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Environmental Noise Computer Modelling
For

Northwest Stoney Trail
In
Calgary, Alberta

Prepared for:
Alberta Transportation

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Executive Summary

aci Acoustical Consultants Inc., of Edmonton AB, was retained by Alberta Transportation (AT) to conduct an environmental noise assessment along the northeast and northwest sections of Stoney Trail in Calgary, Alberta. The purpose of the work was to conduct 24-hour environmental noise monitorings at various locations adjacent to the roadway and generate a computer noise model with current and future traffic conditions and compare the results to the AT noise guidelines. The results of the noise monitorings are provided in the reports entitled "*Environmental Noise Monitoring for Northeast Stoney Trail in Calgary, AB*" and "*Environmental Noise Monitoring for Northwest Stoney Trail in Calgary, AB*", by aci Acoustical Consultants Inc. This report details the computer noise modeling portion of the work for northwest Stoney Trail.

The results of the Current Conditions noise monitoring indicated noise levels which were below 65 dBA $L_{eq}24$[1] at all but one location (M18). It is important to note, however, that all but two of the noise monitoring locations were within the TUC and not on residential property and, as such, the results cannot be directly compared to the applicable criteria of 65 dBA $L_{eq}24$ since the noise monitoring results would be higher than at residential locations. The two monitoring locations within residential property, however, were well below 65 dBA $L_{eq}24$. In most locations, Stoney Trail was the dominant noise source. However there were locations at which other intersecting City streets either contributed a significant amount or were dominant.

The noise modeling results for Current Conditions matched well with the measurement results. The modeled noise levels did not exceeded the limit of 65 dBA $L_{eq}24$ at any of the residential outdoor receptor locations.

The noise modeling results for the Future Conditions (with projected traffic volumes for the 1.6 million population) indicated noise levels which were still below the limit of 65 dBA $L_{eq}24$ at all residential receptor locations. Further, a sensitivity analysis of the traffic volumes, traffic speeds, and % heavy trucks indicated that even with significant increases in all three parameters, the noise levels at all residential receptor locations will still be below the limit of 65 dBA $L_{eq}24$. **As such, based on the criteria set forth by Alberta Transportation, no additional noise mitigation measures are required throughout the entire northwest Stoney Trail study area.**

[1] The term L_{eq} represents the energy equivalent sound level. This is a measure of the equivalent sound level for a specified period of time accounting for fluctuations.

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1.0 Introduction

aci Acoustical Consultants Inc., of Edmonton AB, was retained by Alberta Transportation to conduct an environmental noise assessment along the northeast and northwest sections of Stoney Trail in Calgary, Alberta. The purpose of the work was to conduct 24-hour environmental noise monitorings at various locations adjacent to the roadway and generate a computer noise model with current and future traffic conditions and compare the results to the AT noise guidelines. The results of the noise monitorings are provided in the reports entitled "*Environmental Noise Monitoring for Northeast Stoney Trail in Calgary, AB*" and "*Environmental Noise Monitoring for Northwest Stoney Trail in Calgary, AB*", by aci Acoustical Consultants Inc. This report details the computer noise modeling portion of the work for northwest Stoney Trail.

2.0 Location Description

The current sections of Stoney Trail span from 17 Avenue SE (on the east side of Calgary) to Highway 1 NW (on the west side of Calgary), as indicated in Figs. 1A & 1B. Throughout the entire span (approximately 45 km), Stoney Trail is a twinned road with at least 2-lanes in each direction and some sections with 3-lanes in each direction. The posted speed limit throughout is 100 km/hr[1]. The current and future interchanges/intersections are as follows:

- 17 Avenue SE (a signalized light-controlled intersection at the time of the field monitoring. Scheduled to be an interchange in the near future).
- 16 Avenue NE (grade separated interchange).
- McKnight Blvd NE (grade separated interchange).
- Airport Trail NE (grade separated interchange not yet operational).
- Country Hills Blvd NE (grade separated interchange).
- Deerfoot Trail (grade separated interchange).
- 11 Street NE (currently no intersection. Future grade separated interchange).
- Harvest Hills Blvd NE (a signalized light-controlled intersection at the time of the field monitoring. Grade separated interchange under construction).
- 14 Street NW (currently no intersection. Future grade separated interchange).
- Beddington Trail NW (grade separated interchange).
- Shaganappi Trail NW (Fly-over with westbound Stoney Trail Access. Full interchange access under construction).
- Sarcee Trail NW (grade separated interchange).
- Country Hills Blvd NW (grade separated interchange).

[1] Due to roadway construction activity, the posted speed limit between Country Hills Boulevard NW and Nose Hill Drive was lower for the Current Conditions noise modeling to more accurately reflect the conditions at the time of the noise monitoring. The speeds were increased to 100 km/hr for the Future Conditions modeling.

- Crowchild Trail NW (a signalized light-controlled intersection at the time of the field monitoring. Grade separated interchange under construction).
- Scenic Acres Link (grade separated interchange with modifications related to the Crowchild Trail Interchange).
- Nose Hill Drive (a signalized light-controlled intersection at the time of the field monitoring. Scheduled to be an interchange in the near future).
- Highway 1 (grade separated interchange).

There will therefore be18 grade separated interchanges within the study area for the future case noise modeling scenario[1].

Throughout much of the study area, there are single family detached residential areas with houses that back onto Stoney Trail. At some locations, there are houses that side or front onto Stoney Trail. There are also sections with multi-family 3 and 4 storey residential buildings adjacent to Stoney Trail. Finally, there are commercial areas and areas which have yet to be developed. In particular, there are no residential receptors adjacent to Stoney Trail between Airport Trail NE and 11 Street NE.

Topographically, the land in between Stoney Trail and the residential receptors for northeast Stoney Trail is relatively flat with no significant berms for shielding. Most of the residential lots have direct line-of-sight to Stoney Trail. For the northwest portion of Stoney Trail, there are sections with relatively flat ground in between the road and the adjacent houses and other sections with significant berms blocking the line-of-sight. In addition, for the northwest section, there are significant changes in elevation throughout. Because of this, topographical information provided by Alberta Transportation was incorporated into the noise model.

The vegetation in the areas between the residential locations and Stoney Trail consists mainly of field grasses with small sections of bushes and trees. Given the relative distances from the receptors to the roadways, the level of vegetative sound absorption is considered moderate. Vegetative sound absorption was incorporated into the noise model for calibration purposes (i.e. to ensure the modeled results matched with the monitored results).

[1] The Interchange at Metis Trail has been ignored because it is too far from the NE and NW residential study areas to have an impact on the noise climate.

3.0 Measurement & Modeling Methods

3.1. Environmental Noise Monitoring

As part of the study, a total of twenty five (25) 24-hour noise monitorings were conducted for the northeast and northwest Stoney Trail. The locations for each were selected based on consultation with personnel from AT as well as site specific observations and accessibility.

The measurements were conducted collecting broadband A-weighted as well as 1/3 octave band sound levels. This enabled a detailed analysis of the noise climate. The noise monitorings were conducted on weekdays under "typical" traffic conditions. In particular, measurements avoided any holidays, construction activity re-routing nearby, and other occurrences which would affect the normal traffic on the road. In addition, the monitorings were conducted in summer conditions (i.e. no snow cover) with dry road surfaces, no precipitation, and low wind-speeds. The monitorings were accompanied by a 24-hour digital audio recording for more detailed post process analysis. Finally, a portable weather monitor was used within the area to obtain local weather conditions. All noise measurement instrumentation was calibrated at the start of the measurements and then checked afterwards to ensure that there had been no calibration drift over the duration of the measurements. Refer to the reports entitled "*Environmental Noise Monitoring for Northeast Stoney Trail in Calgary, AB*" and "*Environmental Noise Monitoring for Northwest Stoney Trail in Calgary, AB*", by aci Acoustical Consultants Inc., for more detailed information on the measurement locations, start/stop times, and the equipment used.

3.2. Computer Noise Modeling

The computer noise modeling was conducted using the CADNA/A (version 4.1.137) software package. CADNA/A allows for the modeling of various noise sources such as road, rail, and various stationary sources. In addition, topographical features such as land contours, vegetation, and bodies of water can be included. Finally, meteorological conditions such as temperature, relative humidity, wind-speed and wind-direction can be included in the calculations.

The default calculation method for traffic noise in CADNA/A follows the German Standard RLS-90. It is aci's experience that this calculation method is accurate under the conditions present for this study, with a tendency to slightly over-predict potential noise levels (i.e. resulting in conservative values).. The calculation method used for noise propagation follows the ISO standard 9613-2. All receiver locations

were assumed as being downwind from the source(s). In particular, as stated in Section 5 of the ISO document:

> *"Downwind propagation conditions for the method specified in this part of IS0 9613 are as specified in 5.4.3.3 of IS0 1996-2:1987, namely*
> - *wind direction within an angle of ± 45^0 of the direction connecting the centre of the dominant sound source and the centre of the specified receiver region, with the wind blowing from source to receiver, and*
> - *wind speed between approximately 1 m/s and 5 m/s, measured at a height of 3 m to 11 m above the ground.*
>
> *The equations for calculating the average downwind sound pressure level LAT(DW) in this part of IS0 9613, including the equations for attenuation given in clause 7, are the average for meteorological conditions within these limits. The term average here means the average over a short time interval, as defined in 3.1.*
> *These equations also hold, equivalently, for average propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs on clear, calm nights".*

Throughout the study area, the ground was given an absorption coefficient of 0.5. Trees and field grasses were added where appropriate to match existing conditions in addition to providing a calibration of the modeled results compared to the measured results at the various noise monitoring locations. Therefore, all sound level propagation calculations are considered conservatively representative of summertime conditions for all surrounding residents.

Note that not every commercial building and house in the area was modeled. Only the first row of buildings (in relation to the major roadways) were included, since these are the ones which will have the highest sound levels and will result in the greatest impact and level of shielding for structures further in.

As part of the study, various scenarios were modeled including:

1) Current conditions: This included existing road configurations and traffic volumes present during the noise monitoring traffic volumes. The baseline noise monitoring was used as a calibration method for the model.
2) Future conditions (approximately 30 years): This included final road configurations and interchanges with projected traffic volumes. The traffic volumes used in this scenario were indicative of projected traffic volumes for an approximate 1.6 million population.
3) Future conditions (as in item #2) with a sensitivity analysis: This involved modification of various traffic parameters (listed below) to determine their effect on noise levels.
    a. Traffic counts

b. Traffic speeds
c. Traffic composition (i.e. % heavy vehicles)

The computer noise modeling results were calculated in two ways. First, sound levels were calculated at specific receiver locations. This included the noise monitor locations as well as numerous representative residential locations. Next, the sound levels were calculated using a 5 m x 5 m grid over the entire study area for the Current and Future conditions. This provided color noise contours for easier visualization of the results.

Refer to Appendix I for a list of the computer noise modeling parameters.

4.0 Permissible Sound Levels

Environmental noise levels from road traffic are commonly described in terms of equivalent sound levels or L_{eq}. This is the level of a steady sound having the same acoustic energy, over a given time period, as the fluctuating sound. In addition, this energy averaged level is A–weighted to account for the reduced sensitivity of average human hearing to low frequency sounds. These L_{eq} in dBA, which are the most common environmental noise measure, are often given for day-time (07:00 to 22:00) L_{eq}Day and night-time (22:00 to 07:00) L_{eq}Night while other criteria use the entire 24-hour period as L_{eq}24.

The criterion used to evaluate the road noise in the study area is based on the document entitled "*Noise Attenuation Guidelines for Provincial Highways Under Provincial Jurisdiction Within Cities and Urban Areas"* by Alberta Transportation. The document specifies:

> "For construction or improvements of highways through cities and other urban areas, Alberta Transportation will adopt a noise level of 65 dBA L_{eq}24 measured 1.2 m above ground level and 2 meters inside the property line (outside the highway right-of-way). The measurements should be adjusted to the 10-year planning horizon, as a threshold to consider noise mitigation measures"

As such, the criterion used to assess the noise levels in the computer noise model will be **65 dBA L_{eq}24** for all current dwellings at a height of 1.2 m above grade. For typical residential lots that back or "side" onto the provincial roadway, the assessment will be taken at 2 m inside the residential property line in the back-yard amenity space. For typical residential lots that "front" onto the provincial highway, noise levels will be assessed at 2 m inside the residential property line in the front yard.

5.0 Monitoring Results

The noise monitoring results at all 25 measurement locations are shown in Table 1. The information shows the broadband A-weighted $L_{eq}24$, $L_{eq}Day$ and $L_{eq}Night$ sound levels. At most of the noise monitoring locations, traffic noise on Stoney Trail was the dominant noise source. There were some locations (Location 4 for example) at which the adjacent City of Calgary road was the dominant noise source due to the relative distances from the noise monitor to the City road and Stoney Trail. Note that, although all of the monitoring locations (except M18) resulted in noise levels below 65 dBA $L_{eq}24$, all but two of the monitoring locations (M10 & M13) were within the TUC and, as such, cannot be compared directly to the criteria of 65 dBA $L_{eq}24$. All comparisons to the criteria should be done with the modeled results at the residential locations presented in Section 6. The two monitoring locations within residential property, however, were well below 65 dBA $L_{eq}24$.

More detailed information for the noise monitorings can be found in the reports entitled "*Environmental Noise Monitoring for Northeast Stoney Trail in Calgary, AB*" and "*Environmental Noise Monitoring for Northwest Stoney Trail in Calgary, AB*", by aci Acoustical Consultants Inc.

Table 1. Summary of Noise Monitoring Results

Monitor	$L_{eq}24$ (dBA)	$L_{eq}Day$ (dBA)	$L_{eq}Night$ (dBA)
M1	57.9	58.9	55.5
M2	60.0	60.8	57.9
M3	55.0	55.8	53.0
M4	55.5	56.5	52.9
M5	54.6	55.4	53.0
M6	60.2	61.2	57.6
M7	53.3	54.4	50.5
M8	55.1	56.1	52.9
M9	56.1	57.2	53.3
M10	56.5	57.4	54.5
M11	58.8	59.6	56.8
M12	57.0	58.4	52.7
M13	53.3	54.7	48.8
M14	60.1	61.5	55.6
M15	59.9	61.2	56.1
M16	51.6	52.9	47.6
M17	54.1	55.5	50.0
M18	67.6	69.0	63.3
M19	48.3	48.8	47.2
M20	51.9	52.7	50.2
M21	53.0	54.3	48.9
M22	50.2	51.2	47.8
M23	52.7	54.0	48.7
M24	49.1	49.7	48.1
M25	51.9	53.1	48.4

6.0 Modelling Results

6.1. Current Conditions

The results of the noise modeling under current conditions at the noise monitoring locations are presented in Table 2. The $L_{eq}24$, L_{eq}Day and L_{eq}Night sound levels are presented as well as the difference in the $L_{eq}24$ sound levels relative to the monitor results at each location. It can be seen that the modeled sound levels compare very well with the monitored results at each location. In all cases, the model calibration was such that the model gave slightly higher $L_{eq}24$ sound levels than the monitored results. In some cases, the relative differences are more than 1 dBA. This was done intentionally to account for noise monitored results that may have been slightly lower than anticipated due to wind conditions at the time of the monitoring. As such, all noise modeling results are considered conservative (i.e. slightly higher than actual).

Table 2. Noise Modeling Results Under Current Conditions at Monitor Locations

Monitor	$L_{eq}24$ (dBA)	Difference Relative to Monitor Results $L_{eq}24$ (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
M1	58.4	0.5	60.0	52.7
M2	60.2	0.2	61.8	54.6
M3	56.4	1.4	58.0	50.7
M4	55.5	0.0	57.1	49.3
M5	55.7	1.1	57.2	50.0
M6	60.2	0.0	61.7	55.2
M7	54.0	0.7	55.5	49.0
M8	55.4	0.3	56.9	50.6
M9	56.1	0.0	57.5	51.3
M10	57.7	1.2	59.3	52.2
M11	59.4	0.6	60.9	54.4
M12	57.7	0.7	59.2	52.7
M13	54.7	1.4	56.3	49.0
M14	60.8	0.7	62.4	55.1
M15	60.2	0.3	61.8	54.5
M16	52.8	1.2	54.3	47.3
M17	54.6	0.5	56.2	49.3
M18	67.8	0.2	69.3	62.9
M19	49.7	1.4	51.2	44.7
M20	53.7	1.8	55.1	49.1
M21	54.3	1.3	55.7	49.9
M22	52.1	1.9	53.6	46.9
M23	53.4	0.7	54.9	48.5
M24	50.5	1.4	51.9	46.0
M25	52.8	0.9	54.3	47.5

The results of the Current Conditions noise modeling at the various residential property locations are presented in Tables 3A – 3I. The entire study area was divided into 12 separate sections (3 sections for northeast and 9 sections for northwest), with the roadway interchanges as the dividers for each section. In addition to the information presented in Tables 3A – 3I, the $L_{eq}24$ color noise contours for the entire study area are shown in Figs. 2A – 2I. The color contours provide a very good representation of where the "hot" spots are and the relative contribution from each of the nearby roadways for the various receptor locations. In the event of a discrepancy between the results indicated in the color contours and the Tables, the Tables will be considered as correct. All of the current noise levels at residential property locations are under the limit of 65 dBA $L_{eq}24$.

Table 3A. Noise Modeling Results Under Current Conditions for Region 4

Receptor	$L_{eq}24$ (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	$L_{eq}24$ (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R217	49.1	50.6	43.6		R243	53.3	54.9	47.9
R218	48.6	50.2	43.2		R244	52.3	53.8	46.9
R219	53.0	54.6	47.6		R245	52.0	53.5	46.5
R220	53.2	54.8	47.8		R246	51.4	52.9	46.0
R221	51.9	53.5	46.5		R247	52.9	54.5	47.5
R222	52.8	54.3	47.3		R248	51.1	52.6	45.7
R223	51.8	53.4	46.4		R249	51.2	52.7	45.7
R224	49.8	51.4	44.3		R250	51.2	52.7	45.7
R225	50.7	52.3	45.2		R251	52.1	53.6	46.7
R226	51.8	53.3	46.3		R252	50.3	51.9	44.8
R227	52.3	53.9	46.9		R253	50.8	52.4	45.4
R228	53.5	55.0	48.0		R254	49.0	50.6	43.5
R229	54.3	55.9	48.9		R255	50.7	52.2	45.2
R230	55.4	57.0	49.9		R256	49.8	51.4	44.4
R231	54.0	55.5	48.5		R257	50.3	51.9	44.9
R232	55.1	56.7	49.7		R258	50.6	52.2	45.1
R233	54.1	55.6	48.6		R259	50.9	52.4	45.3
R234	54.8	56.3	49.3		R260	48.9	50.4	43.3
R235	57.0	58.5	51.5		R261	49.3	50.9	43.7
R236	57.1	58.7	51.6		R262	49.4	51.0	43.8
R237	55.5	57.1	50.1		R263	52.7	54.3	47.0
R238	55.5	57.1	50.1		R264	51.9	53.5	46.2
R239	56.7	58.2	51.3		R265	51.6	53.2	45.9
R240	56.9	58.4	51.4		R266	50.7	52.2	45.0
R241	56.2	57.7	50.8		R267	52.7	54.3	47.0
R242	53.9	55.4	48.5					

Table 3B. Noise Modeling Results Under Current Conditions for Region 5

Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R268	53.0	54.6	47.4
R269	54.6	56.1	48.9
R270	53.5	55.1	47.9
R271	52.5	54.1	47.0
R272	50.4	51.9	44.8
R273	53.7	55.2	48.2
R274	52.3	53.8	46.7
R275	53.0	54.5	47.5
R276	54.0	55.5	48.5
R277	53.3	54.8	47.8
R278	54.1	55.7	48.6
R279	54.4	55.9	48.9
R280	51.8	53.4	46.4
R281	53.7	55.3	48.3
R282	55.9	57.5	50.5
R283	55.9	57.4	50.5
R284	56.8	58.4	51.4
R285	52.3	53.8	46.8
R286	56.4	58.0	51.0
R287	55.3	56.8	49.8
R288	56.0	57.6	50.6
R289	56.0	57.5	50.5
R290	55.0	56.6	49.5
R291	54.9	56.5	49.4
R292	54.1	55.7	48.6
R293	54.2	55.8	48.6
R294	54.8	56.3	49.2
R295	53.9	55.5	48.3
R296	53.8	55.4	48.1
R297	53.4	55.0	47.7
R298	53.7	55.3	48.0

Table 3C. Noise Modeling Results Under Current Conditions for Region 6

Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R299	55.3	56.9	49.5		R338	55.3	56.8	49.8
R300	53.7	55.3	48.2		R339	54.1	55.6	48.4
R301	54.5	56.0	48.9		R340	57.1	58.6	51.4
R302	54.6	56.2	49.2		R341	57.2	58.8	51.5
R303	54.8	56.3	49.4		R342	57.6	59.2	51.8
R304	56.0	57.5	50.6		R343	58.0	59.6	52.3
R305	57.2	58.8	51.7		R344	53.9	55.4	48.8
R306	56.3	57.8	50.9		R345	53.7	55.2	48.7
R307	55.9	57.4	50.6		R346	50.6	52.1	45.5
R308	56.1	57.6	51.0		R347	53.3	54.8	48.3
R309	56.4	57.9	51.2		R348	54.0	55.5	49.0
R310	57.7	59.2	52.6		R349	54.9	56.4	49.9
R311	57.1	58.6	52.0		R350	52.6	54.1	47.5
R312	59.0	60.4	53.9		R351	52.5	54.0	47.4
R313	58.6	60.1	53.6		R352	53.0	54.5	48.0
R314	57.7	59.1	52.7		R353	53.6	55.1	48.5
R315	59.7	61.2	54.7		R354	52.4	53.9	47.4
R316	57.1	58.6	52.1		R355	54.6	56.1	49.6
R317	55.9	57.4	51.0		R356	53.8	55.3	48.8
R318	58.5	60.0	53.6		R357	56.0	57.5	50.9
R319	55.8	57.3	50.8		R358	54.9	56.4	49.9
R320	59.8	61.3	54.9		R359	55.4	56.9	50.4
R321	59.3	60.8	54.4		R360	55.0	56.5	50.0
R322	59.5	60.9	54.5		R361	53.7	55.2	48.6
R323	58.6	60.1	53.7		R362	54.3	55.8	49.3
R324	58.8	60.3	53.9		R363	55.1	56.6	50.0
R325	57.7	59.2	52.7		R364	56.0	57.5	50.9
R326	57.1	58.6	52.2		R365	55.7	57.2	50.5
R327	56.6	58.1	51.6		R366	55.0	56.5	49.8
R328	54.1	55.6	49.1		R367	56.0	57.5	50.8
R329	54.0	55.5	48.6		R368	57.3	58.8	51.9
R330	54.4	55.9	49.3		R369	54.6	56.2	49.1
R331	55.0	56.5	49.9		R370	53.9	55.5	48.4
R332	54.2	55.7	49.0		R371	54.5	56.0	48.9
R333	54.2	55.8	49.0		R372	56.1	57.7	50.6
R334	56.8	58.3	51.6		R373	53.9	55.4	48.2
R335	55.8	57.4	50.5		R374	54.4	55.9	48.7
R336	55.7	57.2	50.3		R375	54.3	55.9	48.6
R337	55.5	57.1	50.1					

Table 3D. Noise Modeling Results Under Current Conditions for Region 7

Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R376	61.5	63.1	55.8		R415	55.2	56.8	49.5
R377	56.8	58.4	51.0		R416	58.2	59.8	52.5
R378	55.3	56.9	49.6		R417	57.2	58.7	51.5
R379	55.0	56.6	49.2		R418	56.9	58.5	51.2
R380	55.0	56.6	49.1		R419	56.6	58.2	51.0
R381	54.5	56.1	48.7		R420	54.2	55.8	48.5
R382	54.2	55.8	48.3		R421	52.4	54.0	46.8
R383	54.8	56.4	48.9		R422	53.0	54.5	47.3
R384	55.1	56.6	49.2		R423	60.4	62.0	54.6
R385	54.3	55.9	48.5		R424	53.3	54.9	47.6
R386	51.6	53.2	45.8		R425	51.9	53.5	46.2
R387	54.8	56.4	49.0		R426	54.0	55.6	48.3
R388	56.3	57.8	50.4		R427	55.0	56.6	49.2
R389	52.9	54.5	47.2		R428	56.1	57.7	50.3
R390	48.9	50.5	43.2		R429	54.8	56.4	49.0
R391	51.0	52.6	45.3		R430	55.4	57.0	49.7
R392	49.9	51.5	44.1		R431	53.9	55.5	48.2
R393	50.2	51.8	44.5		R432	50.9	52.5	45.1
R394	51.7	53.3	46.0		R433	49.7	51.3	43.9
R395	53.1	54.7	47.4		R434	51.3	52.9	45.5
R396	53.1	54.6	47.3		R435	52.0	53.6	46.2
R397	51.7	53.3	46.0		R436	50.2	51.8	44.5
R398	50.6	52.2	44.9		R437	49.7	51.3	43.9
R399	51.1	52.7	45.4		R438	49.3	50.9	43.6
R400	53.8	55.4	48.1		R439	49.2	50.8	43.5
R401	54.3	55.9	48.5		R440	49.2	50.8	43.4
R402	54.1	55.7	48.4		R441	49.8	51.4	44.0
R403	55.1	56.7	49.3		R442	51.8	53.4	46.0
R404	53.3	54.9	47.6		R443	52.1	53.7	46.3
R405	53.6	55.1	47.9		R444	48.2	49.8	42.4
R406	51.7	53.3	46.0		R445	49.6	51.1	43.8
R407	56.4	58.0	50.7		R446	49.2	50.8	43.5
R408	55.7	57.3	50.0		R447	48.0	49.6	42.2
R409	55.1	56.7	49.4		R448	50.1	51.7	44.3
R410	54.0	55.5	48.3		R449	50.5	52.1	44.8
R411	55.2	56.8	49.5		R450	50.9	52.5	45.1
R412	54.3	55.9	48.6		R451	52.6	54.2	46.8
R413	53.2	54.8	47.5		R452	54.2	55.8	48.4
R414	48.9	50.5	43.3					

Table 3E. Noise Modeling Results Under Current Conditions for Region 8

Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R453	52.6	54.2	46.9		R478	51.2	52.8	45.7
R454	50.7	52.3	45.1		R479	50.5	52.0	45.0
R455	51.5	53.1	45.8		R480	51.3	52.9	45.8
R456	52.0	53.6	46.4		R481	52.5	54.1	47.0
R457	52.4	53.9	46.8		R482	54.3	55.9	48.7
R458	53.0	54.5	47.4		R483	55.5	57.1	49.8
R459	53.5	55.1	47.9		R484	53.1	54.6	47.3
R460	53.7	55.3	48.2		R485	57.4	59.0	51.7
R461	54.0	55.5	48.5		R486	57.1	58.7	51.4
R462	54.7	56.3	49.3		R487	51.5	53.1	45.8
R463	54.3	55.9	48.9		R488	51.5	53.1	45.9
R464	53.6	55.2	48.1		R489	50.6	52.1	45.0
R465	55.4	57.0	49.7		R490	49.9	51.5	44.3
R466	56.9	58.4	51.2		R491	50.6	52.1	45.0
R467	56.8	58.4	51.2		R492	50.4	52.0	44.8
R468	52.5	54.1	46.9		R493	51.2	52.8	45.7
R469	52.3	53.9	46.8		R494	51.5	53.1	46.0
R470	52.5	54.0	47.0		R495	52.0	53.6	46.5
R471	52.5	54.1	47.0		R496	52.6	54.1	47.1
R472	51.9	53.4	46.4		R497	53.3	54.8	47.8
R473	50.7	52.3	45.2		R498	53.8	55.3	48.3
R474	49.8	51.4	44.3		R499	54.5	56.0	49.0
R475	49.3	50.9	43.8		R500	55.2	56.7	49.7
R476	49.8	51.3	44.3		R501	55.0	56.6	49.5
R477	50.3	51.9	44.8		R502	55.3	56.8	49.8

Table 3F. Noise Modeling Results Under Current Conditions for Region 9

Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R503	56.3	57.9	50.5		R531	53.9	55.4	48.6
R504	55.3	56.8	49.5		R532	55.1	56.7	49.8
R505	55.6	57.2	49.8		R533	55.8	57.3	50.5
R506	53.8	55.4	48.1		R534	56.4	57.9	51.1
R507	53.9	55.5	48.3		R535	57.0	58.5	51.7
R508	54.1	55.7	48.7		R536	57.3	58.9	52.1
R509	54.5	56.1	49.1		R537	57.3	58.8	52.1
R510	54.9	56.4	49.5		R538	57.5	59.0	52.3
R511	54.7	56.3	49.3		R539	58.1	59.6	52.9
R512	54.4	55.9	49.0		R540	54.6	56.1	49.4
R513	54.7	56.3	49.3		R541	54.5	56.0	49.3
R514	55.8	57.3	50.4		R542	54.9	56.4	49.7
R515	55.8	57.4	50.4		R543	57.6	59.2	52.4
R516	55.0	56.5	49.6		R544	59.0	60.5	53.7
R517	54.2	55.8	48.9		R545	58.6	60.2	53.4
R518	53.8	55.4	48.5		R546	58.0	59.6	52.8
R519	54.7	56.3	49.3		R547	57.8	59.3	52.5
R520	53.5	55.0	48.0		R548	57.4	59.0	52.1
R521	51.7	53.3	46.4		R549	52.3	53.9	46.8
R522	51.9	53.4	46.6		R550	51.3	52.9	45.7
R523	52.6	54.1	47.2		R551	53.9	55.5	48.2
R524	52.4	53.9	47.0		R552	54.2	55.7	48.7
R525	52.2	53.8	46.9		R553	52.6	54.2	46.9
R526	51.9	53.5	46.6		R554	52.4	54.0	46.4
R527	52.9	54.5	47.6		R555	55.0	56.7	48.8
R528	54.6	56.2	49.2		R556	61.1	62.7	54.7
R529	57.7	59.3	52.4		R557	61.7	63.4	55.4
R530	54.5	56.0	49.2		R558	60.3	61.9	54.2

Table 3G. Noise Modeling Results Under Current Conditions for Region 10

Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R559	58.9	60.6	52.6		R603	55.2	56.7	49.7
R560	59.9	61.6	53.4		R604	54.5	56.1	49.0
R561	58.2	59.9	51.6		R605	54.1	55.6	48.7
R562	59.6	61.3	53.0		R606	54.4	55.9	49.0
R563	57.3	59.0	50.8		R607	55.2	56.7	49.8
R564	53.5	55.1	47.9		R608	55.4	57.0	49.7
R565	52.5	54.1	46.9		R609	56.4	58.0	50.4
R566	52.9	54.5	47.3		R610	57.6	59.3	51.5
R567	52.8	54.3	47.2		R611	53.0	54.6	47.3
R568	52.3	53.9	46.7		R612	52.8	54.3	47.1
R569	50.1	51.7	44.7		R613	51.8	53.4	46.2
R570	50.5	52.0	45.2		R614	54.1	55.6	48.5
R571	49.1	50.7	44.1		R615	57.7	59.2	52.1
R572	48.3	49.9	43.0		R616	53.3	54.9	47.9
R573	46.8	48.4	41.1		R617	50.4	51.9	45.3
R574	47.0	48.5	41.6		R618	50.9	52.3	46.4
R575	47.5	49.0	42.5		R619	50.1	51.6	45.5
R576	47.0	48.5	41.8		R620	52.8	54.3	48.0
R577	49.3	50.8	44.4		R621	52.9	54.3	48.1
R578	49.8	51.3	44.9		R622	53.9	55.4	49.5
R579	50.2	51.6	45.3		R623	54.5	55.9	50.2
R580	52.0	53.4	47.4		R624	52.0	53.4	47.5
R581	54.8	56.1	50.6		R625	50.1	51.5	45.7
R582	55.6	57.0	51.6		R626	49.6	51.0	45.2
R583	55.2	56.6	50.7		R627	49.5	50.9	45.1
R584	54.1	55.6	49.2		R628	49.4	50.8	45.0
R585	51.9	53.3	47.5		R629	50.6	52.0	46.2
R586	54.7	56.1	50.0		R630	51.2	52.6	46.9
R587	55.3	56.7	50.5		R631	52.8	54.1	48.6
R588	52.9	54.3	48.3		R632	54.3	55.7	50.1
R589	54.3	55.8	49.5		R633	55.0	56.4	50.3
R590	54.6	56.1	49.8		R634	55.4	56.7	51.1
R591	53.3	54.7	48.8		R635	54.3	55.7	49.9
R592	52.2	53.6	47.8		R636	54.1	55.5	49.8
R593	50.3	51.8	45.7		R637	52.9	54.3	48.6
R594	52.2	53.6	47.6		R638	51.7	53.1	47.3
R595	53.0	54.4	48.3		R639	52.1	53.6	47.6
R596	53.4	54.8	48.7		R640	52.5	53.9	48.0
R597	54.1	55.5	49.4		R641	53.3	54.8	48.6
R598	56.5	57.9	51.6		R642	53.3	54.8	48.5
R599	55.3	56.8	50.3		R643	54.3	55.8	49.4
R600	55.7	57.3	50.3		R644	55.5	57.0	50.3
R601	56.2	57.8	50.5		R645	56.1	57.7	50.8
R602	56.6	58.2	50.8					

Table 3H. Noise Modeling Results Under Current Conditions for Region 11

Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R646	58.0	59.6	52.0		R692	51.9	53.4	46.6
R647	51.5	53.1	45.9		R693	52.1	53.7	46.9
R648	54.2	55.7	48.7		R694	52.1	53.7	46.9
R649	50.4	51.9	45.3		R695	51.8	53.3	46.6
R650	50.0	51.6	44.6		R696	51.7	53.2	46.5
R651	52.6	54.1	47.4		R697	54.0	55.5	48.7
R652	53.0	54.5	48.0		R698	58.9	60.4	53.3
R653	52.9	54.3	47.9		R699	58.1	59.7	52.6
R654	51.7	53.2	46.8		R700	55.7	57.2	50.4
R655	52.5	54.0	47.6		R701	56.6	58.2	51.3
R656	53.2	54.7	48.3		R702	53.2	54.8	47.7
R657	50.4	51.9	45.5		R703	52.2	53.8	46.9
R658	51.8	53.3	46.9		R704	51.6	53.1	46.4
R659	52.2	53.7	47.2		R705	52.4	53.9	47.2
R660	51.7	53.2	46.8		R706	53.1	54.6	47.9
R661	52.4	53.9	47.5		R707	53.1	54.6	47.9
R662	51.5	53.0	46.6		R708	52.8	54.4	47.7
R663	51.9	53.4	47.0		R709	53.3	54.8	48.1
R664	54.5	56.0	49.3		R710	53.0	54.5	47.8
R665	59.2	60.7	53.9		R711	51.7	53.2	46.7
R666	52.9	54.4	48.0		R712	51.4	52.8	46.4
R667	51.4	52.9	46.7		R713	51.4	52.9	46.4
R668	51.2	52.6	46.5		R714	51.0	52.5	46.0
R669	51.1	52.5	46.5		R715	51.0	52.5	46.0
R670	51.0	52.4	46.4		R716	51.7	53.2	46.8
R671	51.2	52.6	46.6		R717	51.9	53.4	47.1
R672	51.5	52.9	46.9		R718	51.6	53.0	46.7
R673	50.2	51.6	45.7		R719	50.8	52.3	46.0
R674	50.3	51.7	45.8		R720	51.1	52.6	46.1
R675	50.4	51.9	45.9		R721	51.6	53.1	46.8
R676	51.2	52.6	46.7		R722	50.9	52.3	46.1
R677	52.9	54.4	48.5		R723	50.8	52.3	46.1
R678	51.8	53.2	47.5		R724	50.8	52.3	46.1
R679	51.3	52.7	46.8		R725	50.1	51.5	45.3
R680	48.1	49.6	43.0		R726	50.7	52.2	46.0
R681	51.2	52.6	46.5		R727	51.7	53.1	47.0
R682	51.9	53.4	47.0		R728	51.4	52.8	46.7
R683	56.0	57.5	50.6		R729	51.4	52.8	46.7
R684	56.1	57.6	50.6		R730	51.8	53.2	47.2
R685	54.9	56.5	49.5		R731	52.6	54.1	48.0
R686	57.7	59.3	51.4		R732	50.9	52.3	46.1
R687	51.2	52.8	45.2		R733	50.0	51.5	45.2
R688	50.8	52.4	44.7		R734	48.7	50.2	43.8
R689	50.0	51.6	44.0		R735	48.2	49.7	43.2
R690	54.1	55.7	48.4		R736	49.7	51.2	44.7
R691	52.8	54.4	47.3					

Table 3I. Noise Modeling Results Under Current Conditions for Region 12

Receptor	L_{eq}24 (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R737	49.6	51.1	44.7
R738	48.9	50.4	43.8
R739	46.8	48.3	41.7
R740	53.0	54.6	47.4
R741	53.5	55.0	47.8
R742	53.7	55.3	48.0
R743	53.8	55.4	48.1
R744	54.4	56.0	48.6
R745	54.6	56.2	48.8
R746	54.7	56.3	48.8
R747	54.2	55.8	48.3
R748	55.0	56.6	49.1
R749	55.4	57.0	49.5
R750	55.5	57.1	49.6
R751	55.3	56.9	49.5
R752	54.8	56.4	49.0
R753	54.8	56.4	49.0
R754	53.2	54.7	48.2
R755	52.7	54.2	47.4
R756	52.8	54.3	47.4
R757	53.0	54.5	47.6
R758	53.3	54.9	47.9
R759	54.5	56.0	48.8
R760	54.1	55.6	48.3
R761	53.2	54.8	47.4
R762	53.7	55.3	47.9
R763	54.3	55.9	48.5
R764	56.5	58.1	50.7
R765	57.5	59.1	51.7
R766	57.8	59.4	52.0
R767	58.0	59.6	52.2
R768	58.0	59.6	52.2
R769	57.6	59.2	51.9
R770	56.8	58.3	51.0
R771	55.5	57.1	49.8
R772	57.8	59.4	52.0

6.2. Future Conditions

The results of the noise modeling under future conditions (1.6 million population) at the residential receptor locations are presented in Tables 4A – 4I and shown in Figs. 3A – 3I. The $L_{eq}24$, L_{eq}Day and L_{eq}Night sound levels are presented in the Tables along with the relative increase in the $L_{eq}24$ compared to current conditions. Below each Table is a summary discussion of the results for that particular Region.

Table 4A. Noise Modeling Results Under Future Conditions for Region 4

Receptor	$L_{eq}24$ (dBA)	$L_{eq}24$ Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	$L_{eq}24$ (dBA)	$L_{eq}24$ Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R217	57.8	8.7	59.4	51.8		R243	55.8	2.5	57.4	50.3
R218	59.4	10.8	61.0	53.3		R244	54.9	2.6	56.5	49.3
R219	63.4	10.4	65.0	56.9		R245	54.6	2.6	56.1	49.0
R220	63.1	9.9	64.8	56.6		R246	54.0	2.6	55.6	48.4
R221	59.3	7.4	60.9	52.9		R247	55.6	2.7	57.2	50.0
R222	59.2	6.4	60.9	53.0		R248	53.9	2.8	55.5	48.3
R223	58.2	6.4	59.8	52.0		R249	54.0	2.8	55.6	48.3
R224	55.5	5.7	57.1	49.3		R250	54.0	2.8	55.6	48.3
R225	56.2	5.5	57.8	49.9		R251	54.9	2.8	56.4	49.2
R226	57.0	5.2	58.7	50.9		R252	53.3	3.0	54.9	47.6
R227	57.1	4.8	58.7	51.0		R253	53.8	3.0	55.3	48.0
R228	58.1	4.6	59.7	52.1		R254	52.4	3.4	54.0	46.6
R229	58.4	4.1	60.0	52.5		R255	53.7	3.0	55.3	48.0
R230	59.2	3.8	60.8	53.3		R256	53.6	3.8	55.2	47.7
R231	57.7	3.7	59.3	51.7		R257	54.1	3.8	55.7	48.1
R232	58.5	3.4	60.1	52.7		R258	56.0	5.4	57.6	49.8
R233	57.4	3.3	59.0	51.5		R259	56.4	5.5	58.0	50.3
R234	58.0	3.2	59.6	52.2		R260	55.9	7.0	57.5	49.6
R235	59.8	2.8	61.4	54.1		R261	57.3	8.0	58.9	51.0
R236	59.6	2.5	61.2	53.9		R262	57.6	8.2	59.2	51.3
R237	58.0	2.5	59.5	52.4		R263	60.3	7.6	61.9	54.0
R238	58.0	2.5	59.5	52.4		R264	59.0	7.1	60.7	52.8
R239	59.1	2.4	60.6	53.5		R265	58.6	7.0	60.3	52.4
R240	59.2	2.3	60.8	53.7		R266	57.1	6.4	58.8	51.0
R241	58.6	2.4	60.1	53.1		R267	58.4	5.7	60.0	52.3
R242	56.3	2.4	57.9	50.8						

The Future Conditions noise modeling for Region 4 indicated noise levels below 65 dBA $L_{eq}24$ at all locations. The increases relative to the Current Conditions ranged from +2.3 to +10.8 dBA. At most locations, these increases were due to the projected increases in traffic volumes on Stoney Trail. The highest increases (far east end and far west end) were at locations adjacent to interchanges and City roadways that were not operational for the Current Conditions.

Table 4B. Noise Modeling Results Under Future Conditions for Region 5

Receptor	$L_{eq}24$ (dBA)	$L_{eq}24$ Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R268	57.9	4.9	59.5	51.7
R269	59.3	4.7	61.0	52.9
R270	58.0	4.5	59.6	51.4
R271	57.3	4.8	58.9	50.9
R272	55.4	5.0	57.0	49.1
R273	57.9	4.2	59.5	51.8
R274	56.4	4.1	58.0	50.5
R275	56.8	3.8	58.4	51.0
R276	57.9	3.9	59.5	52.1
R277	57.2	3.9	58.8	51.4
R278	57.8	3.7	59.4	52.1
R279	57.8	3.4	59.4	52.1
R280	55.4	3.6	56.9	49.7
R281	57.3	3.6	58.9	51.6
R282	59.3	3.4	60.9	53.6
R283	59.2	3.3	60.7	53.5
R284	60.0	3.2	61.6	54.4
R285	55.7	3.4	57.3	50.1
R286	59.8	3.4	61.3	54.2
R287	58.8	3.5	60.3	53.1
R288	59.5	3.5	61.1	53.9
R289	59.5	3.5	61.1	53.9
R290	58.7	3.7	60.3	53.0
R291	58.8	3.9	60.3	53.0
R292	58.1	4.0	59.7	52.3
R293	58.4	4.2	60.0	52.6
R294	59.6	4.8	61.2	53.7
R295	58.7	4.8	60.3	52.8
R296	58.7	4.9	60.3	52.7
R297	57.9	4.5	59.5	51.9
R298	57.2	3.5	58.8	51.3

The Future Conditions noise modeling for Region 5 indicated noise levels below 65 dBA $L_{eq}24$ at all locations. The increases relative to the Current Conditions ranged from +3.2 to +5.0 dBA. At essentially all locations, these increases were due to the projected increases in traffic volumes on Stoney Trail.

Table 4C. Noise Modeling Results Under Future Conditions for Region 6

Receptor	$L_{eq}24$ (dBA)	$L_{eq}24$ Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	$L_{eq}24$ (dBA)	$L_{eq}24$ Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R299	59.1	3.8	60.8	53.1		R338	57.9	2.6	59.5	52.4
R300	58.0	4.3	59.6	52.1		R339	56.6	2.5	58.2	50.9
R301	59.3	4.8	61.0	53.4		R340	59.6	2.5	61.2	53.9
R302	59.9	5.3	61.6	53.9		R341	59.8	2.6	61.3	54.0
R303	60.2	5.4	61.8	54.1		R342	60.0	2.4	61.6	54.3
R304	61.9	5.9	63.5	55.6		R343	60.5	2.5	62.0	54.7
R305	63.5	6.3	65.2	57.0		R344	56.9	3.0	58.4	51.7
R306	61.9	5.6	63.5	55.6		R345	56.7	3.0	58.2	51.5
R307	61.1	5.2	62.7	55.0		R346	53.6	3.0	55.1	48.4
R308	60.6	4.5	62.2	54.7		R347	56.2	2.9	57.7	51.0
R309	60.5	4.1	62.0	54.8		R348	56.8	2.8	58.3	51.7
R310	61.5	3.8	63.1	56.0		R349	57.6	2.7	59.1	52.5
R311	60.7	3.6	62.2	55.2		R350	55.3	2.7	56.8	50.2
R312	62.4	3.4	64.0	57.1		R351	55.2	2.7	56.7	50.0
R313	62.0	3.4	63.5	56.6		R352	55.7	2.7	57.2	50.6
R314	60.8	3.1	62.3	55.6		R353	56.0	2.4	57.5	51.0
R315	62.6	2.9	64.1	57.5		R354	54.9	2.5	56.4	49.9
R316	60.0	2.9	61.5	54.9		R355	57.2	2.6	58.7	52.2
R317	58.8	2.9	60.4	53.7		R356	56.3	2.5	57.8	51.3
R318	61.3	2.8	62.8	56.3		R357	58.5	2.5	60.0	53.5
R319	58.5	2.7	60.0	53.5		R358	57.5	2.6	59.0	52.5
R320	62.5	2.7	63.9	57.5		R359	58.0	2.6	59.5	53.0
R321	61.9	2.6	63.4	57.0		R360	57.6	2.6	59.1	52.6
R322	62.0	2.5	63.5	57.1		R361	56.2	2.5	57.7	51.1
R323	61.2	2.6	62.7	56.3		R362	56.9	2.6	58.4	51.9
R324	61.4	2.6	62.8	56.4		R363	57.6	2.5	59.1	52.5
R325	60.2	2.5	61.7	55.3		R364	58.7	2.7	60.2	53.5
R326	59.7	2.6	61.2	54.7		R365	58.4	2.7	59.9	53.2
R327	59.2	2.6	60.7	54.2		R366	57.6	2.6	59.2	52.4
R328	56.7	2.6	58.2	51.6		R367	58.7	2.7	60.2	53.4
R329	55.8	1.8	57.4	50.5		R368	60.0	2.7	61.5	54.6
R330	56.9	2.5	58.4	51.8		R369	57.1	2.5	58.7	51.6
R331	57.6	2.6	59.1	52.4		R370	56.2	2.3	57.8	50.6
R332	56.9	2.7	58.4	51.6		R371	56.5	2.0	58.0	50.8
R333	56.9	2.7	58.5	51.6		R372	58.3	2.2	59.9	52.8
R334	59.5	2.7	61.1	54.2		R373	55.7	1.8	57.3	50.0
R335	58.5	2.7	60.0	53.1		R374	56.4	2.0	58.0	50.8
R336	58.4	2.7	59.9	52.9		R375	56.3	2.0	57.9	50.6
R337	58.2	2.7	59.8	52.7						

The Future Conditions noise modeling for Region 6 indicated noise levels below 65 dBA $L_{eq}24$ at all locations. The increases relative to the Current Conditions ranged from +1.8 to +6.3 dBA. At essentially all locations, these increases were due to the projected increases in traffic volumes on Stoney Trail. The highest increases (R299 – R310) were at locations adjacent to 14 Street NW which was not present for the Current Conditions.

Table 4D. Noise Modeling Results Under Future Conditions for Region 7

Receptor	L_{eq}24 (dBA)	L_{eq}24 Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	L_{eq}24 (dBA)	L_{eq}24 Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R376	64.0	2.5	65.6	58.3		R415	62.7	7.5	64.3	56.9
R377	59.3	2.5	60.9	53.5		R416	60.0	1.8	61.6	54.3
R378	57.8	2.5	59.4	51.9		R417	59.0	1.8	60.6	53.3
R379	57.4	2.4	59.0	51.5		R418	58.8	1.9	60.4	53.1
R380	57.4	2.4	59.0	51.4		R419	58.6	2.0	60.2	52.9
R381	56.9	2.4	58.5	50.9		R420	56.4	2.2	58.0	50.6
R382	56.4	2.2	58.0	50.5		R421	54.6	2.2	56.2	48.8
R383	56.9	2.1	58.5	51.1		R422	54.7	1.7	56.3	48.9
R384	57.3	2.2	58.9	51.4		R423	60.7	0.3	62.3	55.0
R385	56.6	2.3	58.2	50.7		R424	54.9	1.6	56.5	49.2
R386	53.3	1.7	54.9	47.4		R425	53.7	1.8	55.3	48.0
R387	56.9	2.1	58.5	51.0		R426	55.8	1.8	57.4	50.0
R388	58.3	2.0	59.9	52.4		R427	56.9	1.9	58.5	51.0
R389	55.2	2.3	56.8	49.3		R428	58.2	2.1	59.8	52.3
R390	51.3	2.4	52.9	45.4		R429	57.0	2.2	58.6	51.0
R391	53.4	2.4	55.0	47.4		R430	57.6	2.2	59.3	51.7
R392	52.3	2.4	53.9	46.4		R431	56.3	2.4	57.9	50.3
R393	52.4	2.2	54.0	46.5		R432	53.4	2.5	55.0	47.4
R394	54.1	2.4	55.7	48.1		R433	52.2	2.5	53.8	46.1
R395	55.5	2.4	57.1	49.5		R434	53.8	2.5	55.5	47.8
R396	55.4	2.3	57.1	49.4		R435	54.6	2.6	56.3	48.5
R397	54.2	2.5	55.8	48.2		R436	53.0	2.8	54.6	46.9
R398	53.1	2.5	54.7	47.2		R437	52.8	3.1	54.4	46.6
R399	53.5	2.4	55.1	47.5		R438	52.7	3.4	54.3	46.5
R400	56.1	2.3	57.8	50.1		R439	52.8	3.6	54.4	46.6
R401	56.8	2.5	58.5	50.7		R440	52.9	3.7	54.5	46.7
R402	56.7	2.6	58.3	50.6		R441	53.7	3.9	55.3	47.4
R403	57.9	2.8	59.5	51.8		R442	55.9	4.1	57.6	49.5
R404	56.3	3.0	57.9	50.2		R443	55.2	3.1	56.9	48.8
R405	56.6	3.0	58.2	50.5		R444	52.7	4.5	54.3	46.2
R406	54.9	3.2	56.5	48.8		R445	53.5	3.9	55.1	47.0
R407	59.4	3.0	61.1	53.3		R446	52.4	3.2	54.1	46.3
R408	58.7	3.0	60.4	52.6		R447	52.9	4.9	54.5	46.8
R409	58.2	3.1	59.9	52.1		R448	54.8	4.7	56.5	48.6
R410	57.0	3.0	58.7	50.9		R449	55.1	4.6	56.7	49.0
R411	58.9	3.7	60.5	52.7		R450	55.8	4.9	57.4	49.7
R412	58.9	4.6	60.5	52.6		R451	56.6	4.0	58.2	50.6
R413	58.7	5.5	60.3	52.4		R452	60.3	6.1	61.9	54.5
R414	53.9	5.0	55.5	47.8						

The Future Conditions noise modeling for Region 7 indicated noise levels below 65 dBA L_{eq}24 at all locations. The increases relative to the Current Conditions ranged from +0.3 to +7.5 dBA. At most locations, these increases were due to the projected increases in traffic volumes on Stoney Trail. The highest increases were at locations adjacent to Shaganappi Trail which was projected to have a relatively significant increase in traffic volumes in the Future Conditions.

Table 4E. Noise Modeling Results Under Future Conditions for Region 8

Receptor	L_{eq}24 (dBA)	L_{eq}24 Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	L_{eq}24 (dBA)	L_{eq}24 Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R453	60.7	8.1	62.3	54.7		R478	52.9	1.7	54.4	47.2
R454	55.3	4.6	57.0	49.3		R479	52.1	1.6	53.7	46.5
R455	56.6	5.1	58.3	50.6		R480	53.0	1.7	54.5	47.3
R456	56.3	4.3	57.9	50.3		R481	54.2	1.7	55.7	48.5
R457	56.3	3.9	57.9	50.3		R482	56.1	1.8	57.7	50.4
R458	56.7	3.7	58.3	50.8		R483	57.7	2.2	59.2	51.8
R459	57.1	3.6	58.7	51.2		R484	55.4	2.3	57.0	49.5
R460	57.1	3.4	58.7	51.3		R485	59.1	1.7	60.7	53.3
R461	57.1	3.1	58.7	51.3		R486	59.2	2.1	60.8	53.5
R462	57.8	3.1	59.3	52.0		R487	56.5	5.0	58.1	50.6
R463	57.2	2.9	58.8	51.4		R488	56.2	4.7	57.8	50.3
R464	56.2	2.6	57.7	50.4		R489	54.4	3.8	56.0	48.6
R465	56.2	0.8	57.8	50.5		R490	53.2	3.3	54.8	47.4
R466	57.5	0.6	59.1	51.8		R491	53.8	3.2	55.4	48.0
R467	57.5	0.7	59.1	51.8		R492	53.5	3.1	55.1	47.6
R468	54.1	1.6	55.7	48.4		R493	53.9	2.7	55.5	48.1
R469	54.1	1.8	55.7	48.4		R494	54.0	2.5	55.5	48.2
R470	54.3	1.8	55.9	48.7		R495	54.2	2.2	55.8	48.6
R471	54.4	1.9	55.9	48.7		R496	54.6	2.0	56.2	48.9
R472	53.7	1.8	55.3	48.1		R497	55.1	1.8	56.7	49.5
R473	52.5	1.8	54.1	46.9		R498	55.5	1.7	57.1	49.9
R474	51.7	1.9	53.3	46.1		R499	56.2	1.7	57.7	50.6
R475	51.2	1.9	52.7	45.5		R500	56.9	1.7	58.4	51.3
R476	51.6	1.8	53.2	46.0		R501	56.7	1.7	58.2	51.1
R477	52.1	1.8	53.6	46.4		R502	56.8	1.5	58.4	51.2

The Future Conditions noise modeling for Region 8 indicated noise levels below 65 dBA L_{eq}24 at all locations. The increases relative to the Current Conditions ranged from +0.6 to +8.1 dBA. At most locations, these relatively minor increases were due to the projected increases in traffic volumes on Stoney Trail. The highest increases were at locations adjacent to Shaganappi Trail which was projected to have a relatively significant increase in traffic volumes in the Future Conditions.

Table 4F. Noise Modeling Results Under Future Conditions for Region 9

Receptor	L_{eq}24 (dBA)	L_{eq}24 Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	L_{eq}24 (dBA)	L_{eq}24 Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R503	58.4	2.1	60.0	52.7		R531	53.9	0.0	55.5	48.6
R504	57.5	2.2	59.1	51.7		R532	55.2	0.1	56.7	49.8
R505	57.8	2.2	59.3	52.0		R533	55.8	0.0	57.4	50.5
R506	55.7	1.9	57.3	50.0		R534	56.4	0.0	57.9	51.1
R507	55.3	1.4	56.9	49.7		R535	57.0	0.0	58.5	51.7
R508	55.2	1.1	56.8	49.6		R536	57.4	0.1	58.9	52.1
R509	55.4	0.9	57.0	49.8		R537	57.3	0.0	58.8	52.1
R510	55.6	0.7	57.1	50.1		R538	57.5	0.0	59.0	52.3
R511	55.4	0.7	56.9	49.8		R539	58.1	0.0	59.6	52.9
R512	55.0	0.6	56.5	49.5		R540	54.7	0.1	56.2	49.5
R513	55.2	0.5	56.7	49.7		R541	54.7	0.2	56.2	49.5
R514	56.1	0.3	57.6	50.6		R542	55.0	0.1	56.5	49.8
R515	56.1	0.3	57.6	50.6		R543	57.7	0.1	59.2	52.5
R516	55.2	0.2	56.8	49.8		R544	59.1	0.1	60.6	53.9
R517	54.4	0.2	56.0	49.0		R545	58.8	0.2	60.3	53.6
R518	54.0	0.2	55.6	48.6		R546	58.3	0.3	59.8	53.0
R519	54.9	0.2	56.4	49.5		R547	58.0	0.2	59.6	52.7
R520	53.6	0.1	55.1	48.1		R548	57.7	0.3	59.2	52.4
R521	51.9	0.2	53.4	46.6		R549	52.7	0.4	54.2	47.2
R522	52.0	0.1	53.6	46.7		R550	51.9	0.6	53.5	46.4
R523	52.7	0.1	54.2	47.3		R551	54.7	0.8	56.3	49.1
R524	52.5	0.1	54.0	47.1		R552	55.1	0.9	56.6	49.8
R525	52.3	0.1	53.9	47.0		R553	53.3	0.7	54.8	47.6
R526	52.0	0.1	53.5	46.7		R554	52.9	0.5	54.5	47.0
R527	53.0	0.1	54.6	47.7		R555	55.4	0.4	57.1	49.2
R528	54.7	0.1	56.2	49.3		R556	61.4	0.3	63.1	54.9
R529	57.7	0.0	59.3	52.3		R557	62.1	0.4	63.7	55.7
R530	54.5	0.0	56.0	49.2		R558	60.4	0.1	62.1	54.3

The Future Conditions noise modeling for Region 9 indicated noise levels below 65 dBA L_{eq}24 at all locations. The increases relative to the Current Conditions ranged from +0.0 to +2.2 dBA. At essentially all locations, these relatively minor increases were due to the projected increases in traffic volumes on Stoney Trail. In addition, the highest noise levels were at locations at which the dominant noise sources were the intersecting City of Calgary roads and not Stoney Trail.

Table 4G. Noise Modeling Results Under Future Conditions for Region 10

Receptor	L_{eq}24 (dBA)	L_{eq}24 Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	L_{eq}24 (dBA)	L_{eq}24 Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R559	58.9	0.0	60.5	52.6		R603	55.6	0.4	57.2	50.0
R560	59.9	0.0	61.5	53.3		R604	55.3	0.8	56.9	49.8
R561	58.2	0.0	59.9	51.7		R605	54.8	0.7	56.4	49.5
R562	59.7	0.1	61.3	53.2		R606	55.2	0.8	56.8	50.0
R563	57.3	0.0	59.0	50.8		R607	56.2	1.0	57.7	51.0
R564	54.3	0.8	55.8	48.8		R608	56.3	0.9	57.9	50.9
R565	53.3	0.8	54.8	47.9		R609	57.1	0.7	58.7	51.2
R566	53.7	0.8	55.2	48.3		R610	58.2	0.6	59.8	52.2
R567	53.6	0.8	55.2	48.2		R611	54.1	1.1	55.7	48.5
R568	53.2	0.9	54.7	47.7		R612	54.0	1.2	55.6	48.4
R569	51.2	1.1	52.7	46.0		R613	53.2	1.4	54.7	47.7
R570	51.7	1.2	53.2	46.8		R614	55.4	1.3	56.9	49.9
R571	50.7	1.6	52.2	46.1		R615	59.1	1.4	60.6	53.6
R572	49.6	1.3	51.1	44.7		R616	54.6	1.3	56.1	49.2
R573	48.0	1.2	49.6	42.6		R617	51.9	1.5	53.3	47.1
R574	48.5	1.5	50.0	43.5		R618	52.9	2.0	54.3	48.8
R575	49.3	1.8	50.7	44.7		R619	52.4	2.3	53.8	48.2
R576	48.6	1.6	50.1	44.0		R620	55.0	2.2	56.4	50.6
R577	51.1	1.8	52.5	46.6		R621	54.9	2.0	56.3	50.5
R578	51.8	2.0	53.2	47.4		R622	56.1	2.2	57.5	52.0
R579	52.1	1.9	53.5	47.7		R623	56.8	2.3	58.2	52.8
R580	54.2	2.2	55.6	50.0		R624	54.2	2.2	55.6	50.1
R581	57.2	2.4	58.5	53.3		R625	52.4	2.3	53.8	48.3
R582	58.1	2.5	59.3	54.3		R626	51.9	2.3	53.3	47.8
R583	57.1	1.9	58.4	52.9		R627	51.8	2.3	53.2	47.7
R584	55.6	1.5	57.1	51.1		R628	51.7	2.3	53.1	47.6
R585	54.3	2.4	55.6	50.2		R629	52.9	2.3	54.3	48.8
R586	56.6	1.9	58.0	52.3		R630	53.6	2.4	54.9	49.5
R587	57.1	1.8	58.5	52.8		R631	55.3	2.5	56.6	51.3
R588	55.4	2.5	56.8	51.3		R632	56.7	2.4	58.0	52.7
R589	56.3	2.0	57.7	52.0		R633	56.7	1.7	58.1	52.3
R590	56.4	1.8	57.9	52.0		R634	57.5	2.1	58.9	53.4
R591	55.7	2.4	57.0	51.5		R635	56.3	2.0	57.6	52.1
R592	54.6	2.4	56.0	50.5		R636	56.3	2.2	57.7	52.1
R593	52.7	2.4	54.1	48.4		R637	55.2	2.3	56.5	51.0
R594	54.3	2.1	55.7	50.1		R638	53.8	2.1	55.2	49.6
R595	54.6	1.6	56.0	50.0		R639	54.1	2.0	55.5	49.8
R596	54.6	1.2	56.1	50.0		R640	54.7	2.2	56.1	50.4
R597	55.0	0.9	56.5	50.4		R641	55.6	2.3	57.1	50.9
R598	57.1	0.6	58.6	52.2		R642	55.6	2.3	57.1	50.8
R599	55.9	0.6	57.4	50.8		R643	56.8	2.5	58.3	51.8
R600	56.3	0.6	57.8	50.8		R644	57.7	2.2	59.2	52.5
R601	56.9	0.7	58.5	51.1		R645	58.1	2.0	59.7	52.9
R602	57.1	0.5	58.7	51.3						

The Future Conditions noise modeling for Region 10 indicated noise levels below 65 dBA L_{eq}24 at all locations. The increases relative to the Current Conditions ranged from +0.0 to +2.5 dBA. At essentially all locations, these increases were due to the projected increases in traffic volumes on Stoney Trail. In addition, the highest noise levels were at locations at which significant contributors to the noise climate were the intersecting City of Calgary roads and the associated interchanges. In particular, the interchange at Crowchild Trail NW which was under construction during the Current Conditions.

Table 4H. Noise Modeling Results Under Future Conditions for Region 11

Receptor	L_{eq}24 (dBA)	L_{eq}24 Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)		Receptor	L_{eq}24 (dBA)	L_{eq}24 Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R646	58.6	0.6	60.2	52.7		R692	54.1	2.2	55.6	48.8
R647	52.8	1.3	54.4	47.4		R693	54.4	2.3	55.9	49.2
R648	55.3	1.1	56.8	49.9		R694	54.7	2.6	56.2	49.6
R649	51.8	1.4	53.4	46.6		R695	54.1	2.3	55.6	49.1
R650	52.8	2.8	54.3	47.4		R696	54.1	2.4	55.6	49.1
R651	56.6	4.0	58.2	51.2		R697	55.9	1.9	57.4	50.8
R652	55.9	2.9	57.4	50.6		R698	59.4	0.5	60.9	54.0
R653	55.0	2.1	56.5	50.0		R699	58.7	0.6	60.3	53.4
R654	54.2	2.5	55.7	49.3		R700	57.2	1.5	58.7	52.1
R655	55.0	2.5	56.5	50.1		R701	58.1	1.5	59.6	53.0
R656	56.0	2.8	57.5	51.1		R702	54.1	0.9	55.7	48.9
R657	53.4	3.0	54.8	48.6		R703	53.5	1.3	55.0	48.4
R658	54.7	2.9	56.1	49.9		R704	53.4	1.8	54.9	48.4
R659	54.8	2.6	56.3	50.0		R705	54.2	1.8	55.6	49.2
R660	54.5	2.8	55.9	49.7		R706	54.8	1.7	56.3	49.9
R661	55.1	2.7	56.6	50.4		R707	54.8	1.7	56.3	49.8
R662	54.1	2.6	55.5	49.4		R708	54.6	1.8	56.1	49.7
R663	54.3	2.4	55.7	49.6		R709	55.0	1.7	56.5	50.1
R664	55.7	1.2	57.2	50.8		R710	54.7	1.7	56.2	49.9
R665	60.4	1.2	61.9	55.3		R711	53.7	2.0	55.2	49.0
R666	55.2	2.3	56.7	50.5		R712	53.4	2.0	54.9	48.7
R667	54.0	2.6	55.4	49.4		R713	53.3	1.9	54.7	48.5
R668	53.7	2.5	55.1	49.2		R714	52.9	1.9	54.3	48.1
R669	53.7	2.6	55.1	49.3		R715	52.9	1.9	54.3	48.2
R670	53.6	2.6	55.0	49.2		R716	53.7	2.0	55.2	49.1
R671	53.8	2.6	55.3	49.5		R717	54.1	2.2	55.5	49.4
R672	54.0	2.5	55.4	49.6		R718	53.7	2.1	55.2	49.1
R673	53.0	2.8	54.4	48.6		R719	53.1	2.3	54.5	48.5
R674	53.1	2.8	54.5	48.7		R720	53.0	1.9	54.5	48.3
R675	52.9	2.5	54.3	48.5		R721	53.7	2.1	55.1	49.1
R676	53.7	2.5	55.1	49.3		R722	53.2	2.3	54.6	48.7
R677	56.1	3.2	57.5	51.7		R723	53.2	2.4	54.6	48.7
R678	55.3	3.5	56.7	51.0		R724	53.2	2.4	54.6	48.7
R679	54.3	3.0	55.8	49.9		R725	52.5	2.4	53.9	47.9
R680	50.4	2.3	51.9	45.5		R726	53.0	2.3	54.5	48.5
R681	53.6	2.4	55.1	49.1		R727	54.2	2.5	55.6	49.7
R682	54.3	2.4	55.8	49.4		R728	54.1	2.7	55.5	49.5
R683	58.8	2.8	60.3	53.4		R729	54.0	2.6	55.4	49.4
R684	58.5	2.4	60.1	53.0		R730	54.6	2.8	56.0	50.0
R685	56.4	1.5	58.0	51.0		R731	55.5	2.9	57.0	51.0
R686	59.0	1.3	60.7	53.1		R732	53.6	2.7	55.1	48.9
R687	52.0	0.8	53.6	46.1		R733	52.8	2.8	54.2	48.0
R688	52.1	1.3	53.7	46.3		R734	51.5	2.8	53.0	46.7
R689	51.6	1.6	53.2	45.8		R735	50.7	2.5	52.2	45.8
R690	55.8	1.7	57.4	50.3		R736	51.8	2.1	53.3	47.0
R691	54.8	2.0	56.3	49.4						

The Future Conditions noise modeling for Region 11 indicated noise levels below 65 dBA L_{eq}24 at all locations. The increases relative to the Current Conditions ranged from +0.5 to +4.0 dBA. At essentially all locations, these increases were due to the projected increases in traffic volumes on Stoney Trail. In addition, the highest noise levels were at locations at which significant contributors to the noise climate were the intersecting City of Calgary roads and the associated interchanges. In particular, the interchange at Crowchild Trail NW which was under construction during the Current Conditions.

Table 4I. Noise Modeling Results Under Future Conditions for Region 12

Receptor	L_{eq}24 (dBA)	L_{eq}24 Increase Relative to Current Conditions (dBA)	L_{eq}Day (dBA)	L_{eq}Night (dBA)
R737	52.4	2.8	53.9	47.5
R738	51.4	2.5	52.9	46.4
R739	49.2	2.4	50.7	44.2
R740	55.0	2.0	56.5	49.5
R741	55.3	1.8	56.8	49.7
R742	55.6	1.9	57.1	50.0
R743	55.7	1.9	57.3	50.1
R744	56.3	1.9	57.8	50.6
R745	56.4	1.8	58.0	50.7
R746	56.4	1.7	58.0	50.7
R747	56.1	1.9	57.7	50.3
R748	56.9	1.9	58.4	51.1
R749	57.1	1.7	58.7	51.3
R750	57.1	1.6	58.7	51.4
R751	57.0	1.7	58.6	51.2
R752	56.6	1.8	58.2	50.8
R753	56.4	1.6	58.0	50.6
R754	56.0	2.8	57.5	51.0
R755	55.4	2.7	56.9	50.3
R756	55.5	2.7	57.0	50.3
R757	55.8	2.8	57.3	50.5
R758	56.1	2.8	57.6	50.7
R759	57.5	3.0	59.1	51.9
R760	57.1	3.0	58.7	51.5
R761	56.2	3.0	57.8	50.6
R762	56.9	3.2	58.4	51.2
R763	57.6	3.3	59.2	51.9
R764	60.0	3.5	61.6	54.3
R765	61.2	3.7	62.8	55.4
R766	61.6	3.8	63.2	55.8
R767	61.9	3.9	63.5	56.1
R768	61.8	3.8	63.4	56.0
R769	61.5	3.9	63.0	55.7
R770	60.5	3.7	62.1	54.8
R771	59.3	3.8	60.9	53.6
R772	61.5	3.7	63.1	55.8

The Future Conditions noise modeling for Region 12 indicated noise levels below 65 dBA L_{eq}24 at all locations. The increases relative to the Current Conditions ranged from +1.6 to +3.9 dBA. At most locations, these increases were due to the projected increases in traffic volumes on Stoney Trail. In addition, the highest noise levels were at locations at which the dominant noise source was Highway 1.

6.3. Future Conditions Sensitivity Analysis

As part of the study, a sensitivity analysis was performed for the main traffic parameters associated with Stoney Trail. These included the overall traffic volumes, the traffic speeds, and the % heavy trucks. Each was evaluated with an increase and a decrease relative to the future conditions modeled. In addition, the cumulative impact of an increase in all three variables was assessed.

6.3.1. Traffic Volume Analysis

As with any noise source, the relative change in noise level with changing quantity is a simple logarithmic function as indicated below:

$$\Delta SPL = 10\log_{10}\left(relative\ change\right)$$

This means that if the traffic volumes, for example, are doubled, there will be a 3.0 dBA increase. **If there is a relative increase in traffic volumes of 25% (possible error in long term planning horizon), there will be a relative maximum 1.0 dBA increase for locations in which the noise climate is entirely dominated by Stoney Trail (i.e. relative to other City Roadways). Conversely, there is a maximum relative decrease of -1.3 dBA for a relative reduction in traffic volumes of 25%.** At locations in which the noise climate has a greater influence by City Roadways, changes in traffic volumes on Stoney Trail will have less of an impact. Tables 5A – 5I show the $L_{eq}24$ results for the ± 25% vehicles per day conditions as well as the relative change in noise levels at all modeled receptor locations. The relative increase in noise levels with a relative increase of 25% in traffic volumes will not result in any locations along northwest Stoney Trail to have noise levels at or above 65 dBA $L_{eq}24$.

As an aside, typical traffic volumes on typical urban roads only vary a few percent from day-to-day. This means that changes in noise levels from day-to-day are almost entirely dictated by environmental and meteorological conditions, and not by varying traffic volumes.

Table 5A. Effects of Changing Stoney Trail Traffic Volumes for Region 4

Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)		Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)
R217	57.9	0.1		57.6	-0.2		R243	56.6	0.8		54.8	-1.0
R218	59.5	0.1		59.2	-0.2		R244	55.7	0.8		53.9	-1.0
R219	63.5	0.1		63.2	-0.2		R245	55.4	0.8		53.6	-1.0
R220	63.3	0.2		63.0	-0.1		R246	54.8	0.8		53.1	-0.9
R221	59.6	0.3		59.0	-0.3		R247	56.4	0.8		54.7	-0.9
R222	59.6	0.4		58.8	-0.4		R248	54.7	0.8		53.0	-0.9
R223	58.6	0.4		57.8	-0.4		R249	54.7	0.7		53.1	-0.9
R224	55.9	0.4		55.0	-0.5		R250	54.7	0.7		53.1	-0.9
R225	56.6	0.4		55.6	-0.6		R251	55.6	0.7		54.0	-0.9
R226	57.5	0.5		56.5	-0.5		R252	54.0	0.7		52.5	-0.8
R227	57.7	0.6		56.5	-0.6		R253	54.4	0.6		53.0	-0.8
R228	58.7	0.6		57.5	-0.6		R254	53.0	0.6		51.6	-0.8
R229	59.0	0.6		57.7	-0.7		R255	54.4	0.7		53.0	-0.7
R230	59.8	0.6		58.4	-0.8		R256	54.2	0.6		52.9	-0.7
R231	58.3	0.6		56.9	-0.8		R257	54.6	0.5		53.4	-0.7
R232	59.2	0.7		57.6	-0.9		R258	56.3	0.3		55.5	-0.5
R233	58.1	0.7		56.5	-0.9		R259	56.8	0.4		56.0	-0.4
R234	58.7	0.7		57.1	-0.9		R260	56.0	0.1		55.7	-0.2
R235	60.6	0.8		58.8	-1.0		R261	57.4	0.1		57.2	-0.1
R236	60.4	0.8		58.5	-1.1		R262	57.7	0.1		57.5	-0.1
R237	58.8	0.8		56.9	-1.1		R263	60.4	0.1		60.2	-0.1
R238	58.8	0.8		56.9	-1.1		R264	59.1	0.1		58.9	-0.1
R239	59.9	0.8		57.9	-1.2		R265	58.7	0.1		58.6	0.0
R240	60.1	0.9		58.1	-1.1		R266	57.2	0.1		57.1	0.0
R241	59.4	0.8		57.4	-1.2		R267	58.4	0.0		58.3	-0.1
R242	57.2	0.9		55.3	-1.0							

Table 5B. Effects of Changing Stoney Trail Traffic Volumes for Region 5

Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)
R268	58.1	0.2		57.6	-0.3
R269	59.5	0.2		59.1	-0.2
R270	58.3	0.3		57.6	-0.4
R271	57.6	0.3		56.9	-0.4
R272	55.7	0.3		55.0	-0.4
R273	58.4	0.5		57.4	-0.5
R274	56.9	0.5		55.9	-0.5
R275	57.4	0.6		56.1	-0.7
R276	58.5	0.6		57.1	-0.8
R277	57.9	0.7		56.5	-0.7
R278	58.5	0.7		57.1	-0.7
R279	58.5	0.7		56.9	-0.9
R280	56.0	0.6		54.6	-0.8
R281	58.0	0.7		56.5	-0.8
R282	60.1	0.8		58.4	-0.9
R283	59.9	0.7		58.2	-1.0
R284	60.8	0.8		59.1	-0.9
R285	56.4	0.7		55.0	-0.7
R286	60.5	0.7		58.9	-0.9
R287	59.5	0.7		57.9	-0.9
R288	60.2	0.7		58.7	-0.8
R289	60.2	0.7		58.7	-0.8
R290	59.4	0.7		57.9	-0.8
R291	59.4	0.6		58.0	-0.8
R292	58.7	0.6		57.4	-0.7
R293	59.0	0.6		57.8	-0.6
R294	60.1	0.5		59.1	-0.5
R295	59.1	0.4		58.2	-0.5
R296	59.1	0.4		58.3	-0.4
R297	58.3	0.4		57.5	-0.4
R298	57.6	0.4		56.9	-0.3

Table 5C. Effects of Changing Stoney Trail Traffic Volumes for Region 6

Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)		Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)
R299	59.4	0.3		58.9	-0.2		R338	58.4	0.5		57.4	-0.5
R300	58.4	0.4		57.6	-0.4		R339	57.0	0.4		56.2	-0.4
R301	59.7	0.4		58.9	-0.4		R340	59.8	0.2		59.4	-0.2
R302	60.3	0.4		59.5	-0.4		R341	59.9	0.1		59.6	-0.2
R303	60.6	0.4		59.7	-0.5		R342	60.1	0.1		59.9	-0.1
R304	62.2	0.3		61.5	-0.4		R343	60.5	0.0		60.4	-0.1
R305	63.8	0.3		63.2	-0.3		R344	57.7	0.8		55.9	-1.0
R306	62.3	0.4		61.4	-0.5		R345	57.5	0.8		55.7	-1.0
R307	61.5	0.4		60.6	-0.5		R346	54.4	0.8		52.6	-1.0
R308	61.1	0.5		59.9	-0.7		R347	57.0	0.8		55.1	-1.1
R309	61.1	0.6		59.8	-0.7		R348	57.7	0.9		55.8	-1.0
R310	62.2	0.7		60.8	-0.7		R349	58.5	0.9		56.5	-1.1
R311	61.4	0.7		59.8	-0.9		R350	56.2	0.9		54.3	-1.0
R312	63.2	0.8		61.5	-0.9		R351	56.0	0.8		54.1	-1.1
R313	62.7	0.7		61.0	-1.0		R352	56.5	0.8		54.6	-1.1
R314	61.6	0.8		59.8	-1.0		R353	56.9	0.9		54.9	-1.1
R315	63.4	0.8		61.5	-1.1		R354	55.9	1.0		53.8	-1.1
R316	60.9	0.9		58.9	-1.1		R355	58.1	0.9		56.0	-1.2
R317	59.7	0.9		57.8	-1.0		R356	57.2	0.9		55.2	-1.1
R318	62.2	0.9		60.1	-1.2		R357	59.4	0.9		57.4	-1.1
R319	59.4	0.9		57.4	-1.1		R358	58.4	0.9		56.4	-1.1
R320	63.4	0.9		61.3	-1.2		R359	58.9	0.9		56.8	-1.2
R321	62.8	0.9		60.7	-1.2		R360	58.5	0.9		56.5	-1.1
R322	63.0	1.0		60.8	-1.2		R361	57.0	0.8		55.1	-1.1
R323	62.2	1.0		60.0	-1.2		R362	57.8	0.9		55.8	-1.1
R324	62.3	0.9		60.2	-1.2		R363	58.5	0.9		56.6	-1.0
R325	61.2	1.0		59.1	-1.1		R364	59.5	0.8		57.7	-1.0
R326	60.6	0.9		58.6	-1.1		R365	59.2	0.8		57.4	-1.0
R327	60.1	0.9		58.1	-1.1		R366	58.4	0.8		56.7	-0.9
R328	57.6	0.9		55.7	-1.0		R367	59.4	0.7		57.8	-0.9
R329	56.4	0.6		55.1	-0.7		R368	60.6	0.6		59.3	-0.7
R330	57.7	0.8		55.9	-1.0		R369	57.6	0.5		56.6	-0.5
R331	58.4	0.8		56.6	-1.0		R370	56.7	0.5		55.7	-0.5
R332	57.6	0.7		56.0	-0.9		R371	56.8	0.3		56.1	-0.4
R333	57.6	0.7		56.1	-0.8		R372	58.7	0.4		57.9	-0.4
R334	60.2	0.7		58.7	-0.8		R373	55.9	0.2		55.4	-0.3
R335	59.1	0.6		57.8	-0.7		R374	56.7	0.3		56.1	-0.3
R336	59.0	0.6		57.7	-0.7		R375	56.6	0.3		56.0	-0.3
R337	58.7	0.5		57.6	-0.6							

Table 5D. Effects of Changing Stoney Trail Traffic Volumes for Region 7

Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)		Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)
R376	64.1	0.1		64.0	0.0		R415	62.9	0.2		62.6	-0.1
R377	59.4	0.1		59.1	-0.2		R416	60.1	0.1		59.9	-0.1
R378	58.0	0.2		57.6	-0.2		R417	59.2	0.2		58.9	-0.1
R379	57.7	0.3		57.1	-0.3		R418	59.0	0.2		58.6	-0.2
R380	57.6	0.2		57.0	-0.4		R419	58.9	0.3		58.3	-0.3
R381	57.2	0.3		56.5	-0.4		R420	56.9	0.5		55.8	-0.6
R382	56.8	0.4		56.0	-0.4		R421	55.1	0.5		54.0	-0.6
R383	57.4	0.5		56.5	-0.4		R422	55.2	0.5		54.3	-0.4
R384	57.7	0.4		56.9	-0.4		R423	60.9	0.2		60.6	-0.1
R385	56.9	0.3		56.2	-0.4		R424	55.4	0.5		54.4	-0.5
R386	53.8	0.5		52.8	-0.5		R425	54.3	0.6		53.0	-0.7
R387	57.3	0.4		56.5	-0.4		R426	56.5	0.7		55.0	-0.8
R388	58.8	0.5		57.8	-0.5		R427	57.6	0.7		56.0	-0.9
R389	55.6	0.4		54.7	-0.5		R428	59.0	0.8		57.4	-0.8
R390	51.8	0.5		50.8	-0.5		R429	57.7	0.7		56.2	-0.8
R391	53.9	0.5		52.7	-0.7		R430	58.3	0.7		56.8	-0.8
R392	52.9	0.6		51.6	-0.7		R431	57.0	0.7		55.5	-0.8
R393	53.0	0.6		51.8	-0.6		R432	54.0	0.6		52.7	-0.7
R394	54.8	0.7		53.3	-0.8		R433	52.8	0.6		51.4	-0.8
R395	56.2	0.7		54.7	-0.8		R434	54.5	0.7		53.1	-0.7
R396	56.1	0.7		54.6	-0.8		R435	55.3	0.7		53.9	-0.7
R397	54.9	0.7		53.4	-0.8		R436	53.6	0.6		52.3	-0.7
R398	53.8	0.7		52.4	-0.7		R437	53.3	0.5		52.1	-0.7
R399	54.2	0.7		52.7	-0.8		R438	53.2	0.5		52.1	-0.6
R400	56.8	0.7		55.3	-0.8		R439	53.3	0.5		52.3	-0.5
R401	57.5	0.7		56.0	-0.8		R440	53.3	0.4		52.4	-0.5
R402	57.3	0.6		56.0	-0.7		R441	54.1	0.4		53.2	-0.5
R403	58.5	0.6		57.1	-0.8		R442	56.1	0.2		55.7	-0.2
R404	56.9	0.6		55.6	-0.7		R443	55.5	0.3		54.9	-0.3
R405	57.2	0.6		55.9	-0.7		R444	53.0	0.3		52.3	-0.4
R406	55.5	0.6		54.2	-0.7		R445	53.8	0.3		53.1	-0.4
R407	60.1	0.7		58.7	-0.7		R446	52.7	0.3		52.1	-0.3
R408	59.4	0.7		58.0	-0.7		R447	53.1	0.2		52.6	-0.3
R409	58.9	0.7		57.5	-0.7		R448	55.1	0.3		54.5	-0.3
R410	57.7	0.7		56.3	-0.7		R449	55.4	0.3		54.8	-0.3
R411	59.4	0.5		58.2	-0.7		R450	56.1	0.3		55.6	-0.2
R412	59.3	0.4		58.4	-0.5		R451	56.7	0.1		56.4	-0.2
R413	59.0	0.3		58.3	-0.4		R452	60.4	0.1		60.2	-0.1
R414	54.2	0.3		53.6	-0.3							

Table 5E. Effects of Changing Stoney Trail Traffic Volumes for Region 8

Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)		Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)
R453	60.8	0.1		60.6	-0.1		R478	53.5	0.6		52.1	-0.8
R454	55.7	0.4		55.0	-0.3		R479	52.7	0.6		51.4	-0.7
R455	57.0	0.4		56.3	-0.3		R480	53.5	0.5		52.3	-0.7
R456	56.7	0.4		55.8	-0.5		R481	54.7	0.5		53.5	-0.7
R457	56.8	0.5		55.8	-0.5		R482	56.6	0.5		55.7	-0.4
R458	57.2	0.5		56.2	-0.5		R483	57.9	0.2		57.3	-0.4
R459	57.6	0.5		56.6	-0.5		R484	55.6	0.2		55.2	-0.2
R460	57.6	0.5		56.5	-0.6		R485	59.2	0.1		59.0	-0.1
R461	57.7	0.6		56.5	-0.6		R486	59.3	0.1		59.2	0.0
R462	58.3	0.5		57.1	-0.7		R487	56.7	0.2		56.4	-0.1
R463	57.8	0.6		56.5	-0.7		R488	56.4	0.2		55.9	-0.3
R464	56.7	0.5		55.5	-0.7		R489	54.9	0.5		54.0	-0.4
R465	56.5	0.3		55.8	-0.4		R490	53.7	0.5		52.7	-0.5
R466	57.8	0.3		57.3	-0.2		R491	54.3	0.5		53.3	-0.5
R467	57.7	0.2		57.2	-0.3		R492	53.9	0.4		53.0	-0.5
R468	54.7	0.6		53.4	-0.7		R493	54.4	0.5		53.3	-0.6
R469	54.7	0.6		53.3	-0.8		R494	54.6	0.6		53.2	-0.8
R470	55.0	0.7		53.5	-0.8		R495	54.9	0.7		53.5	-0.7
R471	55.0	0.6		53.5	-0.9		R496	55.3	0.7		53.8	-0.8
R472	54.4	0.7		52.9	-0.8		R497	55.9	0.8		54.3	-0.8
R473	53.2	0.7		51.8	-0.7		R498	56.2	0.7		54.6	-0.9
R474	52.3	0.6		50.9	-0.8		R499	56.9	0.7		55.3	-0.9
R475	51.8	0.6		50.4	-0.8		R500	57.6	0.7		56.0	-0.9
R476	52.2	0.6		50.9	-0.7		R501	57.4	0.7		55.8	-0.9
R477	52.7	0.6		51.4	-0.7		R502	57.6	0.8		55.9	-0.9

Table 5F. Effects of Changing Stoney Trail Traffic Volumes for Region 9

Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)		Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)
R503	58.4	0.0		58.4	0.0		R531	54.8	0.9		52.8	-1.1
R504	57.5	0.0		57.4	-0.1		R532	56.1	0.9		54.0	-1.2
R505	57.8	0.0		57.7	-0.1		R533	56.7	0.9		54.7	-1.1
R506	55.9	0.2		55.5	-0.2		R534	57.3	0.9		55.3	-1.1
R507	55.8	0.5		54.8	-0.5		R535	57.9	0.9		55.8	-1.2
R508	55.8	0.6		54.5	-0.7		R536	58.3	0.9		56.2	-1.2
R509	56.1	0.7		54.6	-0.8		R537	58.2	0.9		56.1	-1.2
R510	56.3	0.7		54.7	-0.9		R538	58.4	0.9		56.3	-1.2
R511	56.1	0.7		54.4	-1.0		R539	59.0	0.9		57.0	-1.1
R512	55.7	0.7		54.0	-1.0		R540	55.6	0.9		53.6	-1.1
R513	56.0	0.8		54.2	-1.0		R541	55.5	0.8		53.6	-1.1
R514	56.9	0.8		55.1	-1.0		R542	55.8	0.8		53.9	-1.1
R515	56.9	0.8		55.0	-1.1		R543	58.6	0.9		56.6	-1.1
R516	56.1	0.9		54.2	-1.0		R544	60.0	0.9		58.0	-1.1
R517	55.3	0.9		53.4	-1.0		R545	59.6	0.8		57.7	-1.1
R518	54.9	0.9		53.0	-1.0		R546	59.1	0.8		57.2	-1.1
R519	55.7	0.8		53.8	-1.1		R547	58.8	0.8		57.0	-1.0
R520	54.4	0.8		52.5	-1.1		R548	58.5	0.8		56.7	-1.0
R521	52.7	0.8		50.9	-1.0		R549	53.4	0.7		51.8	-0.9
R522	52.9	0.9		50.9	-1.1		R550	52.5	0.6		51.3	-0.6
R523	53.5	0.8		51.7	-1.0		R551	55.2	0.5		54.2	-0.5
R524	53.3	0.8		51.5	-1.0		R552	55.6	0.5		54.5	-0.6
R525	53.2	0.9		51.3	-1.0		R553	53.7	0.4		52.7	-0.6
R526	52.9	0.9		50.8	-1.2		R554	53.1	0.2		52.6	-0.3
R527	53.9	0.9		52.0	-1.0		R555	55.6	0.2		55.3	-0.1
R528	55.5	0.8		53.7	-1.0		R556	61.4	0.0		61.4	0.0
R529	58.6	0.9		56.6	-1.1		R557	62.1	0.0		62.1	0.0
R530	55.4	0.9		53.3	-1.2		R558	60.5	0.1		60.4	0.0

Table 5G. Effects of Changing Stoney Trail Traffic Volumes for Region 10

Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)		Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)
R559	59.0	0.1		58.8	-0.1		R603	55.9	0.3		55.4	-0.2
R560	59.9	0.0		59.8	-0.1		R604	55.6	0.3		55.0	-0.3
R561	58.3	0.1		58.2	0.0		R605	55.1	0.3		54.5	-0.3
R562	59.8	0.1		59.6	-0.1		R606	55.6	0.4		54.9	-0.3
R563	57.4	0.1		57.3	0.0		R607	56.5	0.3		55.8	-0.4
R564	54.6	0.3		53.9	-0.4		R608	56.6	0.3		56.1	-0.2
R565	53.7	0.4		52.9	-0.4		R609	57.2	0.1		56.9	-0.2
R566	54.0	0.3		53.3	-0.4		R610	58.3	0.1		58.1	-0.1
R567	54.0	0.4		53.2	-0.4		R611	54.2	0.1		53.9	-0.2
R568	53.5	0.3		52.8	-0.4		R612	54.2	0.2		53.8	-0.2
R569	51.6	0.4		50.7	-0.5		R613	53.4	0.2		53.0	-0.2
R570	52.2	0.5		51.2	-0.5		R614	55.6	0.2		55.1	-0.3
R571	51.3	0.6		50.0	-0.7		R615	59.3	0.2		58.9	-0.2
R572	50.2	0.6		49.0	-0.6		R616	54.9	0.3		54.3	-0.3
R573	48.6	0.6		47.4	-0.6		R617	52.5	0.6		51.2	-0.7
R574	49.1	0.6		47.7	-0.8		R618	53.7	0.8		52.0	-0.9
R575	50.0	0.7		48.5	-0.8		R619	53.2	0.8		51.5	-0.9
R576	49.3	0.7		47.9	-0.7		R620	55.7	0.7		54.1	-0.9
R577	51.8	0.7		50.3	-0.8		R621	55.6	0.7		54.0	-0.9
R578	52.5	0.7		50.9	-0.9		R622	56.9	0.8		55.2	-0.9
R579	52.8	0.7		51.2	-0.9		R623	57.6	0.8		55.9	-0.9
R580	55.0	0.8		53.2	-1.0		R624	55.0	0.8		53.3	-0.9
R581	58.0	0.8		56.1	-1.1		R625	53.2	0.8		51.5	-0.9
R582	58.9	0.8		57.0	-1.1		R626	52.6	0.7		51.1	-0.8
R583	57.7	0.6		56.2	-0.9		R627	52.5	0.7		51.0	-0.8
R584	56.2	0.6		55.0	-0.6		R628	52.4	0.7		50.9	-0.8
R585	55.1	0.8		53.3	-1.0		R629	53.6	0.7		52.1	-0.8
R586	57.2	0.6		55.8	-0.8		R630	54.3	0.7		52.7	-0.9
R587	57.8	0.7		56.4	-0.7		R631	56.0	0.7		54.4	-0.9
R588	56.2	0.8		54.5	-0.9		R632	57.4	0.7		55.9	-0.8
R589	57.0	0.7		55.6	-0.7		R633	57.3	0.6		56.1	-0.6
R590	57.0	0.6		55.7	-0.7		R634	58.2	0.7		56.7	-0.8
R591	56.4	0.7		54.8	-0.9		R635	56.9	0.6		55.5	-0.8
R592	55.3	0.7		53.7	-0.9		R636	57.0	0.7		55.5	-0.8
R593	53.4	0.7		52.0	-0.7		R637	55.8	0.6		54.3	-0.9
R594	55.0	0.7		53.5	-0.8		R638	54.5	0.7		53.0	-0.8
R595	55.1	0.5		53.9	-0.7		R639	54.7	0.6		53.3	-0.8
R596	55.2	0.6		54.0	-0.6		R640	55.3	0.6		54.1	-0.6
R597	55.5	0.5		54.4	-0.6		R641	56.1	0.5		55.1	-0.5
R598	57.5	0.4		56.6	-0.5		R642	56.1	0.5		55.2	-0.4
R599	56.3	0.4		55.4	-0.5		R643	57.1	0.3		56.4	-0.4
R600	56.6	0.3		55.9	-0.4		R644	57.9	0.2		57.4	-0.3
R601	57.1	0.2		56.6	-0.3		R645	58.4	0.3		57.9	-0.2
R602	57.3	0.2		56.9	-0.2							

Table 5H. Effects of Changing Stoney Trail Traffic Volumes for Region 11

Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)		Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)
R646	58.7	0.1		58.5	-0.1		R692	54.5	0.4		53.5	-0.6
R647	53.1	0.3		52.6	-0.2		R693	54.9	0.5		53.8	-0.6
R648	55.5	0.2		55.0	-0.3		R694	55.2	0.5		54.1	-0.6
R649	52.2	0.4		51.4	-0.4		R695	54.7	0.6		53.5	-0.6
R650	53.2	0.4		52.3	-0.5		R696	54.7	0.6		53.4	-0.7
R651	57.1	0.5		56.1	-0.5		R697	56.4	0.5		55.2	-0.7
R652	56.4	0.5		55.3	-0.6		R698	59.7	0.3		59.1	-0.3
R653	55.6	0.6		54.3	-0.7		R699	59.1	0.4		58.4	-0.3
R654	54.9	0.7		53.5	-0.7		R700	57.7	0.5		56.6	-0.6
R655	55.7	0.7		54.2	-0.8		R701	58.6	0.5		57.5	-0.6
R656	56.7	0.7		55.2	-0.8		R702	54.5	0.4		53.8	-0.3
R657	54.1	0.7		52.5	-0.9		R703	54.0	0.5		53.0	-0.5
R658	55.4	0.7		53.8	-0.9		R704	53.9	0.5		52.7	-0.7
R659	55.6	0.8		54.0	-0.8		R705	54.7	0.5		53.5	-0.7
R660	55.3	0.8		53.6	-0.9		R706	55.4	0.6		54.1	-0.7
R661	55.9	0.8		54.2	-0.9		R707	55.3	0.5		54.1	-0.7
R662	54.8	0.7		53.2	-0.9		R708	55.2	0.6		53.9	-0.7
R663	55.0	0.7		53.4	-0.9		R709	55.6	0.6		54.3	-0.7
R664	56.2	0.5		55.2	-0.5		R710	55.3	0.6		54.0	-0.7
R665	60.8	0.4		59.9	-0.5		R711	54.4	0.7		52.9	-0.8
R666	56.0	0.8		54.4	-0.8		R712	54.1	0.7		52.6	-0.8
R667	54.8	0.8		53.0	-1.0		R713	53.9	0.6		52.5	-0.8
R668	54.5	0.8		52.7	-1.0		R714	53.5	0.6		52.2	-0.7
R669	54.5	0.8		52.7	-1.0		R715	53.5	0.6		52.1	-0.8
R670	54.4	0.8		52.5	-1.1		R716	54.4	0.7		52.9	-0.8
R671	54.7	0.9		52.8	-1.0		R717	54.8	0.7		53.2	-0.9
R672	54.8	0.8		53.0	-1.0		R718	54.5	0.8		52.9	-0.8
R673	53.8	0.8		52.0	-1.0		R719	53.8	0.7		52.2	-0.9
R674	53.9	0.8		52.1	-1.0		R720	53.7	0.7		52.3	-0.7
R675	53.7	0.8		51.9	-1.0		R721	54.4	0.7		52.9	-0.8
R676	54.5	0.8		52.7	-1.0		R722	54.0	0.8		52.3	-0.9
R677	56.9	0.8		55.0	-1.1		R723	54.0	0.8		52.3	-0.9
R678	56.2	0.9		54.3	-1.0		R724	54.0	0.8		52.3	-0.9
R679	55.1	0.8		53.4	-0.9		R725	53.2	0.7		51.5	-1.0
R680	51.0	0.6		49.7	-0.7		R726	53.8	0.8		52.1	-0.9
R681	54.4	0.8		52.7	-0.9		R727	55.0	0.8		53.3	-0.9
R682	54.9	0.6		53.7	-0.6		R728	54.8	0.7		53.1	-1.0
R683	59.1	0.3		58.5	-0.3		R729	54.7	0.7		53.1	-0.9
R684	58.7	0.2		58.3	-0.2		R730	55.4	0.8		53.6	-1.0
R685	56.7	0.3		56.1	-0.3		R731	56.3	0.8		54.6	-0.9
R686	59.1	0.1		59.0	0.0		R732	54.3	0.7		52.7	-0.9
R687	52.0	0.0		51.9	-0.1		R733	53.5	0.7		51.9	-0.9
R688	52.3	0.2		52.0	-0.1		R734	52.3	0.8		50.7	-0.8
R689	51.8	0.2		51.3	-0.3		R735	51.4	0.7		49.9	-0.8
R690	56.1	0.3		55.5	-0.3		R736	52.5	0.7		51.1	-0.7
R691	55.1	0.3		54.4	-0.4							

Table 5I. Effects of Changing Stoney Trail Traffic Volumes for Region 12

Receptor	L_{eq}24 with +25% Vehicles Per Day (dBA)	Increase Compared to Future Vehicles Per Day (dBA)		L_{eq}24 with -25% Vehicles Per Day (dBA)	Decrease Compared to Future Vehicles Per Day (dBA)
R737	53.2	0.8		51.3	-1.1
R738	52.1	0.7		50.6	-0.8
R739	49.9	0.7		48.4	-0.8
R740	55.3	0.3		54.6	-0.4
R741	55.6	0.3		55.0	-0.3
R742	55.8	0.2		55.3	-0.3
R743	56.0	0.3		55.5	-0.2
R744	56.5	0.2		56.1	-0.2
R745	56.6	0.2		56.3	-0.1
R746	56.5	0.1		56.2	-0.2
R747	56.2	0.1		56.0	-0.1
R748	56.9	0.0		56.8	-0.1
R749	57.2	0.1		57.1	0.0
R750	57.2	0.1		57.1	0.0
R751	57.0	0.0		56.9	-0.1
R752	56.6	0.0		56.6	0.0
R753	56.4	0.0		56.4	0.0
R754	56.7	0.7		55.0	-1.0
R755	56.1	0.7		54.6	-0.8
R756	56.1	0.6		54.8	-0.7
R757	56.3	0.5		55.1	-0.7
R758	56.6	0.5		55.5	-0.6
R759	57.8	0.3		57.2	-0.3
R760	57.4	0.3		56.9	-0.2
R761	56.5	0.3		56.0	-0.2
R762	57.1	0.2		56.6	-0.3
R763	57.8	0.2		57.5	-0.1
R764	60.1	0.1		59.9	-0.1
R765	61.2	0.0		61.1	-0.1
R766	61.6	0.0		61.6	0.0
R767	61.9	0.0		61.9	0.0
R768	61.8	0.0		61.8	0.0
R769	61.5	0.0		61.5	0.0
R770	60.6	0.1		60.5	0.0
R771	59.3	0.0		59.3	0.0
R772	61.5	0.0		61.5	0.0

6.3.2. Traffic Speed Analysis

In order to determine the effect of different traffic speeds, two scenarios were modeled. The baseline future conditions case included a speed of 100 km/hr on Stoney Trail throughout the entire study area. This speed was increased to 110 km/hr and then decreased to 90 km/hr to determine the relative change compared to 100 km/hr. It is unlikely that the posted traffic speeds will fall outside of this range. Tables 6A – 6I show the $L_{eq}24$ results for both the 110 km/hr and 90 km/hr conditions as well as the change in noise levels (relative to 100 km/hr) at all modeled receptor locations. **When increasing the speed to 110 km/hr, the noise levels increased by 0.0 – 0.6 dBA. When reducing the speed to 90 km/hr, the noise levels decreased by 0.0 – 0.6 dBA.** As with the traffic volumes assessment, the largest changes were at locations where the noise climate was completely dominated by the noise from Stoney Trail. The locations with the lowest changes were those where the noise climate was dominated by City of Calgary Roads. The relative increase in noise levels with a speed increase to 110 km/hr will not result in any locations along northwest Stoney Trail to have noise levels at or above 65 dBA $L_{eq}24$. Given that a minimum 2.0 – 3.0 dBA change is required before most people start to notice a change, changing the traffic speeds will not significantly impact the perceived noise climate.

Table 6A. Effects of Changing Stoney Trail Traffic Speed for Region 4

Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)		Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)
R217	57.9	0.1		57.7	-0.1		R243	56.4	0.6		55.3	-0.5
R218	59.5	0.1		59.3	-0.1		R244	55.4	0.5		54.4	-0.5
R219	63.5	0.1		63.3	-0.1		R245	55.1	0.5		54.1	-0.5
R220	63.3	0.2		63.1	0.0		R246	54.5	0.5		53.6	-0.4
R221	59.5	0.2		59.1	-0.2		R247	56.2	0.6		55.2	-0.4
R222	59.5	0.3		59.0	-0.2		R248	54.4	0.5		53.5	-0.4
R223	58.4	0.2		58.0	-0.2		R249	54.4	0.4		53.6	-0.4
R224	55.7	0.2		55.2	-0.3		R250	54.5	0.5		53.6	-0.4
R225	56.5	0.3		55.9	-0.3		R251	55.3	0.4		54.4	-0.5
R226	57.4	0.4		56.8	-0.2		R252	53.7	0.4		52.9	-0.4
R227	57.5	0.4		56.8	-0.3		R253	54.2	0.4		53.4	-0.4
R228	58.5	0.4		57.8	-0.3		R254	52.8	0.4		52.0	-0.4
R229	58.8	0.4		58.1	-0.3		R255	54.2	0.5		53.4	-0.3
R230	59.6	0.4		58.8	-0.4		R256	54.0	0.4		53.3	-0.3
R231	58.1	0.4		57.3	-0.4		R257	54.4	0.3		53.8	-0.3
R232	59.0	0.5		58.1	-0.4		R258	56.2	0.2		55.7	-0.3
R233	57.8	0.4		56.9	-0.5		R259	56.6	0.2		56.2	-0.2
R234	58.5	0.5		57.5	-0.5		R260	56.0	0.1		55.8	-0.1
R235	60.3	0.5		59.3	-0.5		R261	57.4	0.1		57.2	-0.1
R236	60.1	0.5		59.1	-0.5		R262	57.7	0.1		57.6	0.0
R237	58.5	0.5		57.5	-0.5		R263	60.3	0.0		60.3	0.0
R238	58.5	0.5		57.4	-0.6		R264	59.1	0.1		59.0	0.0
R239	59.6	0.5		58.5	-0.6		R265	58.7	0.1		58.6	0.0
R240	59.8	0.6		58.7	-0.5		R266	57.2	0.1		57.1	0.0
R241	59.1	0.5		58.0	-0.6		R267	58.4	0.0		58.4	0.0
R242	56.9	0.6		55.8	-0.5							

Table 6B. Effects of Changing Stoney Trail Traffic Speed for Region 5

Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)
R268	58.0	0.1		57.7	-0.2
R269	59.5	0.2		59.2	-0.1
R270	58.2	0.2		57.8	-0.2
R271	57.5	0.2		57.1	-0.2
R272	55.6	0.2		55.2	-0.2
R273	58.2	0.3		57.6	-0.3
R274	56.7	0.3		56.2	-0.2
R275	57.2	0.4		56.5	-0.3
R276	58.3	0.4		57.5	-0.4
R277	57.6	0.4		56.9	-0.3
R278	58.3	0.5		57.5	-0.3
R279	58.3	0.5		57.4	-0.4
R280	55.8	0.4		55.0	-0.4
R281	57.7	0.4		56.9	-0.4
R282	59.8	0.5		58.9	-0.4
R283	59.7	0.5		58.7	-0.5
R284	60.5	0.5		59.6	-0.4
R285	56.1	0.4		55.4	-0.3
R286	60.2	0.4		59.3	-0.5
R287	59.2	0.4		58.4	-0.4
R288	60.0	0.5		59.1	-0.4
R289	60.0	0.5		59.1	-0.4
R290	59.1	0.4		58.3	-0.4
R291	59.2	0.4		58.4	-0.4
R292	58.4	0.3		57.7	-0.4
R293	58.8	0.4		58.1	-0.3
R294	59.9	0.3		59.4	-0.2
R295	59.0	0.3		58.4	-0.3
R296	58.9	0.2		58.5	-0.2
R297	58.1	0.2		57.7	-0.2
R298	57.4	0.2		57.1	-0.1

Table 6C. Effects of Changing Stoney Trail Traffic Speed for Region 6

Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)		Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)
R299	59.3	0.2		59.0	-0.1		R338	58.2	0.3		57.7	-0.2
R300	58.3	0.3		57.8	-0.2		R339	56.8	0.2		56.4	-0.2
R301	59.6	0.3		59.1	-0.2		R340	59.8	0.2		59.5	-0.1
R302	60.2	0.3		59.7	-0.2		R341	59.8	0.0		59.7	-0.1
R303	60.4	0.2		59.9	-0.3		R342	60.1	0.1		60.0	0.0
R304	62.1	0.2		61.7	-0.2		R343	60.5	0.0		60.4	-0.1
R305	63.7	0.2		63.3	-0.2		R344	57.4	0.5		56.4	-0.5
R306	62.1	0.2		61.7	-0.2		R345	57.2	0.5		56.2	-0.5
R307	61.4	0.3		60.8	-0.3		R346	54.1	0.5		53.1	-0.5
R308	60.9	0.3		60.3	-0.3		R347	56.7	0.5		55.7	-0.5
R309	60.9	0.4		60.1	-0.4		R348	57.4	0.6		56.3	-0.5
R310	62.0	0.5		61.2	-0.3		R349	58.2	0.6		57.1	-0.5
R311	61.1	0.4		60.3	-0.4		R350	55.9	0.6		54.8	-0.5
R312	62.9	0.5		62.0	-0.4		R351	55.7	0.5		54.7	-0.5
R313	62.5	0.5		61.5	-0.5		R352	56.2	0.5		55.2	-0.5
R314	61.3	0.5		60.3	-0.5		R353	56.6	0.6		55.5	-0.5
R315	63.1	0.5		62.0	-0.6		R354	55.5	0.6		54.4	-0.5
R316	60.6	0.6		59.5	-0.5		R355	57.8	0.6		56.6	-0.6
R317	59.4	0.6		58.3	-0.5		R356	56.9	0.6		55.8	-0.5
R318	61.9	0.6		60.7	-0.6		R357	59.1	0.6		58.0	-0.5
R319	59.1	0.6		58.0	-0.5		R358	58.1	0.6		57.0	-0.5
R320	63.1	0.6		61.9	-0.6		R359	58.6	0.6		57.4	-0.6
R321	62.5	0.6		61.3	-0.6		R360	58.2	0.6		57.1	-0.5
R322	62.6	0.6		61.5	-0.5		R361	56.7	0.5		55.7	-0.5
R323	61.8	0.6		60.7	-0.5		R362	57.5	0.6		56.4	-0.5
R324	62.0	0.6		60.8	-0.6		R363	58.2	0.6		57.1	-0.5
R325	60.8	0.6		59.7	-0.5		R364	59.2	0.5		58.2	-0.5
R326	60.3	0.6		59.2	-0.5		R365	58.9	0.5		57.9	-0.5
R327	59.8	0.6		58.7	-0.5		R366	58.1	0.5		57.2	-0.4
R328	57.3	0.6		56.2	-0.5		R367	59.1	0.4		58.3	-0.4
R329	56.2	0.4		55.5	-0.3		R368	60.4	0.4		59.6	-0.4
R330	57.4	0.5		56.5	-0.4		R369	57.4	0.3		56.9	-0.2
R331	58.1	0.5		57.1	-0.5		R370	56.5	0.3		55.9	-0.3
R332	57.4	0.5		56.5	-0.4		R371	56.7	0.2		56.3	-0.2
R333	57.4	0.5		56.5	-0.4		R372	58.6	0.3		58.1	-0.2
R334	60.0	0.5		59.1	-0.4		R373	55.8	0.1		55.6	-0.1
R335	58.9	0.4		58.1	-0.4		R374	56.6	0.2		56.3	-0.1
R336	58.7	0.3		58.0	-0.4		R375	56.5	0.2		56.2	-0.1
R337	58.6	0.4		57.9	-0.3							

Table 6D. Effects of Changing Stoney Trail Traffic Speed for Region 7

Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)		Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)
R376	64.1	0.1		64.0	0.0		R415	62.8	0.1		62.7	0.0
R377	59.4	0.1		59.2	-0.1		R416	60.1	0.1		60.0	0.0
R378	57.9	0.1		57.7	-0.1		R417	59.1	0.1		59.0	0.0
R379	57.6	0.2		57.3	-0.1		R418	59.0	0.2		58.7	-0.1
R380	57.5	0.1		57.2	-0.2		R419	58.8	0.2		58.5	-0.1
R381	57.1	0.2		56.7	-0.2		R420	56.7	0.3		56.1	-0.3
R382	56.7	0.3		56.2	-0.2		R421	54.9	0.3		54.3	-0.3
R383	57.2	0.3		56.7	-0.2		R422	55.0	0.3		54.5	-0.2
R384	57.6	0.3		57.1	-0.2		R423	60.8	0.1		60.7	0.0
R385	56.8	0.2		56.4	-0.2		R424	55.2	0.3		54.7	-0.2
R386	53.6	0.3		53.0	-0.3		R425	54.1	0.4		53.4	-0.3
R387	57.1	0.2		56.7	-0.2		R426	56.3	0.5		55.4	-0.4
R388	58.6	0.3		58.0	-0.3		R427	57.4	0.5		56.5	-0.4
R389	55.5	0.3		54.9	-0.3		R428	58.7	0.5		57.8	-0.4
R390	51.7	0.4		51.1	-0.2		R429	57.5	0.5		56.6	-0.4
R391	53.7	0.3		53.0	-0.4		R430	58.1	0.5		57.2	-0.4
R392	52.7	0.4		52.0	-0.3		R431	56.7	0.4		55.9	-0.4
R393	52.8	0.4		52.1	-0.3		R432	53.8	0.4		53.1	-0.3
R394	54.5	0.4		53.7	-0.4		R433	52.6	0.4		51.8	-0.4
R395	55.9	0.4		55.1	-0.4		R434	54.3	0.5		53.5	-0.3
R396	55.9	0.5		55.0	-0.4		R435	55.1	0.5		54.3	-0.3
R397	54.6	0.4		53.8	-0.4		R436	53.4	0.4		52.6	-0.4
R398	53.5	0.4		52.8	-0.3		R437	53.1	0.3		52.4	-0.4
R399	53.9	0.4		53.1	-0.4		R438	53.0	0.3		52.4	-0.3
R400	56.6	0.5		55.8	-0.3		R439	53.1	0.3		52.5	-0.3
R401	57.3	0.5		56.4	-0.4		R440	53.1	0.2		52.6	-0.3
R402	57.1	0.4		56.3	-0.4		R441	53.9	0.2		53.4	-0.3
R403	58.3	0.4		57.5	-0.4		R442	56.1	0.2		55.8	-0.1
R404	56.7	0.4		55.9	-0.4		R443	55.4	0.2		55.1	-0.1
R405	57.0	0.4		56.3	-0.3		R444	52.9	0.2		52.5	-0.2
R406	55.3	0.4		54.6	-0.3		R445	53.7	0.2		53.3	-0.2
R407	59.9	0.5		59.1	-0.3		R446	52.6	0.2		52.3	-0.1
R408	59.2	0.5		58.4	-0.3		R447	53.0	0.1		52.7	-0.2
R409	58.6	0.4		57.9	-0.3		R448	55.0	0.2		54.7	-0.1
R410	57.4	0.4		56.7	-0.3		R449	55.3	0.2		55.0	-0.1
R411	59.2	0.3		58.6	-0.3		R450	56.0	0.2		55.7	-0.1
R412	59.2	0.3		58.7	-0.2		R451	56.7	0.1		56.5	-0.1
R413	58.9	0.2		58.5	-0.2		R452	60.4	0.1		60.3	0.0
R414	54.1	0.2		53.8	-0.1							

Table 6E. Effects of Changing Stoney Trail Traffic Speed for Region 8

Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)		Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)
R453	60.8	0.1		60.6	-0.1		R478	53.2	0.3		52.5	-0.4
R454	55.5	0.2		55.2	-0.1		R479	52.5	0.4		51.8	-0.3
R455	56.9	0.3		56.5	-0.1		R480	53.3	0.3		52.6	-0.4
R456	56.6	0.3		56.1	-0.2		R481	54.5	0.3		53.8	-0.4
R457	56.6	0.3		56.0	-0.3		R482	56.4	0.3		55.9	-0.2
R458	57.0	0.3		56.5	-0.2		R483	57.8	0.1		57.5	-0.2
R459	57.4	0.3		56.8	-0.3		R484	55.5	0.1		55.3	-0.1
R460	57.5	0.4		56.8	-0.3		R485	59.2	0.1		59.1	0.0
R461	57.5	0.4		56.8	-0.3		R486	59.3	0.1		59.2	0.0
R462	58.1	0.3		57.4	-0.4		R487	56.6	0.1		56.5	0.0
R463	57.5	0.3		56.8	-0.4		R488	56.3	0.1		56.0	-0.2
R464	56.5	0.3		55.8	-0.4		R489	54.7	0.3		54.2	-0.2
R465	56.4	0.2		56.0	-0.2		R490	53.5	0.3		52.9	-0.3
R466	57.7	0.2		57.4	-0.1		R491	54.1	0.3		53.5	-0.3
R467	57.7	0.2		57.4	-0.1		R492	53.8	0.3		53.3	-0.2
R468	54.5	0.4		53.8	-0.3		R493	54.2	0.3		53.6	-0.3
R469	54.5	0.4		53.7	-0.4		R494	54.3	0.3		53.6	-0.4
R470	54.7	0.4		53.9	-0.4		R495	54.6	0.4		53.9	-0.3
R471	54.8	0.4		54.0	-0.4		R496	55.0	0.4		54.2	-0.4
R472	54.1	0.4		53.3	-0.4		R497	55.6	0.5		54.7	-0.4
R473	52.9	0.4		52.2	-0.3		R498	56.0	0.5		55.1	-0.4
R474	52.1	0.4		51.3	-0.4		R499	56.6	0.4		55.7	-0.5
R475	51.6	0.4		50.8	-0.4		R500	57.3	0.4		56.5	-0.4
R476	52.0	0.4		51.2	-0.4		R501	57.1	0.4		56.2	-0.5
R477	52.4	0.3		51.7	-0.4		R502	57.3	0.5		56.4	-0.4

Table 6F. Effects of Changing Stoney Trail Traffic Speed for Region 9

Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)		Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)
R503	58.4	0.0		58.4	0.0		R531	54.5	0.6		53.4	-0.5
R504	57.5	0.0		57.5	0.0		R532	55.7	0.5		54.6	-0.6
R505	57.8	0.0		57.7	-0.1		R533	56.4	0.6		55.3	-0.5
R506	55.9	0.2		55.6	-0.1		R534	57.0	0.6		55.9	-0.5
R507	55.6	0.3		55.1	-0.2		R535	57.6	0.6		56.4	-0.6
R508	55.6	0.4		54.9	-0.3		R536	57.9	0.5		56.8	-0.6
R509	55.8	0.4		55.0	-0.4		R537	57.9	0.6		56.7	-0.6
R510	56.0	0.4		55.1	-0.5		R538	58.1	0.6		56.9	-0.6
R511	55.8	0.4		54.9	-0.5		R539	58.7	0.6		57.6	-0.5
R512	55.4	0.4		54.5	-0.5		R540	55.3	0.6		54.2	-0.5
R513	55.7	0.5		54.7	-0.5		R541	55.2	0.5		54.2	-0.5
R514	56.6	0.5		55.6	-0.5		R542	55.5	0.5		54.5	-0.5
R515	56.6	0.5		55.6	-0.5		R543	58.3	0.6		57.2	-0.5
R516	55.8	0.6		54.7	-0.5		R544	59.6	0.5		58.6	-0.5
R517	55.0	0.6		54.0	-0.4		R545	59.3	0.5		58.3	-0.5
R518	54.6	0.6		53.6	-0.4		R546	58.8	0.5		57.8	-0.5
R519	55.4	0.5		54.4	-0.5		R547	58.5	0.5		57.6	-0.4
R520	54.1	0.5		53.1	-0.5		R548	58.2	0.5		57.2	-0.5
R521	52.4	0.5		51.4	-0.5		R549	53.1	0.4		52.2	-0.5
R522	52.6	0.6		51.5	-0.5		R550	52.3	0.4		51.6	-0.3
R523	53.2	0.5		52.2	-0.5		R551	55.0	0.3		54.4	-0.3
R524	53.0	0.5		52.0	-0.5		R552	55.4	0.3		54.8	-0.3
R525	52.9	0.6		51.8	-0.5		R553	53.6	0.3		53.0	-0.3
R526	52.6	0.6		51.5	-0.5		R554	53.0	0.1		52.7	-0.2
R527	53.6	0.6		52.5	-0.5		R555	55.5	0.1		55.4	0.0
R528	55.2	0.5		54.2	-0.5		R556	61.4	0.0		61.4	0.0
R529	58.3	0.6		57.2	-0.5		R557	62.1	0.0		62.1	0.0
R530	55.1	0.6		53.9	-0.6		R558	60.5	0.1		60.4	0.0

Table 6G. Effects of Changing Stoney Trail Traffic Speed for Region 10

Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)		Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)
R559	58.9	0.0		58.9	0.0		R603	55.8	0.2		55.5	-0.1
R560	59.9	0.0		59.8	-0.1		R604	55.5	0.2		55.2	-0.1
R561	58.3	0.1		58.2	0.0		R605	55.0	0.2		54.7	-0.1
R562	59.7	0.0		59.6	-0.1		R606	55.4	0.2		55.1	-0.1
R563	57.4	0.1		57.3	0.0		R607	56.4	0.2		56.0	-0.2
R564	54.5	0.2		54.1	-0.2		R608	56.5	0.2		56.2	-0.1
R565	53.5	0.2		53.1	-0.2		R609	57.2	0.1		57.0	-0.1
R566	53.9	0.2		53.5	-0.2		R610	58.2	0.0		58.1	-0.1
R567	53.9	0.3		53.4	-0.2		R611	54.2	0.1		54.0	-0.1
R568	53.4	0.2		53.0	-0.2		R612	54.1	0.1		53.9	-0.1
R569	51.5	0.3		51.0	-0.2		R613	53.3	0.1		53.1	-0.1
R570	52.0	0.3		51.4	-0.3		R614	55.5	0.1		55.2	-0.2
R571	51.1	0.4		50.4	-0.3		R615	59.2	0.1		59.0	-0.1
R572	50.0	0.4		49.3	-0.3		R616	54.8	0.2		54.4	-0.2
R573	48.4	0.4		47.7	-0.3		R617	52.2	0.3		51.6	-0.3
R574	48.9	0.4		48.1	-0.4		R618	53.4	0.5		52.5	-0.4
R575	49.7	0.4		48.9	-0.4		R619	52.9	0.5		52.0	-0.4
R576	49.1	0.5		48.3	-0.3		R620	55.5	0.5		54.5	-0.5
R577	51.5	0.4		50.7	-0.4		R621	55.3	0.4		54.4	-0.5
R578	52.3	0.5		51.4	-0.4		R622	56.6	0.5		55.7	-0.4
R579	52.5	0.4		51.7	-0.4		R623	57.4	0.6		56.4	-0.4
R580	54.8	0.6		53.7	-0.5		R624	54.7	0.5		53.8	-0.4
R581	57.7	0.5		56.6	-0.6		R625	52.9	0.5		52.0	-0.4
R582	58.6	0.5		57.5	-0.6		R626	52.4	0.5		51.5	-0.4
R583	57.5	0.4		56.6	-0.5		R627	52.3	0.5		51.4	-0.4
R584	56.0	0.4		55.3	-0.3		R628	52.2	0.5		51.3	-0.4
R585	54.8	0.5		53.8	-0.5		R629	53.4	0.5		52.5	-0.4
R586	57.0	0.4		56.2	-0.4		R630	54.0	0.4		53.1	-0.5
R587	57.5	0.4		56.7	-0.4		R631	55.7	0.4		54.8	-0.5
R588	55.9	0.5		55.0	-0.4		R632	57.1	0.4		56.3	-0.4
R589	56.8	0.5		56.0	-0.3		R633	57.1	0.4		56.4	-0.3
R590	56.8	0.4		56.1	-0.3		R634	58.0	0.5		57.1	-0.4
R591	56.1	0.4		55.2	-0.5		R635	56.7	0.4		55.9	-0.4
R592	55.1	0.5		54.2	-0.4		R636	56.7	0.4		55.9	-0.4
R593	53.1	0.4		52.3	-0.4		R637	55.6	0.4		54.7	-0.5
R594	54.8	0.5		53.9	-0.4		R638	54.2	0.4		53.4	-0.4
R595	55.0	0.4		54.2	-0.4		R639	54.5	0.4		53.7	-0.4
R596	55.0	0.4		54.3	-0.3		R640	55.1	0.4		54.4	-0.3
R597	55.4	0.4		54.7	-0.3		R641	56.0	0.4		55.4	-0.2
R598	57.4	0.3		56.8	-0.3		R642	55.9	0.3		55.4	-0.2
R599	56.2	0.3		55.7	-0.2		R643	57.0	0.2		56.6	-0.2
R600	56.5	0.2		56.1	-0.2		R644	57.8	0.1		57.5	-0.2
R601	57.0	0.1		56.7	-0.2		R645	58.3	0.2		58.0	-0.1
R602	57.3	0.2		57.0	-0.1							

Table 6H. Effects of Changing Stoney Trail Traffic Speed for Region 11

Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)		Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)
R646	58.6	0.0		58.5	-0.1		R692	54.4	0.3		53.8	-0.3
R647	53.0	0.2		52.7	-0.1		R693	54.7	0.3		54.1	-0.3
R648	55.4	0.1		55.1	-0.2		R694	55.1	0.4		54.3	-0.4
R649	52.1	0.3		51.6	-0.2		R695	54.5	0.4		53.8	-0.3
R650	53.1	0.3		52.5	-0.3		R696	54.5	0.4		53.7	-0.4
R651	57.0	0.4		56.4	-0.2		R697	56.3	0.4		55.5	-0.4
R652	56.2	0.3		55.6	-0.3		R698	59.6	0.2		59.2	-0.2
R653	55.5	0.5		54.7	-0.3		R699	59.0	0.3		58.5	-0.2
R654	54.7	0.5		53.8	-0.4		R700	57.5	0.3		56.9	-0.3
R655	55.5	0.5		54.6	-0.4		R701	58.4	0.3		57.7	-0.4
R656	56.5	0.5		55.6	-0.4		R702	54.4	0.3		53.9	-0.2
R657	53.9	0.5		52.9	-0.5		R703	53.8	0.3		53.2	-0.3
R658	55.2	0.5		54.2	-0.5		R704	53.8	0.4		53.0	-0.4
R659	55.4	0.6		54.4	-0.4		R705	54.6	0.4		53.8	-0.4
R660	55.0	0.5		54.0	-0.5		R706	55.2	0.4		54.4	-0.4
R661	55.7	0.6		54.6	-0.5		R707	55.2	0.4		54.4	-0.4
R662	54.6	0.5		53.6	-0.5		R708	55.0	0.4		54.2	-0.4
R663	54.8	0.5		53.8	-0.5		R709	55.4	0.4		54.6	-0.4
R664	56.1	0.4		55.4	-0.3		R710	55.2	0.5		54.3	-0.4
R665	60.7	0.3		60.1	-0.3		R711	54.2	0.5		53.3	-0.4
R666	55.8	0.6		54.8	-0.4		R712	53.9	0.5		53.0	-0.4
R667	54.6	0.6		53.5	-0.5		R713	53.7	0.4		52.9	-0.4
R668	54.3	0.6		53.2	-0.5		R714	53.3	0.4		52.5	-0.4
R669	54.3	0.6		53.2	-0.5		R715	53.4	0.5		52.5	-0.4
R670	54.2	0.6		53.0	-0.6		R716	54.2	0.5		53.3	-0.4
R671	54.4	0.6		53.3	-0.5		R717	54.6	0.5		53.6	-0.5
R672	54.6	0.6		53.5	-0.5		R718	54.3	0.6		53.3	-0.4
R673	53.6	0.6		52.4	-0.6		R719	53.6	0.5		52.6	-0.5
R674	53.7	0.6		52.5	-0.6		R720	53.5	0.5		52.6	-0.4
R675	53.5	0.6		52.4	-0.5		R721	54.2	0.5		53.2	-0.5
R676	54.3	0.6		53.2	-0.5		R722	53.8	0.6		52.7	-0.5
R677	56.7	0.6		55.5	-0.6		R723	53.8	0.6		52.7	-0.5
R678	55.9	0.6		54.7	-0.6		R724	53.7	0.5		52.7	-0.5
R679	54.9	0.6		53.8	-0.5		R725	53.0	0.5		51.9	-0.6
R680	50.8	0.4		50.0	-0.4		R726	53.6	0.6		52.5	-0.5
R681	54.2	0.6		53.1	-0.5		R727	54.7	0.5		53.7	-0.5
R682	54.7	0.4		54.0	-0.3		R728	54.6	0.5		53.5	-0.6
R683	59.0	0.2		58.6	-0.2		R729	54.5	0.5		53.5	-0.5
R684	58.7	0.2		58.4	-0.1		R730	55.1	0.5		54.1	-0.5
R685	56.6	0.2		56.2	-0.2		R731	56.1	0.6		55.0	-0.5
R686	59.1	0.1		59.0	0.0		R732	54.1	0.5		53.1	-0.5
R687	52.0	0.0		51.9	-0.1		R733	53.3	0.5		52.3	-0.5
R688	52.2	0.1		52.0	-0.1		R734	52.1	0.6		51.1	-0.4
R689	51.7	0.1		51.4	-0.2		R735	51.2	0.5		50.3	-0.4
R690	56.0	0.2		55.6	-0.2		R736	52.3	0.5		51.4	-0.4
R691	55.0	0.2		54.6	-0.2							

Table 6I. Effects of Changing Stoney Trail Traffic Speed for Region 12

Receptor	L_{eq}24 with 110 km/hr on Stoney Trail (dBA)	Increase Compared to 100 km/hr (dBA)		L_{eq}24 with 90 km/hr on Stoney Trail (dBA)	Decrease Compared to 100 km/hr (dBA)
R737	53.0	0.6		51.8	-0.6
R738	51.9	0.5		51.0	-0.4
R739	49.7	0.5		48.8	-0.4
R740	55.2	0.2		54.7	-0.3
R741	55.5	0.2		55.1	-0.2
R742	55.7	0.1		55.4	-0.2
R743	55.9	0.2		55.6	-0.1
R744	56.4	0.1		56.2	-0.1
R745	56.5	0.1		56.3	-0.1
R746	56.5	0.1		56.3	-0.1
R747	56.2	0.1		56.0	-0.1
R748	56.9	0.0		56.8	-0.1
R749	57.1	0.0		57.1	0.0
R750	57.2	0.1		57.1	0.0
R751	57.0	0.0		57.0	0.0
R752	56.6	0.0		56.6	0.0
R753	56.4	0.0		56.4	0.0
R754	56.5	0.5		55.5	-0.5
R755	55.9	0.5		55.0	-0.4
R756	55.9	0.4		55.1	-0.4
R757	56.1	0.3		55.4	-0.4
R758	56.4	0.3		55.8	-0.3
R759	57.7	0.2		57.3	-0.2
R760	57.3	0.2		57.0	-0.1
R761	56.4	0.2		56.1	-0.1
R762	57.0	0.1		56.7	-0.2
R763	57.7	0.1		57.5	-0.1
R764	60.1	0.1		59.9	-0.1
R765	61.2	0.0		61.1	-0.1
R766	61.6	0.0		61.6	0.0
R767	61.9	0.0		61.9	0.0
R768	61.8	0.0		61.8	0.0
R769	61.5	0.0		61.5	0.0
R770	60.6	0.1		60.5	0.0
R771	59.3	0.0		59.3	0.0
R772	61.5	0.0		61.5	0.0

6.3.3. % Heavy Trucks Analysis

In order to determine the effect of varying % heavy trucks, two scenarios were modeled. The future conditions were increased by 5% and then decreased by 5% to determine a relative range of values. It is un-likely that the % heavy trucks will fall outside of this range. The results are shown in Tables 7A – 7I. It can be seen that **the relative sound level increase with a relative increase of 5% heavy trucks is approximately 0.0 – 0.9 dBA. The relative sound level decrease with a relative decrease of 5% heavy trucks is approximately 0.0 – 1.1 dBA.** As with the traffic volumes and traffic speeds assessments, the largest changes were at locations where the noise climate was completely dominated by the noise from Stoney Trail. The locations with the lowest changes were those where the noise climate was dominated by City of Calgary Roads. The relative increase in noise levels with a relative increase of 5% heavy trucks will not result in any locations along northwest Stoney Trail to have noise levels at or above 65 dBA $L_{eq}24$. Again, given that a minimum 2.0 – 3.0 dBA change is required before most people start to notice a change, it will take a significant change to the % heavy trucks before most people will notice the difference.

In general, the effect of changing the % heavy trucks is logarithmic. The difference between 0% and 1% is significant (approximately 0.7 dBA) while the difference between 10% and 11% is much less (approximately 0.2 dBA). Since the % heavy trucks is at least 6% during the day-time along the entire Stoney Trail, small % changes will not have a significant impact.

Table 7A. Effects of Changing Stoney Trail % Heavy Trucks for Region 4

Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)		Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)
R217	57.9	0.1		57.6	-0.2		R243	56.6	0.8		54.9	-0.9
R218	59.5	0.1		59.3	-0.1		R244	55.7	0.8		54.0	-0.9
R219	63.5	0.1		63.2	-0.2		R245	55.3	0.7		53.7	-0.9
R220	63.3	0.2		63.0	-0.1		R246	54.8	0.8		53.2	-0.8
R221	59.6	0.3		59.0	-0.3		R247	56.4	0.8		54.8	-0.8
R222	59.6	0.4		58.9	-0.3		R248	54.6	0.7		53.1	-0.8
R223	58.6	0.4		57.8	-0.4		R249	54.7	0.7		53.2	-0.8
R224	55.9	0.4		55.0	-0.5		R250	54.7	0.7		53.2	-0.8
R225	56.6	0.4		55.7	-0.5		R251	55.6	0.7		54.1	-0.8
R226	57.5	0.5		56.5	-0.5		R252	53.9	0.6		52.6	-0.7
R227	57.6	0.5		56.5	-0.6		R253	54.4	0.6		53.0	-0.8
R228	58.6	0.5		57.5	-0.6		R254	53.0	0.6		51.7	-0.7
R229	59.0	0.6		57.8	-0.6		R255	54.4	0.7		53.0	-0.7
R230	59.8	0.6		58.4	-0.8		R256	54.2	0.6		53.0	-0.6
R231	58.3	0.6		57.0	-0.7		R257	54.6	0.5		53.5	-0.6
R232	59.2	0.7		57.7	-0.8		R258	56.3	0.3		55.6	-0.4
R233	58.1	0.7		56.6	-0.8		R259	56.7	0.3		56.1	-0.3
R234	58.7	0.7		57.1	-0.9		R260	56.0	0.1		55.7	-0.2
R235	60.6	0.8		58.9	-0.9		R261	57.4	0.1		57.2	-0.1
R236	60.4	0.8		58.6	-1.0		R262	57.7	0.1		57.5	-0.1
R237	58.8	0.8		57.0	-1.0		R263	60.3	0.0		60.2	-0.1
R238	58.8	0.8		57.0	-1.0		R264	59.1	0.1		58.9	-0.1
R239	59.9	0.8		58.0	-1.1		R265	58.7	0.1		58.6	0.0
R240	60.1	0.9		58.2	-1.0		R266	57.2	0.1		57.1	0.0
R241	59.4	0.8		57.5	-1.1		R267	58.4	0.0		58.3	-0.1
R242	57.1	0.8		55.4	-0.9							

Table 7B. Effects of Changing Stoney Trail % Heavy Trucks for Region 5

Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)
R268	58.1	0.2		57.6	-0.3
R269	59.5	0.2		59.1	-0.2
R270	58.3	0.3		57.7	-0.3
R271	57.6	0.3		56.9	-0.4
R272	55.7	0.3		55.0	-0.4
R273	58.3	0.4		57.4	-0.5
R274	56.9	0.5		55.9	-0.5
R275	57.4	0.6		56.2	-0.6
R276	58.5	0.6		57.2	-0.7
R277	57.8	0.6		56.6	-0.6
R278	58.5	0.7		57.1	-0.7
R279	58.5	0.7		57.0	-0.8
R280	56.0	0.6		54.6	-0.8
R281	58.0	0.7		56.5	-0.8
R282	60.0	0.7		58.5	-0.8
R283	59.9	0.7		58.3	-0.9
R284	60.8	0.8		59.2	-0.8
R285	56.3	0.6		55.1	-0.6
R286	60.5	0.7		59.0	-0.8
R287	59.4	0.6		58.0	-0.8
R288	60.2	0.7		58.7	-0.8
R289	60.2	0.7		58.8	-0.7
R290	59.3	0.6		58.0	-0.7
R291	59.4	0.6		58.1	-0.7
R292	58.6	0.5		57.4	-0.7
R293	58.9	0.5		57.8	-0.6
R294	60.1	0.5		59.2	-0.4
R295	59.1	0.4		58.2	-0.5
R296	59.1	0.4		58.3	-0.4
R297	58.2	0.3		57.6	-0.3
R298	57.6	0.4		56.9	-0.3

Table 7C. Effects of Changing Stoney Trail % Heavy Trucks for Region 6

Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)		Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)
R299	59.4	0.3		58.9	-0.2		R338	58.4	0.5		57.4	-0.5
R300	58.4	0.4		57.6	-0.4		R339	56.9	0.3		56.2	-0.4
R301	59.7	0.4		59.0	-0.3		R340	59.8	0.2		59.4	-0.2
R302	60.3	0.4		59.5	-0.4		R341	59.9	0.1		59.6	-0.2
R303	60.5	0.3		59.7	-0.5		R342	60.1	0.1		60.0	0.0
R304	62.2	0.3		61.5	-0.4		R343	60.5	0.0		60.4	-0.1
R305	63.8	0.3		63.2	-0.3		R344	57.7	0.8		56.0	-0.9
R306	62.3	0.4		61.5	-0.4		R345	57.5	0.8		55.7	-1.0
R307	61.5	0.4		60.6	-0.5		R346	54.3	0.7		52.7	-0.9
R308	61.1	0.5		60.0	-0.6		R347	57.0	0.8		55.2	-1.0
R309	61.0	0.5		59.8	-0.7		R348	57.7	0.9		55.9	-0.9
R310	62.2	0.7		60.8	-0.7		R349	58.4	0.8		56.6	-1.0
R311	61.3	0.6		59.9	-0.8		R350	56.1	0.8		54.3	-1.0
R312	63.1	0.7		61.6	-0.8		R351	56.0	0.8		54.2	-1.0
R313	62.7	0.7		61.1	-0.9		R352	56.5	0.8		54.7	-1.0
R314	61.6	0.8		59.9	-0.9		R353	56.9	0.9		55.0	-1.0
R315	63.4	0.8		61.6	-1.0		R354	55.8	0.9		53.9	-1.0
R316	60.8	0.8		59.1	-0.9		R355	58.1	0.9		56.1	-1.1
R317	59.7	0.9		57.9	-0.9		R356	57.2	0.9		55.3	-1.0
R318	62.1	0.8		60.2	-1.1		R357	59.4	0.9		57.5	-1.0
R319	59.4	0.9		57.5	-1.0		R358	58.4	0.9		56.5	-1.0
R320	63.3	0.8		61.4	-1.1		R359	58.9	0.9		56.9	-1.1
R321	62.8	0.9		60.8	-1.1		R360	58.5	0.9		56.6	-1.0
R322	62.9	0.9		60.9	-1.1		R361	57.0	0.8		55.2	-1.0
R323	62.1	0.9		60.2	-1.0		R362	57.8	0.9		55.9	-1.0
R324	62.3	0.9		60.3	-1.1		R363	58.4	0.8		56.7	-0.9
R325	61.1	0.9		59.2	-1.0		R364	59.5	0.8		57.8	-0.9
R326	60.6	0.9		58.7	-1.0		R365	59.1	0.7		57.5	-0.9
R327	60.1	0.9		58.2	-1.0		R366	58.4	0.8		56.8	-0.8
R328	57.5	0.8		55.8	-0.9		R367	59.3	0.6		57.9	-0.8
R329	56.4	0.6		55.2	-0.6		R368	60.6	0.6		59.3	-0.7
R330	57.7	0.8		56.0	-0.9		R369	57.6	0.5		56.7	-0.4
R331	58.3	0.7		56.7	-0.9		R370	56.6	0.4		55.7	-0.5
R332	57.6	0.7		56.1	-0.8		R371	56.8	0.3		56.1	-0.4
R333	57.6	0.7		56.2	-0.7		R372	58.7	0.4		57.9	-0.4
R334	60.2	0.7		58.8	-0.7		R373	55.9	0.2		55.4	-0.3
R335	59.1	0.6		57.8	-0.7		R374	56.7	0.3		56.2	-0.2
R336	58.9	0.5		57.8	-0.6		R375	56.6	0.3		56.1	-0.2
R337	58.7	0.5		57.7	-0.5							

Table 7D. Effects of Changing Stoney Trail % Heavy Trucks for Region 7

Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)		Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)
R376	64.1	0.1		64.0	0.0		R415	62.8	0.1		62.7	0.0
R377	59.4	0.1		59.1	-0.2		R416	60.1	0.1		59.9	-0.1
R378	58.0	0.2		57.6	-0.2		R417	59.2	0.2		58.9	-0.1
R379	57.7	0.3		57.2	-0.2		R418	59.0	0.2		58.7	-0.1
R380	57.6	0.2		57.1	-0.3		R419	58.9	0.3		58.3	-0.3
R381	57.2	0.3		56.5	-0.4		R420	56.9	0.5		55.8	-0.6
R382	56.8	0.4		56.1	-0.3		R421	55.1	0.5		54.0	-0.6
R383	57.4	0.5		56.5	-0.4		R422	55.1	0.4		54.3	-0.4
R384	57.7	0.4		56.9	-0.4		R423	60.9	0.2		60.6	-0.1
R385	56.9	0.3		56.2	-0.4		R424	55.4	0.5		54.4	-0.5
R386	53.7	0.4		52.8	-0.5		R425	54.3	0.6		53.1	-0.6
R387	57.2	0.3		56.5	-0.4		R426	56.5	0.7		55.1	-0.7
R388	58.8	0.5		57.8	-0.5		R427	57.6	0.7		56.1	-0.8
R389	55.6	0.4		54.7	-0.5		R428	58.9	0.7		57.4	-0.8
R390	51.8	0.5		50.8	-0.5		R429	57.7	0.7		56.2	-0.8
R391	53.9	0.5		52.7	-0.7		R430	58.3	0.7		56.9	-0.7
R392	52.9	0.6		51.7	-0.6		R431	56.9	0.6		55.5	-0.8
R393	53.0	0.6		51.9	-0.5		R432	54.0	0.6		52.7	-0.7
R394	54.7	0.6		53.4	-0.7		R433	52.7	0.5		51.5	-0.7
R395	56.2	0.7		54.7	-0.8		R434	54.5	0.7		53.1	-0.7
R396	56.1	0.7		54.7	-0.7		R435	55.3	0.7		53.9	-0.7
R397	54.8	0.6		53.5	-0.7		R436	53.5	0.5		52.3	-0.7
R398	53.7	0.6		52.5	-0.6		R437	53.3	0.5		52.2	-0.6
R399	54.1	0.6		52.8	-0.7		R438	53.1	0.4		52.2	-0.5
R400	56.8	0.7		55.4	-0.7		R439	53.2	0.4		52.3	-0.5
R401	57.5	0.7		56.1	-0.7		R440	53.3	0.4		52.4	-0.5
R402	57.3	0.6		56.0	-0.7		R441	54.0	0.3		53.3	-0.4
R403	58.5	0.6		57.2	-0.7		R442	56.1	0.2		55.7	-0.2
R404	56.9	0.6		55.6	-0.7		R443	55.5	0.3		54.9	-0.3
R405	57.2	0.6		56.0	-0.6		R444	53.0	0.3		52.4	-0.3
R406	55.5	0.6		54.3	-0.6		R445	53.8	0.3		53.1	-0.4
R407	60.1	0.7		58.7	-0.7		R446	52.7	0.3		52.1	-0.3
R408	59.4	0.7		58.0	-0.7		R447	53.1	0.2		52.6	-0.3
R409	58.8	0.6		57.5	-0.7		R448	55.1	0.3		54.5	-0.3
R410	57.6	0.6		56.4	-0.6		R449	55.4	0.3		54.8	-0.3
R411	59.4	0.5		58.3	-0.6		R450	56.1	0.3		55.6	-0.2
R412	59.3	0.4		58.4	-0.5		R451	56.7	0.1		56.4	-0.2
R413	59.0	0.3		58.3	-0.4		R452	60.4	0.1		60.2	-0.1
R414	54.2	0.3		53.7	-0.2							

Table 7E. Effects of Changing Stoney Trail % Heavy Trucks for Region 8

Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)		Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)
R453	60.8	0.1		60.6	-0.1		R478	53.4	0.5		52.2	-0.7
R454	55.7	0.4		55.0	-0.3		R479	52.7	0.6		51.5	-0.6
R455	57.0	0.4		56.3	-0.3		R480	53.5	0.5		52.3	-0.7
R456	56.7	0.4		55.9	-0.4		R481	54.7	0.5		53.6	-0.6
R457	56.7	0.4		55.8	-0.5		R482	56.6	0.5		55.7	-0.4
R458	57.2	0.5		56.2	-0.5		R483	57.9	0.2		57.4	-0.3
R459	57.6	0.5		56.6	-0.5		R484	55.6	0.2		55.2	-0.2
R460	57.6	0.5		56.6	-0.5		R485	59.2	0.1		59.0	-0.1
R461	57.7	0.6		56.6	-0.5		R486	59.3	0.1		59.2	0.0
R462	58.3	0.5		57.2	-0.6		R487	56.7	0.2		56.4	-0.1
R463	57.7	0.5		56.6	-0.6		R488	56.4	0.2		55.9	-0.3
R464	56.7	0.5		55.6	-0.6		R489	54.8	0.4		54.0	-0.4
R465	56.5	0.3		55.9	-0.3		R490	53.7	0.5		52.7	-0.5
R466	57.8	0.3		57.3	-0.2		R491	54.3	0.5		53.3	-0.5
R467	57.7	0.2		57.2	-0.3		R492	53.9	0.4		53.0	-0.5
R468	54.7	0.6		53.5	-0.6		R493	54.4	0.5		53.3	-0.6
R469	54.7	0.6		53.4	-0.7		R494	54.5	0.5		53.3	-0.7
R470	54.9	0.6		53.6	-0.7		R495	54.8	0.6		53.5	-0.7
R471	55.0	0.6		53.6	-0.8		R496	55.2	0.6		53.9	-0.7
R472	54.3	0.6		53.0	-0.7		R497	55.8	0.7		54.4	-0.7
R473	53.1	0.6		51.9	-0.6		R498	56.2	0.7		54.7	-0.8
R474	52.3	0.6		51.0	-0.7		R499	56.9	0.7		55.4	-0.8
R475	51.8	0.6		50.5	-0.7		R500	57.6	0.7		56.1	-0.8
R476	52.2	0.6		50.9	-0.7		R501	57.4	0.7		55.9	-0.8
R477	52.6	0.5		51.4	-0.7		R502	57.5	0.7		56.0	-0.8

Table 7F. Effects of Changing Stoney Trail % Heavy Trucks for Region 9

Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)		Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)
R503	58.4	0.0		58.4	0.0		R531	54.8	0.9		52.8	-1.1
R504	57.5	0.0		57.4	-0.1		R532	56.0	0.8		54.1	-1.1
R505	57.8	0.0		57.7	-0.1		R533	56.7	0.9		54.8	-1.0
R506	55.9	0.2		55.5	-0.2		R534	57.3	0.9		55.3	-1.1
R507	55.8	0.5		54.8	-0.5		R535	57.9	0.9		55.9	-1.1
R508	55.8	0.6		54.6	-0.6		R536	58.2	0.8		56.3	-1.1
R509	56.0	0.6		54.7	-0.7		R537	58.2	0.9		56.2	-1.1
R510	56.3	0.7		54.7	-0.9		R538	58.3	0.8		56.4	-1.1
R511	56.1	0.7		54.5	-0.9		R539	59.0	0.9		57.1	-1.0
R512	55.7	0.7		54.1	-0.9		R540	55.6	0.9		53.7	-1.0
R513	56.0	0.8		54.3	-0.9		R541	55.5	0.8		53.7	-1.0
R514	56.9	0.8		55.1	-1.0		R542	55.8	0.8		54.0	-1.0
R515	56.9	0.8		55.1	-1.0		R543	58.5	0.8		56.7	-1.0
R516	56.0	0.8		54.2	-1.0		R544	59.9	0.8		58.1	-1.0
R517	55.2	0.8		53.5	-0.9		R545	59.6	0.8		57.8	-1.0
R518	54.8	0.8		53.1	-0.9		R546	59.0	0.7		57.3	-1.0
R519	55.7	0.8		53.9	-1.0		R547	58.8	0.8		57.1	-0.9
R520	54.4	0.8		52.6	-1.0		R548	58.4	0.7		56.7	-1.0
R521	52.7	0.8		50.9	-1.0		R549	53.3	0.6		51.8	-0.9
R522	52.8	0.8		51.0	-1.0		R550	52.5	0.6		51.3	-0.6
R523	53.4	0.7		51.8	-0.9		R551	55.1	0.4		54.2	-0.5
R524	53.2	0.7		51.5	-1.0		R552	55.6	0.5		54.5	-0.6
R525	53.1	0.8		51.4	-0.9		R553	53.7	0.4		52.8	-0.5
R526	52.9	0.9		50.9	-1.1		R554	53.1	0.2		52.6	-0.3
R527	53.8	0.8		52.1	-0.9		R555	55.6	0.2		55.3	-0.1
R528	55.4	0.7		53.7	-1.0		R556	61.4	0.0		61.4	0.0
R529	58.6	0.9		56.7	-1.0		R557	62.1	0.0		62.1	0.0
R530	55.4	0.9		53.4	-1.1		R558	60.5	0.1		60.4	0.0

Table 7G. Effects of Changing Stoney Trail % Heavy Trucks for Region 10

Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)		Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)
R559	59.0	0.1		58.9	0.0		R603	55.9	0.3		55.3	-0.3
R560	59.9	0.0		59.8	-0.1		R604	55.6	0.3		55.0	-0.3
R561	58.3	0.1		58.2	0.0		R605	55.1	0.3		54.5	-0.3
R562	59.7	0.0		59.6	-0.1		R606	55.6	0.4		54.9	-0.3
R563	57.4	0.1		57.3	0.0		R607	56.5	0.3		55.8	-0.4
R564	54.6	0.3		53.9	-0.4		R608	56.6	0.3		56.1	-0.2
R565	53.7	0.4		52.9	-0.4		R609	57.2	0.1		56.9	-0.2
R566	54.0	0.3		53.3	-0.4		R610	58.3	0.1		58.1	-0.1
R567	54.0	0.4		53.3	-0.3		R611	54.2	0.1		53.9	-0.2
R568	53.5	0.3		52.8	-0.4		R612	54.2	0.2		53.8	-0.2
R569	51.6	0.4		50.7	-0.5		R613	53.4	0.2		53.0	-0.2
R570	52.2	0.5		51.2	-0.5		R614	55.6	0.2		55.1	-0.3
R571	51.3	0.6		50.1	-0.6		R615	59.3	0.2		58.9	-0.2
R572	50.1	0.5		49.1	-0.5		R616	54.9	0.3		54.3	-0.3
R573	48.5	0.5		47.5	-0.5		R617	52.4	0.5		51.3	-0.6
R574	49.1	0.6		47.8	-0.7		R618	53.7	0.8		52.1	-0.8
R575	49.9	0.6		48.5	-0.8		R619	53.1	0.7		51.6	-0.8
R576	49.3	0.7		47.9	-0.7		R620	55.7	0.7		54.1	-0.9
R577	51.8	0.7		50.4	-0.7		R621	55.6	0.7		54.1	-0.8
R578	52.5	0.7		51.0	-0.8		R622	56.9	0.8		55.3	-0.8
R579	52.8	0.7		51.3	-0.8		R623	57.6	0.8		55.9	-0.9
R580	55.0	0.8		53.3	-0.9		R624	55.0	0.8		53.4	-0.8
R581	58.0	0.8		56.2	-1.0		R625	53.1	0.7		51.6	-0.8
R582	58.9	0.8		57.1	-1.0		R626	52.6	0.7		51.1	-0.8
R583	57.7	0.6		56.3	-0.8		R627	52.5	0.7		51.0	-0.8
R584	56.2	0.6		55.0	-0.6		R628	52.4	0.7		51.0	-0.7
R585	55.0	0.7		53.4	-0.9		R629	53.6	0.7		52.2	-0.7
R586	57.2	0.6		55.9	-0.7		R630	54.3	0.7		52.7	-0.9
R587	57.7	0.6		56.4	-0.7		R631	56.0	0.7		54.4	-0.9
R588	56.1	0.7		54.6	-0.8		R632	57.4	0.7		55.9	-0.8
R589	57.0	0.7		55.7	-0.6		R633	57.2	0.5		56.1	-0.6
R590	57.0	0.6		55.8	-0.6		R634	58.2	0.7		56.8	-0.7
R591	56.4	0.7		54.9	-0.8		R635	56.9	0.6		55.5	-0.8
R592	55.3	0.7		53.8	-0.8		R636	57.0	0.7		55.5	-0.8
R593	53.3	0.6		52.0	-0.7		R637	55.8	0.6		54.4	-0.8
R594	55.0	0.7		53.5	-0.8		R638	54.5	0.7		53.1	-0.7
R595	55.1	0.5		54.0	-0.6		R639	54.7	0.6		53.4	-0.7
R596	55.2	0.6		54.1	-0.5		R640	55.3	0.6		54.1	-0.6
R597	55.5	0.5		54.5	-0.5		R641	56.1	0.5		55.1	-0.5
R598	57.5	0.4		56.6	-0.5		R642	56.0	0.4		55.2	-0.4
R599	56.3	0.4		55.5	-0.4		R643	57.1	0.3		56.4	-0.4
R600	56.6	0.3		55.9	-0.4		R644	57.9	0.2		57.4	-0.3
R601	57.1	0.2		56.6	-0.3		R645	58.4	0.3		57.9	-0.2
R602	57.3	0.2		56.9	-0.2							

Table 7H. Effects of Changing Stoney Trail % Heavy Trucks for Region 11

Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)		Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)
R646	58.7	0.1		58.5	-0.1		R692	54.5	0.4		53.5	-0.6
R647	53.1	0.3		52.6	-0.2		R693	54.9	0.5		53.8	-0.6
R648	55.5	0.2		55.0	-0.3		R694	55.3	0.6		54.0	-0.7
R649	52.2	0.4		51.4	-0.4		R695	54.7	0.6		53.5	-0.6
R650	53.2	0.4		52.3	-0.5		R696	54.7	0.6		53.3	-0.8
R651	57.1	0.5		56.1	-0.5		R697	56.4	0.5		55.2	-0.7
R652	56.4	0.5		55.3	-0.6		R698	59.7	0.3		59.1	-0.3
R653	55.7	0.7		54.3	-0.7		R699	59.1	0.4		58.4	-0.3
R654	54.9	0.7		53.4	-0.8		R700	57.7	0.5		56.6	-0.6
R655	55.7	0.7		54.2	-0.8		R701	58.6	0.5		57.4	-0.7
R656	56.8	0.8		55.1	-0.9		R702	54.5	0.4		53.7	-0.4
R657	54.2	0.8		52.4	-1.0		R703	54.0	0.5		53.0	-0.5
R658	55.5	0.8		53.7	-1.0		R704	54.0	0.6		52.7	-0.7
R659	55.6	0.8		53.9	-0.9		R705	54.8	0.6		53.4	-0.8
R660	55.3	0.8		53.5	-1.0		R706	55.4	0.6		54.1	-0.7
R661	55.9	0.8		54.1	-1.0		R707	55.4	0.6		54.1	-0.7
R662	54.9	0.8		53.1	-1.0		R708	55.2	0.6		53.9	-0.7
R663	55.1	0.8		53.3	-1.0		R709	55.6	0.6		54.3	-0.7
R664	56.2	0.5		55.1	-0.6		R710	55.4	0.7		54.0	-0.7
R665	60.8	0.4		59.8	-0.6		R711	54.4	0.7		52.9	-0.8
R666	56.0	0.8		54.3	-0.9		R712	54.1	0.7		52.6	-0.8
R667	54.8	0.8		53.0	-1.0		R713	53.9	0.6		52.5	-0.8
R668	54.6	0.9		52.7	-1.0		R714	53.5	0.6		52.1	-0.8
R669	54.6	0.9		52.6	-1.1		R715	53.6	0.7		52.1	-0.8
R670	54.4	0.8		52.5	-1.1		R716	54.4	0.7		52.9	-0.8
R671	54.7	0.9		52.8	-1.0		R717	54.8	0.7		53.2	-0.9
R672	54.9	0.9		53.0	-1.0		R718	54.5	0.8		52.8	-0.9
R673	53.8	0.8		51.9	-1.1		R719	53.9	0.8		52.2	-0.9
R674	54.0	0.9		52.0	-1.1		R720	53.7	0.7		52.2	-0.8
R675	53.7	0.8		51.9	-1.0		R721	54.4	0.7		52.8	-0.9
R676	54.6	0.9		52.6	-1.1		R722	54.0	0.8		52.3	-0.9
R677	56.9	0.8		55.0	-1.1		R723	54.0	0.8		52.2	-1.0
R678	56.2	0.9		54.2	-1.1		R724	54.0	0.8		52.2	-1.0
R679	55.2	0.9		53.3	-1.0		R725	53.3	0.8		51.5	-1.0
R680	51.0	0.6		49.7	-0.7		R726	53.8	0.8		52.1	-0.9
R681	54.5	0.9		52.6	-1.0		R727	55.0	0.8		53.2	-1.0
R682	54.9	0.6		53.6	-0.7		R728	54.9	0.8		53.1	-1.0
R683	59.1	0.3		58.5	-0.3		R729	54.7	0.7		53.0	-1.0
R684	58.8	0.3		58.3	-0.2		R730	55.4	0.8		53.6	-1.0
R685	56.7	0.3		56.1	-0.3		R731	56.4	0.9		54.6	-0.9
R686	59.1	0.1		59.0	0.0		R732	54.4	0.8		52.7	-0.9
R687	52.0	0.0		51.9	-0.1		R733	53.5	0.7		51.8	-1.0
R688	52.3	0.2		51.9	-0.2		R734	52.3	0.8		50.6	-0.9
R689	51.8	0.2		51.3	-0.3		R735	51.4	0.7		49.8	-0.9
R690	56.1	0.3		55.5	-0.3		R736	52.5	0.7		51.0	-0.8
R691	55.1	0.3		54.4	-0.4							

Table 7I. Effects of Changing Stoney Trail % Heavy Trucks for Region 12

Receptor	L_{eq}24 with 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		L_{eq}24 with 5% Fewer Heavy Trucks on Stoney Trail (dBA)	Decrease Compared to Future Conditions (dBA)
R737	53.3	0.9		51.3	-1.1
R738	52.1	0.7		50.6	-0.8
R739	50.0	0.8		48.4	-0.8
R740	55.3	0.3		54.5	-0.5
R741	55.6	0.3		55.0	-0.3
R742	55.8	0.2		55.3	-0.3
R743	56.0	0.3		55.5	-0.2
R744	56.5	0.2		56.1	-0.2
R745	56.6	0.2		56.3	-0.1
R746	56.5	0.1		56.2	-0.2
R747	56.2	0.1		56.0	-0.1
R748	56.9	0.0		56.8	-0.1
R749	57.2	0.1		57.1	0.0
R750	57.2	0.1		57.1	0.0
R751	57.0	0.0		56.9	-0.1
R752	56.6	0.0		56.6	0.0
R753	56.4	0.0		56.4	0.0
R754	56.8	0.8		55.0	-1.0
R755	56.1	0.7		54.6	-0.8
R756	56.1	0.6		54.8	-0.7
R757	56.3	0.5		55.1	-0.7
R758	56.6	0.5		55.5	-0.6
R759	57.8	0.3		57.2	-0.3
R760	57.4	0.3		56.9	-0.2
R761	56.5	0.3		55.9	-0.3
R762	57.1	0.2		56.6	-0.3
R763	57.8	0.2		57.4	-0.2
R764	60.1	0.1		59.9	-0.1
R765	61.3	0.1		61.1	-0.1
R766	61.6	0.0		61.6	0.0
R767	61.9	0.0		61.9	0.0
R768	61.8	0.0		61.8	0.0
R769	61.5	0.0		61.5	0.0
R770	60.6	0.1		60.5	0.0
R771	59.3	0.0		59.3	0.0
R772	61.5	0.0		61.5	0.0

6.3.4. Cumulative Sensitivity Analysis

With the information provided by the sensitivity analysis for each of the three main traffic parameters, it is possible to determine a cumulative effect if all three are taken into account simultaneously. The results are presented in Tables 8A – 8I. Relative increases for locations which are most directly impacted by Stoney Trail are as high as 2.4 dBA. At locations in which the noise climate is most directly impacted by City of Calgary roadways, the increases are as low as 0.0 dBA. The relative increase in noise levels with a relative increase of 25% traffic volumes, 5% heavy trucks and a speed of 110 km/hr would not result in any locations along northwest Stoney Trail to have noise levels at or above 65 dBA $L_{eq}24$.

Table 8A. Effects of Cumulative Effects on Noise Levels For Region 4

Receptor	$L_{eq}24$ with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		Receptor	$L_{eq}24$ with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)
R217	58.2	0.4		R243	57.9	2.1
R218	59.8	0.4		R244	56.9	2.0
R219	63.8	0.4		R245	56.6	2.0
R220	63.6	0.5		R246	56.0	2.0
R221	60.1	0.8		R247	57.6	2.0
R222	60.2	1.0		R248	55.8	1.9
R223	59.2	1.0		R249	55.8	1.8
R224	56.6	1.1		R250	55.9	1.9
R225	57.4	1.2		R251	56.8	1.9
R226	58.4	1.4		R252	55.0	1.7
R227	58.5	1.4		R253	55.5	1.7
R228	59.6	1.5		R254	54.1	1.7
R229	60.0	1.6		R255	55.4	1.7
R230	60.9	1.7		R256	55.2	1.6
R231	59.3	1.6		R257	55.5	1.4
R232	60.3	1.8		R258	57.0	1.0
R233	59.2	1.8		R259	57.4	1.0
R234	59.9	1.9		R260	56.4	0.5
R235	61.8	2.0		R261	57.6	0.3
R236	61.7	2.1		R262	57.9	0.3
R237	60.1	2.1		R263	60.5	0.2
R238	60.1	2.1		R264	59.3	0.3
R239	61.3	2.2		R265	58.8	0.2
R240	61.4	2.2		R266	57.3	0.2
R241	60.8	2.2		R267	58.5	0.1
R242	58.4	2.1				

Table 8B. Effects of Cumulative Effects on Noise Levels For Region 5

Receptor	L_{eq}24 with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)
R268	58.6	0.7
R269	59.9	0.6
R270	58.8	0.8
R271	58.2	0.9
R272	56.4	1.0
R273	59.1	1.2
R274	57.7	1.3
R275	58.3	1.5
R276	59.5	1.6
R277	58.9	1.7
R278	59.5	1.7
R279	59.7	1.9
R280	57.1	1.7
R281	59.1	1.8
R282	61.2	1.9
R283	61.1	1.9
R284	62.0	2.0
R285	57.4	1.7
R286	61.7	1.9
R287	60.5	1.7
R288	61.3	1.8
R289	61.3	1.8
R290	60.4	1.7
R291	60.4	1.6
R292	59.6	1.5
R293	59.9	1.5
R294	60.9	1.3
R295	59.9	1.2
R296	59.7	1.0
R297	58.9	1.0
R298	58.1	0.9

Table 8C. Effects of Cumulative Effects on Noise Levels For Region 6

Receptor	L_{eq}24 with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		Receptor	L_{eq}24 with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)
R299	59.9	0.8		R338	59.2	1.3
R300	59.1	1.1		R339	57.6	1.0
R301	60.4	1.1		R340	60.3	0.7
R302	61.0	1.1		R341	60.1	0.3
R303	61.3	1.1		R342	60.3	0.3
R304	62.9	1.0		R343	60.7	0.2
R305	64.4	0.9		R344	58.9	2.0
R306	62.9	1.0		R345	58.8	2.1
R307	62.3	1.2		R346	55.6	2.0
R308	62.0	1.4		R347	58.3	2.1
R309	62.0	1.5		R348	59.0	2.2
R310	63.2	1.7		R349	59.8	2.2
R311	62.5	1.8		R350	57.4	2.1
R312	64.3	1.9		R351	57.3	2.1
R313	63.9	1.9		R352	57.8	2.1
R314	62.8	2.0		R353	58.2	2.2
R315	64.7	2.1		R354	57.2	2.3
R316	62.1	2.1		R355	59.5	2.3
R317	61.0	2.2		R356	58.5	2.2
R318	63.5	2.2		R357	60.7	2.2
R319	60.7	2.2		R358	59.8	2.3
R320	64.8	2.3		R359	60.2	2.2
R321	64.2	2.3		R360	59.8	2.2
R322	64.4	2.4		R361	58.3	2.1
R323	63.5	2.3		R362	59.1	2.2
R324	63.7	2.3		R363	59.7	2.1
R325	62.5	2.3		R364	60.7	2.0
R326	62.0	2.3		R365	60.3	1.9
R327	61.4	2.2		R366	59.6	2.0
R328	58.8	2.1		R367	60.5	1.8
R329	57.4	1.6		R368	61.6	1.6
R330	58.9	2.0		R369	58.4	1.3
R331	59.6	2.0		R370	57.4	1.2
R332	58.8	1.9		R371	57.4	0.9
R333	58.7	1.8		R372	59.4	1.1
R334	61.3	1.8		R373	56.4	0.7
R335	60.1	1.6		R374	57.3	0.9
R336	59.9	1.5		R375	57.0	0.7
R337	59.6	1.4				

Table 8D. Effects of Cumulative Effects on Noise Levels For Region 7

Receptor	$L_{eq}24$ with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		Receptor	$L_{eq}24$ with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)
R376	64.2	0.2		R415	63.0	0.3
R377	59.7	0.4		R416	60.3	0.3
R378	58.4	0.6		R417	59.5	0.5
R379	58.1	0.7		R418	59.4	0.6
R380	58.1	0.7		R419	59.5	0.9
R381	57.7	0.8		R420	57.7	1.3
R382	57.4	1.0		R421	55.9	1.3
R383	58.1	1.2		R422	55.9	1.2
R384	58.4	1.1		R423	61.1	0.4
R385	57.5	0.9		R424	56.2	1.3
R386	54.6	1.3		R425	55.2	1.5
R387	57.9	1.0		R426	57.6	1.8
R388	59.6	1.3		R427	58.8	1.9
R389	56.4	1.2		R428	60.1	1.9
R390	52.7	1.4		R429	58.8	1.8
R391	54.9	1.5		R430	59.4	1.8
R392	53.9	1.6		R431	58.0	1.7
R393	53.9	1.5		R432	55.0	1.6
R394	55.8	1.7		R433	53.8	1.6
R395	57.3	1.8		R434	55.5	1.7
R396	57.2	1.8		R435	56.3	1.7
R397	55.9	1.7		R436	54.5	1.5
R398	54.8	1.7		R437	54.2	1.4
R399	55.2	1.7		R438	54.0	1.3
R400	57.9	1.8		R439	54.0	1.2
R401	58.6	1.8		R440	54.0	1.1
R402	58.3	1.6		R441	54.7	1.0
R403	59.6	1.7		R442	56.5	0.6
R404	57.9	1.6		R443	56.0	0.8
R405	58.2	1.6		R444	53.6	0.9
R406	56.4	1.5		R445	54.5	1.0
R407	61.1	1.7		R446	53.3	0.9
R408	60.4	1.7		R447	53.6	0.7
R409	59.9	1.7		R448	55.7	0.9
R410	58.6	1.6		R449	55.8	0.7
R411	60.3	1.4		R450	56.5	0.7
R412	60.1	1.2		R451	57.0	0.4
R413	59.6	0.9		R452	60.6	0.3
R414	54.6	0.7				

Table 8E. Effects of Cumulative Effects on Noise Levels For Region 8

Receptor	$L_{eq}24$ with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		Receptor	$L_{eq}24$ with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)
R453	61.1	0.4		R478	54.4	1.5
R454	56.3	1.0		R479	53.7	1.6
R455	57.5	0.9		R480	54.5	1.5
R456	57.4	1.1		R481	55.6	1.4
R457	57.5	1.2		R482	57.3	1.2
R458	58.0	1.3		R483	58.4	0.7
R459	58.5	1.4		R484	55.9	0.5
R460	58.5	1.4		R485	59.5	0.4
R461	58.6	1.5		R486	59.5	0.3
R462	59.2	1.4		R487	56.9	0.4
R463	58.7	1.5		R488	56.9	0.7
R464	57.6	1.4		R489	55.5	1.1
R465	57.1	0.9		R490	54.5	1.3
R466	58.2	0.7		R491	55.1	1.3
R467	58.2	0.7		R492	54.7	1.2
R468	55.6	1.5		R493	55.3	1.4
R469	55.8	1.7		R494	55.5	1.5
R470	56.0	1.7		R495	55.9	1.7
R471	56.1	1.7		R496	56.3	1.7
R472	55.4	1.7		R497	56.9	1.8
R473	54.1	1.6		R498	57.3	1.8
R474	53.4	1.7		R499	58.0	1.8
R475	52.8	1.6		R500	58.7	1.8
R476	53.2	1.6		R501	58.5	1.8
R477	53.6	1.5		R502	58.7	1.9

Table 8F. Effects of Cumulative Effects on Noise Levels For Region 9

Receptor	$L_{eq}24$ with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		Receptor	$L_{eq}24$ with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)
R503	58.5	0.1		R531	56.2	2.3
R504	57.6	0.1		R532	57.4	2.2
R505	58.0	0.2		R533	58.0	2.2
R506	56.3	0.6		R534	58.7	2.3
R507	56.6	1.3		R535	59.3	2.3
R508	56.8	1.6		R536	59.6	2.2
R509	57.1	1.7		R537	59.6	2.3
R510	57.5	1.9		R538	59.7	2.2
R511	57.3	1.9		R539	60.4	2.3
R512	56.9	1.9		R540	56.9	2.2
R513	57.2	2.0		R541	56.8	2.1
R514	58.2	2.1		R542	57.1	2.1
R515	58.2	2.1		R543	59.9	2.2
R516	57.4	2.2		R544	61.2	2.1
R517	56.5	2.1		R545	60.9	2.1
R518	56.1	2.1		R546	60.3	2.0
R519	57.0	2.1		R547	60.0	2.0
R520	55.7	2.1		R548	59.7	2.0
R521	54.0	2.1		R549	54.5	1.8
R522	54.2	2.2		R550	53.5	1.6
R523	54.7	2.0		R551	55.9	1.2
R524	54.5	2.0		R552	56.4	1.3
R525	54.4	2.1		R553	54.5	1.2
R526	54.3	2.3		R554	53.6	0.7
R527	55.1	2.1		R555	55.8	0.4
R528	56.7	2.0		R556	61.5	0.1
R529	60.0	2.3		R557	62.2	0.1
R530	56.8	2.3		R558	60.6	0.2

Table 8G. Effects of Cumulative Effects on Noise Levels For Region 10

Receptor	$L_{eq}24$ with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		Receptor	$L_{eq}24$ with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)
R559	59.1	0.2		R603	56.4	0.8
R560	60.0	0.1		R604	56.1	0.8
R561	58.4	0.2		R605	55.7	0.9
R562	59.9	0.2		R606	56.1	0.9
R563	57.6	0.3		R607	57.1	0.9
R564	55.2	0.9		R608	57.1	0.8
R565	54.3	1.0		R609	57.5	0.4
R566	54.7	1.0		R610	58.5	0.3
R567	54.6	1.0		R611	54.5	0.4
R568	54.1	0.9		R612	54.4	0.4
R569	52.4	1.2		R613	53.7	0.5
R570	53.0	1.3		R614	56.1	0.7
R571	52.3	1.6		R615	59.6	0.5
R572	51.0	1.4		R616	55.4	0.8
R573	49.4	1.4		R617	53.4	1.5
R574	50.1	1.6		R618	54.9	2.0
R575	51.1	1.8		R619	54.3	1.9
R576	50.3	1.7		R620	56.9	1.9
R577	52.8	1.7		R621	56.8	1.9
R578	53.7	1.9		R622	58.1	2.0
R579	53.9	1.8		R623	58.9	2.1
R580	56.3	2.1		R624	56.2	2.0
R581	59.3	2.1		R625	54.3	1.9
R582	60.2	2.1		R626	53.8	1.9
R583	58.8	1.7		R627	53.6	1.8
R584	57.1	1.5		R628	53.5	1.8
R585	56.3	2.0		R629	54.8	1.9
R586	58.3	1.7		R630	55.4	1.8
R587	58.8	1.7		R631	57.1	1.8
R588	57.3	1.9		R632	58.5	1.8
R589	58.0	1.7		R633	58.2	1.5
R590	58.0	1.6		R634	59.3	1.8
R591	57.5	1.8		R635	58.0	1.7
R592	56.5	1.9		R636	58.1	1.8
R593	54.4	1.7		R637	56.9	1.7
R594	56.1	1.8		R638	55.5	1.7
R595	56.1	1.5		R639	55.7	1.6
R596	56.1	1.5		R640	56.3	1.6
R597	56.4	1.4		R641	56.9	1.3
R598	58.4	1.3		R642	56.8	1.2
R599	57.1	1.2		R643	57.8	1.0
R600	57.1	0.8		R644	58.4	0.7
R601	57.6	0.7		R645	58.8	0.7
R602	57.7	0.6				

Table 8H. Effects of Cumulative Effects on Noise Levels For Region 11

Receptor	L_{eq}24 with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)		Receptor	L_{eq}24 with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)
R646	58.9	0.3		R692	55.4	1.3
R647	53.5	0.7		R693	55.8	1.4
R648	56.0	0.7		R694	56.2	1.5
R649	53.0	1.2		R695	55.7	1.6
R650	54.0	1.2		R696	55.7	1.6
R651	57.9	1.3		R697	57.4	1.5
R652	57.3	1.4		R698	60.2	0.8
R653	56.7	1.7		R699	59.7	1.0
R654	56.0	1.8		R700	58.6	1.4
R655	56.9	1.9		R701	59.5	1.4
R656	57.9	1.9		R702	55.2	1.1
R657	55.4	2.0		R703	54.8	1.3
R658	56.7	2.0		R704	55.0	1.6
R659	56.8	2.0		R705	55.8	1.6
R660	56.6	2.1		R706	56.4	1.6
R661	57.2	2.1		R707	56.3	1.5
R662	56.1	2.0		R708	56.2	1.6
R663	56.3	2.0		R709	56.6	1.6
R664	57.1	1.4		R710	56.4	1.7
R665	61.7	1.3		R711	55.5	1.8
R666	57.2	2.0		R712	55.3	1.9
R667	56.1	2.1		R713	55.0	1.7
R668	55.9	2.2		R714	54.6	1.7
R669	55.9	2.2		R715	54.7	1.8
R670	55.8	2.2		R716	55.5	1.8
R671	56.0	2.2		R717	56.0	1.9
R672	56.2	2.2		R718	55.7	2.0
R673	55.2	2.2		R719	55.1	2.0
R674	55.3	2.2		R720	54.8	1.8
R675	55.1	2.2		R721	55.6	1.9
R676	55.9	2.2		R722	55.3	2.1
R677	58.3	2.2		R723	55.3	2.1
R678	57.6	2.3		R724	55.2	2.0
R679	56.5	2.2		R725	54.5	2.0
R680	52.1	1.7		R726	55.0	2.0
R681	55.7	2.1		R727	56.2	2.0
R682	55.9	1.6		R728	56.2	2.1
R683	59.7	0.9		R729	56.0	2.0
R684	59.2	0.7		R730	56.7	2.1
R685	57.2	0.8		R731	57.6	2.1
R686	59.1	0.1		R732	55.6	2.0
R687	52.2	0.2		R733	54.7	1.9
R688	52.6	0.5		R734	53.5	2.0
R689	52.3	0.7		R735	52.6	1.9
R690	56.6	0.8		R736	53.6	1.8
R691	55.8	1.0				

Table 8I. Effects of Cumulative Effects on Noise Levels For Region 12

Receptor	L_{eq}24 with 25% Additional Vehicles, Speed of 110 km/hr, 5% Greater Heavy Trucks on Stoney Trail (dBA)	Increase Compared to Future Conditions (dBA)
R737	54.6	2.2
R738	53.3	1.9
R739	51.1	1.9
R740	56.0	1.0
R741	56.1	0.8
R742	56.3	0.7
R743	56.4	0.7
R744	56.8	0.5
R745	56.9	0.5
R746	56.8	0.4
R747	56.4	0.3
R748	57.1	0.2
R749	57.3	0.2
R750	57.3	0.2
R751	57.1	0.1
R752	56.7	0.1
R753	56.5	0.1
R754	58.0	2.0
R755	57.2	1.8
R756	57.1	1.6
R757	57.3	1.5
R758	57.5	1.4
R759	58.3	0.8
R760	57.9	0.8
R761	57.0	0.8
R762	57.5	0.6
R763	58.1	0.5
R764	60.3	0.3
R765	61.4	0.2
R766	61.6	0.0
R767	61.9	0.0
R768	61.8	0.0
R769	61.5	0.0
R770	60.6	0.1
R771	59.3	0.0
R772	61.5	0.0

7.0 Conclusion

The results of the Current Conditions noise monitoring indicated noise levels which were below 65 dBA $L_{eq}24$ at all but one location (M18). It is important to note, however, that all but two of the noise monitoring locations were within the TUC and not on residential property and, as such, the results cannot be directly compared to the applicable criteria of 65 dBA $L_{eq}24$ since the noise monitoring results would be higher than at residential property locations. The two monitoring locations within residential property, however, were well below 65 dBA $L_{eq}24$. In most locations, Stoney Trail was the dominant noise source. However there were locations at which other intersecting City streets either contributed a significant amount or were dominant.

The noise modeling results for Current Conditions matched well with the measurement results. The modeled noise levels did not exceeded the limit of 65 dBA $L_{eq}24$ at any of the residential outdoor receptor locations.

The noise modeling results for the Future Conditions (with projected traffic volumes for the 1.6 million population) indicated noise levels which were still below the limit of 65 dBA $L_{eq}24$ at all residential receptor locations. Further, a sensitivity analysis of the traffic volumes, traffic speeds, and % heavy trucks indicated that even with significant increases in all three parameters, the noise levels at all residential receptor locations will still be below the limit of 65 dBA $L_{eq}24$. **As such, based on the criteria set forth by Alberta Transportation, no additional noise mitigation measures are required throughout the entire northwest Stoney Trail study area.**

8.0 References

- *"Noise Attenuation Guidelines for Provincial Highways Under Provincial Jurisdiction Within Cities and Urban Areas"*, by Alberta Transportation. October, 2002.
- *"Environmental Noise Monitoring for Northeast Stoney Trail in Calgary, AB"*. Prepared for Alberta Transportation by aci Acoustical Consultants Inc. April, 2011.
- *"Environmental Noise Monitoring for Northwest Stoney Trail in Calgary, AB"*. Prepared for Alberta Transportation by aci Acoustical Consultants Inc. April, 2011.
- City of Edmonton Urban Traffic Noise Policy (C506), 2004
- International Organization for Standardization (ISO), *Standard 1996-1, Acoustics – Description, measurement and assessment of environmental noise – Part 1: Basic quantities and assessment procedures, 2003,* Geneva Switzerland.
- International Organization for Standardization (ISO), *Standard 9613-1, Acoustics – Attenuation of sound during propagation outdoors – Part 1: Calculation of absorption of sound by the atmosphere, 1993,* Geneva Switzerland.
- International Organization for Standardization (ISO), *Standard 9613-2, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation, 1996,* Geneva Switzerland.

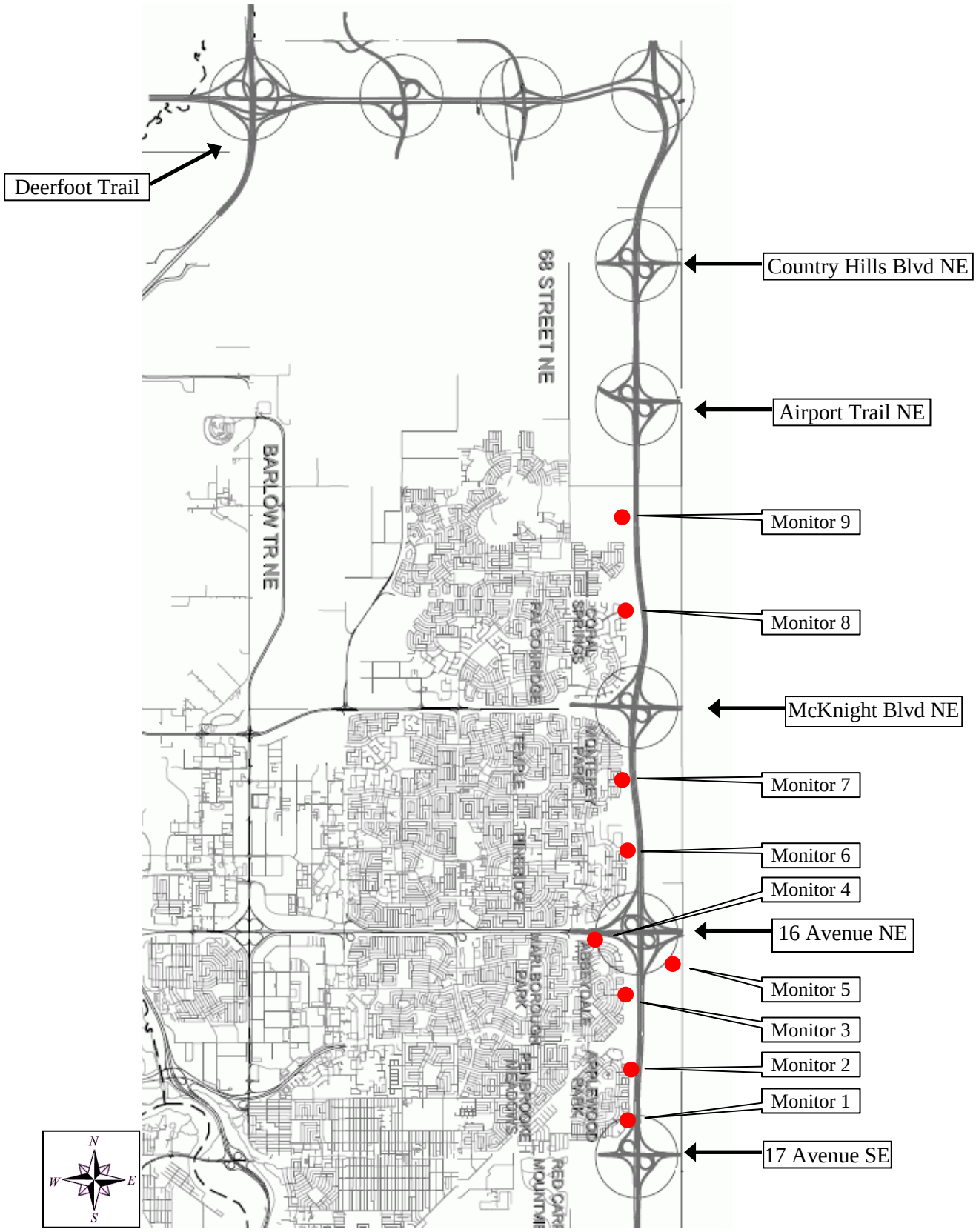


Figure 1A. Stoney Trail Northeast

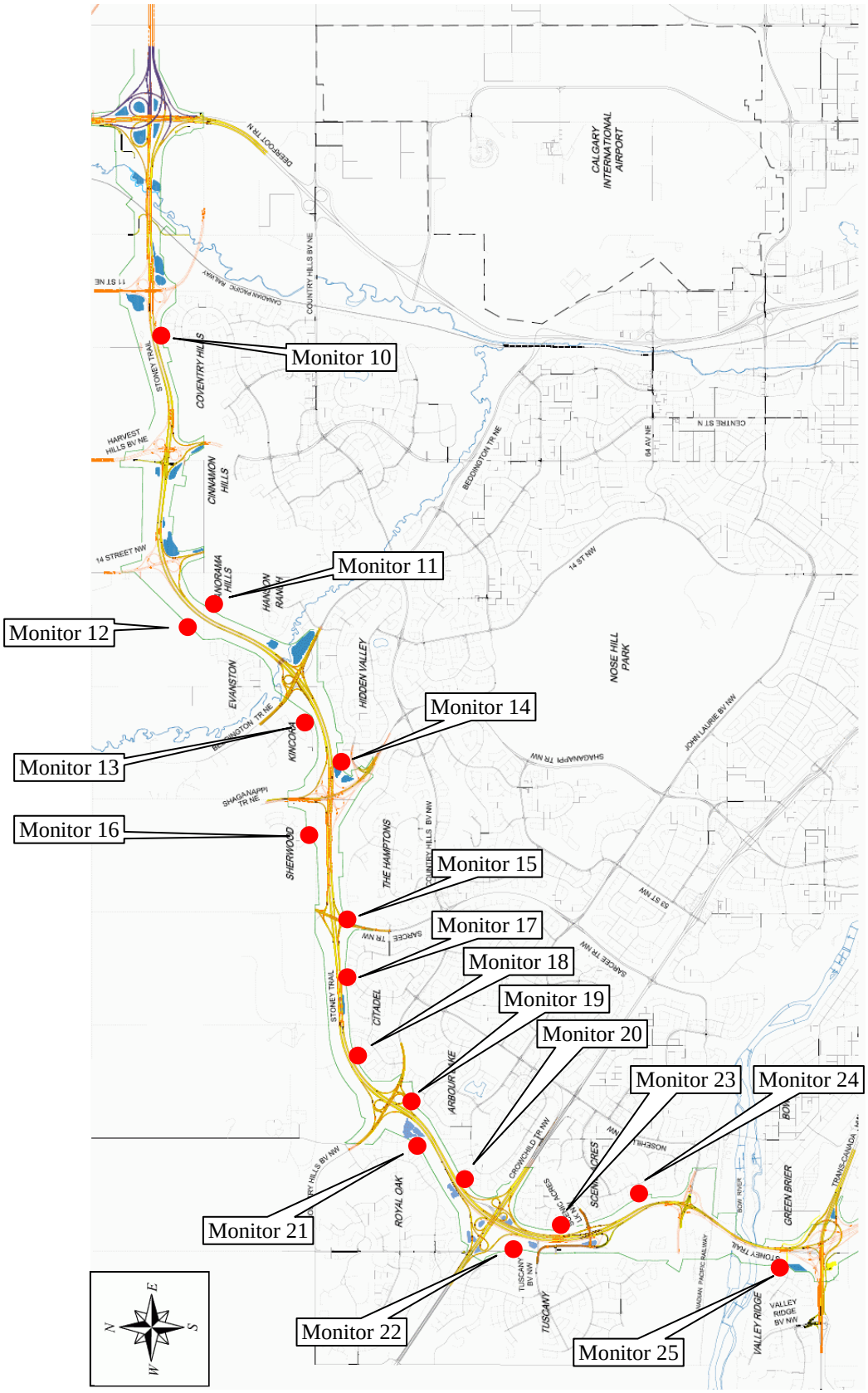


Figure 1B. Stoney Trail Northwest

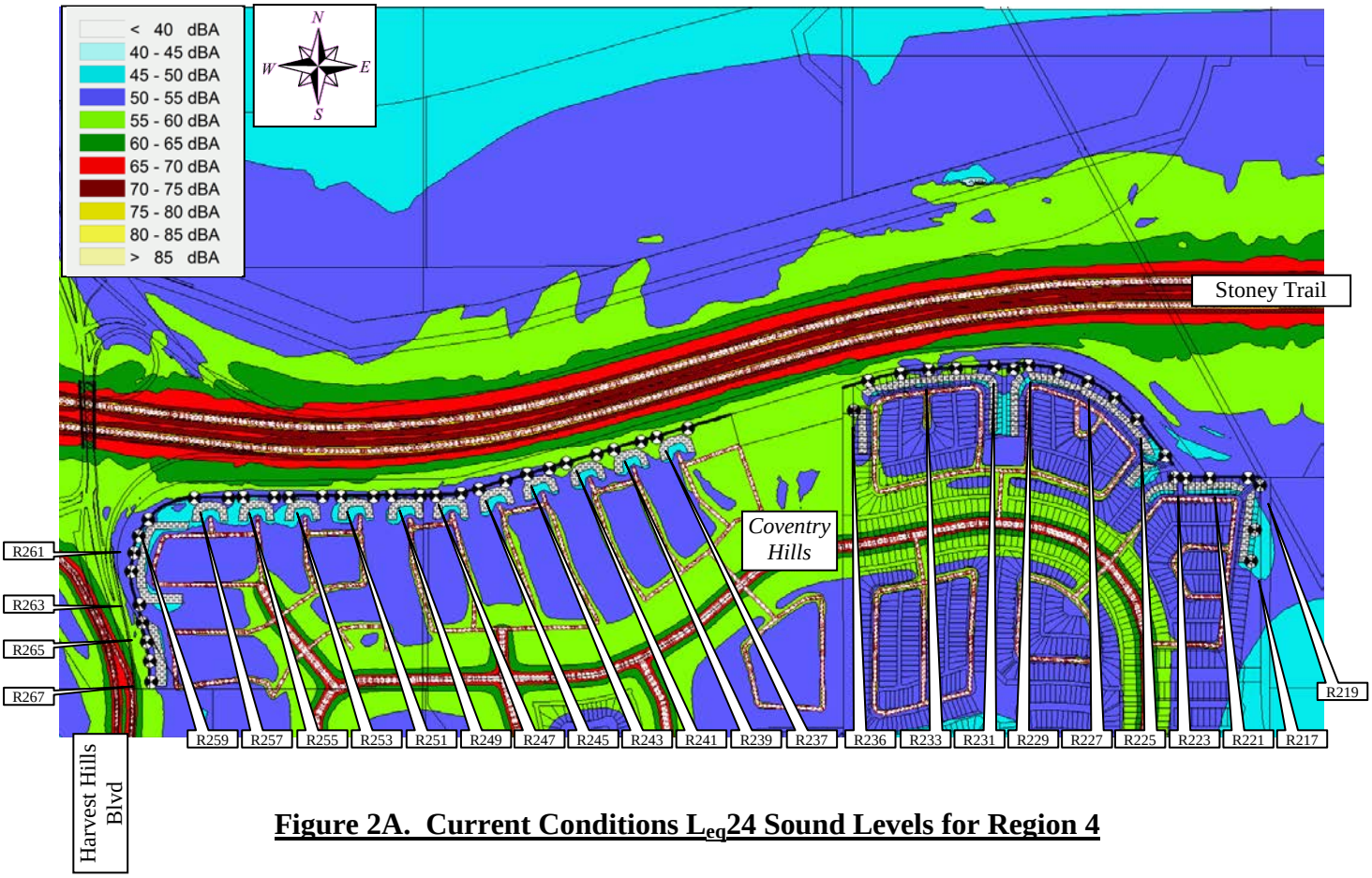


Figure 2A. Current Conditions $L_{eq}24$ Sound Levels for Region 4

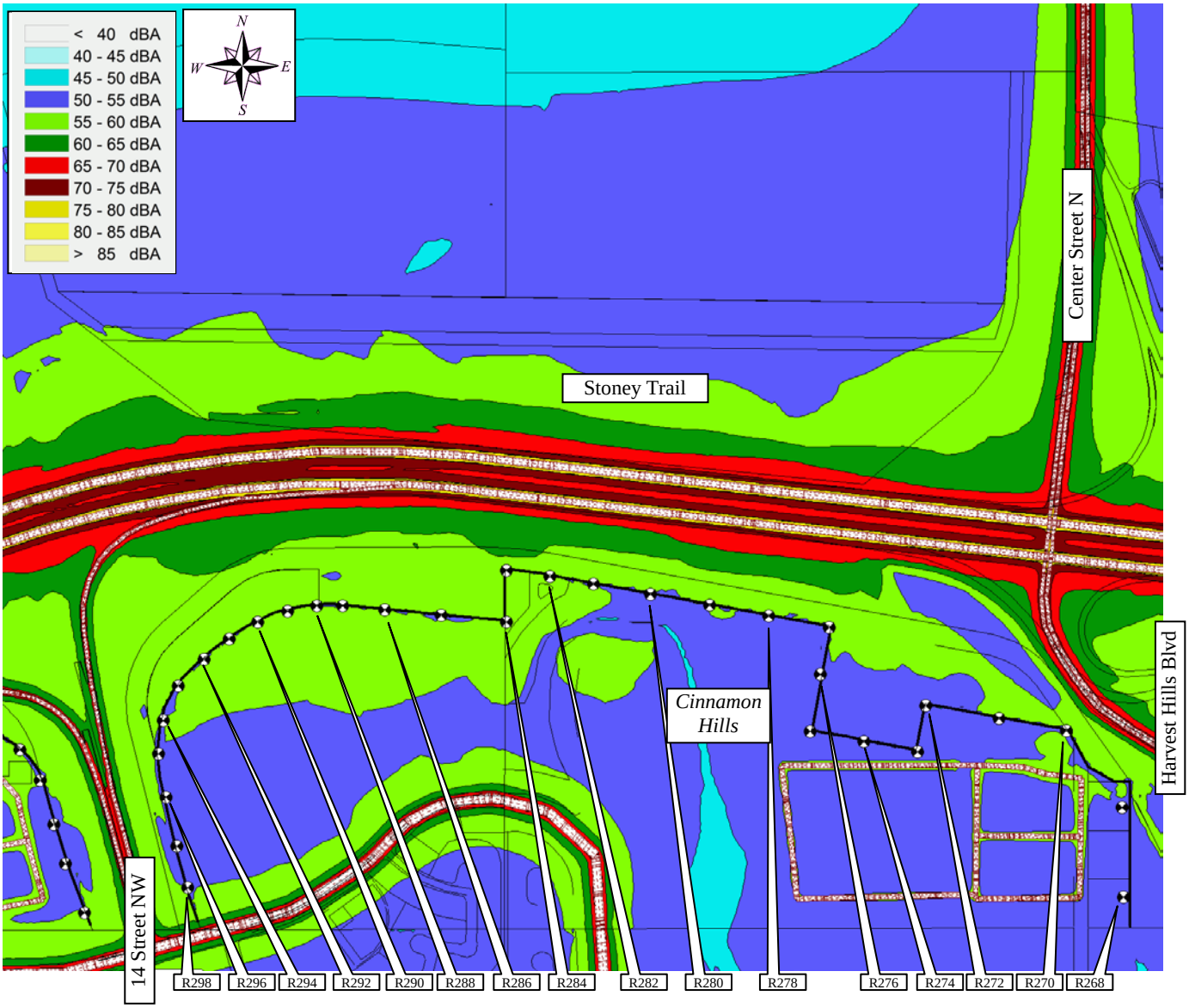


Figure 2B. Current Conditions L_{eq}24 Sound Levels for Region 5

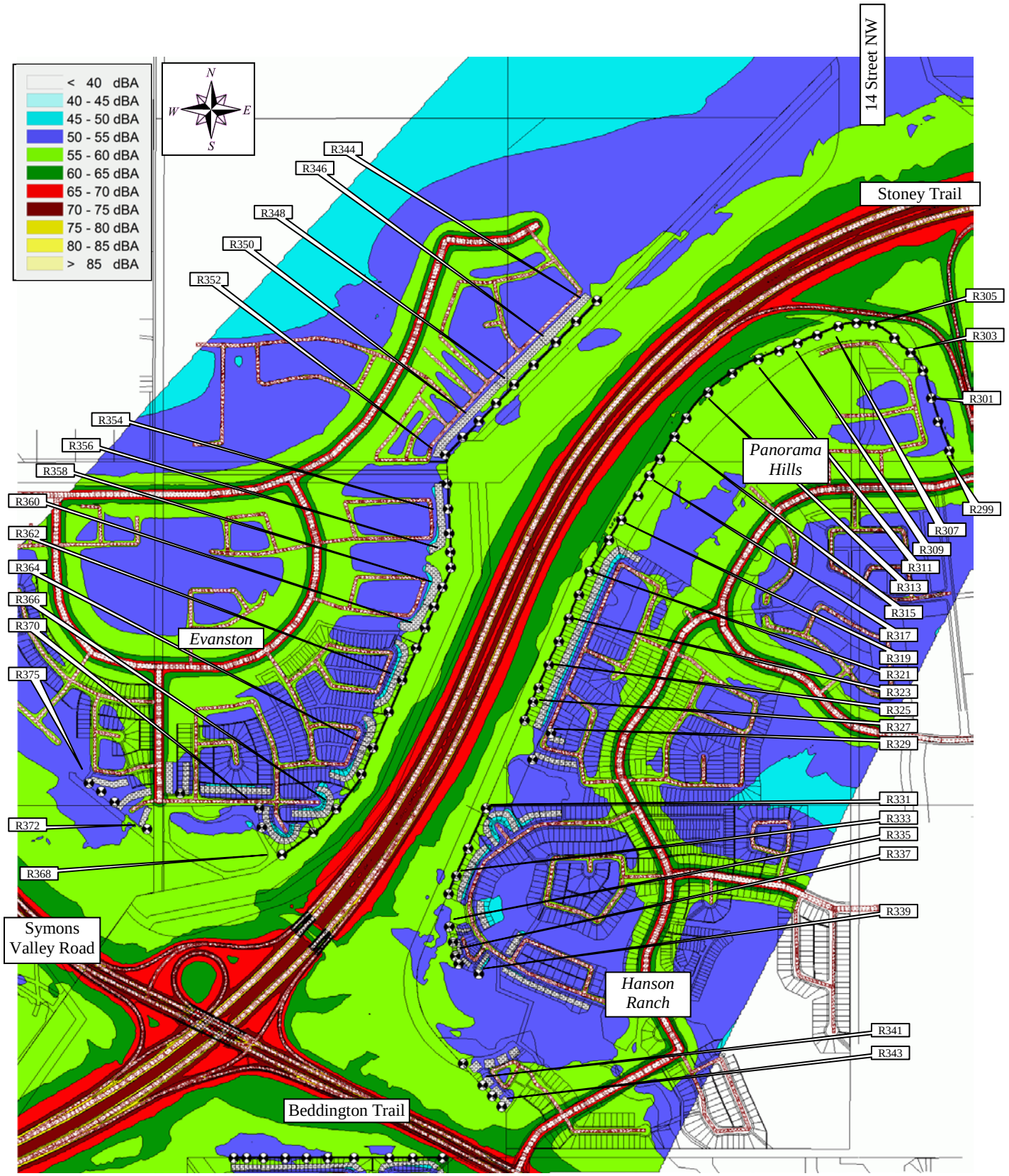


Figure 2C. Current Conditions $L_{eq}24$ Sound Levels for Region 6

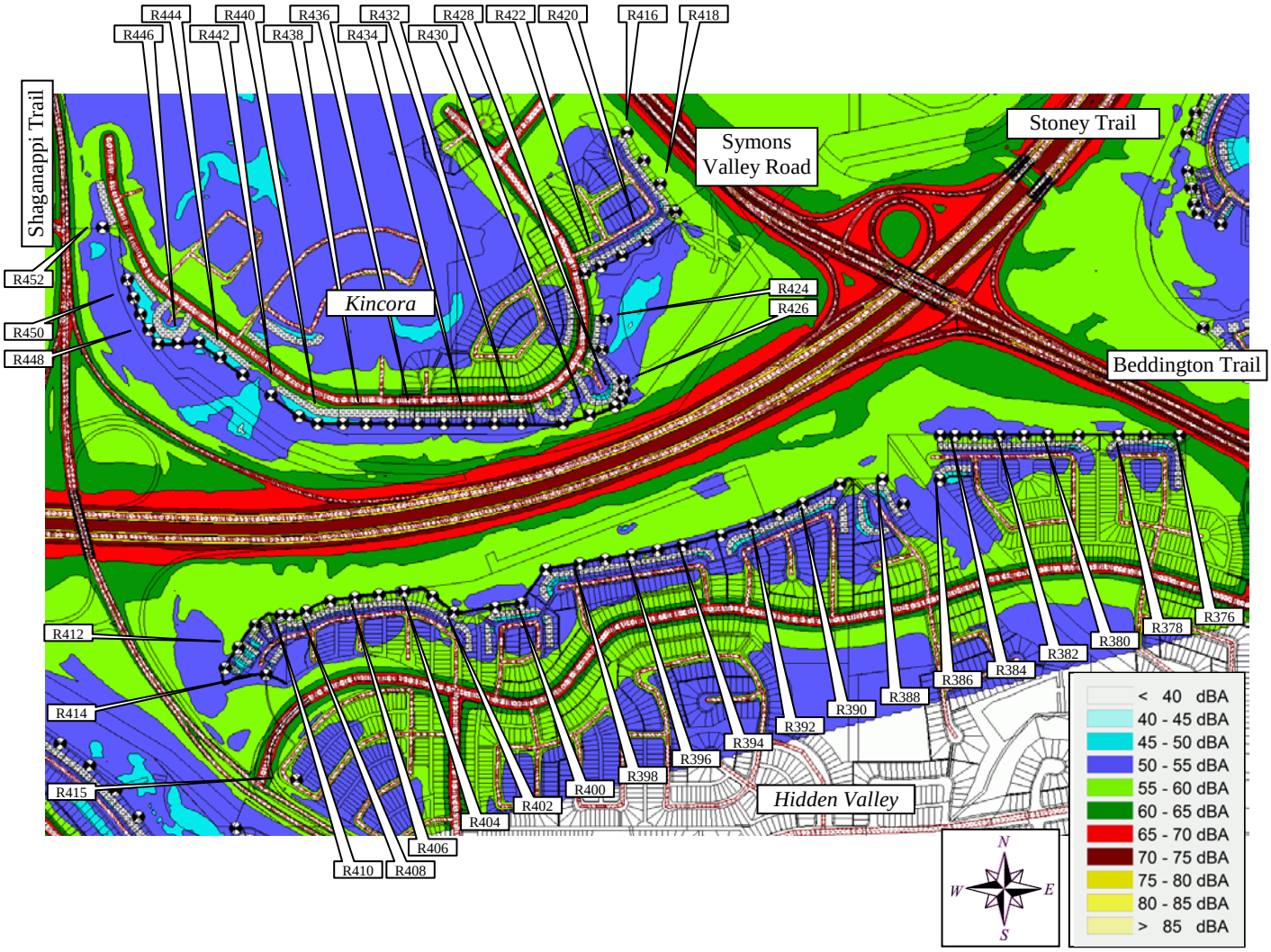


Figure 2D. Current Conditions L_{eq}24 Sound Levels for Region 7

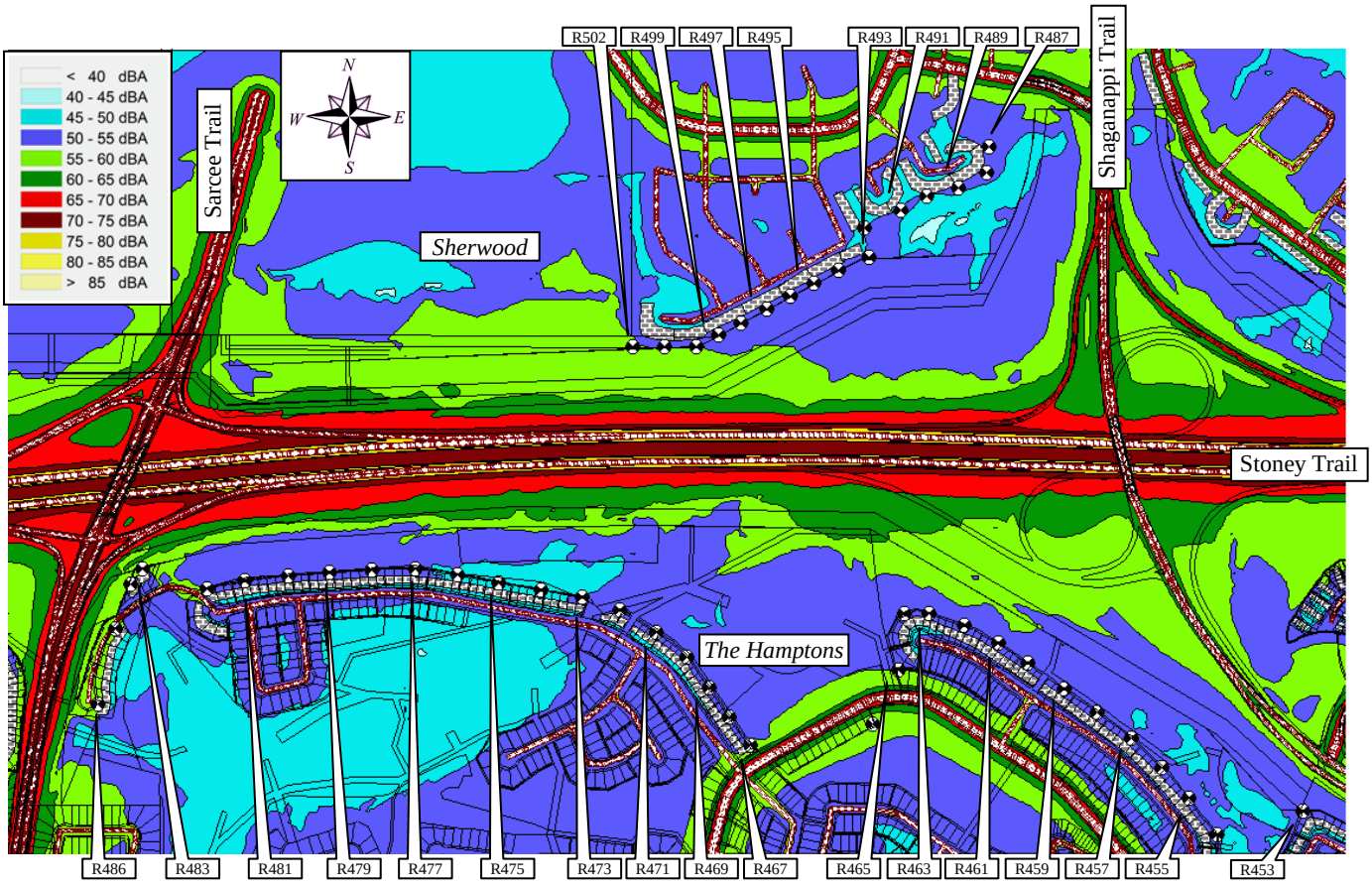


Figure 2E. Current Conditions $L_{eq}24$ Sound Levels for Region 8

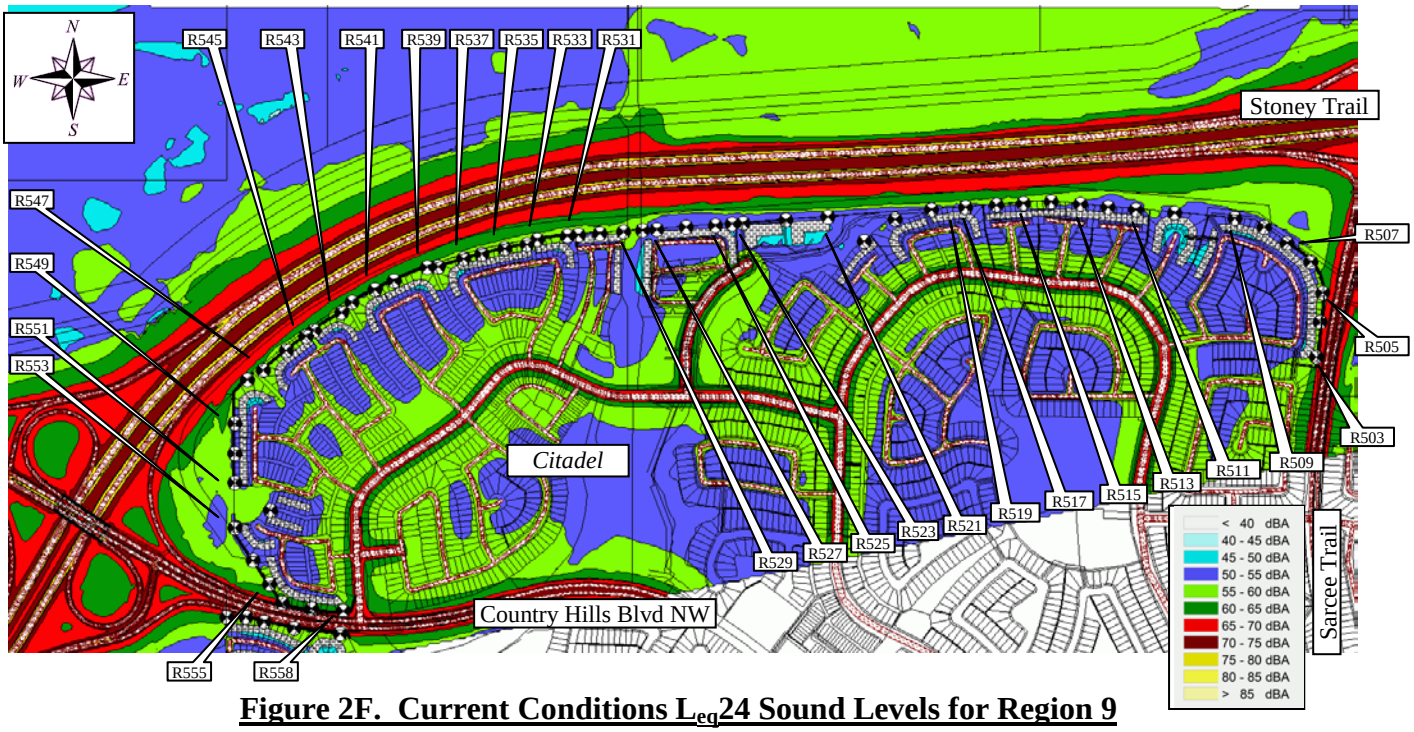


Figure 2F. Current Conditions $L_{eq}24$ Sound Levels for Region 9

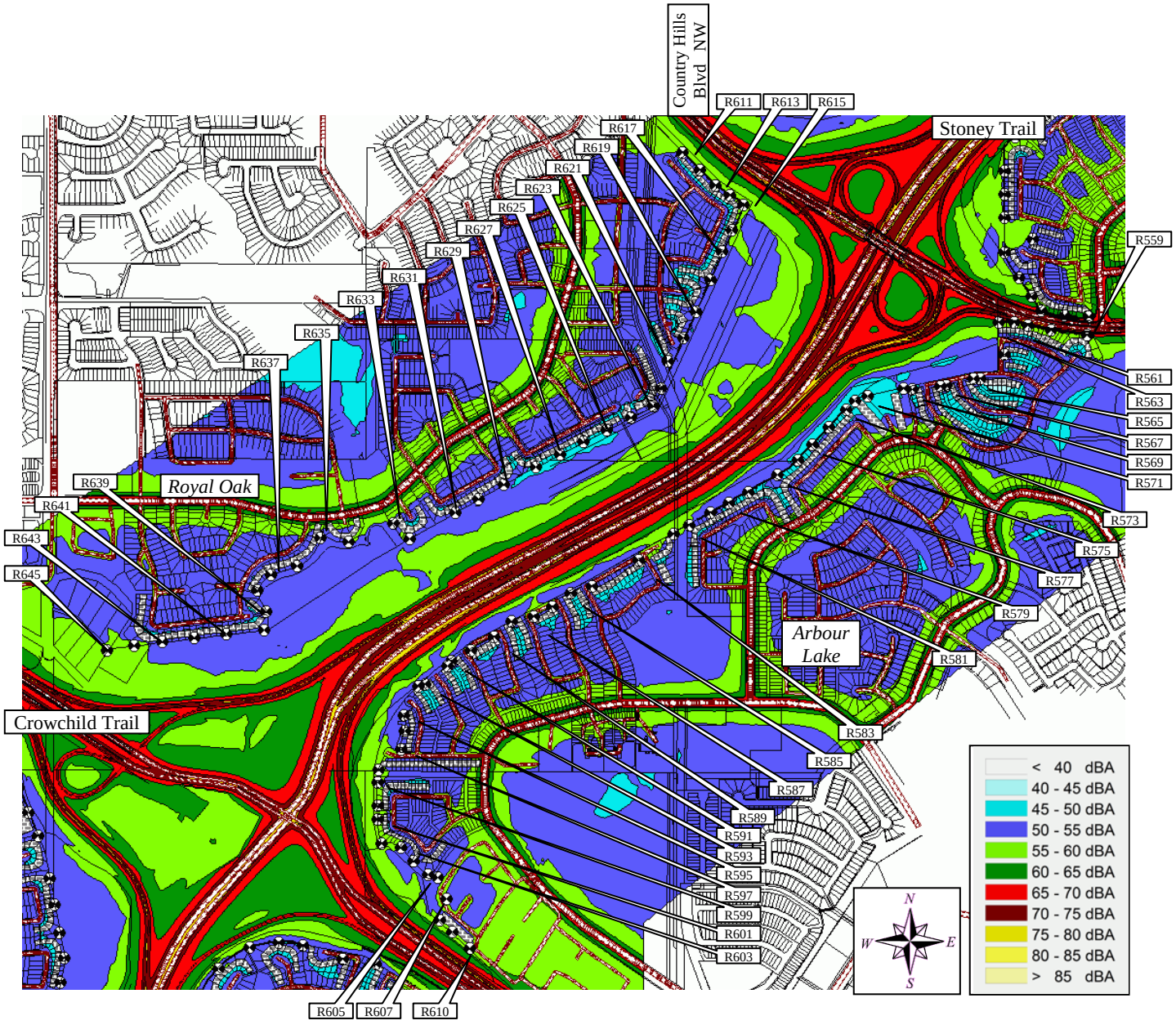


Figure 2G. Current Conditions L_{eq}24 Sound Levels for Region 10

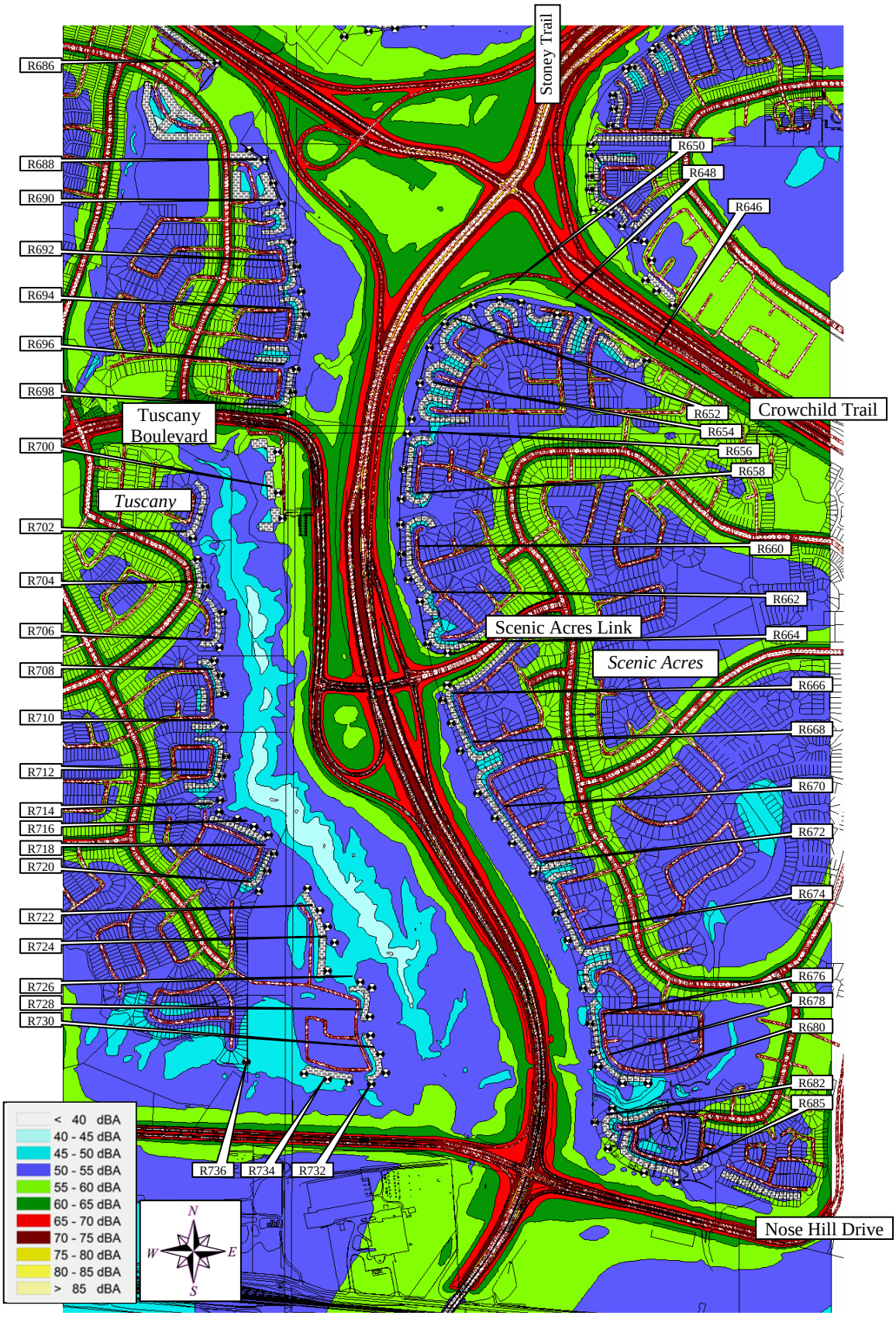


Figure 2H. Current Conditions L_{eq}24 Sound Levels for Region 11

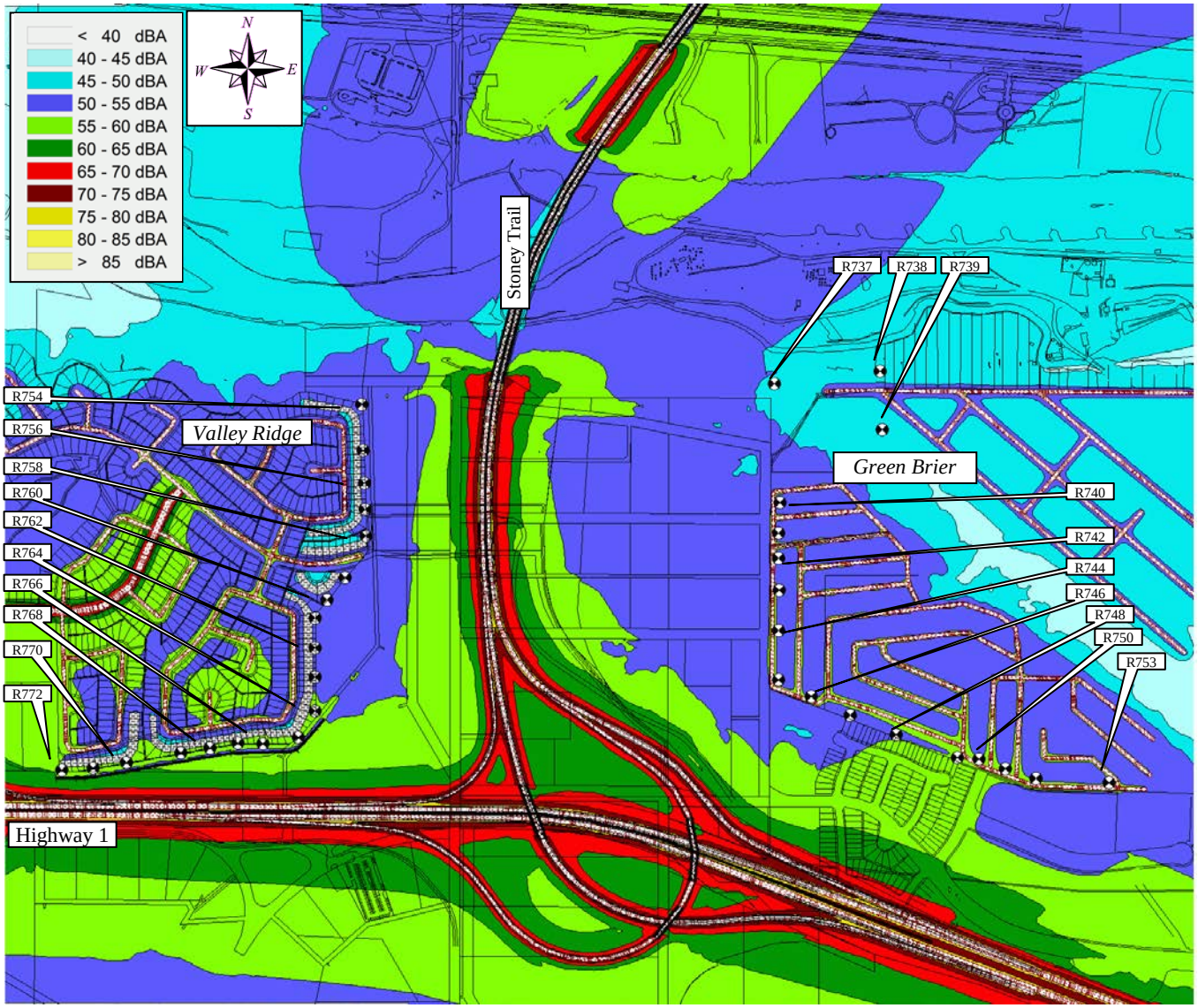


Figure 2I. Current Conditions $L_{eq}24$ Sound Levels for Region 12

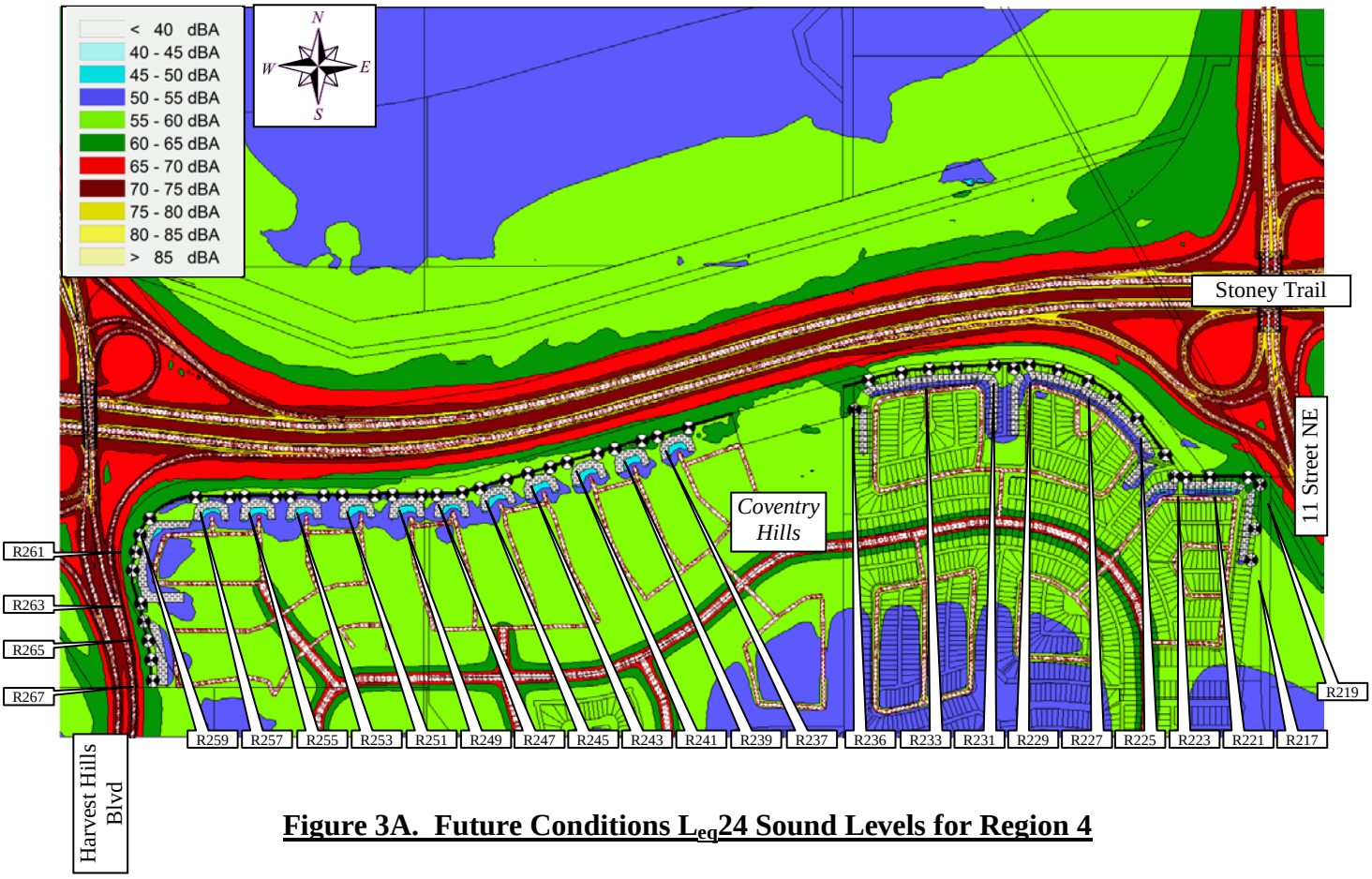


Figure 3A. Future Conditions $L_{eq}24$ Sound Levels for Region 4

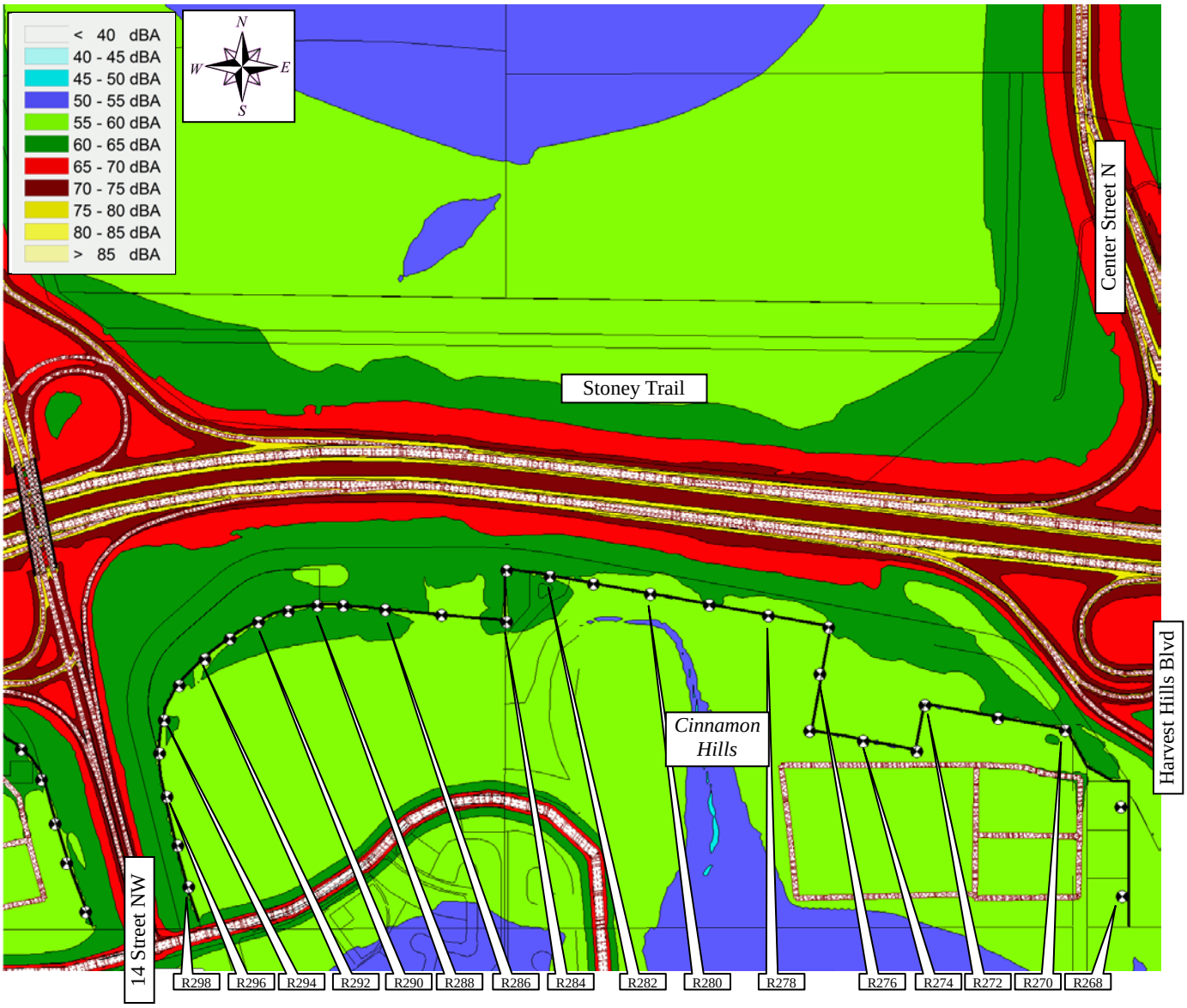


Figure 3B. Future Conditions L_{eq}24 Sound Levels for Region 5

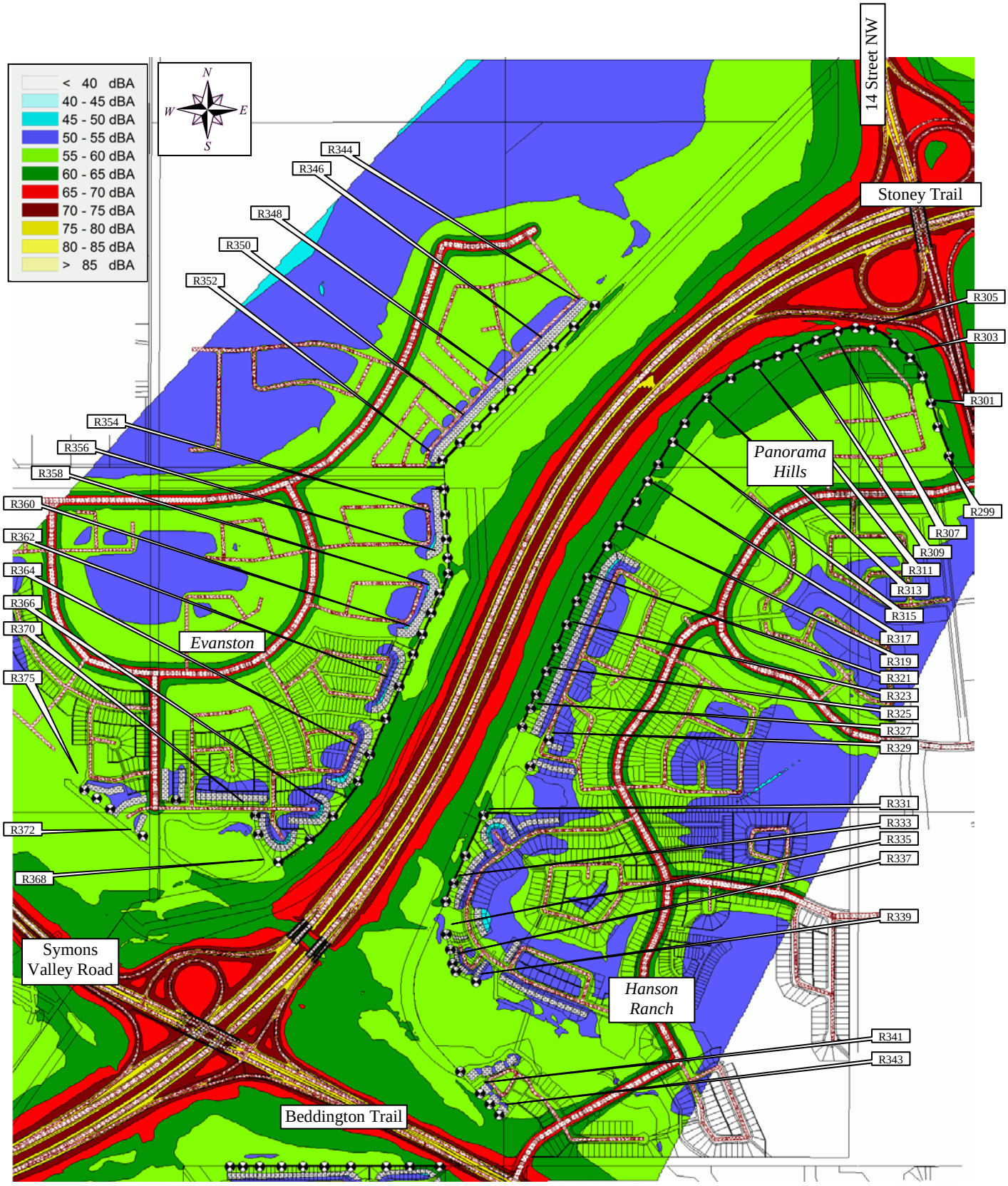


Figure 3C. Future Conditions L_{eq}24 Sound Levels for Region 6

Figure 3D. Future Conditions L_{eq}24 Sound Levels for Region 7

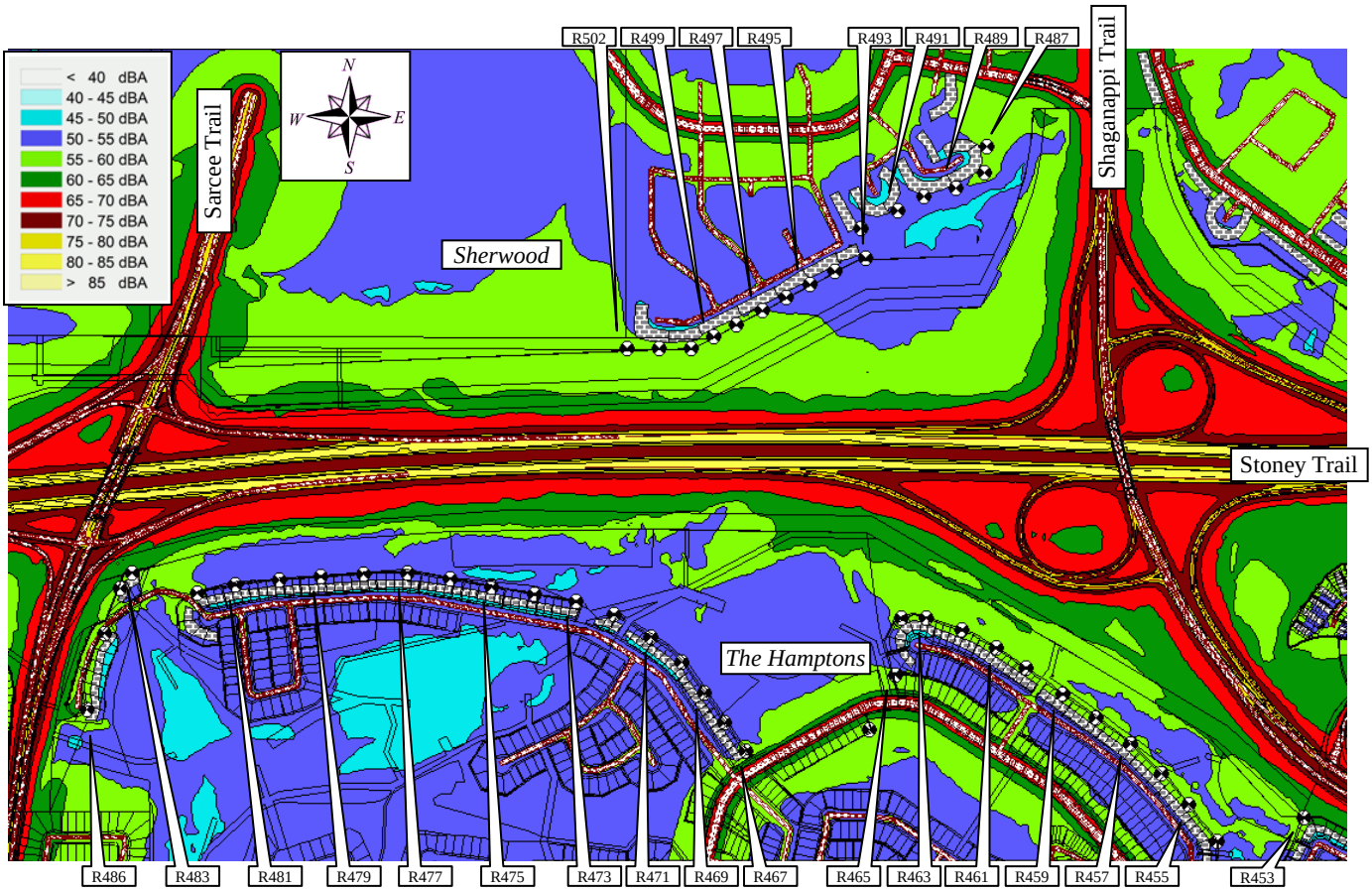


Figure 3E. Future Conditions L_{eq}24 Sound Levels for Region 8

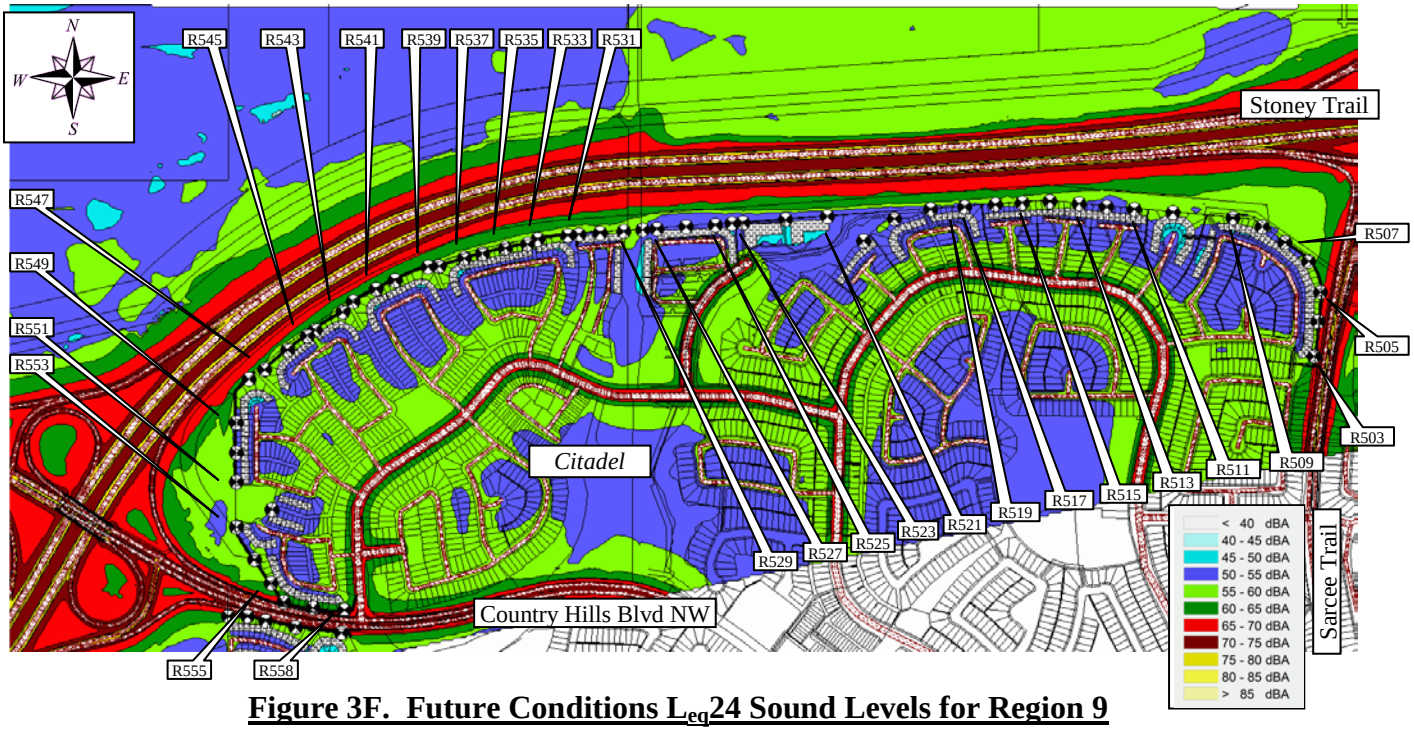


Figure 3F. Future Conditions L_{eq}24 Sound Levels for Region 9

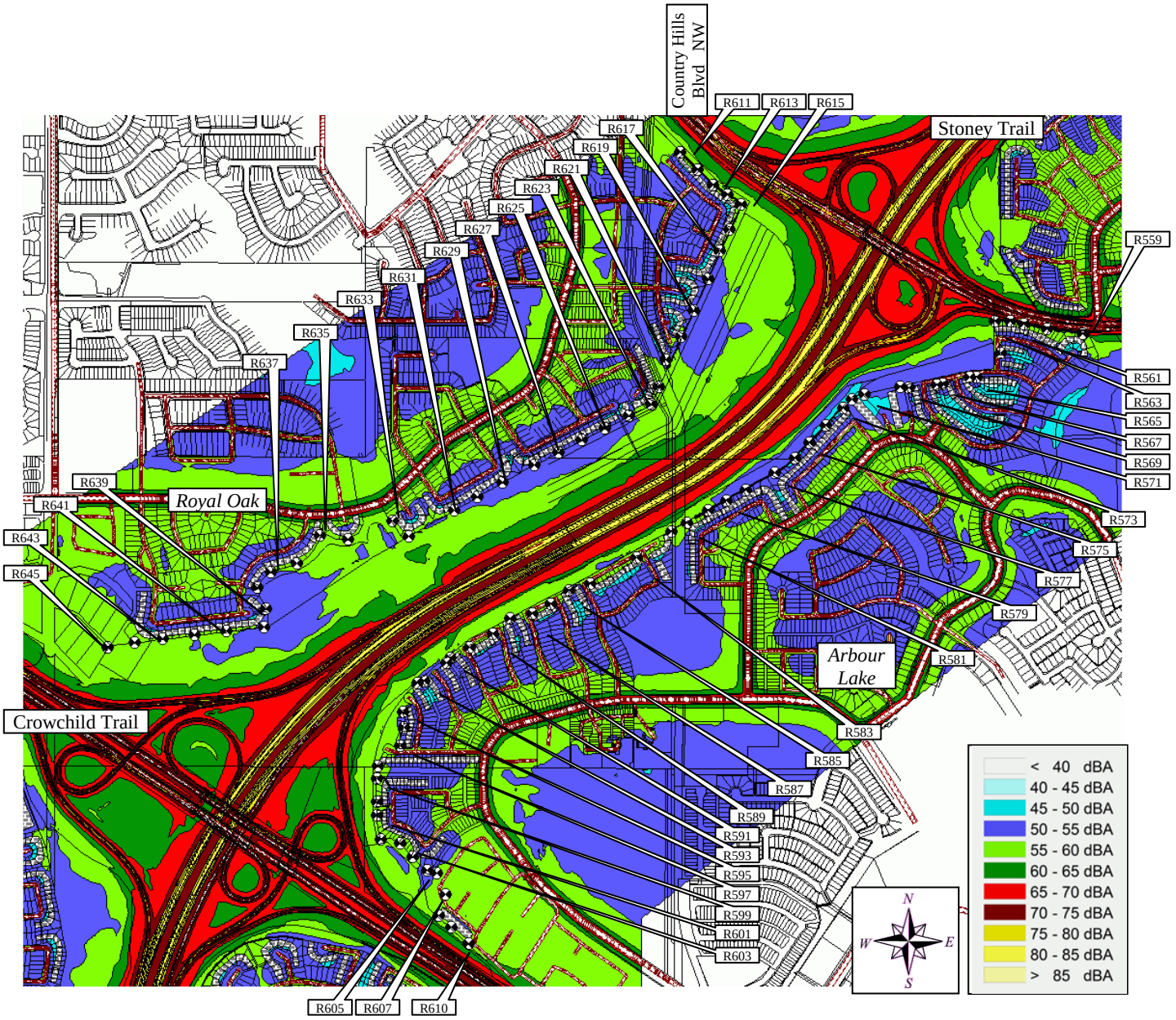


Figure 3G. Future Conditions L_{eq}24 Sound Levels for Region 10

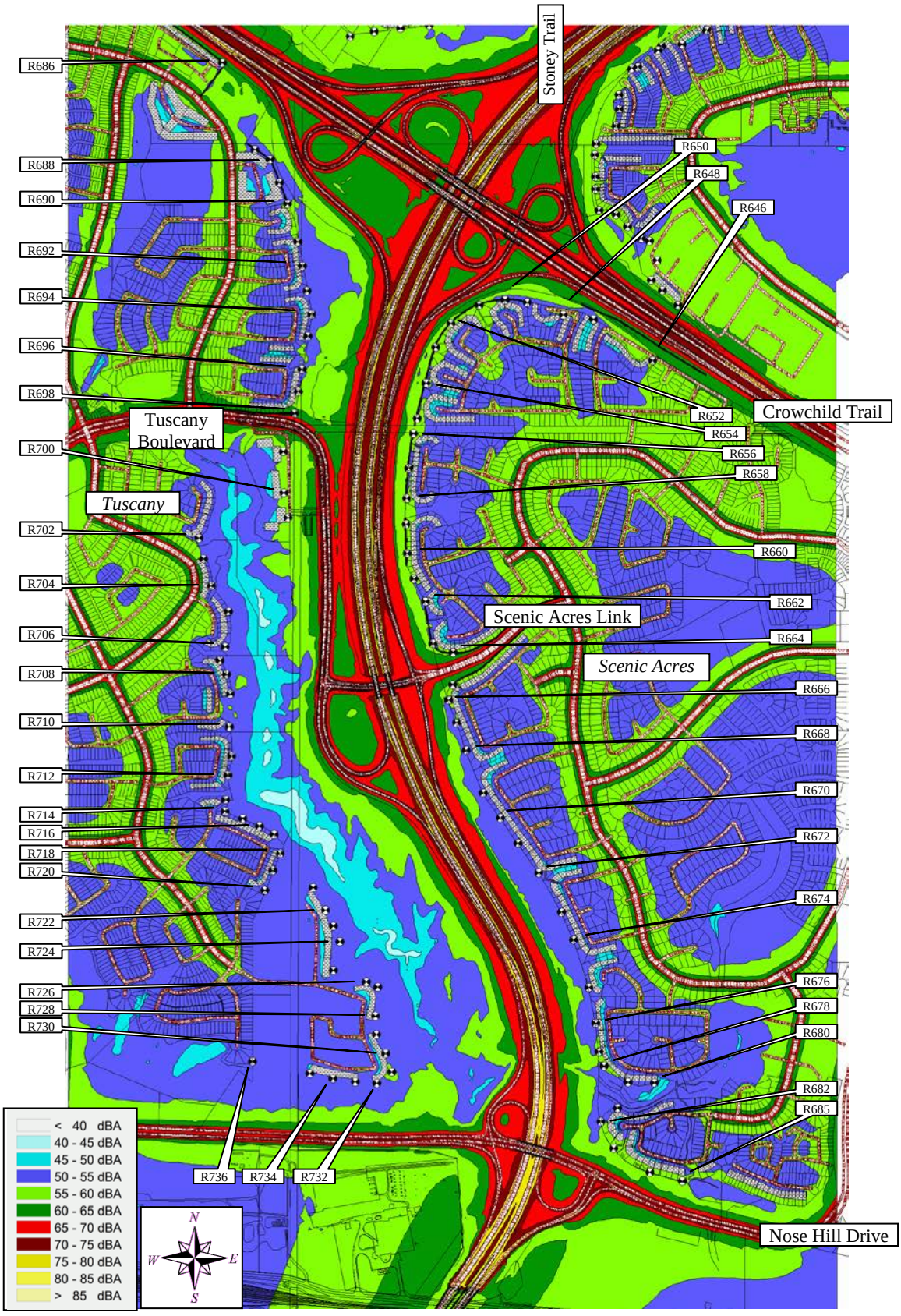


Figure 3H. Future Conditions $L_{eq}24$ Sound Levels for Region 11

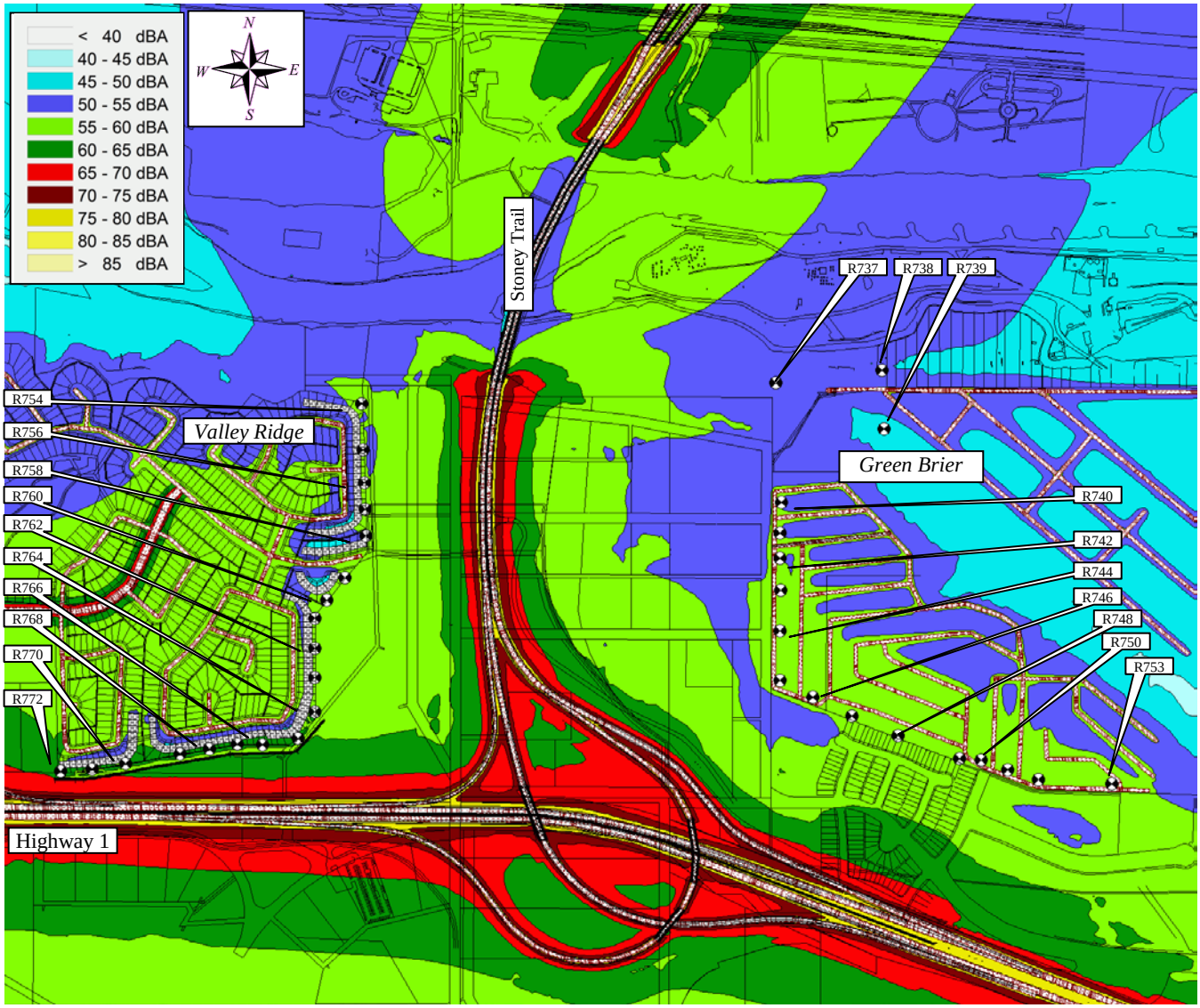


Figure 3I. Future Conditions L_{eq}24 Sound Levels for Region 12

Appendix I

NOISE MODELLING PARAMETERS

Current Conditions

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
Stoney Trail (Hwy. 1 West End - Nose Hill Drive) NB	1275	6	250	6	85	21375
Stoney Trail (Hwy. 1 West End - Nose Hill Drive) SB	1100	8	350	6	85	19650
Stoney Trail (Nose Hill Drive - Scenic Acres Link) NB	1215	6	350	6	70	21375
Stoney Trail (Nose Hill Drive - Scenic Acres Link) SB	1100	8	350	6	70	19650
Stoney Trail (Scenic Acres Link - Crowchild Trail) NB	1270	6	250	6	70	21300
Stoney Trail (Scenic Acres Link - Crowchild Trail) SB	1100	7	350	6	70	19650
Stoney Trail (Crowchild Trail - Country Hills Blvd) NB	1200	10	450	3	70	22050
Stoney Trail (Crowchild Trail - Country Hills Blvd) SB	1170	8	450	10	70	21600
Stoney Trail (Country Hills Blvd - Sarcee Trail) NB	1290	10	400	5	100	22950
Stoney Trail (Country Hills Blvd - Sarcee Trail) SB	1360	9	240	9	100	22560
Stoney Trail (Sarcee Trail - Shaganappi Trail) EB	1250	10	400	3	100	22350
Stoney Trail (Sarcee Trail - Shaganappi Trail) WB	1350	9	250	9	100	22500
Stoney Trail (Shaganappi Trail - Beddington Trail) EB	1272	10	363	3	100	22347
Stoney Trail (Shaganappi Trail - Beddington Trail) WB	1322	8	211	10	100	21729
Stoney Trail (Beddington Trail - 114 Street NW) EB	855	10	300	3	100	15525
Stoney Trail (Beddington Trail - 114 Street NW) WB	920	9	200	9	100	15600
Stoney Trail (114 Street NW - Harvest Hills Blvd) EB	890	10	280	3	100	15870
Stoney Trail (114 Street NW - Harvest Hills Blvd) WB	940	9	170	9	100	15630
Stoney Trail (Harvest Hills Blvd - 11 Street NE) EB	915	10	280	3	100	16245
Stoney Trail (Harvest Hills Blvd - 11 Street NE) WB	945	8	160	10	100	15615
Stoney Trail (11 Street NE - Deerfoot Trail) EB	915	10	280	3	100	16245
Stoney Trail (11 Street NE - Deerfoot Trail) WB	940	8	170	10	100	15630
Stoney Trail (Deerfoot Trail - Metis Trail) EB	710	11	123	14	100	11757
Stoney Trail (Deerfoot Trail - Metis Trail) WB	591	16	169	8	100	10386
Stoney Trail (Metis Trail - Country Hills Blvd NE) EB	710	11	123	14	100	11757
Stoney Trail (Metis Trail - Country Hills Blvd NE) WB	591	16	169	8	100	10386
Stoney Trail (Country Hills Blvd NE - 96 Avenue NE) NB	710	11	123	14	100	11757
Stoney Trail (Country Hills Blvd NE - 96 Avenue NE) SB	591	16	169	8	100	10386
Stoney Trail (96 Avenue NE - McKnight Blvd NE) NB	695	11	150	14	100	11775
Stoney Trail (96 Avenue NE - McKnight Blvd NE) SB	580	16	190	8	100	10410
Stoney Trail (McKnight Blvd NE - 16 Avenue NE) NB	695	11	150	14	100	11775
Stoney Trail (McKnight Blvd NE - 16 Avenue NE) SB	585	16	180	8	100	10395
Stoney Trail (16 Avenue NE - 17 Avenue SE) NB	585	12	95	15	100	9630
Stoney Trail (16 Avenue NE - 17 Avenue SE) NB	538	15	157	6	100	9483
West Valley Road, WB Stoney Trail to NB West Valley Road Ramp	311	3	58	3	50	5177
West Valley Road, EB Stoney Trail to NB West Valley Road Ramp	37	3	7	3	50	618
West Valley Road, SB West Valley Road to EB Stoney Trail Ramp	300	3	56	3	50	5003
West Valley Road, SB West Valley Road to WB Stoney Trail Ramp	9	3	2	3	50	156
Hwy. 1 (West End, West of Stoney Trail) EB	1026	6	190	6	100	17100
Hwy. 1 (West End, West of Stoney Trail) WB	1026	6	190	6	100	17100
Hwy. 1 (West End, East of Stoney Trail) EB	1411	5	261	5	80	23520
Hwy. 1 (West End, East of Stoney Trail) WB	1411	5	261	5	80	23520
Hwy. 1 (West End) EB to Stoney Trail NB Ramp	343	6	63	5	80	5710
Hwy. 1 (West End) WB to Stoney Trail NB Ramp	743	6	138	5	80	12380
Hwy. 1 (West End) SB Stoney Trail to EB Hwy. 1 Ramp	716	8	133	5	80	11940
Hwy. 1 (West End) SB Stoney Trail to WB Hwy. 1 Ramp	346	8	64	5	80	5770
Nose Hill Drive (West of Stoney Trail) EB	413	4	77	4	60	6890
Nose Hill Drive (West of Stoney Trail) WB	413	4	77	4	60	6890
Nose Hill Drive (East of Stoney Trail) EB	490	8	91	8	60	8165
Nose Hill Drive (East of Stoney Trail) WB	490	8	91	8	60	8165
Nose Hill Drive, NB Stoney Trail to EB Nose Hill Drive Ramp	202	8	37	8	80	3370
Nose Hill Drive, WB Nose Hill Drive to NB Stoney Trail Ramp	176	8	33	8	80	2940
Nose Hill Drive, SB Stoney Trail to WB Nose Hill Drive Ramp	119	4	22	4	80	1990
Nose Hill Drive, EB Nose Hill Drive to SB Stoney Trail Ramp	213	4	39	4	80	3550

Current Conditions (Cont.)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
Scenic Acres Link	660	8	122	8	60	11000
Scenic Acres Link, NB Stoney Trail to EB Scenic Acres Link Ramp	140	8	26	8	80	2340
Scenic Acres Link, NB Stoney Trail to WB Scenic Acres Link Ramp	131	4	24	4	80	2190
Scenic Acres Link, WB Scenic Acres Link to NB Stoney Trail Ramp	162	8	30	8	80	2700
Scenic Acres Link, WB Scenic Acres Link to NB Tuscany Blvd Ramp	73	8	14	8	80	1220
Scenic Acres Link, WB Scenic Acres Link to SB Stoney Trail Ramp	89	8	17	8	80	1490
Scenic Acres Link, SB Stoney Trail to NB Tuscany Blvd Ramp	272	4	50	4	80	4530
Scenic Acres Link, SB Stoney Trail to EB Scenic Acres Link Ramp	144	8	27	8	80	2400
Scenic Acres Link, SB Tuscany Blvd to SB Stoney Trail Ramp	148	4	27	4	80	2460
Scenic Acres Link, SB Tuscany Blvd to NB Stoney Trail Ramp	241	4	45	4	80	4020
Scenic Acres Link, SB Tuscany Blvd to EB Scenic Acres Link Ramp	51	8	9	8	80	850
Crowchild Trail (West of Stoney Trail) EB	908	5	168	5	60	15140
Crowchild Trail (West of Stoney Trail) WB	908	5	168	5	60	15140
Crowchild Trail (East of Stoney Trail) EB	1042	4	193	4	60	17365
Crowchild Trail (East of Stoney Trail) WB	1042	4	193	4	60	17365
Crowchild Trail, NB Stoney Trail to EB Crowchild Trail Ramp	80	6	15	4	80	1335
Crowchild Trail, WB Crowchild Trail to NB Stoney Trail Ramp	350	10	55	3	80	5745
Crowchild Trail, SB Stoney Trail to WB Crowchild Trail Ramp	300	8	45	10	80	4905
Crowchild Trail, EB Crowchild Trail to SB Stoney Trail Ramp	450	7	69	4	80	7371
Crowchild Trail, SB Stoney Trail to EB Crowchild Trail Ramp	60	8	43	10	80	1287
Country Hills Blvd NW (West of Stoney Trail) EB	922	7	171	7	60	15360
Country Hills Blvd NW (West of Stoney Trail) WB	922	7	171	7	60	15360
Country Hills Blvd NW (East of Stoney Trail) EB	664	3	123	3	60	11070
Country Hills Blvd NW (East of Stoney Trail) WB	664	3	123	3	60	11070
Country Hills Blvd NW, NB Stoney Trail to EB Country Hills Blvd Ramp	230	10	43	3	80	3840
Country Hills Blvd NW, NB Stoney Trail to WB Country Hills Blvd Ramp	395	10	73	3	80	6590
Country Hills Blvd NW, WB Country Hills Blvd to NB Stoney Trail Ramp	114	10	21	3	80	1900
Country Hills Blvd NW, WB Country Hills Blvd to SB Stoney Trail Ramp	182	8	34	10	80	3040
Country Hills Blvd NW, SB Stoney Trail to WB Country Hills Blvd Ramp	253	9	47	9	80	4210
Country Hills Blvd NW, SB Stoney Trail to EB Country Hills Blvd Ramp	136	9	25	9	80	2270
Country Hills Blvd NW, EB Country Hills Blvd to SB Stoney Trail Ramp	307	8	57	10	80	5120
Country Hills Blvd NW, EB Country Hills Blvd to NB Stoney Trail Ramp	223	10	41	3	80	3710
Sarcee Trail (North of Stoney Trail) NB	353	9	65	9	60	5875
Sarcee Trail (North of Stoney Trail) SB	353	9	65	9	60	5875
Sarcee Trail (South of Stoney Trail) NB	442	12	82	12	60	7370
Sarcee Trail (South of Stoney Trail) SB	442	12	82	12	60	7370
Sarcee Trail, NB Sarcee Trail to EB Stoney Trail Ramp	200	9	60	3	80	3540
Sarcee Trail, NB Sarcee Trail to WB Stoney Trail Ramp	109	9	20	9	80	1810
Sarcee Trail, WB Stoney Trail to NB Sarcee Trail Ramp	142	9	26	9	80	2365
Sarcee Trail, WB Stoney Trail to SB Sarcee Trail Ramp	219	9	41	9	80	3655
Sarcee Trail, SB Sarcee Trail to WB Stoney Trail Ramp	100	9	19	9	80	1670
Sarcee Trail, SB Sarcee Trail to EB Stoney Trail Ramp	111	9	20	3	80	1845
Sarcee Trail, EB Stoney Trail to SB Sarcee Trail Ramp	94	9	17	3	80	1570
Sarcee Trail, EB Stoney Trail to NB Sarcee Trail Ramp	105	9	19	3	80	1750
Shaganappi Trail (North of Stoney Trail) NB	106	9	20	9	60	1760
Shaganappi Trail (North of Stoney Trail) SB	106	9	20	9	60	1760
Shaganappi Trail (South of Stoney Trail) NB	53	3	10	3	60	880
Shaganappi Trail (South of Stoney Trail) SB	53	3	10	3	60	880
Shaganappi Trail, WB Stoney Trail to NB Shaganappi Trail Ramp	57	10	11	3	80	950
Shaganappi Trail, SB Shaganappi Trail to WB Stoney Trail Ramp	49	9	9	9	80	810
Beddington Trail (West of Stoney Trail) EB	823	10	152	10	60	13710
Beddington Trail (West of Stoney Trail) WB	823	10	152	10	60	13710
Beddington Trail (East of Stoney Trail) EB	896	10	166	10	60	14930
Beddington Trail (East of Stoney Trail) WB	896	10	166	10	60	14930
Beddington Trail, EB Stoney Trail to EB Beddington Trail Ramp	306	10	57	3	80	5105
Beddington Trail, EB Stoney Trail to WB Beddington Trail Ramp	155	10	29	3	80	2575
Beddington Trail, WB Beddington Trail to EB Stoney Trail Ramp	109	10	20	3	80	1810
Beddington Trail, WB Beddington Trail to WB Stoney Trail Ramp	334	8	62	10	80	5565
Beddington Trail, WB Stoney Trail to WB Beddington Trail Ramp	156	9	29	9	80	2600
Beddington Trail, WB Stoney Trail to EB Beddington Trail Ramp	68	9	13	9	80	1130
Beddington Trail, EB Beddington Trail to WB Stoney Trail Ramp	218	8	40	10	80	3635
Beddington Trail, EB Beddington Trail to EB Stoney Trail Ramp	142	10	26	3	80	2360

Current Conditions (Cont.)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
114 Street NW, NB 114 Street NW to EB Stoney Trail Ramp	56	10	10	3	80	940
114 Street NW, EB Stoney Trail to SB 114 Street NW Ramp	83	10	15	3	80	1380
Harvest Hills Blvd (North of Stoney Trail) NB	174	14	32	14	60	2905
Harvest Hills Blvd (North of Stoney Trail) SB	174	14	32	14	60	2905
Harvest Hills Blvd (South of Stoney Trail) NB	323	6	60	6	60	5385
Harvest Hills Blvd (South of Stoney Trail) SB	323	6	60	6	60	5385
Deerfoot Trail (North of Stoney Trail) NB	2085	10	386	10	110	34750
Deerfoot Trail (North of Stoney Trail) SB	2085	10	386	10	110	34750
Deerfoot Trail (South of Stoney Trail) NB	1939	10	359	10	110	32320
Deerfoot Trail (South of Stoney Trail) SB	1939	10	359	10	110	32320
Deerfoot Trail, NB Deerfoot Trail to EB Stoney Trail Ramp	50	11	9	14	100	830
Deerfoot Trail, NB Deerfoot Trail to WB Stoney Trail Ramp	284	8	53	10	100	4740
Deerfoot Trail, WB Stoney Trail to NB Deerfoot Trail Ramp	187	16	35	8	100	3110
Deerfoot Trail, WB Stoney Trail to SB Deerfoot Trail Ramp	66	16	12	8	100	1100
Deerfoot Trail, SB Deerfoot Trail to WB Stoney Trail Ramp	246	8	46	10	100	4100
Deerfoot Trail, SB Deerfoot Trail to EB Stoney Trail Ramp	193	11	36	14	100	3210
Deerfoot Trail, EB Stoney Trail to SB Deerfoot Trail Ramp	237	10	44	3	100	3950
Deerfoot Trail, EB Stoney Trail to NB Deerfoot Trail Ramp	304	10	56	3	100	5060
Metis Trail (North of Stoney Trail) NB	131	10	24	10	60	2190
Metis Trail (North of Stoney Trail) SB	131	10	24	10	60	2190
Metis Trail (South of Stoney Trail) NB	119	10	22	10	60	1980
Metis Trail (South of Stoney Trail) SB	119	10	22	10	60	1980
Metis Trail, NB Metis Trail to EB Stoney Trail Ramp	31	11	6	14	80	520
Metis Trail, NB Metis Trail to WB Stoney Trail Ramp	59	16	11	8	80	980
Metis Trail, WB Stoney Trail to NB Metis Trail Ramp	43	16	8	8	80	710
Metis Trail, WB Stoney Trail to SB Metis Trail Ramp	19	16	3	8	80	310
Metis Trail, SB Metis Trail to WB Stoney Trail Ramp	58	16	11	8	80	970
Metis Trail, SB Metis Trail to EB Stoney Trail Ramp	49	11	9	14	80	820
Metis Trail, EB Stoney Trail to SB Metis Trail Ramp	63	11	12	14	80	1050
Metis Trail, EB Stoney Trail to NB Metis Trail Ramp	47	11	9	14	80	780
Country Hills Blvd NE (West of Stoney Trail) EB	161	7	30	7	60	2690
Country Hills Blvd NE (West of Stoney Trail) WB	161	7	30	7	60	2690
Country Hills Blvd NE (East of Stoney Trail) EB	65	7	12	7	60	1085
Country Hills Blvd NE (East of Stoney Trail) WB	65	7	12	7	60	1085
Country Hills Blvd NE, NB Stoney Trail to EB Country Hills Blvd Ramp	20	16	4	8	80	340
Country Hills Blvd NE, NB Stoney Trail to WB Country Hills Blvd Ramp	60	16	11	8	80	1000
Country Hills Blvd NE, WB Country Hills Blvd to NB Stoney Trail Ramp	15	16	3	8	80	250
Country Hills Blvd NE, WB Country Hills Blvd to SB Stoney Trail Ramp	26	11	5	14	80	440
Country Hills Blvd NE, SB Stoney Trail to WB Country Hills Blvd Ramp	68	11	13	14	80	1140
Country Hills Blvd NE, SB Stoney Trail to EB Country Hills Blvd Ramp	11	11	2	14	80	190
Country Hills Blvd NE, EB Country Hills Blvd to SB Stoney Trail Ramp	89	11	16	14	80	1480
Country Hills Blvd NE, EB Country Hills Blvd to NB Stoney Trail Ramp	49	16	9	8	80	810
McKnight Blvd (West of Stoney Trail) EB	381	9	71	9	60	6355
McKnight Blvd (West of Stoney Trail) WB	381	9	71	9	60	6355
McKnight Blvd (East of Stoney Trail) EB	87	10	16	10	60	1455
McKnight Blvd (East of Stoney Trail) WB	87	10	16	10	60	1455
McKnight Blvd, NB Stoney Trail to EB McKnight Blvd Ramp	18	16	3	8	80	300
McKnight Blvd, NB Stoney Trail to WB McKnight Blvd Ramp	237	16	44	8	80	3950
McKnight Blvd, WB McKnight Blvd to NB Stoney Trail Ramp	10	16	2	8	80	160
McKnight Blvd, WB McKnight Blvd to SB Stoney Trail Ramp	23	11	4	14	80	390
McKnight Blvd, SB Stoney Trail to WB McKnight Blvd Ramp	103	11	19	14	80	1720
McKnight Blvd, SB Stoney Trail to EB McKnight Blvd Ramp	12	11	2	14	80	200
McKnight Blvd, EB McKnight Blvd to SB Stoney Trail Ramp	227	11	42	14	80	3790
McKnight Blvd, EB McKnight Blvd to NB Stoney Trail Ramp	83	16	15	8	80	1390
16 Avenue NE (West of Stoney Trail) EB	671	5	124	5	60	11180
16 Avenue NE (West of Stoney Trail) WB	671	5	124	3	60	11180
16 Avenue NE (East of Stoney Trail) EB	671	9	124	9	100	11185

Current Conditions (Cont.)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
16 Avenue NE (East of Stoney Trail) WB	671	9	124	9	100	11185
16 Avenue NE, NB Stoney Trail to EB 16 Avenue NE Ramp	26	12	5	15	80	430
16 Avenue NE, NB Stoney Trail to WB 16 Avenue NE Ramp	89	12	17	15	80	1490
16 Avenue NE, WB 16 Avenue NE to NB Stoney Trail Ramp	189	11	35	14	80	3150
16 Avenue NE, WB 16 Avenue NE to SB Stoney Trail Ramp	37	15	7	6	80	610
16 Avenue NE, SB Stoney Trail to WB 16 Avenue NE Ramp	134	16	25	8	80	2240
16 Avenue NE, SB Stoney Trail to EB 16 Avenue NE Ramp	183	16	34	8	80	3050
16 Avenue NE, EB 16 Avenue NE to SB Stoney Trail Ramp	76	15	14	6	80	1270
16 Avenue NE, EB 16 Avenue NE to NB Stoney Trail Ramp	134	11	25	14	80	2230
17 Avenue SE, West of Stoney Trail	1070	9	198	9	60	17830
17 Avenue SE, East of Stoney Trail	1377	9	255	9	80	22950
Arterial Roads	1200	5	222	5	60	20000
Collector Roads	480	3	89	3	60	8000
Residential Streets	12	3	2	3	50	200

Future Conditions (1.6 Million Population)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
Stoney Trail (Hwy. 1 West End - Nose Hill Drive) NB	1819	6	357	6	100	30500
Stoney Trail (Hwy. 1 West End - Nose Hill Drive) SB	1707	8	543	6	100	30500
Stoney Trail (Nose Hill Drive - Scenic Acres Link) NB	1393	6	401	6	100	24500
Stoney Trail (Nose Hill Drive - Scenic Acres Link) SB	1372	8	436	6	100	24500
Stoney Trail (Scenic Acres Link - Crowchild Trail) NB	1491	6	293	6	100	25000
Stoney Trail (Scenic Acres Link - Crowchild Trail) SB	1399	7	445	6	100	25000
Stoney Trail (Crowchild Trail - Country Hills Blvd) NB	1361	10	510	3	100	25000
Stoney Trail (Crowchild Trail - Country Hills Blvd) SB	1354	8	521	10	100	25000
Stoney Trail (Country Hills Blvd - Sarcee Trail) NB	1265	10	392	5	100	22500
Stoney Trail (Country Hills Blvd - Sarcee Trail) SB	1356	9	239	9	100	22500
Stoney Trail (Sarcee Trail - Shaganappi Trail) EB	1454	10	465	3	100	26000
Stoney Trail (Sarcee Trail - Shaganappi Trail) WB	1560	9	289	9	100	26000
Stoney Trail (Shaganappi Trail - Beddington Trail) EB	1736	10	495	3	100	30500
Stoney Trail (Shaganappi Trail - Beddington Trail) WB	1856	8	296	10	100	30500
Stoney Trail (Beddington Trail - 114 Street NW) EB	1542	10	541	3	100	28000
Stoney Trail (Beddington Trail - 114 Street NW) WB	1651	9	359	9	100	28000
Stoney Trail (114 Street NW - Harvest Hills Blvd) EB	1570	10	494	3	100	28000
Stoney Trail (114 Street NW - Harvest Hills Blvd) WB	1684	9	305	9	100	28000
Stoney Trail (Harvest Hills Blvd - 11 Street NE) EB	1436	10	440	3	100	25500
Stoney Trail (Harvest Hills Blvd - 11 Street NE) WB	1543	8	261	10	100	25500
Stoney Trail (11 Street NE - Deerfoot Trail) EB	1436	10	440	3	100	25500
Stoney Trail (11 Street NE - Deerfoot Trail) WB	1534	8	277	10	100	25500
Stoney Trail (Deerfoot Trail - Metis Trail) EB	1298	11	225	14	100	21500
Stoney Trail (Deerfoot Trail - Metis Trail) WB	1223	16	350	8	100	21500
Stoney Trail (Metis Trail - Country Hills Blvd NE) EB	1902	11	330	14	100	31500
Stoney Trail (Metis Trail - Country Hills Blvd NE) WB	1792	16	513	8	100	31500
Stoney Trail (Country Hills Blvd NE - 96 Avenue NE) NB	2053	11	356	14	100	34000
Stoney Trail (Country Hills Blvd NE - 96 Avenue NE) SB	1935	16	553	8	100	34000
Stoney Trail (96 Avenue NE - McKnight Blvd NE) NB	2125	11	459	14	100	36000
Stoney Trail (96 Avenue NE - McKnight Blvd NE) SB	2006	16	657	8	100	36000
Stoney Trail (McKnight Blvd NE - 16 Avenue NE) NB	2390	11	516	14	100	40500
Stoney Trail (McKnight Blvd NE - 16 Avenue NE) SB	2279	16	701	8	100	40500
Stoney Trail (16 Avenue NE - 17 Avenue SE) NB	2460	12	400	15	100	40500
Stoney Trail (16 Avenue NE - 17 Avenue SE) NB	2298	15	671	6	100	40500
Stoney Trail South of 17 Avenue SE NB	2430	12	450	15	100	40500
Stoney Trail South of 17 Avenue SE SB	2430	15	450	6	100	40500
West Valley Road, WB Stoney Trail to NB West Valley Road Ramp	311	3	57	3	50	5177
West Valley Road, EB Stoney Trail to NB West Valley Road Ramp	37	3	7	3	50	618
West Valley Road, SB West Valley Road to EB Stoney Trail Ramp	300	3	56	3	50	5003
West Valley Road, SB West Valley Road to WB Stoney Trail Ramp	9	3	2	3	50	156
Hwy. 1 (West End, West of Stoney Trail) EB	2526	6	467	6	100	42092
Hwy. 1 (West End, West of Stoney Trail) WB	2569	6	475	6	100	42806
Hwy. 1 (West End, East of Stoney Trail) EB	1894	5	350	5	100	31569
Hwy. 1 (West End, East of Stoney Trail) WB	1820	5	337	5	100	30333
Hwy. 1 (West End) EB to Stoney Trail NB Ramp	675	6	125	5	100	11243
Hwy. 1 (West End) WB to Stoney Trail NB Ramp	327	6	60	5	100	5447
Hwy. 1 (West End) SB Stoney Trail to EB Hwy. 1 Ramp	470	8	87	5	100	7835
Hwy. 1 (West End) SB Stoney Trail to WB Hwy. 1 Ramp	720	8	133	5	100	11993
Nose Hill Drive (West of Stoney Trail) EB	457	4	85	4	60	7619
Nose Hill Drive (West of Stoney Trail) WB	457	4	85	4	60	7619
Nose Hill Drive (East of Stoney Trail) EB	662	8	123	8	60	11039
Nose Hill Drive (East of Stoney Trail) WB	418	8	77	8	60	6959
Nose Hill Drive, NB Stoney Trail to EB Nose Hill Drive Ramp	439	8	81	8	80	7319
Nose Hill Drive, NB Stoney Trail to WB Nose Hill Drive Ramp	425	4	79	4	80	7079

Future Conditions (1.6 Million Population) (Cont.)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
Nose Hill Drive, WB Nose Hill Drive to NB Stoney Trail Ramp	155	8	29	8	80	2580
Nose Hill Drive, WB Nose Hill Drive to SB Stoney Trail Ramp	205	8	38	8	80	3420
Nose Hill Drive, SB Stoney Trail to WB Nose Hill Drive Ramp	7	4	1	4	80	120
Nose Hill Drive, SB Stoney Trail to EB Nose Hill Drive Ramp	194	8	36	8	80	3240
Nose Hill Drive, EB Nose Hill Drive to SB Stoney Trail Ramp	418	4	77	4	80	6959
Nose Hill Drive, EB Nose Hill Drive to NB Stoney Trail Ramp	11	4	2	4	80	180
Scenic Acres Link	644	8	119	8	60	10739
Scenic Acres Link, NB Stoney Trail to EB Scenic Acres Link Ramp	112	8	21	8	80	1860
Scenic Acres Link, NB Stoney Trail to WB Scenic Acres Link Ramp	97	4	18	4	80	1620
Scenic Acres Link, WB Scenic Acres Link to NB Stoney Trail Ramp	122	8	23	8	80	2040
Scenic Acres Link, WB Scenic Acres Link to NB Tuscany Blvd Ramp	83	8	15	8	80	1380
Scenic Acres Link, WB Scenic Acres Link to SB Stoney Trail Ramp	119	8	22	8	80	1980
Scenic Acres Link, SB Stoney Trail to NB Tuscany Blvd Ramp	277	4	51	4	80	4620
Scenic Acres Link, SB Stoney Trail to EB Scenic Acres Link Ramp	126	8	23	8	80	2100
Scenic Acres Link, SB Tuscany Blvd to SB Stoney Trail Ramp	108	4	20	4	80	1800
Scenic Acres Link, SB Tuscany Blvd to NB Stoney Trail Ramp	266	4	49	4	80	4440
Scenic Acres Link, SB Tuscany Blvd to EB Scenic Acres Link Ramp	72	8	13	8	80	1200
Crowchild Trail (West of Stoney Trail) EB	1454	5	269	5	60	24238
Crowchild Trail (West of Stoney Trail) WB	1400	5	259	5	60	23338
Crowchild Trail (East of Stoney Trail) EB	1087	4	201	4	60	18118
Crowchild Trail (East of Stoney Trail) WB	1116	4	206	4	60	18598
Crowchild Trail, NB Stoney Trail to EB Crowchild Trail Ramp	97	6	18	4	80	1620
Crowchild Trail, NB Stoney Trail to WB Crowchild Trail Ramp	446	6	83	4	80	7439
Crowchild Trail, WB Crowchild Trail to NB Stoney Trail Ramp	378	10	70	3	80	6299
Crowchild Trail, WB Crowchild Trail to SB Stoney Trail Ramp	133	7	25	4	80	2220
Crowchild Trail, SB Stoney Trail to WB Crowchild Trail Ramp	349	8	65	10	80	5819
Crowchild Trail, SB Stoney Trail to EB Crowchild Trail Ramp	342	8	63	10	80	5699
Crowchild Trail, EB Crowchild Trail to SB Stoney Trail Ramp	482	7	89	4	80	8039
Crowchild Trail, EB Crowchild Trail to NB Stoney Trail Ramp	302	10	56	3	80	5039
Country Hills Blvd NW (West of Stoney Trail) EB	1249	7	231	7	60	20818
Country Hills Blvd NW (West of Stoney Trail) WB	1202	7	222	7	60	20038
Country Hills Blvd NW (East of Stoney Trail) EB	630	3	117	3	60	10499
Country Hills Blvd NW (East of Stoney Trail) WB	626	3	116	3	60	10439
Country Hills Blvd NW, NB Stoney Trail to EB Country Hills Blvd Ramp	198	10	37	3	80	3300
Country Hills Blvd NW, NB Stoney Trail to WB Country Hills Blvd Ramp	684	10	127	3	80	11399
Country Hills Blvd NW, WB Country Hills Blvd to NB Stoney Trail Ramp	194	10	36	3	80	3240
Country Hills Blvd NW, WB Country Hills Blvd to SB Stoney Trail Ramp	198	8	37	10	80	3300
Country Hills Blvd NW, SB Stoney Trail to WB Country Hills Blvd Ramp	284	9	53	9	80	4740
Country Hills Blvd NW, SB Stoney Trail to EB Country Hills Blvd Ramp	212	9	39	9	80	3540
Country Hills Blvd NW, EB Country Hills Blvd to SB Stoney Trail Ramp	691	8	128	10	80	11519
Country Hills Blvd NW, EB Country Hills Blvd to NB Stoney Trail Ramp	338	10	63	3	80	5639
Sarcee Trail (North of Stoney Trail) NB	1325	9	245	9	60	22078
Sarcee Trail (North of Stoney Trail) SB	1253	9	232	9	60	20878
Sarcee Trail (South of Stoney Trail) NB	796	12	147	12	60	13259
Sarcee Trail (South of Stoney Trail) SB	698	12	129	12	60	11639
Sarcee Trail, NB Sarcee Trail to EB Stoney Trail Ramp	353	9	106	3	80	6240
Sarcee Trail, NB Sarcee Trail to WB Stoney Trail Ramp	72	9	13	9	80	1200
Sarcee Trail, WB Stoney Trail to NB Sarcee Trail Ramp	356	9	66	9	80	5939
Sarcee Trail, WB Stoney Trail to SB Sarcee Trail Ramp	310	9	57	9	80	5159
Sarcee Trail, SB Sarcee Trail to WB Stoney Trail Ramp	443	9	82	9	80	7379
Sarcee Trail, SB Sarcee Trail to EB Stoney Trail Ramp	270	9	50	3	80	4500
Sarcee Trail, EB Stoney Trail to SB Sarcee Trail Ramp	47	9	9	3	80	780
Sarcee Trail, EB Stoney Trail to NB Sarcee Trail Ramp	479	9	89	3	80	7979
Shaganappi Trail (North of Stoney Trail) NB	1325	9	245	9	60	22078
Shaganappi Trail (North of Stoney Trail) SB	1253	9	232	9	60	20878
Shaganappi Trail (South of Stoney Trail) NB	1778	3	329	3	60	29637

Future Conditions (1.6 Million Population) (Cont.)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
Shaganappi Trail (South of Stoney Trail) SB	1757	3	325	3	60	29277
Shaganappi Trail, NB Shaganappi Trail to EB Stoney Trail Ramp	760	10	141	3	80	12659
Shaganappi Trail, NB Shaganappi Trail to WB Stoney Trail Ramp	223	9	41	9	80	3720
Shaganappi Trail, WB Stoney Trail to NB Shaganappi Trail Ramp	245	10	45	3	80	4080
Shaganappi Trail, WB Stoney Trail to SB Shaganappi Trail Ramp	814	10	151	3	80	13559
Shaganappi Trail, SB Shaganappi Trail to WB Stoney Trail Ramp	371	9	69	9	80	6179
Shaganappi Trail, SB Shaganappi Trail to EB Stoney Trail Ramp	299	10	55	3	80	4980
Shaganappi Trail, EB Stoney Trail to SB Shaganappi Trail Ramp	360	9	67	9	80	5999
Shaganappi Trail, EB Stoney Trail to NB Shaganappi Trail Ramp	284	9	53	9	80	4740
Beddington Trail (West of Stoney Trail) EB	1206	10	223	10	60	20098
Beddington Trail (West of Stoney Trail) WB	1246	10	230	10	60	20758
Beddington Trail (East of Stoney Trail) EB	1591	10	294	10	60	26517
Beddington Trail (East of Stoney Trail) WB	1652	10	306	10	60	27537
Beddington Trail, EB Stoney Trail to EB Beddington Trail Ramp	508	10	94	3	80	8459
Beddington Trail, EB Stoney Trail to WB Beddington Trail Ramp	209	10	39	3	80	3480
Beddington Trail, WB Beddington Trail to EB Stoney Trail Ramp	421	10	78	3	80	7019
Beddington Trail, WB Beddington Trail to WB Stoney Trail Ramp	547	8	101	10	80	9119
Beddington Trail, WB Stoney Trail to WB Beddington Trail Ramp	374	9	69	9	80	6239
Beddington Trail, WB Stoney Trail to EB Beddington Trail Ramp	565	9	105	9	80	9419
Beddington Trail, EB Beddington Trail to WB Stoney Trail Ramp	281	8	52	10	80	4680
Beddington Trail, EB Beddington Trail to EB Stoney Trail Ramp	385	10	71	3	80	6419
114 Street NW (North of Stoney Trail) NB	1447	8	268	8	60	24118
114 Street NW (North of Stoney Trail) SB	1530	8	283	8	60	25497
114 Street NW (South of Stoney Trail) NB	432	8	80	8	60	7199
114 Street NW (South of Stoney Trail) SB	407	8	75	8	60	6779
114 Street NW, NB 114 Street NW to EB Stoney Trail Ramp	83	10	15	3	80	1380
114 Street NW, NB 114 Street NW to WB Stoney Trail Ramp	234	9	43	9	80	3900
114 Street NW, WB Stoney Trail to NB 114 Street NW Ramp	702	9	130	9	80	11699
114 Street NW, WB Stoney Trail to SB 114 Street NW Ramp	72	9	13	9	80	1200
114 Street NW, SB 114 Street NW to WB Stoney Trail Ramp	738	9	137	9	80	12299
114 Street NW, SB 114 Street NW to EB Stoney Trail Ramp	684	10	127	3	80	11399
114 Street NW, EB Stoney Trail to SB 114 Street NW Ramp	227	10	42	3	80	3780
114 Street NW, EB Stoney Trail to NB 114 Street NW Ramp	630	10	117	3	80	10499
Harvest Hills Blvd (North of Stoney Trail) NB	1462	14	270	14	60	24358
Harvest Hills Blvd (North of Stoney Trail) SB	1591	14	294	14	60	26517
Harvest Hills Blvd (South of Stoney Trail) NB	929	6	172	6	60	15478
Harvest Hills Blvd (South of Stoney Trail) SB	922	6	170	6	60	15358
Harvest Hills Blvd, NB Harvest Hills Blvd to EB Stoney Trail Ramp	259	10	48	3	80	4320
Harvest Hills Blvd, NB Harvest Hills Blvd to WB Stoney Trail Ramp	270	9	50	9	80	4500
Harvest Hills Blvd, WB Stoney Trail to NB Harvest Hills Blvd Ramp	576	8	107	10	80	9599
Harvest Hills Blvd, WB Stoney Trail to SB Harvest Hills Blvd Ramp	209	8	39	10	80	3480
Harvest Hills Blvd, SB Harvest Hills Blvd to WB Stoney Trail Ramp	547	9	101	9	80	9119
Harvest Hills Blvd, SB Harvest Hills Blvd to EB Stoney Trail Ramp	630	10	117	3	80	10499
Harvest Hills Blvd, EB Stoney Trail to SB Harvest Hills Blvd Ramp	299	10	55	3	80	4980
Harvest Hills Blvd, EB Stoney Trail to NB Harvest Hills Blvd Ramp	486	10	90	3	80	8099
11 Street NE (North of Stoney Trail) NB	1300	8	240	8	60	21658
11 Street NE (North of Stoney Trail) SB	1361	8	252	8	60	22678
11 Street NE (South of Stoney Trail) NB	1188	8	220	8	60	19798
11 Street NE (South of Stoney Trail) SB	1091	8	202	8	60	18178
11 Street NE, NB 11 Street NE to EB Stoney Trail Ramp	202	10	37	3	80	3360
11 Street NE, NB 11 Street NE to WB Stoney Trail Ramp	734	9	136	9	80	12239
11 Street NE, WB Stoney Trail to NB 11 Street NE Ramp	655	9	121	9	80	10919
11 Street NE, WB Stoney Trail to SB 11 Street NE Ramp	166	9	31	9	80	2760
11 Street NE, SB 11 Street NE to WB Stoney Trail Ramp	385	9	71	9	80	6419
11 Street NE, SB 11 Street NE to EB Stoney Trail Ramp	731	10	135	3	80	12179
11 Street NE, EB Stoney Trail to SB 11 Street NE Ramp	680	10	126	3	80	11339
11 Street NE, EB Stoney Trail to NB 11 Street NE Ramp	392	10	73	3	80	6539

Future Conditions (1.6 Million Population) (Cont.)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
Deerfoot Trail (North of Stoney Trail) NB	3643	10	674	10	110	60714
Deerfoot Trail (North of Stoney Trail) SB	3222	10	596	10	110	53695
Deerfoot Trail (South of Stoney Trail) NB	3125	10	578	10	110	52075
Deerfoot Trail (South of Stoney Trail) SB	3053	10	565	10	110	50875
Deerfoot Trail, NB Deerfoot Trail to EB Stoney Trail Ramp	396	11	73	14	100	6599
Deerfoot Trail, NB Deerfoot Trail to WB Stoney Trail Ramp	796	8	147	10	100	13259
Deerfoot Trail, WB Stoney Trail to NB Deerfoot Trail Ramp	720	16	133	8	100	11999
Deerfoot Trail, WB Stoney Trail to SB Deerfoot Trail Ramp	313	16	58	8	100	5219
Deerfoot Trail, SB Deerfoot Trail to WB Stoney Trail Ramp	774	8	143	10	100	12899
Deerfoot Trail, SB Deerfoot Trail to EB Stoney Trail Ramp	695	11	129	14	100	11579
Deerfoot Trail, EB Stoney Trail to SB Deerfoot Trail Ramp	857	10	159	3	100	14279
Deerfoot Trail, EB Stoney Trail to NB Deerfoot Trail Ramp	864	10	160	3	100	14399
Metis Trail (North of Stoney Trail) NB	1156	10	214	10	60	19258
Metis Trail (North of Stoney Trail) SB	745	10	138	10	60	12419
Metis Trail (South of Stoney Trail) NB	749	10	139	10	60	12479
Metis Trail (South of Stoney Trail) SB	662	10	123	10	60	11039
Metis Trail, NB Metis Trail to EB Stoney Trail Ramp	22	11	4	14	80	360
Metis Trail, NB Metis Trail to WB Stoney Trail Ramp	364	16	67	8	80	6059
Metis Trail, WB Stoney Trail to NB Metis Trail Ramp	205	16	38	8	80	3420
Metis Trail, WB Stoney Trail to SB Metis Trail Ramp	43	16	8	8	80	720
Metis Trail, SB Metis Trail to WB Stoney Trail Ramp	378	16	70	8	80	6299
Metis Trail, SB Metis Trail to EB Stoney Trail Ramp	151	11	28	14	80	2520
Metis Trail, EB Stoney Trail to SB Metis Trail Ramp	403	11	75	14	80	6719
Metis Trail, EB Stoney Trail to NB Metis Trail Ramp	587	11	109	14	80	9779
Country Hills Blvd NE (West of Stoney Trail) EB	630	7	117	7	60	10499
Country Hills Blvd NE (West of Stoney Trail) WB	410	7	76	7	60	6839
Country Hills Blvd NE (East of Stoney Trail) EB	234	7	43	7	60	3900
Country Hills Blvd NE (East of Stoney Trail) WB	169	7	31	7	60	2820
Country Hills Blvd NE, NB Stoney Trail to EB Country Hills Blvd Ramp	72	16	13	8	80	1200
Country Hills Blvd NE, NB Stoney Trail to WB Country Hills Blvd Ramp	263	16	49	8	80	4380
Country Hills Blvd NE, WB Country Hills Blvd to NB Stoney Trail Ramp	43	16	8	8	80	720
Country Hills Blvd NE, WB Country Hills Blvd to SB Stoney Trail Ramp	54	11	10	14	80	900
Country Hills Blvd NE, SB Stoney Trail to WB Country Hills Blvd Ramp	76	11	14	14	80	1260
Country Hills Blvd NE, SB Stoney Trail to EB Country Hills Blvd Ramp	90	11	17	14	80	1500
Country Hills Blvd NE, EB Country Hills Blvd to SB Stoney Trail Ramp	504	11	93	14	80	8399
Country Hills Blvd NE, EB Country Hills Blvd to NB Stoney Trail Ramp	54	16	10	8	80	900
96 Avenue NE, NB Stoney Trail to WB 96 Avenue NE Ramp	245	16	45	8	80	4080
96 Avenue NE, SB Stoney Trail to WB 96 Avenue NE Ramp	245	11	45	14	80	4080
96 Avenue NE, EB 96 Avenue NE to SB Stoney Trail Ramp	452	11	84	14	80	7529
96 Avenue NE, EB 96 Avenue NE to NB Stoney Trail Ramp	452	16	84	8	80	7529
McKnight Blvd (West of Stoney Trail) EB	684	9	127	9	60	11399
McKnight Blvd (West of Stoney Trail) WB	695	9	129	9	60	11579
McKnight Blvd (East of Stoney Trail) EB	198	10	37	10	60	3300
McKnight Blvd (East of Stoney Trail) WB	90	10	17	10	60	1500
McKnight Blvd, NB Stoney Trail to EB McKnight Blvd Ramp	83	16	15	8	80	1380
McKnight Blvd, NB Stoney Trail to WB McKnight Blvd Ramp	425	16	79	8	80	7079
McKnight Blvd, WB McKnight Blvd to NB Stoney Trail Ramp	22	16	4	8	80	360
McKnight Blvd, WB McKnight Blvd to SB Stoney Trail Ramp	7	11	1	14	80	120
McKnight Blvd, SB Stoney Trail to WB McKnight Blvd Ramp	209	11	39	14	80	3480
McKnight Blvd, SB Stoney Trail to EB McKnight Blvd Ramp	22	11	4	14	80	360
McKnight Blvd, EB McKnight Blvd to SB Stoney Trail Ramp	518	11	96	14	80	8639
McKnight Blvd, EB McKnight Blvd to NB Stoney Trail Ramp	72	16	13	8	80	1200
16 Avenue NE (West of Stoney Trail) EB	2549	5	472	5	60	42476
16 Avenue NE (West of Stoney Trail) WB	2232	5	413	3	60	37196
16 Avenue NE (East of Stoney Trail) EB	1879	9	348	9	100	31317
16 Avenue NE (East of Stoney Trail) WB	2189	9	405	9	100	36476
16 Avenue NE, NB Stoney Trail to EB 16 Avenue NE Ramp	104	12	19	15	80	1740

Future Conditions (1.6 Million Population) (Cont.)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
16 Avenue NE, NB Stoney Trail to WB 16 Avenue NE Ramp	796	12	147	15	80	13259
16 Avenue NE, WB 16 Avenue NE to NB Stoney Trail Ramp	673	11	125	14	80	11219
16 Avenue NE, WB 16 Avenue NE to SB Stoney Trail Ramp	313	15	58	6	80	5219
16 Avenue NE, SB Stoney Trail to WB 16 Avenue NE Ramp	234	16	43	8	80	3900
16 Avenue NE, SB Stoney Trail to EB 16 Avenue NE Ramp	331	16	61	8	80	5519
16 Avenue NE, EB 16 Avenue NE to SB Stoney Trail Ramp	810	15	150	6	80	13499
16 Avenue NE, EB 16 Avenue NE to NB Stoney Trail Ramp	302	11	56	14	80	5039
17 Avenue SE (West of Stoney Trail) EB	1033	9	191	9	60	17218
17 Avenue SE (West of Stoney Trail) WB	1300	9	240	9	60	21658
17 Avenue SE (East of Stoney Trail) EB	1397	9	258	9	80	23278
17 Avenue SE (East of Stoney Trail) WB	1469	9	272	9	80	24478
17 Avenue SE, NB Stoney Trail to EB 17 Avenue SE Ramp	490	12	91	15	80	8159
17 Avenue SE, NB Stoney Trail to WB 17 Avenue SE Ramp	522	12	97	15	80	8699
17 Avenue SE, WB 17 Avenue SE to NB Stoney Trail Ramp	486	12	90	15	80	8099
17 Avenue SE, WB 17 Avenue SE to SB Stoney Trail Ramp	479	15	89	6	80	7979
17 Avenue SE, SB Stoney Trail to WB 17 Avenue SE Ramp	274	15	51	6	80	4560
17 Avenue SE, SB Stoney Trail to EB 17 Avenue SE Ramp	371	15	69	6	80	6179
17 Avenue SE, EB 17 Avenue SE to SB Stoney Trail Ramp	313	15	58	6	80	5219
17 Avenue SE, EB 17 Avenue NE to NB Stoney Trail Ramp	184	12	34	15	80	3060
Arterial Roads	1200	5	222	5	60	20000
Collector Roads	480	3	89	3	60	8000
Residential Streets	12	3	2	3	50	200

Appendix II

THE ASSESSMENT OF ENVIRONMENTAL NOISE (GENERAL)

Sound Pressure Level

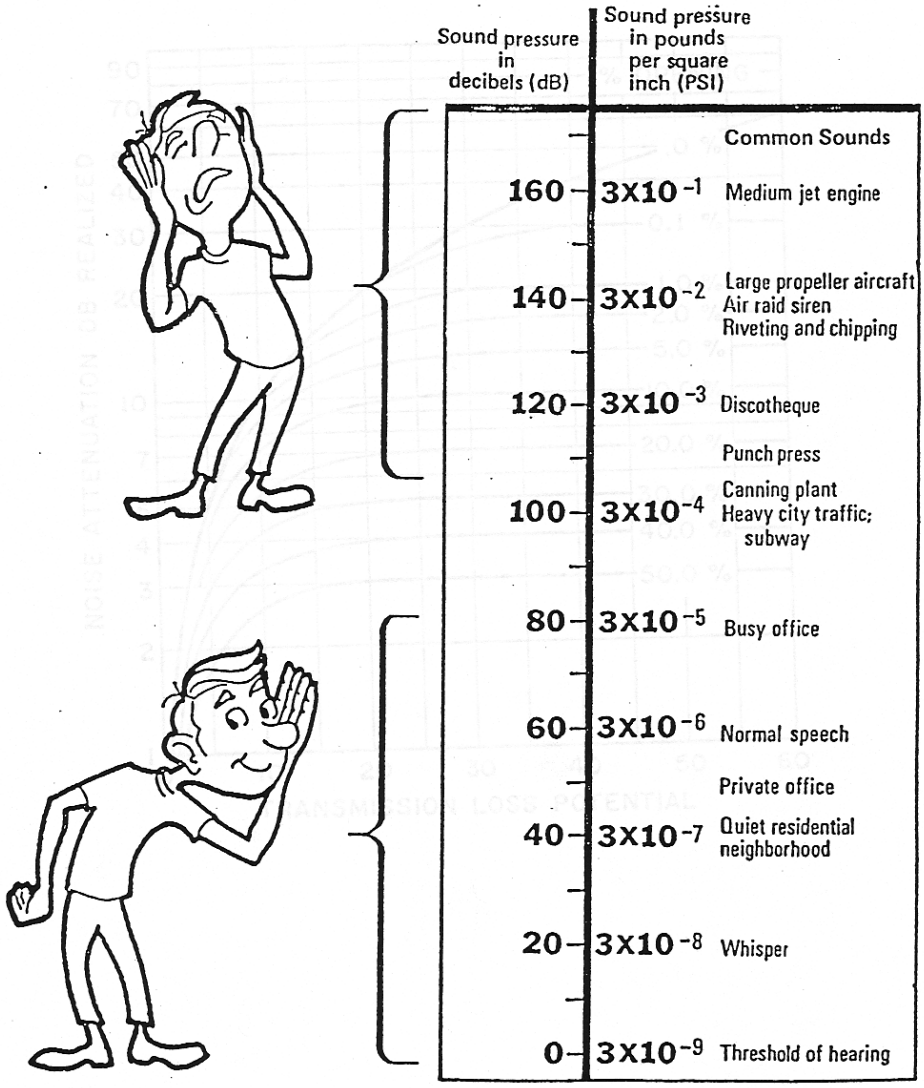
Sound pressure is initially measured in Pascal's (Pa). Humans can hear several orders of magnitude in sound pressure levels, so a more convenient scale is used. This scale is known as the decibel (dB) scale, named after Alexander Graham Bell (telephone guy). It is a base 10 logarithmic scale. When we measure pressure we typically measure the RMS sound pressure.

$$SPL = 10\log_{10}\left[\frac{P_{RMS}^{2}}{P_{ref}^{2}}\right] = 20\log_{10}\left[\frac{P_{RMS}}{P_{ref}}\right]$$

Where: SPL = Sound Pressure Level in dB
P_{RMS} = Root Mean Square measured pressure (Pa)
P_{ref} = Reference sound pressure level ($P_{ref} = 2\text{x}10^{-5}$ Pa = 20 μPa)

This reference sound pressure level is an internationally agreed upon value. It represents the threshold of human hearing for "typical" people based on numerous testing. It is possible to have a threshold which is lower than 20 μPa which will result in negative dB levels. As such, zero dB does not mean there is no sound!

In general, a difference of 1 – 2 dB is the threshold for humans to notice that there has been a change in sound level. A difference of 3 dB (factor of 2 in acoustical energy) is perceptible and a change of 5 dB is strongly perceptible. A change of 10 dB is typically considered a factor of 2. This is quite remarkable when considering that 10 dB is 10-times the acoustical energy!


Sound pressure in decibels (dB)
Sound pressure in pounds per square inch (PSI)
Common Sounds
160 3X10 -1 Medium jet engine
140 3X10 -2 Large propeller aircraft
Air raid siren
Riveting and chipping
120 3X10 -3 Discotheque
Punch press
100 3X10 -4 Canning plant
Heavy city traffic; subway
80 3X10 -5 Busy office
60 3X10 -6 Normal speech
Private office
40 3X10 -7 Quiet residential neighborhood
20 3X10 -8 Whisper
0 3X10 -9 Threshold of hearing

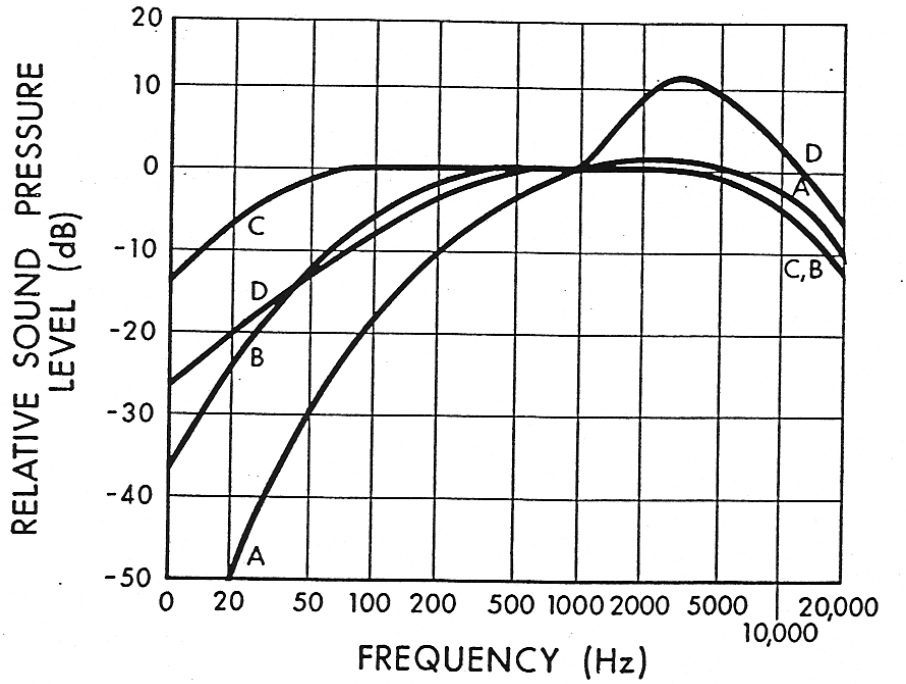
Frequency

The range of frequencies audible to the human ear ranges from approximately 20 Hz to 20 kHz. Within this range, the human ear does not hear equally at all frequencies. It is not very sensitive to low frequency sounds, is very sensitive to mid frequency sounds and is slightly less sensitive to high frequency sounds. Due to the large frequency range of human hearing, the entire spectrum is often divided into 31 bands, each known as a 1/3 octave band.

The internationally agreed upon center frequencies and upper and lower band limits for the 1/1 (whole octave) and 1/3 octave bands are as follows:

Whole Octave			1/3 Octave		
Lower Band Limit	Center Frequency	Upper Band Limit	Lower Band Limit	Center Frequency	Upper Band Limit
11	**16**	22	14.1	**16**	17.8
			17.8	**20**	22.4
22	**31.5**	44	22.4	**25**	28.2
			28.2	**31.5**	35.5
			35.5	**40**	44.7
44	**63**	88	44.7	**50**	56.2
			56.2	**63**	70.8
			70.8	**80**	89.1
88	**125**	177	89.1	**100**	112
			112	**125**	141
			141	**160**	178
177	**250**	355	178	**200**	224
			224	**250**	282
			282	**315**	355
355	**500**	710	355	**400**	447
			447	**500**	562
			562	**630**	708
710	**1000**	1420	708	**800**	891
			891	**1000**	1122
			1122	**1250**	1413
1420	**2000**	2840	1413	**1600**	1778
			1778	**2000**	2239
			2239	**2500**	2818
2840	**4000**	5680	2818	**3150**	3548
			3548	**4000**	4467
			4467	**5000**	5623
5680	**8000**	11360	5623	**6300**	7079
			7079	**8000**	8913
			8913	**10000**	11220
11360	**16000**	22720	11220	**12500**	14130
			14130	**16000**	17780
			17780	**20000**	22390

Human hearing is most sensitive at approximately 3500 Hz which corresponds to the ¼ wavelength of the ear canal (approximately 2.5 cm). Because of this range of sensitivity to various frequencies, we typically apply various weighting networks to the broadband measured sound to more appropriately account for the way humans hear. By default, the most common weighting network used is the so-called "A-weighting". It can be seen in the figure that the low frequency sounds are reduced significantly with the A-weighting.



Combination of Sounds

When combining multiple sound sources the general equation is:

$$\Sigma SPL_n = 10\log_{10}\left[\sum_{i=1}^{n} 10^{\frac{SPL_i}{10}}\right]$$

Examples:

- Two sources of 50 dB each add together to result in 53 dB.
- Three sources of 50 dB each add together to result in 55 dB.
- Ten sources of 50 dB each add together to result in 60 dB.
- One source of 50 dB added to another source of 40 dB results in 50.4 dB

It can be seen that, if multiple similar sources exist, removing or reducing only one source will have little effect.

Sound Level Measurements

Over the years a number of methods for measuring and describing environmental noise have been developed. The most widely used and accepted is the concept of the Energy Equivalent Sound Level (L_{eq}) which was developed in the US (1970's) to characterize noise levels near US Air-force bases. This is the level of a steady state sound which, for a given period of time, would contain the same energy as the time varying sound. The concept is that the same amount of annoyance occurs from a sound having a high level for a short period of time as from a sound at a lower level for a longer period of time.
The L_{eq} is defined as:

$$L_{eq} = 10\log_{10}\left[\frac{1}{T}\int_0^T 10^{\frac{dB}{10}}\,dT\right] = 10\log_{10}\left[\frac{1}{T}\int_0^T \frac{P^2}{P_{ref}^2}\,dT\right]$$

We must specify the time period over which to measure the sound. i.e. 1-second, 10-seconds, 15-seconds, 1-minute, 1-day, etc**. An L_{eq} is meaningless if there is no time period associated**.

In general there a few very common L_{eq} sample durations which are used in describing environmental noise measurements. These include:

- $L_{eq}24$ - Measured over a 24-hour period
- L_{eq}Night - Measured over the night-time (typically 22:00 – 07:00)
- L_{eq}Day - Measured over the day-time (typically 07:00 – 22:00)
- L_{DN} - Same as $L_{eq}24$ with a 10 dB penalty added to the night-time

Statistical Descriptor

Another method of conveying long term noise levels utilizes statistical descriptors. These are calculated from a cumulative distribution of the sound levels over the entire measurement duration and then determining the sound level at xx % of the time.

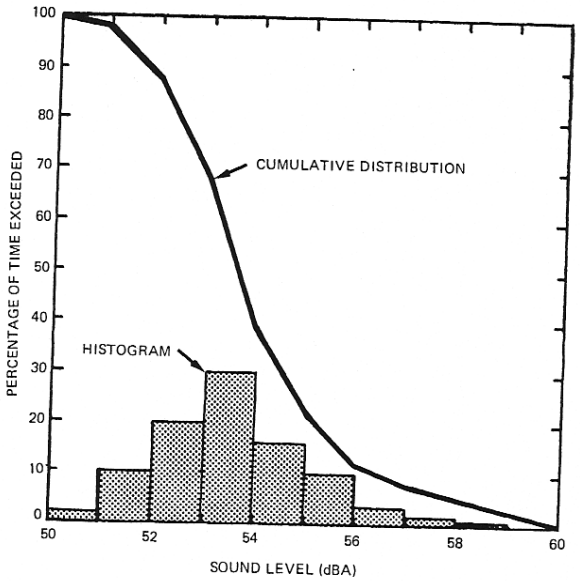


Figure 16.6 Statistically processed community noise showing histogram and cumulative distribution of A weighted sound levels.

Industrial Noise Control, Lewis Bell, Marcel Dekker, Inc. 1994

The most common statistical descriptors are:

- L_{min} - minimum sound level measured
- L_{01} - sound level that was exceeded only 1% of the time
- L_{10} - sound level that was exceeded only 10% of the time.
  - Good measure of intermittent or intrusive noise
  - Good measure of Traffic Noise
- L_{50} - sound level that was exceeded 50% of the time (arithmetic average)
  - Good to compare to L_{eq} to determine steadiness of noise
- L_{90} - sound level that was exceeded 90% of the time
  - Good indicator of typical "ambient" noise levels
- L_{99} - sound level that was exceeded 99% of the time
- L_{max} - maximum sound level measured

These descriptors can be used to provide a more detailed analysis of the varying noise climate:

- If there is a large difference between the L_{eq} and the L_{50} (L_{eq} can never be any lower than the L_{50}) then it can be surmised that one or more short duration, high level sound(s) occurred during the time period.
- If the gap between the L_{10} and L_{90} is relatively small (less than 15 – 20 dBA) then it can be surmised that the noise climate was relatively steady.

Sound Propagation

In order to understand sound propagation, the nature of the source must first be discussed. In general, there are three types of sources. These are known as 'point', 'line', and 'area'. This discussion will concentrate on point and line sources since area sources are much more complex and can usually be approximated by point sources at large distances.

Point Source

As sound radiates from a point source, it dissipates through geometric spreading. The basic relationship between the sound levels at two distances from a point source is:

$$\therefore SPL_1 - SPL_2 = 20\log_{10}\left(\frac{r_2}{r_1}\right)$$

Where: SPL_1 = sound pressure level at location 1, SPL_2 = sound pressure level at location 2
r_1 = distance from source to location 1, r_2 = distance from source to location 2

Thus, the reduction in sound pressure level for a point source radiating in a free field is **6 dB per doubling of distance**. This relationship is independent of reflectivity factors provided they are always present. Note that this only considers geometric spreading and does not take into account atmospheric effects. Point sources still have some physical dimension associated with them, and typically do not radiate sound equally in all directions in all frequencies. The directionality of a source is also highly dependent on frequency. As frequency increases, directionality increases.

Examples (note no atmospheric absorption):

- A point source measuring 50 dB at 100m will be 44 dB at 200m.
- A point source measuring 50 dB at 100m will be 40.5 dB at 300m.
- A point source measuring 50 dB at 100m will be 38 dB at 400m.
- A point source measuring 50 dB at 100m will be 30 dB at 1000m.

Line Source

A line source is similar to a point source in that it dissipates through geometric spreading. The difference is that a line source is equivalent to a long line of many point sources. The basic relationship between the sound levels at two distances from a line source is:

$$SPL_1 - SPL_2 = 10\log_{10}\left(\frac{r_2}{r_1}\right)$$

The difference from the point source is that the '20' term in front of the 'log' is now only 10. Thus, the reduction in sound pressure level for a line source radiating in a free field is **3 dB per doubling of distance**.

Examples (note no atmospheric absorption):

- A line source measuring 50 dB at 100m will be 47 dB at 200m.
- A line source measuring 50 dB at 100m will be 45 dB at 300m.
- A line source measuring 50 dB at 100m will be 44 dB at 400m.
- A line source measuring 50 dB at 100m will be 40 dB at 1000m.

Atmospheric Absorption

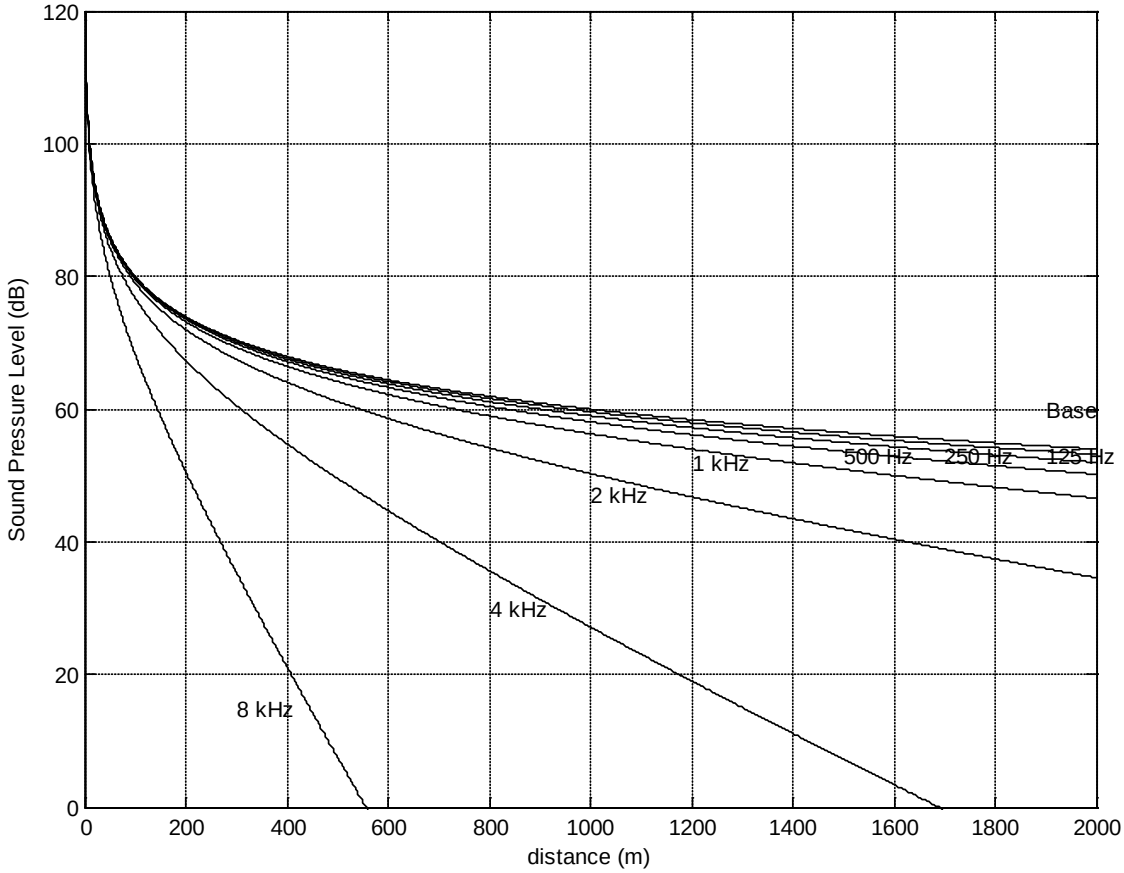
As sound transmits through a medium, there is an attenuation (or dissipation of acoustic energy) which can be attributed to three mechanisms:

1) **Viscous Effects** - Dissipation of acoustic energy due to fluid friction which results in thermodynamically irreversible propagation of sound.
2) **Heat Conduction Effects** - Heat transfer between high and low temperature regions in the wave which result in non-adiabatic propagation of the sound.
3) **Inter Molecular Energy Interchanges** - Molecular energy relaxation effects which result in a time lag between changes in translational kinetic energy and the energy associated with rotation and vibration of the molecules.

The following table illustrates the attenuation coefficient of sound at standard pressure (101.325 kPa) in units of dB/100m.

Temperature	Relative Humidity	Frequency (Hz)					
^{o}C	(%)	125	250	500	1000	2000	4000
30	20	0.06	0.18	0.37	0.64	1.40	4.40
	50	0.03	0.10	0.33	0.75	1.30	2.50
	90	0.02	0.06	0.24	0.70	1.50	2.60
20	20	0.07	0.15	0.27	0.62	1.90	6.70
	50	0.04	0.12	0.28	0.50	1.00	2.80
	90	0.02	0.08	0.26	0.56	0.99	2.10
10	20	0.06	0.11	0.29	0.94	3.20	9.00
	50	0.04	0.11	0.20	0.41	1.20	4.20
	90	0.03	0.10	0.21	0.38	0.81	2.50
0	20	0.05	0.15	0.50	1.60	3.70	5.70
	50	0.04	0.08	0.19	0.60	2.10	6.70
	90	0.03	0.08	0.15	0.36	1.10	4.10

- As frequency increases, absorption tends to increase
- As Relative Humidity increases, absorption tends to decrease
- There is no direct relationship between absorption and temperature
- **The net result of atmospheric absorption is to modify the sound propagation of a point source from 6 dB/doubling-of-distance to approximately 7 – 8 dB/doubling-of-distance (based on anecdotal experience)**



Atmospheric Absorption at 10°C and 70% RH

Meteorological Effects

There are many meteorological factors which can affect how sound propagates over large distances. These various phenomena must be considered when trying to determine the relative impact of a noise source either after installation or during the design stage.

Wind

- Can greatly alter the noise climate away from a source depending on direction
- Sound levels downwind from a source can be increased due to refraction of sound back down towards the surface. This is due to the generally higher velocities as altitude increases.
- Sound levels upwind from a source can be decreased due to a "bending" of the sound away from the earth's surface.
- Sound level differences of ±10dB are possible depending on severity of wind and distance from source.
- Sound levels crosswind are generally not disturbed by an appreciable amount
- Wind tends to generate its own noise, however, and can provide a high degree of masking relative to a noise source of particular interest.

Temperature

- Temperature effects can be similar to wind effects
- Typically, the temperature is warmer at ground level than it is at higher elevations.
- If there is a very large difference between the ground temperature (very warm) and the air aloft (only a few hundred meters) then the transmitted sound refracts upward due to the changing speed of sound.
- If the air aloft is warmer than the ground temperature (known as an *inversion*) the resulting higher speed of sound aloft tends to refract the transmitted sound back down towards the ground. This essentially works on Snell's law of reflection and refraction.
- Temperature inversions typically happen early in the morning and are most common over large bodies of water or across river valleys.
- Sound level differences of ±10dB are possible depending on gradient of temperature and distance from source.

Rain

- Rain does not affect sound propagation by an appreciable amount unless it is very heavy
- The larger concern is the noise generated by the rain itself. A heavy rain striking the ground can cause a significant amount of highly broadband noise. The amount of noise generated is difficult to predict.
- Rain can also affect the output of various noise sources such as vehicle traffic.

Summary

- In general, these wind and temperature effects are difficult to predict
- Empirical models (based on measured data) have been generated to attempt to account for these effects.
- Environmental noise measurements must be conducted with these effects in mind. Sometimes it is desired to have completely calm conditions, other times a "worst case" of downwind noise levels are desired.

Topographical Effects

Similar to the various atmospheric effects outlined in the previous section, the effect of various geographical and vegetative factors must also be considered when examining the propagation of noise over large distances.

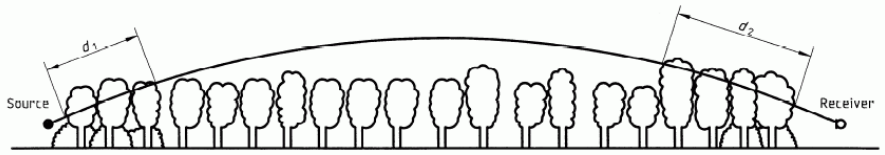
Topography
- One of the most important factors in sound propagation.
- Can provide a natural barrier between source and receiver (i.e. if berm or hill in between).
- Can provide a natural amplifier between source and receiver (i.e. large valley in between or hard reflective surface in between).
- Must look at location of topographical features relative to source and receiver to determine importance (i.e. small berm 1km away from source and 1km away from receiver will make negligible impact).

Grass
- Can be an effective absorber due to large area covered
- Only effective at low height above ground. Does not affect sound transmitted direct from source to receiver if there is line of sight.
- Typically less absorption than atmospheric absorption when there is line of sight.
- Approximate rule of thumb based on empirical data is:

$$A_g = 18\log_{10}(f) - 31 \qquad (dB/100m)$$

Where: A_g is the absorption amount

Trees
- Provide absorption due to foliage
- Deciduous trees are essentially ineffective in the winter
- Absorption depends heavily on density and height of trees
- No data found on absorption of various kinds of trees
- Large spans of trees are required to obtain even minor amounts of sound reduction
- In many cases, trees can provide an effective visual barrier, even if the noise attenuation is negligible.



NOTE — $d_f = d_1 + d_2$

For calculating d_1 and d_2, the curved path radius may be assumed to be 5 km.

Figure A.1 — Attenuation due to propagation through foliage increases linearly with propagation distance d_f through the foliage

Table A.1 — Attenuation of an octave band of noise due to propagation a distance d_f through dense foliage

Propagation distance d_f	Nominal midband frequency Hz							
m	63	125	250	500	1 000	2 000	4 000	8 000
	Attenuation, dB:							
$10 \leq d_f \leq 20$	0	0	1	1	1	1	2	3
	Attenuation, dB/m:							
$20 \leq d_f \leq 200$	0,02	0,03	0,04	0,05	0,06	0,08	0,09	0,12

Tree/Foliage attenuation from ISO 9613-2:1996

Bodies of Water

- Large bodies of water can provide the opposite effect to grass and trees.
- Reflections caused by small incidence angles (grazing) can result in larger sound levels at great distances (increased reflectivity, Q).
- Typically air temperatures are warmer high aloft since air temperatures near water surface tend to be more constant. Result is a high probability of temperature inversion.
- Sound levels can "carry" much further.

Snow

- Covers the ground for much of the year in northern climates.
- Can act as an absorber or reflector (and varying degrees in between).
- Freshly fallen snow can be quite absorptive.
- Snow which has been sitting for a while and hard packed due to wind can be quite reflective.
- Falling snow can be more absorptive than rain, but does not tend to produce its own noise.
- Snow can cover grass which might have provided some means of absorption.
- Typically sound propagates with less impedance in winter due to hard snow on ground and no foliage on trees/shrubs.

Appendix III

SOUND LEVELS OF FAMILIAR NOISE SOURCES

Used with Permission Obtained from EUB Guide 38: Noise Control Directive User Guide (November 1999)

Source[1]	Sound Level (dBA)
Bedroom of a country home	30
Soft whisper at 1.5 m	30
Quiet office or living room	40
Moderate rainfall	50
Inside average urban home	50
Quiet street	50
Normal conversation at 1 m	60
Noisy office	60
Noisy restaurant	70
Highway traffic at 15 m	75
Loud singing at 1 m	75
Tractor at 15 m	78-95
Busy traffic intersection	80
Electric typewriter	80
Bus or heavy truck at 15 m	88-94
Jackhammer	88-98
Loud shout	90
Freight train at 15 m	95
Modified motorcycle	95
Jet taking off at 600 m	100
Amplified rock music	110
Jet taking off at 60 m	120
Air-raid siren	130

[1] Cottrell, Tom, 1980, *Noise in Alberta*, Table 1, p.8, ECA80 - 16/1B4 (Edmonton: Environment Council of Alberta).

SOUND LEVELS GENERATED BY COMMON APPLIANCES

Used with Permission Obtained from EUB Guide 38: Noise Control Directive User Guide (November 1999)

Source[1]	Sound level at 3 feet (dBA)
Freezer	38-45
Refrigerator	34-53
Electric heater	47
Hair clipper	50
Electric toothbrush	48-57
Humidifier	41-54
Clothes dryer	51-65
Air conditioner	50-67
Electric shaver	47-68
Water faucet	62
Hair dryer	58-64
Clothes washer	48-73
Dishwasher	59-71
Electric can opener	60-70
Food mixer	59-75
Electric knife	65-75
Electric knife sharpener	72
Sewing machine	70-74
Vacuum cleaner	65-80
Food blender	65-85
Coffee mill	75-79
Food waste disposer	69-90
Edger and trimmer	81
Home shop tools	64-95
Hedge clippers	85
Electric lawn mower	80-90

[1] Reif, Z. F., and Vermeulen, P. J., 1979, "Noise from domestic appliances, construction, and industry," Table 1, p.166, in Jones, H. W., ed., *Noise in the Human Environment*, vol. 2, ECA79-SP/1 (Edmonton: Environment Council of Alberta).