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Kizell Lands - Fernbank
5618 Hazeldean Road

Noise Feasibility Study

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Kizell Lands – Fernbank
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Prepared by:

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

February 23, 2018

Ref: R-2018-005
Novatech File No. 108195

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February 23, 2018

BY COURIER

City of Ottawa
Planning and Growth Management Department
110 Laurier Avenue West, 4th Floor
Ottawa, ON K1P 1J1

Attention: **Mr. Eric Surprenant**

Reference: **Kizell Lands – Fernbank**
5618 Hazeldean Road
Noise Feasibility Study
Our File No.: 108195

Enclosed are four (4) copies of the 'Noise Feasibility Study' for the Kizell Lands within the Fernbank Community.

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

Sincerely,

NOVATECH

Mark Bissett, P.Eng.
Senior Project Manager

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1.0 INTRODUCTION

The Kizell Lands are located within the Fernbank Community and will be bordered by industrial lands to the west (Iber Road), the Trans-Canada Trail to the south, future Craig Subdivision to the east (Richcraft), and commercial lands to the north (Hazeldean Road). **Figure 1-1** shows the location of the Fernbank Community and the Kizell Lands. The subject property will be developed with a mix of residential products (low, medium and high-density), accompanied by commercial, institutional and recreational land uses.

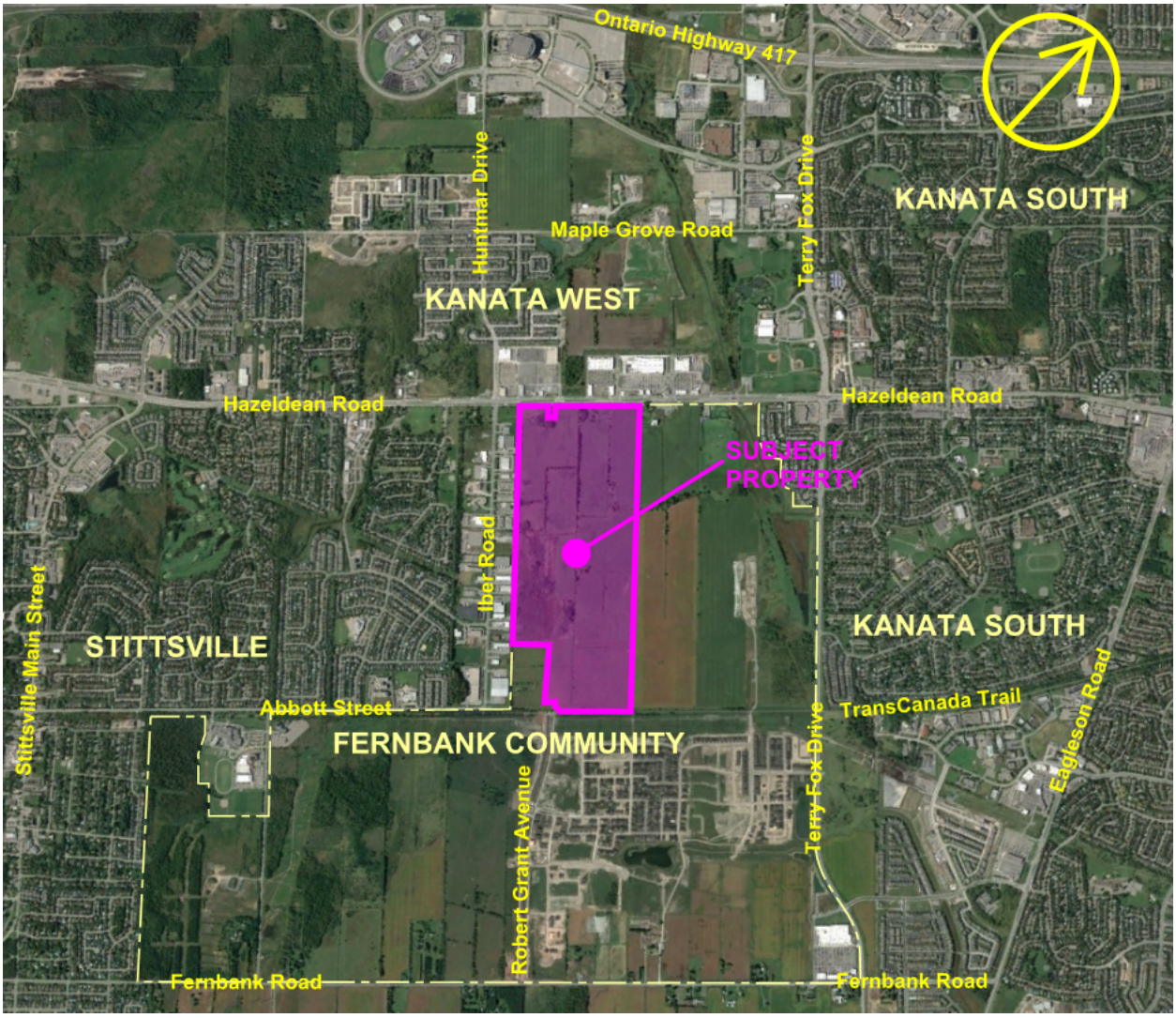


Figure 1-1 Key Plan

The Subdivision will be comprised of low, medium, and high-density residential dwellings with a planned total of 326 singles, 274 townhouses, and 225 stacked townhouses. Approximately 646 units are proposed within the medium density blocks, that will be located adjacent the proposed extension of Robert Grant Avenue. An additional 380 apartment units within the high-density block will be located in proximity to the proposed Robert Grant Avenue. Mixed-Use blocks are proposed along the existing Hazeldean Road and proposed Robert Grant Avenue, with Commercial blocks located west of the proposed Robert Grant Avenue. A school will front onto the proposed minor collector (Backbend) along the east boundary of the site. A Park n' Ride

facility is proposed at the corner of the proposed Robert Grant Avenue and Hazeldean Road. The remainder of the site is comprised of Parkland, Open Space, Hydro Corridor, and a SWM Facility. The proposed Land Use Plan is shown in **Figure 1-2**.

This report will assess the environmental impact of noise from traffic on the outdoor living areas, and review the feasibility of mitigation methods. Mitigation of in-door noise levels will not be discussed in this report since floor areas, window/door areas and building sections are not available. These components will be reviewed in the future, as part of a detailed noise study in conjunction with plan of subdivision and/or site plan applications.

Figure 1-2 Land Use Plan

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 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 and patios. 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.

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 (noise level greater than 65dBA) and warning clauses. The sound criterion is broadly summarized in **Table 2-1**.

Table 2-1 City of Ottawa Outdoor 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)	General offices, reception areas, retail stores, etc.	50 dBA
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

3.0 NOISE SOURCES

Figure 3-1 shows the noise sources which have an impact on this development. Robert Grant Avenue (Arterial), Hazeldean Road (Arterial), Abbott Street (Major Collector), Cranesbill Road (Major Collector) and Backbend (Minor Collector) are the most significant vehicular noise sources, per the 2013 Transportation Master Plan, as all other sources of noise are located beyond the limits of consideration as outlined in Section 2.1 of the ENCG.

3.1 Robert Grant Avenue (Arterial)

In the interim, Robert Grant Avenue will be built as a 2-Lane Urban Arterial. For the purpose of this report, the ultimate design will be used as it provides the worst-case scenario. **Table 3-1** summarizes the noise parameters for the ultimate design of Robert Grant Avenue.

Table 3-1 Robert Grant Avenue Noise Parameters

Roadway Classification	4-Lane Urban Arterial-Divided
Annual Average Daily Traffic (AADT)	35,000 veh/day
Day/Night Split (%)	92/8
Heavy Trucks (%)	5
Medium Trucks (%)	7
Posted Speed Limit	70 km/hr
Road Gradient	0.5%

Robert Grant Avenue will include a Transitway between the north and southbound lanes and the noise parameters are summarized below in **Table 3-2.**

Table 3-2 Transitway Noise Parameters

Roadway Classification	Transitway
Annual Average Daily Traffic (AADT)	844 veh/day
Day/Night Split (%)	85/15
Posted Speed Limit	70 km/hr
Road Gradient	0.5%

3.2 Hazeldean Road (Arterial)

Table 3-3 summarizes the noise parameters for Hazeldean Road.

Table 3-3 Hazeldean Road Noise Parameters

Roadway Classification	4-Lane Urban Arterial-Divided
Annual Average Daily Traffic (AADT)	35,000 veh/day
Day/Night Split (%)	92/8
Heavy Trucks (%)	5

Medium Trucks (%)	7
Posted Speed Limit	60 km/hr
Road Gradient	0.5%

3.3 Abbott Street and Cranesbill Road (Major Collector)

Table 3-4 summarizes the noise parameters for Abbott Street and Cranesbill Road.

Table 3-4 Abbott Street/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/hr
Road Gradient	0.5%

3.4 Backbend (Collector)

Table 3-5 summarizes the noise parameters for Backbend.

Table 3-5 Backbend Noise Parameters

Roadway Classification	2-Lane Urban Collector
Annual Average Daily Traffic (AADT)	8,000 veh/day
Day/Night Split (%)	92/8
Heavy Trucks (%)	5
Medium Trucks (%)	7
Posted Speed Limit	50 km/hr
Road Gradient	0.5%

4.0 NOISE LEVEL PREDICTIONS

4.1 Noise Level Analysis

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 the tables below.

4.1.1 *Robert Grant Avenue Noise Impact Area*

Land uses along Robert Grant Avenue within the Impact Area include commercial, mixed-use and medium-density residential. **Table 4-1** below shows that unattenuated sound levels will exceed City of Ottawa and MOE criteria.

Outdoor Living Areas within the medium-density residential blocks will need to be located such that the proposed buildings provide shielding to reduce the noise levels below 55dBA. OLA's within the future single and townhouse units will meet the City of Ottawa noise requirement of 55dBA when considering the future shielding from the medium-density residential blocks.

Building component assessments will be required on units facing Robert Grant Avenue to determine the exterior cladding system needed to ensure the indoor noise criteria is achieved. Based on past experience, the minimum window and wall type assemblies required by the Ontario Building Code (OBC) will be sufficient to mitigate the indoor noise levels below the City's criteria. This analysis will be conducted during the detailed design stage along with determining the required 'Warning Clauses'.

Table 4-1 Robert Grant Avenue Noise Level Summary

LOCATION	OUTDOOR NOISE LEVEL – Leq - (dBA)	OUTDOOR NOISE LEVEL – L_{eq} - (dBA)
	Unattenuated	Attenuated
R1	71.65	-
R2	62.52	54.72 (Building Shielding)
R3	59.25	52.72 (Building Shielding)
R4	61.07	54.45 (Building Shielding)

4.1.2 *Robert Grant Avenue and Cranesbill Noise Impact Area*

Land uses along Cranesbill within the Impact Area include medium-density residential and townhouse units. **Table 4-2** below shows that unattenuated sound levels will exceed City of Ottawa and MOE criteria.

Outdoor Living Areas within the medium-density residential blocks will need to be located such that the proposed buildings provide shielding to reduce the noise levels below 55dBA. Due to the planned orientation of the outdoor living areas, noise levels will be below the required 55dBA for all units facing Cranesbill. Units with rear yards exposed to Cranesbill (receiver R5) physical mitigation of noise will be required. A 2.5m noise wall would potentially reduce the noise level to 58.06dBA. To reduce the noise level below 55dBA would require a noise wall approximately 3.5m in height; such a barrier is deemed aesthetically unappealing, provides

minimal acoustic improvement, and is not a recommended solution. The wood noise barrier shall be constructed to blend with the typical privacy fence.

Building component assessments will be required on units facing Cranesbill to determine the exterior cladding system needed to ensure the indoor noise criteria is achieved. Based on past experience, the minimum window and wall type assemblies required by the Ontario Building Code (OBC) will be sufficient to mitigate the indoor noise levels below the City's criteria. If the minimum window and wall type assemblies do not provide sufficient mitigation to meet the City's criteria, upgrades are possible using brick or resilient clips to help mitigate the indoor noise levels. This analysis will be conducted during the detailed design stage along with determining the required 'Warning Clauses'.

Table 4-2 Robert Grant/Cranesbill Noise Level Summary

LOCATION	OUTDOOR NOISE LEVEL – Leq - (dBA)	OUTDOOR NOISE LEVEL – Leq - (dBA)
	Unattenuated	Attenuated
R5	65.70	58.12 (2.5m Wall) 54.71 (3.5m Wall)
R6	65.09	-
R7	70.45	-

4.1.3 *Cranesbill Noise Impact Area*

Land uses along Cranesbill within the Impact Area include townhouse units and singles. **Table 4-3** below shows that unattenuated sound levels will exceed City of Ottawa and MOE criteria.

Outdoor Living Areas along the townhouse units will be shielded by the proposed townhouses resulting in noise levels below the required 55dBA. Due to the planned orientation of the outdoor living areas, noise levels will be below the required 55dBA for all units facing Cranesbill. Units with rear yards exposed to Cranesbill (lots 123, 124 and 189) physical mitigation of noise will be required. A 2.5m noise wall would reduce the noise level to 54.86dBA at lot 182, below the required 55dBA. A combination of 2.2m and 2.5m noise barriers would be recommended at lots 123, 124 and 189 to reduce the noise levels below 55dBA. The wood noise barrier shall be constructed to blend with the typical privacy fence.

Since noise levels do not exceed 65dBA, building component assessment is not required for the exterior cladding system. Potential warning clauses will be determined during the detailed design stage.

Table 4-3 Cranesbill Noise Level Summary

LOCATION	OUTDOOR NOISE LEVEL – Leq - (dBA)	OUTDOOR NOISE LEVEL – Leq - (dBA)
	Unattenuated	Attenuated
R8	63.63	54.86 (2.5m Wall)
R9	51.63	-

4.1.4 *Cranesbill and Backbend Noise Impact Area*

Land use along Cranesbill and Backbend within the Impact Area include singles. **Table 4-4** below shows that unattenuated sound levels will exceed City of Ottawa and MOE criteria.

Most of the Outdoor Living Areas for singles facing Cranesbill and Backbend will have a noise level below the required 55dBA. The exceptions are lots 155 and 156, where the unattenuated noise levels are above 55dBA and physical mitigation of noise will be required. A 2.5m noise wall would reduce the noise level to 57.10dBA at lot 156. To reduce the noise level below 55dBA would require a noise wall approximately 3.5m in height; such a barrier is deemed aesthetically unappealing, provides minimal acoustic improvement, and is not a recommended solution. The wood noise barrier shall be constructed to blend with the typical privacy fence.

Building component assessments will be required on units facing Cranesbill and Backbend to determine the exterior cladding system needed to ensure the indoor noise criteria is achieved. Based on past experience, the minimum window and wall type assemblies required by the Ontario Building Code (OBC) will be sufficient to mitigate the indoor noise levels below the City's criteria. If the minimum window and wall type assemblies do not provide sufficient mitigation to meet the City's criteria, upgrades are possible using brick or resilient clips to help mitigate the indoor noise levels. This analysis will be conducted during the detailed design stage along with determining the required 'Warning Clauses'.

Table 4-4 Cranesbill/Backbend Noise Level Summary

LOCATION	OUTDOOR NOISE LEVEL – Leq - (dBA)	OUTDOOR NOISE LEVEL – Leq - (dBA)
	Unattenuated	Attenuated
R10	66.06	-
R11	64.05	57.10 (2.5m Wall) 54.50 (3.5m Wall)
R12	58.73	54.87 (Building Shielding)

4.1.5 *Backbend Noise Impact Zone*

Land uses along Backbend within the Impact Area include singles, a park and a school block. **Table 4-5** below shows that unattenuated sound levels will exceed City of Ottawa and MOE criteria.

Outdoor Living Areas for singles facing Backbend will be shielded by the proposed singles resulting in noise levels below the required 55dBA. Units with rear yards exposed to Backbend (lot 66) physical mitigation of noise will be required. A 2.5m noise wall would reduce the noise level below 55dBA to 54.79dBA at lot 66. The wood noise barrier shall be constructed to blend with the typical privacy fence.

Since noise levels do not exceed 65dBA, building component assessment is not required for the exterior cladding system. Potential warning clauses will be determined during the detailed design stage.

Table 4-5 Backbend Noise Level Summary

LOCATION	OUTDOOR NOISE LEVEL – Leq - (dBA)	OUTDOOR NOISE LEVEL – Leq - (dBA)
	Unattenuated	Attenuated
R13	57.59	53.77 (Building Shielding)
R14	49.86	-
R15	62.98	54.79 (2.5m Wall)
R16	50.00	-

4.1.6 *Backbend and Abbott Noise Impact Area*

Land uses along Backbend and Abbott within the Impact Area include singles, high-density residential and a district park. **Table 4-6** below shows that unattenuated sound levels will exceed City of Ottawa and MOE criteria.

Potential OLA's within the high-density residential block should be located so that the proposed buildings provide shielding to reduce the noise levels below 55dBA. Outdoor Living Areas for single units with rear yards exposed to Backbend (lot 1) physical mitigation of noise will be required. A 2.5m noise wall would reduce the noise level below 55dBA to 54.69dBA at lot 1. The wood noise barrier shall be constructed to blend with the typical privacy fence.

Since noise levels at singles facing Backbend do not exceed 65dBA, building component assessment is not required for the exterior cladding system. Noise levels may exceed 65dBA for units facing Abbott Street, depending on the height of future apartments within the medium-density block. Building component assessments will be required on units exceeding 65dBA to determine the exterior cladding system needed to ensure the indoor noise criteria is achieved. If the minimum window and wall type assemblies do not provide sufficient mitigation to meet the City's criteria, upgrades are possible using brick or resilient clips to help mitigate the indoor noise levels. This analysis will be conducted during the detailed design stage along with determining the required 'Warning Clauses'.

Table 4-6 Backbend/Abbott Noise Level Summary

LOCATION	OUTDOOR NOISE LEVEL – Leq - (dBA)	OUTDOOR NOISE LEVEL – Leq - (dBA)
	Unattenuated	Attenuated
R17	62.59	54.69 (2.5m Wall)
R19	64.74	-

4.1.7 *Abbott Noise Impact Area*

Land uses along Abbott Street within the Impact Area include singles, medium-density residential and a district park. **Table 4-7** below shows that unattenuated sound levels will exceed City of Ottawa and MOE criteria.

Outdoor Living Areas within the high-density residential block will need to be located such that the proposed buildings provide shielding to reduce the noise levels below 55dBA.

Since noise levels do not exceed 65dBA, building component assessment is not required for the exterior cladding system. Potential warning clauses will be determined during the detailed design stage.

Table 4-7 Abbott Noise Level Summary

LOCATION	OUTDOOR NOISE LEVEL – Leq - (dBA)	OUTDOOR NOISE LEVEL – Leq - (dBA)
	Unattenuated	Attenuated
R20	64.66	-
R21	55.69	-
R22	51.63	-

4.1.8 *Abbott and Robert Grant Noise Impact Zone*

Land use along Abbott Street and Robert Grant Avenue within the Impact Area include mixed-use. **Table 4-8** below shows that unattenuated sound levels will exceed City of Ottawa and MOE criteria.

Any proposed Outdoor Living Areas within the mixed-use block are to be located so that the proposed buildings provide shielding to reduce the noise levels below the required 55dBA.

Building component assessments will be required on units facing Abbott and Robert Grant to determine the exterior cladding system needed to ensure the indoor noise criteria is achieved. Based on past experience, the minimum window and wall type assemblies required by the Ontario Building Code (OBC) will be sufficient to mitigate the indoor noise levels below the City's criteria. If the minimum window and wall type assemblies do not provide sufficient mitigation to meet the City's criteria, upgrades are possible using brick or resilient clips to help mitigate the indoor noise levels. This analysis will be conducted during the detailed design stage along with determining the required 'Warning Clauses'.

Table 4-8 Abbott/Robert Grant Noise Level Summary

LOCATION	OUTDOOR NOISE LEVEL – Leq - (dBA)	OUTDOOR NOISE LEVEL – Leq - (dBA)
	Unattenuated	Attenuated
R23	65.71	-
R24	59.79	-
R25	71.42	-
R26	69.15	-

4.1.9 *Hazeldean Noise Impact Zone*

Land use along Hazeldean Road within the Impact Area include mixed-use. **Table 4-9** below shows that unattenuated sound levels will exceed City of Ottawa and MOE criteria.

Any proposed Outdoor Living Areas within the mixed-use block are to be located so that the proposed buildings provide shielding to reduce the noise levels below the required 55dBA.

Building component assessments will be required on units facing Hazeldean Road to determine the exterior cladding system needed to ensure the indoor noise criteria is achieved. Based on past experience, the minimum window and wall type assemblies required by the Ontario Building Code (OBC) will be sufficient to mitigate the indoor noise levels below the City's criteria. If the minimum window and wall type assemblies do not provide sufficient mitigation to meet the City's criteria, upgrades are possible using brick or resilient clips to help mitigate the indoor noise levels. This analysis will be conducted during the detailed design stage along with determining the required 'Warning Clauses'.

Table 4-9 Hazeldean Noise Level Summary

LOCATION	OUTDOOR NOISE LEVEL – Leq - (dBA)	OUTDOOR NOISE LEVEL – Leq - (dBA)
	Unattenuated	Attenuated
R27	68.47	-
R28	60.89	-
R29	57.14	-

5.0 CONCLUSIONS AND RECOMMENDATIONS

This report identifies select areas within the development lands that exceed the City of Ottawa's and the Ministry of the Environment guidelines. The sound level predictions indicate there are feasible means to reduce sound levels to ensure respective guidelines are satisfied inside the proposed development. The following recommendations ensure required noise levels are met:

- Detailed Noise Study required for each parcel within a noise impact area.
- Noise impact areas are identified on **Figure 3-1** and generally includes the lands in proximity to Robert Grant Avenue, Hazeldean Road, Abbott Street, Cranesbill Road and Backbend.
- Appropriate land use planning will minimize the extent of noise barriers required within the development.
- Noise barrier will likely be required at select locations, as identified on **Figure 5-1**, and may be constructed to blend in with adjacent privacy fences.
- A maximum noise barrier of 2.5m is recommended for aesthetic and public safety reasons.
- Building component assessment is required where the modelled noise level exceeds 65dBA. Locations include units facing Robert Grant Avenue, units facing Cranesbill and Backbend within the combined noise impact zone, units facing Abbott Street within the Abbott/Robert Grant noise impact zone and on units facing Hazeldean Road. There is no technical reason why the indoor noise level cannot be adequately mitigated using either an improved cladding system (i.e. brick), and/or resilient clips.

In conclusion, all blocks on the land use plan are deemed to have appropriate noise levels for the intended use, or suitable mitigation techniques can be readily employed.

Please contact the undersigned if you have any questions or comments with regards to this report.

Respectfully issued,

NOVATECH

Prepared By:

Lucas Wilson, P.Eng.
Project Coordinator

Reviewed By:

Mark Bissett, P.Eng.
Project Manager

APPENDIX A

Delcan Memorandum
Stamson Model Output

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:

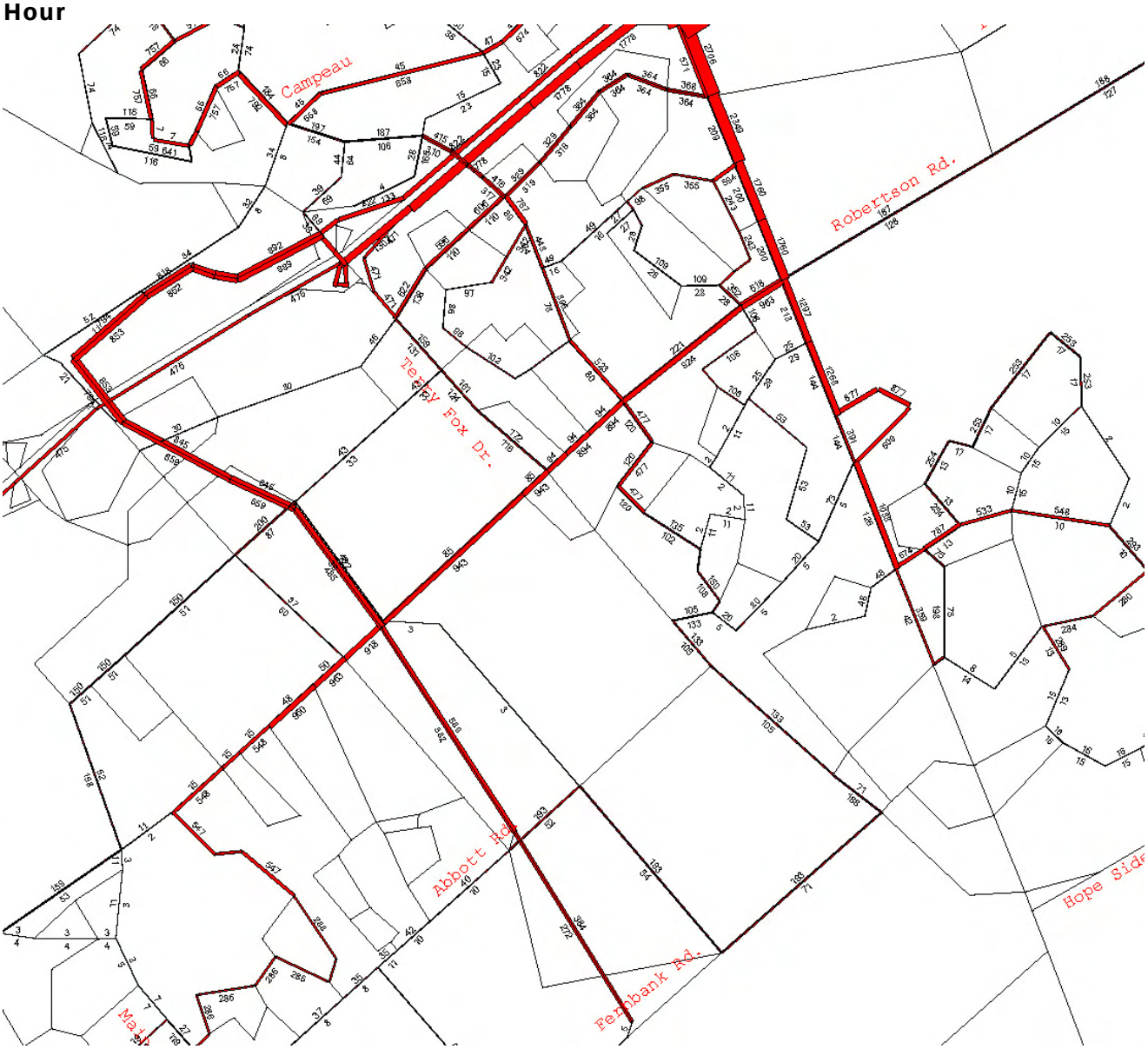
Transit Trips	Auto Trips	Total Trips (peak hour)	Modal Split
2,400	9,300	11,700	21%

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

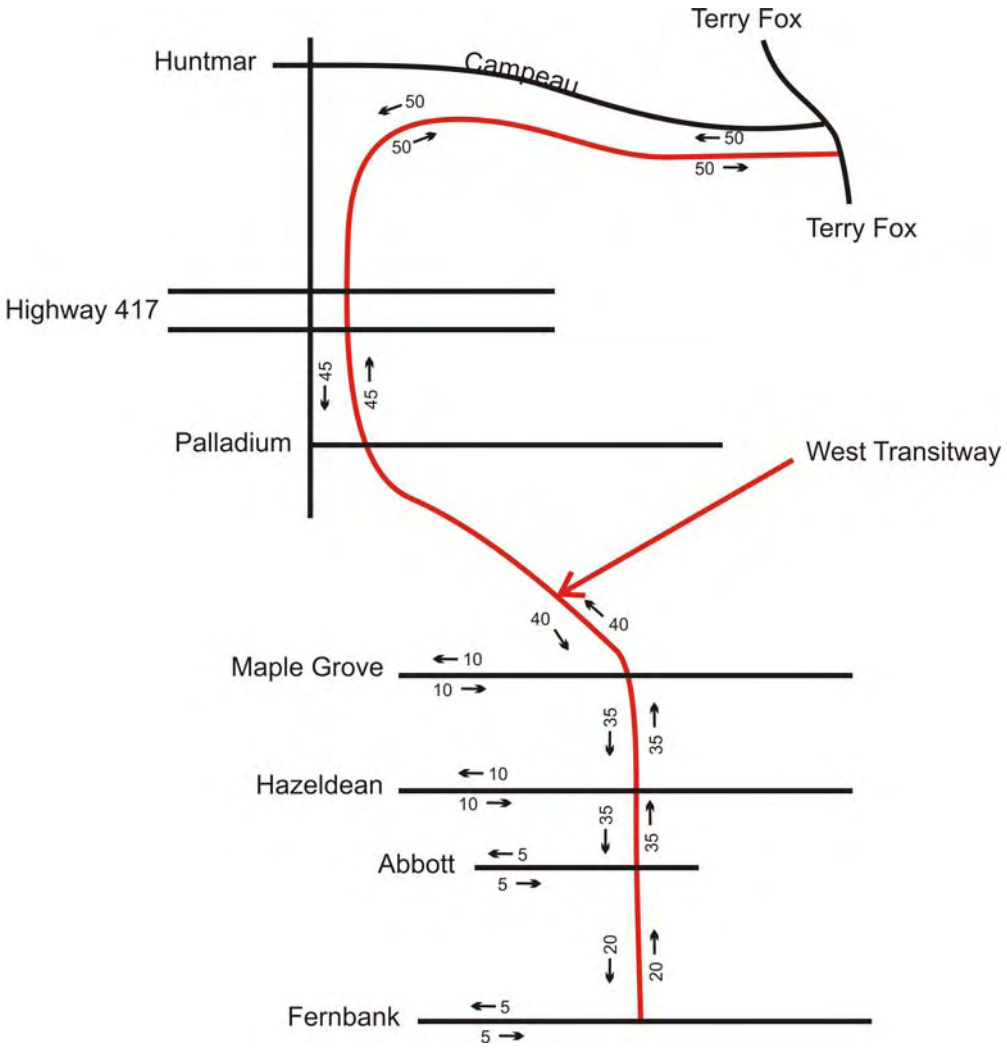
Consequently, based on first principles, the potential number of buses crossing the Hazeldean South screenline within the Fernbank Community would be within the range of 18 vph to 29 vph. To this volume can be added potential routes to/from Stittsville that would operate on Abbott/Fernbank. These ultimate 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

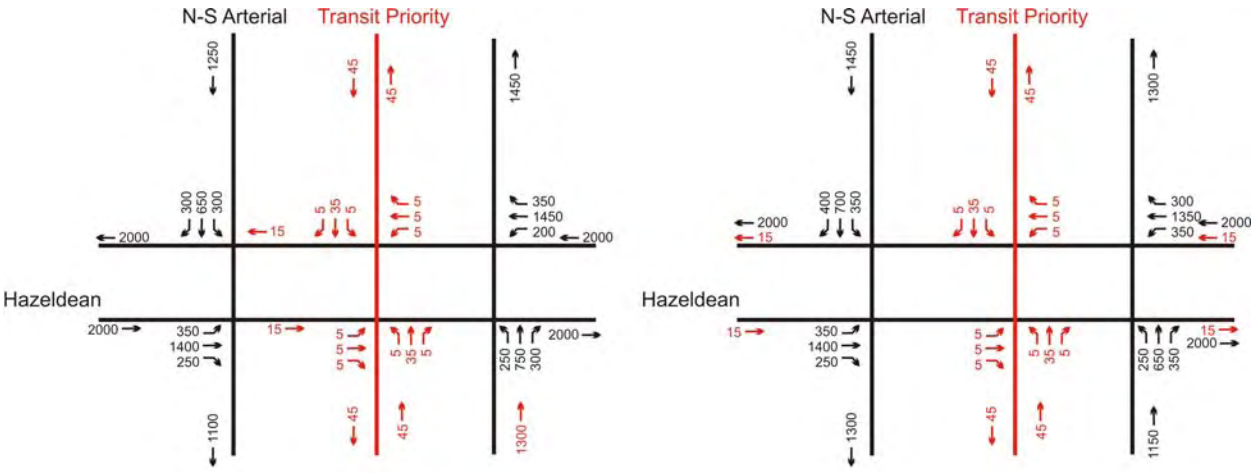
This might be assumed to apply for the next 10 years to approximately 2020.

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

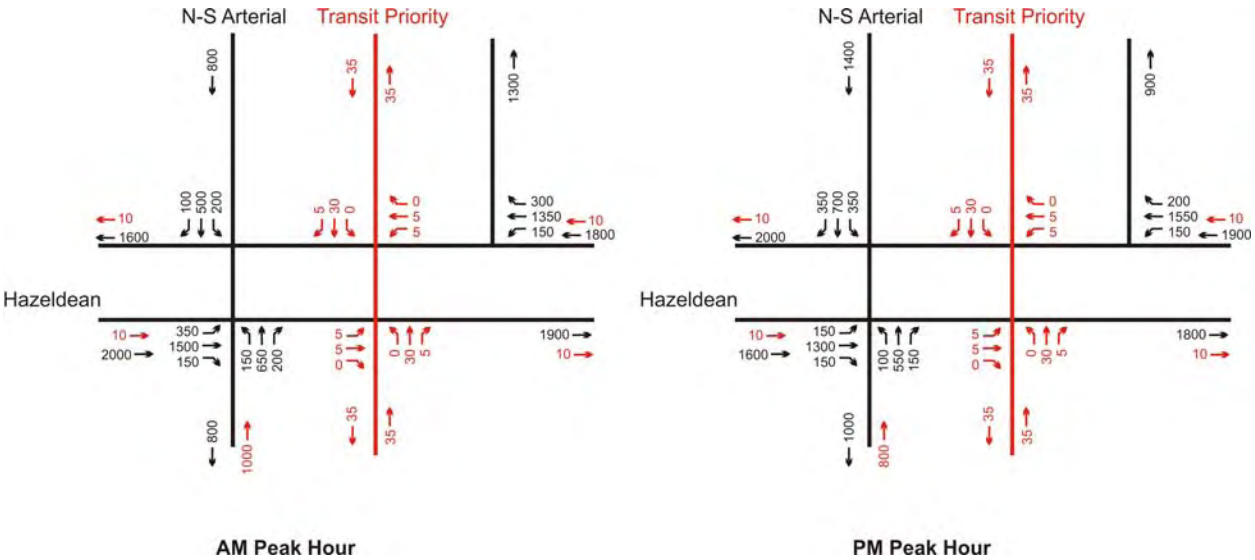


4.2 Scenario 2

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.

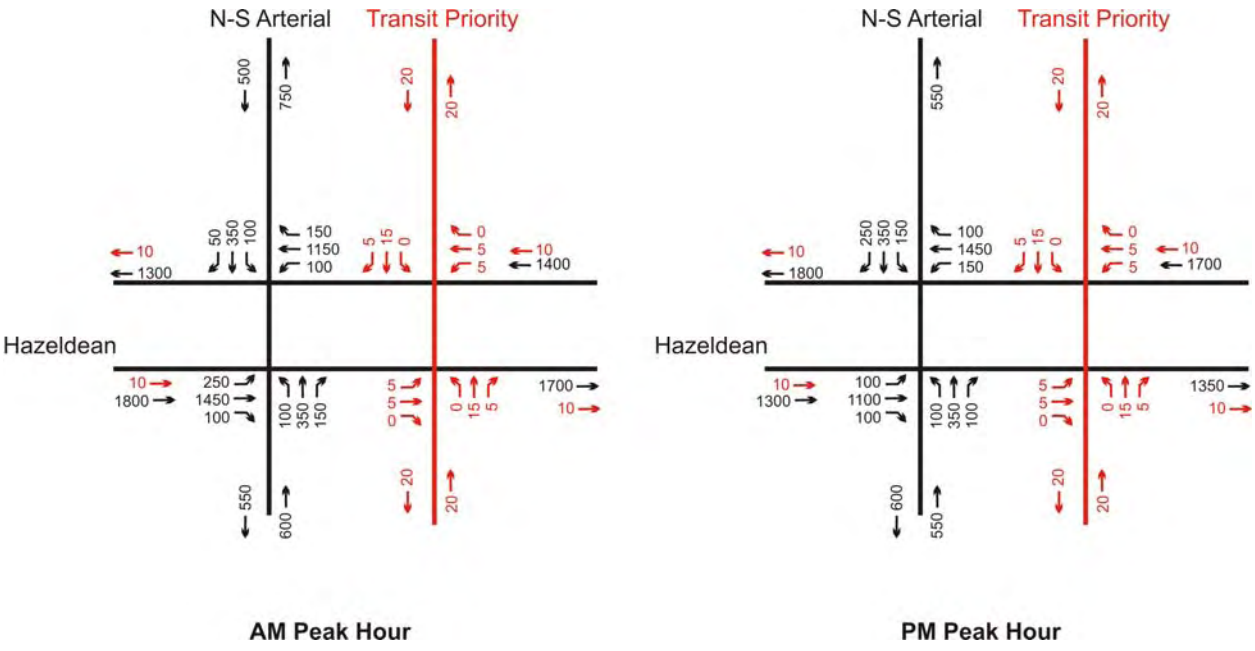
Figure 4: N-S Arterial Projected Peak Hour Traffic: ±2031: pcus/buses



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.

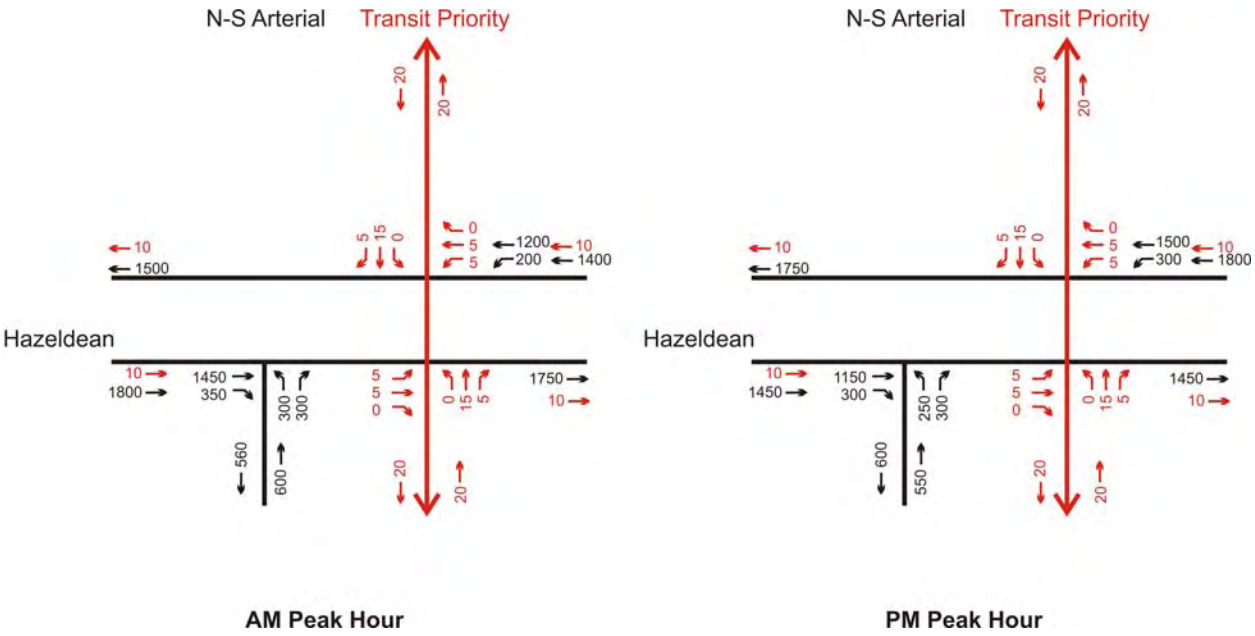
Based on the likely distribution of afternoon peak hour traffic at build-out of Fernbank (Table 8.2 Fernbank CDP), it is assumed that by 2020 the peak hour peak directional

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.

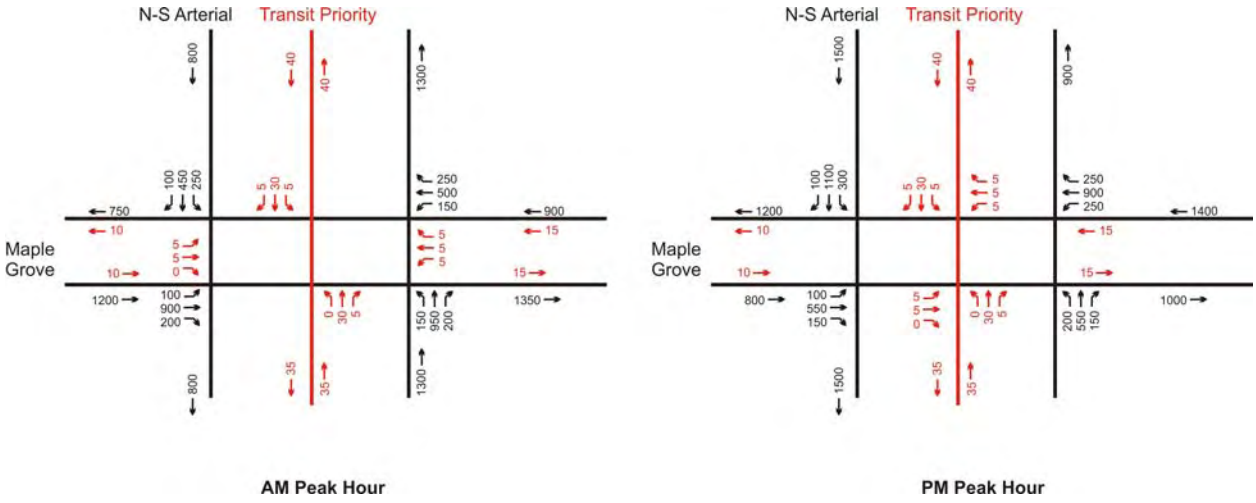
As a result of the above, it is considered most likely that future traffic volumes on Maple Grove Road, although warranting its ultimate widening to 4-lanes to serve the needs of Kanata West, will fall well short of the ultimate capacity of a 4-lane arterial (±2000 vph per direction).

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



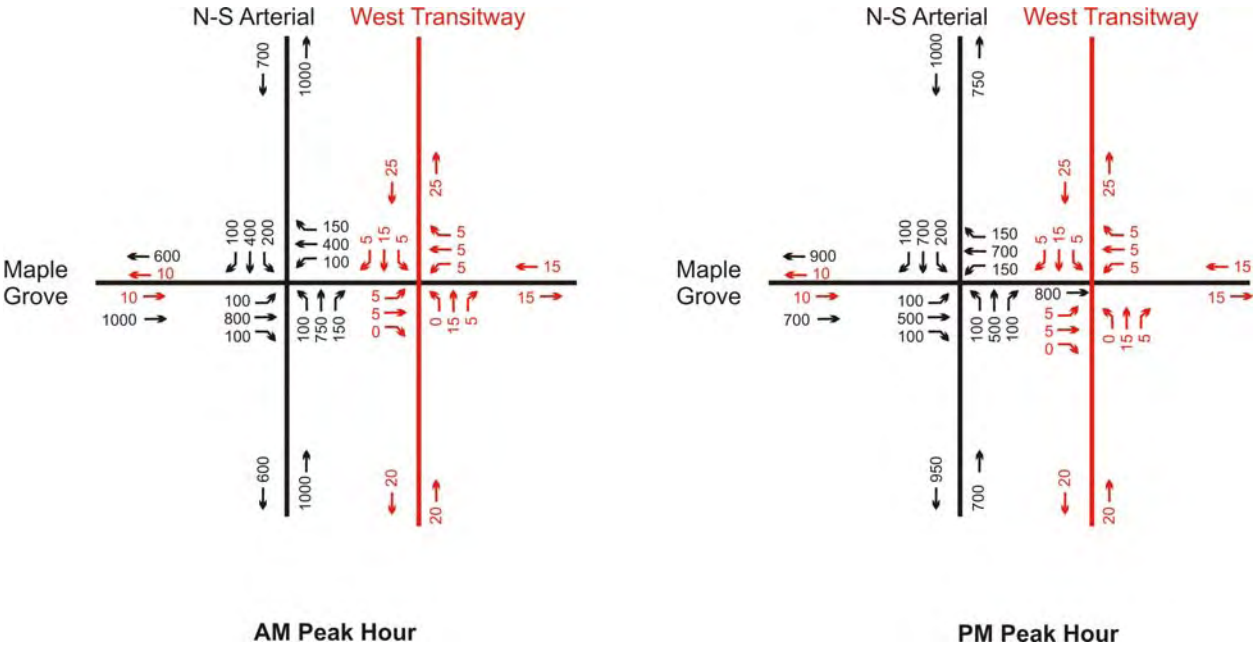
7.0 OPERATIONAL ANALYSIS

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.

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 12:50:46
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r1.te Time Period: Day/Night 16/8 hours
Description: Receiver R1, Facing Robert Grant

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  35.50 / 35.50  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial S (day/night)

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

Results segment # 1: Arterial N (day)

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

Source height = 1.50 m

ROAD (0.00 + 64.32 + 0.00) = 64.32 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  71.98   0.00  -6.21  -1.46   0.00   0.00   0.00  64.32
-------------------------------------------------------------------------------

Segment Leq : 64.32 dBA
```

Results segment # 2: Arterial S (day)

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

Source height = 1.50 m

ROAD (0.00 + 70.53 + 0.00) = 70.53 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  71.98   0.00   0.00  -1.46   0.00   0.00   0.00  70.53
-------------------------------------------------------------------------------

Segment Leq : 70.53 dBA

Total Leq All Segments: 71.46 dBA
```

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

```
-------------------------------------------------
1 - Bus:
Traffic volume    :   717/127   veh/TimePeriod
Speed             :    70 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                   :      1       (Absorptive ground surface)
Receiver source distance  :  28.00 / 28.00  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 + 57.82 + 0.00) = 57.82 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-4.50	-1.46	0.00	0.00	0.00	57.82

Segment Leq : 57.82 dBA

Total Leq All Segments: 57.82 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.65

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 12:59:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2.te Time Period: Day/Night 16/8 hours
Description: Receiver R2, Facing Robert Grant

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  88.00 / 88.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial S (day/night)

```
-----------------------------------------
Angle1   Angle2          : -90.00 deg   90.00 deg
Wood depth               :      0       (No woods.)
No of house rows         :      0 / 0
Surface                  :      1       (Absorptive ground surface)
Receiver source distance :  62.00 / 62.00  m
Receiver height          :   1.50 / 4.50   m
Topography               :      1       (Flat/gentle slope; no barrier)
Reference angle          :   0.00
```

Results segment # 1: Arterial N (day)

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

Source height = 1.50 m

ROAD (0.00 + 57.77 + 0.00) = 57.77 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  71.98   0.00 -12.76  -1.46   0.00   0.00   0.00  57.77
-------------------------------------------------------------------------------

Segment Leq : 57.77 dBA
```

Results segment # 2: Arterial S (day)

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

Source height = 1.50 m

ROAD (0.00 + 60.30 + 0.00) = 60.30 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  71.98   0.00 -10.23  -1.46   0.00   0.00   0.00  60.30
-------------------------------------------------------------------------------

Segment Leq : 60.30 dBA

Total Leq All Segments: 62.23 dBA
```

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

```
-------------------------------------------------
1 - Bus:
Traffic volume    :   717/127   veh/TimePeriod
Speed             :    70 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                  :      1       (Absorptive ground surface)
Receiver source distance :  75.00 / 75.00  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 + 50.71 + 0.00) = 50.71 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-11.60	-1.46	0.00	0.00	0.00	50.71

Segment Leq : 50.71 dBA

Total Leq All Segments: 50.71 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.52

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:03:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2a.te Time Period: Day/Night 16/8 hours
Description: Receiver R2a, Future Building Shielding

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     90 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  88.00 / 88.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial S (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     90 %
Surface                   :      1       (Absorptive ground surface)
```

Receiver source distance : 62.00 / 62.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Arterial N (day)

Source height = 1.50 m

ROAD (0.00 + 50.11 + 0.00) = 50.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-12.76	-1.46	0.00	-7.67	0.00	50.11

Segment Leq : 50.11 dBA

Results segment # 2: Arterial S (day)

Source height = 1.50 m

ROAD (0.00 + 52.41 + 0.00) = 52.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-10.23	-1.46	0.00	-7.88	0.00	52.41

Segment Leq : 52.41 dBA

Total Leq All Segments: 54.42 dBA

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

1 - Bus:
Traffic volume : 717/127 veh/TimePeriod
Speed : 70 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 : 90 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 75.00 / 75.00 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 + 42.94 + 0.00) = 42.94 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-11.60	-1.46	0.00	-7.78	0.00	42.94

Segment Leq : 42.94 dBA

Total Leq All Segments: 42.94 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.72

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:08:16
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3.te Time Period: Day/Night 16/8 hours
Description: Receiver R3, Facing Robert Grant

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 128.00 / 128.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial S (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 103.00 / 103.00 m
Receiver height           :   1.50 / 4.50   m
```

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Arterial N (day)

Source height = 1.50 m

ROAD (0.00 + 55.07 + 0.00) = 55.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-15.46	-1.46	0.00	0.00	0.00	55.07

Segment Leq : 55.07 dBA

Results segment # 2: Arterial S (day)

Source height = 1.50 m

ROAD (0.00 + 56.64 + 0.00) = 56.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-13.89	-1.46	0.00	0.00	0.00	56.64

Segment Leq : 56.64 dBA

Total Leq All Segments: 58.94 dBA

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

1 - Bus:
Traffic volume : 717/127 veh/TimePeriod
Speed : 70 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 : 1 (Absorptive ground surface)
Receiver source distance : 115.00 / 115.00 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 + 47.63 + 0.00) = 47.63 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-14.68	-1.46	0.00	0.00	0.00	47.63

Segment Leq : 47.63 dBA

Total Leq All Segments: 47.63 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.25

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:10:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r3a.te Time Period: Day/Night 16/8 hours
Description: Receiver R3a, Future Building Shielding

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     75 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 128.00 / 128.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial S (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      2 / 2
House density             :     75 %
Surface                   :      1       (Absorptive ground surface)
```

Receiver source distance : 103.00 / 103.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Arterial N (day)

Source height = 1.50 m

ROAD (0.00 + 48.59 + 0.00) = 48.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-15.46	-1.46	0.00	-6.48	0.00	48.59

Segment Leq : 48.59 dBA

Results segment # 2: Arterial S (day)

Source height = 1.50 m

ROAD (0.00 + 50.08 + 0.00) = 50.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-13.89	-1.46	0.00	-6.56	0.00	50.08

Segment Leq : 50.08 dBA

Total Leq All Segments: 52.41 dBA

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

1 - Bus:
Traffic volume : 717/127 veh/TimePeriod
Speed : 70 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 : 2 / 2
House density : 75 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 115.00 / 115.00 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 + 41.12 + 0.00) = 41.12 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-14.68	-1.46	0.00	-6.52	0.00	41.12

Segment Leq : 41.12 dBA

Total Leq All Segments: 41.12 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 52.72

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:13:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4.te Time Period: Day/Night 16/8 hours
Description: Receiver R4, Facing Robert Grant

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 1: Arterial N (day/night)

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

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: Arterial S (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 103.00 / 103.00 m
Receiver height : 1.50 / 4.50 m

```
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Arterial N (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 58.64 + 0.00) = 58.64 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  71.98   0.00 -11.89  -1.46   0.00   0.00   0.00  58.64
-------------------------------------------------------------------------------

Segment Leq : 58.64 dBA

Results segment # 2: Arterial S (day)
-------------------------------------

Source height = 1.50 m

ROAD (0.00 + 56.64 + 0.00) = 56.64 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  71.98   0.00 -13.89  -1.46   0.00   0.00   0.00  56.64
-------------------------------------------------------------------------------

Segment Leq : 56.64 dBA

Total Leq All Segments: 60.76 dBA

RT/Custom data, segment # 1: Transitway (day/night)
---------------------------------------------------
1 - Bus:
Traffic volume    :   717/127   veh/TimePeriod
Speed             :    70 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                   :      1       (Absorptive ground surface)
Receiver source distance  :  91.00 / 91.00  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 + 49.32 + 0.00) = 49.32 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-13.00	-1.46	0.00	0.00	0.00	49.32

Segment Leq : 49.32 dBA

Total Leq All Segments: 49.32 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.07

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:21:42
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r4a.te Time Period: Day/Night 16/8 hours
Description: Receiver R4a, Future Building Shielding

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     85 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  78.00 / 78.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial S (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     85 %
Surface                   :      1       (Absorptive ground surface)
```

Receiver source distance : 103.00 / 103.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Arterial N (day)

Source height = 1.50 m

ROAD (0.00 + 51.96 + 0.00) = 51.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-11.89	-1.46	0.00	-6.68	0.00	51.96

Segment Leq : 51.96 dBA

Results segment # 2: Arterial S (day)

Source height = 1.50 m

ROAD (0.00 + 50.13 + 0.00) = 50.13 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-13.89	-1.46	0.00	-6.51	0.00	50.13

Segment Leq : 50.13 dBA

Total Leq All Segments: 54.15 dBA

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

1 - Bus:
Traffic volume : 717/127 veh/TimePeriod
Speed : 70 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 : 85 %
Surface : 1 (Absorptive ground surface)
Receiver source distance : 91.00 / 91.00 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 + 42.73 + 0.00) = 42.73 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-13.00	-1.46	0.00	-6.59	0.00	42.73

Segment Leq : 42.73 dBA

Total Leq All Segments: 42.73 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.45

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:24:28
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5.te Time Period: Day/Night 16/8 hours
Description: Receiver R5, Facing Robert Grant

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  77.50 / 77.50  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial S (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 103.00 / 103.00 m
Receiver height           :   1.50 / 4.50   m
```

Topography : 1 (Flat/gentle slope; no barrier)
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 : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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 : -90.00 deg 75.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Arterial N (day)

Source height = 1.50 m

ROAD (0.00 + 58.69 + 0.00) = 58.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-11.84	-1.46	0.00	0.00	0.00	58.69

Segment Leq : 58.69 dBA

Results segment # 2: Arterial S (day)

Source height = 1.50 m

ROAD (0.00 + 56.64 + 0.00) = 56.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-13.89	-1.46	0.00	0.00	0.00	56.64

Segment Leq : 56.64 dBA

Results segment # 3: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 63.85 + 0.00) = 63.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	75	0.66	67.51	0.00	-2.07	-1.58	0.00	0.00	0.00	63.85

Segment Leq : 63.85 dBA

Total Leq All Segments: 65.60 dBA

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

1 - Bus:
Traffic volume : 717/127 veh/TimePeriod
Speed : 70 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 : 1 (Absorptive ground surface)
Receiver source distance : 90.00 / 90.00 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 + 49.40 + 0.00) = 49.40 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-12.92	-1.46	0.00	0.00	0.00	49.40

Segment Leq : 49.40 dBA

Total Leq All Segments: 49.40 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.70

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:27:07
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5a.te Time Period: Day/Night 16/8 hours
Description: Receiver R5a, 2.5m Wall

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     80 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  77.50 / 77.50  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            :   2.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial S (day/night)

```
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     80 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 103.00 / 103.00 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            :   2.50 m
Barrier receiver distance :   6.00 / 6.00   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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  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           : -58.00 deg   75.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  20.00 / 20.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -58.00 deg   Angle2 : 75.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

Results segment # 1: Arterial N (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 + 52.78 + 0.00) = 52.78 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-11.84	-1.46	0.00	-5.81	0.00	52.88
-90	90	0.51	71.98	0.00	-10.77	-1.19	0.00	0.00	-7.24	52.78

Segment Leq : 52.78 dBA

Results segment # 2: Arterial S (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 + 50.95 + 0.00) = 50.95 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-13.89	-1.46	0.00	-5.68	0.00	50.95
-90	90	0.51	71.98	0.00	-12.64	-1.19	0.00	0.00	-7.20	50.95

Segment Leq : 50.95 dBA

Results segment # 3: 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 + 54.96 + 0.00) = 54.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	75	0.51	67.51	0.00	-1.89	-1.90	0.00	0.00	-8.76	54.96

Segment Leq : 54.96 dBA

Total Leq All Segments: 57.98 dBA

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

```
1 - Bus:
Traffic volume    :   717/127   veh/TimePeriod
Speed             :    70 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 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  90.00 / 90.00  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            :   2.50 m
Barrier receiver distance :   6.00 / 6.00   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	1.43	1.43

RT/Custom (0.00 + 43.10 + 0.00) = 43.10 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-12.92	-1.46	0.00	-5.75	0.00	43.65
-90	90	0.54	63.77	-11.98	-1.25	0.00	0.00	-7.44	43.10

Segment Leq : 43.10 dBA

Total Leq All Segments: 43.10 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.11

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:31:52
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r5b.te Time Period: Day/Night 16/8 hours
Description: Receiver R5b, 3.5m Wall

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     80 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  77.50 / 77.50  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            :   3.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial S (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     80 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 103.00 / 103.00 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            :   3.50 m
Barrier receiver distance :   6.00 / 6.00   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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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           : -58.00 deg   75.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  20.00 / 20.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -58.00 deg   Angle2 : 75.00 deg
Barrier height            :   3.50 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

Results segment # 1: Arterial N (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 + 50.19 + 0.00) = 50.19 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-11.84	-1.46	0.00	-5.81	0.00	52.88
-90	90	0.45	71.98	0.00	-10.34	-1.08	0.00	0.00	-10.37	50.19

Segment Leq : 50.19 dBA

Results segment # 2: Arterial S (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 + 48.46 + 0.00) = 48.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-13.89	-1.46	0.00	-5.68	0.00	50.95
-90	90	0.45	71.98	0.00	-12.13	-1.08	0.00	0.00	-10.31	48.46

Segment Leq : 48.46 dBA

Results segment # 3: 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 + 50.42 + 0.00) = 50.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-58	75	0.45	67.51	0.00	-1.81	-1.84	0.00	0.00	-13.44	50.42

Segment Leq : 50.42 dBA

Total Leq All Segments: 54.54 dBA

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

```
1 - Bus:
Traffic volume    :   717/127   veh/TimePeriod
Speed             :    70 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 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  90.00 / 90.00  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            :   3.50 m
Barrier receiver distance :   6.00 / 6.00   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	1.43	1.43

RT/Custom (0.00 + 40.59 + 0.00) = 40.59 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-12.92	-1.46	0.00	-5.75	0.00	43.65
-90	90	0.48	63.77	-11.52	-1.14	0.00	0.00	-10.52	40.59

Segment Leq : 40.59 dBA

Total Leq All Segments: 40.59 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.72

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:38:34
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r6.te Time Period: Day/Night 16/8 hours
Description: Receiver R6, Facing Robert Grant

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  45.00 / 45.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial S (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  70.00 / 70.00  m
Receiver height           :   1.50 / 4.50   m
```

```
Topography                :      1       (Flat/gentle slope; no barrier)
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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  66.00 / 66.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Arterial N (day)

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

Source height = 1.50 m

ROAD (0.00 + 62.61 + 0.00) = 62.61 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-7.92	-1.46	0.00	0.00	0.00	62.61

Segment Leq : 62.61 dBA

Results segment # 2: Arterial S (day)

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

Source height = 1.50 m

ROAD (0.00 + 59.42 + 0.00) = 59.42 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-11.11	-1.46	0.00	0.00	0.00	59.42

Segment Leq : 59.42 dBA

Results segment # 3: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 55.37 + 0.00) = 55.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-10.68	-1.46	0.00	0.00	0.00	55.37

Segment Leq : 55.37 dBA

Total Leq All Segments: 64.83 dBA

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

1 - Bus:
Traffic volume : 717/127 veh/TimePeriod
Speed : 70 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	: 1	(Absorptive ground surface)
Receiver source distance	: 57.00 / 57.00	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 + 52.69 + 0.00) = 52.69 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-9.62	-1.46	0.00	0.00	0.00	52.69

Segment Leq : 52.69 dBA

Total Leq All Segments: 52.69 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.09

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:41:51
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r7.te Time Period: Day/Night 16/8 hours
Description: Receiver R7, Facing Robert Grant

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Arterial N (day/night)

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

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial S (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  47.00 / 47.00  m
Receiver height           :   1.50 / 4.50   m
```

```
Topography                :      1       (Flat/gentle slope; no barrier)
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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  20.00 / 20.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Arterial N (day)

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

Source height = 1.50 m

ROAD (0.00 + 68.10 + 0.00) = 68.10 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-2.43	-1.46	0.00	0.00	0.00	68.10

Segment Leq : 68.10 dBA

Results segment # 2: Arterial S (day)

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

Source height = 1.50 m

ROAD (0.00 + 62.29 + 0.00) = 62.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-8.23	-1.46	0.00	0.00	0.00	62.29

Segment Leq : 62.29 dBA

Results segment # 3: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 63.98 + 0.00) = 63.98 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-2.07	-1.46	0.00	0.00	0.00	63.98

Segment Leq : 63.98 dBA

Total Leq All Segments: 70.27 dBA

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

1 - Bus:
Traffic volume : 717/127 veh/TimePeriod
Speed : 70 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 : 1 (Absorptive ground surface)
Receiver source distance : 34.00 / 34.00 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 + 56.42 + 0.00) = 56.42 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-5.90	-1.46	0.00	0.00	0.00	56.42

Segment Leq : 56.42 dBA

Total Leq All Segments: 56.42 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 70.45

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:44:43
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: 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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Cranesbill (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  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: Cranesbill (day)

```
Source height = 1.50 m

ROAD (0.00 + 63.63 + 0.00) = 63.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  67.51   0.00  -2.43  -1.46   0.00   0.00   0.00  63.63
-------------------------------------------------------------------------------

Segment Leq : 63.63 dBA

Total Leq All Segments: 63.63 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 63.63

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:46:22
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r8a.te Time Period: Day/Night 16/8 hours
Description: Receiver R8a, 2.5m Wall

Road data, segment # 1: 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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Cranesbill (day/night)

```
-----------------------------------------------
Angle1   Angle2           : -71.00 deg   59.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  21.00 / 21.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -71.00 deg   Angle2 : 59.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

Results segment # 1: Cranesbill (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 + 54.86 + 0.00) = 54.86 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -71     59   0.51  67.51   0.00  -2.21  -1.96   0.00   0.00  -8.49  54.86
-------------------------------------------------------------------------------
Segment Leq : 54.86 dBA
Total Leq All Segments: 54.86 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 54.86

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:48:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: 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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Cranesbill (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 111.00 / 111.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Cranesbill (day)

```
Source height = 1.50 m

ROAD (0.00 + 51.63 + 0.00) = 51.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  67.51   0.00 -14.43  -1.46   0.00   0.00   0.00  51.63
-------------------------------------------------------------------------------

Segment Leq : 51.63 dBA

Total Leq All Segments: 51.63 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 51.63

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:50:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: 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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Cranesbill (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  17.30 / 17.30  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Backbend (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  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: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 65.03 + 0.00) = 65.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-1.03	-1.46	0.00	0.00	0.00	65.03

Segment Leq : 65.03 dBA

Results segment # 2: Backbend (day)

Source height = 1.50 m

ROAD (0.00 + 59.30 + 0.00) = 59.30 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.75	0.00	-5.00	-1.46	0.00	0.00	0.00	59.30

Segment Leq : 59.30 dBA

Total Leq All Segments: 66.06 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 66.06

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:51:44
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: 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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Cranesbill (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  21.30 / 21.30  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Backbend (day/night)

```
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  38.00 / 38.00  m
Receiver height           :   1.50 / 4.50   m
```

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 63.53 + 0.00) = 63.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-2.53	-1.46	0.00	0.00	0.00	63.53

Segment Leq : 63.53 dBA

Results segment # 2: Backbend (day)

Source height = 1.50 m

ROAD (0.00 + 54.58 + 0.00) = 54.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.66	65.75	0.00	-6.70	-4.47	0.00	0.00	0.00	54.58

Segment Leq : 54.58 dBA

Total Leq All Segments: 64.05 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.05

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:53:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r11a.te Time Period: Day/Night 16/8 hours
Description: Receiver R11a, 2.5m Wall

Road data, segment # 1: 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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Cranesbill (day/night)

```
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  21.30 / 21.30  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            :   2.50 m
Barrier receiver distance :   8.00 / 8.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

```
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Backbend (day/night)

```
----------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     85 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  38.00 / 38.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Cranesbill (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 + 56.59 + 0.00) = 56.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.51	67.51	0.00	-2.30	-1.19	0.00	0.00	-7.43	56.59

Segment Leq : 56.59 dBA

Results segment # 2: Backbend (day)

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

Source height = 1.50 m

ROAD (0.00 + 47.56 + 0.00) = 47.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.66	65.75	0.00	-6.70	-4.47	0.00	-7.02	0.00	47.56

Segment Leq : 47.56 dBA

Total Leq All Segments: 57.10 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.10

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:55:05
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r11b.te Time Period: Day/Night 16/8 hours
Description: Receiver R11b, 3.5m Wall

Road data, segment # 1: 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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Cranesbill (day/night)

```
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  21.30 / 21.30  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            :   3.50 m
Barrier receiver distance :   8.00 / 8.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

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

```
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Backbend (day/night)

```
----------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     85 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  38.00 / 38.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Cranesbill (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 + 53.52 + 0.00) = 53.52 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.45	67.51	0.00	-2.21	-1.08	0.00	0.00	-10.70	53.52

Segment Leq : 53.52 dBA

Results segment # 2: Backbend (day)

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

Source height = 1.50 m

ROAD (0.00 + 47.56 + 0.00) = 47.56 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
0	90	0.66	65.75	0.00	-6.70	-4.47	0.00	-7.02	0.00	47.56

Segment Leq : 47.56 dBA

Total Leq All Segments: 54.50 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.50

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:58:06
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: 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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Cranesbill (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 100.00 / 100.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Backbend (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  38.00 / 38.00  m
Receiver height           :   1.50 / 4.50   m
```

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 52.38 + 0.00) = 52.38 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-13.68	-1.46	0.00	0.00	0.00	52.38

Segment Leq : 52.38 dBA

Results segment # 2: Backbend (day)

Source height = 1.50 m

ROAD (0.00 + 57.59 + 0.00) = 57.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.75	0.00	-6.70	-1.46	0.00	0.00	0.00	57.59

Segment Leq : 57.59 dBA

Total Leq All Segments: 58.73 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 58.73

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 13:58:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r12a.te Time Period: Day/Night 16/8 hours
Description: Receiver R12a, Future Building Shielding

Road data, segment # 1: 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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Cranesbill (day/night)

```
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 111.00 / 111.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
-----------------------------------------------
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Backbend (day/night)

```
-----------------------------------------------
Angle1   Angle2           : -72.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      1 / 1
House density             :     75 %
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  38.00 / 38.00  m
```

Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Cranesbill (day)

Source height = 1.50 m

ROAD (0.00 + 51.63 + 0.00) = 51.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-14.43	-1.46	0.00	0.00	0.00	51.63

Segment Leq : 51.63 dBA

Results segment # 2: Backbend (day)

Source height = 1.50 m

ROAD (0.00 + 52.07 + 0.00) = 52.07 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-72	90	0.66	65.75	0.00	-6.70	-1.63	0.00	-5.35	0.00	52.07

Segment Leq : 52.07 dBA

Total Leq All Segments: 54.87 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 54.87

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:01:36
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

```
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

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

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

Results segment # 1: Backbend (day)

Source height = 1.50 m

ROAD (0.00 + 57.59 + 0.00) = 57.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.75	0.00	-6.70	-1.46	0.00	0.00	0.00	57.59

Segment Leq : 57.59 dBA

Total Leq All Segments: 57.59 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.59

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:02:09
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r13a.te Time Period: Day/Night 16/8 hours
Description: Receiver R13a, Future Building Shielding

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

Car traffic volume	6477/563	veh/TimePeriod *
Medium truck volume	515/45	veh/TimePeriod *
Heavy truck volume	368/32	veh/TimePeriod *
Posted speed limit	50 km/h	
Road gradient	0 %	
Road pavement	1 (Typical asphalt or concrete)	

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

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

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

Angle1 Angle2	-90.00 deg	45.00 deg
Wood depth	0	(No woods.)
No of house rows	1 / 1	
House density	75 %	
Surface	1	(Absorptive ground surface)
Receiver source distance	38.00 / 38.00	m
Receiver height	1.50 / 4.50	m
Topography	1	(Flat/gentle slope; no barrier)
Reference angle	0.00	

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

Car traffic volume	6477/563	veh/TimePeriod *
Medium truck volume	515/45	veh/TimePeriod *
Heavy truck volume	368/32	veh/TimePeriod *
Posted speed limit	50 km/h	
Road gradient	0 %	
Road pavement	1 (Typical asphalt or concrete)	

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

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

Data for Segment # 2: Backbend (day/night)

Angle1 Angle2	45.00 deg	90.00 deg
Wood depth	0	(No woods.)
No of house rows	0 / 0	
Surface	1	(Absorptive ground surface)
Receiver source distance	38.00 / 38.00	m

Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Backbend (day)

Source height = 1.50 m

ROAD (0.00 + 51.41 + 0.00) = 51.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.66	65.75	0.00	-6.70	-2.29	0.00	-5.35	0.00	51.41

Segment Leq : 51.41 dBA

Results segment # 2: Backbend (day)

Source height = 1.50 m

ROAD (0.00 + 50.00 + 0.00) = 50.00 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
45	90	0.66	65.75	0.00	-6.70	-9.05	0.00	0.00	0.00	50.00

Segment Leq : 50.00 dBA

Total Leq All Segments: 53.77 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 53.77

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:05:00
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

```
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

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

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 111.00 / 111.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Backbend (day)

Source height = 1.50 m

ROAD (0.00 + 49.86 + 0.00) = 49.86 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.75	0.00	-14.43	-1.46	0.00	0.00	0.00	49.86

Segment Leq : 49.86 dBA

Total Leq All Segments: 49.86 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 49.86

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:06:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

```
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

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

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  18.00 / 18.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Backbend (day)

Source height = 1.50 m

ROAD (0.00 + 62.98 + 0.00) = 62.98 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.75	0.00	-1.31	-1.46	0.00	0.00	0.00	62.98

Segment Leq : 62.98 dBA

Total Leq All Segments: 62.98 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.98

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:06:50
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r15a.te Time Period: Day/Night 16/8 hours
Description: Receiver R15a, 2.5m Wall

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

```
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

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

```
Angle1   Angle2           : -90.00 deg   56.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  18.00 / 18.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -90.00 deg   Angle2 : 56.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :   8.00 / 8.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

Results segment # 1: Backbend (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 + 54.79 + 0.00) = 54.79 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     56   0.51  65.75   0.00  -1.20  -1.77   0.00   0.00  -8.00  54.79
-------------------------------------------------------------------------------
Segment Leq : 54.79 dBA
Total Leq All Segments: 54.79 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 54.79

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:09:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

```
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

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

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 109.00 / 109.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Backbend (day)

```
Source height = 1.50 m

ROAD (0.00 + 50.00 + 0.00) = 50.00 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  65.75   0.00 -14.30  -1.46   0.00   0.00   0.00  50.00
-------------------------------------------------------------------------------

Segment Leq : 50.00 dBA

Total Leq All Segments: 50.00 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 50.00

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:10:29
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

Car traffic volume : 6477/563 veh/TimePeriod *
Medium truck volume : 515/45 veh/TimePeriod *
Heavy truck volume : 368/32 veh/TimePeriod *
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

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

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

Angle1 Angle2 : -70.00 deg 73.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 19.00 / 19.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: Abbott (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 : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 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: Abbott (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 110.00 / 110.00 m
Receiver height : 1.50 / 4.50 m

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Backbend (day)

Source height = 1.50 m

ROAD (0.00 + 62.22 + 0.00) = 62.22 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-70	73	0.66	65.75	0.00	-1.70	-1.83	0.00	0.00	0.00	62.22

Segment Leq : 62.22 dBA

Results segment # 2: Abbott (day)

Source height = 1.50 m

ROAD (0.00 + 51.69 + 0.00) = 51.69 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-14.36	-1.46	0.00	0.00	0.00	51.69

Segment Leq : 51.69 dBA

Total Leq All Segments: 62.59 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 62.59

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:10:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r17a.te Time Period: Day/Night 16/8 hours
Description: Receiver R17a, 2.5m Wall

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

```
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

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

```
Angle1   Angle2           : -70.00 deg   73.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  19.00 / 19.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -70.00 deg   Angle2 : 73.00 deg
Barrier height            :   2.50 m
Barrier receiver distance :   6.00 / 6.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

Road data, segment # 2: Abbott (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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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: Abbott (day/night)

```
--------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 110.00 / 110.00 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            :   2.50 m
Barrier receiver distance :   5.00 / 5.00   m
Source elevation          :   0.00 m
Receiver elevation        :   0.00 m
Barrier elevation         :   0.00 m
Reference angle           :   0.00
```

Results segment # 1: Backbend (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 + 54.09 + 0.00) = 54.09 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -70     73   0.51  65.75   0.00  -1.55  -1.66   0.00   0.00  -8.45  54.09
-------------------------------------------------------------------------------

Segment Leq : 54.09 dBA
```

Results segment # 2: Abbott (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 + 45.76 + 0.00) = 45.76 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.51  67.51   0.00 -13.07  -1.19   0.00   0.00  -7.49  45.76
-------------------------------------------------------------------------------

Segment Leq : 45.76 dBA

Total Leq All Segments: 54.69 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 54.69

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:11:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

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

```
Car traffic volume  :  6477/563   veh/TimePeriod  *
Medium truck volume :   515/45    veh/TimePeriod  *
Heavy truck volume  :   368/32    veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

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

```
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 105.00 / 105.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Road data, segment # 2: Abbott (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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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: Abbott (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  18.20 / 18.20  m
Receiver height           :   1.50 / 4.50   m
```

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Backbend (day)

Source height = 1.50 m

ROAD (0.00 + 47.25 + 0.00) = 47.25 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	0	0.66	65.75	0.00	-14.03	-4.47	0.00	0.00	0.00	47.25

Segment Leq : 47.25 dBA

Results segment # 2: Abbott (day)

Source height = 1.50 m

ROAD (0.00 + 64.66 + 0.00) = 64.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-1.39	-1.46	0.00	0.00	0.00	64.66

Segment Leq : 64.66 dBA

Total Leq All Segments: 64.74

TOTAL Leq FROM ALL SOURCES (DAY): 64.74

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:15:18
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

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

Road data, segment # 1: Abbott (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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Abbott (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  18.20 / 18.20  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Abbott (day)

```
Source height = 1.50 m

ROAD (0.00 + 64.66 + 0.00) = 64.66 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  67.51   0.00  -1.39  -1.46   0.00   0.00   0.00  64.66
-------------------------------------------------------------------------------

Segment Leq : 64.66 dBA

Total Leq All Segments: 64.66 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 64.66

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:15:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r21.te Time Period: Day/Night 16/8 hours
Description: Receiver R21

Road data, segment # 1: Abbott (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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Abbott (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  63.20 / 63.20  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Abbott (day)

```
Source height = 1.50 m

ROAD (0.00 + 55.69 + 0.00) = 55.69 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  67.51   0.00 -10.37  -1.46   0.00   0.00   0.00  55.69
-------------------------------------------------------------------------------

Segment Leq : 55.69 dBA

Total Leq All Segments: 55.69 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 55.69

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:16:08
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r22.te Time Period: Day/Night 16/8 hours
Description: Receiver R22

Road data, segment # 1: Abbott (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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Abbott (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 111.00 / 111.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Abbott (day)

```
Source height = 1.50 m

ROAD (0.00 + 51.63 + 0.00) = 51.63 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.66  67.51   0.00 -14.43  -1.46   0.00   0.00   0.00  51.63
-------------------------------------------------------------------------------

Segment Leq : 51.63 dBA

Total Leq All Segments: 51.63 dBA
```

TOTAL Leq FROM ALL SOURCES (DAY): 51.63

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:19:26
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r23.te Time Period: Day/Night 16/8 hours
Description: Receiver R23

Road data, segment # 1: Abbott (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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Abbott (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  18.20 / 18.20  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 104.00 / 104.00 m
Receiver height           :   1.50 / 4.50   m
```

```
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Road data, segment # 3: Arterial S (day/night)

```
-------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 3: Arterial S (day/night)

```
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 136.00 / 136.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

Results segment # 1: Abbott (day)

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

Source height = 1.50 m

ROAD (0.00 + 64.66 + 0.00) = 64.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-1.39	-1.46	0.00	0.00	0.00	64.66

Segment Leq : 64.66 dBA

Results segment # 2: Arterial N (day)

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

Source height = 1.50 m

ROAD (0.00 + 56.57 + 0.00) = 56.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-13.96	-1.46	0.00	0.00	0.00	56.57

Segment Leq : 56.57 dBA

Results segment # 3: Arterial S (day)

Source height = 1.50 m

ROAD (0.00 + 54.63 + 0.00) = 54.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-15.89	-1.46	0.00	0.00	0.00	54.63

Segment Leq : 54.63 dBA

Total Leq All Segments: 65.64 dBA

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

1 - Bus:
Traffic volume : 717/127 veh/TimePeriod
Speed : 70 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 : 1 (Absorptive ground surface)
Receiver source distance : 117.00 / 117.00 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 + 47.51 + 0.00) = 47.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-14.81	-1.46	0.00	0.00	0.00	47.51

Segment Leq : 47.51 dBA

Total Leq All Segments: 47.51 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.71

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:20:10
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r24.te Time Period: Day/Night 16/8 hours
Description: Receiver R24

Road data, segment # 1: Abbott (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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Abbott (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 108.20 / 108.20 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 104.00 / 104.00 m
Receiver height           :   1.50 / 4.50   m
```

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Arterial S (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 3: Arterial S (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 136.00 / 136.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Abbott (day)

Source height = 1.50 m

ROAD (0.00 + 51.81 + 0.00) = 51.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-14.25	-1.46	0.00	0.00	0.00	51.81

Segment Leq : 51.81 dBA

Results segment # 2: Arterial N (day)

Source height = 1.50 m

ROAD (0.00 + 56.57 + 0.00) = 56.57 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-13.96	-1.46	0.00	0.00	0.00	56.57

Segment Leq : 56.57 dBA

Results segment # 3: Arterial S (day)

Source height = 1.50 m

ROAD (0.00 + 54.63 + 0.00) = 54.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-15.89	-1.46	0.00	0.00	0.00	54.63

Segment Leq : 54.63 dBA

Total Leq All Segments: 59.52 dBA

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

1 - Bus:
Traffic volume : 717/127 veh/TimePeriod
Speed : 70 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 : 1 (Absorptive ground surface)
Receiver source distance : 117.00 / 117.00 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 + 47.51 + 0.00) = 47.51 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-14.81	-1.46	0.00	0.00	0.00	47.51

Segment Leq : 47.51 dBA

Total Leq All Segments: 47.51 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.79

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MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r25.te Time Period: Day/Night 16/8 hours
Description: Receiver R25

Road data, segment # 1: Abbott (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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Abbott (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 108.20 / 108.20 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  15.00 / 15.00  m
Receiver height           :   1.50 / 4.50   m
```

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Arterial S (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 3: Arterial S (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 45.50 / 45.50 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Abbott (day)

Source height = 1.50 m

ROAD (0.00 + 51.81 + 0.00) = 51.81 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-14.25	-1.46	0.00	0.00	0.00	51.81

Segment Leq : 51.81 dBA

Results segment # 2: Arterial N (day)

Source height = 1.50 m

ROAD (0.00 + 70.53 + 0.00) = 70.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	0.00	-1.46	0.00	0.00	0.00	70.53

Segment Leq : 70.53 dBA

Results segment # 3: Arterial S (day)

Source height = 1.50 m

ROAD (0.00 + 62.53 + 0.00) = 62.53 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-8.00	-1.46	0.00	0.00	0.00	62.53

Segment Leq : 62.53 dBA

Total Leq All Segments: 71.22 dBA

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

1 - Bus:
Traffic volume : 717/127 veh/TimePeriod
Speed : 70 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	: 1	(Absorptive ground surface)
Receiver source distance	: 27.00 / 27.00	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 + 58.08 + 0.00) = 58.08 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-4.24	-1.46	0.00	0.00	0.00	58.08

Segment Leq : 58.08 dBA

Total Leq All Segments: 58.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 71.42

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MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r26.te Time Period: Day/Night 16/8 hours
Description: Receiver R26

Road data, segment # 1: Abbott (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       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

```
    24 hr Traffic Volume (AADT or SADT):  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 # 1: Abbott (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    70 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Arterial N (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  25.00 / 25.00  m
Receiver height           :   1.50 / 4.50   m
```

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: Arterial S (day/night)

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 3: Arterial S (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 56.00 / 56.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Abbott (day)

Source height = 1.50 m

ROAD (0.00 + 62.37 + 0.00) = 62.37 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	67.51	0.00	-3.68	-1.46	0.00	0.00	0.00	62.37

Segment Leq : 62.37 dBA

Results segment # 2: Arterial N (day)

Source height = 1.50 m

ROAD (0.00 + 66.85 + 0.00) = 66.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-3.68	-1.46	0.00	0.00	0.00	66.85

Segment Leq : 66.85 dBA

Results segment # 3: Arterial S (day)

Source height = 1.50 m

ROAD (0.00 + 61.03 + 0.00) = 61.03 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.98	0.00	-9.50	-1.46	0.00	0.00	0.00	61.03

Segment Leq : 61.03 dBA

Total Leq All Segments: 68.94 dBA

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

1 - Bus:
Traffic volume : 717/127 veh/TimePeriod
Speed : 70 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 : 1 (Absorptive ground surface)
Receiver source distance : 37.00 / 37.00 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 + 55.81 + 0.00) = 55.81 dBA

Angle1	Angle2	Alpha	RefLeq	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	63.77	-6.51	-1.46	0.00	0.00	0.00	55.81

Segment Leq : 55.81 dBA

Total Leq All Segments: 55.81 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.15

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MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r27.te Time Period: Day/Night 16/8 hours
Description: Receiver R27

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 1: Hazeldean E (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 20.00 / 20.00 m
Receiver height : 1.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 14168/1232 veh/TimePeriod *
Medium truck volume : 1127/98 veh/TimePeriod *
Heavy truck volume : 805/70 veh/TimePeriod *
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

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

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

Data for Segment # 2: Hazeldean W (day/night)

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 37.00 / 37.00 m
Receiver height : 1.50 / 4.50 m

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Hazeldean E (day)

Source height = 1.50 m

ROAD (0.00 + 67.14 + 0.00) = 67.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.67	0.00	-2.07	-1.46	0.00	0.00	0.00	67.14

Segment Leq : 67.14 dBA

Results segment # 2: Hazeldean W (day)

Source height = 1.50 m

ROAD (0.00 + 62.70 + 0.00) = 62.70 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.67	0.00	-6.51	-1.46	0.00	0.00	0.00	62.70

Segment Leq : 62.70 dBA

Total Leq All Segments: 68.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 68.47

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:22:27
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r28.te Time Period: Day/Night 16/8 hours
Description: Receiver R28

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Hazeldean E (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  65.00 / 65.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Hazeldean W (day/night)

```
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  82.00 / 82.00  m
Receiver height           :   1.50 / 4.50   m
```

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Hazeldean E (day)

Source height = 1.50 m

ROAD (0.00 + 58.64 + 0.00) = 58.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.67	0.00	-10.57	-1.46	0.00	0.00	0.00	58.64

Segment Leq : 58.64 dBA

Results segment # 2: Hazeldean W (day)

Source height = 1.50 m

ROAD (0.00 + 56.96 + 0.00) = 56.96 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.67	0.00	-12.25	-1.46	0.00	0.00	0.00	56.96

Segment Leq : 56.96 dBA

Total Leq All Segments: 60.89 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 60.89

STAMSON 5.0 NORMAL REPORT Date: 22-01-2018 14:22:48
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r29.te Time Period: Day/Night 16/8 hours
Description: Receiver R29

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

```
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 1: Hazeldean E (day/night)

```
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 110.00 / 110.00 m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

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

```
-----------------------------------------------
Car traffic volume  : 14168/1232  veh/TimePeriod  *
Medium truck volume :  1127/98    veh/TimePeriod  *
Heavy truck volume  :   805/70    veh/TimePeriod  *
Posted speed limit  :    60 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)
```

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

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

Data for Segment # 2: Hazeldean W (day/night)

```
-----------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 137.00 / 137.00 m
Receiver height           :   1.50 / 4.50   m
```

Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: Hazeldean E (day)

Source height = 1.50 m

ROAD (0.00 + 54.85 + 0.00) = 54.85 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.67	0.00	-14.36	-1.46	0.00	0.00	0.00	54.85

Segment Leq : 54.85 dBA

Results segment # 2: Hazeldean W (day)

Source height = 1.50 m

ROAD (0.00 + 53.26 + 0.00) = 53.26 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	70.67	0.00	-15.95	-1.46	0.00	0.00	0.00	53.26

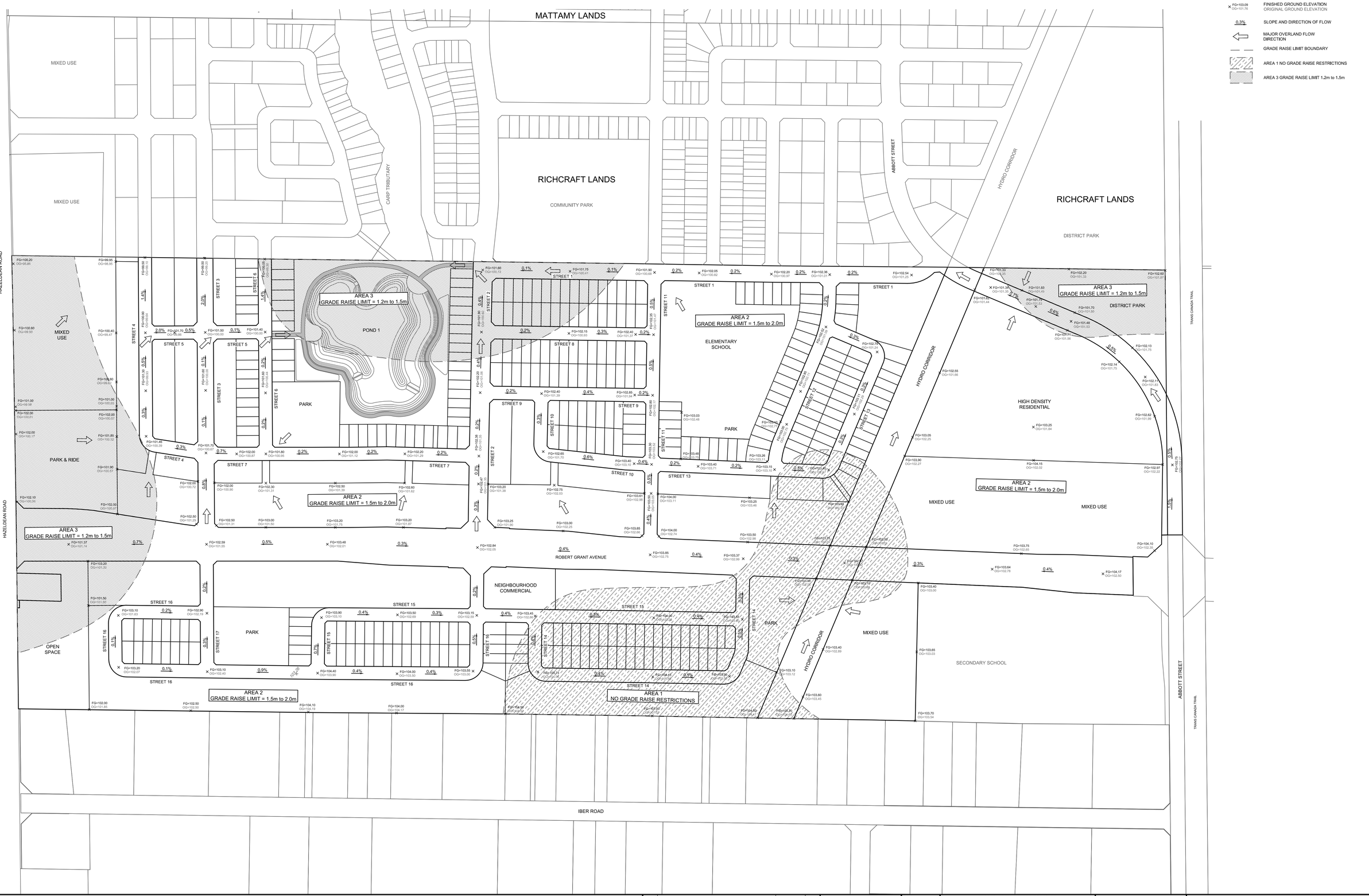
Segment Leq : 53.26 dBA

Total Leq All Segments: 57.14 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 57.14

APPENDIX B

Grading Plan (108195-GR)



LEGEND

- ORIGINAL GROUND CONTOUR AND ELEVATION
- FG=103.09 / OG=101.76 — FINISHED GROUND ELEVATION / ORIGINAL GROUND ELEVATION
- 0.3% — SLOPE AND DIRECTION OF FLOW
- MAJOR OVERLAND FLOW DIRECTION
- GRADE RAISE LIMIT BOUNDARY
- AREA 1 NO GRADE RAISE RESTRICTIONS
- AREA 3 GRADE RAISE LIMIT 1.2m to 1.5m

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
3.	DRAFT PLAN RESUBMISSION	FEB 23/18	MAB
2.	REVISED PER CITY COMMENTS	JUL 20/17	MAB
1.	DRAFT PLAN APPLICATION	NOV 9/16	MAB

SCALE 1:2000 (1:2000, 0 20 40 60 80)

DESIGN LRW
CHECKED MAB
DRAWN DTD
CHECKED MAB
APPROVED JGR

FOR REVIEW ONLY

LICENSED PROFESSIONAL ENGINEER — L.R. WILSON — 100160065 — PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER — M.A. BISSETT — 2018.02.23 — PROVINCE OF ONTARIO

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
FERNBANK COMMUNITY - KIZELL LANDS

MASTER GRADING PLAN

PROJECT No. 108195
REV REV # 3
DRAWING No. 108195-GRD

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