.86 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.58
(NIGHT): 49.32

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 22:01:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r15.te Time Period: Day/Night 16/8 hours
Description: R15 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -90.00 deg -12.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 56.70 / 56.70 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -25.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 10.30 / 10.30 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Cranesbill (day/night)

Angle1 Angle2 : -41.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 34.50 / 34.50 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -41.00 deg Angle2 : 90.00 deg
Barrier height : 11.00 m

Barrier receiver distance : 0.10 / 0.10 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.50	1.50

ROAD (0.00 + 46.35 + 56.49) = 56.89 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-25	0.00	73.68	0.00	-5.77	-4.42	0.00	0.00	-17.13	46.35
-25	-12	0.00	73.68	0.00	-5.77	-11.41	0.00	0.00	0.00	56.49

Segment Leq : 56.89 dBA

Results segment # 2: Cranesbill (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.50	1.50

ROAD (0.00 + 43.32 + 0.00) = 43.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-41	90	0.00	67.51	0.00	-3.62	-1.38	0.00	0.00	-19.20	43.32

Segment Leq : 43.32 dBA

Total Leq All Segments: 57.08 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	3.95	3.95

ROAD (0.00 + 40.03 + 48.89) = 49.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-25	0.00	66.08	0.00	-5.77	-4.42	0.00	0.00	-15.85	40.03
-25	-12	0.00	66.08	0.00	-5.77	-11.41	0.00	0.00	0.00	48.89

Segment Leq : 49.42 dBA

Results segment # 2: Cranesbill (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	4.49	4.49

ROAD (0.00 + 36.01 + 0.00) = 36.01 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-41	90	0.00	59.91	0.00	-3.62	-1.38	0.00	0.00	-18.90	36.01

Segment Leq : 36.01 dBA

Total Leq All Segments: 49.61 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---
1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -90.00 deg -12.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 56.70 / 56.70 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : -25.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 10.30 / 10.30 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	1.50	1.32	1.32

RT/Custom (0.00 + 32.33 + 42.56) = 42.95 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-25	0.00	59.75	-5.77	-4.42	0.00	0.00	-17.22	32.33
-25	-12	0.00	59.75	-5.77	-11.41	0.00	0.00	0.00	42.56

Segment Leq : 42.95 dBA

Total Leq All Segments: 42.95 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	3.77	3.77

RT/Custom (0.00 + 29.01 + 38.01) = 38.53 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-25	0.00	55.20	-5.77	-4.42	0.00	0.00	-15.99	29.01
-25	-12	0.00	55.20	-5.77	-11.41	0.00	0.00	0.00	38.01

Segment Leq : 38.53 dBA

Total Leq All Segments: 38.53 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.24
(NIGHT): 49.94

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 22:01:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r16.te Time Period: Day/Night 16/8 hours
Description: R16 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 46.90 / 46.90 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 0.10 / 0.10 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.50	1.50

ROAD (0.00 + 49.88 + 0.00) = 49.88 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	73.68	0.00	-4.95	0.00	0.00	0.00	-18.84	49.88

Segment Leq : 49.88 dBA

Total Leq All Segments: 49.88 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	4.49	4.49

ROAD (0.00 + 42.70 + 0.00) = 42.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.08	0.00	-4.95	0.00	0.00	0.00	-18.43	42.70

Segment Leq : 42.70 dBA

Total Leq All Segments: 42.70 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---
1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 46.90 / 46.90 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 0.10 / 0.10 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	1.50	1.50	1.50

RT/Custom (0.00 + 35.93 + 0.00) = 35.93 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.75	-4.95	0.00	0.00	0.00	-18.86	35.93

Segment Leq : 35.93 dBA

Total Leq All Segments: 35.93 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	4.49	4.49

RT/Custom (0.00 + 31.79 + 0.00) = 31.79 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	55.20	-4.95	0.00	0.00	0.00	-18.46	31.79

Segment Leq : 31.79 dBA

Total Leq All Segments: 31.79 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 50.05
(NIGHT): 43.04

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 22:02:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r17.te Time Period: Day/Night 16/8 hours
Description: R17 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 46.40 / 46.40 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -90.00 deg Angle2 : 90.00 deg
Barrier height : 11.00 m
Barrier receiver distance : 0.10 / 0.10 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

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

Car traffic volume : 9715/845 veh/TimePeriod *
Medium truck volume : 773/67 veh/TimePeriod *
Heavy truck volume : 552/48 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): 12000
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: Cranesbill (day/night)

Angle1 Angle2 : 0.00 deg 53.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 57.90 / 57.90 m
Receiver height : 1.50 / 4.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : 0.00 deg Angle2 : 53.00 deg
Barrier height : 11.00 m

```
Barrier receiver distance :  23.40 / 23.40  m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Road data, segment # 3: Cranesbill (day/night)
-----------------------------------------------
Car traffic volume  :  9715/845   veh/TimePeriod  *
Medium truck volume :   773/67    veh/TimePeriod  *
Heavy truck volume  :   552/48    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):  12000
    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 # 3: Cranesbill (day/night)
---------------------------------------------
Angle1   Angle2           :  53.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     80 %
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  57.90 / 57.90  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Robert Grant (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 !        1.50 !        1.50 !         1.50

ROAD (0.00 + 49.93 + 0.00) = 49.93 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  73.68   0.00  -4.90   0.00   0.00   0.00 -18.85  49.93
-------------------------------------------------------------------------------

Segment Leq : 49.93 dBA
```

Results segment # 2: Cranesbill (day)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	1.50	1.50	1.50

ROAD (0.00 + 36.34 + 0.00) = 36.34 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	53	0.00	67.51	0.00	-5.87	-5.31	0.00	0.00	-20.00	36.34

Segment Leq : 36.34 dBA

Results segment # 3: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 48.85 + 0.00) = 48.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
53	90	0.00	67.51	0.00	-5.87	-6.87	0.00	-5.92	0.00	48.85

Segment Leq : 48.85 dBA

Total Leq All Segments: 52.54 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	4.49	4.49

ROAD (0.00 + 42.74 + 0.00) = 42.74 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.08	0.00	-4.90	0.00	0.00	0.00	-18.43	42.74

Segment Leq : 42.74 dBA

Results segment # 2: Cranesbill (night)

Source height = 1.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.50	4.50	3.29	3.29

ROAD (0.00 + 28.97 + 0.00) = 28.97 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	53	0.00	59.91	0.00	-5.87	-5.31	0.00	0.00	-19.77	28.97

```
-------------------------------------------------------------------------------

Segment Leq : 28.97 dBA

Results segment # 3: Cranesbill (night)
---------------------------------------

Source height = 1.50 m

ROAD (0.00 + 41.25 + 0.00) = 41.25 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
    53     90   0.00  59.91   0.00  -5.87  -6.87   0.00  -5.92   0.00  41.25
-------------------------------------------------------------------------------

Segment Leq : 41.25 dBA

Total Leq All Segments: 45.17 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---------------------------------------------------
1 - Bus:
Traffic volume    :   410/72    veh/TimePeriod
Speed             :    60 km/h

Data for Segment # 1: Transitway (day/night)
--------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  46.40 / 46.40  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 90.00 deg
Barrier height            :  11.00 m
Barrier receiver distance :   0.10 / 0.10   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00

Results segment # 1: Transitway (day)
-------------------------------------

Source height = 0.50 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       0.50 !        1.50 !        1.50 !         1.50

RT/Custom (0.00 + 35.98 + 0.00) = 35.98 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90     90   0.00  59.75  -4.90   0.00   0.00   0.00 -18.86  35.98
-------------------------------------------------------------------------

Segment Leq : 35.98 dBA

Total Leq All Segments: 35.98 dBA
```

Results segment # 1: Transitway (night)

Source height = 0.50 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
0.50	4.50	4.49	4.49

RT/Custom (0.00 + 31.84 + 0.00) = 31.84 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	55.20	-4.90	0.00	0.00	0.00	-18.46	31.84

Segment Leq : 31.84 dBA

Total Leq All Segments: 31.84 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.63
(NIGHT): 45.37

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 22:02:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r18.te Time Period: Day/Night 16/8 hours
Description: R18 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 95 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 66.50 / 66.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 57.90 + 0.00) = 57.90 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	73.68	0.00	-6.47	0.00	0.00	-9.31	0.00	57.90

Segment Leq : 57.90 dBA

Total Leq All Segments: 57.90 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 50.30 + 0.00) = 50.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	66.08	0.00	-6.47	0.00	0.00	-9.31	0.00	50.30

Segment Leq : 50.30 dBA

Total Leq All Segments: 50.30 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 95 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 66.50 / 66.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 43.96 + 0.00) = 43.96 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	59.75	-6.47	0.00	0.00	-9.31	0.00	43.96

Segment Leq : 43.96 dBA

Total Leq All Segments: 43.96 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 39.42 + 0.00) = 39.42 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	55.20	-6.47	0.00	0.00	-9.31	0.00	39.42

Segment Leq : 39.42 dBA

Total Leq All Segments: 39.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.07
(NIGHT): 50.64

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 22:02:52
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r19.te Time Period: Day/Night 16/8 hours
Description: R19 POW

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -90.00 deg 0.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 95 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 78.70 / 78.70 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 54.32 + 0.00) = 54.32 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	73.68	0.00	-7.20	-3.01	0.00	-9.15	0.00	54.32

Segment Leq : 54.32 dBA

Total Leq All Segments: 54.32 dBA

Results segment # 1: Robert Grant (night)

Source height = 1.50 m

ROAD (0.00 + 46.72 + 0.00) = 46.72 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	66.08	0.00	-7.20	-3.01	0.00	-9.15	0.00	46.72

Segment Leq : 46.72 dBA

Total Leq All Segments: 46.72 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---

1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2	: -90.00 deg	0.00 deg
Wood depth	: 0	(No woods.)
No of house rows	: 1 / 1	
House density	: 95 %	
Surface	: 2	(Reflective ground surface)
Receiver source distance	: 78.70 / 78.70	m
Receiver height	: 1.50 / 4.50	m
Topography	: 1	(Flat/gentle slope; no barrier)
Reference angle	: 0.00	

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 40.39 + 0.00) = 40.39 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	59.75	-7.20	-3.01	0.00	-9.15	0.00	40.39

Segment Leq : 40.39 dBA

Total Leq All Segments: 40.39 dBA

Results segment # 1: Transitway (night)

Source height = 0.50 m

RT/Custom (0.00 + 35.84 + 0.00) = 35.84 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.00	55.20	-7.20	-3.01	0.00	-9.15	0.00	35.84

Segment Leq : 35.84 dBA

Total Leq All Segments: 35.84 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.49
(NIGHT): 47.06

STAMSON 5.0 NORMAL REPORT Date: 12-05-2025 22:03:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r20.te Time Period: Day/Night 16/8 hours
Description: R20 OLA

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

Car traffic volume : 28336/2464 veh/TimePeriod *
Medium truck volume : 2254/196 veh/TimePeriod *
Heavy truck volume : 1610/140 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): 35000
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: Robert Grant (day/night)

Angle1 Angle2 : -30.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 95 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 80.00 / 80.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Robert Grant (day)

Source height = 1.50 m

ROAD (0.00 + 55.51 + 0.00) = 55.51 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	90	0.00	73.68	0.00	-7.27	-1.76	0.00	-9.13	0.00	55.51

Segment Leq : 55.51 dBA

Total Leq All Segments: 55.51 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---
1 - Bus:
Traffic volume : 410/72 veh/TimePeriod
Speed : 60 km/h

Data for Segment # 1: Transitway (day/night)

Angle1 Angle2 : -30.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 1 / 1
House density : 95 %
Surface : 2 (Reflective ground surface)
Receiver source distance : 80.00 / 80.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Transitway (day)

Source height = 0.50 m

RT/Custom (0.00 + 41.58 + 0.00) = 41.58 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-30	90	0.00	59.75	-7.27	-1.76	0.00	-9.13	0.00	41.58

Segment Leq : 41.58 dBA

Total Leq All Segments: 41.58 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.68

APPENDIX C

Building Component Assessment (AIF Analysis)

TABLE 5: Acoustic Insulation Factor for Various Types of Windows

Window area as a percentage of total floor area of room[1]													
4	5	6	8	10	13	16	20	25	32	40	50	63	80
Acoustic Insulation Factor (AIF)[2]													
35	34	33	32	31	30	29	28	27	26	25	24	23	22
36	35	34	33	32	31	30	29	28	27	26	25	24	23
37	36	35	34	33	32	31	30	29	28	27	26	25	24
38	37	36	35	34	33	32	31	30	29	28	27	26	25
39	38	37	36	35	34	33	32	31	30	29	28	27	26
40	39	38	37	36	35	34	33	32	31	30	29	28	27
41	40	39	38	37	36	35	34	33	32	31	30	29	28
42	41	40	39	38	37	36	35	34	33	32	31	30	29
43	42	41	40	39	38	37	36	35	34	33	32	31	30
44	43	42	41	40	39	38	37	36	35	34	33	32	31
45	44	43	42	41	40	39	38	37	36	35	34	33	32
46	45	44	43	42	41	40	39	38	37	36	35	34	33
47	46	45	44	43	42	41	40	39	38	37	36	35	34
48	47	46	45	44	43	42	41	40	39	38	37	36	35
49	48	47	46	45	44	43	42	41	40	39	38	37	36
50	49	48	47	46	45	44	43	42	41	40	39	38	37

Single glazing	Double glazing of indicated glass thickness					Triple Glazing	
	2mm and 2mm glass	3mm and 3mm glass	4mm and 4mm glass	3mm and 6mm glass	6mm and 6mm glass	3mm, 3mm and 3mm glass	3mm, 3mm and 6mm glass
Thickness	Interpane spacing in mm[3]					Interpane spacings in mm[5]	
3mm	6						
	13						
3mm	19	6					
4mm, 6mm	18	13	6				
	22	16	13	6	6	6,6	
9mm[4]	28	20	16	13	13	6,10	6,6
	35	25	20	16	16	6,15	6,10
12mm[4]	42	32	25	20	20	6,20	6,15
	50	40	32	25	24	6,30	6,20
	63	50	40	32	30	6,40	6,30
	80	63	50	40	37	6,50	6,40
	100	80	63	55	50	6,65	6,50
	125	100	80	75	70	6,80	6,65
	130	125	100	95	90	6,100	6,80
		150	125	110	100		6,100
			150	135	125		

Source: National Research Council, Division of Building Research, June 1980.

Explanatory Notes:

1) Where the calculated percentage window area is not presented as a column heading, the nearest percentage column in the table values should be used.
2) AIF data listed in the table are for well-fitted weatherstripped units that can be opened. The AIF values apply only when the windows are closed. For windows fixed and sealed to the frame, add three (3) to the AIF given in the table.
3) If the interpane spacing or glass thickness for a specific double glazed window is not listed in the table, the nearest listed values should be used.
4) The AIF ratings for 9mm and 12mm glass are for laminated glass only; for solid glass subtract two (2) from the AIF values listed in the table.
5) If the interpane spacings for a specific triple-glazed window are not listed in the table, use the listed case whose combined spacings are nearest the actual combined spacing.
6) The AIF data listed in the table are for typical windows, but details of glass mounting, window seals, etc. may result in slightly different performance for some manufacturers' products. If laboratory sound transmission loss data (conforming to ASTM test method E-90) are available, these should be used to calculate the AIF.

Table 6.3 - Acoustic Insulation Factor for Various Types of Exterior Wall

Percentage of exterior wall area to total floor area of room											Type of Exterior Wall
16	20	25	32	40	50	63	80	100	125	160	
Acoustic Insulation Factor											
39	38	37	36	35	34	33	32	31	30	29	EW1
41	40	39	38	37	36	35	34	33	32	31	EW2
44	43	42	41	40	39	38	37	36	35	34	EW3
47	46	45	44	43	42	41	40	39	38	37	EW4
48	47	46	45	44	43	42	41	40	39	38	EW1R
49	48	47	46	45	44	43	42	41	40	39	EW2R
50	49	48	47	46	45	44	43	42	41	40	EW3R
55	54	53	52	51	50	49	48	47	46	45	EW5
56	55	54	53	52	51	50	49	48	47	46	EW4R
58	57	56	55	54	53	52	51	50	49	48	EW6
59	58	57	56	55	54	53	52	51	50	49	EW7 or EW5R
63	62	61	60	59	58	57	56	55	54	53	EW8

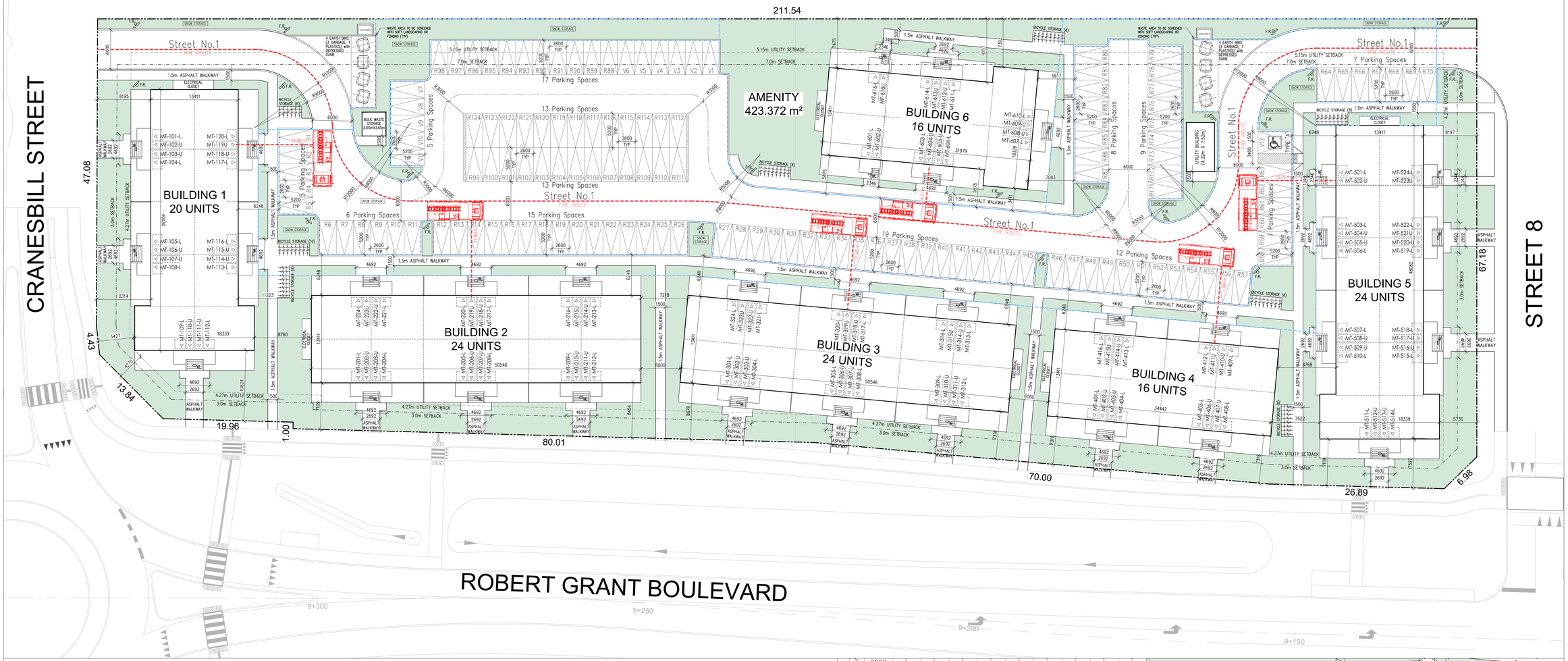
Source : National Research Council, Division of Building Research, December 1980.

Explanatory Notes :

1) Where the calculated percentage wall area is not presented as a column heading, the nearest percentage column in the table should be used.
2) The common structure of walls EW1 to EW5 is composed of 12.7 mm gypsum board, vapour barrier, and 38 x 89 mm studs with 50 mm (or thicker) mineral wool or glass fibre batts in inter-stud cavities
3) EW1 denotes exterior wall as in Note 2), plus sheathing, plus wood siding or metal siding and fibre backer board.
EW2 denotes exterior wall as in Note 2), plus rigid insulation (25-30 mm), and wood siding or metal siding and fibre backer board.
EW3 denotes simulated mansard with structure as in Note 2), plus sheathing, 28 x 89 mm framing, sheathing, and asphalt roofing material.
EW4 denotes exterior wall as in Note 2), plus sheathing and 20 mm stucco.
EW5 denotes exterior wall as in Note 2), plus sheathing, 25 mm air space, 100 mm brick veneer.
EW6 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 100 mm back-up block, 100 mm face brick.
EW7 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 140 mm back-up block, 100 mm face brick.
EW8 denotes exterior wall composed of 12.7 mm gypsum board, rigid insulation (25-50 mm), 200 mm concrete.
4) R signifies the mounting of the interior gypsum board on resilient clips.
5) An exterior wall conforming to rainscreen design principles and composed of 12.7 mm gypsum board, 100 mm concrete block, rigid insulation (25-50 mm), 25 mm air space, and 100 mm brick veneer has the same AIF as EW6.
6) An exterior wall described in EW1 with the addition of rigid insulation (25-50 mm) between the sheathing and the external finish has the same AIF as EW2.

APPENDIX D

Abbott's Run – Block 13 Site Plan



1 / A100 ARCHITECTURAL SITE PLAN

SCALE: 1:250

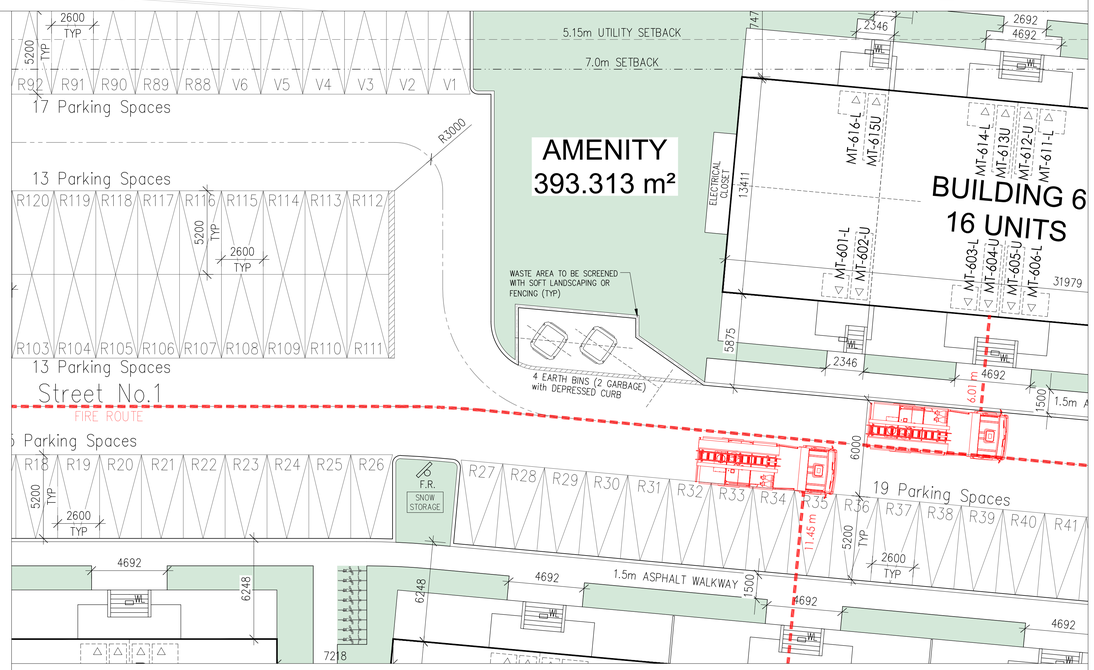
SITE STATISTICS

PROVISION	REQUIRED	PROPOSED	COMPLIANCE
NET LOT AREA (excludes dedication):	NO MINIMUM	13932.545 m²	**N/A**
DEDICATION AREA (easement):	NO MINIMUM	N/A	**N/A**
GROSS LOT AREA (includes dedication):	NO MINIMUM	13932.545 m²	**N/A**
BUILDING AREA	NO MINIMUM	3583.023 m²	**N/A**
LOT COVERAGE (building area/net lot area):	NO MINIMUM	3583.023 m²	**N/A**
GROSS FLOOR AREA	NO MINIMUM	10642.193 m²	**N/A**
NET F.S.I. (gross floor area/net lot area):	NO MINIMUM	0.76	**N/A**
GROSS F.S.I. (gross floor area/gross lot area):	NO MINIMUM	0.76	**N/A**
BUILDING HEIGHTS (mid-point of roof):			
STACKED DWELLINGS:	11.00 m	11.62m (MID-POINT)	**NO**
SETBACKS :			
MIN. FRONT YARD (WEST):	3.00 m	5.43 m	**YES**
MIN INTERIOR SIDE YARD (NORTH):	7.00m	7.30 m	**YES**
MIN REAR YARD (EAST):	3.00m	5.74 m	**YES**
MIN CORNER SIDE YARD (SOUTH):	3.00m	4.27 m	**YES**
NUMBER OF STACKED TOWNHOUSE UNITS :		**124 SUITES**	
2 BED INTERIOR:	NO MINIMUM	**76 SUITES**	
3 BED END:	NO MINIMUM	**48 SUITES**	
TOTAL PARKING SPACES :		**136 PS**	
RESIDENT PARKING SPACES (STACKED-TOWNS):	**0.9 SPACES/UNIT = (124x0.9) MIN. 112 SP**	**124**	**1:1** **YES**
VISITOR PARKING SPACES (STACKED-TOWNS) (INCLUDES BARRIER FREE PS)	**0.1 SPACES/UNIT = (124x0.1) MIN. 12 SP**	**12**	**0.1:1** **YES**
BARRIER FREE PARKING SPACES DEDICATED FOR VISITORS :	**0**	**1**	**N/A** **N/A**
BICYCLE SPACES (STACKED-TOWNS):			
BICYCLE SPACES :	**0.5 SPACES/UNIT = (124x0.5) MIN. 62**	**62**	**YES**
TOTAL LANDSCAPE :	**30%**	6178.343m² (44.34% OF NET LOT AREA)	**YES**
LANDSCAPED OPEN SPACE AREA :			
SOFT LANDSCAPE AREA :	**N/A**	3243.920m² (52.50% OF LANDSCAPING)	**N/A**
HARD LANDSCAPE AREA :	**N/A**	2934.423m² (47.50% OF LANDSCAPING)	**N/A**
LANDSCAPED PARKING AREA :			
TOTAL PARKING AREA :	**N/A**	5411.410m²	**N/A**
PAVED PARKING AREA :	**85% MAX**	3795.744m² (70.14 % OF PARKING AREA)	**YES**
LANDSCAPED PARKING AREA :	**15% MIN**	1615.666 m² (29.86 % OF PARKING AREA)	**YES**
AMENITY:			
TOTAL AMENITY AREA: (6 m² PER METRO UNIT INCULDES PRIVATE + COMMUNAL)	**124 UNITS X 6 m² =744 m²**	LOWER PATIO = 19.889 m² X 24 END UNITS LOWER PATIO = 16.483m² X 38 INT. UNITS UPPER BALCONY AREA 6.828m² X 62 UNITS = 1527.045m² TOTAL PRIVATE AREA +PRIVATE 1527.045m² + COMMUNAL 423.372m² =1950.417m² TOTAL AMENITY	**YES**
COMMUNAL AMENITY AREA: (50% OF REQUIRED)	**744 m^2 +372 m²**	AREA WEST OF BUILDING 6 = 423.372m² TOTAL COMMUNAL AREA	**YES**

LEGEND

- MAIN ENTRANCE
- BICYCLE PARKING, REFER TO LANDSCAPE DRAWINGS
- BARRIER FREE PARKING
- R10 RESIDENT PARKING
- V10 VISITOR PARKING
- H&V FIRE HYDRANT, REFER TO CIVIL DRAWINGS
- LS LIGHT POLE, REFER TO ELECTRICAL DRAWINGS
- LB LIGHT BOLLARD, REFER TO ELECTRICAL DRAWINGS
- WL WALL MOUNTED LIGHT FIXTURE, REFER TO ELECTRICAL DWGS
- F.R. FIRE ROUTE SIGN AS PER CITY STANDARD
- H.S. BARRIER FREE PARKING SIGN, AS PER CITY STANDARD
- S.S. STOP SIGN
- I.S. IDLE FREE ZONE SIGN
- P.S. POPS SIGN
- TACTILE INDICATOR
- DC TRANSFORMER
- DEPRESSED CURB
- G GAS METER
- H HYDRO METER
- NFHB NON FREEZABLE HOSE BIB
- EVCS ELECTRIC VEHICLE CHARGING STATION
- SIAMESE CONNECTION
- XXX SUITE NUMBER
- FIRE BREAK BLOCK
- LLE LOWER LEVEL ELEVATION
- FFE FIRST FLOOR ELEVATION
- AREA DRAIN
- DENOTES FIRE ROUTE
- DENOTES AMENITY BOUNDARY
- DENOTES PARKING LOT LANDSCAPING BOUNDARY
- DENOTES SOFT LANDSCAPING AREA
- DENOTES DECORATIVE FENCING

SCALE=1:250



2 / A100 OPTIONAL SITE PLAN W/ ADDITIONAL WASTE COLLECTION

SCALE: 1:150

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NO:	DATE:	ISSUED FOR:
1	2024.04.28	COORDINATION

minto

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PLAN OF SURVEY OF
BLOCK 140
REGISTERED PLAN 4M-1544
CITY OF OTTAWA
SURVEYED BY ANNIS, O'SULLIVAN, VOLLEBEKK LTD.

APPLICANT:
MINTO CANADA
200-180 KENT STREET
OTTAWA ON K1P 0B6

CIVIL ENGINEER:
DAVID SCHAEFER ENGINEERING LTD.
120 IBER ROAD, UNIT 103
STITTVILLE, ON K4S 1E9

SURVEYOR:
ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 CONCOURSE GATE, SUITE 500
NEPEAN, ON K2E 7S6

PRELIMINARY, NOT FOR CONSTRUCTION
ALL AREAS CALCULATIONS ARE PRELIMINARY

NO:	DATE:	REVISION COMMENT:

SRN ARCHITECTS
8395 JANE STREET, SUITE 203
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

CLIENT:
Minto Canada
200-180 Kent Street
Ottawa, Ontario K1P 0B6

PROJECT:
Abbott's Run
Block 13
Ottawa, Ontario

DRAWING TITLE:
SITE PLAN

DATE: 2025-04-28	SCALE: 1:250
DRAWN BY: AB	CHECKED BY: GF
PROJECT NUMBER: S25016	DRAWING NUMBER: A100