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Environmental Noise Computer Modelling

For

Southeast Stoney Trail
in
Calgary, AB

Prepared for:
Alberta Transportation

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Executive Summary

aci Acoustical Consultants Inc., of Edmonton AB, was retained by Alberta Transportation to conduct an environmental noise assessment for the Southeast section of Stoney Trail (SEST) in Calgary, Alberta. The purpose of the work was to conduct 24-hour environmental noise monitorings at various locations adjacent to the roadway and to generate a computer noise model with current and future traffic conditions and compare the results to the Alberta Transportation noise guidelines. The information contained within this report details the results of the computer noise modeling for the entire study area.

The results of the Current Conditions noise monitoring indicated noise levels which were below 65 dBA $L_{eq}24$[1] at most locations. At all of the noise monitoring locations, traffic noise on SEST or Deerfoot Trail or a related interchange was the dominant noise source. Note that all of the noise monitoring locations were conducted on public land within the TUC or at the TUC boundary and cannot be directly compared to the criteria of 65 dBA $L_{eq}24$.

The noise modeling results for Current Conditions matched well with the measurement results. The modeled noise levels were below the limit of 65 dBA $L_{eq}24$ at most of the residential outdoor receptor locations with the exception of the area directly east of Deerfoot Trail, in between SEST and Mckenzie Towne Blvd SE. For these locations, the dominant noise source is vehicle traffic on Deerfoot Trail.

The noise modeling results for the Future Conditions (with projected traffic volumes for the Year 2035) indicated noise levels which were still below the limit of 65 dBA $L_{eq}24$ at most locations. The locations with Future Conditions noise levels above 65 dBA $L_{eq}24$ include:

- SE of interchange between SEST and Glenmore Trail. The dominant noise source for this area is Glenmore Trail. Note that, currently, there is no acoustical shielding fence on this property.
- Locations east and west of Deerfoot Trail, between SEST and McKenzie Towne Blvd SE. At these locations, the dominant noise source is vehicle traffic on Deerfoot Trail. For those residents to the west of Deerfoot Trail, there is already a 5 m tall masonry noise wall. For those residents to the east of Deerfoot Trail, there is already an earth berm with a 1.83 m fence on top, however, there is not a tall noise barrier.

[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.

A sensitivity analysis of the traffic volumes, traffic speeds, and % heavy trucks indicated that significant individual increases to each parameter or significant increases to all three combined, would result in additional locations with noise levels at or above 65 dBA $L_{eq}24$. The locations are as follows:

- Northwest of the interchange between SEST and 17 Avenue SE. Note that, currently, the rear fences within this area are either chainlink or acoustically poor wooden fences with large gaps. Thus, there is currently no significant level of acoustical shielding provided by the existing rear fences.
- Southeast of the interchange between Glenmore Trail and SEST. The dominant noise source for this area is Glenmore Trail. Note that, currently, there is no acoustical shielding fence on this property.
- Additional locations east and west of Deerfoot Trail, between SEST and McKenzie Towne Blvd SE.
- One location northwest of the interchange between SEST and McKenzie Lake Blvd SE, at the top of the hill overlooking the River Valley. Note that, currently, there is only a solid screen wood fence on the south property line, but there is only a chainlink fence on the west property line.
- Southeast of the interchange between SEST and Deerfoot Trail.
- East of Deerfoot Trail, midway between SEST and Seton Blvd SE.
- North of Seton Blvd SE, west of Auburn Bay Gate SE.
- Northwest of the interchange between Deerfoot Trail and Cranston Avenue SE. Note there is no noise barrier at this location other than a small earth berm.
- Southeast of the interchange between SEST and Chaparral Blvd SE.
- East of Macleod Trail SE, approximately 1,070 m south of SEST. Note that the dominant noise source in this area is vehicle traffic on Macleod Trail, with the noise contribution from SEST much lower.

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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 for the Southeast section of Stoney Trail (SEST) in Calgary, Alberta. The purpose of the work was to conduct 24-hour environmental noise monitorings at various locations adjacent to the roadway and to generate a computer noise model with current and future traffic conditions and compare the results to the Alberta Transportation noise guidelines. The information contained within this report details the results of the computer noise modeling for the entire study area.

2.0 Location Description

2.1. Roadways

The study area for SEST starts just north of the interchange at 17 Avenue SE and spans to the south and then west until the interchange at Macleod Trail SE, as indicated in Figures 1a & 1b. Throughout the entire span (approximately 25 km), SEST is a twinned road with mostly 3-lanes in each direction. The posted speed limit throughout is 100 km/hr. The study area also encompasses Deerfoot Trail from McKenzie Town Blvd SE down to Cranston Avenue SE / Seton Blvd SE (approximately 4 km). Currently, there are grade separated interchanges or fly-overs at the following locations:

- 17 Avenue SE
- Peigan Trail SE
- CN Rail Line South of Peigan Trail SE (flyover)
- 61 Avenue SE (flyover)
- Glenmore Trail SE
- CP Rail Line North of 114 Avenue SE (flyover)
- 114 Avenue SE
- Interchange at Highway 22X
- 52 Street SE
- Deerfoot Trail
- McKenzie Lake Blvd SE / Cranston Blvd SE
- Sun Valley Blvd SE / Chaparrel Blvd SE
- Macleod Trail SE
- McKenzie Lake Blvd SE / McKenzie Towne Blvd SE
- Cranston Avenue SE / Seton Blvd SE

There is also a future interchange proposed at 130 Avenue SE. The earth work has been largely completed, however, the timeline for completion of the interchange has not been determined. As such, it has not been included in the noise study.

2.2. Adjacent Development

Starting from the northeast portion of the study area, there is single family and multi-family residential development backing directly onto the Transportation and Utility Corridor (TUC) to the northwest of the interchange between SEST and 17 Avenue SE. Most of the residents have direct line-of-sight to SEST and the interchange. There is commercial development and open field to the northeast, southeast, and southwest of the interchange.

In between 17 Avenue SE and Peigan Trail SE, there is open field and commercial/industrial development to the east and west of SEST, with acreage style residential lots further to the east (the closest resident is approximately 650 m to the east of SEST).

In between Peigan Trail SE and Glenmore Trail SE is open field and commercial/industrial development on both sides of SEST for at least 1,000 m to the east and west. There are two residential receptors to the east of SEST in this region, with the closest being approximately 530 m to the east of SEST.

In between Glenmore Trail SE and 114 Avenue SE is open field and commercial/industrial development on both sides of SEST for at least 1,000 m to the east and west. There are a few acreage style residential lots to the southeast of the interchange between Glenmore Trail SE and SEST (east of 84 Street SE) with the closest houses approximately 600 m from SEST. There is also a residential subdivision located to the northeast of the interchange between 114 Avenue SE and SEST. The closest houses are approximately 600 m east of SEST.

In between 114 Avenue SE and 130 Avenue SE is largely open field and marshland with sparse commercial/industrial development. There are some acreage style residential lots to the east, with the closest being approximately 470 m from SEST.

In between 130 Avenue SE and Highway 22X there is single family residential development to the west of SEST. Some of the residential structures have line-of-sight to SEST over top of their backyard fences, however, there is also an earth berm (approximately 3 m tall) that spans north-south in between SEST and the residential property lines which blocks the line-of-sight in the backyard space for most residents. Further to the south and west of SEST is an open natural reserved area with no development.

To the east of SEST are acreage style residential lots with the closest house approximately 250 m east of SEST. These houses have direct line-of-sight to SEST.

In between Highway 22X and 52 Street SE is single family residential development on the north and south of SEST. There is line-of-sight to SEST over top of the fences. To the north of SEST (Copperfield neighbourhood), the fence consists largely of 2.74 m (9 ft) plastic solid screen fencing with 1.83 m (6 ft) plastic solid screen fencing for the houses backing onto the interchange between 52 Street SE and SEST. For the residents immediately northeast of the interchange, the elevations are such that they have direct line-of-sight to the interchange, with no acoustical screening provided by the rear fence. To the south of SEST (Mahogany neighbourhood), the fence consists of a 2.44 m (8 ft) solid screen wood fence throughout.

In between 52 Street SE and Deerfoot Trail is single family residential development to the north (Elgin and Inverness neighbourhoods) and south (Auburn Bay neighbourhood) of SEST. There is also a multi-family area to the northeast of the interchange between Deerfoot Trail and SEST. Immediately northwest of the interchange between 52 Street SE and SEST is green space with residential development further to the northwest. Some of the residential lots that back onto the green space have chainlink fences. Moving further west (still north of SEST), the residential lots have 1.83 m wooden fences at the south property line until near the interchange at Deerfoot Trail. There is also an earth berm (approximately 5m above residential property grade) that starts approximately 600 m west of 52 Street SE and spans approximately 500 m east of Deerfoot Trail. The berm blocks the line-of-sight between the residential lots and SEST. As the Elgin neighbourhood wraps around to the north, along Deerfoot Trail, the residential lots have either 1.83 m wooden fences or chainlink fences or no fences at all. However, as part of the interchange construction, an earth berm (approximately 7 m tall) has been built in between the residential lots and the westbound -to- northbound ramp. This blocks the line-of-sight to SEST, Deerfoot Trail, and the interchange for most of the residences.

Immediately southwest of the interchange between 52 Street SE and SEST is a dog park with residential development to the south. The closest residential development has a 1.83 m wood fence. There is line-of-sight to SEST and 52 Street SE over top of the fence. There are residential lots along Auburn Glen Drive SE with chainlink fences and direct line-of-sight to SEST. Moving further west, the residential lots backing onto SEST have 2.44 m wooden fences (with line-of-sight to SEST over top of the fence)

until the green space indentation area approximately 950 m east of Deerfoot Trail. The residential lots in this area have chainlink fences with line-of-sight to SEST. Moving further west, there is a 2.44 m wooden fence until Autumn Crescent SE where the fence height reduces to 1.83 m. The residents have line-of-sight to SEST, Deerfoot Trail, and the interchange over top of the fences.

In between Deerfoot Trail and McKenzie Lake Blvd SE, to the north of SEST (McKenzie Lake neighbourhood), the area backing onto SEST is comprised of single family residential development. Starting from the area northwest of the interchange between Deerfoot Trail and SEST, the residential lots have 1.83 m wooden fences with line-of-sight to SEST, the interchange between Deerfoot Trail and SEST, and the interchange between McKenzie Lake Blvd SE and SEST (over top of the fence). There is no direct line-of-sight to Deerfoot Trail in this area because of the elevation changes associated with the ramps for the interchange between Deerfoot Trail and SEST.

In between Deerfoot Trail and Cranston Blvd SE, to the south of SEST (Cranston neighbourhood), the area backing onto SEST is comprised of single family residential development in the eastern portion and multi-family residential development in the western portion. In the northeast corner, there are lots with 1.83 m wooden fences, however, many of the houses along Crammond Close SE have no rear fences. Starting with the houses on Cranfield Garden SE, there is a 1.83 m wood fence that spans to the west all the way until Cranston Blvd SE. In all areas, there is line-of-sight to SEST over top of the fences. Also, as part of the construction of the interchange between Deerfoot Trail and SEST, an earth berm (approximately 2 - 4 m tall, depending on the location) has been built spanning from the northeast corner of the Cranston neighbourhood, along the northeast and east sides all the way down to approximately 650 m north of Cranston Avenue SE.

In between McKenzie Lake Blvd SE and Sun Valley Blvd SE, to the north of SEST (Mountain Park neighbourhood), is single family residential development spanning approximately 260 m west of McKenzie Lake Blvd SE. There is a 1.83 m wood fence along the south property line until the southwest corner where the fence changes to chainlink. There is line-of-sight to SEST and McKenzie Lake Blvd SE over top of the wooden fence and direct line-of-sight to SEST through the chainlink fence. The houses in this area are elevated above SEST by as much as 37 m as SEST drops down in to the Bow River Valley. Further west is recreational area within the Bow River Valley (golf course and public park) with no further residential development.

In between Cranston Blvd SE and Chaparral Blvd SE, to the south of SEST (Cranston neighbourhood), is single family residential development spanning approximately 550 m west of Cranston Blvd SE. There is a 1.52 m (5 ft) wooden fence along the rear property line. As such, there is line-of-sight to SEST and Cranston Blvd over top of the fence. Further west is green space within the Bow River Valley on the east and west sides of the Bow River. Further west is single family residential development (Chaparral neighbourhood) within the Bow River Valley. The north fences are chainlink and the residential lots are "walkout" style. There is direct line-of-sight to SEST for these lots. Further west, up at the top of the Bow River Valley, is single family residential development. The northern most houses have a 1.83 m masonry wall at the north property line that wraps around along Chaparral Blvd SE. These residents have line-of-sight to SEST and Chaparral Blvd SE over top of the wall. There is a cul-de-sac to the east of Chaparral Ridge Circle SE in which the houses have chainlink fences at the rear property lines and direct line-of-sight to SEST.

In between Sun Valley Blvd SE and Macleod Trail SE, to the north of SEST, is single family residential development (Sundance neighbourhood). The majority of the residential lots have chainlink fences along the south property line, however, there is an earth berm (approximately 4 m tall) that starts from the interchange between Sun Valley Blvd SE and SEST and spans to the west until approximately 600 m east of Macleod Trail SE. Further west, and wrapping around to the north along Macleod Trail SE, there are typically no fences and there is no earth berm to the south and west of the residential lots. Some individual lots that "side" onto Macleod Trail SE have 1.83 m wood fences for the backyard portion of the lot. The residences in this area have line-of-sight to Macleod Trail either directly or over top of their fences. As Macleod Trail SE continues further north, there is commercial development on the east and west sides.

In between Chaparral Blvd SE and Macleod Trail SE, to the south of SEST, is single family residential development (Chaparral neighbourhood). There are 1.83 m wood fences along the north property lines for all areas except two green space indentations at which there are only chainlink fences. These areas include along Chaparral Common SE and for two houses in between Chapalina Way SE and Chaparral Circle SE. All of the residential lots have line-of-sight to SEST over top of the fences. Starting at the northwest portion of the residential development, there is a 2.44 m masonry wall at the rear property lines, along Macleod Trail SE that extends down for approximately 1,000 m south of SEST. To the west

of Macleod Trail SE, south of SEST, is green space with residential development more than 1,000 m further to the west

In between SEST and McKenzie Towne Blvd SE, on the east side of Deerfoot Trail, is single family residential development (Inverness neighbourhood). Continuing on from the newly constructed earth berm to the northeast of the interchange at SEST and Deerfoot Trail, there is an existing earth berm in between Deerfoot Trail and the houses to the east, extending north all the way to McKenzie Towne Blvd SE (following along the off ramp). In addition, starting at the southwest portion of Inverness Drive SE, there is a 1.83 m solid fence on top of the berm that extends all the way north to McKenzie Towne Blvd SE. As such, the houses to the east of Deerfoot Trail do not have line-of-sight to Deerfoot Trail, McKenzie Towne Blvd SE, or SEST.

In between SEST and McKenzie Lake Blvd SE, on the west side of Deerfoot Trail, is single family residential development (McKenzie Lake neighbourhood). There is an existing earth berm (approximately 2 - 2.5 m tall, depending on the location) that extends the entire length of this section of Deerfoot Trail with a continuous 5 m tall concrete noise barrier on top, separating Deerfoot Trail from the houses. As such, most of the houses do not have line-of-sight to Deerfoot Trail, McKenzie Lake Blvd SE, or SEST. The northern-most houses, that back onto McKenzie Lake Blvd SE do have line-of-sight to McKenzie Lake Blvd SE over top of the noise barrier because the barrier height is reduced in this location.

In between SEST and Seton Blvd SE, on the east side of Deerfoot Trail (Auburn Bay neighbourhood), is largely single family residential development with a small section of multi-family residential development adjacent to Auburn Bay Common SE. There is an earth berm (approximately 3 - 5 m tall depending on location). As well, noise barriers have recently been modified and added. At the time of the noise monitoring, the barrier installation was still underway with some sections not yet complete. When complete, most of the residents will not have line-of-sight to Deerfoot Trail.

In between SEST and Cranston Avenue SE, on the west side of Deerfoot Trail, is entirely single family residential development (Cranston neighbourhood). In the northeast portion of the residential neighbourhood, there are lots which "front" or "side" onto the adjacent interchange. Further south, the lots have back-alley access with garages in the rear of the house. There are many lots with no backyard

fence. On the east side of the back-alley, there is a chainlink fence. However, as part of the construction of the road project, an earth berm (approximately 5m tall) has been built spanning from the northeast corner of the Cranston neighbourhood, along the northeast and east sides all the way down to approximately 650 m north of Cranston Avenue SE. Where the berm ends at the south end, a 2.44 m barrier starts and continues down to approximately 350 m north of Cranston Avenue SE where another earth berm (approximately 2 m tall) starts. This final earth berm extends down to approximately 160 m north of Cranston Avenue SE and then ends. As a result, none of the houses north of this point have line-of-sight to Deerfoot Trail. South of this point, the houses all have chainlink fences and have direct line-of-sight to Cranston Avenue SE but do not have line-of-sight to Deerfoot Trail because of the topography related to the interchange.

2.3. Topography

Topographically, the land surrounding SEST from 17 Avenue SE all the way to McKenzie Lake Blvd SE is generally flat with only small hills and ditches between the roadway and the adjacent residential structures. To the west of McKenzie Lake Blvd SE is the Bow River Valley which drops down approximately 40 m. To the west of the Bow River Valley the land surrounding SEST all the way to Macleod Trail is generally flat with only small changes in elevation. As noted in Section 2.2, there are some areas with existing earth berms and some areas in which new earth berms have been built as part of the SEST project. Detailed elevation contours, in 0.5 m elevation intervals, including the newly constructed earth berms, have been included in the noise model generation for increased accuracy.

Throughout the study area, the ground is generally covered with field grasses and small patches of trees and bushes. There are some sections with marsh-lands and other small bodies of water. The vegetation adjacent to SEST provides a moderate level of sound absorption for the houses nearby.

3.0 Measurement & Modeling Methods

3.1. Environmental Noise Monitoring

As part of the study a total of eighteen (18) 24-hour environmental noise monitorings were conducted throughout the study area. The noise monitoring locations, as indicated in Figures 1a & 1b, were selected based on their proximity to SEST and adjacent interchanges as well as adjacent residential receptors.

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, major construction activity that would re-route traffic 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 report entitled "*Environmental Noise Monitoring for Southeast Stoney Trail in Calgary, Alberta,* prepared for Alberta Transportation, by aci Acoustical Consultants Inc., January, 2015" 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 4.4.145) 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. 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. Also, given the relatively low traffic volumes (and thus, low noise levels) associated with typical Residential Streets relative to Collector Roads, Arterial Roads, and are freeways, Residential Streets were not included in the noise model

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 (Year 2035): This included final road configurations and interchanges with projected traffic volumes.
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 volumes
    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, to Appendix II for a description of the acoustical terminology and to Appendix III for a list of common noise sources.

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. Note also that the criteria state that a 10-year planning horizon should be used for the *future* conditions. Normally, this would mean using traffic data for year 2024 which was not available. Using traffic data for the year 2035 exceeds the requirements of Alberta Transportation and provides a more conservative estimate of the future noise levels.

5.0 Monitoring Results

The noise monitoring results at all 18 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 all of the noise monitoring locations, traffic noise on SEST or Deerfoot Trail was the dominant noise source. Note that all of the noise monitoring locations were conducted on public land within the TUC or at the TUC boundary and cannot be directly compared to the criteria of 65 dBA $L_{eq}24$ since they were not conducted within residential property. Further comparisons to the criteria should be done with the modeled results at the residential locations presented in Section 6.

More detailed information for the noise monitorings can be found in the report entitled "*Environmental Noise Monitoring for Southeast Stoney Trail in Calgary, Alberta,* prepared for Alberta Transportation, by aci Acoustical Consultants Inc., January, 2015"

Table 1. Summary of Noise Monitoring Results

Noise Monitor	$L_{eq}24$ (dBA)	$L_{eq}Day$ (dBA)	$L_{eq}Night$ (dBA)
M1	57.8	58.5	56.4
M2	63.4	64.5	60.4
M3	62.5	63.8	58.6
M4	66.6	67.8	63.4
M5	61.8	62.9	59.1
M6	59.4	61.2	51.8
M7	54.8	55.6	53.1
M8	53.0	54.2	50.0
M9	52.3	53.0	50.9
M10	76.1	77.3	72.8
M11	58.2	59.4	54.6
M12	57.5	58.7	54.2
M13	57.2	58.0	55.6
M14	52.3	52.9	51.3
M15	56.9	57.9	54.4
M16	62.4	63.7	58.5
M17	53.5	54.9	49.0
M18	50.9	50.2	51.9

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 $L_{eq}24$ 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. At all locations, the model calibration was such that the model gave the same or slightly higher $L_{eq}24$ sound levels than the monitored results. At M6, the modeled noise levels were 1.1 dBA higher than the monitored results because the wind direction during the peak morning traffic period was from the northwest (not ideal), so the noise monitored results are likely a bit low. Similarly, at M18, the modeled noise levels were 1.9 dBA higher than the monitored results because the wind direction for a portion of the noise monitoring was from the south (not ideal), so the noise monitored results are likely a bit low. 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

Noise Monitor	$L_{eq}24$ (dBA)	Difference Relative to Monitor Results $L_{eq}24$ (dBA)
M1	58.7	0.9
M2	63.7	0.4
M3	63.0	0.5
M4	66.7	0.1
M5	61.9	0.1
M6	60.5	1.1
M7	54.9	0.1
M8	53.4	0.4
M9	52.6	0.3
M10	76.1	0.0
M11	58.8	0.6
M12	58.3	0.8
M13	58.0	0.8
M14	52.8	0.5
M15	57.3	0.4
M16	62.5	0.1
M17	53.9	0.4
M18	52.8	1.9

The results of the Current Conditions noise modeling at the various residential property locations are presented in Tables 3a - 3m. For the purposes of reporting, the study area was divided into 13 separate sections, which are generally delineated by the interchanges. In addition to the information presented in Tables 3a - 3m, the $L_{eq}24$ color noise contours for the entire study area are shown in Figures 2a – 2o. The color contours provide a good visual 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 because the calculation locations in the Tables are at exact coordinates while the color contours are calculated on a 5m x 5m grid and the results are interpolated.

The current noise levels at residential property locations are under the limit of 65 dBA $L_{eq}24$ at most locations. The exceptions include the residential area immediately east of Deerfoot Trail and south of McKenzie Towne Blvd SE (R-0366, R-0369, R-0370, R-0371). For this residential area, the dominant noise source is vehicle traffic on Deerfoot Trail.

Table 3a. Noise Modeling Results Under Current Conditions for Region 1

Receptor	L_{eq}24 (dBA)
R-0001	61.7
R-0002	61.0
R-0003	60.8
R-0004	60.9
R-0005	60.8
R-0006	61.3
R-0007	61.9
R-0008	61.8
R-0009	61.7
R-0010	61.8
R-0011	61.8
R-0012	61.6
R-0013	61.1
R-0014	60.4
R-0015	59.7
R-0016	59.1
R-0017	58.6
R-0018	58.0
R-0019	56.5
R-0020	57.2
R-0021	57.0
R-0022	56.9
R-0023	57.0
R-0024	57.1
R-0025	56.9

Table 3b. Noise Modeling Results Under Current Conditions for Region 2

Receptor	L_{eq}24 (dBA)
R-0026	51.5
R-0027	50.7
R-0028	49.5
R-0029	50.7
R-0030	50.6
R-0031	50.5
R-0032	49.5
R-0033	49.5
R-0034	49.8
R-0035	50.5
R-0036	52.8
R-0037	53.1

Table 3c. Noise Modeling Results Under Current Conditions for Region 3

Receptor	L_{eq}24 (dBA)
R-0038	54.0
R-0039	53.9

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

Receptor	L_{eq}24 (dBA)
R-0040	62.0
R-0041	59.0
R-0042	52.8
R-0043	53.6
R-0044	56.3
R-0045	57.3
R-0046	58.0
R-0047	58.4
R-0048	54.4
R-0049	54.4
R-0050	58.6
R-0051	58.9
R-0052	58.7
R-0053	60.1
R-0054	53.5

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

Receptor	L_{eq}24 (dBA)
R-0055	52.6
R-0056	52.3
R-0057	52.2
R-0058	51.9
R-0059	55.0
R-0060	50.8
R-0061	53.2
R-0062	53.3
R-0063	53.1

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

Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)
R-0064	53.4		R-0105	54.3		R-0146	56.0
R-0065	53.2		R-0106	54.1		R-0147	51.1
R-0066	53.4		R-0107	53.7		R-0148	55.3
R-0067	52.8		R-0108	53.2		R-0149	50.4
R-0068	56.0		R-0109	52.9		R-0150	56.6
R-0069	53.5		R-0110	52.7		R-0151	56.7
R-0070	55.7		R-0111	52.5		R-0152	55.4
R-0071	53.6		R-0112	48.9		R-0153	51.8
R-0072	54.4		R-0113	48.3		R-0154	52.4
R-0073	52.9		R-0114	48.1		R-0155	56.2
R-0074	53.7		R-0115	49.9		R-0156	57.1
R-0075	53.4		R-0116	50.7		R-0157	57.9
R-0076	53.5		R-0117	48.4		R-0158	52.1
R-0077	53.8		R-0118	49.9		R-0159	56.6
R-0078	54.3		R-0119	50.3		R-0160	51.6
R-0079	54.1		R-0120	49.4		R-0161	51.5
R-0080	55.1		R-0121	49.6		R-0162	52.0
R-0081	54.8		R-0122	48.7		R-0163	51.2
R-0082	54.9		R-0123	48.7		R-0164	51.3
R-0083	54.8		R-0124	50.3		R-0165	51.4
R-0084	54.7		R-0125	51.3		R-0166	51.5
R-0085	54.1		R-0126	49.4		R-0167	51.6
R-0086	54.1		R-0127	49.3		R-0168	52.3
R-0087	54.0		R-0128	49.9		R-0169	56.8
R-0088	54.1		R-0129	49.7		R-0170	57.2
R-0089	54.1		R-0130	50.1		R-0171	52.7
R-0090	54.1		R-0131	49.9		R-0172	53.7
R-0091	54.1		R-0132	49.9		R-0173	54.7
R-0092	54.1		R-0133	50.5		R-0174	57.2
R-0093	54.1		R-0134	51.4		R-0175	57.1
R-0094	54.2		R-0135	51.0		R-0176	57.0
R-0095	54.2		R-0136	53.0		R-0177	57.8
R-0096	54.1		R-0137	53.2		R-0178	55.0
R-0097	54.0		R-0138	53.6		R-0179	56.5
R-0098	54.2		R-0139	53.9		R-0180	55.8
R-0099	55.4		R-0140	54.6		R-0181	57.6
R-0100	56.8		R-0141	55.5		R-0182	57.7
R-0101	56.1		R-0142	56.4		R-0183	57.1
R-0102	55.5		R-0143	51.0		R-0184	56.3
R-0103	55.1		R-0144	56.0		R-0185	57.2
R-0104	54.7		R-0145	56.2		R-0186	56.3

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

Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)
R-0187	48.0		R-0220	56.1		R-0253	54.5
R-0188	48.1		R-0221	56.3		R-0254	55.1
R-0189	47.7		R-0222	56.4		R-0255	51.1
R-0190	48.1		R-0223	56.5		R-0256	54.6
R-0191	48.7		R-0224	56.6		R-0257	54.8
R-0192	50.1		R-0225	56.7		R-0258	54.8
R-0193	50.1		R-0226	57.0		R-0259	50.7
R-0194	49.3		R-0227	57.7		R-0260	50.1
R-0195	50.3		R-0228	57.8		R-0261	50.7
R-0196	49.5		R-0229	57.7		R-0262	50.3
R-0197	48.9		R-0230	57.5		R-0263	50.2
R-0198	50.2		R-0231	57.4		R-0264	50.9
R-0199	53.1		R-0232	57.1		R-0265	50.3
R-0200	53.3		R-0233	56.8		R-0266	50.2
R-0201	54.0		R-0234	56.5		R-0267	50.2
R-0202	54.4		R-0235	56.2		R-0268	51.2
R-0203	54.7		R-0236	57.1		R-0269	49.9
R-0204	55.0		R-0237	58.5		R-0270	51.7
R-0205	55.1		R-0238	57.5		R-0271	50.6
R-0206	52.2		R-0239	53.2		R-0272	50.4
R-0207	54.9		R-0240	52.9		R-0273	50.5
R-0208	54.2		R-0241	52.2		R-0274	49.8
R-0209	52.7		R-0242	52.1		R-0275	51.0
R-0210	55.1		R-0243	51.8		R-0276	49.3
R-0211	52.9		R-0244	51.8		R-0277	50.5
R-0212	55.7		R-0245	51.8		R-0278	50.0
R-0213	55.5		R-0246	52.5		R-0279	50.0
R-0214	55.4		R-0247	55.5		R-0280	49.8
R-0215	55.5		R-0248	55.9		R-0281	50.1
R-0216	55.7		R-0249	54.9		R-0282	51.8
R-0217	55.8		R-0250	54.8		R-0283	53.1
R-0218	55.9		R-0251	54.3			
R-0219	56.0		R-0252	54.4			

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

Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)
R-0284	56.1		R-0317	57.5		R-0350	50.8
R-0285	56.0		R-0318	57.1		R-0351	51.2
R-0286	56.4		R-0319	56.5		R-0352	51.7
R-0287	55.8		R-0320	55.7		R-0353	52.6
R-0288	55.7		R-0321	54.7		R-0354	54.4
R-0289	55.3		R-0322	54.4		R-0355	57.0
R-0290	55.4		R-0323	54.7		R-0356	57.3
R-0291	53.5		R-0324	54.6		R-0357	59.9
R-0292	53.3		R-0325	52.7		R-0358	61.6
R-0293	53.2		R-0326	53.6		R-0359	62.1
R-0294	52.4		R-0327	54.6		R-0360	61.9
R-0295	52.4		R-0328	55.1		R-0361	63.4
R-0296	52.8		R-0329	53.7		R-0362	63.6
R-0297	53.3		R-0330	54.0		R-0363	64.4
R-0298	54.6		R-0331	54.7		R-0364	64.3
R-0299	54.2		R-0332	55.6		R-0365	64.1
R-0300	53.9		R-0333	53.9		R-0366	65.2
R-0301	52.9		R-0334	57.2		R-0367	64.8
R-0302	53.2		R-0335	58.5		R-0368	64.3
R-0303	53.4		R-0336	58.2		R-0369	65.5
R-0304	53.3		R-0337	57.3		R-0370	65.9
R-0305	52.7		R-0338	55.4		R-0371	65.6
R-0306	54.9		R-0339	54.7		R-0372	64.4
R-0307	54.6		R-0340	54.1		R-0373	64.2
R-0308	54.5		R-0341	53.4		R-0374	63.3
R-0309	54.1		R-0342	53.4		R-0375	61.3
R-0310	53.7		R-0343	53.7		R-0376	61.3
R-0311	54.3		R-0344	53.7		R-0377	61.9
R-0312	56.4		R-0345	53.7		R-0378	62.4
R-0313	57.0		R-0346	53.6		R-0379	62.0
R-0314	57.4		R-0347	53.3		R-0380	61.7
R-0315	57.6		R-0348	52.4		R-0381	61.7
R-0316	57.6		R-0349	51.9			

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

Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)
R-0382	59.4		R-0425	57.7		R-0468	55.1
R-0383	59.0		R-0426	57.7		R-0469	55.0
R-0384	58.3		R-0427	57.1		R-0470	55.0
R-0385	60.5		R-0428	57.2		R-0471	57.0
R-0386	59.3		R-0429	56.7		R-0472	54.9
R-0387	60.7		R-0430	60.9		R-0473	55.0
R-0388	61.8		R-0431	60.7		R-0474	54.5
R-0389	62.0		R-0432	56.1		R-0475	54.7
R-0390	62.7		R-0433	55.5		R-0476	55.0
R-0391	62.2		R-0434	55.2		R-0477	54.7
R-0392	62.2		R-0435	55.3		R-0478	54.9
R-0393	60.3		R-0436	55.9		R-0479	54.5
R-0394	57.9		R-0437	55.4		R-0480	55.0
R-0395	57.8		R-0438	55.2		R-0481	54.6
R-0396	57.8		R-0439	55.9		R-0482	55.2
R-0397	57.2		R-0440	56.0		R-0483	55.4
R-0398	57.5		R-0441	55.9		R-0484	55.0
R-0399	57.6		R-0442	55.7		R-0485	54.7
R-0400	60.7		R-0443	55.5		R-0486	55.0
R-0401	62.1		R-0444	56.2		R-0487	55.1
R-0402	61.9		R-0445	57.5		R-0488	55.9
R-0403	62.9		R-0446	58.2		R-0489	55.7
R-0404	62.0		R-0447	58.4		R-0490	57.1
R-0405	61.5		R-0448	58.1		R-0491	57.5
R-0406	62.6		R-0449	57.8		R-0492	57.3
R-0407	61.1		R-0450	57.5		R-0493	54.7
R-0408	61.9		R-0451	57.2		R-0494	51.3
R-0409	62.0		R-0452	57.0		R-0495	51.3
R-0410	61.9		R-0453	57.0		R-0496	52.0
R-0411	61.9		R-0454	57.4		R-0497	53.4
R-0412	62.2		R-0455	56.6		R-0498	54.6
R-0413	62.8		R-0456	56.1		R-0499	57.9
R-0414	63.1		R-0457	55.3		R-0500	57.2
R-0415	63.7		R-0458	56.8		R-0501	56.9
R-0416	63.7		R-0459	54.9		R-0502	57.5
R-0417	63.1		R-0460	54.6		R-0503	57.8
R-0418	62.8		R-0461	54.6		R-0504	56.9
R-0419	61.8		R-0462	54.5		R-0505	57.4
R-0420	62.0		R-0463	54.7		R-0506	56.7
R-0421	57.8		R-0464	56.4		R-0507	60.8
R-0422	57.3		R-0465	54.8		R-0508	57.8
R-0423	57.5		R-0466	54.9		R-0509	54.5
R-0424	57.7		R-0467	55.5			

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

Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)
R-0510	53.3		R-0551	50.6		R-0592	55.9
R-0511	51.1		R-0552	51.8		R-0593	55.7
R-0512	51.1		R-0553	51.7		R-0594	55.4
R-0513	51.4		R-0554	54.5		R-0595	54.6
R-0514	52.6		R-0555	54.3		R-0596	54.2
R-0515	51.8		R-0556	54.2		R-0597	52.7
R-0516	50.4		R-0557	54.2		R-0598	54.4
R-0517	49.2		R-0558	54.3		R-0599	54.6
R-0518	49.2		R-0559	54.6		R-0600	54.9
R-0519	49.6		R-0560	54.5		R-0601	52.6
R-0520	49.2		R-0561	54.5		R-0602	60.3
R-0521	49.6		R-0562	54.0		R-0603	60.6
R-0522	51.2		R-0563	54.4		R-0604	60.8
R-0523	50.7		R-0564	54.4		R-0605	60.8
R-0524	50.0		R-0565	55.2		R-0606	60.5
R-0525	49.7		R-0566	56.0		R-0607	59.4
R-0526	49.8		R-0567	56.6		R-0608	58.7
R-0527	50.0		R-0568	57.4		R-0609	58.4
R-0528	50.1		R-0569	58.5		R-0610	58.6
R-0529	51.5		R-0570	59.9		R-0611	59.1
R-0530	51.0		R-0571	60.9		R-0612	58.7
R-0531	50.6		R-0572	60.6		R-0613	58.0
R-0532	50.6		R-0573	60.2		R-0614	58.7
R-0533	50.2		R-0574	59.9		R-0615	59.0
R-0534	54.7		R-0575	57.9		R-0616	58.8
R-0535	55.1		R-0576	59.3		R-0617	58.7
R-0536	54.1		R-0577	56.3		R-0618	58.1
R-0537	55.4		R-0578	55.9		R-0619	57.8
R-0538	55.5		R-0579	58.2		R-0620	56.8
R-0539	55.8		R-0580	58.5		R-0621	56.1
R-0540	55.9		R-0581	58.2		R-0622	55.7
R-0541	50.4		R-0582	56.1		R-0623	57.2
R-0542	51.0		R-0583	55.1		R-0624	57.1
R-0543	50.0		R-0584	54.8		R-0625	57.6
R-0544	50.5		R-0585	55.9		R-0626	57.6
R-0545	51.0		R-0586	55.0		R-0627	58.9
R-0546	51.4		R-0587	59.3		R-0628	58.5
R-0547	51.0		R-0588	59.8		R-0629	58.9
R-0548	50.4		R-0589	56.8		R-0630	59.5
R-0549	51.5		R-0590	56.8			
R-0550	51.3		R-0591	56.1			

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

Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)
R-0631	60.5		R-0675	56.6		R-0719	56.4
R-0632	60.0		R-0676	56.5		R-0720	56.3
R-0633	58.9		R-0677	56.3		R-0721	56.2
R-0634	58.4		R-0678	56.2		R-0722	54.2
R-0635	58.2		R-0679	56.4		R-0723	53.9
R-0636	58.4		R-0680	56.2		R-0724	53.6
R-0637	58.7		R-0681	56.3		R-0725	54.7
R-0638	58.7		R-0682	56.3		R-0726	54.8
R-0639	59.1		R-0683	56.3		R-0727	54.7
R-0640	57.9		R-0684	56.5		R-0728	53.1
R-0641	59.6		R-0685	56.5		R-0729	52.7
R-0642	59.7		R-0686	56.7		R-0730	52.7
R-0643	59.3		R-0687	57.1		R-0731	53.0
R-0644	59.1		R-0688	57.4		R-0732	53.2
R-0645	58.9		R-0689	57.7		R-0733	55.2
R-0646	58.8		R-0690	57.9		R-0734	57.3
R-0647	58.9		R-0691	58.2		R-0735	57.0
R-0648	59.1		R-0692	58.4		R-0736	57.0
R-0649	60.0		R-0693	58.8		R-0737	57.2
R-0650	59.5		R-0694	57.3		R-0738	56.8
R-0651	58.2		R-0695	55.8		R-0739	57.0
R-0652	58.1		R-0696	56.2		R-0740	57.2
R-0653	57.7		R-0697	54.4		R-0741	57.5
R-0654	56.0		R-0698	56.6		R-0742	56.5
R-0655	54.6		R-0699	55.2		R-0743	56.1
R-0656	53.7		R-0700	54.9		R-0744	57.5
R-0657	53.2		R-0701	54.8		R-0745	56.0
R-0658	54.5		R-0702	55.5		R-0746	54.7
R-0659	53.9		R-0703	56.1		R-0747	54.2
R-0660	54.5		R-0704	56.4		R-0748	53.1
R-0661	54.6		R-0705	55.7		R-0749	52.8
R-0662	54.7		R-0706	54.7		R-0750	52.3
R-0663	54.6		R-0707	55.1		R-0751	51.5
R-0664	54.6		R-0708	56.3		R-0752	51.5
R-0665	54.4		R-0709	56.9		R-0753	51.1
R-0666	54.7		R-0710	57.0		R-0754	51.3
R-0667	53.5		R-0711	56.5		R-0755	52.0
R-0668	53.7		R-0712	56.4		R-0756	53.6
R-0669	55.2		R-0713	56.4		R-0757	55.7
R-0670	55.9		R-0714	56.4		R-0758	53.6
R-0671	56.1		R-0715	56.4		R-0759	52.5
R-0672	56.2		R-0716	56.4		R-0760	51.3
R-0673	56.6		R-0717	56.4		R-0761	51.8
R-0674	56.3		R-0718	56.4			

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

Receptor	L_{eq}24 (dBA)
R-0762	55.5
R-0763	56.9
R-0764	57.2
R-0765	57.3
R-0766	57.2
R-0767	57.1
R-0768	56.8
R-0769	56.4
R-0770	55.3
R-0771	54.3
R-0772	53.6
R-0773	54.0
R-0774	53.5
R-0775	52.9
R-0776	51.4
R-0777	51.2
R-0778	51.4
R-0779	52.0
R-0780	53.1
R-0781	54.6
R-0782	56.4
R-0783	58.1
R-0784	58.3
R-0785	58.4
R-0786	57.9
R-0787	57.7
R-0788	58.0
R-0789	58.2

Table 3m. Noise Modeling Results Under Current Conditions for Region 13

Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)		Receptor	L_{eq}24 (dBA)
R-0790	58.1		R-0837	52.0		R-0884	55.7
R-0791	58.4		R-0838	53.5		R-0885	55.5
R-0792	58.5		R-0839	53.1		R-0886	55.5
R-0793	57.7		R-0840	51.2		R-0887	54.8
R-0794	56.6		R-0841	54.1		R-0888	54.6
R-0795	57.9		R-0842	55.4		R-0889	54.1
R-0796	52.0		R-0843	55.9		R-0890	54.4
R-0797	52.5		R-0844	56.3		R-0891	54.7
R-0798	52.3		R-0845	56.6		R-0892	55.3
R-0799	51.9		R-0846	55.6		R-0893	55.6
R-0800	50.2		R-0847	57.5		R-0894	55.4
R-0801	49.6		R-0848	55.3		R-0895	56.6
R-0802	49.6		R-0849	55.9		R-0896	56.8
R-0803	49.1		R-0850	53.0		R-0897	56.9
R-0804	49.9		R-0851	56.7		R-0898	56.9
R-0805	49.8		R-0852	55.8		R-0899	57.1
R-0806	49.7		R-0853	55.3		R-0900	57.1
R-0807	49.7		R-0854	56.0		R-0901	57.1
R-0808	49.8		R-0855	55.9		R-0902	55.2
R-0809	50.1		R-0856	55.9		R-0903	55.7
R-0810	50.1		R-0857	55.7		R-0904	55.3
R-0811	50.2		R-0858	56.1		R-0905	54.1
R-0812	50.3		R-0859	55.9		R-0906	55.8
R-0813	50.7		R-0860	56.2		R-0907	56.8
R-0814	52.1		R-0861	56.5		R-0908	56.8
R-0815	51.4		R-0862	55.7		R-0909	56.8
R-0816	50.0		R-0863	56.3		R-0910	56.7
R-0817	50.3		R-0864	56.4		R-0911	56.5
R-0818	50.0		R-0865	56.0		R-0912	56.5
R-0819	50.0		R-0866	55.4		R-0913	56.7
R-0820	50.5		R-0867	58.0		R-0914	55.0
R-0821	51.1		R-0868	59.7		R-0915	54.4
R-0822	50.7		R-0869	58.7		R-0916	54.6
R-0823	50.8		R-0870	56.9		R-0917	54.2
R-0824	52.0		R-0871	56.4		R-0918	56.2
R-0825	51.6		R-0872	56.1		R-0919	56.8
R-0826	51.7		R-0873	56.8		R-0920	56.9
R-0827	53.1		R-0874	55.7		R-0921	57.9
R-0828	51.3		R-0875	55.5		R-0922	55.4
R-0829	52.2		R-0876	54.4		R-0923	55.3
R-0830	52.5		R-0877	53.4		R-0924	59.3
R-0831	52.6		R-0878	53.2		R-0925	59.4
R-0832	52.5		R-0879	52.8		R-0926	58.1
R-0833	52.0		R-0880	53.3		R-0927	58.3
R-0834	53.1		R-0881	53.3		R-0928	56.3
R-0835	53.2		R-0882	53.7		R-0929	57.4
R-0836	53.1		R-0883	55.2			

6.2. Future Conditions

The results of the noise modeling under future conditions (Year 2035) at the residential receptor locations are presented in Tables 4a - 4m and shown in Figures 3a – 3o. The $L_{eq}24$ sound levels are presented in the Tables along with the relative increase in the $L_{eq}24$ compared to the Current Conditions. As with the Current Conditions, in the event of a discrepancy between the results indicated in the color contours and the Tables, the Tables will be considered as correct because the calculation locations in the Tables are at exact coordinates while the color contours are calculated on a 5m x 5m grid and the results are interpolated. Below each Table is a summary discussion of the results for that particular Region.

Table 4a. Noise Modeling Results Under Future Conditions for Region 1

Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)
R-0001	63.8	2.1
R-0002	63.1	2.1
R-0003	63.0	2.2
R-0004	63.0	2.1
R-0005	63.0	2.2
R-0006	63.5	2.2
R-0007	64.0	2.1
R-0008	64.0	2.2
R-0009	63.9	2.2
R-0010	64.0	2.2
R-0011	63.9	2.1
R-0012	63.7	2.1
R-0013	63.2	2.1
R-0014	62.5	2.1
R-0015	61.7	2.0
R-0016	61.1	2.0
R-0017	60.7	2.1
R-0018	60.1	2.1
R-0019	58.6	2.1
R-0020	59.3	2.1
R-0021	59.1	2.1
R-0022	59.1	2.2
R-0023	59.2	2.2
R-0024	59.4	2.3
R-0025	59.2	2.3

The Future Conditions noise modeling for Region 1 indicate noise levels below 65 dBA $L_{eq}24$ at all locations. The noise climate for these receptors is dominated by vehicle traffic on SEST and the adjacent ramps from southbound SEST to 17 Avenue SE. The increases relative to the Current Conditions for Region 1 ranged from +2.0 to +2.3 dBA. At all locations, these increases were mostly due to the projected increases in traffic volumes on SEST and 17 Avenue SE and the ramps at the interchange between the two.

Table 4b. Noise Modeling Results Under Future Conditions for Region 2

Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)
R-0026	54.0	2.5
R-0027	52.8	2.1
R-0028	51.6	2.1
R-0029	52.6	1.9
R-0030	52.5	1.9
R-0031	52.3	1.8
R-0032	51.3	1.8
R-0033	51.3	1.8
R-0034	51.7	1.9
R-0035	52.4	1.9
R-0036	54.8	2.0
R-0037	55.1	2.0

The Future Conditions noise modeling for Region 2 indicate noise levels below 65 dBA $L_{eq}24$ at all locations. The noise climate for these receptors is dominated by vehicle traffic on SEST, 17 Avenue SE, and Peigan Trail (depending on the location). The increases relative to the Current Conditions for Region 2 ranged from +1.8 to +2.5 dBA. At all locations, these increases were due to the projected increases in traffic volumes on SEST, 17 Avenue SE, and Peigan Trail.

Table 4c. Noise Modeling Results Under Future Conditions for Region 3

Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)
R-0038	55.1	1.1
R-0039	55.6	1.7

The Future Conditions noise modeling for Region 3 indicate noise levels below 65 dBA $L_{eq}24$ at all locations. The noise climate for these receptors is dominated by vehicle traffic on SEST. The increases relative to the Current Conditions for Region 3 ranged from +1.1 to +1.7 dBA. At all locations, these increases were due to the projected increases in traffic volumes on SEST.

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

Receptor	L_{eq}24 (dBA)	Increase Relative to Current Conditions (dBA)
R-0040	66.9	4.9
R-0041	64.6	5.6
R-0042	56.5	3.7
R-0043	56.9	3.3
R-0044	58.0	1.7
R-0045	58.9	1.6
R-0046	59.4	1.4
R-0047	59.7	1.3
R-0048	56.9	2.5
R-0049	57.0	2.6
R-0050	60.0	1.4
R-0051	60.2	1.3
R-0052	60.1	1.4
R-0053	61.3	1.2
R-0054	55.7	2.2

The Future Conditions noise modeling for Region 4 indicate noise levels below 65 dBA L_{eq}24 at all but one receptor location (R-0040). At R-0040, the noise climate is dominated by vehicle traffic on Glenmore Trail, east of SEST and then by vehicle traffic on 84 Street SE. The noise climate for the other receptors is dominated by vehicle traffic primarily on 84 Street SE, then by vehicle traffic on SEST, and Glenmore Trail. The increases relative to the Current Conditions for Region 4 ranged from +1.2 to +5.6 dBA. At all locations, these increases were mostly due to the projected increases in traffic volumes on SEST and Glenmore Trail

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

Receptor	L_{eq}24 (dBA)	Increase Relative to Current Conditions (dBA)
R-0055	54.8	2.2
R-0056	54.5	2.2
R-0057	54.4	2.2
R-0058	54.1	2.2
R-0059	56.8	1.8
R-0060	53.2	2.4
R-0061	55.2	2.0
R-0062	55.3	2.0
R-0063	55.0	1.9

The Future Conditions noise modeling for Region 5 indicate noise levels below 65 dBA L_{eq}24 at all locations. The noise climate for these receptors is dominated by vehicle traffic on SEST and 84 Street SE. The increases relative to the Current Conditions for Region 5 ranged from +1.8 to +2.4 dBA. At all locations, these increases were due to the projected increases in traffic volumes on SEST.

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

Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)
R-0064	55.8	2.4		R-0105	58.3	4.0		R-0146	59.2	3.2
R-0065	55.7	2.5		R-0106	58.1	4.0		R-0147	54.3	3.2
R-0066	56.0	2.6		R-0107	57.6	3.9		R-0148	58.4	3.1
R-0067	56.3	3.5		R-0108	57.1	3.9		R-0149	53.6	3.2
R-0068	60.0	4.0		R-0109	56.8	3.9		R-0150	59.7	3.1
R-0069	55.8	2.3		R-0110	56.5	3.8		R-0151	59.8	3.1
R-0070	57.1	1.4		R-0111	55.5	3.0		R-0152	58.5	3.1
R-0071	56.0	2.4		R-0112	52.7	3.8		R-0153	54.7	2.9
R-0072	57.2	2.8		R-0113	52.0	3.7		R-0154	55.3	2.9
R-0073	55.8	2.9		R-0114	51.7	3.6		R-0155	59.1	2.9
R-0074	56.5	2.8		R-0115	53.4	3.5		R-0156	60.2	3.1
R-0075	56.4	3.0		R-0116	54.3	3.6		R-0157	61.0	3.1
R-0076	56.6	3.1		R-0117	52.5	4.1		R-0158	55.0	2.9
R-0077	56.7	2.9		R-0118	53.7	3.8		R-0159	59.5	2.9
R-0078	57.1	2.8		R-0119	54.0	3.7		R-0160	54.7	3.1
R-0079	57.0	2.9		R-0120	52.6	3.2		R-0161	54.5	3.0
R-0080	57.7	2.6		R-0121	52.9	3.3		R-0162	55.1	3.1
R-0081	57.4	2.6		R-0122	51.9	3.2		R-0163	54.2	3.0
R-0082	57.5	2.6		R-0123	51.7	3.0		R-0164	54.3	3.0
R-0083	57.5	2.7		R-0124	52.5	2.2		R-0165	54.4	3.0
R-0084	57.6	2.9		R-0125	53.2	1.9		R-0166	54.5	3.0
R-0085	57.4	3.3		R-0126	52.5	3.1		R-0167	54.6	3.0
R-0086	57.4	3.3		R-0127	52.4	3.1		R-0168	55.2	2.9
R-0087	57.4	3.4		R-0128	53.1	3.2		R-0169	59.5	2.7
R-0088	57.5	3.4		R-0129	52.8	3.1		R-0170	60.0	2.8
R-0089	57.5	3.4		R-0130	53.6	3.5		R-0171	55.2	2.5
R-0090	57.6	3.5		R-0131	53.4	3.5		R-0172	56.2	2.5
R-0091	57.6	3.5		R-0132	53.6	3.7		R-0173	57.2	2.5
R-0092	57.7	3.6		R-0133	54.2	3.7		R-0174	59.9	2.7
R-0093	57.8	3.7		R-0134	55.1	3.7		R-0175	59.7	2.6
R-0094	57.9	3.7		R-0135	54.7	3.7		R-0176	59.5	2.5
R-0095	57.9	3.7		R-0136	56.7	3.7		R-0177	60.3	2.5
R-0096	57.9	3.8		R-0137	56.8	3.6		R-0178	57.6	2.6
R-0097	57.8	3.8		R-0138	57.3	3.7		R-0179	59.2	2.7
R-0098	58.0	3.8		R-0139	57.6	3.7		R-0180	58.5	2.7
R-0099	59.4	4.0		R-0140	58.3	3.7		R-0181	60.5	2.9
R-0100	60.8	4.0		R-0141	59.1	3.6		R-0182	60.6	2.9
R-0101	60.1	4.0		R-0142	59.9	3.5		R-0183	59.9	2.8
R-0102	59.5	4.0		R-0143	54.3	3.3		R-0184	59.1	2.8
R-0103	59.1	4.0		R-0144	59.3	3.3		R-0185	60.1	2.9
R-0104	58.7	4.0		R-0145	59.5	3.3		R-0186	59.0	2.7

The Future Conditions noise modeling for Region 6 indicate noise levels below 65 dBA $L_{eq}24$ at all locations. The noise climate for these receptors is dominated by vehicle traffic on SEST, Highway 22x, 52 Street SE, and the interchanges (depending on the location). The increases relative to the Current Conditions for Region 6 ranged from +1.4 to +4.1 dBA. At all locations, these increases were due to the projected increases in traffic volumes on SEST, Highway 22x, and 52 Street SE.

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

Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)
R-0187	54.1	6.1		R-0220	60.5	4.4		R-0253	57.8	3.3
R-0188	56.7	8.6		R-0221	60.7	4.4		R-0254	58.4	3.3
R-0189	55.7	8.0		R-0222	60.7	4.3		R-0255	54.3	3.2
R-0190	55.9	7.8		R-0223	60.8	4.3		R-0256	57.8	3.2
R-0191	56.7	8.0		R-0224	60.9	4.3		R-0257	57.9	3.1
R-0192	57.2	7.1		R-0225	61.0	4.3		R-0258	57.8	3.0
R-0193	57.3	7.2		R-0226	61.2	4.2		R-0259	53.7	3.0
R-0194	56.8	7.5		R-0227	61.9	4.2		R-0260	53.3	3.2
R-0195	57.3	7.0		R-0228	61.9	4.1		R-0261	53.8	3.1
R-0196	57.0	7.5		R-0229	61.8	4.1		R-0262	53.5	3.2
R-0197	54.4	5.5		R-0230	61.6	4.1		R-0263	53.3	3.1
R-0198	57.2	7.0		R-0231	61.5	4.1		R-0264	54.0	3.1
R-0199	58.9	5.8		R-0232	61.2	4.1		R-0265	53.3	3.0
R-0200	59.2	5.9		R-0233	60.9	4.1		R-0266	53.3	3.1
R-0201	59.6	5.6		R-0234	60.5	4.0		R-0267	53.2	3.0
R-0202	59.8	5.4		R-0235	60.3	4.1		R-0268	54.1	2.9
R-0203	60.0	5.3		R-0236	61.2	4.1		R-0269	52.6	2.7
R-0204	60.2	5.2		R-0237	62.6	4.1		R-0270	54.6	2.9
R-0205	60.2	5.1		R-0238	61.6	4.1		R-0271	53.4	2.8
R-0206	57.1	4.9		R-0239	57.1	3.9		R-0272	53.0	2.6
R-0207	59.7	4.8		R-0240	56.8	3.9		R-0273	53.2	2.7
R-0208	58.9	4.7		R-0241	56.1	3.9		R-0274	52.3	2.5
R-0209	57.8	5.1		R-0242	56.0	3.9		R-0275	53.5	2.5
R-0210	59.9	4.8		R-0243	55.7	3.9		R-0276	51.4	2.1
R-0211	57.6	4.7		R-0244	55.6	3.8		R-0277	52.6	2.1
R-0212	60.3	4.6		R-0245	55.7	3.9		R-0278	51.9	1.9
R-0213	60.2	4.7		R-0246	56.1	3.6		R-0279	51.8	1.8
R-0214	60.0	4.6		R-0247	59.0	3.5		R-0280	51.6	1.8
R-0215	60.1	4.6		R-0248	59.4	3.5		R-0281	51.8	1.7
R-0216	60.2	4.5		R-0249	58.4	3.5		R-0282	53.1	1.3
R-0217	60.3	4.5		R-0250	58.2	3.4		R-0283	54.0	0.9
R-0218	60.4	4.5		R-0251	57.7	3.4				
R-0219	60.5	4.5		R-0252	57.7	3.3				

The Future Conditions noise modeling for Region 7 indicate noise levels below 65 dBA $L_{eq}24$ at all locations. The noise climate for these receptors is dominated by vehicle traffic on SEST, Highway 22x, 84 Street SE, 52 Street SE, and the interchanges (depending on the location). The increases relative to the Current Conditions for Region 7 ranged from +0.9 to +8.6 dBA. At all locations, these increases were due to the projected increases in traffic volumes on SEST, Highway 22x, 84 Street SE, and 52 Street SE.

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

Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)
R-0284	59.0	2.9		R-0317	60.5	3.0		R-0350	53.5	2.7
R-0285	58.9	2.9		R-0318	60.2	3.1		R-0351	53.8	2.6
R-0286	59.3	2.9		R-0319	59.6	3.1		R-0352	54.3	2.6
R-0287	58.7	2.9		R-0320	58.8	3.1		R-0353	55.2	2.6
R-0288	58.6	2.9		R-0321	57.8	3.1		R-0354	57.0	2.6
R-0289	58.2	2.9		R-0322	57.5	3.1		R-0355	59.6	2.6
R-0290	58.3	2.9		R-0323	57.7	3.0		R-0356	59.8	2.5
R-0291	56.2	2.7		R-0324	57.5	2.9		R-0357	62.5	2.6
R-0292	56.1	2.8		R-0325	55.6	2.9		R-0358	64.1	2.5
R-0293	55.9	2.7		R-0326	56.4	2.8		R-0359	64.7	2.6
R-0294	55.2	2.8		R-0327	57.6	3.0		R-0360	64.5	2.6
R-0295	55.1	2.7		R-0328	57.9	2.8		R-0361	66.0	2.6
R-0296	55.5	2.7		R-0329	56.6	2.9		R-0362	66.3	2.7
R-0297	56.1	2.8		R-0330	57.0	3.0		R-0363	67.1	2.7
R-0298	57.5	2.9		R-0331	57.7	3.0		R-0364	67.0	2.7
R-0299	57.0	2.8		R-0332	58.5	2.9		R-0365	66.7	2.6
R-0300	56.7	2.8		R-0333	57.0	3.1		R-0366	67.9	2.7
R-0301	55.6	2.7		R-0334	60.4	3.2		R-0367	67.5	2.7
R-0302	56.0	2.8		R-0335	61.8	3.3		R-0368	67.0	2.7
R-0303	56.3	2.9		R-0336	61.4	3.2		R-0369	68.3	2.8
R-0304	56.2	2.9		R-0337	60.4	3.1		R-0370	68.7	2.8
R-0305	55.6	2.9		R-0338	58.6	3.2		R-0371	68.4	2.8
R-0306	57.8	2.9		R-0339	57.8	3.1		R-0372	67.1	2.7
R-0307	57.5	2.9		R-0340	57.1	3.0		R-0373	66.9	2.7
R-0308	57.4	2.9		R-0341	56.4	3.0		R-0374	66.0	2.7
R-0309	57.0	2.9		R-0342	56.4	3.0		R-0375	63.8	2.5
R-0310	56.6	2.9		R-0343	56.6	2.9		R-0376	63.7	2.4
R-0311	57.0	2.7		R-0344	56.5	2.8		R-0377	63.7	1.8
R-0312	59.4	3.0		R-0345	56.3	2.6		R-0378	64.2	1.8
R-0313	60.0	3.0		R-0346	56.4	2.8		R-0379	63.6	1.6
R-0314	60.4	3.0		R-0347	56.0	2.7		R-0380	63.3	1.6
R-0315	60.7	3.1		R-0348	55.0	2.6		R-0381	63.0	1.3
R-0316	60.7	3.1		R-0349	54.6	2.7				

The Future Conditions noise modeling for Region 8 indicate noise levels below 65 dBA $L_{eq}24$ at most receptor locations. For receptors R-0361 to R-0374, the noise levels are modeled to exceed 65 dBA $L_{eq}24$. For these receptors, the noise climate is dominated by vehicle traffic on Deerfoot Trail. In addition, as indicated in Figure 3j, the noise levels are modeled to exceed 65 dBA $L_{eq}24$ for the first 1 to 4 lots inward from Deerfoot Trail. The noise climate for the other receptors is dominated by vehicle traffic on SEST, 52 Street SE, Deerfoot Trail, McKenzie Towne Blvd SE, and the interchanges. The increases relative to the Current Conditions for Region 8 ranged from +1.3 to +3.3 dBA. At all locations, these increases were mostly due to the projected increases in traffic volumes on SEST, 52 Street SE, Deerfoot Trail, and McKenzie Towne Blvd SE.

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

Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)
R-0382	60.9	1.5		R-0425	60.3	2.6		R-0468	57.7	2.6
R-0383	60.6	1.6		R-0426	60.3	2.6		R-0469	57.6	2.6
R-0384	59.9	1.6		R-0427	59.7	2.6		R-0470	57.7	2.7
R-0385	62.3	1.8		R-0428	59.7	2.5		R-0471	59.8	2.8
R-0386	60.9	1.6		R-0429	59.2	2.5		R-0472	57.6	2.7
R-0387	62.4	1.7		R-0430	63.5	2.6		R-0473	57.8	2.8
R-0388	63.8	2.0		R-0431	63.3	2.6		R-0474	57.3	2.8
R-0389	64.0	2.0		R-0432	58.6	2.5		R-0475	57.4	2.7
R-0390	64.7	2.0		R-0433	58.0	2.5		R-0476	57.8	2.8
R-0391	64.3	2.1		R-0434	57.7	2.5		R-0477	57.5	2.8
R-0392	64.6	2.4		R-0435	57.8	2.5		R-0478	57.7	2.8
R-0393	62.8	2.5		R-0436	58.4	2.5		R-0479	57.2	2.7
R-0394	60.3	2.4		R-0437	57.9	2.5		R-0480	57.8	2.8
R-0395	59.9	2.1		R-0438	57.7	2.5		R-0481	57.3	2.7
R-0396	60.0	2.2		R-0439	58.4	2.5		R-0482	57.9	2.7
R-0397	59.5	2.3		R-0440	58.6	2.6		R-0483	58.1	2.7
R-0398	59.8	2.3		R-0441	58.5	2.6		R-0484	57.5	2.5
R-0399	60.0	2.4		R-0442	58.2	2.5		R-0485	57.1	2.4
R-0400	63.3	2.6		R-0443	58.0	2.5		R-0486	57.4	2.4
R-0401	64.7	2.6		R-0444	58.7	2.5		R-0487	57.3	2.2
R-0402	64.6	2.7		R-0445	60.1	2.6		R-0488	58.0	2.1
R-0403	65.5	2.6		R-0446	60.8	2.6		R-0489	57.7	2.0
R-0404	64.6	2.6		R-0447	61.0	2.6		R-0490	58.4	1.3
R-0405	64.1	2.6		R-0448	60.7	2.6		R-0491	58.5	1.0
R-0406	65.2	2.6		R-0449	60.3	2.5		R-0492	58.4	1.1
R-0407	63.8	2.7		R-0450	60.0	2.5		R-0493	55.7	1.0
R-0408	64.5	2.6		R-0451	59.7	2.5		R-0494	53.0	1.7
R-0409	64.6	2.6		R-0452	59.5	2.5		R-0495	52.8	1.5
R-0410	64.5	2.6		R-0453	59.4	2.4		R-0496	53.5	1.5
R-0411	64.5	2.6		R-0454	59.9	2.5		R-0497	54.7	1.3
R-0412	64.8	2.6		R-0455	59.1	2.5		R-0498	55.9	1.3
R-0413	65.4	2.6		R-0456	58.4	2.3		R-0499	59.6	1.7
R-0414	65.8	2.7		R-0457	57.7	2.4		R-0500	58.9	1.7
R-0415	66.4	2.7		R-0458	59.1	2.3		R-0501	58.9	2.0
R-0416	66.4	2.7		R-0459	57.2	2.3		R-0502	59.7	2.2
R-0417	65.7	2.6		R-0460	56.9	2.3		R-0503	60.0	2.2
R-0418	65.4	2.6		R-0461	56.9	2.3		R-0504	59.1	2.2
R-0419	64.5	2.7		R-0462	56.9	2.4		R-0505	59.7	2.3
R-0420	64.7	2.7		R-0463	57.1	2.4		R-0506	59.0	2.3
R-0421	60.3	2.5		R-0464	58.8	2.4		R-0507	63.1	2.3
R-0422	59.8	2.5		R-0465	57.3	2.5		R-0508	60.2	2.4
R-0423	60.0	2.5		R-0466	57.4	2.5		R-0509	56.9	2.4
R-0424	60.2	2.5		R-0467	58.1	2.6				

The Future Conditions noise modeling for Region 9 indicate noise levels below 65 dBA $L_{eq}24$ at most receptor locations. For receptors R-0403, R-0406, and R-0413 to R-0418, the noise levels are modeled to exceed 65 dBA $L_{eq}24$. For these receptors, the noise climate is dominated by vehicle traffic on Deerfoot Trail. In addition, as indicated in Figure 3k, the noise levels are modeled to exceed 65 dBA $L_{eq}24$ for the first 1 to 2 lots inward from Deerfoot Trail and there are some lots which will have noise levels above 65 dBA $L_{eq}24$ closer to the house, but not at the receptor location 2 m from the property line because of the close "shadow-zone" of the noise barrier. The noise climate for the other receptors is dominated by vehicle traffic on SEST, McKenzie Lake Blvd SE, Deerfoot Trail and the interchanges (depending on the location). The increases relative to the Current Conditions for Region 9 ranged from +1.0 to +2.8 dBA. At essentially all locations, these increases were mostly due to the projected increases in traffic volumes on SEST McKenzie Lake Blvd SE, Deerfoot Trail.

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

Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)
R-0510	54.1	0.8		R-0551	53.4	2.8		R-0592	58.7	2.8
R-0511	52.6	1.5		R-0552	54.5	2.7		R-0593	58.4	2.7
R-0512	52.8	1.7		R-0553	54.4	2.7		R-0594	58.1	2.7
R-0513	53.3	1.9		R-0554	57.1	2.6		R-0595	57.4	2.8
R-0514	54.5	1.9		R-0555	56.9	2.6		R-0596	57.0	2.8
R-0515	54.0	2.2		R-0556	56.8	2.6		R-0597	55.6	2.9
R-0516	52.1	1.7		R-0557	56.8	2.6		R-0598	57.1	2.7
R-0517	51.1	1.9		R-0558	56.9	2.6		R-0599	57.3	2.7
R-0518	51.3	2.1		R-0559	57.2	2.6		R-0600	57.6	2.7
R-0519	51.7	2.1		R-0560	57.1	2.6		R-0601	55.4	2.8
R-0520	51.7	2.5		R-0561	57.1	2.6		R-0602	62.9	2.6
R-0521	52.1	2.5		R-0562	56.6	2.6		R-0603	63.2	2.6
R-0522	54.0	2.8		R-0563	56.9	2.5		R-0604	63.3	2.5
R-0523	53.7	3.0		R-0564	56.9	2.5		R-0605	63.3	2.5
R-0524	53.0	3.0		R-0565	57.7	2.5		R-0606	63.0	2.5
R-0525	52.7	3.0		R-0566	58.5	2.5		R-0607	62.0	2.6
R-0526	52.8	3.0		R-0567	59.2	2.6		R-0608	61.3	2.6
R-0527	52.9	2.9		R-0568	60.0	2.6		R-0609	61.0	2.6
R-0528	53.0	2.9		R-0569	61.1	2.6		R-0610	61.2	2.6
R-0529	54.4	2.9		R-0570	62.5	2.6		R-0611	61.7	2.6
R-0530	53.9	2.9		R-0571	63.7	2.8		R-0612	61.2	2.5
R-0531	53.5	2.9		R-0572	63.4	2.8		R-0613	60.6	2.6
R-0532	53.6	3.0		R-0573	62.9	2.7		R-0614	61.3	2.6
R-0533	53.1	2.9		R-0574	62.6	2.7		R-0615	61.7	2.7
R-0534	57.6	2.9		R-0575	60.6	2.7		R-0616	61.5	2.7
R-0535	58.0	2.9		R-0576	62.1	2.8		R-0617	61.5	2.8
R-0536	57.0	2.9		R-0577	59.0	2.7		R-0618	60.9	2.8
R-0537	58.3	2.9		R-0578	58.6	2.7		R-0619	60.8	3.0
R-0538	58.5	3.0		R-0579	60.8	2.6		R-0620	60.0	3.2
R-0539	58.8	3.0		R-0580	61.2	2.7		R-0621	59.4	3.3
R-0540	58.8	2.9		R-0581	60.9	2.7		R-0622	59.1	3.4
R-0541	53.2	2.8		R-0582	58.8	2.7		R-0623	60.8	3.6
R-0542	53.8	2.8		R-0583	57.7	2.6		R-0624	60.7	3.6
R-0543	52.8	2.8		R-0584	57.5	2.7		R-0625	61.3	3.7
R-0544	53.4	2.9		R-0585	58.6	2.7		R-0626	61.3	3.7
R-0545	53.8	2.8		R-0586	57.7	2.7		R-0627	62.8	3.9
R-0546	54.2	2.8		R-0587	62.0	2.7		R-0628	62.4	3.9
R-0547	53.8	2.8		R-0588	62.5	2.7		R-0629	62.8	3.9
R-0548	53.2	2.8		R-0589	59.5	2.7		R-0630	63.2	3.7
R-0549	54.3	2.8		R-0590	59.5	2.7				
R-0550	54.1	2.8		R-0591	58.9	2.8				

The Future Conditions noise modeling for Region 10 indicate noise levels below 65 dBA $L_{eq}24$ at all locations. The noise climate for these receptors is dominated by vehicle traffic on SEST, 52 Street SE, Deerfoot Trail, Seton Blvd SE, and the interchanges (depending on the location). The increases relative to the Current Conditions for Region 10 ranged from +0.8 to +3.9 dBA. At all locations, these increases were due to the projected increases in traffic volumes on SEST, 52 Street SE, Deerfoot Trail, and Seton Blvd SE.

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

Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)
R-0631	61.5	1.0		R-0675	59.3	2.7		R-0719	58.9	2.5
R-0632	61.2	1.2		R-0676	59.2	2.7		R-0720	58.8	2.5
R-0633	60.0	1.1		R-0677	59.0	2.7		R-0721	58.7	2.5
R-0634	59.6	1.2		R-0678	58.9	2.7		R-0722	56.7	2.5
R-0635	59.4	1.2		R-0679	59.0	2.6		R-0723	56.4	2.5
R-0636	59.6	1.2		R-0680	58.9	2.7		R-0724	56.1	2.5
R-0637	60.0	1.3		R-0681	59.0	2.7		R-0725	57.2	2.5
R-0638	60.1	1.4		R-0682	59.0	2.7		R-0726	57.2	2.4
R-0639	60.5	1.4		R-0683	59.0	2.7		R-0727	57.1	2.4
R-0640	59.5	1.6		R-0684	59.2	2.7		R-0728	55.4	2.3
R-0641	61.4	1.8		R-0685	59.2	2.7		R-0729	55.1	2.4
R-0642	61.5	1.8		R-0686	59.4	2.7		R-0730	55.0	2.3
R-0643	61.3	2.0		R-0687	59.8	2.7		R-0731	55.3	2.3
R-0644	61.2	2.1		R-0688	60.1	2.7		R-0732	55.4	2.2
R-0645	61.2	2.3		R-0689	60.3	2.6		R-0733	56.9	1.7
R-0646	61.2	2.4		R-0690	60.6	2.7		R-0734	58.5	1.2
R-0647	61.4	2.5		R-0691	60.8	2.6		R-0735	57.9	0.9
R-0648	61.5	2.4		R-0692	61.1	2.7		R-0736	57.8	0.8
R-0649	62.5	2.5		R-0693	61.4	2.6		R-0737	57.9	0.7
R-0650	62.0	2.5		R-0694	59.9	2.6		R-0738	57.6	0.8
R-0651	60.7	2.5		R-0695	58.4	2.6		R-0739	57.9	0.9
R-0652	60.6	2.5		R-0696	58.8	2.6		R-0740	58.2	1.0
R-0653	60.2	2.5		R-0697	57.0	2.6		R-0741	58.6	1.1
R-0654	58.5	2.5		R-0698	59.2	2.6		R-0742	57.6	1.1
R-0655	57.1	2.5		R-0699	57.8	2.6		R-0743	57.4	1.3
R-0656	56.2	2.5		R-0700	57.5	2.6		R-0744	58.9	1.4
R-0657	55.7	2.5		R-0701	57.5	2.7		R-0745	57.6	1.6
R-0658	57.1	2.6		R-0702	58.2	2.7		R-0746	56.5	1.8
R-0659	56.5	2.6		R-0703	58.8	2.7		R-0747	56.0	1.8
R-0660	57.1	2.6		R-0704	59.1	2.7		R-0748	55.0	1.9
R-0661	57.2	2.6		R-0705	58.5	2.8		R-0749	54.7	1.9
R-0662	57.2	2.5		R-0706	57.3	2.6		R-0750	54.3	2.0
R-0663	57.2	2.6		R-0707	57.7	2.6		R-0751	53.6	2.1
R-0664	57.2	2.6		R-0708	58.8	2.5		R-0752	53.6	2.1
R-0665	57.0	2.6		R-0709	59.5	2.6		R-0753	53.3	2.2
R-0666	57.2	2.5		R-0710	59.7	2.7		R-0754	53.6	2.3
R-0667	56.1	2.6		R-0711	59.1	2.6		R-0755	54.4	2.4
R-0668	56.3	2.6		R-0712	59.0	2.6		R-0756	56.0	2.4
R-0669	57.8	2.6		R-0713	59.0	2.6		R-0757	58.2	2.5
R-0670	58.6	2.7		R-0714	59.0	2.6		R-0758	56.1	2.5
R-0671	58.8	2.7		R-0715	58.9	2.5		R-0759	55.0	2.5
R-0672	58.9	2.7		R-0716	58.9	2.5		R-0760	53.8	2.5
R-0673	59.2	2.6		R-0717	58.9	2.5		R-0761	54.2	2.4
R-0674	59.0	2.7		R-0718	58.9	2.5				

The Future Conditions noise modeling for Region 11 indicate noise levels below 65 dBA $L_{eq}24$ at all locations. The noise climate for these receptors is dominated by vehicle traffic on SEST, Cranston Avenue SE, Deerfoot Trail, Cranston Blvd SE, and the interchanges (depending on the location). The increases relative to the Current Conditions for Region 11 ranged from +0.7 to +2.8 dBA. At all locations, these increases were due to the projected increases in traffic volumes on SEST, Cranston Avenue SE, Deerfoot Trail, and Cranston Blvd SE.

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

Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)
R-0762	58.2	2.7
R-0763	59.5	2.6
R-0764	59.9	2.7
R-0765	59.9	2.6
R-0766	59.8	2.6
R-0767	59.7	2.6
R-0768	59.4	2.6
R-0769	59.0	2.6
R-0770	57.9	2.6
R-0771	56.9	2.6
R-0772	56.2	2.6
R-0773	56.7	2.7
R-0774	56.1	2.6
R-0775	55.6	2.7
R-0776	54.2	2.8
R-0777	54.0	2.8
R-0778	54.3	2.9
R-0779	54.9	2.9
R-0780	56.1	3.0
R-0781	57.7	3.1
R-0782	59.5	3.1
R-0783	61.2	3.1
R-0784	61.4	3.1
R-0785	61.5	3.1
R-0786	60.9	3.0
R-0787	60.6	2.9
R-0788	60.9	2.9
R-0789	61.0	2.8

The Future Conditions noise modeling for Region 12 indicate noise levels below 65 dBA $L_{eq}24$ at all locations. The noise climate for these receptors is dominated by vehicle traffic on SEST, Chaparral Blvd SE, and the interchange. The increases relative to the Current Conditions for Region 12 ranged from +2.6 to +3.1 dBA. At all locations, these increases were due to the projected increases in traffic volumes on SEST and Chaparral Blvd SE.

Table 4m. Noise Modeling Results Under Future Conditions for Region 13

Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)		Receptor	$L_{eq}24$ (dBA)	Increase Relative to Current Conditions (dBA)
R-0790	60.5	2.4		R-0837	55.0	3.0		R-0884	59.0	3.3
R-0791	61.0	2.6		R-0838	56.7	3.2		R-0885	58.9	3.4
R-0792	61.1	2.6		R-0839	56.4	3.3		R-0886	58.9	3.4
R-0793	60.5	2.8		R-0840	54.5	3.3		R-0887	58.2	3.4
R-0794	59.5	2.9		R-0841	57.5	3.4		R-0888	58.0	3.4
R-0795	60.8	2.9		R-0842	58.7	3.3		R-0889	57.5	3.4
R-0796	55.0	3.0		R-0843	59.2	3.3		R-0890	57.8	3.4
R-0797	55.4	2.9		R-0844	59.7	3.4		R-0891	58.1	3.4
R-0798	55.3	3.0		R-0845	59.9	3.3		R-0892	58.8	3.5
R-0799	54.9	3.0		R-0846	58.9	3.3		R-0893	59.0	3.4
R-0800	53.2	3.0		R-0847	60.9	3.4		R-0894	58.8	3.4
R-0801	52.6	3.0		R-0848	58.7	3.4		R-0895	59.9	3.3
R-0802	52.6	3.0		R-0849	59.2	3.3		R-0896	60.1	3.3
R-0803	52.2	3.1		R-0850	56.3	3.3		R-0897	60.1	3.2
R-0804	52.9	3.0		R-0851	60.1	3.4		R-0898	60.1	3.2
R-0805	53.0	3.2		R-0852	59.2	3.4		R-0899	60.3	3.2
R-0806	52.9	3.2		R-0853	58.6	3.3		R-0900	60.2	3.1
R-0807	52.9	3.2		R-0854	59.3	3.3		R-0901	60.2	3.1
R-0808	53.0	3.2		R-0855	59.2	3.3		R-0902	58.3	3.1
R-0809	53.3	3.2		R-0856	59.3	3.4		R-0903	58.8	3.1
R-0810	53.3	3.2		R-0857	59.1	3.4		R-0904	58.4	3.1
R-0811	53.5	3.3		R-0858	59.4	3.3		R-0905	57.1	3.0
R-0812	53.6	3.3		R-0859	59.2	3.3		R-0906	58.9	3.1
R-0813	53.9	3.2		R-0860	59.5	3.3		R-0907	59.8	3.0
R-0814	55.4	3.3		R-0861	59.8	3.3		R-0908	59.8	3.0
R-0815	54.7	3.3		R-0862	59.0	3.3		R-0909	59.7	2.9
R-0816	53.2	3.2		R-0863	59.6	3.3		R-0910	59.5	2.8
R-0817	53.5	3.2		R-0864	59.7	3.3		R-0911	59.3	2.8
R-0818	53.3	3.3		R-0865	59.3	3.3		R-0912	59.2	2.7
R-0819	53.2	3.2		R-0866	58.7	3.3		R-0913	59.3	2.6
R-0820	53.7	3.2		R-0867	61.3	3.3		R-0914	57.6	2.6
R-0821	54.3	3.2		R-0868	63.0	3.3		R-0915	57.0	2.6
R-0822	53.9	3.2		R-0869	59.7	1.0		R-0916	57.1	2.5
R-0823	54.0	3.2		R-0870	58.4	1.5		R-0917	56.7	2.5
R-0824	55.3	3.3		R-0871	57.8	1.4		R-0918	58.6	2.4
R-0825	54.7	3.1		R-0872	57.7	1.6		R-0919	59.2	2.4
R-0826	54.9	3.2		R-0873	58.7	1.9		R-0920	59.3	2.4
R-0827	56.2	3.1		R-0874	58.0	2.3		R-0921	60.1	2.2
R-0828	54.4	3.1		R-0875	57.9	2.4		R-0922	57.7	2.3
R-0829	55.4	3.2		R-0876	57.0	2.6		R-0923	57.5	2.2
R-0830	55.7	3.2		R-0877	56.2	2.8		R-0924	61.4	2.1
R-0831	55.8	3.2		R-0878	55.9	2.7		R-0925	61.5	2.1
R-0832	55.7	3.2		R-0879	55.3	2.5		R-0926	60.2	2.1
R-0833	55.2	3.2		R-0880	56.2	2.9		R-0927	60.3	2.0
R-0834	56.3	3.2		R-0881	56.2	2.9		R-0928	58.4	2.1
R-0835	56.4	3.2		R-0882	56.7	3.0		R-0929	59.3	1.9
R-0836	56.3	3.2		R-0883	58.4	3.2				

The Future Conditions noise modeling for Region 13 indicate noise levels below 65 dBA $L_{eq}24$ at all locations. The noise climate for these receptors is dominated by vehicle traffic on SEST, Chaparral Blvd SE, Sun Valley Blvd SE, Macleod Trail SE, and the interchanges. The increases relative to the Current Conditions for Region 13 ranged from +1.0 to +3.5 dBA. At all locations, these increases were due to the projected increases in traffic volumes on SEST, Chaparral Blvd SE, Sun Valley Blvd SE, and Macleod Trail SE.

6.3. Future Conditions Sensitivity Analysis

As part of the study, a sensitivity analysis was performed for the main traffic parameters. 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. A 10 dBA increase would require the traffic volumes to increase by 10x. **Relative to the Future Conditions, if there is an increase in traffic volumes of 25% (possible error in long term planning horizon), there will be an increase between 0.4 to 1.0 dBA depending on the location relative to the major roadways. Conversely, if there is a reduction in traffic volumes of 25%, relative to the Future Conditions, there will be a decrease between -0.4 to -1.3 dBA depending on the location relative to the major roadways.** At locations in which the noise climate has a greater influence by internal City Roadways, changes in traffic volumes on SEST, Deerfoot Trail, and the major intersecting roads will have less of an impact. Tables 5a – 5m 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. Compared to the Future Conditions noise modeling results, the increase in noise levels with a relative increase of 25% in traffic volumes would result noise levels at or above 65 dBA $L_{eq}24$ at the following additional locations:

- Northwest of the interchange at SEST and 17 Avenue SE. Note that, currently, the rear fences within this area are either chainlink or acoustically poor wooden fences with large gaps. Thus, there is currently no significant level of acoustical shielding provided by the existing rear fences.
- Southeast of the interchange at Glenmore Trail and SEST. The dominant noise source for this area is Glenmore Trail. Note that, currently, there is no acoustical shielding fence on this property.
- Additional locations east and west of Deerfoot Trail, between SEST and McKenzie Towne Blvd SE.

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. Noise Modeling Results For Changing Future Traffic Volumes for Region 1

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0001	64.8	1.0		62.6	-1.2
R-0002	64.0	0.9		61.8	-1.3
R-0003	64.0	1.0		61.7	-1.3
R-0004	64.0	1.0		61.8	-1.2
R-0005	63.9	0.9		61.7	-1.3
R-0006	64.4	0.9		62.2	-1.3
R-0007	65.0	1.0		62.8	-1.2
R-0008	64.9	0.9		62.7	-1.3
R-0009	64.8	0.9		62.6	-1.3
R-0010	64.9	0.9		62.7	-1.3
R-0011	64.9	1.0		62.7	-1.2
R-0012	64.7	1.0		62.5	-1.2
R-0013	64.2	1.0		61.9	-1.3
R-0014	63.4	0.9		61.2	-1.3
R-0015	62.7	1.0		60.5	-1.2
R-0016	62.1	1.0		59.9	-1.2
R-0017	61.6	0.9		59.4	-1.3
R-0018	61.1	1.0		58.9	-1.2
R-0019	59.6	1.0		57.4	-1.2
R-0020	60.3	1.0		58.1	-1.2
R-0021	60.1	1.0		57.9	-1.2
R-0022	60.0	0.9		57.8	-1.3
R-0023	60.1	0.9		57.9	-1.3
R-0024	60.3	0.9		58.1	-1.3
R-0025	60.2	1.0		58.0	-1.2

Table 5b. Noise Modeling Results For Changing Future Traffic Volumes for Region 2

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0026	55.0	1.0		52.7	-1.3
R-0027	53.8	1.0		51.6	-1.2
R-0028	52.5	0.9		50.3	-1.3
R-0029	53.6	1.0		51.3	-1.3
R-0030	53.4	0.9		51.2	-1.3
R-0031	53.3	1.0		51.1	-1.2
R-0032	52.3	1.0		50.0	-1.3
R-0033	52.3	1.0		50.1	-1.2
R-0034	52.6	0.9		50.4	-1.3
R-0035	53.3	0.9		51.1	-1.3
R-0036	55.8	1.0		53.6	-1.2
R-0037	56.1	1.0		53.9	-1.2

Table 5c. Noise Modeling Results For Changing Future Traffic Volumes for Region 3

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0038	55.7	0.6		54.4	-0.7
R-0039	56.4	0.8		54.5	-1.1

Table 5d. Noise Modeling Results For Changing Future Traffic Volumes for Region 4

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0040	67.8	0.9		65.7	-1.2
R-0041	65.5	0.9		63.3	-1.3
R-0042	57.4	0.9		55.3	-1.2
R-0043	57.8	0.9		55.9	-1.0
R-0044	58.6	0.6		57.3	-0.7
R-0045	59.4	0.5		58.3	-0.6
R-0046	59.9	0.5		58.8	-0.6
R-0047	60.1	0.4		59.2	-0.5
R-0048	57.7	0.8		56.1	-0.8
R-0049	57.7	0.7		56.1	-0.9
R-0050	60.4	0.4		59.5	-0.5
R-0051	60.6	0.4		59.7	-0.5
R-0052	60.6	0.5		59.6	-0.5
R-0053	61.7	0.4		60.9	-0.4
R-0054	56.4	0.7		55.0	-0.7

Table 5e. Noise Modeling Results For Changing Future Traffic Volumes for Region 5

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0055	55.6	0.8		54.0	-0.8
R-0056	55.2	0.7		53.6	-0.9
R-0057	55.1	0.7		53.5	-0.9
R-0058	54.8	0.7		53.2	-0.9
R-0059	57.5	0.7		56.0	-0.8
R-0060	54.0	0.8		52.2	-1.0
R-0061	55.9	0.7		54.3	-0.9
R-0062	56.0	0.7		54.4	-0.9
R-0063	55.7	0.7		54.2	-0.8

Table 5f. Noise Modeling Results For Changing Future Traffic Volumes for Region 6

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0064	56.6	0.8		54.8	-1.0		R-0105	59.3	1.0		57.1	-1.2		R-0146	60.2	1.0		58.0	-1.2
R-0065	56.5	0.8		54.7	-1.0		R-0106	59.1	1.0		56.9	-1.2		R-0147	55.3	1.0		53.1	-1.2
R-0066	56.8	0.8		55.0	-1.0		R-0107	58.6	1.0		56.4	-1.2		R-0148	59.3	0.9		57.2	-1.2
R-0067	57.2	0.9		55.2	-1.1		R-0108	58.1	1.0		56.0	-1.1		R-0149	54.5	0.9		52.4	-1.2
R-0068	60.9	0.9		58.9	-1.1		R-0109	57.7	0.9		55.6	-1.2		R-0150	60.7	1.0		58.5	-1.2
R-0069	56.6	0.8		54.8	-1.0		R-0110	57.4	0.9		55.3	-1.2		R-0151	60.8	1.0		58.6	-1.2
R-0070	57.7	0.6		56.4	-0.7		R-0111	56.3	0.8		54.5	-1.0		R-0152	59.4	0.9		57.3	-1.2
R-0071	56.9	0.9		55.0	-1.0		R-0112	53.6	0.9		51.6	-1.1		R-0153	55.7	1.0		53.5	-1.2
R-0072	58.1	0.9		56.0	-1.2		R-0113	52.9	0.9		50.9	-1.1		R-0154	56.2	0.9		54.1	-1.2
R-0073	56.7	0.9		54.6	-1.2		R-0114	52.6	0.9		50.6	-1.1		R-0155	60.1	1.0		57.9	-1.2
R-0074	57.5	1.0		55.4	-1.1		R-0115	54.2	0.8		52.2	-1.2		R-0156	61.1	0.9		58.9	-1.3
R-0075	57.3	0.9		55.1	-1.3		R-0116	55.2	0.9		53.1	-1.2		R-0157	61.9	0.9		59.7	-1.3
R-0076	57.5	0.9		55.3	-1.3		R-0117	53.4	0.9		51.2	-1.3		R-0158	56.0	1.0		53.8	-1.2
R-0077	57.7	1.0		55.5	-1.2		R-0118	54.6	0.9		52.5	-1.2		R-0159	60.5	1.0		58.3	-1.2
R-0078	58.1	1.0		56.0	-1.1		R-0119	55.0	1.0		52.8	-1.2		R-0160	55.6	0.9		53.4	-1.3
R-0079	58.0	1.0		55.9	-1.1		R-0120	53.5	0.9		51.5	-1.1		R-0161	55.5	1.0		53.3	-1.2
R-0080	58.5	0.8		56.6	-1.1		R-0121	53.8	0.9		51.8	-1.1		R-0162	56.1	1.0		53.9	-1.2
R-0081	58.2	0.8		56.3	-1.1		R-0122	52.7	0.8		50.7	-1.2		R-0163	55.2	1.0		53.0	-1.2
R-0082	58.3	0.8		56.4	-1.1		R-0123	52.5	0.8		50.6	-1.1		R-0164	55.3	1.0		53.1	-1.2
R-0083	58.4	0.9		56.4	-1.1		R-0124	53.3	0.8		51.6	-0.9		R-0165	55.3	0.9		53.1	-1.3
R-0084	58.5	0.9		56.4	-1.2		R-0125	53.9	0.7		52.4	-0.8		R-0166	55.5	1.0		53.3	-1.2
R-0085	58.4	1.0		56.2	-1.2		R-0126	53.3	0.8		51.4	-1.1		R-0167	55.5	0.9		53.3	-1.3
R-0086	58.4	1.0		56.2	-1.2		R-0127	53.2	0.8		51.3	-1.1		R-0168	56.2	1.0		54.0	-1.2
R-0087	58.4	1.0		56.2	-1.2		R-0128	54.0	0.9		52.0	-1.1		R-0169	60.4	0.9		58.4	-1.1
R-0088	58.5	1.0		56.3	-1.2		R-0129	53.7	0.9		51.7	-1.1		R-0170	60.9	0.9		58.8	-1.2
R-0089	58.5	1.0		56.3	-1.2		R-0130	54.5	0.9		52.4	-1.2		R-0171	56.1	0.9		54.0	-1.2
R-0090	58.5	0.9		56.3	-1.3		R-0131	54.3	0.9		52.2	-1.2		R-0172	57.1	0.9		55.0	-1.2
R-0091	58.6	1.0		56.4	-1.2		R-0132	54.6	1.0		52.4	-1.2		R-0173	58.2	1.0		56.0	-1.2
R-0092	58.7	1.0		56.5	-1.2		R-0133	55.2	1.0		53.0	-1.2		R-0174	60.9	1.0		58.7	-1.2
R-0093	58.7	0.9		56.5	-1.3		R-0134	56.0	0.9		53.8	-1.3		R-0175	60.6	0.9		58.5	-1.2
R-0094	58.8	0.9		56.6	-1.3		R-0135	55.6	0.9		53.5	-1.2		R-0176	60.5	1.0		58.3	-1.2
R-0095	58.9	1.0		56.7	-1.2		R-0136	57.7	1.0		55.5	-1.2		R-0177	61.3	1.0		59.1	-1.2
R-0096	58.9	1.0		56.7	-1.2		R-0137	57.8	1.0		55.6	-1.2		R-0178	58.5	0.9		56.3	-1.3
R-0097	58.7	0.9		56.6	-1.2		R-0138	58.2	0.9		56.0	-1.3		R-0179	60.1	0.9		57.9	-1.3
R-0098	58.9	0.9		56.8	-1.2		R-0139	58.6	1.0		56.4	-1.2		R-0180	59.5	1.0		57.3	-1.2
R-0099	60.3	0.9		58.1	-1.3		R-0140	59.2	0.9		57.0	-1.3		R-0181	61.5	1.0		59.3	-1.2
R-0100	61.7	0.9		59.5	-1.3		R-0141	60.0	0.9		57.8	-1.3		R-0182	61.5	0.9		59.3	-1.3
R-0101	61.0	0.9		58.8	-1.3		R-0142	60.9	1.0		58.6	-1.3		R-0183	60.9	1.0		58.7	-1.2
R-0102	60.5	1.0		58.3	-1.2		R-0143	55.2	0.9		53.0	-1.3		R-0184	60.1	1.0		57.9	-1.2
R-0103	60.0	0.9		57.9	-1.2		R-0144	60.3	1.0		58.1	-1.2		R-0185	61.0	0.9		58.8	-1.3
R-0104	59.6	0.9		57.5	-1.2		R-0145	60.5	1.0		58.3	-1.2		R-0186	60.0	1.0		57.8	-1.2

Table 5g. Noise Modeling Results For Changing Future Traffic Volumes for Region 7

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0187	55.0	0.9		52.8	-1.3		R-0220	61.5	1.0		59.3	-1.2		R-0253	58.8	1.0		56.6	-1.2
R-0188	57.6	0.9		55.4	-1.3		R-0221	61.6	0.9		59.4	-1.3		R-0254	59.3	0.9		57.1	-1.3
R-0189	56.6	0.9		54.4	-1.3		R-0222	61.7	1.0		59.5	-1.2		R-0255	55.3	1.0		53.2	-1.1
R-0190	56.8	0.9		54.6	-1.3		R-0223	61.8	1.0		59.5	-1.3		R-0256	58.7	0.9		56.6	-1.2
R-0191	57.6	0.9		55.4	-1.3		R-0224	61.8	0.9		59.6	-1.3		R-0257	58.9	1.0		56.7	-1.2
R-0192	58.2	1.0		56.0	-1.2		R-0225	61.9	0.9		59.7	-1.3		R-0258	58.7	0.9		56.6	-1.2
R-0193	58.2	0.9		56.1	-1.2		R-0226	62.1	0.9		59.9	-1.3		R-0259	54.6	0.9		52.6	-1.1
R-0194	57.8	1.0		55.6	-1.2		R-0227	62.8	0.9		60.6	-1.3		R-0260	54.3	1.0		52.1	-1.2
R-0195	58.2	0.9		56.1	-1.2		R-0228	62.9	1.0		60.7	-1.2		R-0261	54.8	1.0		52.6	-1.2
R-0196	58.0	1.0		55.8	-1.2		R-0229	62.8	1.0		60.6	-1.2		R-0262	54.4	0.9		52.2	-1.3
R-0197	55.4	1.0		53.3	-1.1		R-0230	62.6	1.0		60.4	-1.2		R-0263	54.3	1.0		52.1	-1.2
R-0198	58.1	0.9		56.0	-1.2		R-0231	62.5	1.0		60.3	-1.2		R-0264	54.9	0.9		52.8	-1.2
R-0199	59.8	0.9		57.6	-1.3		R-0232	62.2	1.0		59.9	-1.3		R-0265	54.3	1.0		52.1	-1.2
R-0200	60.1	0.9		58.0	-1.2		R-0233	61.8	0.9		59.6	-1.3		R-0266	54.2	0.9		52.0	-1.3
R-0201	60.6	1.0		58.4	-1.2		R-0234	61.5	1.0		59.3	-1.2		R-0267	54.2	1.0		52.0	-1.2
R-0202	60.8	1.0		58.6	-1.2		R-0235	61.2	0.9		59.0	-1.3		R-0268	55.0	0.9		52.8	-1.3
R-0203	61.0	1.0		58.8	-1.2		R-0236	62.2	1.0		59.9	-1.3		R-0269	53.6	1.0		51.4	-1.2
R-0204	61.1	0.9		58.9	-1.3		R-0237	63.6	1.0		61.4	-1.2		R-0270	55.5	0.9		53.4	-1.2
R-0205	61.2	1.0		59.0	-1.2		R-0238	62.6	1.0		60.3	-1.3		R-0271	54.3	0.9		52.1	-1.3
R-0206	58.1	1.0		55.9	-1.2		R-0239	58.1	1.0		55.9	-1.2		R-0272	53.9	0.9		51.8	-1.2
R-0207	60.7	1.0		58.5	-1.2		R-0240	57.7	0.9		55.5	-1.3		R-0273	54.2	1.0		52.0	-1.2
R-0208	59.9	1.0		57.7	-1.2		R-0241	57.1	1.0		54.9	-1.2		R-0274	53.3	1.0		51.1	-1.2
R-0209	58.8	1.0		56.6	-1.2		R-0242	57.0	1.0		54.8	-1.2		R-0275	54.5	1.0		52.3	-1.2
R-0210	60.9	1.0		58.7	-1.2		R-0243	56.6	0.9		54.4	-1.3		R-0276	52.3	0.9		50.2	-1.2
R-0211	58.6	1.0		56.4	-1.2		R-0244	56.6	1.0		54.4	-1.2		R-0277	53.5	0.9		51.4	-1.2
R-0212	61.3	1.0		59.1	-1.2		R-0245	56.6	0.9		54.4	-1.3		R-0278	52.8	0.9		50.7	-1.2
R-0213	61.1	0.9		58.9	-1.3		R-0246	57.1	1.0		54.9	-1.2		R-0279	52.7	0.9		50.6	-1.2
R-0214	61.0	1.0		58.7	-1.3		R-0247	60.0	1.0		57.8	-1.2		R-0280	52.5	0.9		50.5	-1.1
R-0215	61.1	1.0		58.8	-1.3		R-0248	60.4	1.0		58.2	-1.2		R-0281	52.7	0.9		50.7	-1.1
R-0216	61.2	1.0		59.0	-1.2		R-0249	59.3	0.9		57.1	-1.3		R-0282	53.8	0.7		52.1	-1.0
R-0217	61.3	1.0		59.0	-1.3		R-0250	59.2	1.0		57.0	-1.2		R-0283	54.5	0.5		53.3	-0.7
R-0218	61.3	0.9		59.1	-1.3		R-0251	58.6	0.9		56.5	-1.2							
R-0219	61.4	0.9		59.2	-1.3		R-0252	58.6	0.9		56.5	-1.2							

Table 5h. Noise Modeling Results For Changing Future Traffic Volumes for Region 8

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0284	59.9	0.9		57.8	-1.2		R-0317	61.5	1.0		59.3	-1.2		R-0350	54.5	1.0		52.3	-1.2
R-0285	59.8	0.9		57.7	-1.2		R-0318	61.2	1.0		59.0	-1.2		R-0351	54.8	1.0		52.6	-1.2
R-0286	60.2	0.9		58.0	-1.3		R-0319	60.6	1.0		58.4	-1.2		R-0352	55.3	1.0		53.1	-1.2
R-0287	59.7	1.0		57.5	-1.2		R-0320	59.8	1.0		57.6	-1.2		R-0353	56.1	0.9		53.9	-1.3
R-0288	59.6	1.0		57.4	-1.2		R-0321	58.8	1.0		56.6	-1.2		R-0354	58.0	1.0		55.8	-1.2
R-0289	59.1	0.9		56.9	-1.3		R-0322	58.5	1.0		56.3	-1.2		R-0355	60.6	1.0		58.4	-1.2
R-0290	59.2	0.9		57.0	-1.3		R-0323	58.7	1.0		56.5	-1.2		R-0356	60.8	1.0		58.6	-1.2
R-0291	57.2	1.0		55.0	-1.2		R-0324	58.5	1.0		56.3	-1.2		R-0357	63.4	0.9		61.2	-1.3
R-0292	57.0	0.9		54.9	-1.2		R-0325	56.6	1.0		54.4	-1.2		R-0358	65.1	1.0		62.9	-1.2
R-0293	56.9	1.0		54.7	-1.2		R-0326	57.4	1.0		55.2	-1.2		R-0359	65.7	1.0		63.5	-1.2
R-0294	56.1	0.9		54.0	-1.2		R-0327	58.5	0.9		56.4	-1.2		R-0360	65.5	1.0		63.3	-1.2
R-0295	56.0	0.9		53.9	-1.2		R-0328	58.9	1.0		56.7	-1.2		R-0361	67.0	1.0		64.7	-1.3
R-0296	56.4	0.9		54.3	-1.2		R-0329	57.5	0.9		55.4	-1.2		R-0362	67.3	1.0		65.0	-1.3
R-0297	57.1	1.0		54.9	-1.2		R-0330	58.0	1.0		55.8	-1.2		R-0363	68.0	0.9		65.8	-1.3
R-0298	58.4	0.9		56.2	-1.3		R-0331	58.7	1.0		56.5	-1.2		R-0364	67.9	0.9		65.7	-1.3
R-0299	58.0	1.0		55.8	-1.2		R-0332	59.5	1.0		57.3	-1.2		R-0365	67.7	1.0		65.5	-1.2
R-0300	57.6	0.9		55.5	-1.2		R-0333	57.9	0.9		55.8	-1.2		R-0366	68.9	1.0		66.7	-1.2
R-0301	56.6	1.0		54.4	-1.2		R-0334	61.4	1.0		59.2	-1.2		R-0367	68.5	1.0		66.3	-1.2
R-0302	57.0	1.0		54.8	-1.2		R-0335	62.7	0.9		60.5	-1.3		R-0368	68.0	1.0		65.8	-1.2
R-0303	57.2	0.9		55.0	-1.3		R-0336	62.3	0.9		60.1	-1.3		R-0369	69.2	0.9		67.0	-1.3
R-0304	57.1	0.9		55.0	-1.2		R-0337	61.4	1.0		59.2	-1.2		R-0370	69.7	1.0		67.5	-1.2
R-0305	56.6	1.0		54.4	-1.2		R-0338	59.5	0.9		57.3	-1.3		R-0371	69.4	1.0		67.1	-1.3
R-0306	58.8	1.0		56.6	-1.2		R-0339	58.8	1.0		56.6	-1.2		R-0372	68.1	1.0		65.9	-1.2
R-0307	58.4	0.9		56.3	-1.2		R-0340	58.1	1.0		55.9	-1.2		R-0373	67.9	1.0		65.6	-1.3
R-0308	58.4	1.0		56.2	-1.2		R-0341	57.3	0.9		55.1	-1.3		R-0374	66.9	0.9		64.7	-1.3
R-0309	57.9	0.9		55.8	-1.2		R-0342	57.4	1.0		55.2	-1.2		R-0375	64.7	0.9		62.5	-1.3
R-0310	57.5	0.9		55.3	-1.3		R-0343	57.6	1.0		55.4	-1.2		R-0376	64.7	1.0		62.5	-1.2
R-0311	58.0	1.0		55.8	-1.2		R-0344	57.4	0.9		55.2	-1.3		R-0377	64.7	1.0		62.5	-1.2
R-0312	60.3	0.9		58.1	-1.3		R-0345	57.3	1.0		55.1	-1.2		R-0378	65.2	1.0		63.0	-1.2
R-0313	61.0	1.0		58.8	-1.2		R-0346	57.3	0.9		55.1	-1.3		R-0379	64.6	1.0		62.4	-1.2
R-0314	61.4	1.0		59.2	-1.2		R-0347	57.0	1.0		54.8	-1.2		R-0380	64.2	0.9		62.0	-1.3
R-0315	61.6	0.9		59.4	-1.3		R-0348	56.0	1.0		53.8	-1.2		R-0381	63.9	0.9		61.7	-1.3
R-0316	61.6	0.9		59.4	-1.3		R-0349	55.6	1.0		53.4	-1.2							

Table 5i. Noise Modeling Results For Changing Future Traffic Volumes for Region 9

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0382	61.8	0.9		59.7	-1.2		R-0425	61.2	0.9		59.0	-1.3		R-0468	58.6	0.9		56.4	-1.3
R-0383	61.5	0.9		59.5	-1.1		R-0426	61.2	0.9		59.0	-1.3		R-0469	58.6	1.0		56.4	-1.2
R-0384	60.8	0.9		58.7	-1.2		R-0427	60.6	0.9		58.4	-1.3		R-0470	58.6	0.9		56.4	-1.3
R-0385	63.3	1.0		61.1	-1.2		R-0428	60.6	0.9		58.4	-1.3		R-0471	60.8	1.0		58.6	-1.2
R-0386	61.9	1.0		59.7	-1.2		R-0429	60.2	1.0		58.0	-1.2		R-0472	58.6	1.0		56.4	-1.2
R-0387	63.3	0.9		61.2	-1.2		R-0430	64.5	1.0		62.3	-1.2		R-0473	58.7	0.9		56.5	-1.3
R-0388	64.8	1.0		62.6	-1.2		R-0431	64.3	1.0		62.1	-1.2		R-0474	58.3	1.0		56.1	-1.2
R-0389	64.9	0.9		62.7	-1.3		R-0432	59.5	0.9		57.3	-1.3		R-0475	58.4	1.0		56.2	-1.2
R-0390	65.7	1.0		63.5	-1.2		R-0433	58.9	0.9		56.7	-1.3		R-0476	58.7	0.9		56.5	-1.3
R-0391	65.3	1.0		63.1	-1.2		R-0434	58.7	1.0		56.5	-1.2		R-0477	58.4	0.9		56.2	-1.3
R-0392	65.5	0.9		63.3	-1.3		R-0435	58.8	1.0		56.6	-1.2		R-0478	58.7	1.0		56.5	-1.2
R-0393	63.8	1.0		61.6	-1.2		R-0436	59.4	1.0		57.2	-1.2		R-0479	58.2	1.0		56.0	-1.2
R-0394	61.2	0.9		59.0	-1.3		R-0437	58.9	1.0		56.7	-1.2		R-0480	58.7	0.9		56.5	-1.3
R-0395	60.9	1.0		58.7	-1.2		R-0438	58.7	1.0		56.5	-1.2		R-0481	58.3	1.0		56.1	-1.2
R-0396	61.0	1.0		58.8	-1.2		R-0439	59.4	1.0		57.2	-1.2		R-0482	58.8	0.9		56.6	-1.3
R-0397	60.5	1.0		58.3	-1.2		R-0440	59.5	0.9		57.3	-1.3		R-0483	59.0	0.9		56.8	-1.3
R-0398	60.8	1.0		58.6	-1.2		R-0441	59.4	0.9		57.2	-1.3		R-0484	58.5	1.0		56.3	-1.2
R-0399	61.0	1.0		58.8	-1.2		R-0442	59.2	1.0		57.0	-1.2		R-0485	58.1	1.0		55.9	-1.2
R-0400	64.3	1.0		62.0	-1.3		R-0443	59.0	1.0		56.8	-1.2		R-0486	58.3	0.9		56.1	-1.3
R-0401	65.7	1.0		63.5	-1.2		R-0444	59.7	1.0		57.5	-1.2		R-0487	58.3	1.0		56.1	-1.2
R-0402	65.5	0.9		63.3	-1.3		R-0445	61.1	1.0		58.9	-1.2		R-0488	59.0	1.0		56.8	-1.2
R-0403	66.5	1.0		64.3	-1.2		R-0446	61.7	0.9		59.5	-1.3		R-0489	58.7	1.0		56.5	-1.2
R-0404	65.6	1.0		63.4	-1.2		R-0447	61.9	0.9		59.7	-1.3		R-0490	59.3	0.9		57.1	-1.3
R-0405	65.1	1.0		62.9	-1.2		R-0448	61.6	0.9		59.4	-1.3		R-0491	59.5	1.0		57.3	-1.2
R-0406	66.2	1.0		64.0	-1.2		R-0449	61.3	1.0		59.1	-1.2		R-0492	59.3	0.9		57.2	-1.2
R-0407	64.8	1.0		62.5	-1.3		R-0450	61.0	1.0		58.8	-1.2		R-0493	56.7	1.0		54.6	-1.1
R-0408	65.5	1.0		63.3	-1.2		R-0451	60.7	1.0		58.5	-1.2		R-0494	53.9	0.9		51.8	-1.2
R-0409	65.6	1.0		63.4	-1.2		R-0452	60.5	1.0		58.3	-1.2		R-0495	53.6	0.8		51.7	-1.1
R-0410	65.5	1.0		63.3	-1.2		R-0453	60.4	1.0		58.2	-1.2		R-0496	54.4	0.9		52.4	-1.1
R-0411	65.5	1.0		63.3	-1.2		R-0454	60.8	0.9		58.6	-1.3		R-0497	55.6	0.9		53.5	-1.2
R-0412	65.8	1.0		63.6	-1.2		R-0455	60.0	0.9		57.8	-1.3		R-0498	56.8	0.9		54.8	-1.1
R-0413	66.4	1.0		64.2	-1.2		R-0456	59.4	1.0		57.2	-1.2		R-0499	60.6	1.0		58.4	-1.2
R-0414	66.8	1.0		64.5	-1.3		R-0457	58.6	0.9		56.4	-1.3		R-0500	59.8	0.9		57.7	-1.2
R-0415	67.4	1.0		65.1	-1.3		R-0458	60.1	1.0		57.9	-1.2		R-0501	59.8	0.9		57.6	-1.3
R-0416	67.4	1.0		65.1	-1.3		R-0459	58.2	1.0		56.0	-1.2		R-0502	60.6	0.9		58.4	-1.3
R-0417	66.7	1.0		64.5	-1.2		R-0460	57.9	1.0		55.7	-1.2		R-0503	61.0	1.0		58.8	-1.2
R-0418	66.4	1.0		64.2	-1.2		R-0461	57.9	1.0		55.7	-1.2		R-0504	60.1	1.0		57.9	-1.2
R-0419	65.5	1.0		63.3	-1.2		R-0462	57.9	1.0		55.7	-1.2		R-0505	60.7	1.0		58.5	-1.2
R-0420	65.7	1.0		63.5	-1.2		R-0463	58.1	1.0		55.9	-1.2		R-0506	60.0	1.0		57.8	-1.2
R-0421	61.3	1.0		59.1	-1.2		R-0464	59.8	1.0		57.6	-1.2		R-0507	64.1	1.0		61.9	-1.2
R-0422	60.8	1.0		58.6	-1.2		R-0465	58.2	0.9		56.0	-1.3		R-0508	61.2	1.0		59.0	-1.2
R-0423	61.0	1.0		58.8	-1.2		R-0466	58.4	1.0		56.2	-1.2		R-0509	57.9	1.0		55.7	-1.2
R-0424	61.1	0.9		58.9	-1.3		R-0467	59.1	1.0		56.9	-1.2							

Table 5j. Noise Modeling Results For Changing Future Traffic Volumes for Region 10

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0510	54.7	0.6		53.5	-0.6		R-0551	54.4	1.0		52.2	-1.2		R-0592	59.6	0.9		57.4	-1.3
R-0511	53.4	0.8		51.5	-1.1		R-0552	55.4	0.9		53.3	-1.2		R-0593	59.4	1.0		57.2	-1.2
R-0512	53.7	0.9		51.7	-1.1		R-0553	55.3	0.9		53.2	-1.2		R-0594	59.0	0.9		56.8	-1.3
R-0513	54.2	0.9		52.1	-1.2		R-0554	58.0	0.9		55.8	-1.3		R-0595	58.3	0.9		56.1	-1.3
R-0514	55.4	0.9		53.3	-1.2		R-0555	57.9	1.0		55.7	-1.2		R-0596	57.9	0.9		55.7	-1.3
R-0515	54.9	0.9		52.8	-1.2		R-0556	57.8	1.0		55.6	-1.2		R-0597	56.5	0.9		54.4	-1.2
R-0516	53.0	0.9		50.9	-1.2		R-0557	57.7	0.9		55.6	-1.2		R-0598	58.1	1.0		55.9	-1.2
R-0517	52.1	1.0		50.0	-1.1		R-0558	57.9	1.0		55.7	-1.2		R-0599	58.2	0.9		56.0	-1.3
R-0518	52.2	0.9		50.2	-1.1		R-0559	58.1	0.9		55.9	-1.3		R-0600	58.5	0.9		56.4	-1.2
R-0519	52.6	0.9		50.5	-1.2		R-0560	58.0	0.9		55.8	-1.3		R-0601	56.4	1.0		54.2	-1.2
R-0520	52.6	0.9		50.5	-1.2		R-0561	58.0	0.9		55.9	-1.2		R-0602	63.9	1.0		61.7	-1.2
R-0521	53.0	0.9		50.9	-1.2		R-0562	57.5	0.9		55.4	-1.2		R-0603	64.2	1.0		62.0	-1.2
R-0522	54.9	0.9		52.7	-1.3		R-0563	57.8	0.9		55.7	-1.2		R-0604	64.3	1.0		62.1	-1.2
R-0523	54.6	0.9		52.4	-1.3		R-0564	57.8	0.9		55.7	-1.2		R-0605	64.3	1.0		62.1	-1.2
R-0524	53.9	0.9		51.7	-1.3		R-0565	58.7	1.0		56.5	-1.2		R-0606	64.0	1.0		61.8	-1.2
R-0525	53.6	0.9		51.4	-1.3		R-0566	59.5	1.0		57.3	-1.2		R-0607	63.0	1.0		60.8	-1.2
R-0526	53.7	0.9		51.5	-1.3		R-0567	60.2	1.0		58.0	-1.2		R-0608	62.2	0.9		60.0	-1.3
R-0527	53.9	1.0		51.7	-1.2		R-0568	61.0	1.0		58.8	-1.2		R-0609	62.0	1.0		59.8	-1.2
R-0528	54.0	1.0		51.8	-1.2		R-0569	62.1	1.0		59.9	-1.2		R-0610	62.1	0.9		59.9	-1.3
R-0529	55.4	1.0		53.2	-1.2		R-0570	63.5	1.0		61.3	-1.2		R-0611	62.6	0.9		60.4	-1.3
R-0530	54.9	1.0		52.7	-1.2		R-0571	64.7	1.0		62.5	-1.2		R-0612	62.2	1.0		60.0	-1.2
R-0531	54.5	1.0		52.3	-1.2		R-0572	64.3	0.9		62.1	-1.3		R-0613	61.6	1.0		59.4	-1.2
R-0532	54.5	0.9		52.3	-1.3		R-0573	63.9	1.0		61.7	-1.2		R-0614	62.3	1.0		60.1	-1.2
R-0533	54.1	1.0		51.9	-1.2		R-0574	63.6	1.0		61.4	-1.2		R-0615	62.6	0.9		60.4	-1.3
R-0534	58.5	0.9		56.4	-1.2		R-0575	61.6	1.0		59.4	-1.2		R-0616	62.4	0.9		60.2	-1.3
R-0535	58.9	0.9		56.8	-1.2		R-0576	63.0	0.9		60.8	-1.3		R-0617	62.4	0.9		60.2	-1.3
R-0536	58.0	1.0		55.8	-1.2		R-0577	59.9	0.9		57.8	-1.2		R-0618	61.9	1.0		59.7	-1.2
R-0537	59.3	1.0		57.1	-1.2		R-0578	59.6	1.0		57.4	-1.2		R-0619	61.8	1.0		59.6	-1.2
R-0538	59.4	0.9		57.3	-1.2		R-0579	61.8	1.0		59.6	-1.2		R-0620	60.9	0.9		58.7	-1.3
R-0539	59.7	0.9		57.5	-1.3		R-0580	62.2	1.0		60.0	-1.2		R-0621	60.4	1.0		58.2	-1.2
R-0540	59.7	0.9		57.6	-1.2		R-0581	61.9	1.0		59.7	-1.2		R-0622	60.1	1.0		57.9	-1.2
R-0541	54.1	0.9		52.0	-1.2		R-0582	59.8	1.0		57.6	-1.2		R-0623	61.8	1.0		59.6	-1.2
R-0542	54.7	0.9		52.5	-1.3		R-0583	58.7	1.0		56.5	-1.2		R-0624	61.7	1.0		59.5	-1.2
R-0543	53.8	1.0		51.6	-1.2		R-0584	58.5	1.0		56.3	-1.2		R-0625	62.3	1.0		60.1	-1.2
R-0544	54.3	0.9		52.1	-1.3		R-0585	59.6	1.0		57.4	-1.2		R-0626	62.3	1.0		60.1	-1.2
R-0545	54.8	1.0		52.6	-1.2		R-0586	58.7	1.0		56.5	-1.2		R-0627	63.7	0.9		61.5	-1.3
R-0546	55.2	1.0		53.0	-1.2		R-0587	63.0	1.0		60.8	-1.2		R-0628	63.4	1.0		61.2	-1.2
R-0547	54.8	1.0		52.6	-1.2		R-0588	63.4	0.9		61.2	-1.3		R-0629	63.7	0.9		61.6	-1.2
R-0548	54.2	1.0		52.0	-1.2		R-0589	60.5	1.0		58.3	-1.2		R-0630	64.1	0.9		62.0	-1.2
R-0549	55.3	1.0		53.1	-1.2		R-0590	60.5	1.0		58.3	-1.2							
R-0550	55.1	1.0		52.9	-1.2		R-0591	59.8	0.9		57.6	-1.3							

Table 5k. Noise Modeling Results For Changing Future Traffic Volumes for Region 11

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0631	62.4	0.9		60.4	-1.1		R-0675	60.3	1.0		58.1	-1.2		R-0719	59.8	0.9		57.6	-1.3
R-0632	62.1	0.9		59.9	-1.3		R-0676	60.2	1.0		58.0	-1.2		R-0720	59.8	1.0		57.6	-1.2
R-0633	60.9	0.9		58.7	-1.3		R-0677	60.0	1.0		57.8	-1.2		R-0721	59.6	0.9		57.4	-1.3
R-0634	60.5	0.9		58.3	-1.3		R-0678	59.9	1.0		57.7	-1.2		R-0722	57.6	0.9		55.4	-1.3
R-0635	60.4	1.0		58.2	-1.2		R-0679	60.0	1.0		57.8	-1.2		R-0723	57.3	0.9		55.1	-1.3
R-0636	60.5	0.9		58.3	-1.3		R-0680	59.8	0.9		57.7	-1.2		R-0724	57.0	0.9		54.8	-1.3
R-0637	61.0	1.0		58.8	-1.2		R-0681	59.9	0.9		57.7	-1.3		R-0725	58.1	0.9		55.9	-1.3
R-0638	61.0	0.9		58.8	-1.3		R-0682	60.0	1.0		57.8	-1.2		R-0726	58.2	1.0		56.0	-1.2
R-0639	61.5	1.0		59.3	-1.2		R-0683	60.0	1.0		57.8	-1.2		R-0727	58.1	1.0		55.8	-1.3
R-0640	60.4	0.9		58.3	-1.2		R-0684	60.1	0.9		57.9	-1.3		R-0728	56.4	1.0		54.2	-1.2
R-0641	62.4	1.0		60.2	-1.2		R-0685	60.1	0.9		58.0	-1.2		R-0729	56.0	0.9		53.8	-1.3
R-0642	62.5	1.0		60.3	-1.2		R-0686	60.3	0.9		58.1	-1.3		R-0730	56.0	1.0		53.8	-1.2
R-0643	62.3	1.0		60.1	-1.2		R-0687	60.7	0.9		58.5	-1.3		R-0731	56.3	1.0		54.1	-1.2
R-0644	62.2	1.0		60.0	-1.2		R-0688	61.1	1.0		58.9	-1.2		R-0732	56.3	0.9		54.1	-1.3
R-0645	62.1	0.9		59.9	-1.3		R-0689	61.3	1.0		59.1	-1.2		R-0733	57.8	0.9		55.6	-1.3
R-0646	62.2	1.0		60.0	-1.2		R-0690	61.6	1.0		59.3	-1.3		R-0734	59.5	1.0		57.3	-1.2
R-0647	62.3	0.9		60.1	-1.3		R-0691	61.8	1.0		59.6	-1.2		R-0735	58.8	0.9		56.7	-1.2
R-0648	62.5	1.0		60.3	-1.2		R-0692	62.1	1.0		59.8	-1.3		R-0736	58.7	0.9		56.6	-1.2
R-0649	63.4	0.9		61.2	-1.3		R-0693	62.4	1.0		60.2	-1.2		R-0737	58.9	1.0		56.8	-1.1
R-0650	62.9	0.9		60.7	-1.3		R-0694	60.9	1.0		58.7	-1.2		R-0738	58.5	0.9		56.4	-1.2
R-0651	61.6	0.9		59.4	-1.3		R-0695	59.3	0.9		57.1	-1.3		R-0739	58.8	0.9		56.6	-1.3
R-0652	61.5	0.9		59.4	-1.2		R-0696	59.8	1.0		57.6	-1.2		R-0740	59.1	0.9		56.9	-1.3
R-0653	61.2	1.0		59.0	-1.2		R-0697	57.9	0.9		55.7	-1.3		R-0741	59.5	0.9		57.3	-1.3
R-0654	59.5	1.0		57.3	-1.2		R-0698	60.2	1.0		58.0	-1.2		R-0742	58.5	0.9		56.3	-1.3
R-0655	58.1	1.0		55.9	-1.2		R-0699	58.8	1.0		56.6	-1.2		R-0743	58.4	1.0		56.2	-1.2
R-0656	57.2	1.0		55.0	-1.2		R-0700	58.5	1.0		56.3	-1.2		R-0744	59.8	0.9		57.6	-1.3
R-0657	56.6	0.9		54.5	-1.2		R-0701	58.5	1.0		56.3	-1.2		R-0745	58.5	0.9		56.3	-1.3
R-0658	58.0	0.9		55.8	-1.3		R-0702	59.2	1.0		57.0	-1.2		R-0746	57.4	0.9		55.2	-1.3
R-0659	57.4	0.9		55.2	-1.3		R-0703	59.8	1.0		57.6	-1.2		R-0747	56.9	0.9		54.8	-1.2
R-0660	58.1	1.0		55.9	-1.2		R-0704	60.0	0.9		57.8	-1.3		R-0748	56.0	1.0		53.8	-1.2
R-0661	58.2	1.0		56.0	-1.2		R-0705	59.4	0.9		57.2	-1.3		R-0749	55.7	1.0		53.5	-1.2
R-0662	58.2	1.0		56.0	-1.2		R-0706	58.3	1.0		56.1	-1.2		R-0750	55.3	1.0		53.1	-1.2
R-0663	58.1	0.9		55.9	-1.3		R-0707	58.7	1.0		56.5	-1.2		R-0751	54.6	1.0		52.4	-1.2
R-0664	58.1	0.9		55.9	-1.3		R-0708	59.8	1.0		57.6	-1.2		R-0752	54.6	1.0		52.4	-1.2
R-0665	58.0	1.0		55.8	-1.2		R-0709	60.5	1.0		58.3	-1.2		R-0753	54.3	1.0		52.1	-1.2
R-0666	58.2	1.0		56.0	-1.2		R-0710	60.6	0.9		58.4	-1.3		R-0754	54.6	1.0		52.4	-1.2
R-0667	57.0	0.9		54.9	-1.2		R-0711	60.1	1.0		57.9	-1.2		R-0755	55.4	1.0		53.2	-1.2
R-0668	57.2	0.9		55.1	-1.2		R-0712	60.0	1.0		57.8	-1.2		R-0756	57.0	1.0		54.8	-1.2
R-0669	58.8	1.0		56.6	-1.2		R-0713	59.9	0.9		57.7	-1.3		R-0757	59.2	1.0		57.0	-1.2
R-0670	59.6	1.0		57.4	-1.2		R-0714	60.0	1.0		57.8	-1.2		R-0758	57.1	1.0		54.9	-1.2
R-0671	59.8	1.0		57.6	-1.2		R-0715	59.9	1.0		57.7	-1.2		R-0759	56.0	1.0		53.8	-1.2
R-0672	59.9	1.0		57.7	-1.2		R-0716	59.9	1.0		57.7	-1.2		R-0760	54.7	0.9		52.6	-1.2
R-0673	60.2	1.0		58.0	-1.2		R-0717	59.8	0.9		57.6	-1.3		R-0761	55.2	1.0		53.0	-1.2
R-0674	59.9	0.9		57.7	-1.3		R-0718	59.8	0.9		57.6	-1.3							

Table 5l. Noise Modeling Results For Changing Future Traffic Volumes for Region 12

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0762	59.1	0.9		56.9	-1.3
R-0763	60.5	1.0		58.3	-1.2
R-0764	60.8	0.9		58.6	-1.3
R-0765	60.8	0.9		58.6	-1.3
R-0766	60.8	1.0		58.6	-1.2
R-0767	60.7	1.0		58.5	-1.2
R-0768	60.4	1.0		58.2	-1.2
R-0769	59.9	0.9		57.7	-1.3
R-0770	58.8	0.9		56.6	-1.3
R-0771	57.9	1.0		55.7	-1.2
R-0772	57.2	1.0		55.0	-1.2
R-0773	57.6	0.9		55.4	-1.3
R-0774	57.1	1.0		54.9	-1.2
R-0775	56.5	0.9		54.3	-1.3
R-0776	55.1	0.9		52.9	-1.3
R-0777	55.0	1.0		52.8	-1.2
R-0778	55.2	0.9		53.0	-1.3
R-0779	55.9	1.0		53.7	-1.2
R-0780	57.0	0.9		54.8	-1.3
R-0781	58.7	1.0		56.4	-1.3
R-0782	60.5	1.0		58.3	-1.2
R-0783	62.1	0.9		59.9	-1.3
R-0784	62.4	1.0		60.2	-1.2
R-0785	62.5	1.0		60.3	-1.2
R-0786	61.9	1.0		59.7	-1.2
R-0787	61.6	1.0		59.4	-1.2
R-0788	61.8	0.9		59.6	-1.3
R-0789	62.0	1.0		59.7	-1.3

Table 5m. Noise Modeling Results For Changing Future Traffic Volumes for Region 13

Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +25% VPD (dBA)	Diff (dBA)		Future $L_{eq}24$ with -25% VPD (dBA)	Diff (dBA)
R-0790	61.5	1.0		59.3	-1.2		R-0837	56.0	1.0		53.8	-1.2		R-0884	60.0	1.0		57.8	-1.2
R-0791	61.9	0.9		59.7	-1.3		R-0838	57.6	0.9		55.4	-1.3		R-0885	59.9	1.0		57.7	-1.2
R-0792	62.1	1.0		59.9	-1.2		R-0839	57.4	1.0		55.2	-1.2		R-0886	59.9	1.0		57.7	-1.2
R-0793	61.4	0.9		59.2	-1.3		R-0840	55.5	1.0		53.3	-1.2		R-0887	59.2	1.0		57.0	-1.2
R-0794	60.4	0.9		58.2	-1.3		R-0841	58.4	0.9		56.2	-1.3		R-0888	59.0	1.0		56.8	-1.2
R-0795	61.7	0.9		59.5	-1.3		R-0842	59.7	1.0		57.5	-1.2		R-0889	58.4	0.9		56.2	-1.3
R-0796	55.9	0.9		53.7	-1.3		R-0843	60.2	1.0		58.0	-1.2		R-0890	58.7	0.9		56.5	-1.3
R-0797	56.4	1.0		54.2	-1.2		R-0844	60.6	0.9		58.4	-1.3		R-0891	59.1	1.0		56.9	-1.2
R-0798	56.3	1.0		54.1	-1.2		R-0845	60.9	1.0		58.7	-1.2		R-0892	59.7	0.9		57.5	-1.3
R-0799	55.9	1.0		53.7	-1.2		R-0846	59.9	1.0		57.7	-1.2		R-0893	59.9	0.9		57.7	-1.3
R-0800	54.1	0.9		51.9	-1.3		R-0847	61.8	0.9		59.6	-1.3		R-0894	59.8	1.0		57.6	-1.2
R-0801	53.5	0.9		51.4	-1.2		R-0848	59.6	0.9		57.4	-1.3		R-0895	60.8	0.9		58.6	-1.3
R-0802	53.6	1.0		51.4	-1.2		R-0849	60.2	1.0		58.0	-1.2		R-0896	61.0	0.9		58.8	-1.3
R-0803	53.1	0.9		50.9	-1.3		R-0850	57.3	1.0		55.1	-1.2		R-0897	61.0	0.9		58.8	-1.3
R-0804	53.9	1.0		51.7	-1.2		R-0851	61.0	0.9		58.8	-1.3		R-0898	61.0	0.9		58.8	-1.3
R-0805	54.0	1.0		51.7	-1.3		R-0852	60.1	0.9		57.9	-1.3		R-0899	61.3	1.0		59.0	-1.3
R-0806	53.8	0.9		51.6	-1.3		R-0853	59.6	1.0		57.3	-1.3		R-0900	61.2	1.0		59.0	-1.2
R-0807	53.9	1.0		51.7	-1.2		R-0854	60.2	0.9		58.0	-1.3		R-0901	61.2	1.0		59.0	-1.2
R-0808	54.0	1.0		51.8	-1.2		R-0855	60.2	1.0		58.0	-1.2		R-0902	59.2	0.9		57.0	-1.3
R-0809	54.3	1.0		52.1	-1.2		R-0856	60.2	0.9		58.0	-1.3		R-0903	59.8	1.0		57.6	-1.2
R-0810	54.3	1.0		52.1	-1.2		R-0857	60.0	0.9		57.8	-1.3		R-0904	59.4	1.0		57.2	-1.2
R-0811	54.5	1.0		52.3	-1.2		R-0858	60.4	1.0		58.2	-1.2		R-0905	58.1	1.0		55.9	-1.2
R-0812	54.5	0.9		52.3	-1.3		R-0859	60.2	1.0		58.0	-1.2		R-0906	59.9	1.0		57.7	-1.2
R-0813	54.8	0.9		52.7	-1.2		R-0860	60.5	1.0		58.3	-1.2		R-0907	60.8	1.0		58.6	-1.2
R-0814	56.3	0.9		54.1	-1.3		R-0861	60.8	1.0		58.6	-1.2		R-0908	60.7	0.9		58.5	-1.3
R-0815	55.6	0.9		53.4	-1.3		R-0862	60.0	1.0		57.8	-1.2		R-0909	60.7	1.0		58.4	-1.3
R-0816	54.2	1.0		52.0	-1.2		R-0863	60.6	1.0		58.3	-1.3		R-0910	60.5	1.0		58.3	-1.2
R-0817	54.5	1.0		52.3	-1.2		R-0864	60.7	1.0		58.4	-1.3		R-0911	60.3	1.0		58.1	-1.2
R-0818	54.2	0.9		52.0	-1.3		R-0865	60.3	1.0		58.0	-1.3		R-0912	60.2	1.0		58.0	-1.2
R-0819	54.2	1.0		52.0	-1.2		R-0866	59.7	1.0		57.4	-1.3		R-0913	60.3	1.0		58.1	-1.2
R-0820	54.6	0.9		52.4	-1.3		R-0867	62.3	1.0		60.1	-1.2		R-0914	58.6	1.0		56.4	-1.2
R-0821	55.3	1.0		53.1	-1.2		R-0868	64.0	1.0		61.8	-1.2		R-0915	58.0	1.0		55.8	-1.2
R-0822	54.8	0.9		52.6	-1.3		R-0869	60.7	1.0		58.5	-1.2		R-0916	58.1	1.0		55.9	-1.2
R-0823	55.0	1.0		52.8	-1.2		R-0870	59.4	1.0		57.2	-1.2		R-0917	57.6	0.9		55.5	-1.2
R-0824	56.2	0.9		54.0	-1.3		R-0871	58.8	1.0		56.6	-1.2		R-0918	59.6	1.0		57.4	-1.2
R-0825	55.7	1.0		53.5	-1.2		R-0872	58.7	1.0		56.5	-1.2		R-0919	60.2	1.0		58.0	-1.2
R-0826	55.8	0.9		53.6	-1.3		R-0873	59.6	0.9		57.4	-1.3		R-0920	60.3	1.0		58.1	-1.2
R-0827	57.2	1.0		55.0	-1.2		R-0874	59.0	1.0		56.8	-1.2		R-0921	61.1	1.0		58.9	-1.2
R-0828	55.3	0.9		53.2	-1.2		R-0875	58.8	0.9		56.6	-1.3		R-0922	58.7	1.0		56.5	-1.2
R-0829	56.4	1.0		54.2	-1.2		R-0876	58.0	1.0		55.8	-1.2		R-0923	58.4	0.9		56.3	-1.2
R-0830	56.7	1.0		54.5	-1.2		R-0877	57.2	1.0		54.9	-1.3		R-0924	62.4	1.0		60.2	-1.2
R-0831	56.7	0.9		54.5	-1.3		R-0878	56.8	0.9		54.6	-1.3		R-0925	62.4	0.9		60.2	-1.3
R-0832	56.6	0.9		54.4	-1.3		R-0879	56.3	1.0		54.1	-1.2		R-0926	61.2	1.0		59.0	-1.2
R-0833	56.1	0.9		53.9	-1.3		R-0880	57.2	1.0		55.0	-1.2		R-0927	61.3	1.0		59.1	-1.2
R-0834	57.3	1.0		55.1	-1.2		R-0881	57.2	1.0		55.0	-1.2		R-0928	59.4	1.0		57.2	-1.2
R-0835	57.4	1.0		55.2	-1.2		R-0882	57.6	0.9		55.4	-1.3		R-0929	60.2	0.9		58.1	-1.2
R-0836	57.2	0.9		55.0	-1.3		R-0883	59.4	1.0		57.1	-1.3							

6.3.2. Traffic Speed Analysis

In order to determine the effect of different traffic speeds, two scenarios were modeled. For all major study area roads, the traffic speed was increased by 10 km/hr and then decreased by 10 km/hr to determine the relative change compared to the current posted speed limits. It is unlikely that the posted traffic speeds will fall outside of this range. Tables 6a – 6m show the $L_{eq}24$ results for both the increased and decreased traffic speed conditions as well as the change in noise levels (relative to the Future Conditions) at all modeled receptor locations. **Relative to the Future Conditions, when increasing the traffic speed by 10 km/hr, the noise levels increased by 0.1 to 1.1 dBA, depending on the location. Relative to the Future Conditions, when reducing the traffic speed by 10 km/hr, the noise levels decreased by -0.2 to -1.2 dBA, depending on the location.** In general, the largest changes in noise levels were at locations where the adjacent roadways had the lowest posted speed limits. This is because changes in noise levels relative to changes in traffic speeds decrease as the traffic speed increases. For example, the difference in noise levels between 50 km/hr and 60 km/hr is approximately 1.1 dBA while the difference in noise levels between90 km/hr and 100 km/hr is approximately 0.5 dBA.

Compared to the Future Conditions noise modeling results, the increase in noise levels with an increase of traffic speeds of 10 km/hr would result noise levels at or above 65 dBA $L_{eq}24$ at the following additional locations:

- Southeast of the interchange between Glenmore Trail and SEST. The dominant noise source for this area is Glenmore Trail. Note that, currently, there is no acoustical shielding fence on this property.
- Additional locations east and west of Deerfoot Trail, between SEST and McKenzie Towne Blvd SE.

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. Noise Modeling Results For Changing Future Traffic Speeds for Region 1

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0001	64.2	0.4		63.4	-0.4
R-0002	63.5	0.4		62.7	-0.4
R-0003	63.4	0.4		62.6	-0.4
R-0004	63.4	0.4		62.6	-0.4
R-0005	63.4	0.4		62.6	-0.4
R-0006	63.9	0.4		63.1	-0.4
R-0007	64.5	0.5		63.7	-0.3
R-0008	64.4	0.4		63.6	-0.4
R-0009	64.3	0.4		63.5	-0.4
R-0010	64.4	0.4		63.6	-0.4
R-0011	64.4	0.5		63.5	-0.4
R-0012	64.2	0.5		63.3	-0.4
R-0013	63.7	0.5		62.7	-0.5
R-0014	63.0	0.5		62.0	-0.5
R-0015	62.3	0.6		61.2	-0.5
R-0016	61.7	0.6		60.6	-0.5
R-0017	61.3	0.6		60.1	-0.6
R-0018	60.8	0.7		59.5	-0.6
R-0019	59.3	0.7		58.0	-0.6
R-0020	60.0	0.7		58.7	-0.6
R-0021	59.8	0.7		58.4	-0.7
R-0022	59.8	0.7		58.3	-0.8
R-0023	59.9	0.7		58.4	-0.8
R-0024	60.2	0.8		58.5	-0.9
R-0025	60.1	0.9		58.3	-0.9

Table 6b. Noise Modeling Results For Changing Future Traffic Speeds for Region 2

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0026	54.7	0.7		53.2	-0.8
R-0027	53.4	0.6		52.2	-0.6
R-0028	52.2	0.6		51.0	-0.6
R-0029	53.1	0.5		52.1	-0.5
R-0030	52.9	0.4		52.0	-0.5
R-0031	52.8	0.5		51.8	-0.5
R-0032	51.7	0.4		50.8	-0.5
R-0033	51.8	0.5		50.8	-0.5
R-0034	52.1	0.4		51.1	-0.6
R-0035	52.8	0.4		51.8	-0.6
R-0036	55.3	0.5		54.2	-0.6
R-0037	55.6	0.5		54.5	-0.6

Table 6c. Noise Modeling Results For Changing Future Traffic Speeds for Region 3

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0038	55.3	0.2		54.8	-0.3
R-0039	55.9	0.3		55.2	-0.4

Table 6d. Noise Modeling Results For Changing Future Traffic Speeds for Region 4

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0040	67.6	0.7		66.1	-0.8
R-0041	65.3	0.7		63.7	-0.9
R-0042	57.0	0.5		55.9	-0.6
R-0043	57.4	0.5		56.4	-0.5
R-0044	58.2	0.2		57.7	-0.3
R-0045	59.1	0.2		58.6	-0.3
R-0046	59.6	0.2		59.1	-0.3
R-0047	59.8	0.1		59.4	-0.3
R-0048	57.2	0.3		56.5	-0.4
R-0049	57.3	0.3		56.6	-0.4
R-0050	60.2	0.2		59.7	-0.3
R-0051	60.3	0.1		59.9	-0.3
R-0052	60.3	0.2		59.9	-0.2
R-0053	61.4	0.1		61.1	-0.2
R-0054	56.0	0.3		55.4	-0.3

Table 6e. Noise Modeling Results For Changing Future Traffic Speeds for Region 5

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0055	55.1	0.3		54.5	-0.3
R-0056	54.8	0.3		54.1	-0.4
R-0057	54.7	0.3		54.0	-0.4
R-0058	54.4	0.3		53.7	-0.4
R-0059	57.1	0.3		56.5	-0.3
R-0060	53.6	0.4		52.9	-0.3
R-0061	55.5	0.3		54.9	-0.3
R-0062	55.6	0.3		55.0	-0.3
R-0063	55.3	0.3		54.7	-0.3

Table 6f. Noise Modeling Results For Changing Future Traffic Speeds for Region 6

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0064	56.2	0.4		55.5	-0.3		R-0105	58.7	0.4		57.9	-0.4		R-0146	59.8	0.6		58.6	-0.6
R-0065	56.1	0.4		55.4	-0.3		R-0106	58.5	0.4		57.7	-0.4		R-0147	54.9	0.6		53.8	-0.5
R-0066	56.4	0.4		55.7	-0.3		R-0107	58.0	0.4		57.2	-0.4		R-0148	59.0	0.6		57.8	-0.6
R-0067	56.6	0.3		55.9	-0.4		R-0108	57.5	0.4		56.7	-0.4		R-0149	54.2	0.6		53.0	-0.6
R-0068	60.3	0.3		59.6	-0.4		R-0109	57.2	0.4		56.4	-0.4		R-0150	60.4	0.7		59.1	-0.6
R-0069	56.2	0.4		55.4	-0.4		R-0110	56.9	0.4		56.1	-0.4		R-0151	60.4	0.6		59.2	-0.6
R-0070	57.4	0.3		56.9	-0.2		R-0111	55.9	0.4		55.2	-0.3		R-0152	59.1	0.6		57.9	-0.6
R-0071	56.4	0.4		55.7	-0.3		R-0112	53.1	0.4		52.3	-0.4		R-0153	55.4	0.7		54.1	-0.6
R-0072	57.6	0.4		56.8	-0.4		R-0113	52.4	0.4		51.6	-0.4		R-0154	55.9	0.6		54.7	-0.6
R-0073	56.2	0.4		55.4	-0.4		R-0114	52.1	0.4		51.3	-0.4		R-0155	59.8	0.7		58.5	-0.6
R-0074	57.0	0.5		56.1	-0.4		R-0115	53.7	0.3		53.0	-0.4		R-0156	60.8	0.6		59.5	-0.7
R-0075	56.8	0.4		56.0	-0.4		R-0116	54.7	0.4		53.9	-0.4		R-0157	61.6	0.6		60.3	-0.7
R-0076	57.0	0.4		56.1	-0.5		R-0117	52.9	0.4		52.0	-0.5		R-0158	55.7	0.7		54.4	-0.6
R-0077	57.2	0.5		56.3	-0.4		R-0118	54.1	0.4		53.3	-0.4		R-0159	60.2	0.7		58.9	-0.6
R-0078	57.6	0.5		56.7	-0.4		R-0119	54.4	0.4		53.6	-0.4		R-0160	55.3	0.6		54.0	-0.7
R-0079	57.5	0.5		56.6	-0.4		R-0120	53.0	0.4		52.1	-0.5		R-0161	55.2	0.7		53.9	-0.6
R-0080	58.1	0.4		57.3	-0.4		R-0121	53.4	0.5		52.5	-0.4		R-0162	55.8	0.7		54.5	-0.6
R-0081	57.8	0.4		57.0	-0.4		R-0122	52.3	0.4		51.4	-0.5		R-0163	54.9	0.7		53.5	-0.7
R-0082	57.9	0.4		57.1	-0.4		R-0123	52.1	0.4		51.2	-0.5		R-0164	55.0	0.7		53.6	-0.7
R-0083	57.9	0.4		57.2	-0.3		R-0124	53.0	0.5		52.1	-0.4		R-0165	55.1	0.7		53.7	-0.7
R-0084	58.0	0.4		57.2	-0.4		R-0125	53.6	0.4		52.9	-0.3		R-0166	55.2	0.7		53.9	-0.6
R-0085	57.8	0.4		57.0	-0.4		R-0126	52.9	0.4		52.0	-0.5		R-0167	55.3	0.7		53.9	-0.7
R-0086	57.8	0.4		57.0	-0.4		R-0127	52.8	0.4		51.9	-0.5		R-0168	55.9	0.7		54.6	-0.6
R-0087	57.9	0.5		57.0	-0.4		R-0128	53.5	0.4		52.6	-0.5		R-0169	60.1	0.6		58.9	-0.6
R-0088	57.9	0.4		57.1	-0.4		R-0129	53.3	0.5		52.4	-0.4		R-0170	60.7	0.7		59.3	-0.7
R-0089	58.0	0.5		57.1	-0.4		R-0130	54.0	0.4		53.1	-0.5		R-0171	55.9	0.7		54.4	-0.8
R-0090	58.0	0.4		57.2	-0.4		R-0131	53.9	0.5		52.9	-0.5		R-0172	57.0	0.8		55.3	-0.9
R-0091	58.0	0.4		57.2	-0.4		R-0132	54.1	0.5		53.2	-0.4		R-0173	58.1	0.9		56.3	-0.9
R-0092	58.1	0.4		57.3	-0.4		R-0133	54.7	0.5		53.8	-0.4		R-0174	60.7	0.8		59.1	-0.8
R-0093	58.2	0.4		57.4	-0.4		R-0134	55.6	0.5		54.6	-0.5		R-0175	60.5	0.8		58.9	-0.8
R-0094	58.3	0.4		57.5	-0.4		R-0135	55.1	0.4		54.2	-0.5		R-0176	60.4	0.9		58.7	-0.8
R-0095	58.3	0.4		57.5	-0.4		R-0136	57.3	0.6		56.2	-0.5		R-0177	61.2	0.9		59.5	-0.8
R-0096	58.3	0.4		57.5	-0.4		R-0137	57.3	0.5		56.3	-0.5		R-0178	58.5	0.9		56.6	-1.0
R-0097	58.2	0.4		57.4	-0.4		R-0138	57.8	0.5		56.8	-0.5		R-0179	60.1	0.9		58.2	-1.0
R-0098	58.4	0.4		57.6	-0.4		R-0139	58.1	0.5		57.1	-0.5		R-0180	59.5	1.0		57.5	-1.0
R-0099	59.7	0.3		59.0	-0.4		R-0140	58.8	0.5		57.7	-0.6		R-0181	61.5	1.0		59.5	-1.0
R-0100	61.1	0.3		60.4	-0.4		R-0141	59.6	0.5		58.5	-0.6		R-0182	61.6	1.0		59.5	-1.1
R-0101	60.4	0.3		59.7	-0.4		R-0142	60.5	0.6		59.3	-0.6		R-0183	60.9	1.0		58.9	-1.0
R-0102	59.9	0.4		59.1	-0.4		R-0143	54.8	0.5		53.7	-0.6		R-0184	60.1	1.0		58.1	-1.0
R-0103	59.4	0.3		58.7	-0.4		R-0144	59.9	0.6		58.8	-0.5		R-0185	61.1	1.0		59.0	-1.1
R-0104	59.0	0.3		58.3	-0.4		R-0145	60.1	0.6		59.0	-0.5		R-0186	60.0	1.0		58.0	-1.0

Table 6g. Noise Modeling Results For Changing Future Traffic Speeds for Region 7

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0187	54.3	0.2		53.7	-0.4		R-0220	60.9	0.4		60.2	-0.3		R-0253	58.4	0.6		57.3	-0.5
R-0188	56.8	0.1		56.3	-0.4		R-0221	61.1	0.4		60.3	-0.4		R-0254	59.0	0.6		57.8	-0.6
R-0189	55.9	0.2		55.3	-0.4		R-0222	61.1	0.4		60.3	-0.4		R-0255	54.9	0.6		53.8	-0.5
R-0190	56.1	0.2		55.5	-0.4		R-0223	61.2	0.4		60.4	-0.4		R-0256	58.4	0.6		57.2	-0.6
R-0191	56.9	0.2		56.3	-0.4		R-0224	61.3	0.4		60.5	-0.4		R-0257	58.5	0.6		57.3	-0.6
R-0192	57.4	0.2		56.8	-0.4		R-0225	61.4	0.4		60.6	-0.4		R-0258	58.4	0.6		57.2	-0.6
R-0193	57.5	0.2		56.9	-0.4		R-0226	61.6	0.4		60.8	-0.4		R-0259	54.3	0.6		53.2	-0.5
R-0194	57.1	0.3		56.4	-0.4		R-0227	62.3	0.4		61.5	-0.4		R-0260	54.0	0.7		52.7	-0.6
R-0195	57.5	0.2		56.9	-0.4		R-0228	62.3	0.4		61.5	-0.4		R-0261	54.4	0.6		53.2	-0.6
R-0196	57.2	0.2		56.6	-0.4		R-0229	62.3	0.5		61.4	-0.4		R-0262	54.1	0.6		52.9	-0.6
R-0197	54.7	0.3		54.1	-0.3		R-0230	62.1	0.5		61.2	-0.4		R-0263	53.9	0.6		52.7	-0.6
R-0198	57.4	0.2		56.7	-0.5		R-0231	61.9	0.4		61.1	-0.4		R-0264	54.6	0.6		53.4	-0.6
R-0199	59.1	0.2		58.5	-0.4		R-0232	61.6	0.4		60.8	-0.4		R-0265	53.9	0.6		52.7	-0.6
R-0200	59.5	0.3		58.8	-0.4		R-0233	61.3	0.4		60.4	-0.5		R-0266	53.9	0.6		52.6	-0.7
R-0201	59.9	0.3		59.2	-0.4		R-0234	61.0	0.5		60.1	-0.4		R-0267	53.9	0.7		52.6	-0.6
R-0202	60.2	0.4		59.5	-0.3		R-0235	60.7	0.4		59.9	-0.4		R-0268	54.7	0.6		53.4	-0.7
R-0203	60.4	0.4		59.7	-0.3		R-0236	61.7	0.5		60.8	-0.4		R-0269	53.3	0.7		52.0	-0.6
R-0204	60.5	0.3		59.8	-0.4		R-0237	63.1	0.5		62.2	-0.4		R-0270	55.2	0.6		53.9	-0.7
R-0205	60.6	0.4		59.9	-0.3		R-0238	62.1	0.5		61.1	-0.5		R-0271	54.0	0.6		52.7	-0.7
R-0206	57.5	0.4		56.7	-0.4		R-0239	57.6	0.5		56.7	-0.4		R-0272	53.6	0.6		52.3	-0.7
R-0207	60.1	0.4		59.4	-0.3		R-0240	57.2	0.4		56.3	-0.5		R-0273	53.9	0.7		52.6	-0.6
R-0208	59.3	0.4		58.6	-0.3		R-0241	56.6	0.5		55.7	-0.4		R-0274	53.0	0.7		51.6	-0.7
R-0209	58.1	0.3		57.4	-0.4		R-0242	56.5	0.5		55.6	-0.4		R-0275	54.2	0.7		52.8	-0.7
R-0210	60.3	0.4		59.6	-0.3		R-0243	56.2	0.5		55.2	-0.5		R-0276	52.1	0.7		50.6	-0.8
R-0211	57.9	0.3		57.2	-0.4		R-0244	56.1	0.5		55.1	-0.5		R-0277	53.4	0.8		51.8	-0.8
R-0212	60.7	0.4		60.0	-0.3		R-0245	56.1	0.4		55.2	-0.5		R-0278	52.7	0.8		51.0	-0.9
R-0213	60.5	0.3		59.8	-0.4		R-0246	56.6	0.5		55.6	-0.5		R-0279	52.6	0.8		50.9	-0.9
R-0214	60.4	0.4		59.6	-0.4		R-0247	59.6	0.6		58.5	-0.5		R-0280	52.4	0.8		50.8	-0.8
R-0215	60.5	0.4		59.7	-0.4		R-0248	60.0	0.6		58.9	-0.5		R-0281	52.6	0.8		51.0	-0.8
R-0216	60.6	0.4		59.8	-0.4		R-0249	58.9	0.5		57.8	-0.6		R-0282	53.8	0.7		52.4	-0.7
R-0217	60.7	0.4		59.9	-0.4		R-0250	58.8	0.6		57.7	-0.5		R-0283	54.5	0.5		53.5	-0.5
R-0218	60.7	0.3		60.0	-0.4		R-0251	58.2	0.5		57.1	-0.6							
R-0219	60.8	0.3		60.1	-0.4		R-0252	58.3	0.6		57.1	-0.6							

Table 6h. Noise Modeling Results For Changing Future Traffic Speeds for Region 8

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0284	60.0	1.0		57.9	-1.1		R-0317	61.1	0.6		59.9	-0.6		R-0350	54.2	0.7		52.8	-0.7
R-0285	59.9	1.0		57.8	-1.1		R-0318	60.8	0.6		59.6	-0.6		R-0351	54.4	0.6		53.1	-0.7
R-0286	60.3	1.0		58.2	-1.1		R-0319	60.2	0.6		59.0	-0.6		R-0352	54.9	0.6		53.6	-0.7
R-0287	59.7	1.0		57.7	-1.0		R-0320	59.4	0.6		58.2	-0.6		R-0353	55.8	0.6		54.5	-0.7
R-0288	59.6	1.0		57.6	-1.0		R-0321	58.4	0.6		57.2	-0.6		R-0354	57.7	0.7		56.3	-0.7
R-0289	59.1	0.9		57.2	-1.0		R-0322	58.1	0.6		56.9	-0.6		R-0355	60.3	0.7		58.9	-0.7
R-0290	59.2	0.9		57.4	-0.9		R-0323	58.3	0.6		57.1	-0.6		R-0356	60.5	0.7		59.1	-0.7
R-0291	57.0	0.8		55.5	-0.7		R-0324	58.1	0.6		56.9	-0.6		R-0357	63.1	0.6		61.8	-0.7
R-0292	56.9	0.8		55.3	-0.8		R-0325	56.3	0.7		55.0	-0.6		R-0358	64.8	0.7		63.5	-0.6
R-0293	56.7	0.8		55.2	-0.7		R-0326	57.0	0.6		55.8	-0.6		R-0359	65.4	0.7		64.1	-0.6
R-0294	55.9	0.7		54.4	-0.8		R-0327	58.2	0.6		57.0	-0.6		R-0360	65.2	0.7		63.9	-0.6
R-0295	55.8	0.7		54.3	-0.8		R-0328	58.5	0.6		57.3	-0.6		R-0361	66.7	0.7		65.3	-0.7
R-0296	56.3	0.8		54.7	-0.8		R-0329	57.2	0.6		56.0	-0.6		R-0362	67.0	0.7		65.6	-0.7
R-0297	56.9	0.8		55.4	-0.7		R-0330	57.6	0.6		56.4	-0.6		R-0363	67.7	0.6		66.4	-0.7
R-0298	58.2	0.7		56.8	-0.7		R-0331	58.3	0.6		57.1	-0.6		R-0364	67.6	0.6		66.3	-0.7
R-0299	57.7	0.7		56.3	-0.7		R-0332	59.1	0.6		57.9	-0.6		R-0365	67.4	0.7		66.1	-0.6
R-0300	57.4	0.7		56.0	-0.7		R-0333	57.6	0.6		56.3	-0.7		R-0366	68.6	0.7		67.3	-0.6
R-0301	56.3	0.7		54.9	-0.7		R-0334	61.0	0.6		59.8	-0.6		R-0367	68.2	0.7		66.9	-0.6
R-0302	56.7	0.7		55.3	-0.7		R-0335	62.3	0.5		61.1	-0.7		R-0368	67.7	0.7		66.4	-0.6
R-0303	56.9	0.6		55.6	-0.7		R-0336	62.0	0.6		60.7	-0.7		R-0369	68.9	0.6		67.6	-0.7
R-0304	56.9	0.7		55.5	-0.7		R-0337	61.0	0.6		59.8	-0.6		R-0370	69.4	0.7		68.1	-0.6
R-0305	56.3	0.7		54.9	-0.7		R-0338	59.2	0.6		57.9	-0.7		R-0371	69.1	0.7		67.7	-0.7
R-0306	58.4	0.6		57.2	-0.6		R-0339	58.4	0.6		57.1	-0.7		R-0372	67.8	0.7		66.5	-0.6
R-0307	58.1	0.6		56.8	-0.7		R-0340	57.8	0.7		56.5	-0.6		R-0373	67.6	0.7		66.2	-0.7
R-0308	58.1	0.7		56.8	-0.6		R-0341	57.0	0.6		55.7	-0.7		R-0374	66.7	0.7		65.3	-0.7
R-0309	57.6	0.6		56.4	-0.6		R-0342	57.0	0.6		55.8	-0.6		R-0375	64.5	0.7		63.0	-0.8
R-0310	57.2	0.6		55.9	-0.7		R-0343	57.3	0.7		56.0	-0.6		R-0376	64.5	0.8		63.0	-0.7
R-0311	57.7	0.7		56.4	-0.6		R-0344	57.1	0.6		55.8	-0.7		R-0377	64.7	1.0		62.7	-1.0
R-0312	60.0	0.6		58.8	-0.6		R-0345	57.0	0.7		55.7	-0.6		R-0378	65.2	1.0		63.2	-1.0
R-0313	60.6	0.6		59.4	-0.6		R-0346	57.0	0.6		55.7	-0.7		R-0379	64.6	1.0		62.6	-1.0
R-0314	61.0	0.6		59.8	-0.6		R-0347	56.7	0.7		55.4	-0.6		R-0380	64.3	1.0		62.2	-1.1
R-0315	61.3	0.6		60.1	-0.6		R-0348	55.7	0.7		54.4	-0.6		R-0381	64.1	1.1		61.9	-1.1
R-0316	61.2	0.5		60.1	-0.6		R-0349	55.3	0.7		54.0	-0.6							

Table 6i. Noise Modeling Results For Changing Future Traffic Speeds for Region 9

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0382	61.8	0.9		60.0	-0.9		R-0425	60.9	0.6		59.6	-0.7		R-0468	58.4	0.7		56.9	-0.8
R-0383	61.5	0.9		59.7	-0.9		R-0426	60.9	0.6		59.6	-0.7		R-0469	58.3	0.7		56.9	-0.7
R-0384	60.7	0.8		59.0	-0.9		R-0427	60.3	0.6		59.0	-0.7		R-0470	58.4	0.7		56.9	-0.8
R-0385	63.2	0.9		61.4	-0.9		R-0428	60.3	0.6		59.0	-0.7		R-0471	60.5	0.7		59.1	-0.7
R-0386	61.8	0.9		60.0	-0.9		R-0429	59.9	0.7		58.6	-0.6		R-0472	58.3	0.7		56.9	-0.7
R-0387	63.3	0.9		61.5	-0.9		R-0430	64.2	0.7		62.8	-0.7		R-0473	58.5	0.7		57.0	-0.8
R-0388	64.7	0.9		62.9	-0.9		R-0431	64.0	0.7		62.7	-0.6		R-0474	58.0	0.7		56.6	-0.7
R-0389	64.8	0.8		63.1	-0.9		R-0432	59.2	0.6		57.9	-0.7		R-0475	58.2	0.8		56.7	-0.7
R-0390	65.6	0.9		63.9	-0.8		R-0433	58.6	0.6		57.3	-0.7		R-0476	58.5	0.7		57.0	-0.8
R-0391	65.1	0.8		63.4	-0.9		R-0434	58.4	0.7		57.0	-0.7		R-0477	58.2	0.7		56.7	-0.8
R-0392	65.3	0.7		63.8	-0.8		R-0435	58.5	0.7		57.2	-0.6		R-0478	58.4	0.7		56.9	-0.8
R-0393	63.6	0.8		62.1	-0.7		R-0436	59.1	0.7		57.7	-0.7		R-0479	58.0	0.8		56.5	-0.7
R-0394	61.0	0.7		59.5	-0.8		R-0437	58.6	0.7		57.2	-0.7		R-0480	58.5	0.7		57.0	-0.8
R-0395	60.7	0.8		59.1	-0.8		R-0438	58.4	0.7		57.0	-0.7		R-0481	58.1	0.8		56.6	-0.7
R-0396	60.8	0.8		59.3	-0.7		R-0439	59.1	0.7		57.8	-0.6		R-0482	58.6	0.7		57.1	-0.8
R-0397	60.3	0.8		58.8	-0.7		R-0440	59.2	0.6		57.9	-0.7		R-0483	58.8	0.7		57.3	-0.8
R-0398	60.5	0.7		59.1	-0.7		R-0441	59.1	0.6		57.8	-0.7		R-0484	58.3	0.8		56.7	-0.8
R-0399	60.7	0.7		59.3	-0.7		R-0442	58.9	0.7		57.6	-0.6		R-0485	57.9	0.8		56.3	-0.8
R-0400	64.0	0.7		62.6	-0.7		R-0443	58.7	0.7		57.3	-0.7		R-0486	58.2	0.8		56.6	-0.8
R-0401	65.4	0.7		64.0	-0.7		R-0444	59.4	0.7		58.0	-0.7		R-0487	58.1	0.8		56.5	-0.8
R-0402	65.2	0.6		63.9	-0.7		R-0445	60.8	0.7		59.4	-0.7		R-0488	58.8	0.8		57.1	-0.9
R-0403	66.2	0.7		64.8	-0.7		R-0446	61.5	0.7		60.1	-0.7		R-0489	58.5	0.8		56.8	-0.9
R-0404	65.3	0.7		64.0	-0.6		R-0447	61.6	0.6		60.3	-0.7		R-0490	59.3	0.9		57.4	-1.0
R-0405	64.8	0.7		63.4	-0.7		R-0448	61.3	0.6		60.0	-0.7		R-0491	59.5	1.0		57.5	-1.0
R-0406	65.9	0.7		64.6	-0.6		R-0449	61.0	0.7		59.6	-0.7		R-0492	59.4	1.0		57.4	-1.0
R-0407	64.5	0.7		63.1	-0.7		R-0450	60.7	0.7		59.3	-0.7		R-0493	56.7	1.0		54.7	-1.0
R-0408	65.2	0.7		63.9	-0.6		R-0451	60.4	0.7		59.1	-0.6		R-0494	53.8	0.8		52.1	-0.9
R-0409	65.3	0.7		64.0	-0.6		R-0452	60.2	0.7		58.8	-0.7		R-0495	53.6	0.8		52.0	-0.8
R-0410	65.2	0.7		63.9	-0.6		R-0453	60.1	0.7		58.7	-0.7		R-0496	54.3	0.8		52.7	-0.8
R-0411	65.2	0.7		63.9	-0.6		R-0454	60.6	0.7		59.2	-0.7		R-0497	55.5	0.8		53.8	-0.9
R-0412	65.5	0.7		64.2	-0.6		R-0455	59.7	0.6		58.3	-0.8		R-0498	56.8	0.9		55.0	-0.9
R-0413	66.1	0.7		64.8	-0.6		R-0456	59.1	0.7		57.7	-0.7		R-0499	60.4	0.8		58.8	-0.8
R-0414	66.5	0.7		65.1	-0.7		R-0457	58.4	0.7		56.9	-0.8		R-0500	59.7	0.8		58.0	-0.9
R-0415	67.1	0.7		65.7	-0.7		R-0458	59.8	0.7		58.4	-0.7		R-0501	59.6	0.7		58.0	-0.9
R-0416	67.1	0.7		65.7	-0.7		R-0459	57.9	0.7		56.5	-0.7		R-0502	60.4	0.7		58.8	-0.9
R-0417	66.4	0.7		65.1	-0.6		R-0460	57.6	0.7		56.2	-0.7		R-0503	60.8	0.8		59.2	-0.8
R-0418	66.1	0.7		64.8	-0.6		R-0461	57.7	0.8		56.2	-0.7		R-0504	59.9	0.8		58.4	-0.7
R-0419	65.2	0.7		63.9	-0.6		R-0462	57.6	0.7		56.2	-0.7		R-0505	60.5	0.8		58.9	-0.8
R-0420	65.4	0.7		64.1	-0.6		R-0463	57.8	0.7		56.4	-0.7		R-0506	59.8	0.8		58.3	-0.7
R-0421	61.0	0.7		59.7	-0.6		R-0464	59.5	0.7		58.1	-0.7		R-0507	63.9	0.8		62.4	-0.7
R-0422	60.5	0.7		59.1	-0.7		R-0465	58.0	0.7		56.5	-0.8		R-0508	60.9	0.7		59.4	-0.8
R-0423	60.7	0.7		59.4	-0.6		R-0466	58.1	0.7		56.7	-0.7		R-0509	57.6	0.7		56.1	-0.8
R-0424	60.9	0.7		59.5	-0.7		R-0467	58.8	0.7		57.4	-0.7							

Table 6j. Noise Modeling Results For Changing Future Traffic Speeds for Region 10

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0510	54.7	0.6		53.6	-0.5		R-0551	54.0	0.6		52.8	-0.6		R-0592	59.3	0.6		58.0	-0.7
R-0511	53.4	0.8		51.8	-0.8		R-0552	55.1	0.6		53.9	-0.6		R-0593	59.1	0.7		57.8	-0.6
R-0512	53.6	0.8		52.0	-0.8		R-0553	55.0	0.6		53.8	-0.6		R-0594	58.7	0.6		57.4	-0.7
R-0513	54.1	0.8		52.4	-0.9		R-0554	57.7	0.6		56.5	-0.6		R-0595	58.0	0.6		56.7	-0.7
R-0514	55.3	0.8		53.7	-0.8		R-0555	57.5	0.6		56.3	-0.6		R-0596	57.6	0.6		56.3	-0.7
R-0515	54.7	0.7		53.2	-0.8		R-0556	57.5	0.7		56.2	-0.6		R-0597	56.3	0.7		55.0	-0.6
R-0516	52.9	0.8		51.2	-0.9		R-0557	57.4	0.6		56.2	-0.6		R-0598	57.8	0.7		56.5	-0.6
R-0517	51.9	0.8		50.3	-0.8		R-0558	57.5	0.6		56.3	-0.6		R-0599	57.9	0.6		56.6	-0.7
R-0518	52.1	0.8		50.6	-0.7		R-0559	57.8	0.6		56.6	-0.6		R-0600	58.3	0.7		56.9	-0.7
R-0519	52.4	0.7		50.9	-0.8		R-0560	57.7	0.6		56.5	-0.6		R-0601	56.1	0.7		54.8	-0.6
R-0520	52.3	0.6		51.0	-0.7		R-0561	57.7	0.6		56.5	-0.6		R-0602	63.6	0.7		62.3	-0.6
R-0521	52.7	0.6		51.4	-0.7		R-0562	57.2	0.6		56.0	-0.6		R-0603	63.9	0.7		62.6	-0.6
R-0522	54.6	0.6		53.3	-0.7		R-0563	57.5	0.6		56.3	-0.6		R-0604	64.0	0.7		62.7	-0.6
R-0523	54.3	0.6		53.0	-0.7		R-0564	57.5	0.6		56.3	-0.6		R-0605	64.0	0.7		62.7	-0.6
R-0524	53.6	0.6		52.3	-0.7		R-0565	58.3	0.6		57.1	-0.6		R-0606	63.7	0.7		62.4	-0.6
R-0525	53.3	0.6		52.0	-0.7		R-0566	59.1	0.6		57.9	-0.6		R-0607	62.7	0.7		61.4	-0.6
R-0526	53.4	0.6		52.1	-0.7		R-0567	59.8	0.6		58.6	-0.6		R-0608	61.9	0.6		60.6	-0.7
R-0527	53.5	0.6		52.3	-0.6		R-0568	60.6	0.6		59.4	-0.6		R-0609	61.7	0.7		60.4	-0.6
R-0528	53.7	0.7		52.4	-0.6		R-0569	61.7	0.6		60.5	-0.6		R-0610	61.9	0.7		60.5	-0.7
R-0529	55.0	0.6		53.8	-0.6		R-0570	63.2	0.7		61.9	-0.6		R-0611	62.3	0.6		61.0	-0.7
R-0530	54.5	0.6		53.3	-0.6		R-0571	64.3	0.6		63.1	-0.6		R-0612	61.9	0.7		60.6	-0.6
R-0531	54.2	0.7		52.9	-0.6		R-0572	64.0	0.6		62.8	-0.6		R-0613	61.3	0.7		60.0	-0.6
R-0532	54.2	0.6		52.9	-0.7		R-0573	63.6	0.7		62.3	-0.6		R-0614	62.0	0.7		60.6	-0.7
R-0533	53.7	0.6		52.5	-0.6		R-0574	63.3	0.7		62.0	-0.6		R-0615	62.4	0.7		61.0	-0.7
R-0534	58.2	0.6		56.9	-0.7		R-0575	61.3	0.7		60.0	-0.6		R-0616	62.2	0.7		60.8	-0.7
R-0535	58.6	0.6		57.3	-0.7		R-0576	62.7	0.6		61.4	-0.7		R-0617	62.2	0.7		60.7	-0.8
R-0536	57.6	0.6		56.4	-0.6		R-0577	59.6	0.6		58.4	-0.6		R-0618	61.7	0.8		60.2	-0.7
R-0537	58.9	0.6		57.7	-0.6		R-0578	59.2	0.6		58.0	-0.6		R-0619	61.6	0.8		60.0	-0.8
R-0538	59.1	0.6		57.8	-0.7		R-0579	61.5	0.7		60.2	-0.6		R-0620	60.8	0.8		59.1	-0.9
R-0539	59.4	0.6		58.1	-0.7		R-0580	61.8	0.6		60.6	-0.6		R-0621	60.3	0.9		58.6	-0.8
R-0540	59.4	0.6		58.1	-0.7		R-0581	61.6	0.7		60.3	-0.6		R-0622	60.0	0.9		58.2	-0.9
R-0541	53.8	0.6		52.5	-0.7		R-0582	59.5	0.7		58.2	-0.6		R-0623	61.7	0.9		59.9	-0.9
R-0542	54.4	0.6		53.1	-0.7		R-0583	58.4	0.7		57.1	-0.6		R-0624	61.6	0.9		59.8	-0.9
R-0543	53.4	0.6		52.2	-0.6		R-0584	58.2	0.7		56.9	-0.6		R-0625	62.3	1.0		60.4	-0.9
R-0544	54.0	0.6		52.7	-0.7		R-0585	59.3	0.7		58.0	-0.6		R-0626	62.3	1.0		60.4	-0.9
R-0545	54.4	0.6		53.2	-0.6		R-0586	58.4	0.7		57.1	-0.6		R-0627	63.7	0.9		61.8	-1.0
R-0546	54.8	0.6		53.6	-0.6		R-0587	62.7	0.7		61.4	-0.6		R-0628	63.4	1.0		61.4	-1.0
R-0547	54.4	0.6		53.2	-0.6		R-0588	63.1	0.6		61.8	-0.7		R-0629	63.8	1.0		61.8	-1.0
R-0548	53.8	0.6		52.6	-0.6		R-0589	60.2	0.7		58.9	-0.6		R-0630	64.1	0.9		62.2	-1.0
R-0549	54.9	0.6		53.7	-0.6		R-0590	60.2	0.7		58.9	-0.6							
R-0550	54.7	0.6		53.5	-0.6		R-0591	59.5	0.6		58.2	-0.7							

Table 6k. Noise Modeling Results For Changing Future Traffic Speeds for Region 11

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0631	62.3	0.8		60.6	-0.9		R-0675	60.0	0.7		58.7	-0.6		R-0719	59.6	0.7		58.1	-0.8
R-0632	62.0	0.8		60.1	-1.1		R-0676	59.8	0.6		58.6	-0.6		R-0720	59.5	0.7		58.1	-0.7
R-0633	60.8	0.8		58.9	-1.1		R-0677	59.7	0.7		58.4	-0.6		R-0721	59.4	0.7		57.9	-0.8
R-0634	60.4	0.8		58.6	-1.0		R-0678	59.5	0.6		58.3	-0.6		R-0722	57.4	0.7		55.9	-0.8
R-0635	60.3	0.9		58.4	-1.0		R-0679	59.7	0.7		58.4	-0.6		R-0723	57.1	0.7		55.6	-0.8
R-0636	60.4	0.8		58.6	-1.0		R-0680	59.5	0.6		58.3	-0.6		R-0724	56.8	0.7		55.3	-0.8
R-0637	60.9	0.9		59.0	-1.0		R-0681	59.6	0.6		58.3	-0.7		R-0725	57.9	0.7		56.4	-0.8
R-0638	60.9	0.8		59.1	-1.0		R-0682	59.7	0.7		58.4	-0.6		R-0726	58.0	0.8		56.5	-0.7
R-0639	61.4	0.9		59.6	-0.9		R-0683	59.7	0.7		58.4	-0.6		R-0727	57.8	0.7		56.3	-0.8
R-0640	60.3	0.8		58.6	-0.9		R-0684	59.8	0.6		58.5	-0.7		R-0728	56.2	0.8		54.6	-0.8
R-0641	62.2	0.8		60.5	-0.9		R-0685	59.8	0.6		58.6	-0.6		R-0729	55.8	0.7		54.3	-0.8
R-0642	62.3	0.8		60.7	-0.8		R-0686	60.0	0.6		58.8	-0.6		R-0730	55.8	0.8		54.2	-0.8
R-0643	62.1	0.8		60.5	-0.8		R-0687	60.4	0.6		59.1	-0.7		R-0731	56.1	0.8		54.5	-0.8
R-0644	62.0	0.8		60.4	-0.8		R-0688	60.8	0.7		59.5	-0.6		R-0732	56.1	0.7		54.6	-0.8
R-0645	61.9	0.7		60.4	-0.8		R-0689	61.0	0.7		59.7	-0.6		R-0733	57.7	0.8		56.0	-0.9
R-0646	62.0	0.8		60.5	-0.7		R-0690	61.2	0.6		60.0	-0.6		R-0734	59.5	1.0		57.5	-1.0
R-0647	62.1	0.7		60.7	-0.7		R-0691	61.5	0.7		60.2	-0.6		R-0735	58.9	1.0		56.8	-1.1
R-0648	62.2	0.7		60.9	-0.6		R-0692	61.7	0.6		60.5	-0.6		R-0736	58.8	1.0		56.7	-1.1
R-0649	63.1	0.6		61.8	-0.7		R-0693	62.0	0.6		60.8	-0.6		R-0737	59.0	1.1		56.9	-1.0
R-0650	62.7	0.7		61.3	-0.7		R-0694	60.6	0.7		59.3	-0.6		R-0738	58.6	1.0		56.5	-1.1
R-0651	61.3	0.6		60.0	-0.7		R-0695	59.0	0.6		57.7	-0.7		R-0739	58.9	1.0		56.8	-1.1
R-0652	61.3	0.7		59.9	-0.7		R-0696	59.4	0.6		58.2	-0.6		R-0740	59.2	1.0		57.1	-1.1
R-0653	60.9	0.7		59.5	-0.7		R-0697	57.6	0.6		56.3	-0.7		R-0741	59.6	1.0		57.5	-1.1
R-0654	59.2	0.7		57.8	-0.7		R-0698	59.9	0.7		58.6	-0.6		R-0742	58.6	1.0		56.5	-1.1
R-0655	57.8	0.7		56.4	-0.7		R-0699	58.5	0.7		57.1	-0.7		R-0743	58.4	1.0		56.5	-0.9
R-0656	56.9	0.7		55.5	-0.7		R-0700	58.2	0.7		56.9	-0.6		R-0744	59.8	0.9		57.9	-1.0
R-0657	56.3	0.6		55.0	-0.7		R-0701	58.1	0.6		56.8	-0.7		R-0745	58.4	0.8		56.6	-1.0
R-0658	57.7	0.6		56.4	-0.7		R-0702	58.8	0.6		57.5	-0.7		R-0746	57.3	0.8		55.6	-0.9
R-0659	57.1	0.6		55.8	-0.7		R-0703	59.5	0.7		58.2	-0.6		R-0747	56.8	0.8		55.1	-0.9
R-0660	57.8	0.7		56.4	-0.7		R-0704	59.7	0.6		58.4	-0.7		R-0748	55.8	0.8		54.2	-0.8
R-0661	57.9	0.7		56.6	-0.6		R-0705	59.1	0.6		57.8	-0.7		R-0749	55.5	0.8		53.9	-0.8
R-0662	57.9	0.7		56.6	-0.6		R-0706	58.0	0.7		56.7	-0.6		R-0750	55.1	0.8		53.5	-0.8
R-0663	57.8	0.6		56.5	-0.7		R-0707	58.4	0.7		57.0	-0.7		R-0751	54.4	0.8		52.8	-0.8
R-0664	57.8	0.6		56.5	-0.7		R-0708	59.5	0.7		58.1	-0.7		R-0752	54.4	0.8		52.8	-0.8
R-0665	57.7	0.7		56.4	-0.6		R-0709	60.2	0.7		58.8	-0.7		R-0753	54.1	0.8		52.5	-0.8
R-0666	57.9	0.7		56.6	-0.6		R-0710	60.4	0.7		59.0	-0.7		R-0754	54.4	0.8		52.8	-0.8
R-0667	56.7	0.6		55.4	-0.7		R-0711	59.8	0.7		58.4	-0.7		R-0755	55.2	0.8		53.6	-0.8
R-0668	56.9	0.6		55.6	-0.7		R-0712	59.7	0.7		58.3	-0.7		R-0756	56.8	0.8		55.2	-0.8
R-0669	58.5	0.7		57.2	-0.6		R-0713	59.7	0.7		58.2	-0.8		R-0757	59.0	0.8		57.4	-0.8
R-0670	59.2	0.6		58.0	-0.6		R-0714	59.7	0.7		58.3	-0.7		R-0758	56.9	0.8		55.4	-0.7
R-0671	59.5	0.7		58.2	-0.6		R-0715	59.7	0.8		58.2	-0.7		R-0759	55.8	0.8		54.2	-0.8
R-0672	59.6	0.7		58.3	-0.6		R-0716	59.6	0.7		58.2	-0.7		R-0760	54.5	0.7		53.0	-0.8
R-0673	59.9	0.7		58.6	-0.6		R-0717	59.6	0.7		58.1	-0.8		R-0761	55.0	0.8		53.5	-0.7
R-0674	59.6	0.6		58.3	-0.7		R-0718	59.6	0.7		58.1	-0.8							

Table 6l. Noise Modeling Results For Changing Future Traffic Speeds for Region 12

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0762	58.9	0.7		57.4	-0.8
R-0763	60.3	0.8		58.7	-0.8
R-0764	60.6	0.7		59.1	-0.8
R-0765	60.6	0.7		59.1	-0.8
R-0766	60.6	0.8		59.0	-0.8
R-0767	60.5	0.8		58.9	-0.8
R-0768	60.2	0.8		58.6	-0.8
R-0769	59.7	0.7		58.2	-0.8
R-0770	58.7	0.8		57.1	-0.8
R-0771	57.7	0.8		56.1	-0.8
R-0772	57.0	0.8		55.4	-0.8
R-0773	57.5	0.8		55.9	-0.8
R-0774	56.9	0.8		55.3	-0.8
R-0775	56.4	0.8		54.7	-0.9
R-0776	55.0	0.8		53.3	-0.9
R-0777	54.9	0.9		53.1	-0.9
R-0778	55.2	0.9		53.3	-1.0
R-0779	55.8	0.9		53.9	-1.0
R-0780	57.0	0.9		55.0	-1.1
R-0781	58.6	0.9		56.6	-1.1
R-0782	60.5	1.0		58.5	-1.0
R-0783	62.1	0.9		60.1	-1.1
R-0784	62.4	1.0		60.3	-1.1
R-0785	62.5	1.0		60.4	-1.1
R-0786	61.9	1.0		59.8	-1.1
R-0787	61.7	1.1		59.5	-1.1
R-0788	62.0	1.1		59.7	-1.2
R-0789	62.1	1.1		59.8	-1.2

Table 6m. Noise Modeling Results For Changing Future Traffic Speeds for Region 13

Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +10 km/hr (dBA)	Diff (dBA)		Future $L_{eq}24$ with -10 km/hr (dBA)	Diff (dBA)
R-0790	61.6	1.1		59.4	-1.1		R-0837	55.7	0.7		54.4	-0.6		R-0884	59.7	0.7		58.2	-0.8
R-0791	62.1	1.1		59.8	-1.2		R-0838	57.3	0.6		56.0	-0.7		R-0885	59.7	0.8		58.2	-0.7
R-0792	62.2	1.1		60.0	-1.1		R-0839	57.0	0.6		55.7	-0.7		R-0886	59.6	0.7		58.2	-0.7
R-0793	61.5	1.0		59.4	-1.1		R-0840	55.1	0.6		53.8	-0.7		R-0887	58.9	0.7		57.5	-0.7
R-0794	60.5	1.0		58.4	-1.1		R-0841	58.1	0.6		56.8	-0.7		R-0888	58.8	0.8		57.3	-0.7
R-0795	61.7	0.9		59.7	-1.1		R-0842	59.3	0.6		58.0	-0.7		R-0889	58.2	0.7		56.8	-0.7
R-0796	55.9	0.9		53.9	-1.1		R-0843	59.8	0.6		58.5	-0.7		R-0890	58.5	0.7		57.1	-0.7
R-0797	56.4	1.0		54.4	-1.0		R-0844	60.2	0.5		58.9	-0.8		R-0891	58.8	0.7		57.4	-0.7
R-0798	56.2	0.9		54.3	-1.0		R-0845	60.5	0.6		59.2	-0.7		R-0892	59.5	0.7		58.1	-0.7
R-0799	55.8	0.9		54.0	-0.9		R-0846	59.5	0.6		58.2	-0.7		R-0893	59.7	0.7		58.3	-0.7
R-0800	54.0	0.8		52.2	-1.0		R-0847	61.4	0.5		60.1	-0.8		R-0894	59.5	0.7		58.2	-0.6
R-0801	53.4	0.8		51.7	-0.9		R-0848	59.2	0.5		57.9	-0.8		R-0895	60.5	0.6		59.2	-0.7
R-0802	53.4	0.8		51.8	-0.8		R-0849	59.8	0.6		58.5	-0.7		R-0896	60.7	0.6		59.4	-0.7
R-0803	53.0	0.8		51.3	-0.9		R-0850	56.9	0.6		55.6	-0.7		R-0897	60.7	0.6		59.4	-0.7
R-0804	53.7	0.8		52.1	-0.8		R-0851	60.6	0.5		59.3	-0.8		R-0898	60.7	0.6		59.4	-0.7
R-0805	53.8	0.8		52.2	-0.8		R-0852	59.7	0.5		58.4	-0.8		R-0899	61.0	0.7		59.6	-0.7
R-0806	53.6	0.7		52.1	-0.8		R-0853	59.2	0.6		57.9	-0.7		R-0900	60.9	0.7		59.6	-0.6
R-0807	53.7	0.8		52.2	-0.7		R-0854	59.8	0.5		58.5	-0.8		R-0901	60.9	0.7		59.6	-0.6
R-0808	53.7	0.7		52.2	-0.8		R-0855	59.8	0.6		58.5	-0.7		R-0902	58.9	0.6		57.6	-0.7
R-0809	54.0	0.7		52.6	-0.7		R-0856	59.8	0.5		58.5	-0.8		R-0903	59.5	0.7		58.2	-0.6
R-0810	54.1	0.8		52.6	-0.7		R-0857	59.6	0.5		58.3	-0.8		R-0904	59.1	0.7		57.7	-0.7
R-0811	54.2	0.7		52.8	-0.7		R-0858	60.0	0.6		58.6	-0.8		R-0905	57.8	0.7		56.4	-0.7
R-0812	54.3	0.7		52.9	-0.7		R-0859	59.8	0.6		58.5	-0.7		R-0906	59.6	0.7		58.2	-0.7
R-0813	54.6	0.7		53.2	-0.7		R-0860	60.1	0.6		58.7	-0.8		R-0907	60.5	0.7		59.1	-0.7
R-0814	56.1	0.7		54.7	-0.7		R-0861	60.4	0.6		59.0	-0.8		R-0908	60.5	0.7		59.1	-0.7
R-0815	55.4	0.7		54.0	-0.7		R-0862	59.6	0.6		58.2	-0.8		R-0909	60.4	0.7		59.0	-0.7
R-0816	53.9	0.7		52.5	-0.7		R-0863	60.2	0.6		58.8	-0.8		R-0910	60.2	0.7		58.8	-0.7
R-0817	54.2	0.7		52.8	-0.7		R-0864	60.3	0.6		58.9	-0.8		R-0911	60.0	0.7		58.6	-0.7
R-0818	53.9	0.6		52.6	-0.7		R-0865	59.9	0.6		58.4	-0.9		R-0912	59.9	0.7		58.5	-0.7
R-0819	53.9	0.7		52.5	-0.7		R-0866	59.3	0.6		57.8	-0.9		R-0913	60.1	0.8		58.6	-0.7
R-0820	54.3	0.6		53.0	-0.7		R-0867	61.9	0.6		60.4	-0.9		R-0914	58.4	0.8		56.9	-0.7
R-0821	55.0	0.7		53.6	-0.7		R-0868	63.6	0.6		62.1	-0.9		R-0915	57.8	0.8		56.2	-0.8
R-0822	54.5	0.6		53.2	-0.7		R-0869	60.8	1.1		58.6	-1.1		R-0916	57.9	0.8		56.4	-0.7
R-0823	54.7	0.7		53.4	-0.6		R-0870	59.4	1.0		57.4	-1.0		R-0917	57.4	0.7		55.9	-0.8
R-0824	55.9	0.6		54.6	-0.7		R-0871	58.8	1.0		56.8	-1.0		R-0918	59.4	0.8		57.8	-0.8
R-0825	55.4	0.7		54.0	-0.7		R-0872	58.7	1.0		56.7	-1.0		R-0919	60.0	0.8		58.4	-0.8
R-0826	55.5	0.6		54.2	-0.7		R-0873	59.6	0.9		57.7	-1.0		R-0920	60.1	0.8		58.5	-0.8
R-0827	56.9	0.7		55.6	-0.6		R-0874	58.9	0.9		57.1	-0.9		R-0921	60.9	0.8		59.2	-0.9
R-0828	55.0	0.6		53.7	-0.7		R-0875	58.7	0.8		57.0	-0.9		R-0922	58.5	0.8		56.9	-0.8
R-0829	56.1	0.7		54.7	-0.7		R-0876	57.8	0.8		56.2	-0.8		R-0923	58.3	0.8		56.6	-0.9
R-0830	56.4	0.7		55.0	-0.7		R-0877	57.0	0.8		55.4	-0.8		R-0924	62.2	0.8		60.5	-0.9
R-0831	56.4	0.6		55.1	-0.7		R-0878	56.7	0.8		55.0	-0.9		R-0925	62.3	0.8		60.5	-1.0
R-0832	56.3	0.6		55.0	-0.7		R-0879	56.1	0.8		54.5	-0.8		R-0926	61.1	0.9		59.3	-0.9
R-0833	55.8	0.6		54.5	-0.7		R-0880	57.0	0.8		55.4	-0.8		R-0927	61.1	0.8		59.4	-0.9
R-0834	57.0	0.7		55.6	-0.7		R-0881	57.0	0.8		55.4	-0.8		R-0928	59.2	0.8		57.4	-1.0
R-0835	57.1	0.7		55.7	-0.7		R-0882	57.5	0.8		55.9	-0.8		R-0929	60.1	0.8		58.4	-0.9
R-0836	56.9	0.6		55.6	-0.7		R-0883	59.2	0.8		57.6	-0.8							

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 unlikely that the % heavy trucks will fall outside of this range. The results are shown in Tables 7a – 7m. **Relative to the Future Conditions, when increasing the trucks by 5%, the noise levels increased by 0.3 to 2.1 dBA, depending on the location. Relative to the Future Conditions, when reducing the trucks by 5%, the noise levels decreased by -0.3 to -2.6 dBA depending on the location.** 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). As such, the locations which resulted in the largest change in noise levels are those with relatively low % heavy trucks.

Compared to the Future Conditions noise modeling results, the increase in noise levels with an increase of trucks by 5% would result noise levels at or above 65 dBA $L_{eq}24$ at the following additional locations:

- Southeast of the interchange between Glenmore Trail and SEST. The dominant noise source for this area is Glenmore Trail. Note that, currently, there is no acoustical shielding fence on this property.
- Additional locations east and west of Deerfoot Trail, between SEST and McKenzie Towne Blvd SE.

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.

Table 7a. Noise Modeling Results For Changing Future % Heavy Trucks for Region 1

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0001	64.5	0.7		63.0	-0.8
R-0002	63.8	0.7		62.3	-0.8
R-0003	63.7	0.7		62.2	-0.8
R-0004	63.7	0.7		62.2	-0.8
R-0005	63.7	0.7		62.1	-0.9
R-0006	64.2	0.7		62.6	-0.9
R-0007	64.7	0.7		63.2	-0.8
R-0008	64.7	0.7		63.1	-0.9
R-0009	64.6	0.7		63.0	-0.9
R-0010	64.7	0.7		63.1	-0.9
R-0011	64.7	0.8		63.1	-0.8
R-0012	64.5	0.8		62.8	-0.9
R-0013	64.0	0.8		62.2	-1.0
R-0014	63.3	0.8		61.5	-1.0
R-0015	62.6	0.9		60.7	-1.0
R-0016	62.0	0.9		60.0	-1.1
R-0017	61.6	0.9		59.5	-1.2
R-0018	61.1	1.0		58.9	-1.2
R-0019	59.6	1.0		57.4	-1.2
R-0020	60.3	1.0		58.0	-1.3
R-0021	60.2	1.1		57.8	-1.3
R-0022	60.1	1.0		57.6	-1.5
R-0023	60.3	1.1		57.6	-1.6
R-0024	60.6	1.2		57.7	-1.7
R-0025	60.5	1.3		57.4	-1.8

Table 7b. Noise Modeling Results For Changing Future % Heavy Trucks for Region 2

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0026	55.2	1.2		52.4	-1.6
R-0027	53.8	1.0		51.5	-1.3
R-0028	52.5	0.9		50.3	-1.3
R-0029	53.4	0.8		51.5	-1.1
R-0030	53.2	0.7		51.5	-1.0
R-0031	53.1	0.8		51.4	-0.9
R-0032	52.0	0.7		50.4	-0.9
R-0033	52.1	0.8		50.5	-0.8
R-0034	52.3	0.6		50.8	-0.9
R-0035	53.0	0.6		51.6	-0.8
R-0036	55.4	0.6		54.1	-0.7
R-0037	55.7	0.6		54.4	-0.7

Table 7c. Noise Modeling Results For Changing Future % Heavy Trucks for Region 3

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0038	55.5	0.4		54.6	-0.5
R-0039	56.2	0.6		54.9	-0.7

Table 7d. Noise Modeling Results For Changing Future % Heavy Trucks for Region 4

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0040	67.5	0.6		66.1	-0.8
R-0041	65.2	0.6		63.8	-0.8
R-0042	57.1	0.6		55.7	-0.8
R-0043	57.5	0.6		56.2	-0.7
R-0044	58.4	0.4		57.5	-0.5
R-0045	59.2	0.3		58.5	-0.4
R-0046	59.7	0.3		59.0	-0.4
R-0047	60.0	0.3		59.3	-0.4
R-0048	57.4	0.5		56.3	-0.6
R-0049	57.5	0.5		56.4	-0.6
R-0050	60.3	0.3		59.7	-0.3
R-0051	60.5	0.3		59.9	-0.3
R-0052	60.4	0.3		59.8	-0.3
R-0053	61.6	0.3		61.0	-0.3
R-0054	56.2	0.5		55.3	-0.4

Table 7e. Noise Modeling Results For Changing Future % Heavy Trucks for Region 5

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0055	55.3	0.5		54.2	-0.6
R-0056	55.0	0.5		53.9	-0.6
R-0057	54.9	0.5		53.8	-0.6
R-0058	54.6	0.5		53.5	-0.6
R-0059	57.3	0.5		56.3	-0.5
R-0060	53.8	0.6		52.5	-0.7
R-0061	55.8	0.6		54.6	-0.6
R-0062	55.8	0.5		54.7	-0.6
R-0063	55.5	0.5		54.4	-0.6

Table 7f. Noise Modeling Results For Changing Future % Heavy Trucks for Region 6

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0064	56.4	0.6		55.1	-0.7		R-0105	59.0	0.7		57.6	-0.7		R-0146	60.1	0.9		58.1	-1.1
R-0065	56.3	0.6		55.0	-0.7		R-0106	58.7	0.6		57.4	-0.7		R-0147	55.2	0.9		53.2	-1.1
R-0066	56.6	0.6		55.3	-0.7		R-0107	58.3	0.7		56.9	-0.7		R-0148	59.3	0.9		57.2	-1.2
R-0067	56.9	0.6		55.6	-0.7		R-0108	57.8	0.7		56.4	-0.7		R-0149	54.5	0.9		52.5	-1.1
R-0068	60.6	0.6		59.4	-0.6		R-0109	57.4	0.6		56.0	-0.8		R-0150	60.7	1.0		58.5	-1.2
R-0069	56.4	0.6		55.1	-0.7		R-0110	57.1	0.6		55.7	-0.8		R-0151	60.8	1.0		58.6	-1.2
R-0070	57.6	0.5		56.6	-0.5		R-0111	56.1	0.6		54.9	-0.6		R-0152	59.4	0.9		57.3	-1.2
R-0071	56.7	0.7		55.3	-0.7		R-0112	53.4	0.7		52.0	-0.7		R-0153	55.7	1.0		53.5	-1.2
R-0072	57.9	0.7		56.3	-0.9		R-0113	52.7	0.7		51.2	-0.8		R-0154	56.3	1.0		54.0	-1.3
R-0073	56.5	0.7		54.9	-0.9		R-0114	52.4	0.7		50.9	-0.8		R-0155	60.1	1.0		57.9	-1.2
R-0074	57.2	0.7		55.7	-0.8		R-0115	54.0	0.6		52.6	-0.8		R-0156	61.1	0.9		58.9	-1.3
R-0075	57.1	0.7		55.5	-0.9		R-0116	55.0	0.7		53.5	-0.8		R-0157	62.0	1.0		59.7	-1.3
R-0076	57.3	0.7		55.7	-0.9		R-0117	53.1	0.6		51.6	-0.9		R-0158	56.0	1.0		53.8	-1.2
R-0077	57.4	0.7		55.9	-0.8		R-0118	54.3	0.6		52.9	-0.8		R-0159	60.5	1.0		58.3	-1.2
R-0078	57.8	0.7		56.3	-0.8		R-0119	54.7	0.7		53.2	-0.8		R-0160	55.7	1.0		53.4	-1.3
R-0079	57.7	0.7		56.2	-0.8		R-0120	53.3	0.7		51.7	-0.9		R-0161	55.5	1.0		53.2	-1.3
R-0080	58.3	0.6		56.9	-0.8		R-0121	53.7	0.8		52.1	-0.8		R-0162	56.1	1.0		53.8	-1.3
R-0081	58.0	0.6		56.7	-0.7		R-0122	52.6	0.7		50.9	-1.0		R-0163	55.2	1.0		52.9	-1.3
R-0082	58.1	0.6		56.7	-0.8		R-0123	52.4	0.7		50.7	-1.0		R-0164	55.4	1.1		53.0	-1.3
R-0083	58.2	0.7		56.8	-0.7		R-0124	53.2	0.7		51.7	-0.8		R-0165	55.4	1.0		53.0	-1.4
R-0084	58.2	0.6		56.8	-0.8		R-0125	53.8	0.6		52.5	-0.7		R-0166	55.6	1.1		53.2	-1.3
R-0085	58.1	0.7		56.6	-0.8		R-0126	53.2	0.7		51.6	-0.9		R-0167	55.6	1.0		53.2	-1.4
R-0086	58.1	0.7		56.6	-0.8		R-0127	53.1	0.7		51.5	-0.9		R-0168	56.3	1.1		53.9	-1.3
R-0087	58.1	0.7		56.6	-0.8		R-0128	53.8	0.7		52.2	-0.9		R-0169	60.4	0.9		58.3	-1.2
R-0088	58.2	0.7		56.7	-0.8		R-0129	53.6	0.8		51.9	-0.9		R-0170	61.0	1.0		58.7	-1.3
R-0089	58.2	0.7		56.7	-0.8		R-0130	54.3	0.7		52.6	-1.0		R-0171	56.4	1.2		53.6	-1.6
R-0090	58.3	0.7		56.8	-0.8		R-0131	54.2	0.8		52.5	-0.9		R-0172	57.5	1.3		54.4	-1.8
R-0091	58.3	0.7		56.8	-0.8		R-0132	54.4	0.8		52.7	-0.9		R-0173	58.6	1.4		55.4	-1.8
R-0092	58.4	0.7		56.9	-0.8		R-0133	55.0	0.8		53.3	-0.9		R-0174	61.2	1.3		58.3	-1.6
R-0093	58.4	0.6		57.0	-0.8		R-0134	55.8	0.7		54.1	-1.0		R-0175	61.0	1.3		58.0	-1.7
R-0094	58.5	0.6		57.1	-0.8		R-0135	55.4	0.7		53.7	-1.0		R-0176	60.8	1.3		57.8	-1.7
R-0095	58.6	0.7		57.1	-0.8		R-0136	57.5	0.8		55.7	-1.0		R-0177	61.7	1.4		58.6	-1.7
R-0096	58.6	0.7		57.1	-0.8		R-0137	57.6	0.8		55.8	-1.0		R-0178	59.0	1.4		55.6	-2.0
R-0097	58.4	0.6		57.0	-0.8		R-0138	58.1	0.8		56.3	-1.0		R-0179	60.6	1.4		57.1	-2.1
R-0098	58.6	0.6		57.2	-0.8		R-0139	58.4	0.8		56.6	-1.0		R-0180	60.1	1.6		56.0	-2.5
R-0099	60.0	0.6		58.6	-0.8		R-0140	59.1	0.8		57.2	-1.1		R-0181	62.1	1.6		58.1	-2.4
R-0100	61.4	0.6		60.0	-0.8		R-0141	59.9	0.8		58.0	-1.1		R-0182	62.1	1.5		58.1	-2.5
R-0101	60.7	0.6		59.3	-0.8		R-0142	60.8	0.9		58.8	-1.1		R-0183	61.5	1.6		57.5	-2.4
R-0102	60.1	0.6		58.8	-0.7		R-0143	55.1	0.8		53.2	-1.1		R-0184	60.7	1.6		56.8	-2.3
R-0103	59.7	0.6		58.3	-0.8		R-0144	60.2	0.9		58.2	-1.1		R-0185	61.7	1.6		57.5	-2.6
R-0104	59.3	0.6		57.9	-0.8		R-0145	60.4	0.9		58.4	-1.1		R-0186	60.6	1.6		56.6	-2.4

Table 7g. Noise Modeling Results For Changing Future % Heavy Trucks for Region 7

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0187	54.6	0.5		53.4	-0.7		R-0220	61.2	0.7		59.8	-0.7		R-0253	58.7	0.9		56.7	-1.1
R-0188	57.1	0.4		56.2	-0.5		R-0221	61.3	0.6		59.9	-0.8		R-0254	59.3	0.9		57.2	-1.2
R-0189	56.1	0.4		55.2	-0.5		R-0222	61.4	0.7		59.9	-0.8		R-0255	55.2	0.9		53.3	-1.0
R-0190	56.3	0.4		55.4	-0.5		R-0223	61.5	0.7		60.0	-0.8		R-0256	58.7	0.9		56.6	-1.2
R-0191	57.1	0.4		56.2	-0.5		R-0224	61.5	0.6		60.1	-0.8		R-0257	58.9	1.0		56.7	-1.2
R-0192	57.7	0.5		56.7	-0.5		R-0225	61.6	0.6		60.2	-0.8		R-0258	58.8	1.0		56.6	-1.2
R-0193	57.7	0.4		56.8	-0.5		R-0226	61.9	0.7		60.4	-0.8		R-0259	54.6	0.9		52.6	-1.1
R-0194	57.3	0.5		56.3	-0.5		R-0227	62.5	0.6		61.1	-0.8		R-0260	54.3	1.0		52.1	-1.2
R-0195	57.8	0.5		56.8	-0.5		R-0228	62.6	0.7		61.1	-0.8		R-0261	54.8	1.0		52.6	-1.2
R-0196	57.4	0.4		56.5	-0.5		R-0229	62.5	0.7		61.0	-0.8		R-0262	54.5	1.0		52.2	-1.3
R-0197	55.0	0.6		53.9	-0.5		R-0230	62.3	0.7		60.8	-0.8		R-0263	54.3	1.0		52.0	-1.3
R-0198	57.6	0.4		56.6	-0.6		R-0231	62.2	0.7		60.7	-0.8		R-0264	55.0	1.0		52.7	-1.3
R-0199	59.4	0.5		58.2	-0.7		R-0232	61.9	0.7		60.3	-0.9		R-0265	54.3	1.0		52.0	-1.3
R-0200	59.7	0.5		58.6	-0.6		R-0233	61.6	0.7		60.0	-0.9		R-0266	54.3	1.0		51.9	-1.4
R-0201	60.2	0.6		59.0	-0.6		R-0234	61.2	0.7		59.7	-0.8		R-0267	54.3	1.1		51.9	-1.3
R-0202	60.4	0.6		59.2	-0.6		R-0235	61.0	0.7		59.4	-0.9		R-0268	55.1	1.0		52.7	-1.4
R-0203	60.6	0.6		59.4	-0.6		R-0236	61.9	0.7		60.3	-0.9		R-0269	53.7	1.1		51.3	-1.3
R-0204	60.8	0.6		59.5	-0.7		R-0237	63.4	0.8		61.7	-0.9		R-0270	55.6	1.0		53.3	-1.3
R-0205	60.8	0.6		59.5	-0.7		R-0238	62.3	0.7		60.7	-0.9		R-0271	54.4	1.0		52.0	-1.4
R-0206	57.7	0.6		56.4	-0.7		R-0239	57.9	0.8		56.3	-0.8		R-0272	54.0	1.0		51.6	-1.4
R-0207	60.4	0.7		59.0	-0.7		R-0240	57.5	0.7		55.9	-0.9		R-0273	54.3	1.1		51.9	-1.3
R-0208	59.5	0.6		58.2	-0.7		R-0241	56.9	0.8		55.2	-0.9		R-0274	53.4	1.1		50.9	-1.4
R-0209	58.4	0.6		57.1	-0.7		R-0242	56.8	0.8		55.1	-0.9		R-0275	54.7	1.2		52.1	-1.4
R-0210	60.5	0.6		59.2	-0.7		R-0243	56.4	0.7		54.7	-1.0		R-0276	52.6	1.2		49.7	-1.7
R-0211	58.2	0.6		56.9	-0.7		R-0244	56.4	0.8		54.7	-0.9		R-0277	53.8	1.2		50.8	-1.8
R-0212	61.0	0.7		59.6	-0.7		R-0245	56.4	0.7		54.7	-1.0		R-0278	53.2	1.3		50.0	-1.9
R-0213	60.8	0.6		59.4	-0.8		R-0246	56.9	0.8		55.1	-1.0		R-0279	53.1	1.3		49.9	-1.9
R-0214	60.6	0.6		59.2	-0.8		R-0247	59.9	0.9		58.0	-1.0		R-0280	52.9	1.3		49.8	-1.8
R-0215	60.7	0.6		59.3	-0.8		R-0248	60.3	0.9		58.3	-1.1		R-0281	53.0	1.2		50.0	-1.8
R-0216	60.8	0.6		59.5	-0.7		R-0249	59.2	0.8		57.3	-1.1		R-0282	54.2	1.1		51.6	-1.5
R-0217	60.9	0.6		59.5	-0.8		R-0250	59.1	0.9		57.1	-1.1		R-0283	54.8	0.8		52.9	-1.1
R-0218	61.0	0.6		59.6	-0.8		R-0251	58.5	0.8		56.6	-1.1							
R-0219	61.1	0.6		59.7	-0.8		R-0252	58.6	0.9		56.6	-1.1							

Table 7h. Noise Modeling Results For Changing Future % Heavy Trucks for Region 8

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0284	60.6	1.6		56.4	-2.6		R-0317	61.5	1.0		59.3	-1.2		R-0350	54.6	1.1		52.2	-1.3
R-0285	60.5	1.6		56.4	-2.5		R-0318	61.2	1.0		59.0	-1.2		R-0351	54.9	1.1		52.5	-1.3
R-0286	60.8	1.5		56.8	-2.5		R-0319	60.6	1.0		58.4	-1.2		R-0352	55.4	1.1		53.0	-1.3
R-0287	60.3	1.6		56.3	-2.4		R-0320	59.8	1.0		57.6	-1.2		R-0353	56.2	1.0		53.9	-1.3
R-0288	60.2	1.6		56.3	-2.3		R-0321	58.8	1.0		56.6	-1.2		R-0354	58.1	1.1		55.7	-1.3
R-0289	59.6	1.4		55.9	-2.3		R-0322	58.5	1.0		56.3	-1.2		R-0355	60.7	1.1		58.3	-1.3
R-0290	59.7	1.4		56.2	-2.1		R-0323	58.7	1.0		56.5	-1.2		R-0356	60.9	1.1		58.5	-1.3
R-0291	57.5	1.3		54.6	-1.6		R-0324	58.5	1.0		56.3	-1.2		R-0357	63.5	1.0		61.1	-1.4
R-0292	57.3	1.2		54.4	-1.7		R-0325	56.6	1.0		54.4	-1.2		R-0358	65.2	1.1		62.8	-1.3
R-0293	57.1	1.2		54.3	-1.6		R-0326	57.4	1.0		55.2	-1.2		R-0359	65.8	1.1		63.4	-1.3
R-0294	56.4	1.2		53.5	-1.7		R-0327	58.6	1.0		56.4	-1.2		R-0360	65.6	1.1		63.2	-1.3
R-0295	56.3	1.2		53.4	-1.7		R-0328	58.9	1.0		56.7	-1.2		R-0361	67.0	1.0		64.7	-1.3
R-0296	56.7	1.2		53.9	-1.6		R-0329	57.6	1.0		55.4	-1.2		R-0362	67.3	1.0		65.0	-1.3
R-0297	57.3	1.2		54.5	-1.6		R-0330	58.0	1.0		55.8	-1.2		R-0363	68.1	1.0		65.8	-1.3
R-0298	58.6	1.1		56.0	-1.5		R-0331	58.7	1.0		56.5	-1.2		R-0364	68.0	1.0		65.7	-1.3
R-0299	58.1	1.1		55.6	-1.4		R-0332	59.5	1.0		57.3	-1.2		R-0365	67.7	1.0		65.5	-1.2
R-0300	57.8	1.1		55.3	-1.4		R-0333	58.0	1.0		55.7	-1.3		R-0366	68.9	1.0		66.7	-1.2
R-0301	56.7	1.1		54.1	-1.5		R-0334	61.4	1.0		59.2	-1.2		R-0367	68.5	1.0		66.3	-1.2
R-0302	57.1	1.1		54.6	-1.4		R-0335	62.7	0.9		60.5	-1.3		R-0368	68.0	1.0		65.7	-1.3
R-0303	57.4	1.1		54.8	-1.5		R-0336	62.4	1.0		60.1	-1.3		R-0369	69.3	1.0		67.0	-1.3
R-0304	57.3	1.1		54.8	-1.4		R-0337	61.4	1.0		59.2	-1.2		R-0370	69.7	1.0		67.4	-1.3
R-0305	56.7	1.1		54.2	-1.4		R-0338	59.6	1.0		57.3	-1.3		R-0371	69.4	1.0		67.1	-1.3
R-0306	58.8	1.0		56.5	-1.3		R-0339	58.8	1.0		56.5	-1.3		R-0372	68.1	1.0		65.9	-1.2
R-0307	58.5	1.0		56.2	-1.3		R-0340	58.2	1.1		55.9	-1.2		R-0373	67.9	1.0		65.6	-1.3
R-0308	58.4	1.0		56.1	-1.3		R-0341	57.4	1.0		55.1	-1.3		R-0374	67.0	1.0		64.7	-1.3
R-0309	58.0	1.0		55.7	-1.3		R-0342	57.4	1.0		55.1	-1.3		R-0375	65.0	1.2		62.5	-1.3
R-0310	57.6	1.0		55.3	-1.3		R-0343	57.7	1.1		55.4	-1.2		R-0376	64.9	1.2		62.4	-1.3
R-0311	58.0	1.0		55.8	-1.2		R-0344	57.5	1.0		55.2	-1.3		R-0377	65.5	1.8		62.4	-1.3
R-0312	60.4	1.0		58.1	-1.3		R-0345	57.4	1.1		55.1	-1.2		R-0378	66.0	1.8		62.9	-1.3
R-0313	61.0	1.0		58.8	-1.2		R-0346	57.4	1.0		55.1	-1.3		R-0379	65.5	1.9		62.3	-1.3
R-0314	61.4	1.0		59.2	-1.2		R-0347	57.0	1.0		54.8	-1.2		R-0380	65.2	1.9		61.9	-1.4
R-0315	61.6	0.9		59.4	-1.3		R-0348	56.1	1.1		53.7	-1.3		R-0381	65.1	2.1		61.6	-1.4
R-0316	61.6	0.9		59.4	-1.3		R-0349	55.7	1.1		53.4	-1.2							

Table 7i. Noise Modeling Results For Changing Future % Heavy Trucks for Region 9

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0382	62.5	1.6		59.5	-1.4		R-0425	61.3	1.0		59.0	-1.3		R-0468	58.9	1.2		56.3	-1.4
R-0383	62.2	1.6		59.2	-1.4		R-0426	61.3	1.0		59.0	-1.3		R-0469	58.8	1.2		56.2	-1.4
R-0384	61.4	1.5		58.5	-1.4		R-0427	60.7	1.0		58.4	-1.3		R-0470	58.8	1.1		56.2	-1.5
R-0385	63.9	1.6		60.9	-1.4		R-0428	60.7	1.0		58.4	-1.3		R-0471	61.0	1.2		58.4	-1.4
R-0386	62.5	1.6		59.5	-1.4		R-0429	60.2	1.0		57.9	-1.3		R-0472	58.8	1.2		56.2	-1.4
R-0387	64.0	1.6		61.0	-1.4		R-0430	64.5	1.0		62.2	-1.3		R-0473	59.0	1.2		56.4	-1.4
R-0388	65.3	1.5		62.4	-1.4		R-0431	64.3	1.0		62.1	-1.2		R-0474	58.5	1.2		55.9	-1.4
R-0389	65.5	1.5		62.6	-1.4		R-0432	59.6	1.0		57.3	-1.3		R-0475	58.6	1.2		56.0	-1.4
R-0390	66.2	1.5		63.4	-1.3		R-0433	59.0	1.0		56.7	-1.3		R-0476	59.0	1.2		56.3	-1.5
R-0391	65.7	1.4		63.0	-1.3		R-0434	58.8	1.1		56.4	-1.3		R-0477	58.7	1.2		56.0	-1.5
R-0392	65.9	1.3		63.3	-1.3		R-0435	58.9	1.1		56.5	-1.3		R-0478	58.9	1.2		56.3	-1.4
R-0393	64.0	1.2		61.6	-1.2		R-0436	59.5	1.1		57.1	-1.3		R-0479	58.4	1.2		55.8	-1.4
R-0394	61.4	1.1		59.0	-1.3		R-0437	59.0	1.1		56.6	-1.3		R-0480	59.0	1.2		56.3	-1.5
R-0395	61.3	1.4		58.7	-1.2		R-0438	58.8	1.1		56.4	-1.3		R-0481	58.6	1.3		55.9	-1.4
R-0396	61.3	1.3		58.7	-1.3		R-0439	59.5	1.1		57.1	-1.3		R-0482	59.1	1.2		56.4	-1.5
R-0397	60.7	1.2		58.3	-1.2		R-0440	59.6	1.0		57.3	-1.3		R-0483	59.3	1.2		56.6	-1.5
R-0398	61.0	1.2		58.5	-1.3		R-0441	59.5	1.0		57.2	-1.3		R-0484	58.8	1.3		56.1	-1.4
R-0399	61.1	1.1		58.8	-1.2		R-0442	59.3	1.1		56.9	-1.3		R-0485	58.4	1.3		55.6	-1.5
R-0400	64.3	1.0		62.0	-1.3		R-0443	59.1	1.1		56.7	-1.3		R-0486	58.7	1.3		55.9	-1.5
R-0401	65.7	1.0		63.4	-1.3		R-0444	59.8	1.1		57.4	-1.3		R-0487	58.7	1.4		55.8	-1.5
R-0402	65.6	1.0		63.3	-1.3		R-0445	61.2	1.1		58.8	-1.3		R-0488	59.4	1.4		56.4	-1.6
R-0403	66.5	1.0		64.2	-1.3		R-0446	61.8	1.0		59.5	-1.3		R-0489	59.1	1.4		56.1	-1.6
R-0404	65.7	1.1		63.4	-1.2		R-0447	62.0	1.0		59.7	-1.3		R-0490	60.0	1.6		56.4	-2.0
R-0405	65.1	1.0		62.8	-1.3		R-0448	61.7	1.0		59.4	-1.3		R-0491	60.3	1.8		56.4	-2.1
R-0406	66.2	1.0		64.0	-1.2		R-0449	61.4	1.1		59.0	-1.3		R-0492	60.1	1.7		56.4	-2.0
R-0407	64.8	1.0		62.5	-1.3		R-0450	61.1	1.1		58.7	-1.3		R-0493	57.4	1.7		53.7	-2.0
R-0408	65.5	1.0		63.2	-1.3		R-0451	60.8	1.1		58.4	-1.3		R-0494	54.4	1.4		51.4	-1.6
R-0409	65.6	1.0		63.4	-1.2		R-0452	60.6	1.1		58.2	-1.3		R-0495	54.1	1.3		51.2	-1.6
R-0410	65.5	1.0		63.2	-1.3		R-0453	60.5	1.1		58.1	-1.3		R-0496	54.9	1.4		52.0	-1.5
R-0411	65.5	1.0		63.3	-1.2		R-0454	61.0	1.1		58.5	-1.4		R-0497	56.1	1.4		53.0	-1.7
R-0412	65.8	1.0		63.6	-1.2		R-0455	60.2	1.1		57.7	-1.4		R-0498	57.4	1.5		54.2	-1.7
R-0413	66.4	1.0		64.2	-1.2		R-0456	59.5	1.1		57.0	-1.4		R-0499	61.0	1.4		58.0	-1.6
R-0414	66.8	1.0		64.5	-1.3		R-0457	58.8	1.1		56.3	-1.4		R-0500	60.3	1.4		57.3	-1.6
R-0415	67.4	1.0		65.1	-1.3		R-0458	60.3	1.2		57.8	-1.3		R-0501	60.2	1.3		57.3	-1.6
R-0416	67.4	1.0		65.1	-1.3		R-0459	58.4	1.2		55.8	-1.4		R-0502	60.9	1.2		58.1	-1.6
R-0417	66.7	1.0		64.5	-1.2		R-0460	58.1	1.2		55.5	-1.4		R-0503	61.3	1.3		58.5	-1.5
R-0418	66.4	1.0		64.2	-1.2		R-0461	58.1	1.2		55.5	-1.4		R-0504	60.3	1.2		57.6	-1.5
R-0419	65.5	1.0		63.2	-1.3		R-0462	58.1	1.2		55.5	-1.4		R-0505	60.9	1.2		58.2	-1.5
R-0420	65.7	1.0		63.5	-1.2		R-0463	58.3	1.2		55.7	-1.4		R-0506	60.2	1.2		57.5	-1.5
R-0421	61.4	1.1		59.1	-1.2		R-0464	60.0	1.2		57.4	-1.4		R-0507	64.3	1.2		61.6	-1.5
R-0422	60.8	1.0		58.5	-1.3		R-0465	58.4	1.1		55.9	-1.4		R-0508	61.3	1.1		58.7	-1.5
R-0423	61.1	1.1		58.8	-1.2		R-0466	58.6	1.2		56.0	-1.4		R-0509	58.0	1.1		55.4	-1.5
R-0424	61.2	1.0		58.9	-1.3		R-0467	59.3	1.2		56.7	-1.4							

Table 7j. Noise Modeling Results For Changing Future % Heavy Trucks for Region 10

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0510	55.0	0.9		53.1	-1.0		R-0551	54.4	1.0		52.2	-1.2		R-0592	59.7	1.0		57.3	-1.4
R-0511	53.8	1.2		50.8	-1.8		R-0552	55.5	1.0		53.3	-1.2		R-0593	59.5	1.1		57.1	-1.3
R-0512	54.1	1.3		51.0	-1.8		R-0553	55.3	0.9		53.2	-1.2		R-0594	59.2	1.1		56.8	-1.3
R-0513	54.5	1.2		51.4	-1.9		R-0554	58.1	1.0		55.9	-1.2		R-0595	58.4	1.0		56.0	-1.4
R-0514	55.8	1.3		52.7	-1.8		R-0555	57.9	1.0		55.7	-1.2		R-0596	58.0	1.0		55.7	-1.3
R-0515	55.2	1.2		52.4	-1.6		R-0556	57.8	1.0		55.6	-1.2		R-0597	56.7	1.1		54.3	-1.3
R-0516	53.4	1.3		50.2	-1.9		R-0557	57.8	1.0		55.6	-1.2		R-0598	58.2	1.1		55.8	-1.3
R-0517	52.4	1.3		49.4	-1.7		R-0558	57.9	1.0		55.7	-1.2		R-0599	58.3	1.0		55.9	-1.4
R-0518	52.5	1.2		49.7	-1.6		R-0559	58.2	1.0		56.0	-1.2		R-0600	58.7	1.1		56.3	-1.3
R-0519	52.9	1.2		50.1	-1.6		R-0560	58.0	0.9		55.9	-1.2		R-0601	56.5	1.1		54.1	-1.3
R-0520	52.7	1.0		50.2	-1.5		R-0561	58.0	0.9		55.9	-1.2		R-0602	64.0	1.1		61.6	-1.3
R-0521	53.1	1.0		50.8	-1.3		R-0562	57.6	1.0		55.4	-1.2		R-0603	64.3	1.1		61.9	-1.3
R-0522	55.0	1.0		52.6	-1.4		R-0563	57.9	1.0		55.7	-1.2		R-0604	64.4	1.1		62.0	-1.3
R-0523	54.7	1.0		52.3	-1.4		R-0564	57.9	1.0		55.7	-1.2		R-0605	64.4	1.1		62.0	-1.3
R-0524	54.0	1.0		51.6	-1.4		R-0565	58.7	1.0		56.5	-1.2		R-0606	64.1	1.1		61.7	-1.3
R-0525	53.7	1.0		51.4	-1.3		R-0566	59.5	1.0		57.3	-1.2		R-0607	63.1	1.1		60.7	-1.3
R-0526	53.8	1.0		51.5	-1.3		R-0567	60.2	1.0		58.0	-1.2		R-0608	62.4	1.1		59.9	-1.4
R-0527	53.9	1.0		51.6	-1.3		R-0568	61.0	1.0		58.8	-1.2		R-0609	62.1	1.1		59.7	-1.3
R-0528	54.1	1.1		51.7	-1.3		R-0569	62.1	1.0		59.9	-1.2		R-0610	62.3	1.1		59.8	-1.4
R-0529	55.4	1.0		53.1	-1.3		R-0570	63.6	1.1		61.3	-1.2		R-0611	62.7	1.0		60.3	-1.4
R-0530	54.9	1.0		52.7	-1.2		R-0571	64.7	1.0		62.5	-1.2		R-0612	62.3	1.1		59.9	-1.3
R-0531	54.6	1.1		52.3	-1.2		R-0572	64.4	1.0		62.1	-1.3		R-0613	61.8	1.2		59.2	-1.4
R-0532	54.6	1.0		52.3	-1.3		R-0573	64.0	1.1		61.7	-1.2		R-0614	62.4	1.1		59.9	-1.4
R-0533	54.1	1.0		51.8	-1.3		R-0574	63.6	1.0		61.4	-1.2		R-0615	62.8	1.1		60.2	-1.5
R-0534	58.6	1.0		56.3	-1.3		R-0575	61.6	1.0		59.4	-1.2		R-0616	62.6	1.1		60.0	-1.5
R-0535	59.0	1.0		56.7	-1.3		R-0576	63.1	1.0		60.8	-1.3		R-0617	62.7	1.2		59.9	-1.6
R-0536	58.0	1.0		55.8	-1.2		R-0577	60.0	1.0		57.7	-1.3		R-0618	62.2	1.3		59.3	-1.6
R-0537	59.3	1.0		57.1	-1.2		R-0578	59.6	1.0		57.4	-1.2		R-0619	62.1	1.3		59.1	-1.7
R-0538	59.5	1.0		57.2	-1.3		R-0579	61.9	1.1		59.6	-1.2		R-0620	61.3	1.3		58.2	-1.8
R-0539	59.8	1.0		57.5	-1.3		R-0580	62.2	1.0		60.0	-1.2		R-0621	60.8	1.4		57.5	-1.9
R-0540	59.8	1.0		57.5	-1.3		R-0581	62.0	1.1		59.7	-1.2		R-0622	60.5	1.4		57.1	-2.0
R-0541	54.2	1.0		51.9	-1.3		R-0582	59.9	1.1		57.6	-1.2		R-0623	62.3	1.5		58.7	-2.1
R-0542	54.8	1.0		52.5	-1.3		R-0583	58.8	1.1		56.5	-1.2		R-0624	62.2	1.5		58.6	-2.1
R-0543	53.8	1.0		51.6	-1.2		R-0584	58.6	1.1		56.3	-1.2		R-0625	62.9	1.6		59.1	-2.2
R-0544	54.4	1.0		52.1	-1.3		R-0585	59.7	1.1		57.4	-1.2		R-0626	62.9	1.6		59.1	-2.2
R-0545	54.8	1.0		52.6	-1.2		R-0586	58.7	1.0		56.4	-1.3		R-0627	64.3	1.5		60.5	-2.3
R-0546	55.2	1.0		53.0	-1.2		R-0587	63.1	1.1		60.8	-1.2		R-0628	64.0	1.6		60.1	-2.3
R-0547	54.8	1.0		52.6	-1.2		R-0588	63.5	1.0		61.2	-1.3		R-0629	64.4	1.6		60.5	-2.3
R-0548	54.2	1.0		52.0	-1.2		R-0589	60.6	1.1		58.2	-1.3		R-0630	64.7	1.5		60.9	-2.3
R-0549	55.3	1.0		53.1	-1.2		R-0590	60.6	1.1		58.2	-1.3							
R-0550	55.1	1.0		52.9	-1.2		R-0591	60.0	1.1		57.6	-1.3							

Table 7k. Noise Modeling Results For Changing Future % Heavy Trucks for Region 11

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0631	62.9	1.4		59.5	-2.0		R-0675	60.4	1.1		58.0	-1.3		R-0719	60.0	1.1		57.5	-1.4
R-0632	62.6	1.4		59.0	-2.2		R-0676	60.2	1.0		57.9	-1.3		R-0720	60.0	1.2		57.5	-1.3
R-0633	61.4	1.4		57.8	-2.2		R-0677	60.0	1.0		57.7	-1.3		R-0721	59.9	1.2		57.3	-1.4
R-0634	61.0	1.4		57.4	-2.2		R-0678	59.9	1.0		57.6	-1.3		R-0722	57.8	1.1		55.3	-1.4
R-0635	60.8	1.4		57.3	-2.1		R-0679	60.1	1.1		57.8	-1.2		R-0723	57.6	1.2		55.0	-1.4
R-0636	61.0	1.4		57.5	-2.1		R-0680	59.9	1.0		57.6	-1.3		R-0724	57.3	1.2		54.7	-1.4
R-0637	61.4	1.4		57.9	-2.1		R-0681	60.0	1.0		57.7	-1.3		R-0725	58.4	1.2		55.8	-1.4
R-0638	61.5	1.4		58.0	-2.1		R-0682	60.0	1.0		57.8	-1.2		R-0726	58.4	1.2		55.8	-1.4
R-0639	61.9	1.4		58.5	-2.0		R-0683	60.1	1.1		57.8	-1.2		R-0727	58.3	1.2		55.7	-1.4
R-0640	60.8	1.3		57.6	-1.9		R-0684	60.2	1.0		57.9	-1.3		R-0728	56.7	1.3		54.0	-1.4
R-0641	62.7	1.3		59.5	-1.9		R-0685	60.2	1.0		57.9	-1.3		R-0729	56.3	1.2		53.6	-1.5
R-0642	62.8	1.3		59.7	-1.8		R-0686	60.4	1.0		58.1	-1.3		R-0730	56.3	1.3		53.6	-1.4
R-0643	62.6	1.3		59.6	-1.7		R-0687	60.8	1.0		58.5	-1.3		R-0731	56.6	1.3		53.9	-1.4
R-0644	62.5	1.3		59.6	-1.6		R-0688	61.1	1.0		58.9	-1.2		R-0732	56.7	1.3		53.9	-1.5
R-0645	62.4	1.2		59.6	-1.6		R-0689	61.4	1.1		59.1	-1.2		R-0733	58.4	1.5		55.2	-1.7
R-0646	62.4	1.2		59.7	-1.5		R-0690	61.6	1.0		59.3	-1.3		R-0734	60.2	1.7		56.7	-1.8
R-0647	62.5	1.1		59.9	-1.5		R-0691	61.9	1.1		59.6	-1.2		R-0735	59.8	1.9		55.9	-2.0
R-0648	62.7	1.2		60.1	-1.4		R-0692	62.1	1.0		59.8	-1.3		R-0736	59.7	1.9		55.9	-1.9
R-0649	63.6	1.1		61.1	-1.4		R-0693	62.4	1.0		60.2	-1.2		R-0737	59.8	1.9		56.1	-1.8
R-0650	63.1	1.1		60.6	-1.4		R-0694	60.9	1.0		58.7	-1.2		R-0738	59.4	1.8		55.7	-1.9
R-0651	61.8	1.1		59.2	-1.5		R-0695	59.4	1.0		57.1	-1.3		R-0739	59.7	1.8		55.9	-2.0
R-0652	61.7	1.1		59.2	-1.4		R-0696	59.8	1.0		57.5	-1.3		R-0740	60.0	1.8		56.2	-2.0
R-0653	61.3	1.1		58.8	-1.4		R-0697	58.0	1.0		55.7	-1.3		R-0741	60.4	1.8		56.6	-2.0
R-0654	59.6	1.1		57.1	-1.4		R-0698	60.3	1.1		58.0	-1.2		R-0742	59.4	1.8		55.7	-1.9
R-0655	58.2	1.1		55.7	-1.4		R-0699	58.8	1.0		56.5	-1.3		R-0743	59.1	1.7		55.6	-1.8
R-0656	57.3	1.1		54.9	-1.3		R-0700	58.6	1.1		56.2	-1.3		R-0744	60.5	1.6		57.1	-1.8
R-0657	56.8	1.1		54.4	-1.3		R-0701	58.5	1.0		56.2	-1.3		R-0745	59.1	1.5		55.9	-1.7
R-0658	58.1	1.0		55.8	-1.3		R-0702	59.2	1.0		56.9	-1.3		R-0746	57.9	1.4		54.8	-1.7
R-0659	57.5	1.0		55.1	-1.4		R-0703	59.8	1.0		57.5	-1.3		R-0747	57.4	1.4		54.4	-1.6
R-0660	58.2	1.1		55.8	-1.3		R-0704	60.1	1.0		57.8	-1.3		R-0748	56.4	1.4		53.4	-1.6
R-0661	58.3	1.1		55.9	-1.3		R-0705	59.5	1.0		57.2	-1.3		R-0749	56.1	1.4		53.1	-1.6
R-0662	58.3	1.1		55.9	-1.3		R-0706	58.4	1.1		56.1	-1.2		R-0750	55.6	1.3		52.7	-1.6
R-0663	58.2	1.0		55.8	-1.4		R-0707	58.8	1.1		56.4	-1.3		R-0751	54.9	1.3		52.0	-1.6
R-0664	58.2	1.0		55.8	-1.4		R-0708	59.9	1.1		57.5	-1.3		R-0752	54.9	1.3		52.1	-1.5
R-0665	58.1	1.1		55.7	-1.3		R-0709	60.7	1.2		58.2	-1.3		R-0753	54.6	1.3		51.8	-1.5
R-0666	58.3	1.1		56.0	-1.2		R-0710	60.8	1.1		58.3	-1.4		R-0754	54.8	1.2		52.1	-1.5
R-0667	57.1	1.0		54.8	-1.3		R-0711	60.3	1.2		57.8	-1.3		R-0755	55.6	1.2		52.9	-1.5
R-0668	57.3	1.0		55.0	-1.3		R-0712	60.2	1.2		57.6	-1.4		R-0756	57.2	1.2		54.5	-1.5
R-0669	58.9	1.1		56.5	-1.3		R-0713	60.1	1.1		57.6	-1.4		R-0757	59.3	1.1		56.7	-1.5
R-0670	59.6	1.0		57.3	-1.3		R-0714	60.2	1.2		57.6	-1.4		R-0758	57.3	1.2		54.7	-1.4
R-0671	59.9	1.1		57.5	-1.3		R-0715	60.1	1.2		57.6	-1.3		R-0759	56.1	1.1		53.5	-1.5
R-0672	59.9	1.0		57.6	-1.3		R-0716	60.1	1.2		57.5	-1.4		R-0760	54.9	1.1		52.3	-1.5
R-0673	60.3	1.1		58.0	-1.2		R-0717	60.1	1.2		57.5	-1.4		R-0761	55.4	1.2		52.8	-1.4
R-0674	60.0	1.0		57.7	-1.3		R-0718	60.0	1.1		57.5	-1.4							

Table 7l. Noise Modeling Results For Changing Future % Heavy Trucks for Region 12

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0762	59.3	1.1		56.7	-1.5
R-0763	60.7	1.2		58.0	-1.5
R-0764	61.0	1.1		58.4	-1.5
R-0765	61.0	1.1		58.4	-1.5
R-0766	61.0	1.2		58.3	-1.5
R-0767	60.9	1.2		58.2	-1.5
R-0768	60.6	1.2		57.9	-1.5
R-0769	60.1	1.1		57.5	-1.5
R-0770	59.1	1.2		56.4	-1.5
R-0771	58.1	1.2		55.4	-1.5
R-0772	57.4	1.2		54.7	-1.5
R-0773	57.9	1.2		55.2	-1.5
R-0774	57.3	1.2		54.6	-1.5
R-0775	56.9	1.3		54.0	-1.6
R-0776	55.6	1.4		52.5	-1.7
R-0777	55.5	1.5		52.3	-1.7
R-0778	55.8	1.5		52.5	-1.8
R-0779	56.5	1.6		53.1	-1.8
R-0780	57.7	1.6		54.2	-1.9
R-0781	59.4	1.7		55.7	-2.0
R-0782	61.3	1.8		57.5	-2.0
R-0783	63.0	1.8		59.1	-2.1
R-0784	63.2	1.8		59.3	-2.1
R-0785	63.4	1.9		59.4	-2.1
R-0786	62.8	1.9		58.8	-2.1
R-0787	62.5	1.9		58.4	-2.2
R-0788	62.8	1.9		58.6	-2.3
R-0789	62.9	1.9		58.7	-2.3

Table 7m. Noise Modeling Results For Changing Future % Heavy Trucks for Region 13

Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)		Rcptr	Future $L_{eq}24$ with +5% Trucks (dBA)	Diff (dBA)		Future $L_{eq}24$ with -5% Trucks (dBA)	Diff (dBA)
R-0790	62.5	2.0		58.3	-2.2		R-0837	56.1	1.1		53.7	-1.3		R-0884	60.2	1.2		57.6	-1.4
R-0791	62.9	1.9		58.8	-2.2		R-0838	57.8	1.1		55.3	-1.4		R-0885	60.1	1.2		57.5	-1.4
R-0792	63.0	1.9		59.0	-2.1		R-0839	57.5	1.1		55.0	-1.4		R-0886	60.1	1.2		57.5	-1.4
R-0793	62.3	1.8		58.4	-2.1		R-0840	55.6	1.1		53.1	-1.4		R-0887	59.3	1.1		56.8	-1.4
R-0794	61.3	1.8		57.4	-2.1		R-0841	58.6	1.1		56.0	-1.5		R-0888	59.2	1.2		56.7	-1.3
R-0795	62.5	1.7		58.7	-2.1		R-0842	59.9	1.2		57.3	-1.4		R-0889	58.5	1.0		56.1	-1.4
R-0796	56.7	1.7		53.0	-2.0		R-0843	60.4	1.2		57.7	-1.5		R-0890	58.9	1.1		56.4	-1.4
R-0797	57.1	1.7		53.5	-1.9		R-0844	60.8	1.1		58.1	-1.6		R-0891	59.2	1.1		56.8	-1.3
R-0798	57.0	1.7		53.5	-1.8		R-0845	61.1	1.2		58.4	-1.5		R-0892	59.8	1.0		57.4	-1.4
R-0799	56.5	1.6		53.1	-1.8		R-0846	60.0	1.1		57.4	-1.5		R-0893	60.0	1.0		57.7	-1.3
R-0800	54.7	1.5		51.4	-1.8		R-0847	62.0	1.1		59.3	-1.6		R-0894	59.8	1.0		57.5	-1.3
R-0801	53.9	1.3		51.0	-1.6		R-0848	59.8	1.1		57.1	-1.6		R-0895	60.9	1.0		58.6	-1.3
R-0802	54.0	1.4		51.1	-1.5		R-0849	60.3	1.1		57.7	-1.5		R-0896	61.1	1.0		58.8	-1.3
R-0803	53.5	1.3		50.6	-1.6		R-0850	57.5	1.2		54.8	-1.5		R-0897	61.1	1.0		58.8	-1.3
R-0804	54.3	1.4		51.4	-1.5		R-0851	61.2	1.1		58.5	-1.6		R-0898	61.1	1.0		58.8	-1.3
R-0805	54.3	1.3		51.5	-1.5		R-0852	60.3	1.1		57.6	-1.6		R-0899	61.3	1.0		59.0	-1.3
R-0806	54.1	1.2		51.4	-1.5		R-0853	59.8	1.2		57.0	-1.6		R-0900	61.3	1.1		58.9	-1.3
R-0807	54.2	1.3		51.5	-1.4		R-0854	60.4	1.1		57.7	-1.6		R-0901	61.3	1.1		58.9	-1.3
R-0808	54.2	1.2		51.6	-1.4		R-0855	60.4	1.2		57.7	-1.5		R-0902	59.3	1.0		57.0	-1.3
R-0809	54.5	1.2		51.9	-1.4		R-0856	60.4	1.1		57.7	-1.6		R-0903	59.9	1.1		57.5	-1.3
R-0810	54.5	1.2		51.9	-1.4		R-0857	60.3	1.2		57.4	-1.7		R-0904	59.5	1.1		57.1	-1.3
R-0811	54.6	1.1		52.1	-1.4		R-0858	60.6	1.2		57.8	-1.6		R-0905	58.2	1.1		55.8	-1.3
R-0812	54.7	1.1		52.2	-1.4		R-0859	60.4	1.2		57.6	-1.6		R-0906	60.0	1.1		57.6	-1.3
R-0813	55.0	1.1		52.5	-1.4		R-0860	60.7	1.2		57.9	-1.6		R-0907	60.9	1.1		58.5	-1.3
R-0814	56.5	1.1		54.0	-1.4		R-0861	61.1	1.3		58.1	-1.7		R-0908	60.9	1.1		58.4	-1.4
R-0815	55.8	1.1		53.3	-1.4		R-0862	60.2	1.2		57.3	-1.7		R-0909	60.8	1.1		58.3	-1.4
R-0816	54.3	1.1		51.9	-1.3		R-0863	60.8	1.2		57.9	-1.7		R-0910	60.7	1.2		58.1	-1.4
R-0817	54.6	1.1		52.2	-1.3		R-0864	60.9	1.2		57.9	-1.8		R-0911	60.5	1.2		57.9	-1.4
R-0818	54.3	1.0		51.9	-1.4		R-0865	60.6	1.3		57.5	-1.8		R-0912	60.4	1.2		57.8	-1.4
R-0819	54.3	1.1		51.9	-1.3		R-0866	60.0	1.3		56.9	-1.8		R-0913	60.6	1.3		57.9	-1.4
R-0820	54.7	1.0		52.3	-1.4		R-0867	62.6	1.3		59.4	-1.9		R-0914	58.9	1.3		56.2	-1.4
R-0821	55.4	1.1		53.0	-1.3		R-0868	64.3	1.3		61.1	-1.9		R-0915	58.3	1.3		55.6	-1.4
R-0822	54.9	1.0		52.5	-1.4		R-0869	61.6	1.9		57.9	-1.8		R-0916	58.5	1.4		55.7	-1.4
R-0823	55.1	1.1		52.7	-1.3		R-0870	60.2	1.8		56.7	-1.7		R-0917	58.0	1.3		55.2	-1.5
R-0824	56.3	1.0		53.9	-1.4		R-0871	59.6	1.8		56.1	-1.7		R-0918	60.0	1.4		57.1	-1.5
R-0825	55.8	1.1		53.4	-1.3		R-0872	59.5	1.8		56.0	-1.7		R-0919	60.6	1.4		57.7	-1.5
R-0826	55.9	1.0		53.5	-1.4		R-0873	60.3	1.6		57.0	-1.7		R-0920	60.7	1.4		57.8	-1.5
R-0827	57.3	1.1		54.9	-1.3		R-0874	59.5	1.5		56.4	-1.6		R-0921	61.6	1.5		58.6	-1.5
R-0828	55.5	1.1		53.1	-1.3		R-0875	59.3	1.4		56.3	-1.6		R-0922	59.2	1.5		56.2	-1.5
R-0829	56.5	1.1		54.1	-1.3		R-0876	58.4	1.4		55.5	-1.5		R-0923	59.0	1.5		55.9	-1.6
R-0830	56.8	1.1		54.4	-1.3		R-0877	57.5	1.3		54.7	-1.5		R-0924	63.0	1.6		59.8	-1.6
R-0831	56.8	1.0		54.4	-1.4		R-0878	57.2	1.3		54.3	-1.6		R-0925	63.0	1.5		59.9	-1.6
R-0832	56.7	1.0		54.3	-1.4		R-0879	56.7	1.4		53.8	-1.5		R-0926	61.8	1.6		58.6	-1.6
R-0833	56.2	1.0		53.8	-1.4		R-0880	57.5	1.3		54.7	-1.5		R-0927	61.9	1.6		58.7	-1.6
R-0834	57.5	1.2		54.9	-1.4		R-0881	57.5	1.3		54.7	-1.5		R-0928	59.9	1.5		56.8	-1.6
R-0835	57.5	1.1		55.1	-1.3		R-0882	58.0	1.3		55.2	-1.5		R-0929	60.9	1.6		57.7	-1.6
R-0836	57.3	1.0		54.9	-1.4		R-0883	59.6	1.2		56.9	-1.5							

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 – 8m. **Relative to the Future Conditions, when increasing the volumes by 25%, the traffic speeds by 10 km/hr and the trucks by 5%, the noise levels increased by 0.8 to 4.0 dBA.**

Compared to the Future Conditions noise modeling results, the increase in noise levels with a cumulative increase in volumes by 25%, traffic speeds by 10 km/hr, and trucks by 5%, would result noise levels at or above 65 dBA $L_{eq}24$ at the following additional locations:

- Northwest of interchange between SEST and 17 Avenue SE. Note that, currently, the rear fences within this area are either chainlink or acoustically poor wooden fences with large gaps. Thus, there is currently no significant level of acoustical shielding provided by the existing rear fences.
- Southeast of the interchange between Glenmore Trail and SEST. The dominant noise source for this area is Glenmore Trail. Note that, currently, there is no acoustical shielding fence on this property.
- Additional locations east and west of Deerfoot Trail, between SEST and McKenzie Towne Blvd SE.
- One location northwest of the interchange between SEST and McKenzie Lake Blvd SE, at the top of the hill overlooking the River Valley. Note that, currently, there is only a solid screen wood fence on the south property line, but there is only a chainlink fence on the west property line.
- Southeast of the interchange between SEST and Deerfoot Trail.
- East of Deerfoot Trail, midway between SEST and Seton Blvd SE.
- North of Seton Blvd SE, west of Auburn Bay Gate SE.
- Northwest of the interchange between Deerfoot Trail and Cranston Avenue SE. Note there is no noise barrier at this location other than a small earth berm.
- Southeast of the interchange between SEST and Chaparral Blvd SE.
- East of Macleod Trail SE, approximately 1,070 m south of SEST. Note that the dominant noise source in this area is vehicle traffic on Macleod Trail, with the noise contribution from SEST much lower.

Table 8a. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 1

Receptor	Future L_{eq}24 with Combined Increase (dBA)	Diff (dBA)
R-0001	65.8	2.0
R-0002	65.1	2.0
R-0003	65.0	2.0
R-0004	65.0	2.0
R-0005	65.0	2.0
R-0006	65.5	2.0
R-0007	66.1	2.1
R-0008	66.0	2.0
R-0009	65.9	2.0
R-0010	66.0	2.0
R-0011	66.0	2.1
R-0012	65.8	2.1
R-0013	65.3	2.1
R-0014	64.7	2.2
R-0015	64.1	2.4
R-0016	63.6	2.5
R-0017	63.1	2.4
R-0018	62.7	2.6
R-0019	61.2	2.6
R-0020	61.9	2.6
R-0021	61.7	2.6
R-0022	61.8	2.7
R-0023	62.0	2.8
R-0024	62.3	2.9
R-0025	62.3	3.1

Table 8b. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 2

Receptor	Future L_{eq}24 with Combined Increase (dBA)	Diff (dBA)
R-0026	56.8	2.8
R-0027	55.3	2.5
R-0028	54.0	2.4
R-0029	54.9	2.3
R-0030	54.6	2.1
R-0031	54.4	2.1
R-0032	53.4	2.1
R-0033	53.4	2.1
R-0034	53.7	2.0
R-0035	54.4	2.0
R-0036	56.8	2.0
R-0037	57.1	2.0

Table 8c. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 3

Receptor	Future L_{eq}24 with Combined Increase (dBA)	Diff (dBA)
R-0038	56.3	1.2
R-0039	57.3	1.7

Table 8d. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 4

Receptor	Future L_{eq}24 with Combined Increase (dBA)	Diff (dBA)
R-0040	69.2	2.3
R-0041	66.9	2.3
R-0042	58.6	2.1
R-0043	58.9	2.0
R-0044	59.2	1.2
R-0045	60.0	1.1
R-0046	60.4	1.0
R-0047	60.6	0.9
R-0048	58.4	1.5
R-0049	58.5	1.5
R-0050	61.0	1.0
R-0051	61.1	0.9
R-0052	61.1	1.0
R-0053	62.1	0.8
R-0054	57.0	1.3

Table 8e. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 5

Receptor	Future L_{eq}24 with Combined Increase (dBA)	Diff (dBA)
R-0055	56.4	1.6
R-0056	56.1	1.6
R-0057	55.9	1.5
R-0058	55.7	1.6
R-0059	58.3	1.5
R-0060	55.0	1.8
R-0061	56.8	1.6
R-0062	56.9	1.6
R-0063	56.5	1.5

Table 8f. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 6

Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)
R-0064	57.5	1.7		R-0105	60.2	1.9		R-0146	61.5	2.3
R-0065	57.4	1.7		R-0106	60.0	1.9		R-0147	56.6	2.3
R-0066	57.8	1.8		R-0107	59.5	1.9		R-0148	60.8	2.4
R-0067	58.0	1.7		R-0108	59.0	1.9		R-0149	55.9	2.3
R-0068	61.7	1.7		R-0109	58.7	1.9		R-0150	62.2	2.5
R-0069	57.6	1.8		R-0110	58.4	1.9		R-0151	62.2	2.4
R-0070	58.4	1.3		R-0111	57.2	1.7		R-0152	60.9	2.4
R-0071	57.9	1.9		R-0112	54.6	1.9		R-0153	57.1	2.4
R-0072	59.2	2.0		R-0113	53.9	1.9		R-0154	57.8	2.5
R-0073	57.8	2.0		R-0114	53.6	1.9		R-0155	61.6	2.5
R-0074	58.5	2.0		R-0115	55.2	1.8		R-0156	62.6	2.4
R-0075	58.4	2.0		R-0116	56.2	1.9		R-0157	63.4	2.4
R-0076	58.6	2.0		R-0117	54.4	1.9		R-0158	57.5	2.5
R-0077	58.7	2.0		R-0118	55.6	1.9		R-0159	62.0	2.5
R-0078	59.1	2.0		R-0119	56.0	2.0		R-0160	57.2	2.5
R-0079	59.0	2.0		R-0120	54.6	2.0		R-0161	57.0	2.5
R-0080	59.5	1.8		R-0121	55.0	2.1		R-0162	57.6	2.5
R-0081	59.2	1.8		R-0122	53.9	2.0		R-0163	56.8	2.6
R-0082	59.3	1.8		R-0123	53.7	2.0		R-0164	56.9	2.6
R-0083	59.4	1.9		R-0124	54.4	1.9		R-0165	57.0	2.6
R-0084	59.5	1.9		R-0125	54.9	1.7		R-0166	57.1	2.6
R-0085	59.4	2.0		R-0126	54.4	1.9		R-0167	57.1	2.5
R-0086	59.4	2.0		R-0127	54.3	1.9		R-0168	57.8	2.6
R-0087	59.4	2.0		R-0128	55.1	2.0		R-0169	61.9	2.4
R-0088	59.5	2.0		R-0129	54.9	2.1		R-0170	62.5	2.5
R-0089	59.5	2.0		R-0130	55.6	2.0		R-0171	57.9	2.7
R-0090	59.6	2.0		R-0131	55.5	2.1		R-0172	59.3	3.1
R-0091	59.6	2.0		R-0132	55.7	2.1		R-0173	60.3	3.1
R-0092	59.7	2.0		R-0133	56.3	2.1		R-0174	62.8	2.9
R-0093	59.7	1.9		R-0134	57.2	2.1		R-0175	62.7	3.0
R-0094	59.8	1.9		R-0135	56.7	2.0		R-0176	62.6	3.1
R-0095	59.9	2.0		R-0136	58.9	2.2		R-0177	63.4	3.1
R-0096	59.8	1.9		R-0137	59.0	2.2		R-0178	60.8	3.2
R-0097	59.7	1.9		R-0138	59.4	2.1		R-0179	62.4	3.2
R-0098	59.9	1.9		R-0139	59.8	2.2		R-0180	62.0	3.5
R-0099	61.3	1.9		R-0140	60.5	2.2		R-0181	64.0	3.5
R-0100	62.6	1.8		R-0141	61.3	2.2		R-0182	64.0	3.4
R-0101	61.9	1.8		R-0142	62.2	2.3		R-0183	63.4	3.5
R-0102	61.4	1.9		R-0143	56.6	2.3		R-0184	62.5	3.4
R-0103	60.9	1.8		R-0144	61.7	2.4		R-0185	63.6	3.5
R-0104	60.5	1.8		R-0145	61.9	2.4		R-0186	62.4	3.4

Table 8g. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 7

Receptor	Future L_{eq}24 with Combined Increase (dBA)	Diff (dBA)		Receptor	Future L_{eq}24 with Combined Increase (dBA)	Diff (dBA)		Receptor	Future L_{eq}24 with Combined Increase (dBA)	Diff (dBA)
R-0187	55.8	1.7		R-0220	62.5	2.0		R-0253	60.2	2.4
R-0188	58.2	1.5		R-0221	62.6	1.9		R-0254	60.7	2.3
R-0189	57.2	1.5		R-0222	62.7	2.0		R-0255	56.6	2.3
R-0190	57.5	1.6		R-0223	62.7	1.9		R-0256	60.2	2.4
R-0191	58.2	1.5		R-0224	62.8	1.9		R-0257	60.3	2.4
R-0192	58.7	1.5		R-0225	62.9	1.9		R-0258	60.2	2.4
R-0193	58.8	1.5		R-0226	63.2	2.0		R-0259	56.0	2.3
R-0194	58.4	1.6		R-0227	63.8	1.9		R-0260	55.8	2.5
R-0195	58.9	1.6		R-0228	63.9	2.0		R-0261	56.3	2.5
R-0196	58.5	1.5		R-0229	63.8	2.0		R-0262	55.9	2.4
R-0197	56.1	1.7		R-0230	63.7	2.1		R-0263	55.8	2.5
R-0198	58.7	1.5		R-0231	63.5	2.0		R-0264	56.5	2.5
R-0199	60.6	1.7		R-0232	63.2	2.0		R-0265	55.8	2.5
R-0200	60.9	1.7		R-0233	62.9	2.0		R-0266	55.8	2.5
R-0201	61.4	1.8		R-0234	62.6	2.1		R-0267	55.7	2.5
R-0202	61.6	1.8		R-0235	62.3	2.0		R-0268	56.6	2.5
R-0203	61.8	1.8		R-0236	63.3	2.1		R-0269	55.2	2.6
R-0204	62.0	1.8		R-0237	64.7	2.1		R-0270	57.1	2.5
R-0205	62.1	1.9		R-0238	63.7	2.1		R-0271	55.9	2.5
R-0206	59.0	1.9		R-0239	59.2	2.1		R-0272	55.6	2.6
R-0207	61.6	1.9		R-0240	58.8	2.0		R-0273	55.8	2.6
R-0208	60.8	1.9		R-0241	58.2	2.1		R-0274	55.0	2.7
R-0209	59.6	1.8		R-0242	58.1	2.1		R-0275	56.2	2.7
R-0210	61.8	1.9		R-0243	57.8	2.1		R-0276	54.2	2.8
R-0211	59.5	1.9		R-0244	57.8	2.2		R-0277	55.5	2.9
R-0212	62.2	1.9		R-0245	57.8	2.1		R-0278	54.8	2.9
R-0213	62.1	1.9		R-0246	58.3	2.2		R-0279	54.8	3.0
R-0214	61.9	1.9		R-0247	61.3	2.3		R-0280	54.6	3.0
R-0215	62.0	1.9		R-0248	61.7	2.3		R-0281	54.7	2.9
R-0216	62.1	1.9		R-0249	60.6	2.2		R-0282	55.7	2.6
R-0217	62.2	1.9		R-0250	60.5	2.3		R-0283	56.0	2.0
R-0218	62.3	1.9		R-0251	59.9	2.2				
R-0219	62.4	1.9		R-0252	60.0	2.3				

Table 8h. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 8

Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)
R-0284	62.5	3.5		R-0317	62.9	2.4		R-0350	56.0	2.5
R-0285	62.3	3.4		R-0318	62.6	2.4		R-0351	56.3	2.5
R-0286	62.7	3.4		R-0319	62.0	2.4		R-0352	56.8	2.5
R-0287	62.1	3.4		R-0320	61.2	2.4		R-0353	57.7	2.5
R-0288	62.0	3.4		R-0321	60.2	2.4		R-0354	59.5	2.5
R-0289	61.5	3.3		R-0322	59.9	2.4		R-0355	62.2	2.6
R-0290	61.4	3.1		R-0323	60.1	2.4		R-0356	62.4	2.6
R-0291	59.1	2.9		R-0324	59.9	2.4		R-0357	65.0	2.5
R-0292	58.9	2.8		R-0325	58.1	2.5		R-0358	66.7	2.6
R-0293	58.7	2.8		R-0326	58.8	2.4		R-0359	67.3	2.6
R-0294	58.0	2.8		R-0327	60.0	2.4		R-0360	67.1	2.6
R-0295	57.9	2.8		R-0328	60.3	2.4		R-0361	68.5	2.5
R-0296	58.3	2.8		R-0329	59.0	2.4		R-0362	68.8	2.5
R-0297	58.9	2.8		R-0330	59.5	2.5		R-0363	69.5	2.4
R-0298	60.2	2.7		R-0331	60.1	2.4		R-0364	69.5	2.5
R-0299	59.7	2.7		R-0332	60.9	2.4		R-0365	69.2	2.5
R-0300	59.3	2.6		R-0333	59.4	2.4		R-0366	70.4	2.5
R-0301	58.3	2.7		R-0334	62.9	2.5		R-0367	70.0	2.5
R-0302	58.7	2.7		R-0335	64.2	2.4		R-0368	69.5	2.5
R-0303	58.9	2.6		R-0336	63.8	2.4		R-0369	70.8	2.5
R-0304	58.8	2.6		R-0337	62.8	2.4		R-0370	71.2	2.5
R-0305	58.3	2.7		R-0338	61.0	2.4		R-0371	70.9	2.5
R-0306	60.3	2.5		R-0339	60.2	2.4		R-0372	69.6	2.5
R-0307	60.0	2.5		R-0340	59.6	2.5		R-0373	69.4	2.5
R-0308	59.9	2.5		R-0341	58.8	2.4		R-0374	68.5	2.5
R-0309	59.5	2.5		R-0342	58.9	2.5		R-0375	66.5	2.7
R-0310	59.0	2.4		R-0343	59.1	2.5		R-0376	66.5	2.8
R-0311	59.5	2.5		R-0344	58.9	2.4		R-0377	67.2	3.5
R-0312	61.8	2.4		R-0345	58.8	2.5		R-0378	67.7	3.5
R-0313	62.4	2.4		R-0346	58.8	2.4		R-0379	67.3	3.7
R-0314	62.8	2.4		R-0347	58.5	2.5		R-0380	67.0	3.7
R-0315	63.1	2.4		R-0348	57.5	2.5		R-0381	67.0	4.0
R-0316	63.1	2.4		R-0349	57.1	2.5				

Table 8i. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 9

Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)
R-0382	64.2	3.3		R-0425	62.8	2.5		R-0468	60.4	2.7
R-0383	63.9	3.3		R-0426	62.8	2.5		R-0469	60.3	2.7
R-0384	63.1	3.2		R-0427	62.2	2.5		R-0470	60.3	2.6
R-0385	65.6	3.3		R-0428	62.2	2.5		R-0471	62.5	2.7
R-0386	64.2	3.3		R-0429	61.7	2.5		R-0472	60.3	2.7
R-0387	65.7	3.3		R-0430	66.0	2.5		R-0473	60.5	2.7
R-0388	67.0	3.2		R-0431	65.8	2.5		R-0474	60.0	2.7
R-0389	67.1	3.1		R-0432	61.1	2.5		R-0475	60.1	2.7
R-0390	67.8	3.1		R-0433	60.5	2.5		R-0476	60.5	2.7
R-0391	67.4	3.1		R-0434	60.2	2.5		R-0477	60.2	2.7
R-0392	67.4	2.8		R-0435	60.4	2.6		R-0478	60.4	2.7
R-0393	65.5	2.7		R-0436	60.9	2.5		R-0479	60.0	2.8
R-0394	63.0	2.7		R-0437	60.4	2.5		R-0480	60.5	2.7
R-0395	62.9	3.0		R-0438	60.2	2.5		R-0481	60.1	2.8
R-0396	62.8	2.8		R-0439	60.9	2.5		R-0482	60.6	2.7
R-0397	62.3	2.8		R-0440	61.1	2.5		R-0483	60.8	2.7
R-0398	62.5	2.7		R-0441	61.0	2.5		R-0484	60.3	2.8
R-0399	62.7	2.7		R-0442	60.8	2.6		R-0485	59.9	2.8
R-0400	65.8	2.5		R-0443	60.5	2.5		R-0486	60.2	2.8
R-0401	67.2	2.5		R-0444	61.3	2.6		R-0487	60.2	2.9
R-0402	67.1	2.5		R-0445	62.6	2.5		R-0488	60.9	2.9
R-0403	68.0	2.5		R-0446	63.3	2.5		R-0489	60.7	3.0
R-0404	67.1	2.5		R-0447	63.5	2.5		R-0490	61.8	3.4
R-0405	66.6	2.5		R-0448	63.2	2.5		R-0491	62.1	3.6
R-0406	67.7	2.5		R-0449	62.9	2.6		R-0492	61.9	3.5
R-0407	66.3	2.5		R-0450	62.5	2.5		R-0493	59.3	3.6
R-0408	67.0	2.5		R-0451	62.3	2.6		R-0494	56.0	3.0
R-0409	67.1	2.5		R-0452	62.1	2.6		R-0495	55.7	2.9
R-0410	67.0	2.5		R-0453	62.0	2.6		R-0496	56.5	3.0
R-0411	67.0	2.5		R-0454	62.5	2.6		R-0497	57.7	3.0
R-0412	67.3	2.5		R-0455	61.6	2.5		R-0498	59.1	3.2
R-0413	67.9	2.5		R-0456	61.0	2.6		R-0499	62.6	3.0
R-0414	68.3	2.5		R-0457	60.3	2.6		R-0500	61.8	2.9
R-0415	68.9	2.5		R-0458	61.7	2.6		R-0501	61.7	2.8
R-0416	68.9	2.5		R-0459	59.9	2.7		R-0502	62.4	2.7
R-0417	68.2	2.5		R-0460	59.6	2.7		R-0503	62.8	2.8
R-0418	67.9	2.5		R-0461	59.6	2.7		R-0504	61.9	2.8
R-0419	67.0	2.5		R-0462	59.6	2.7		R-0505	62.4	2.7
R-0420	67.2	2.5		R-0463	59.8	2.7		R-0506	61.8	2.8
R-0421	62.9	2.6		R-0464	61.5	2.7		R-0507	65.8	2.7
R-0422	62.3	2.5		R-0465	59.9	2.6		R-0508	62.9	2.7
R-0423	62.5	2.5		R-0466	60.1	2.7		R-0509	59.6	2.7
R-0424	62.7	2.5		R-0467	60.8	2.7				

Table 8j. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 10

Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)
R-0510	56.2	2.1		R-0551	55.8	2.4		R-0592	61.2	2.5
R-0511	55.5	2.9		R-0552	56.9	2.4		R-0593	61.0	2.6
R-0512	55.7	2.9		R-0553	56.8	2.4		R-0594	60.6	2.5
R-0513	56.2	2.9		R-0554	59.5	2.4		R-0595	59.9	2.5
R-0514	57.5	3.0		R-0555	59.3	2.4		R-0596	59.5	2.5
R-0515	56.8	2.8		R-0556	59.3	2.5		R-0597	58.2	2.6
R-0516	55.0	2.9		R-0557	59.2	2.4		R-0598	59.7	2.6
R-0517	54.0	2.9		R-0558	59.3	2.4		R-0599	59.8	2.5
R-0518	54.1	2.8		R-0559	59.6	2.4		R-0600	60.2	2.6
R-0519	54.5	2.8		R-0560	59.5	2.4		R-0601	58.0	2.6
R-0520	54.3	2.6		R-0561	59.5	2.4		R-0602	65.5	2.6
R-0521	54.6	2.5		R-0562	59.0	2.4		R-0603	65.8	2.6
R-0522	56.5	2.5		R-0563	59.3	2.4		R-0604	65.9	2.6
R-0523	56.2	2.5		R-0564	59.3	2.4		R-0605	65.9	2.6
R-0524	55.5	2.5		R-0565	60.1	2.4		R-0606	65.6	2.6
R-0525	55.2	2.5		R-0566	61.0	2.5		R-0607	64.6	2.6
R-0526	55.3	2.5		R-0567	61.6	2.4		R-0608	63.8	2.5
R-0527	55.4	2.5		R-0568	62.4	2.4		R-0609	63.6	2.6
R-0528	55.5	2.5		R-0569	63.5	2.4		R-0610	63.8	2.6
R-0529	56.9	2.5		R-0570	65.0	2.5		R-0611	64.2	2.5
R-0530	56.4	2.5		R-0571	66.2	2.5		R-0612	63.8	2.6
R-0531	56.0	2.5		R-0572	65.8	2.4		R-0613	63.3	2.7
R-0532	56.0	2.4		R-0573	65.4	2.5		R-0614	63.9	2.6
R-0533	55.6	2.5		R-0574	65.1	2.5		R-0615	64.3	2.6
R-0534	60.0	2.4		R-0575	63.1	2.5		R-0616	64.2	2.7
R-0535	60.4	2.4		R-0576	64.5	2.4		R-0617	64.2	2.7
R-0536	59.4	2.4		R-0577	61.4	2.4		R-0618	63.8	2.9
R-0537	60.7	2.4		R-0578	61.0	2.4		R-0619	63.7	2.9
R-0538	60.9	2.4		R-0579	63.3	2.5		R-0620	63.0	3.0
R-0539	61.2	2.4		R-0580	63.7	2.5		R-0621	62.5	3.1
R-0540	61.2	2.4		R-0581	63.4	2.5		R-0622	62.3	3.2
R-0541	55.6	2.4		R-0582	61.3	2.5		R-0623	64.1	3.3
R-0542	56.2	2.4		R-0583	60.3	2.6		R-0624	64.0	3.3
R-0543	55.3	2.5		R-0584	60.0	2.5		R-0625	64.6	3.3
R-0544	55.8	2.4		R-0585	61.1	2.5		R-0626	64.7	3.4
R-0545	56.3	2.5		R-0586	60.2	2.5		R-0627	66.1	3.3
R-0546	56.6	2.4		R-0587	64.5	2.5		R-0628	65.8	3.4
R-0547	56.3	2.5		R-0588	65.0	2.5		R-0629	66.2	3.4
R-0548	55.6	2.4		R-0589	62.1	2.6		R-0630	66.5	3.3
R-0549	56.7	2.4		R-0590	62.0	2.5				
R-0550	56.6	2.5		R-0591	61.4	2.5				

Table 8k. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 11

Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)
R-0631	64.5	3.0		R-0675	61.8	2.5		R-0719	61.6	2.7
R-0632	64.3	3.1		R-0676	61.7	2.5		R-0720	61.5	2.7
R-0633	63.1	3.1		R-0677	61.5	2.5		R-0721	61.4	2.7
R-0634	62.7	3.1		R-0678	61.4	2.5		R-0722	59.3	2.6
R-0635	62.5	3.1		R-0679	61.5	2.5		R-0723	59.1	2.7
R-0636	62.7	3.1		R-0680	61.4	2.5		R-0724	58.8	2.7
R-0637	63.2	3.2		R-0681	61.5	2.5		R-0725	59.9	2.7
R-0638	63.2	3.1		R-0682	61.5	2.5		R-0726	60.0	2.8
R-0639	63.6	3.1		R-0683	61.5	2.5		R-0727	59.8	2.7
R-0640	62.5	3.0		R-0684	61.6	2.4		R-0728	58.2	2.8
R-0641	64.3	2.9		R-0685	61.7	2.5		R-0729	57.9	2.8
R-0642	64.4	2.9		R-0686	61.9	2.5		R-0730	57.8	2.8
R-0643	64.2	2.9		R-0687	62.2	2.4		R-0731	58.2	2.9
R-0644	64.0	2.8		R-0688	62.6	2.5		R-0732	58.2	2.8
R-0645	63.9	2.7		R-0689	62.8	2.5		R-0733	60.1	3.2
R-0646	63.9	2.7		R-0690	63.1	2.5		R-0734	62.1	3.6
R-0647	64.0	2.6		R-0691	63.3	2.5		R-0735	61.6	3.7
R-0648	64.2	2.7		R-0692	63.6	2.5		R-0736	61.6	3.8
R-0649	65.0	2.5		R-0693	63.9	2.5		R-0737	61.7	3.8
R-0650	64.6	2.6		R-0694	62.4	2.5		R-0738	61.3	3.7
R-0651	63.2	2.5		R-0695	60.9	2.5		R-0739	61.6	3.7
R-0652	63.2	2.6		R-0696	61.3	2.5		R-0740	61.9	3.7
R-0653	62.8	2.6		R-0697	59.5	2.5		R-0741	62.2	3.6
R-0654	61.1	2.6		R-0698	61.7	2.5		R-0742	61.2	3.6
R-0655	59.7	2.6		R-0699	60.3	2.5		R-0743	60.8	3.4
R-0656	58.8	2.6		R-0700	60.0	2.5		R-0744	62.3	3.4
R-0657	58.2	2.5		R-0701	60.0	2.5		R-0745	60.8	3.2
R-0658	59.6	2.5		R-0702	60.7	2.5		R-0746	59.5	3.0
R-0659	59.0	2.5		R-0703	61.3	2.5		R-0747	59.0	3.0
R-0660	59.7	2.6		R-0704	61.5	2.4		R-0748	58.0	3.0
R-0661	59.8	2.6		R-0705	60.9	2.4		R-0749	57.7	3.0
R-0662	59.8	2.6		R-0706	59.8	2.5		R-0750	57.2	2.9
R-0663	59.7	2.5		R-0707	60.3	2.6		R-0751	56.5	2.9
R-0664	59.7	2.5		R-0708	61.4	2.6		R-0752	56.4	2.8
R-0665	59.5	2.5		R-0709	62.1	2.6		R-0753	56.1	2.8
R-0666	59.7	2.5		R-0710	62.3	2.6		R-0754	56.4	2.8
R-0667	58.6	2.5		R-0711	61.7	2.6		R-0755	57.1	2.7
R-0668	58.8	2.5		R-0712	61.6	2.6		R-0756	58.7	2.7
R-0669	60.3	2.5		R-0713	61.6	2.6		R-0757	60.9	2.7
R-0670	61.1	2.5		R-0714	61.7	2.7		R-0758	58.8	2.7
R-0671	61.3	2.5		R-0715	61.6	2.7		R-0759	57.7	2.7
R-0672	61.4	2.5		R-0716	61.6	2.7		R-0760	56.4	2.6
R-0673	61.7	2.5		R-0717	61.6	2.7		R-0761	56.9	2.7
R-0674	61.5	2.5		R-0718	61.6	2.7				

Table 8l. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 12

Receptor	Future L_{eq}24 with Combined Increase (dBA)	Diff (dBA)
R-0762	60.8	2.6
R-0763	62.2	2.7
R-0764	62.6	2.7
R-0765	62.6	2.7
R-0766	62.5	2.7
R-0767	62.5	2.8
R-0768	62.2	2.8
R-0769	61.7	2.7
R-0770	60.6	2.7
R-0771	59.7	2.8
R-0772	59.0	2.8
R-0773	59.5	2.8
R-0774	58.9	2.8
R-0775	58.5	2.9
R-0776	57.2	3.0
R-0777	57.1	3.1
R-0778	57.5	3.2
R-0779	58.2	3.3
R-0780	59.4	3.3
R-0781	61.2	3.5
R-0782	63.1	3.6
R-0783	64.7	3.5
R-0784	65.0	3.6
R-0785	65.2	3.7
R-0786	64.6	3.7
R-0787	64.4	3.8
R-0788	64.7	3.8
R-0789	64.9	3.9

Table 8m. Noise Modeling Results For Future Cumulative Sensitivity Analysis for Region 13

Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)		Receptor	Future $L_{eq}24$ with Combined Increase (dBA)	Diff (dBA)
R-0790	64.4	3.9		R-0837	57.6	2.6		R-0884	61.7	2.7
R-0791	64.8	3.8		R-0838	59.2	2.5		R-0885	61.6	2.7
R-0792	64.9	3.8		R-0839	59.0	2.6		R-0886	61.6	2.7
R-0793	64.1	3.6		R-0840	57.1	2.6		R-0887	60.9	2.7
R-0794	63.1	3.6		R-0841	60.0	2.5		R-0888	60.7	2.7
R-0795	64.3	3.5		R-0842	61.3	2.6		R-0889	60.0	2.5
R-0796	58.4	3.4		R-0843	61.8	2.6		R-0890	60.4	2.6
R-0797	58.9	3.5		R-0844	62.2	2.5		R-0891	60.7	2.6
R-0798	58.7	3.4		R-0845	62.5	2.6		R-0892	61.3	2.5
R-0799	58.2	3.3		R-0846	61.4	2.5		R-0893	61.5	2.5
R-0800	56.4	3.2		R-0847	63.4	2.5		R-0894	61.3	2.5
R-0801	55.5	2.9		R-0848	61.2	2.5		R-0895	62.4	2.5
R-0802	55.6	3.0		R-0849	61.7	2.5		R-0896	62.5	2.4
R-0803	55.1	2.9		R-0850	58.8	2.5		R-0897	62.6	2.5
R-0804	55.8	2.9		R-0851	62.6	2.5		R-0898	62.6	2.5
R-0805	55.9	2.9		R-0852	61.7	2.5		R-0899	62.8	2.5
R-0806	55.7	2.8		R-0853	61.1	2.5		R-0900	62.7	2.5
R-0807	55.7	2.8		R-0854	61.8	2.5		R-0901	62.7	2.5
R-0808	55.8	2.8		R-0855	61.8	2.6		R-0902	60.8	2.5
R-0809	56.0	2.7		R-0856	61.8	2.5		R-0903	61.4	2.6
R-0810	56.0	2.7		R-0857	61.6	2.5		R-0904	60.9	2.5
R-0811	56.2	2.7		R-0858	62.0	2.6		R-0905	59.7	2.6
R-0812	56.2	2.6		R-0859	61.8	2.6		R-0906	61.4	2.5
R-0813	56.5	2.6		R-0860	62.1	2.6		R-0907	62.4	2.6
R-0814	58.0	2.6		R-0861	62.4	2.6		R-0908	62.4	2.6
R-0815	57.3	2.6		R-0862	61.6	2.6		R-0909	62.3	2.6
R-0816	55.8	2.6		R-0863	62.2	2.6		R-0910	62.2	2.7
R-0817	56.1	2.6		R-0864	62.3	2.6		R-0911	62.0	2.7
R-0818	55.8	2.5		R-0865	61.9	2.6		R-0912	61.9	2.7
R-0819	55.8	2.6		R-0866	61.4	2.7		R-0913	62.1	2.8
R-0820	56.2	2.5		R-0867	64.0	2.7		R-0914	60.4	2.8
R-0821	56.9	2.6		R-0868	65.7	2.7		R-0915	59.8	2.8
R-0822	56.4	2.5		R-0869	63.5	3.8		R-0916	60.0	2.9
R-0823	56.6	2.6		R-0870	61.9	3.5		R-0917	59.5	2.8
R-0824	57.8	2.5		R-0871	61.4	3.6		R-0918	61.5	2.9
R-0825	57.3	2.6		R-0872	61.2	3.5		R-0919	62.1	2.9
R-0826	57.4	2.5		R-0873	62.0	3.3		R-0920	62.2	2.9
R-0827	58.7	2.5		R-0874	61.1	3.1		R-0921	63.1	3.0
R-0828	56.9	2.5		R-0875	61.0	3.1		R-0922	60.7	3.0
R-0829	57.9	2.5		R-0876	60.0	3.0		R-0923	60.5	3.0
R-0830	58.2	2.5		R-0877	59.1	2.9		R-0924	64.5	3.1
R-0831	58.3	2.5		R-0878	58.8	2.9		R-0925	64.6	3.1
R-0832	58.2	2.5		R-0879	58.3	3.0		R-0926	63.3	3.1
R-0833	57.7	2.5		R-0880	59.1	2.9		R-0927	63.4	3.1
R-0834	58.9	2.6		R-0881	59.1	2.9		R-0928	61.5	3.1
R-0835	59.0	2.6		R-0882	59.6	2.9		R-0929	62.3	3.0
R-0836	58.8	2.5		R-0883	61.2	2.8				

7.0 Conclusion

The results of the Current Conditions noise monitoring indicated noise levels which were below 65 dBA $L_{eq}24$ at most locations. At all of the noise monitoring locations, traffic noise on SEST or Deerfoot Trail or a related interchange was the dominant noise source. Note that all of the noise monitoring locations were conducted on public land within the TUC or at the TUC boundary and cannot be directly compared to the criteria of 65 dBA $L_{eq}24$.

The noise modeling results for Current Conditions matched well with the measurement results. The modeled noise levels were below the limit of 65 dBA $L_{eq}24$ at most of the residential outdoor receptor locations with the exception of the area directly east of Deerfoot Trail, in between SEST and Mckenzie Towne Blvd SE. For these locations, the dominant noise source is vehicle traffic on Deerfoot Trail.

The noise modeling results for the Future Conditions (with projected traffic volumes for the Year 2035) indicated noise levels which were still below the limit of 65 dBA $L_{eq}24$ at most locations. The locations with Future Conditions noise levels above 65 dBA $L_{eq}24$ include:

- SE of interchange between SEST and Glenmore Trail. The dominant noise source for this area is Glenmore Trail. Note that, currently, there is no acoustical shielding fence on this property.
- Locations east and west of Deerfoot Trail, between SEST and McKenzie Towne Blvd SE. At these locations, the dominant noise source is vehicle traffic on Deerfoot Trail. For those residents to the west of Deerfoot Trail, there is already a 5 m tall masonry noise wall. For those residents to the east of Deerfoot Trail, there is already an earth berm with a 1.83 m fence on top, however, there is not a tall noise barrier.

A sensitivity analysis of the traffic volumes, traffic speeds, and % heavy trucks indicated that significant individual increases to each parameter or significant increases to all three combined, would result in additional locations with noise levels at or above 65 dBA $L_{eq}24$. The locations are as follows:

- Northwest of the interchange between SEST and 17 Avenue SE. Note that, currently, the rear fences within this area are either chainlink or acoustically poor wooden fences with large gaps. Thus, there is currently no significant level of acoustical shielding provided by the existing rear fences.
- Southeast of the interchange between Glenmore Trail and SEST. The dominant noise source for this area is Glenmore Trail. Note that, currently, there is no acoustical shielding fence on this property.
- Additional locations east and west of Deerfoot Trail, between SEST and McKenzie Towne Blvd SE.

- One location northwest of the interchange between SEST and McKenzie Lake Blvd SE, at the top of the hill overlooking the River Valley. Note that, currently, there is only a solid screen wood fence on the south property line, but there is only a chainlink fence on the west property line.
- Southeast of the interchange between SEST and Deerfoot Trail.
- East of Deerfoot Trail, midway between SEST and Seton Blvd SE.
- North of Seton Blvd SE, west of Auburn Bay Gate SE.
- Northwest of the interchange between Deerfoot Trail and Cranston Avenue SE. Note there is no noise barrier at this location other than a small earth berm.
- Southeast of the interchange between SEST and Chaparral Blvd SE.
- East of Macleod Trail SE, approximately 1,070 m south of SEST. Note that the dominant noise source in this area is vehicle traffic on Macleod Trail, with the noise contribution from SEST much lower.

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 Southeast Stoney Trail in Calgary, Alberta"*. Prepared for Alberta Transportation, by aci Acoustical Consultants Inc. January, 2015.
- 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.

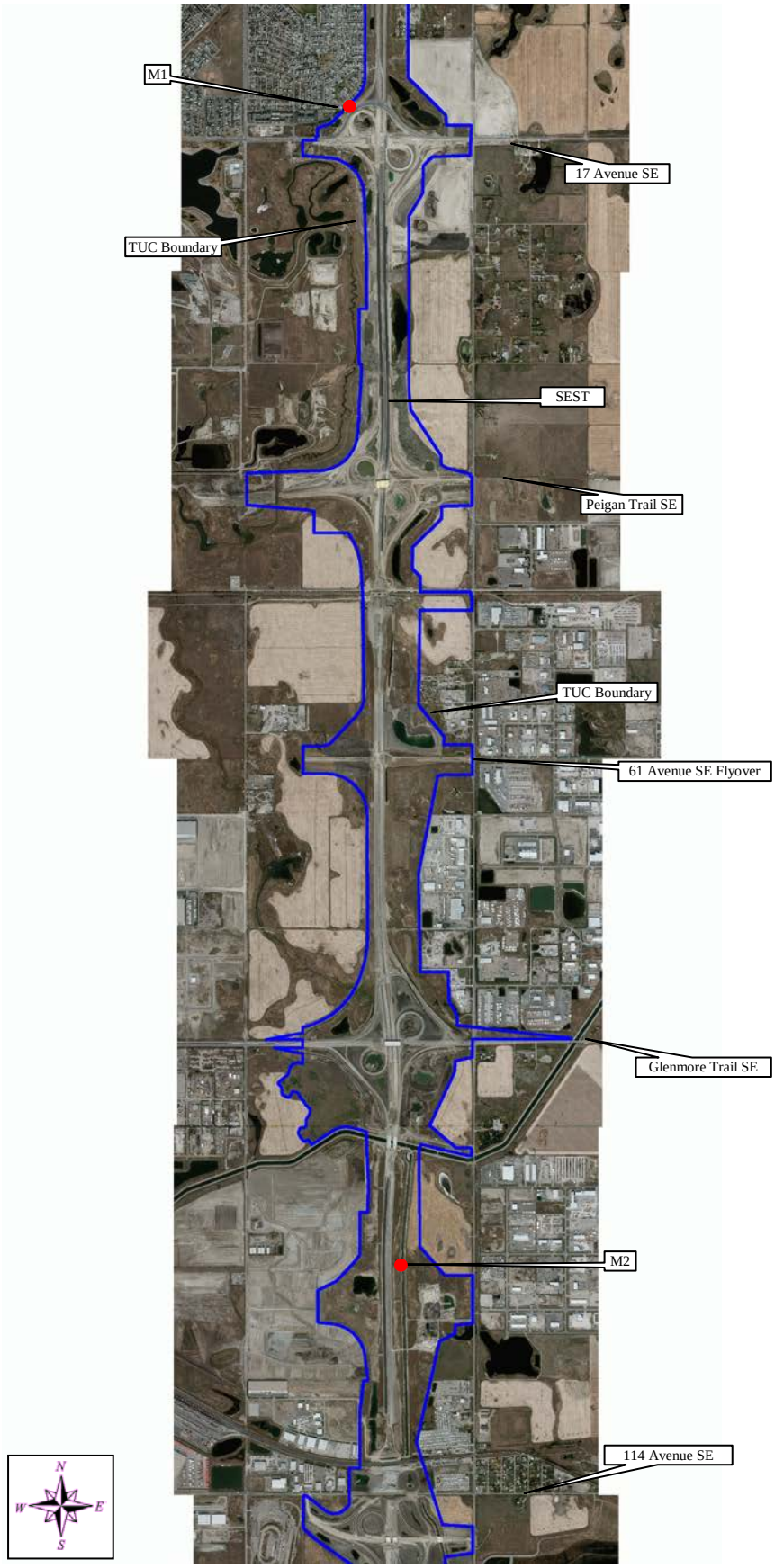


Figure 1a. Northern Study Area

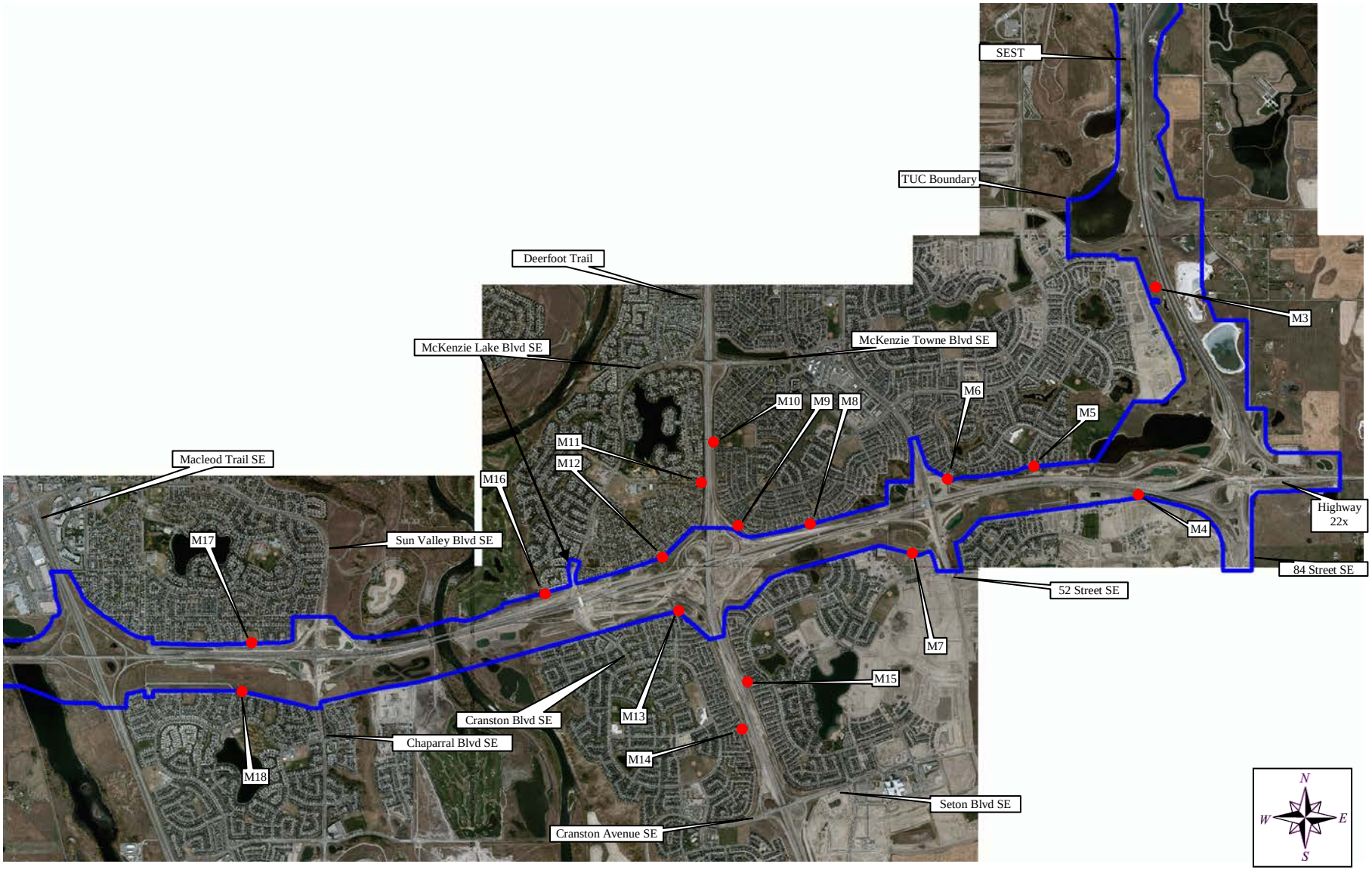


Figure 1b. Southern Study Area

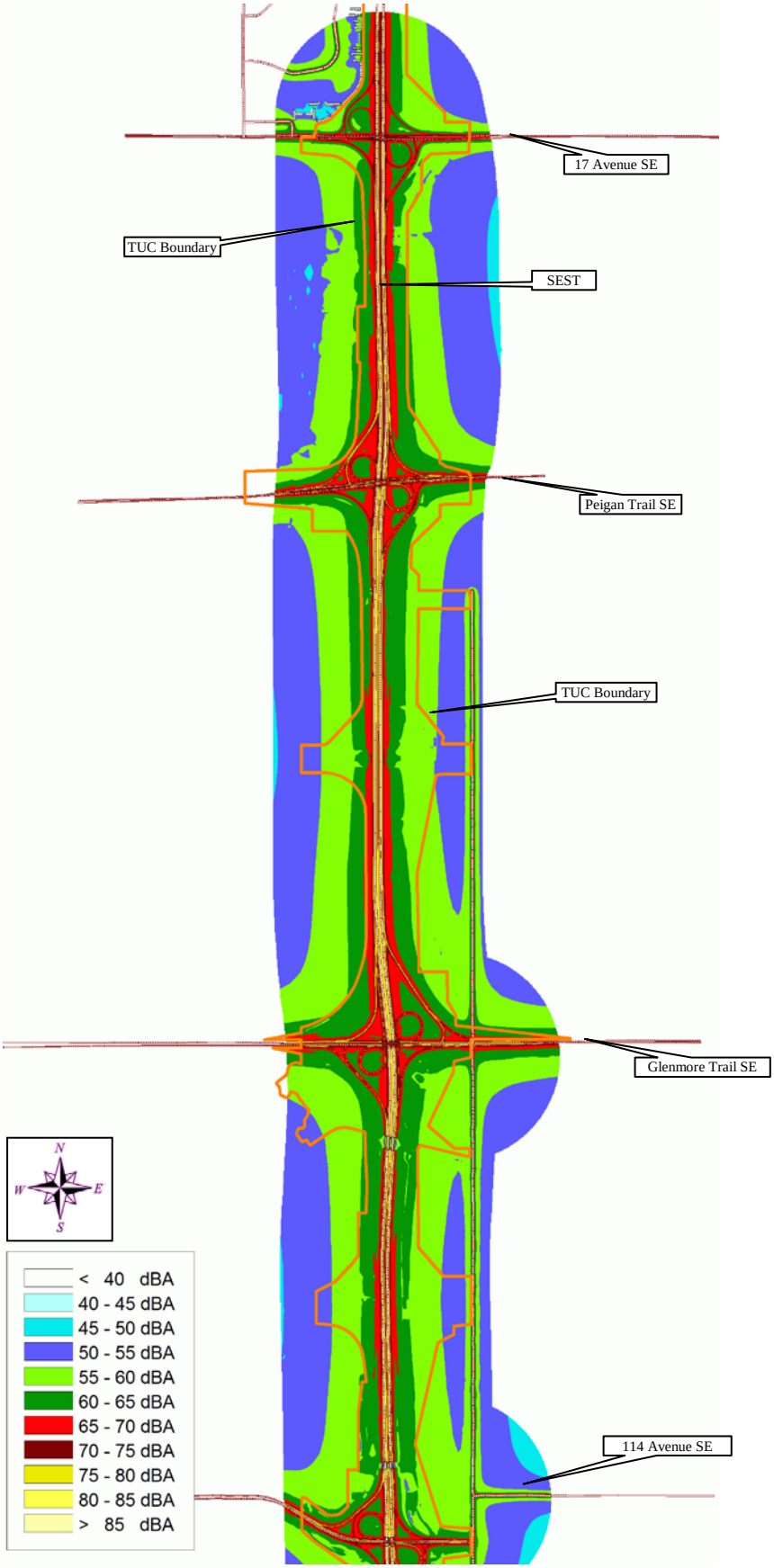


Figure 2a. Current Conditions $L_{eq}24$ Sound Levels for Northern Study Area

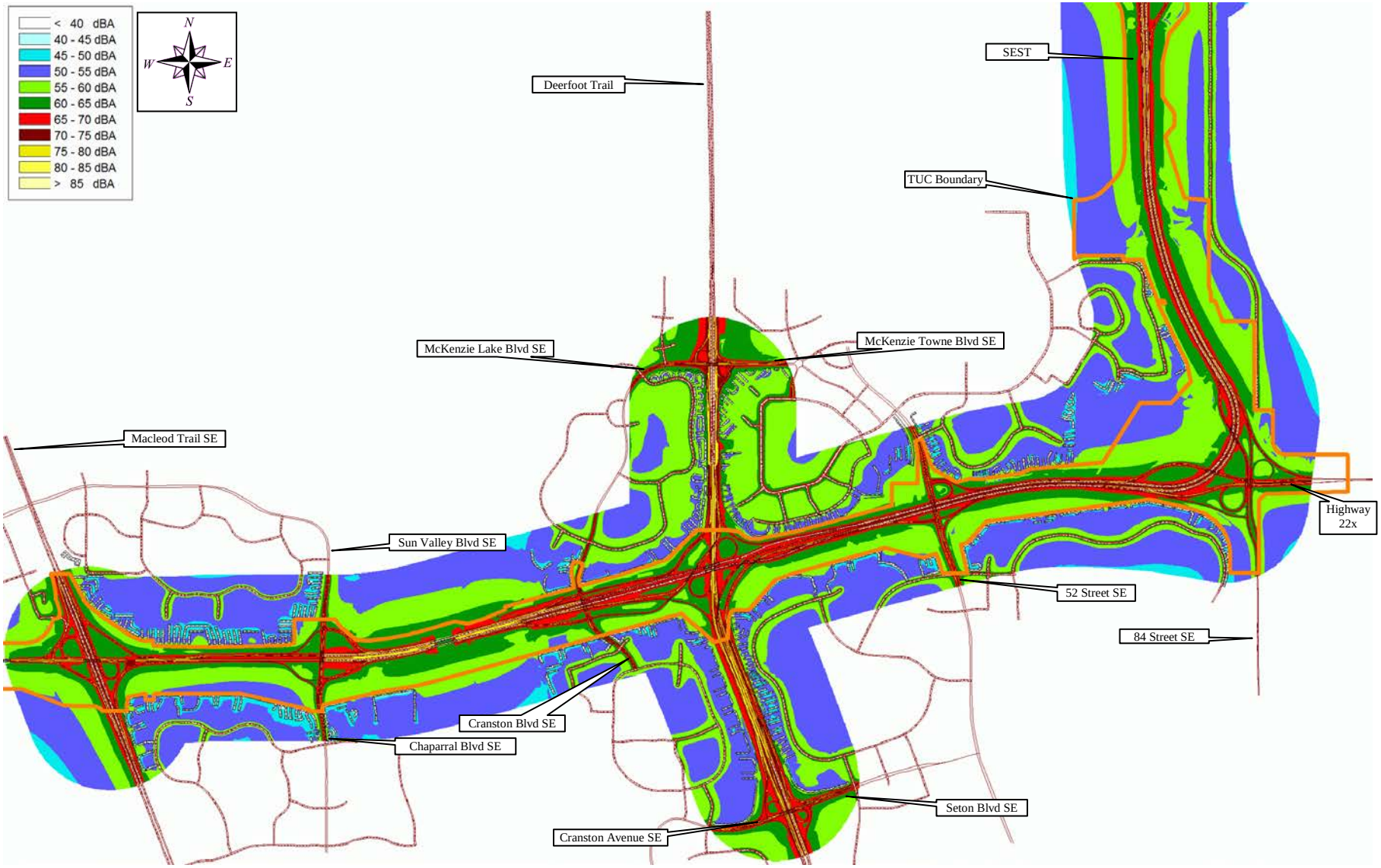


Figure 2b. Current Conditions $L_{eq}24$ Sound Levels for Southern Study Area

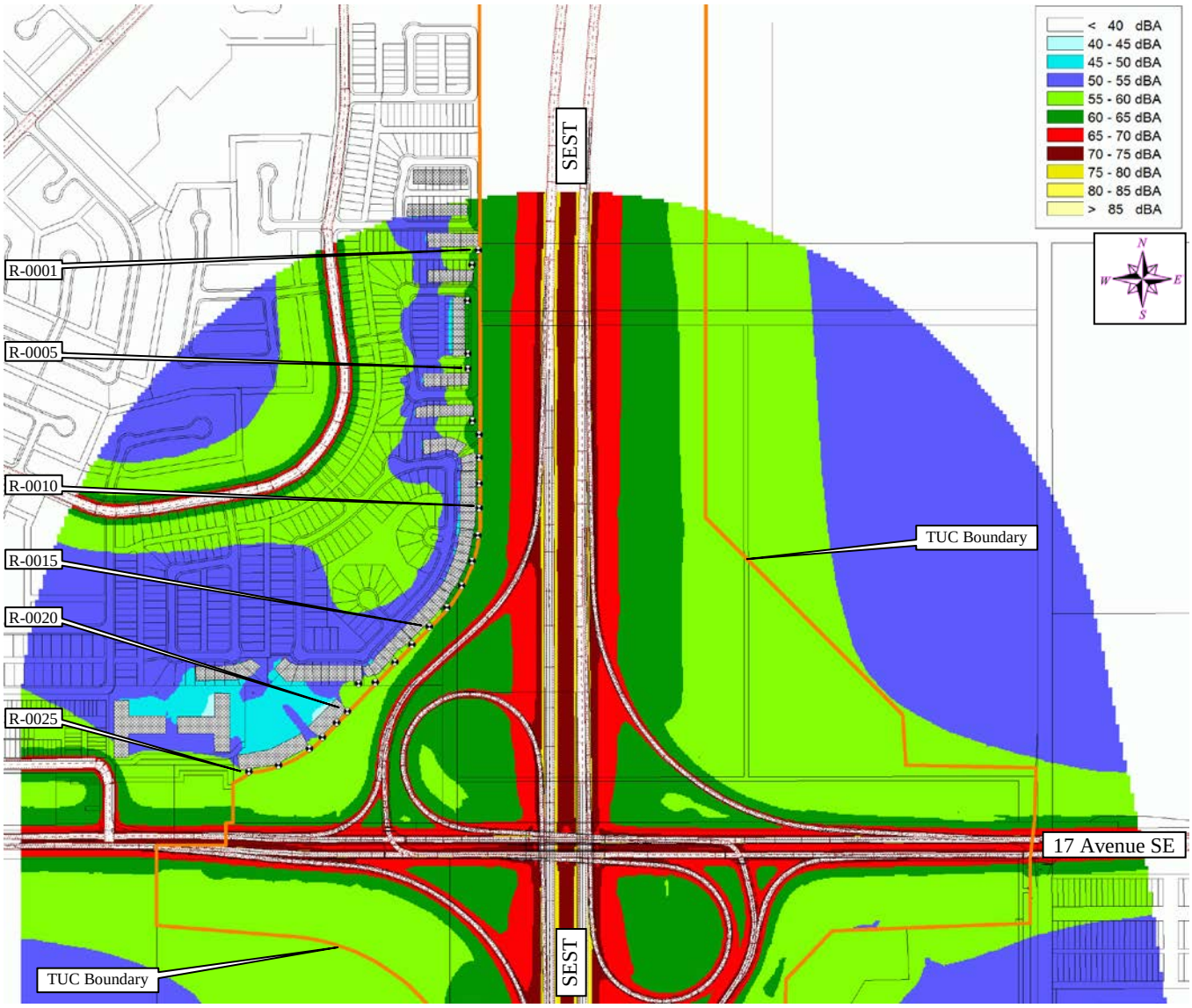


Figure 2c. Current Conditions $L_{eq}24$ Sound Levels for Region 1

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

Figure 2e. Current Conditions $L_{eq}24$ Sound Levels for Region 3

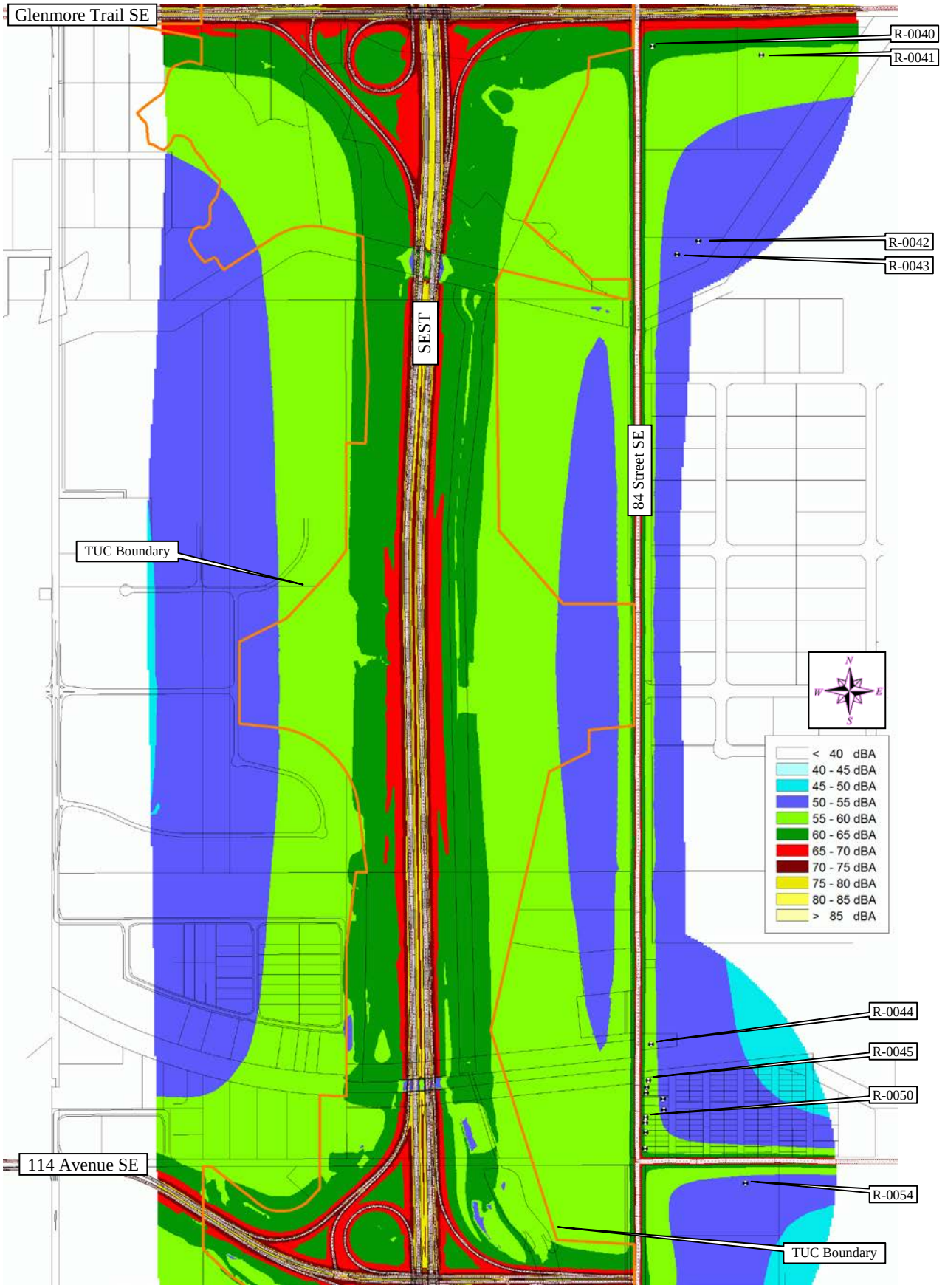


Figure 2f. Current Conditions $L_{eq}24$ Sound Levels for Region 4

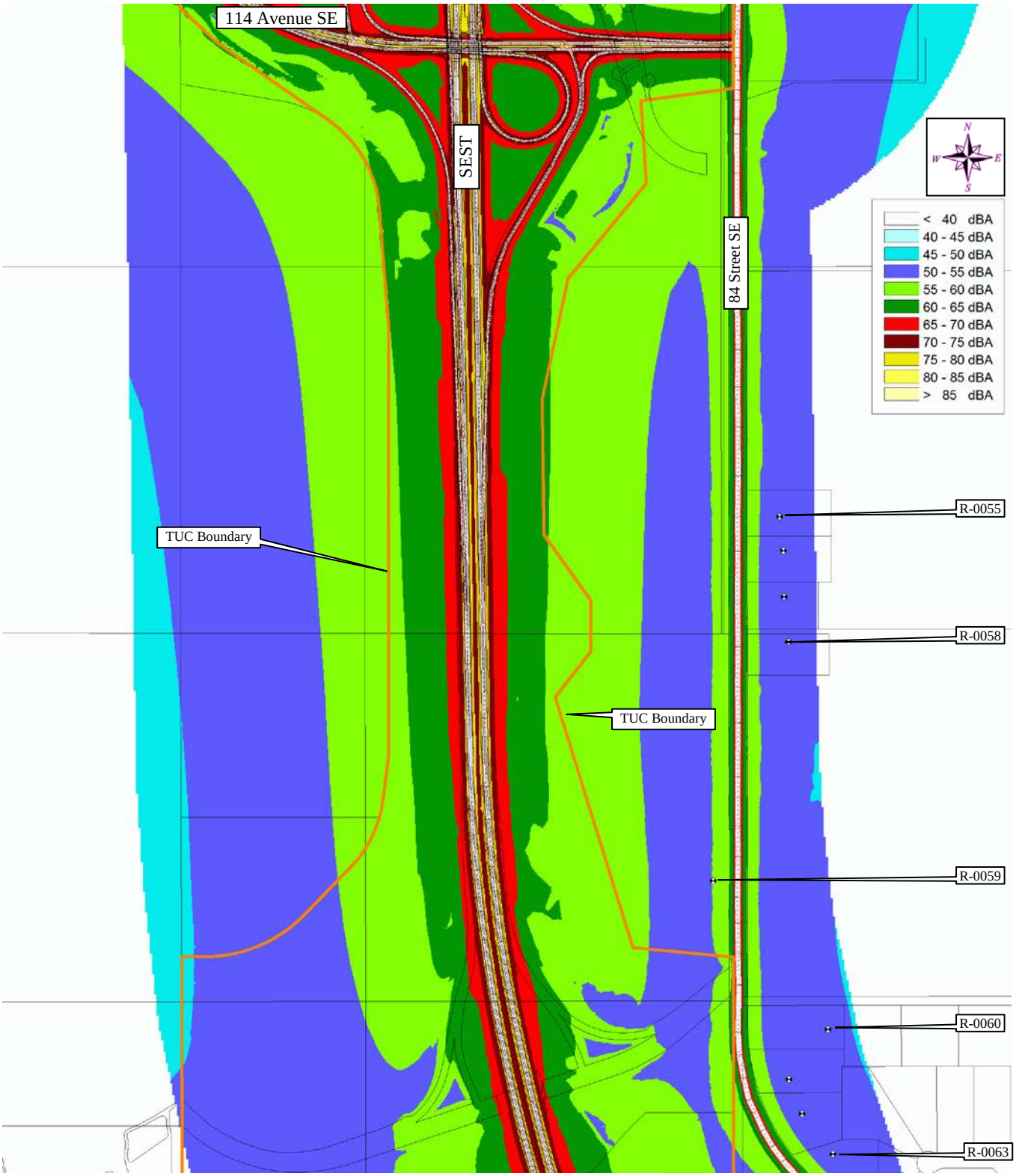


Figure 2g. Current Conditions $L_{eq}24$ Sound Levels for Region 5

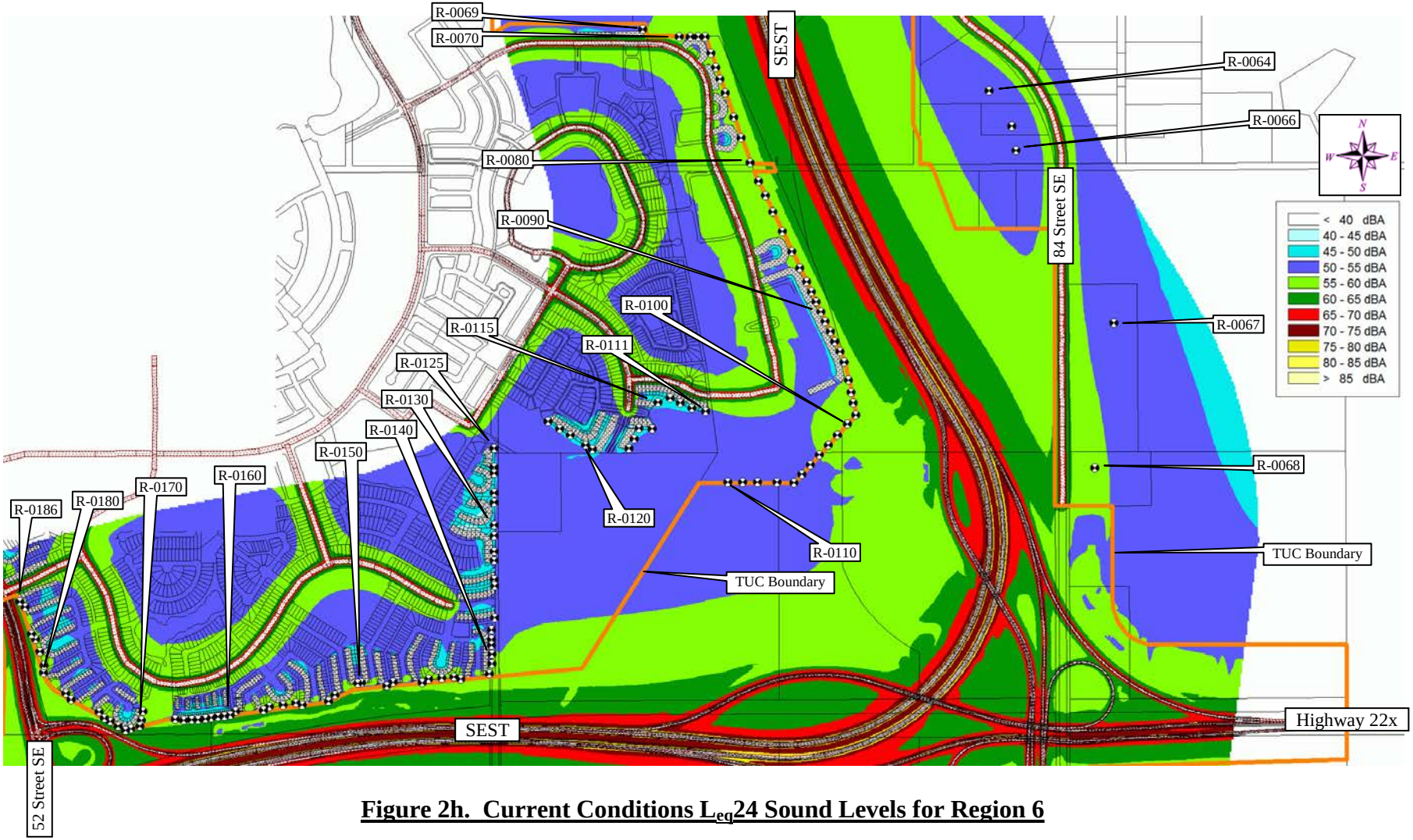


Figure 2h. Current Conditions L_{eq}24 Sound Levels for Region 6

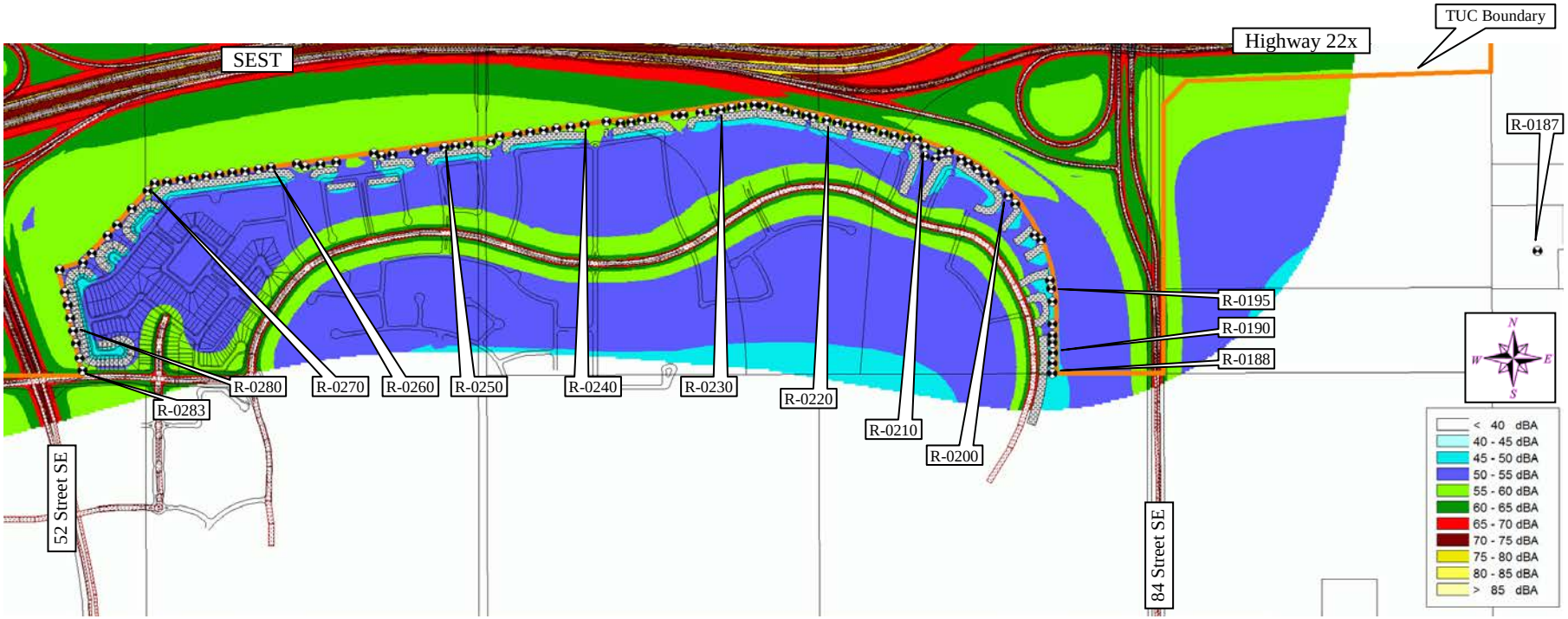


Figure 2i. Current Conditions $L_{eq}24$ Sound Levels for Region 7

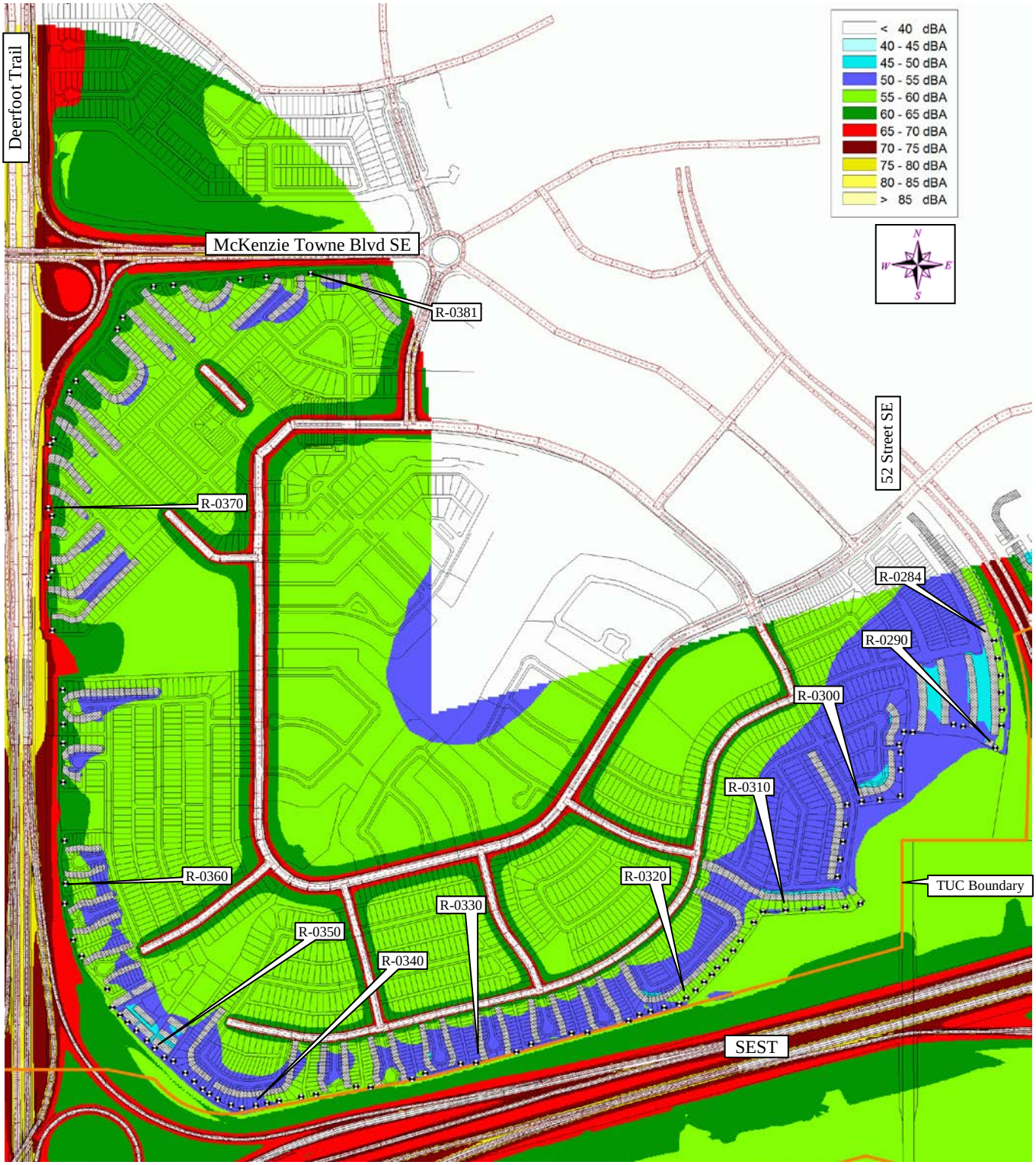


Figure 2j. Current Conditions $L_{eq}24$ Sound Levels for Region 8

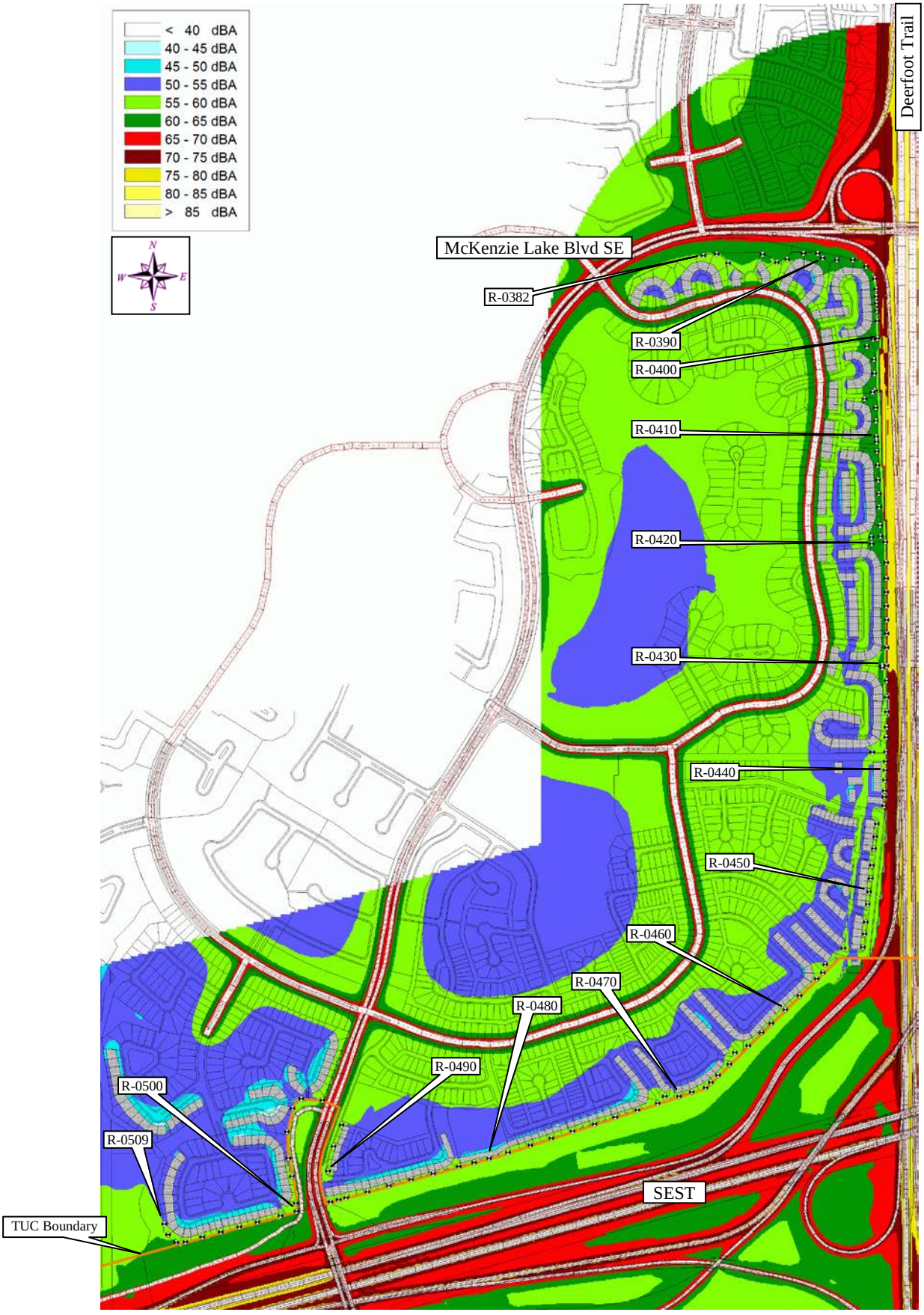


Figure 2k. Current Conditions L_{eq}24 Sound Levels for Region 9

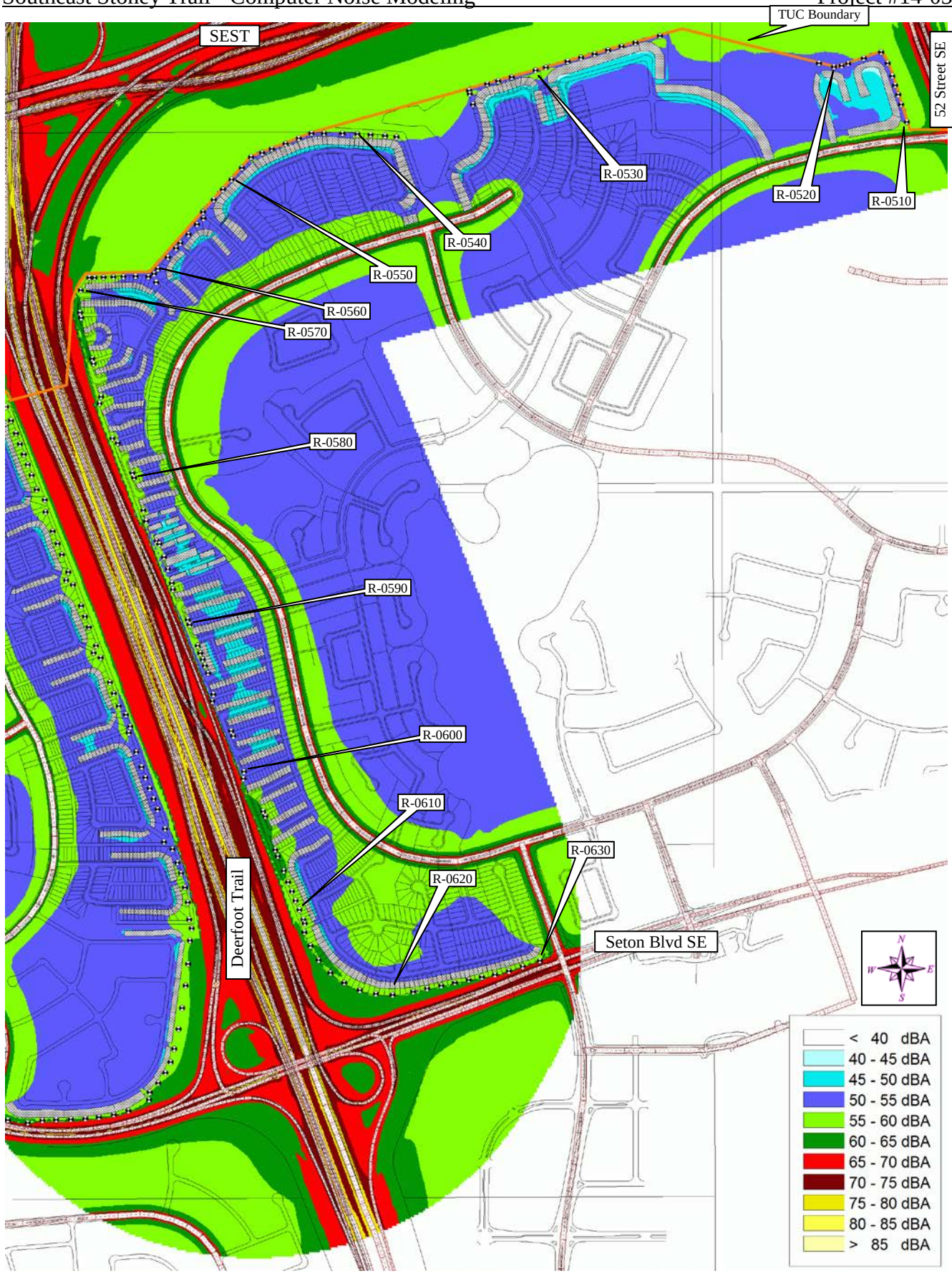


Figure 2l. Current Conditions L_{eq}24 Sound Levels for Region 10

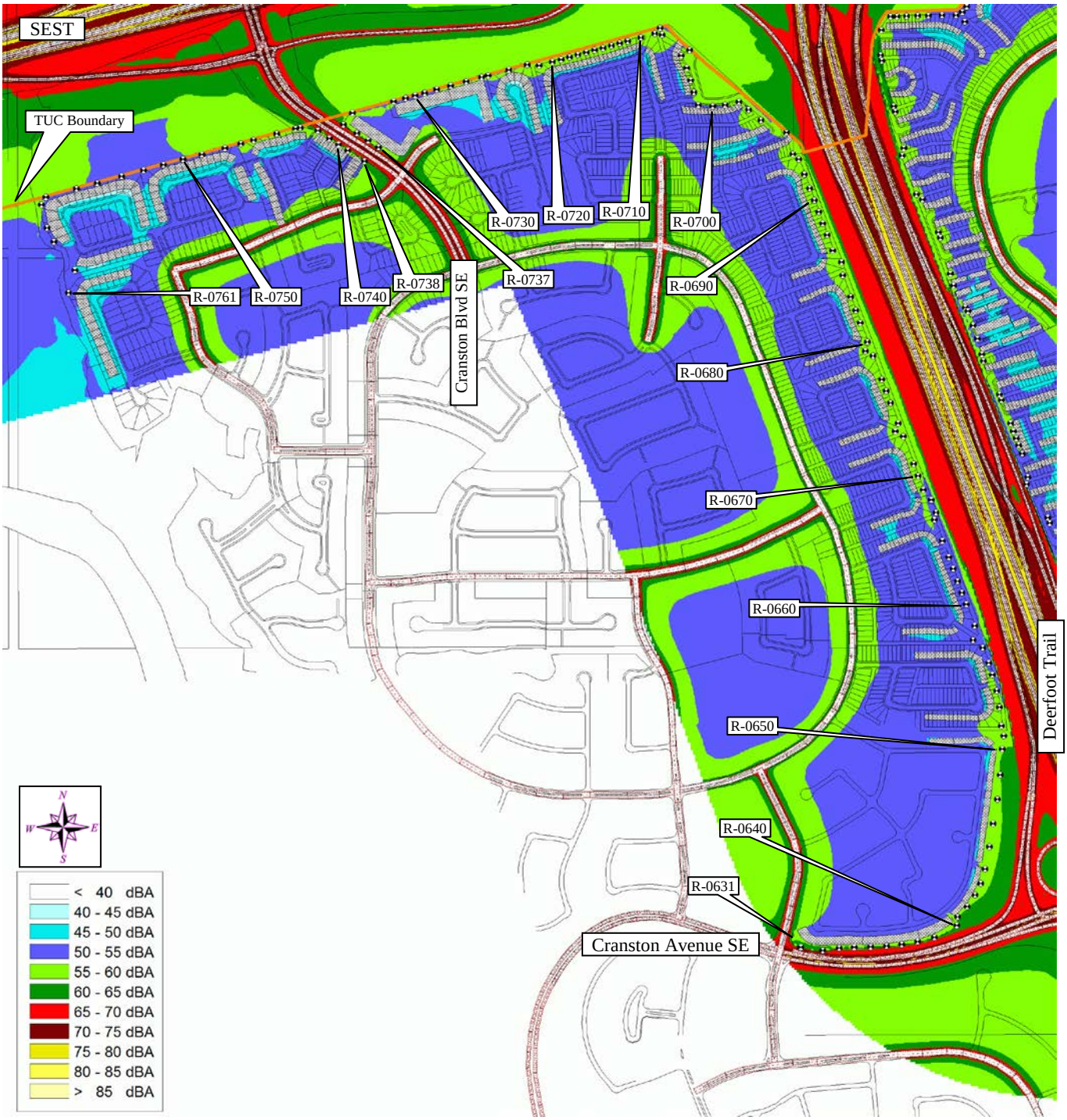


Figure 2m. Current Conditions $L_{eq}24$ Sound Levels for Region 11

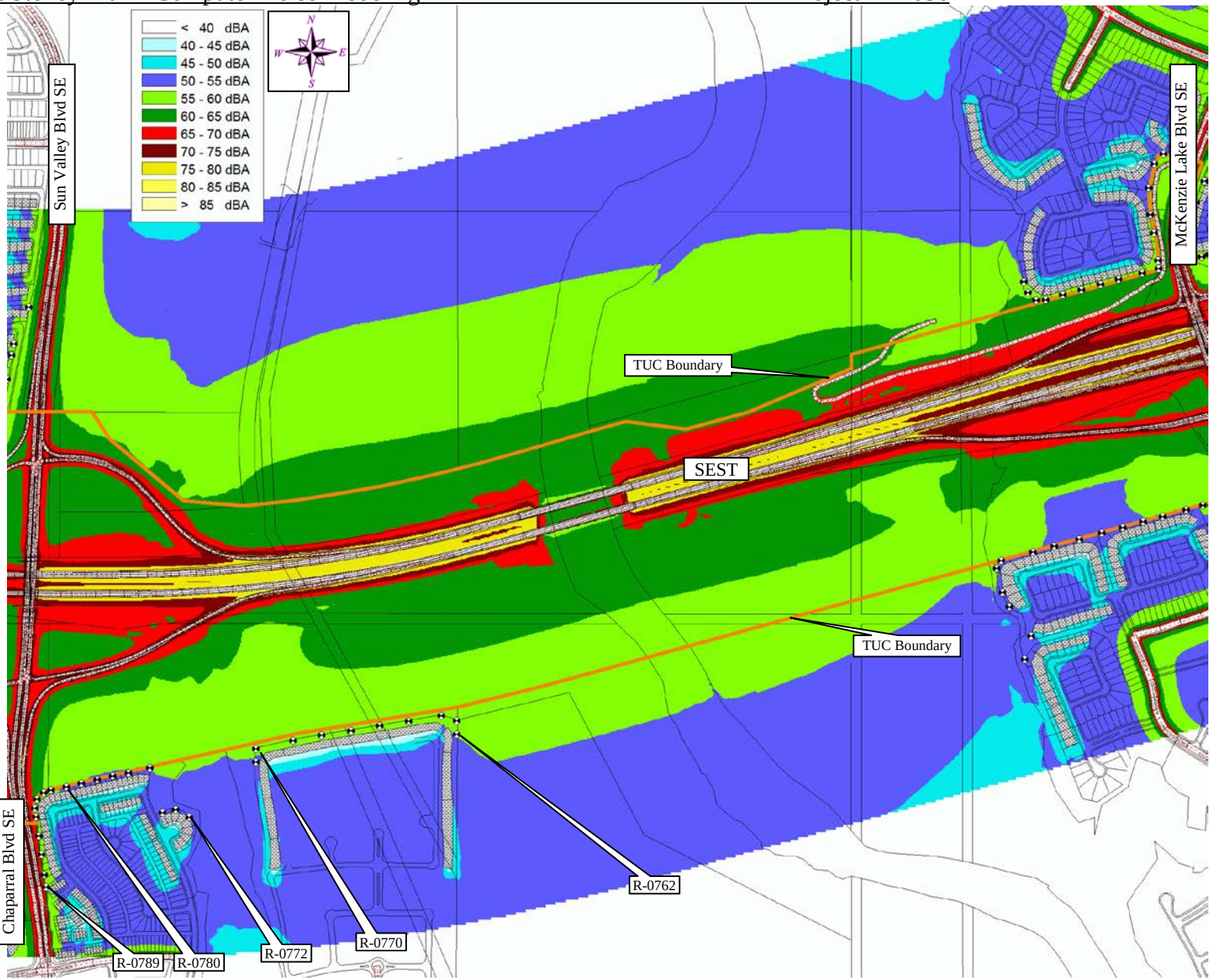


Figure 2n. Current Conditions $L_{eq}24$ Sound Levels for Region 12

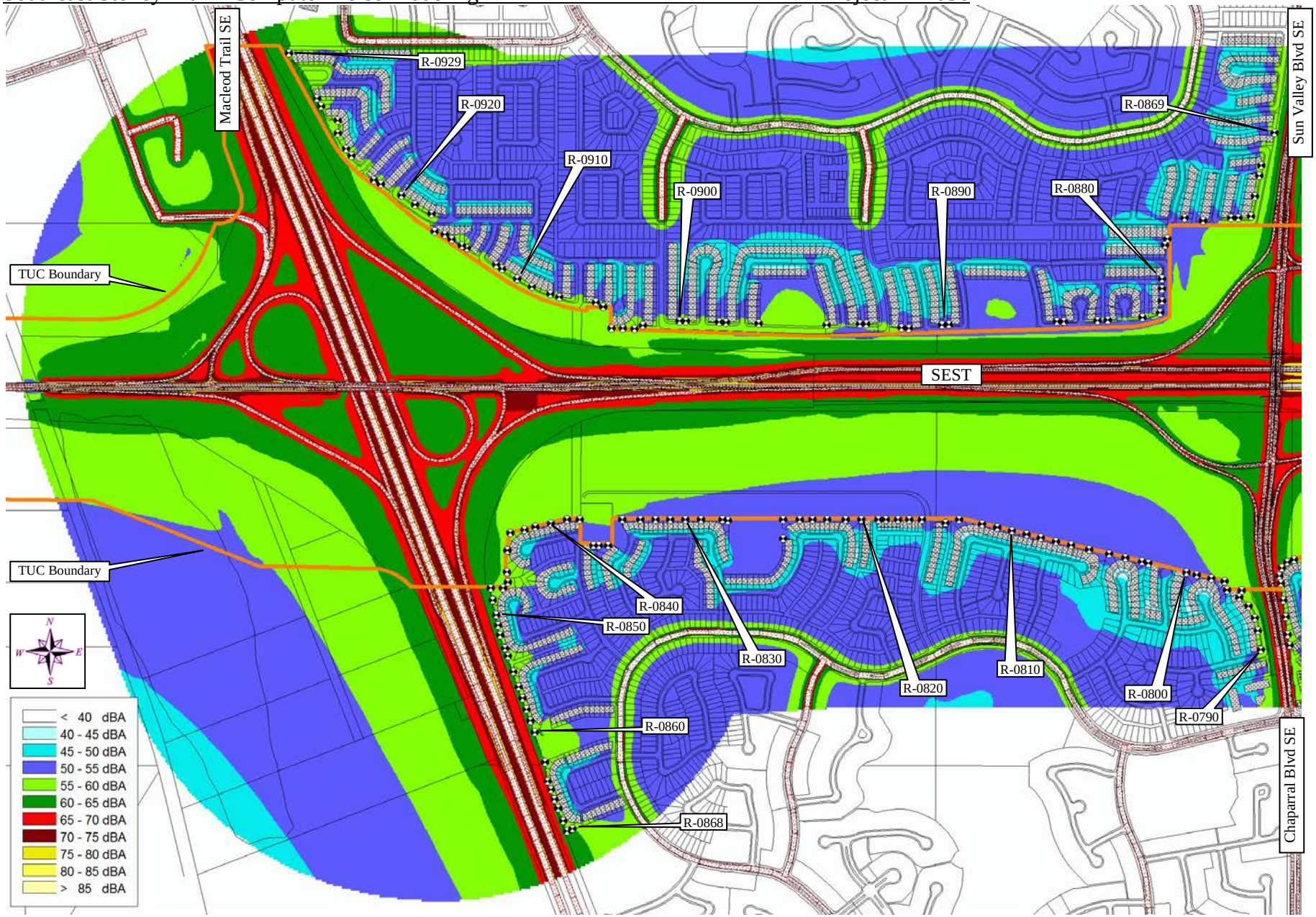


Figure 2o. Current Conditions L_{eq}24 Sound Levels for Region 13

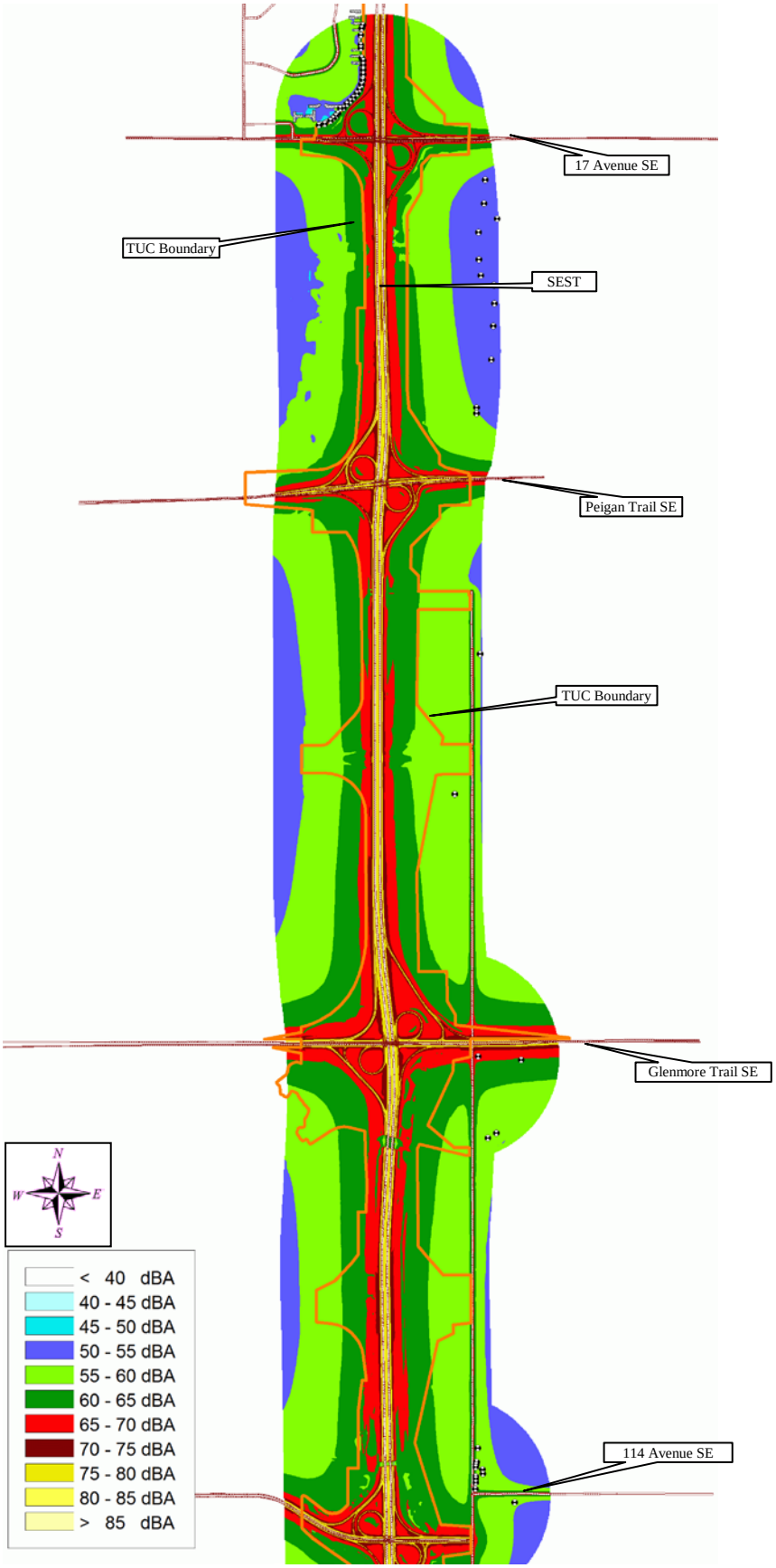


Figure 3a. Future Conditions L_{eq}24 Sound Levels for Northern Study Area

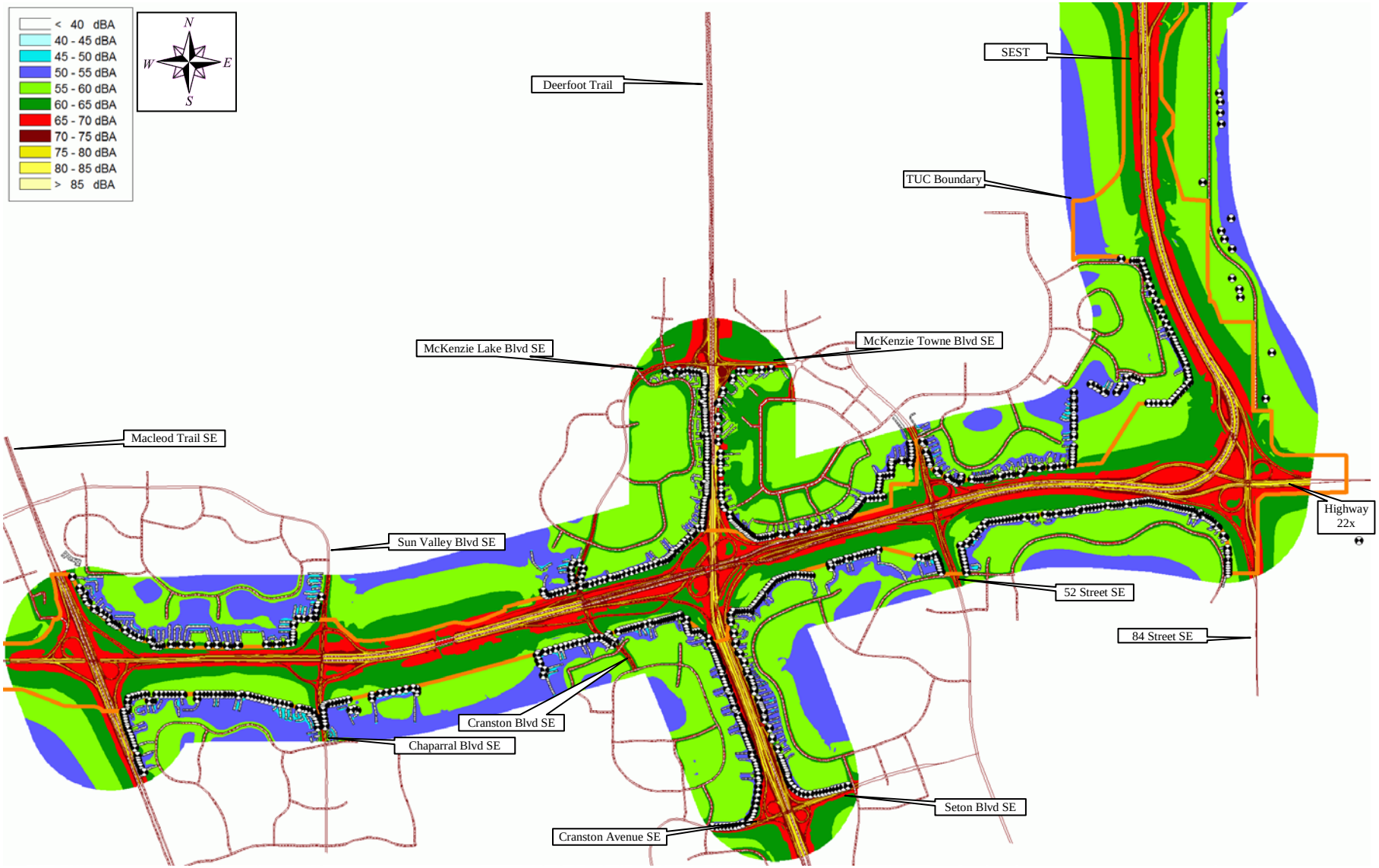


Figure 3b. Future Conditions L_{eq}24 Sound Levels for Southern Study Area

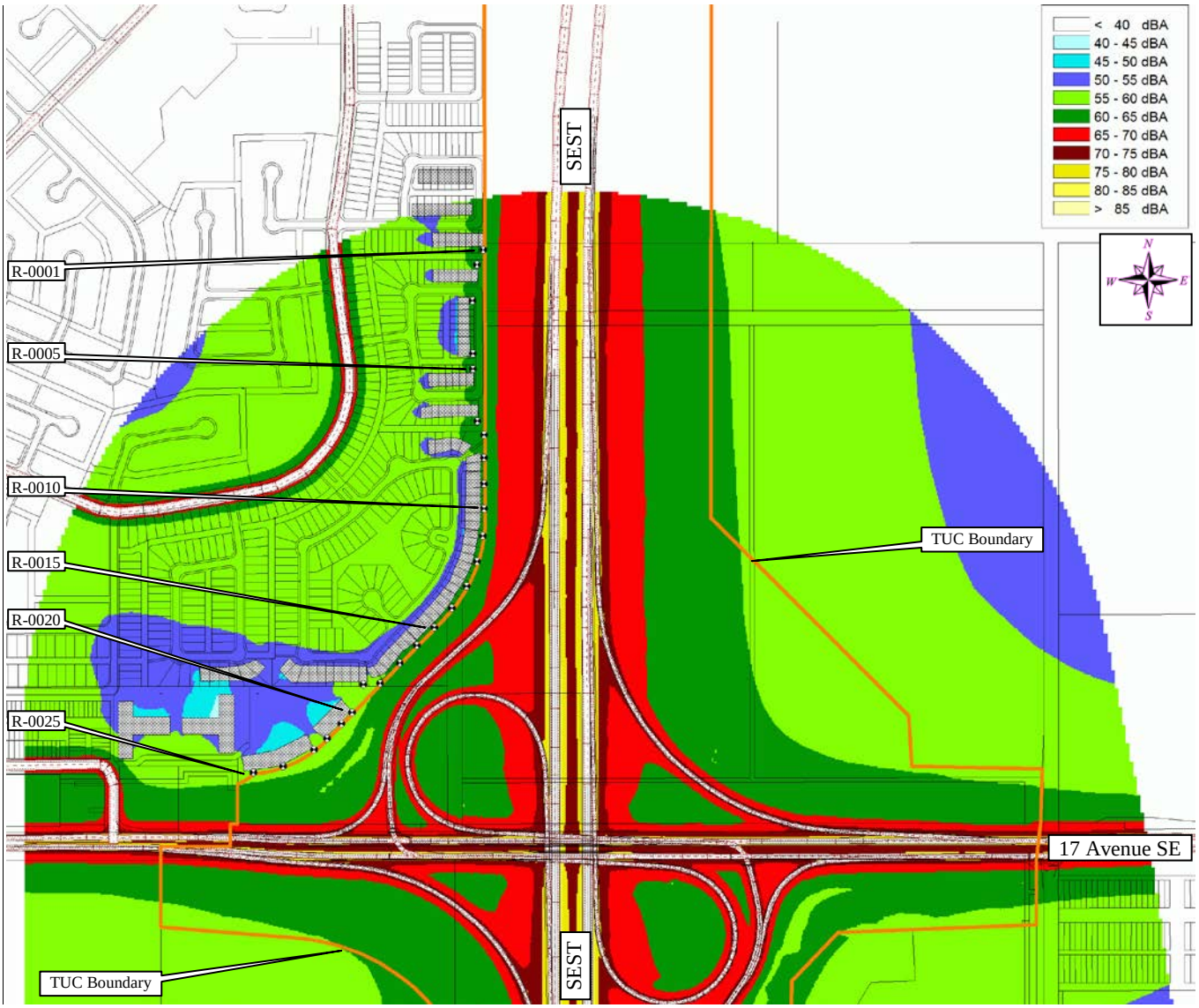


Figure 3c. Future Conditions L_{eq}24 Sound Levels for Region 1

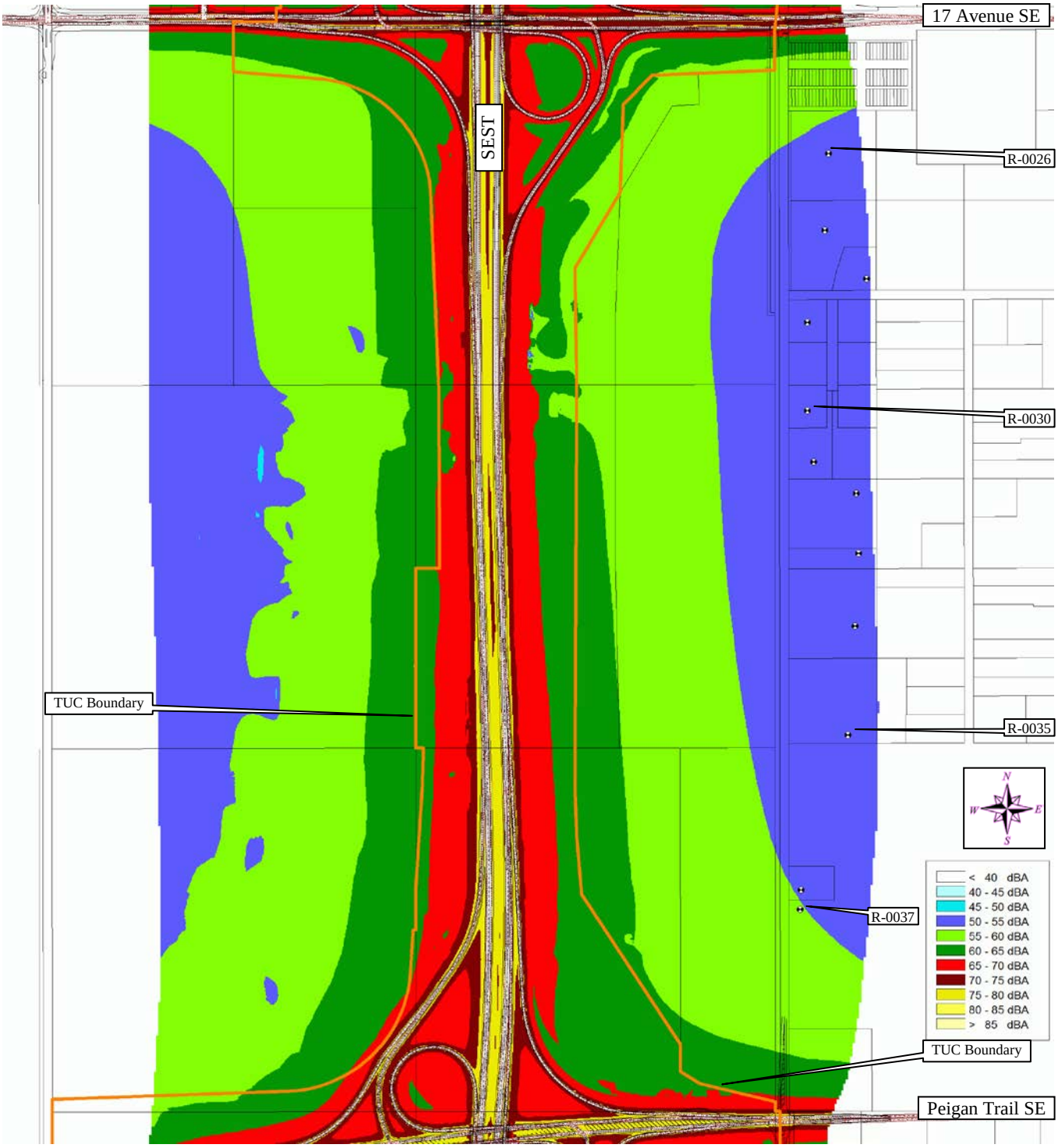


Figure 3d. Future Conditions $L_{eq}24$ Sound Levels for Region 2

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

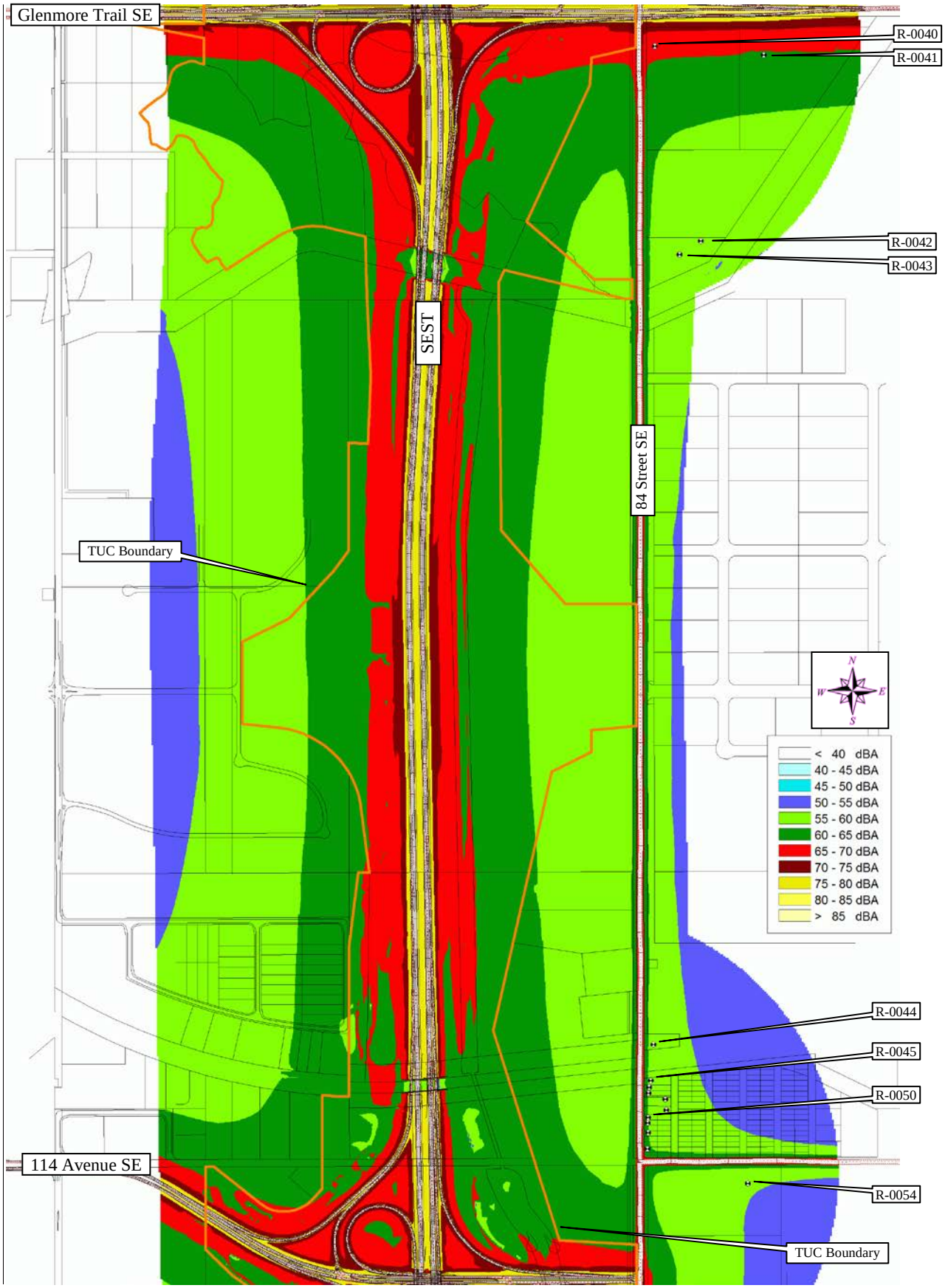


Figure 3f. Future Conditions $L_{eq}24$ Sound Levels for Region 4

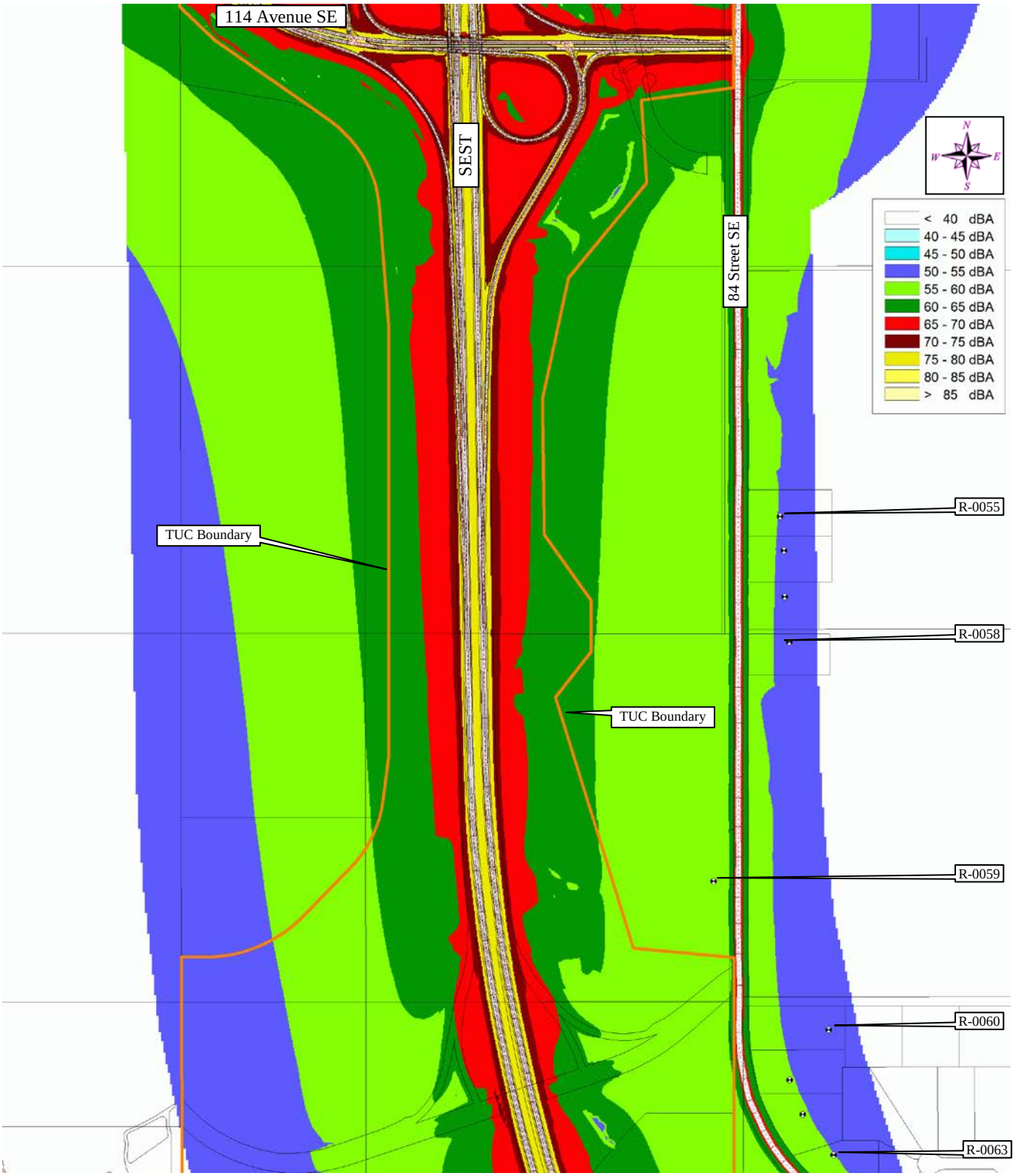


Figure 3g. Future Conditions $L_{eq}24$ Sound Levels for Region 5

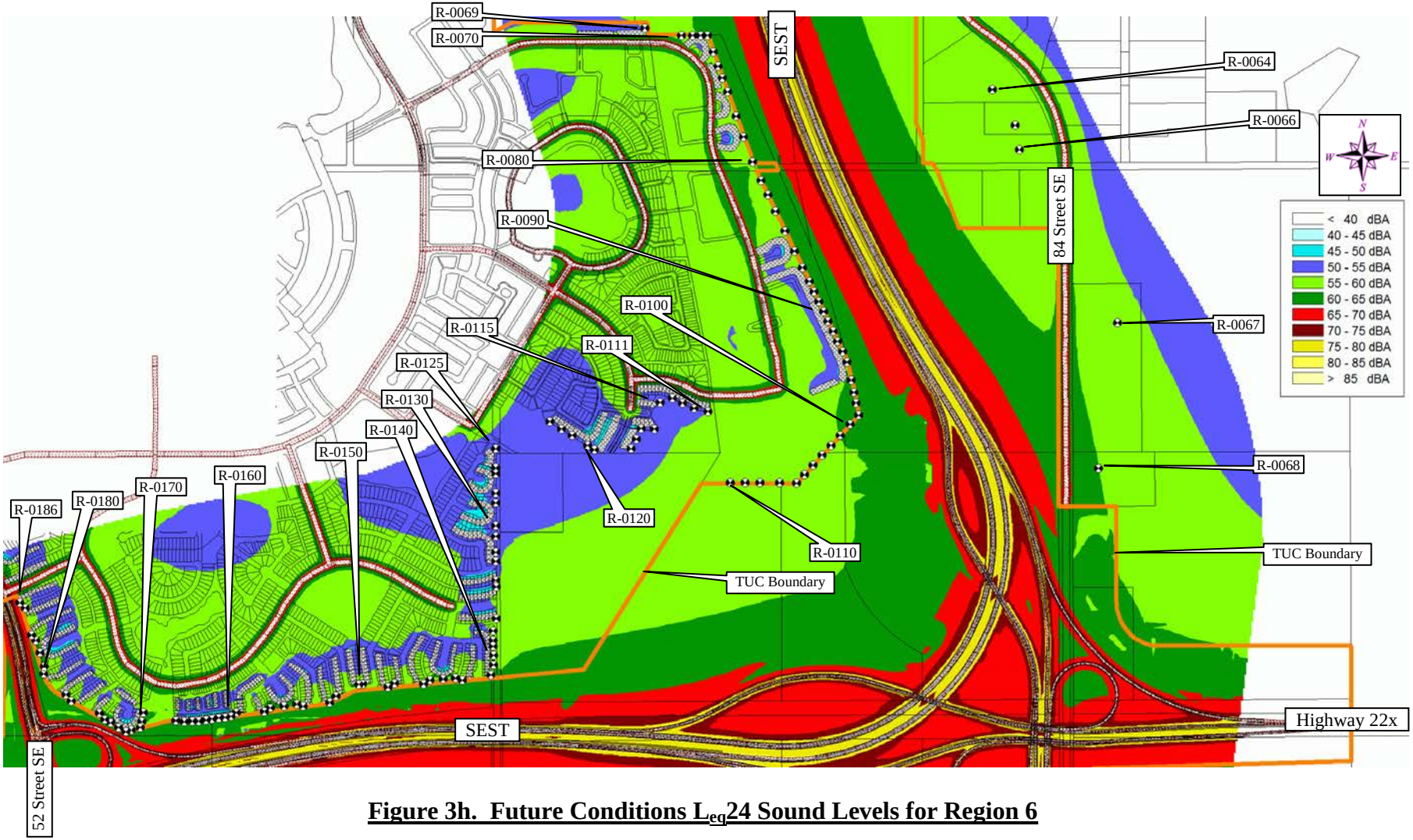


Figure 3h. Future Conditions L_{eq}24 Sound Levels for Region 6

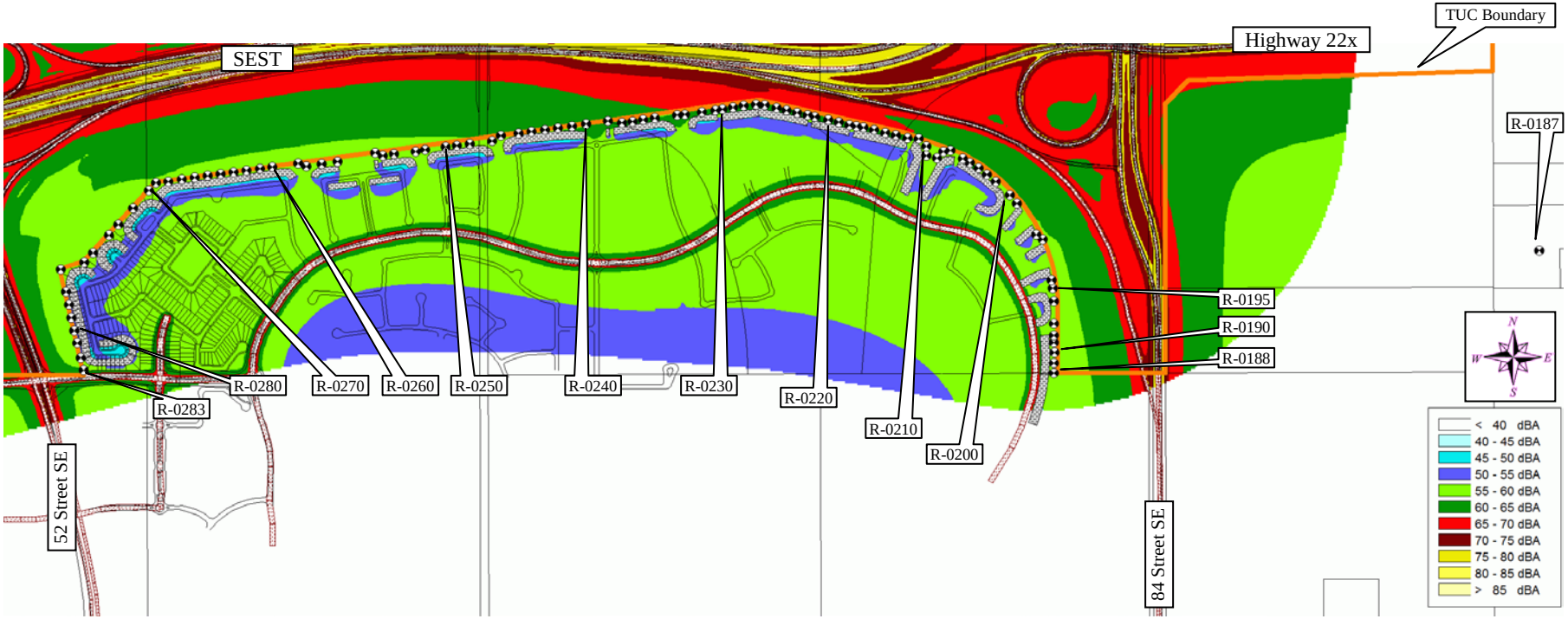


Figure 3i. Future Conditions $L_{eq}24$ Sound Levels for Region 7

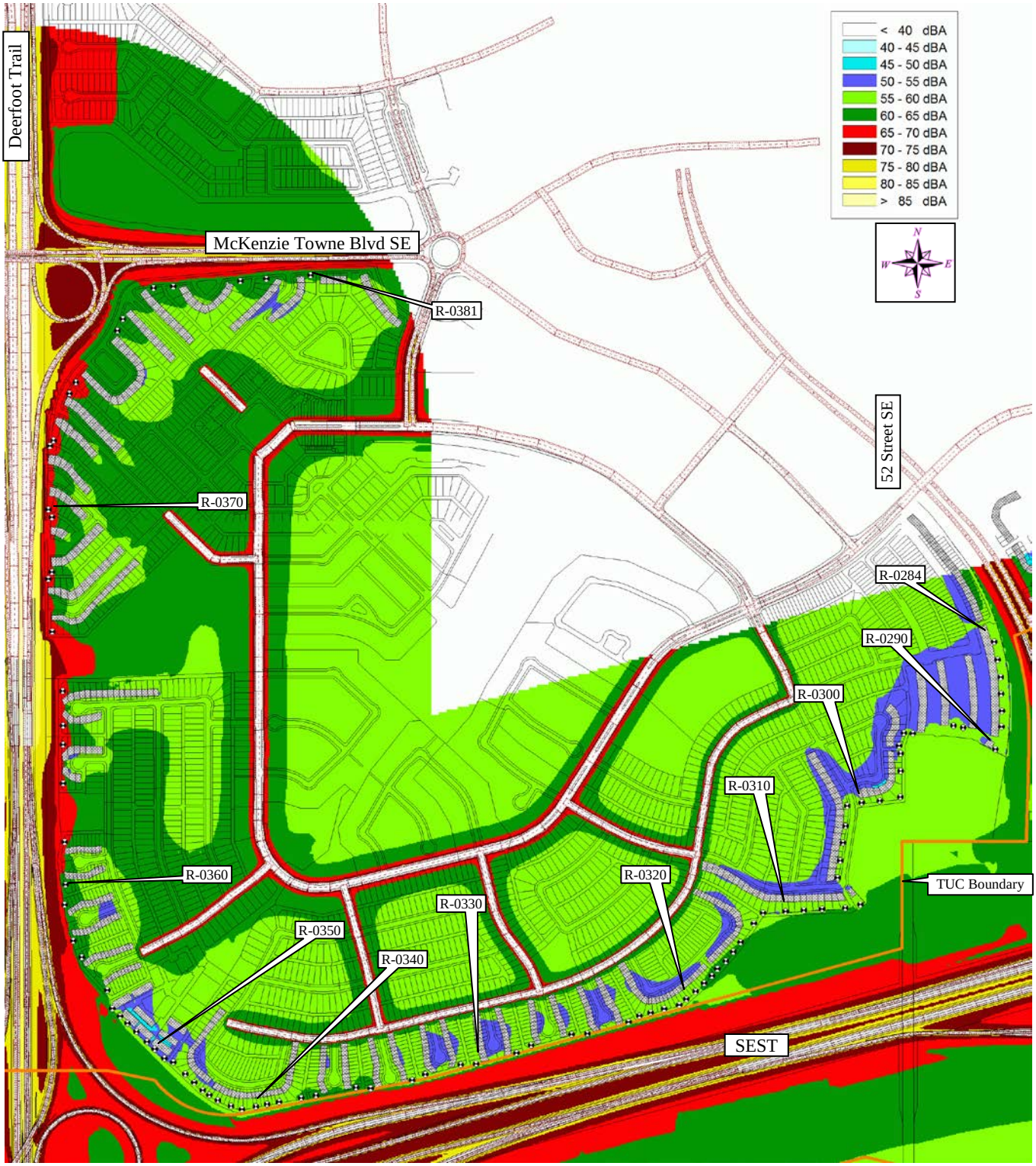


Figure 3j. Future Conditions $L_{eq}24$ Sound Levels for Region 8

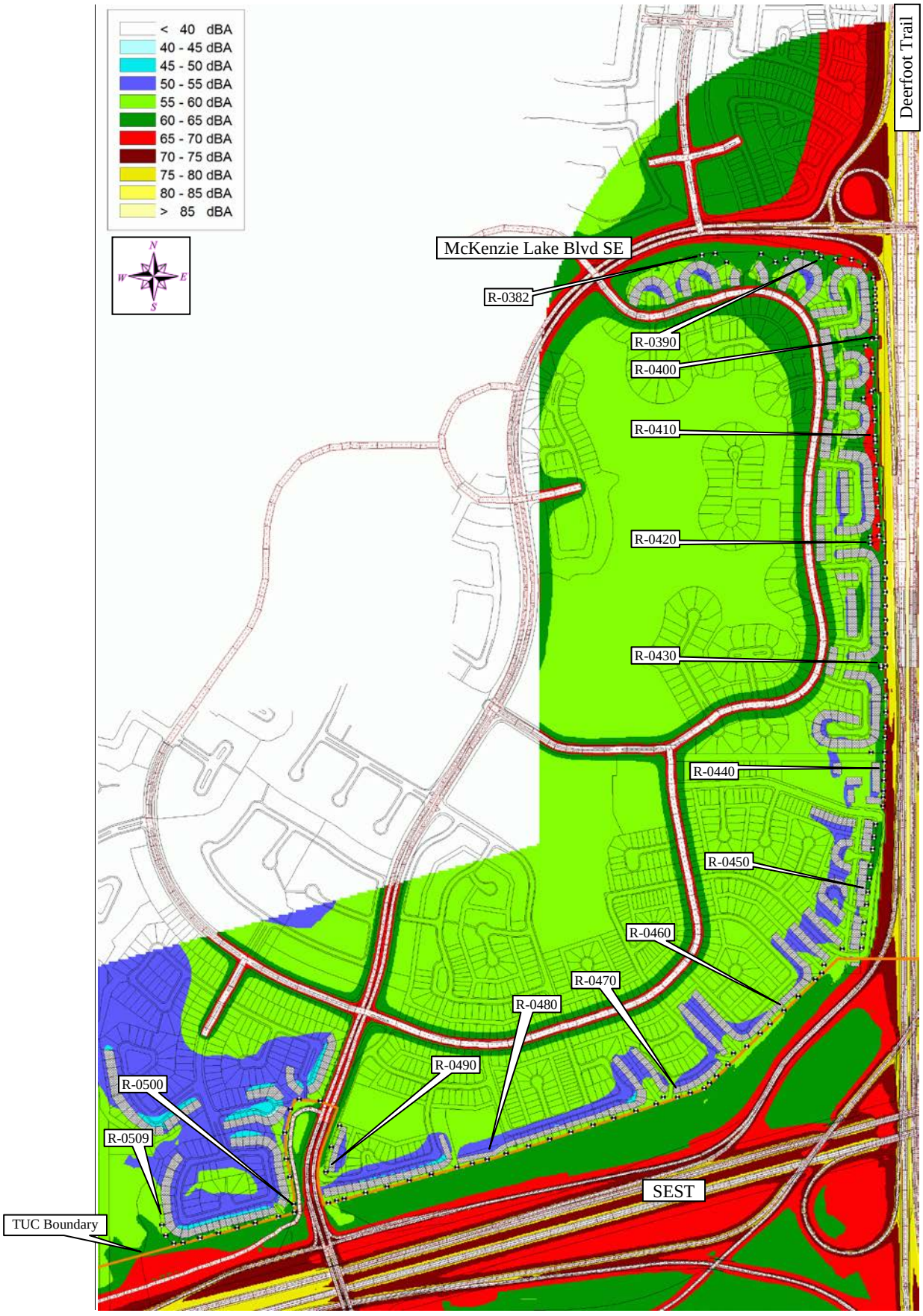


Figure 3k. Future Conditions L_{eq}24 Sound Levels for Region 9

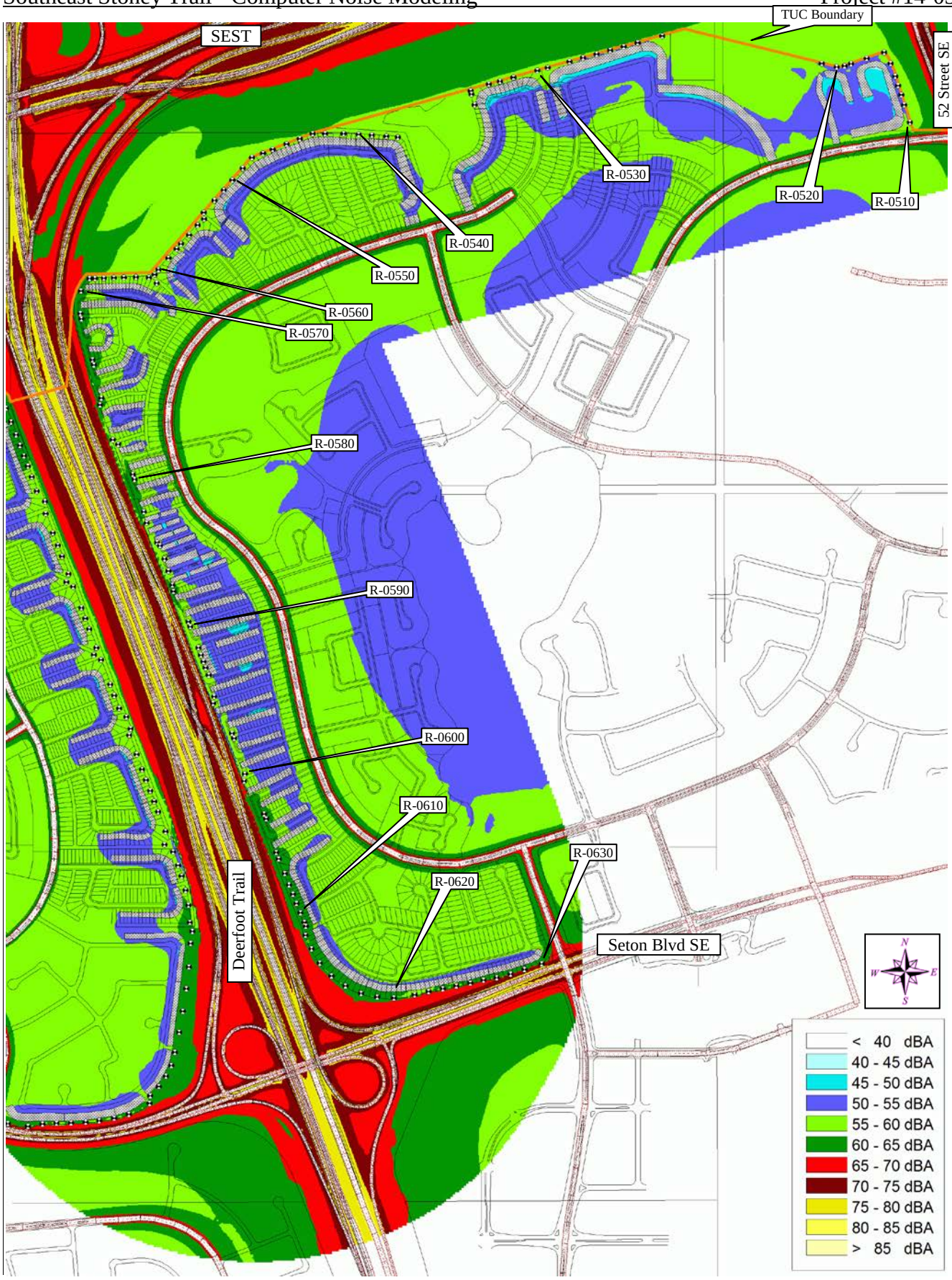


Figure 3l. Future Conditions L_{eq}24 Sound Levels for Region 10

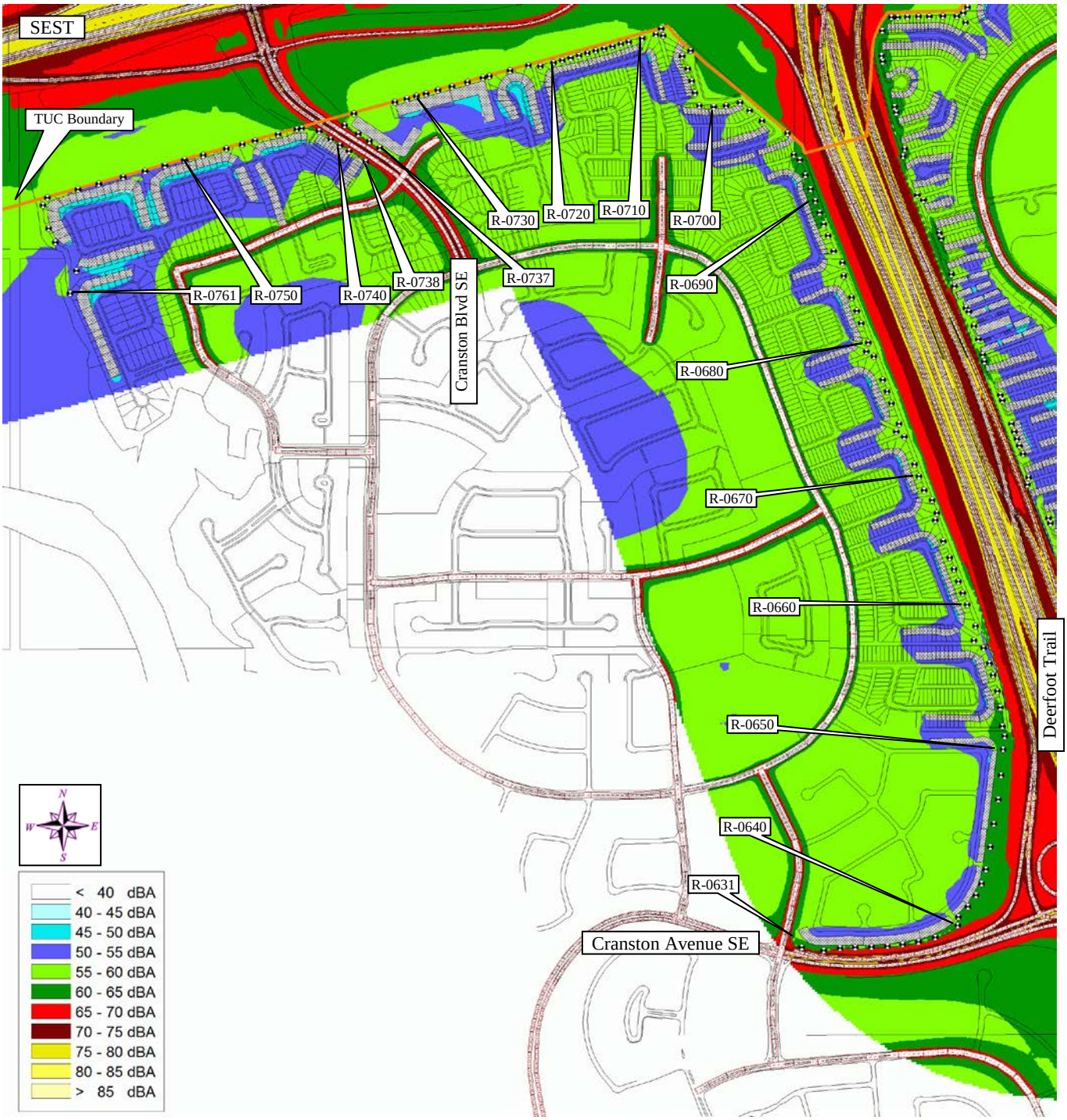


Figure 3m. Future Conditions L_{eq}24 Sound Levels for Region 11

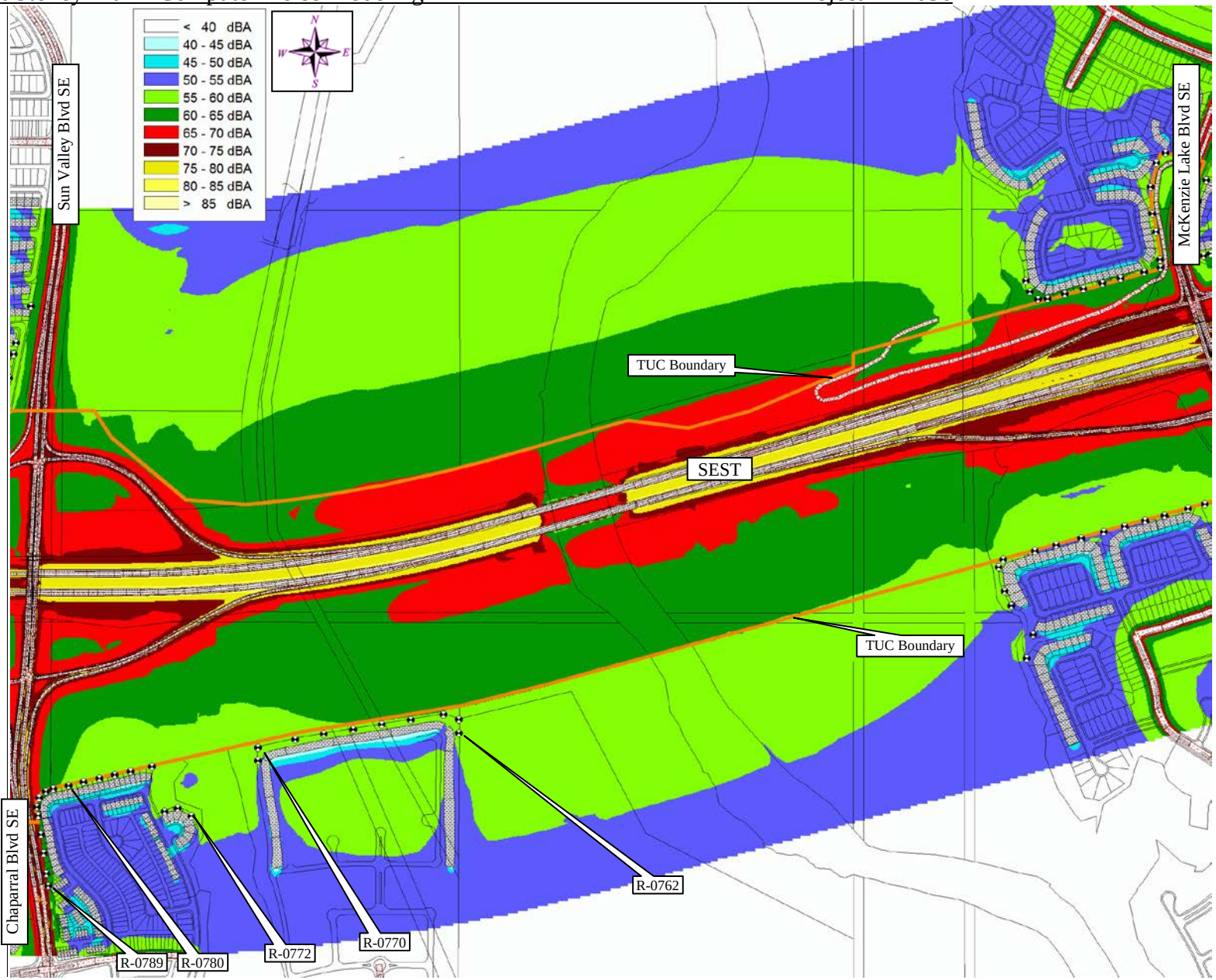


Figure 3n. Future Conditions $L_{eq}24$ Sound Levels for Region 12

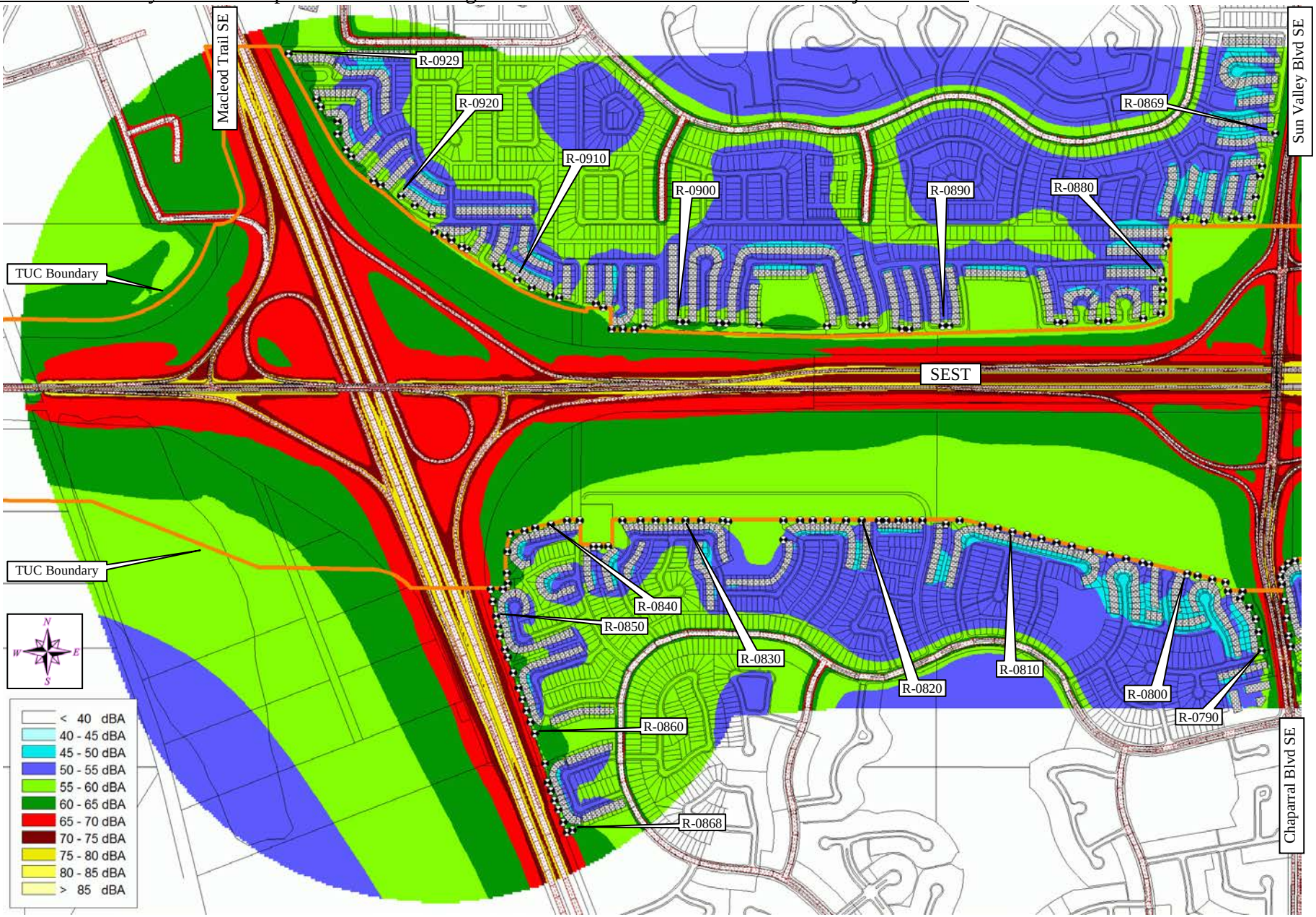


Figure 3o. Future Conditions $L_{eq}24$ Sound Levels for Region 13

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)
SEST North of 17 Avenue SE NB	1171	18.1	600	18.1	100	22960
SEST North of 17 Avenue SE SB	1171	19.3	600	19.3	100	22960
SEST North of Peigan Trail SE NB	1201	17.6	615	17.6	100	23550
SEST North of Peigan Trail SE SB	1201	19.3	615	19.3	100	23550
SEST North of Glenmore Trail SE NB	1015	15.6	520	15.6	100	19900
SEST North of Glenmore Trail SE SB	1015	17.0	520	17.0	100	19900
SEST North of 114 Avenue SE NB	833	15.2	426	15.2	100	16330
SEST North of 114 Avenue SE SB	833	14.5	427	14.5	100	16340
SEST North of Highway 22x NB	664	17.3	340	17.3	100	13010
SEST North of Highway 22x SB	664	13.1	340	13.1	100	13010
SEST East of 52 Street SE EB	670	9.6	343	9.6	100	13140
SEST East of 52 Street SE WB	806	8.4	413	8.4	100	15800
SEST East of Deerfoot Trail EB	845	11.4	433	11.4	100	16570
SEST East of Deerfoot Trail WB	845	11.6	433	11.6	100	16570
SEST East of Cranston Blvd SE EB	379	8.0	194	8.0	100	7430
SEST East of Cranston Blvd SE WB	379	7.5	194	7.5	100	7430
SEST East of Chaparral Blvd SE EB	1185	5.3	607	5.3	100	23230
SEST East of Chaparral Blvd SE WB	1184	5.4	606	5.4	100	23220
SEST East of Macleod Trail SE EB	768	6.9	393	6.9	100	15050
SEST East of Macleod Trail SE WB	767	7.1	393	7.1	100	15040
SEST West of Macleod Trail SE EB	694	5.1	355	5.1	100	13610
SEST West of Macleod Trail SE WB	695	5.9	356	5.9	100	13620
17 Avenue SE East of SEST EB	402	5.9	206	5.9	60	7890
17 Avenue SE East of SEST WB	402	5.7	206	5.7	60	7890
17 Avenue SE West of SEST EB	519	6.9	266	6.9	60	10180
17 Avenue SE West of SEST WB	519	6.4	266	6.4	60	10180
SEST NB to 17 Avenue SE EB Ramp	84	10.2	43	10.2	80	1650
SEST NB to 17 Avenue SE WB Ramp	140	8.1	72	8.1	80	2750
17 Avenue SE WB to SEST NB Ramp	67	6.7	34	6.7	80	1310
17 Avenue SE WB to SEST SB Ramp	84	10.7	43	10.7	70	1650
SEST SB to 17 Avenue SE WB Ramp	128	9.6	65	9.6	70	2500
SEST SB to 17 Avenue SE EB Ramp	67	8.5	34	8.5	70	1310
17 Avenue SE EB to SEST SB Ramp	140	9.6	72	9.6	80	2750
17 Avenue SE EB to SEST NB Ramp	128	10.3	65	10.3	80	2500
68 Street SE North of 17 Avenue SE	918	5.6	470	5.6	70	18000
Peigan Trail SE East of SEST EB	274	38.1	140	38.1	60	5380
Peigan Trail SE East of SEST WB	275	31.1	141	31.1	60	5400
Peigan Trail SE West of SEST EB	292	24.4	149	24.4	60	5720
Peigan Trail SE West of SEST WB	293	26.5	150	26.5	60	5740
SEST NB to Peigan Trail EB Ramp	47	34.3	24	34.3	80	920
SEST NB to Peigan Trail WB Ramp	53	23.1	27	23.1	80	1030
Peigan Trail WB to SEST NB Ramp	137	27.5	70	27.5	80	2680
Peigan Trail WB to SEST SB Ramp	47	34.0	24	34.0	80	930

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)
SEST SB to Peigan Trail WB Ramp	149	22.5	76	22.5	80	2920
SEST SB to Peigan Trail EB Ramp	137	40.3	70	40.3	80	2680
Peigan Trail EB to SEST SB Ramp	52	18.2	27	18.2	80	1020
Peigan Trail EB to SEST NB Ramp	149	19.0	76	19.0	80	2920
Glenmore Trail SE East of SEST EB	419	26.9	215	26.9	70	8220
Glenmore Trail SE East of SEST WB	419	23.2	215	23.2	70	8220
Glenmore Trail SE West of SEST EB	569	23.9	291	23.9	70	11160
Glenmore Trail SE West of SEST WB	568	25.8	291	25.8	70	11140
SEST NB to Glenmore Trail SE EB Ramp	64	22.8	33	22.8	80	1250
SEST NB to Glenmore Trail SE WB Ramp	56	30.9	29	30.9	80	1100
Glenmore Trail SE WB to SEST NB Ramp	72	20.6	37	20.6	80	1420
Glenmore Trail SE WB to SEST SB Ramp	64	16.4	33	16.4	80	1260
SEST SB to Glenmore Trail SE WB Ramp	230	24.9	118	24.9	80	4500
SEST SB to Glenmore Trail SE EB Ramp	72	30.2	37	30.2	80	1420
Glenmore Trail SE EB to SEST SB Ramp	56	29.6	29	29.6	80	1100
Glenmore Trail SE EB to SEST NB Ramp	230	18.8	118	18.8	80	4510
114 Avenue SE East of SEST EB	160	29.3	82	29.3	80	3130
114 Avenue SE East of SEST WB	161	24.7	83	24.7	80	3160
114 Avenue SE West of SEST EB	312	18.9	160	18.9	80	6110
114 Avenue SE West of SEST WB	313	22.0	160	22.0	80	6140
SEST NB to 114 Avenue SE EB Ramp	42	41.2	21	41.2	80	820
SEST NB to 114 Avenue SE WB Ramp	31	46.2	16	46.2	80	600
114 Avenue SE WB to SEST NB Ramp	39	29.7	20	29.7	80	770
114 Avenue SE WB to SEST SB Ramp	42	31.6	21	31.6	80	820
SEST SB to 114 Avenue SE WB Ramp	202	19.6	104	19.6	80	3970
SEST SB to 114 Avenue SE EB Ramp	39	39.6	20	39.6	80	770
114 Avenue SE EB to SEST SB Ramp	31	28.0	16	28.0	80	600
114 Avenue SE EB to SEST NB Ramp	202	17.9	104	17.9	80	3970
84 Street SE NB to SEST NB Ramp	19	60.8	10	60.8	80	380
84 Street SE NB to SEST WB Ramp	10	16.3	5	16.3	80	190
Highway 22x WB to SEST NB Ramp	39	42.6	20	42.6	100	760
Highway 22x WB to SEST WB Ramp	123	22.7	63	22.7	100	2420
SEST SB to 84 Street SE SB Ramp	19	44.7	10	44.7	100	380
SEST SB to Highway 22x EB Ramp	39	36.2	20	36.2	80	770
SEST EB to 84 Street SB Ramp	10	34.7	5	34.7	100	190
SEST EB to Highway 22x EB Ramp	123	22.5	63	22.5	100	2410
52 Street SE North of SEST NB	505	5.7	259	5.7	60	9900
52 Street SE North of SEST SB	504	5.3	258	5.3	60	9890
52 Street SE South of SEST NB	492	5.9	252	5.9	60	9640
52 Street SE South of SEST SB	533	6.1	273	6.1	60	10450
52 Street SE NB to SEST EB Ramp	92	6.2	47	6.2	80	1810
52 Street SE NB to SEST WB Ramp	185	4.3	95	4.3	60	3620
SEST WB to 52 Street SE NB Ramp	149	3.3	76	3.3	70	2920

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)
SEST WB to 52 Street SE SB Ramp	129	7.0	66	7.0	70	2530
52 Street SE SB to SEST WB Ramp	180	4.0	92	4.0	60	3520
52 Street SE SB to SEST EB Ramp	87	4.0	45	4.0	80	1710
SEST EB to 52 Street SE SB Ramp	166	4.6	85	4.6	80	3260
SEST EB to 52 Street SE NB Ramp	141	6.1	72	6.1	80	2770
McIvor Blvd SE	663	5.0	339	5.0	60	13000
McKenzie Towne Drive SE	663	5.0	339	5.0	60	13000
Deerfoot Trail North of SEST NB	1973	8.5	1010	8.5	100	38690
Deerfoot Trail North of SEST SB	1973	7.2	1010	7.2	100	38690
Deerfoot Trail South of SEST NB	1511	9.5	774	9.5	100	29630
Deerfoot Trail at Interchange with SEST NB	1139	8.2	583	8.2	100	22330
Deerfoot Trail at Interchange with SEST SB	1139	7.9	583	7.9	100	22330
Deerfoot Trail NB to SEST EB Ramp	256	17.7	131	17.7	100	5020
Deerfoot Trail NB to SEST WB Ramp	116	4.2	60	4.2	80	2280
SEST WB to Deerfoot Trail NB Ramp	210	10.8	108	10.8	80	4120
SEST WB to Deerfoot Trail SB Ramp	256	18.5	131	18.5	100	5020
Deerfoot Trail SB to SEST WB Ramp	624	4.9	320	4.9	80	12240
Deerfoot Trail SB to SEST EB Ramp	210	9.5	108	9.5	80	4120
SEST EB to Deerfoot Trail SB Ramp	117	3.8	60	3.8	90	2290
SEST EB to Deerfoot Trail NB Ramp	624	5.7	320	5.7	100	12240
McKenzie Lake Blvd SE North of SEST NB	176	3.8	90	3.8	60	3460
McKenzie Lake Blvd SE North of SEST SB	177	3.6	91	3.6	60	3470
Cranston Blvd SE South of SEST NB	358	3.0	183	3.0	60	7020
Cranston Blvd SE South of SEST SB	359	3.4	184	3.4	60	7030
Cranston Blvd SE NB to Deerfoot Trail NB Ramp	155	1.5	79	1.5	80	3040
Cranston Blvd SE NB to SEST WB Ramp	154	4.0	79	4.0	80	3020
Deerfoot Trail SB to McKenzie Lake Blvd SE NB Ramp	31	3.0	16	3.0	80	610
Deerfoot Trail SB to Cranston Blvd SE SB Ramp	155	1.8	79	1.8	80	3030
McKenzie Lake Blvd SE SB to SEST WB Ramp	96	4.2	49	4.2	80	1890
McKenzie Lake Blvd SE SB to Deerfoot Trail NB Ramp	31	2.8	16	2.8	80	610
SEST EB to Cranston Blvd SE SB Ramp	155	5.1	79	5.1	80	3030
SEST EB to McKenzie Lake Blvd SE NB Ramp	96	3.7	49	3.7	80	1890
Sun Valley Blvd SE North of SEST NB	388	2.5	199	2.5	60	7610
Sun Valley Blvd SE North of SEST SB	388	3.0	199	3.0	60	7610
Chaparral Blvd SE South of SEST NB	412	3.6	211	3.6	60	8070
Chaparral Blvd SE South of SEST SB	413	3.4	211	3.4	60	8090
Chaparral Blvd SE NB to SEST EB Ramp	234	3.9	120	3.9	80	4580
Chaparral Blvd SE NB to SEST WB Ramp	73	2.8	38	2.8	80	1440
SEST WB to Sun Valley Blvd SE NB Ramp	270	1.9	138	1.9	80	5300
SEST WB to Chaparral Blvd SE SB Ramp	234	3.6	120	3.6	80	4590
Sun Valley Blvd SE SB to SEST WB Ramp	13	5.0	7	5.0	80	260
Sun Valley Blvd SE SB to SEST EB Ramp	270	2.7	138	2.7	80	5300
SEST EB to Chaparral Blvd SE SB Ramp	74	3.0	38	3.0	80	1450

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)
SEST EB to Sun Valley Blvd SE NB Ramp	13	6.5	7	6.5	80	260
Macleod Trail SE North of SEST NB	1176	3.1	602	3.1	80	23060
Macleod Trail SE North of SEST SB	1177	4.0	602	4.0	80	23070
Macleod Trail SE South of SEST NB	865	6.5	443	6.5	80	16960
Macleod Trail SE South of SEST SB	864	7.4	443	7.4	80	16950
Macleod Trail SE NB to SEST EB Ramp	66	31.8	34	31.8	90	1290
Macleod Trail SE NB to SEST WB Ramp	135	11.0	69	11.0	90	2640
SEST WB to Macleod Trail SE NB Ramp	327	3.6	167	3.6	90	6410
SEST WB to Macleod Trail SE SB Ramp	65	35.9	33	35.9	90	1280
Macleod Trail SE SB to SEST WB Ramp	185	3.7	95	3.7	90	3630
Macleod Trail SE SB to SEST EB Ramp	327	4.0	167	4.0	90	6410
SEST EB to Macleod Trail SE SB Ramp	135	9.7	69	9.7	90	2640
SEST EB to Macleod Trail SE NB Ramp	185	2.0	95	2.0	90	3620
Deerfoot Trail South of Seton Blvd SE NB	1012	12.9	518	12.9	100	19850
Deerfoot Trail South of Seton Blvd SE SB	1012	13.2	518	13.2	100	19850
Seton Blvd SE East of Deerfoot Trail EB	484	5.6	248	5.6	60	9490
Seton Blvd SE East of Deerfoot Trail WB	482	5.0	247	5.0	60	9460
Cranston Ave SE West of Deerfoot Trail EB	426	7.9	218	7.9	60	8350
Cranston Ave SE West of Deerfoot Trail WB	426	6.5	218	6.5	60	8350
Deerfoot Trail NB to Seton Blvd SE EB Ramp	39	5.8	20	5.8	80	760
Deerfoot Trail NB to Cranston Ave SE WB Ramp	42	9.8	21	9.8	80	820
Seton Blvd SE WB to Deerfoot Trail NB Ramp	160	3.8	82	3.8	90	3130
Seton Blvd SE WB to SEST EB Ramp	160	3.8	82	3.8	90	3130
Seton Blvd SE WB to Deerfoot Trail SB Ramp	39	8.0	20	8.0	70	760
Deerfoot Trail SB to Cranston Ave SE WB Ramp	260	5.6	133	5.6	80	5090
Deerfoot Trail SB to Seton Blvd SE EB Ramp	321	4.0	164	4.0	80	6290
Cranston Ave SE EB to Deerfoot Trail SB Ramp	42	9.5	21	9.5	80	820
Cranston Ave SE EB to Deerfoot Trail NB Ramp	130	6.8	66	6.8	90	2545
Cranston Ave SE EB to SEST EB Ramp	130	6.8	66	6.8	90	2545
Deerfoot Trail North of McKenzie Lake Blvd SE NB	2540	6.8	1300	6.8	100	49800
Deerfoot Trail North of McKenzie Lake Blvd SE SB	2540	5.8	1301	5.8	100	49810
McKenzie Towne Blvd SE East of Deerfoot Trail EB	733	2.0	375	2.0	60	14380
McKenzie Towne Blvd SE East of Deerfoot Trail WB	728	1.9	373	1.9	60	14270
McKenzie Lake Blvd SE West of Deerfoot Trail EB	458	2.6	235	2.6	60	8990
McKenzie Lake Blvd SE West of Deerfoot Trail WB	453	2.8	232	2.8	60	8890
Deerfoot Trail NB to McKenzie Towne Blvd SE EB Ramp	127	3.1	65	3.1	80	2490
Deerfoot Trail NB to McKenzie Lake Blvd SE WB Ramp	79	3.7	40	3.7	80	1540
McKenzie Towne Blvd SE WB to Deerfoot Trail NB Ramp	499	1.3	256	1.3	80	9790
McKenzie Towne Blvd SE WB to Deerfoot Trail SB Ramp	127	2.7	65	2.7	80	2490
Deerfoot Trail SB to McKenzie Lake Blvd SE WB Ramp	273	2.2	140	2.2	80	5360
Deerfoot Trail SB to McKenzie Towne Blvd SE EB Ramp	499	1.3	256	1.3	80	9790
McKenzie Lake Blvd SE EB to Deerfoot Trail SB Ramp	79	3.4	40	3.4	80	1540
McKenzie Lake Blvd SE EB to Deerfoot Trail NB Ramp	273	1.9	140	1.9	80	5350
Collector Roads	306	3.0	157	3.0	60	6000

Future Conditions (Year 2035)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
SEST North of 17 Avenue SE NB	1836	18.1	940	18.1	100	36000
SEST North of 17 Avenue SE SB	1938	19.3	992	19.3	100	38000
SEST North of Peigan Trail SE NB	1479	17.6	757	17.6	100	29000
SEST North of Peigan Trail SE SB	2040	19.3	1044	19.3	100	40000
SEST North of Glenmore Trail SE NB	1428	15.6	731	15.6	100	28000
SEST North of Glenmore Trail SE SB	1836	17.0	940	17.0	100	36000
SEST North of 114 Avenue SE NB	1836	15.2	940	15.2	100	36000
SEST North of 114 Avenue SE SB	1938	14.5	992	14.5	100	38000
SEST North of Highway 22x NB	1275	17.3	653	17.3	100	25000
SEST North of Highway 22x SB	1377	13.1	705	13.1	100	27000
SEST East of 52 Street SE EB	1428	9.6	731	9.6	100	28000
SEST East of 52 Street SE WB	1632	8.4	836	8.4	100	32000
SEST East of Deerfoot Trail EB	1734	11.4	888	11.4	100	34000
SEST East of Deerfoot Trail WB	1785	11.6	914	11.6	100	35000
SEST East of Cranston Blvd SE EB	765	8.0	392	8.0	100	15000
SEST East of Cranston Blvd SE WB	1173	7.5	601	7.5	100	23000
SEST East of Chaparral Blvd SE EB	2244	5.3	1149	5.3	100	44000
SEST East of Chaparral Blvd SE WB	2142	5.4	1097	5.4	100	42000
SEST East of Macleod Trail SE EB	1632	6.9	836	6.9	100	32000
SEST East of Macleod Trail SE WB	1836	7.1	940	7.1	100	36000
SEST West of Macleod Trail SE EB	1887	5.1	966	5.1	100	37000
SEST West of Macleod Trail SE WB	2193	5.9	1123	5.9	100	43000
17 Avenue SE East of SEST EB	714	5.9	366	5.9	60	14000
17 Avenue SE East of SEST WB	1071	5.7	548	5.7	60	21000
17 Avenue SE West of SEST EB	1020	6.9	522	6.9	60	20000
17 Avenue SE West of SEST WB	867	6.4	444	6.4	60	17000
SEST NB to 17 Avenue SE EB Ramp	102	10.2	52	10.2	80	2000
SEST NB to 17 Avenue SE WB Ramp	153	8.1	78	8.1	80	3000
17 Avenue SE WB to SEST NB Ramp	311	6.7	159	6.7	80	6100
17 Avenue SE WB to SEST SB Ramp	158	10.7	81	10.7	70	3100
SEST SB to 17 Avenue SE WB Ramp	189	9.6	97	9.6	70	3700
SEST SB to 17 Avenue SE EB Ramp	97	8.5	50	8.5	70	1900
17 Avenue SE EB to SEST SB Ramp	260	9.6	133	9.6	80	5100
17 Avenue SE EB to SEST NB Ramp	158	10.3	81	10.3	80	3100
68 Street SE North of 17 Avenue SE	918	5.6	470	5.6	70	18000
Peigan Trail SE East of SEST EB	459	38.1	235	38.1	60	9000
Peigan Trail SE East of SEST WB	459	31.1	235	31.1	60	9000
Peigan Trail SE West of SEST EB	510	24.4	261	24.4	60	10000
Peigan Trail SE West of SEST WB	714	26.5	366	26.5	60	14000
SEST NB to Peigan Trail EB Ramp	143	34.3	73	34.3	80	2800
SEST NB to Peigan Trail WB Ramp	128	23.1	65	23.1	80	2500
Peigan Trail WB to SEST NB Ramp	138	27.5	71	27.5	80	2700
Peigan Trail WB to SEST SB Ramp	153	34.0	78	34.0	80	3000

Future Conditions (Year 2035) (Cont.)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
SEST SB to Peigan Trail WB Ramp	265	22.5	136	22.5	80	5200
SEST SB to Peigan Trail EB Ramp	240	40.3	123	40.3	80	4700
Peigan Trail EB to SEST SB Ramp	92	18.2	47	18.2	80	1800
Peigan Trail EB to SEST NB Ramp	255	19.0	131	19.0	80	5000
Glenmore Trail SE East of SEST EB	1683	26.9	862	26.9	70	33000
Glenmore Trail SE East of SEST WB	1683	23.2	862	23.2	70	33000
Glenmore Trail SE West of SEST EB	1377	23.9	705	23.9	70	27000
Glenmore Trail SE West of SEST WB	1275	25.8	653	25.8	70	25000
SEST NB to Glenmore Trail SE EB Ramp	102	22.8	52	22.8	80	2000
SEST NB to Glenmore Trail SE WB Ramp	133	30.9	68	30.9	80	2600
Glenmore Trail SE WB to SEST NB Ramp	87	20.6	44	20.6	80	1700
Glenmore Trail SE WB to SEST SB Ramp	102	16.4	52	16.4	80	2000
SEST SB to Glenmore Trail SE WB Ramp	428	24.9	219	24.9	80	8400
SEST SB to Glenmore Trail SE EB Ramp	102	30.2	52	30.2	80	2000
Glenmore Trail SE EB to SEST SB Ramp	219	29.6	112	29.6	80	4300
Glenmore Trail SE EB to SEST NB Ramp	255	18.8	131	18.8	80	5000
114 Avenue SE East of SEST EB	714	29.3	366	29.3	80	14000
114 Avenue SE East of SEST WB	1071	24.7	548	24.7	80	21000
114 Avenue SE West of SEST EB	1020	18.9	522	18.9	80	20000
114 Avenue SE West of SEST WB	867	22.0	444	22.0	80	17000
SEST NB to 114 Avenue SE EB Ramp	163	41.2	84	41.2	80	3200
SEST NB to 114 Avenue SE WB Ramp	92	46.2	47	46.2	80	1800
114 Avenue SE WB to SEST NB Ramp	102	29.7	52	29.7	80	2000
114 Avenue SE WB to SEST SB Ramp	107	31.6	55	31.6	80	2100
SEST SB to 114 Avenue SE WB Ramp	301	19.6	154	19.6	80	5900
SEST SB to 114 Avenue SE EB Ramp	112	39.6	57	39.6	80	2200
114 Avenue SE EB to SEST SB Ramp	77	28.0	39	28.0	80	1500
114 Avenue SE EB to SEST NB Ramp	204	17.9	104	17.9	80	4000
84 Street SE NB to SEST NB Ramp	240	60.8	123	60.8	80	4700
84 Street SE NB to SEST WB Ramp	117	16.3	60	16.3	80	2300
Highway 22x WB to SEST NB Ramp	87	42.6	44	42.6	100	1700
Highway 22x WB to SEST WB Ramp	561	22.7	287	22.7	100	11000
SEST SB to 84 Street SE SB Ramp	281	44.7	144	44.7	100	5500
SEST SB to Highway 22x EB Ramp	173	36.2	89	36.2	80	3400
SEST EB to 84 Street SB Ramp	56	34.7	29	34.7	100	1100
SEST EB to Highway 22x EB Ramp	459	22.5	235	22.5	100	9000
52 Street SE North of SEST NB	969	5.7	496	5.7	60	19000
52 Street SE North of SEST SB	1071	5.3	548	5.3	60	21000
52 Street SE South of SEST NB	612	5.9	313	5.9	60	12000
52 Street SE South of SEST SB	612	6.1	313	6.1	60	12000
52 Street SE NB to SEST EB Ramp	184	6.2	94	6.2	80	3600
52 Street SE NB to SEST WB Ramp	296	4.3	151	4.3	60	5800
SEST WB to 52 Street SE NB Ramp	222	3.3	114	3.3	70	4350

Future Conditions (Year 2035) (Cont.)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
SEST WB to 52 Street SE SB Ramp	191	7.0	98	7.0	70	3750
52 Street SE SB to SEST WB Ramp	281	4.0	144	4.0	60	5500
52 Street SE SB to SEST EB Ramp	173	4.0	89	4.0	80	3400
SEST EB to 52 Street SE SB Ramp	347	4.6	178	4.6	80	6800
SEST EB to 52 Street SE NB Ramp	296	6.1	151	6.1	80	5800
McIvor Blvd SE	663	5.0	339	5.0	60	13000
McKenzie Towne Drive SE	663	5.0	339	5.0	60	13000
Deerfoot Trail North of SEST NB	4121	8.5	2110	8.5	100	80800
Deerfoot Trail North of SEST SB	3305	7.2	1692	7.2	100	64800
Deerfoot Trail South of SEST NB	2407	9.5	1232	9.5	100	47200
Deerfoot Trail at Interchange with SEST NB	2407	8.2	1232	8.2	100	47200
Deerfoot Trail at Interchange with SEST SB	1902	7.9	974	7.9	100	37300
Deerfoot Trail NB to SEST EB Ramp	352	17.7	180	17.7	100	6900
Deerfoot Trail NB to SEST WB Ramp	342	4.2	175	4.2	80	6700
SEST WB to Deerfoot Trail NB Ramp	576	10.8	295	10.8	80	11300
SEST WB to Deerfoot Trail SB Ramp	377	18.5	193	18.5	100	7400
Deerfoot Trail SB to SEST WB Ramp	673	4.9	345	4.9	80	13200
Deerfoot Trail SB to SEST EB Ramp	500	9.5	256	9.5	80	9800
SEST EB to Deerfoot Trail SB Ramp	372	3.8	191	3.8	90	7300
SEST EB to Deerfoot Trail NB Ramp	908	5.7	465	5.7	100	17800
McKenzie Lake Blvd SE North of SEST NB	204	3.8	104	3.8	60	4000
McKenzie Lake Blvd SE North of SEST SB	204	3.6	104	3.6	60	4000
Cranston Blvd SE South of SEST NB	408	3.0	209	3.0	60	8000
Cranston Blvd SE South of SEST SB	408	3.4	209	3.4	60	8000
Cranston Blvd SE NB to Deerfoot Trail NB Ramp	171	1.5	87	1.5	80	3350
Cranston Blvd SE NB to SEST WB Ramp	189	4.0	97	4.0	80	3700
Deerfoot Trail SB to McKenzie Lake Blvd SE NB Ramp	43	3.0	22	3.0	80	850
Deerfoot Trail SB to Cranston Blvd SE SB Ramp	212	1.8	108	1.8	80	4150
McKenzie Lake Blvd SE SB to SEST WB Ramp	117	4.2	60	4.2	80	2300
McKenzie Lake Blvd SE SB to Deerfoot Trail NB Ramp	33	2.8	17	2.8	80	650
SEST EB to Cranston Blvd SE SB Ramp	204	5.1	104	5.1	80	4000
SEST EB to McKenzie Lake Blvd SE NB Ramp	128	3.7	65	3.7	80	2500
Sun Valley Blvd SE North of SEST NB	408	2.5	209	2.5	60	8000
Sun Valley Blvd SE North of SEST SB	408	3.0	209	3.0	60	8000
Chaparral Blvd SE South of SEST NB	867	3.6	444	3.6	60	17000
Chaparral Blvd SE South of SEST SB	612	3.4	313	3.4	60	12000
Chaparral Blvd SE NB to SEST EB Ramp	581	3.9	298	3.9	80	11400
Chaparral Blvd SE NB to SEST WB Ramp	214	2.8	110	2.8	80	4200
SEST WB to Sun Valley Blvd SE NB Ramp	306	1.9	157	1.9	80	6000
SEST WB to Chaparral Blvd SE SB Ramp	377	3.6	193	3.6	80	7400
Sun Valley Blvd SE SB to SEST WB Ramp	56	5.0	29	5.0	80	1100
Sun Valley Blvd SE SB to SEST EB Ramp	270	2.7	138	2.7	80	5300
SEST EB to Chaparral Blvd SE SB Ramp	184	3.0	94	3.0	80	3600

Future Conditions (Year 2035) (Cont.)

Road	Day (Vehicles Per Hour)	Day % Heavy Vehicles	Night (Vehicles Per Hour)	Night % Heavy Vehicles	Speed (km/hr)	Total Volume (vehicles per day)
SEST EB to Sun Valley Blvd SE NB Ramp	41	6.5	21	6.5	80	800
Macleod Trail SE North of SEST NB	1836	3.1	940	3.1	80	36000
Macleod Trail SE North of SEST SB	2040	4.0	1044	4.0	80	40000
Macleod Trail SE South of SEST NB	1836	6.5	940	6.5	80	36000
Macleod Trail SE South of SEST SB	1887	7.4	966	7.4	80	37000
Macleod Trail SE NB to SEST EB Ramp	102	31.8	52	31.8	90	2000
Macleod Trail SE NB to SEST WB Ramp	367	11.0	188	11.0	90	7200
SEST WB to Macleod Trail SE NB Ramp	398	3.6	204	3.6	90	7800
SEST WB to Macleod Trail SE SB Ramp	102	35.9	52	35.9	90	2000
Macleod Trail SE SB to SEST WB Ramp	418	3.7	214	3.7	90	8200
Macleod Trail SE SB to SEST EB Ramp	408	4.0	209	4.0	90	8000
SEST EB to Macleod Trail SE SB Ramp	459	9.7	235	9.7	90	9000
SEST EB to Macleod Trail SE NB Ramp	255	2.0	131	2.0	90	5000
Deerfoot Trail South of Seton Blvd SE NB	2040	12.9	1044	12.9	100	40000
Deerfoot Trail South of Seton Blvd SE SB	1785	13.2	914	13.2	100	35000
Seton Blvd SE East of Deerfoot Trail EB	1122	5.6	574	5.6	60	22000
Seton Blvd SE East of Deerfoot Trail WB	1479	5.0	757	5.0	60	29000
Cranston Ave SE West of Deerfoot Trail EB	459	7.9	235	7.9	60	9000
Cranston Ave SE West of Deerfoot Trail WB	459	6.5	235	6.5	60	9000
Deerfoot Trail NB to Seton Blvd SE EB Ramp	82	5.8	42	5.8	80	1600
Deerfoot Trail NB to Cranston Ave SE WB Ramp	87	9.8	44	9.8	80	1700
Seton Blvd SE WB to Deerfoot Trail NB Ramp	357	3.8	183	3.8	90	7000
Seton Blvd SE WB to SEST EB Ramp	357	3.8	183	3.8	90	7000
Seton Blvd SE WB to Deerfoot Trail SB Ramp	158	8.0	81	8.0	70	3100
Deerfoot Trail SB to Cranston Ave SE WB Ramp	459	5.6	235	5.6	80	9000
Deerfoot Trail SB to Seton Blvd SE EB Ramp	556	4.0	285	4.0	80	10900
Cranston Ave SE EB to Deerfoot Trail SB Ramp	87	9.5	44	9.5	80	1700
Cranston Ave SE EB to Deerfoot Trail NB Ramp	194	6.8	99	6.8	90	3800
Cranston Ave SE EB to SEST EB Ramp	306	6.8	157	6.8	90	6000
Deerfoot Trail North of McKenzie Lake Blvd SE NB	4544	6.8	2327	6.8	100	89100
Deerfoot Trail North of McKenzie Lake Blvd SE SB	3733	5.8	1911	5.8	100	73200
McKenzie Towne Blvd SE East of Deerfoot Trail EB	918	2.0	470	2.0	60	18000
McKenzie Towne Blvd SE East of Deerfoot Trail WB	969	1.9	496	1.9	60	19000
McKenzie Lake Blvd SE West of Deerfoot Trail EB	561	2.6	287	2.6	60	11000
McKenzie Lake Blvd SE West of Deerfoot Trail WB	612	2.8	313	2.8	60	12000
Deerfoot Trail NB to McKenzie Towne Blvd SE EB Ramp	286	3.1	146	3.1	80	5600
Deerfoot Trail NB to McKenzie Lake Blvd SE WB Ramp	179	3.7	91	3.7	80	3500
McKenzie Towne Blvd SE WB to Deerfoot Trail NB Ramp	602	1.3	308	1.3	80	11800
McKenzie Towne Blvd SE WB to Deerfoot Trail SB Ramp	214	2.7	110	2.7	80	4200
Deerfoot Trail SB to McKenzie Lake Blvd SE WB Ramp	357	2.2	183	2.2	80	7000
Deerfoot Trail SB to McKenzie Towne Blvd SE EB Ramp	612	1.3	313	1.3	80	12000
McKenzie Lake Blvd SE EB to Deerfoot Trail SB Ramp	179	3.4	91	3.4	80	3500
McKenzie Lake Blvd SE EB to Deerfoot Trail NB Ramp	306	1.9	157	1.9	80	6000
Collector Roads	306	3.0	157	3.0	60	6000

Appendix II THE ASSESSMENT OF ENVIRONMENTAL NOISE (GENERAL)

Sound Pressure Level

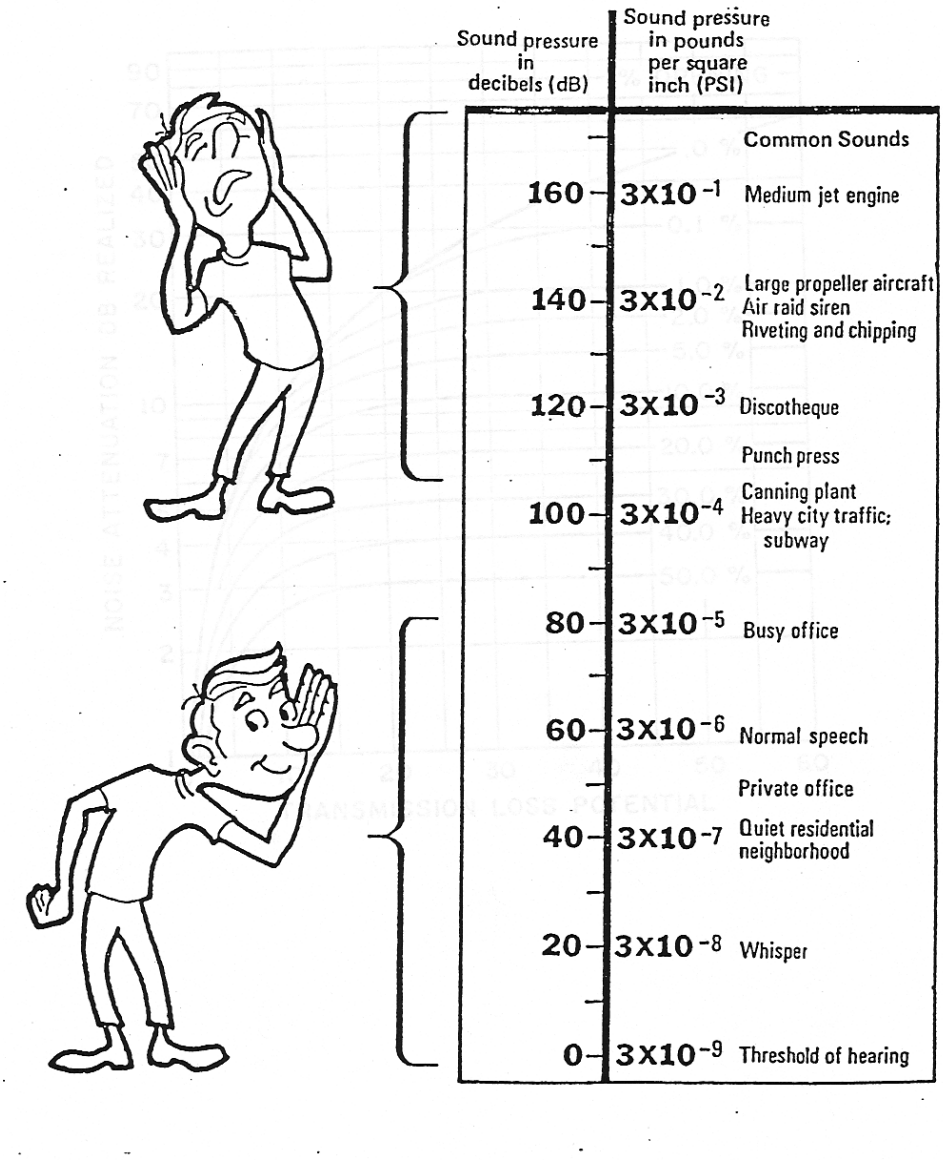
Sound pressure is initially measured in Pascal's (Pa). Humans can hear several orders of magnitude in sound pressure levels, so a more convenient scale is used. This scale is known as the decibel (dB) scale, named after Alexander Graham Bell (telephone guy). It is a base 10 logarithmic scale. When we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

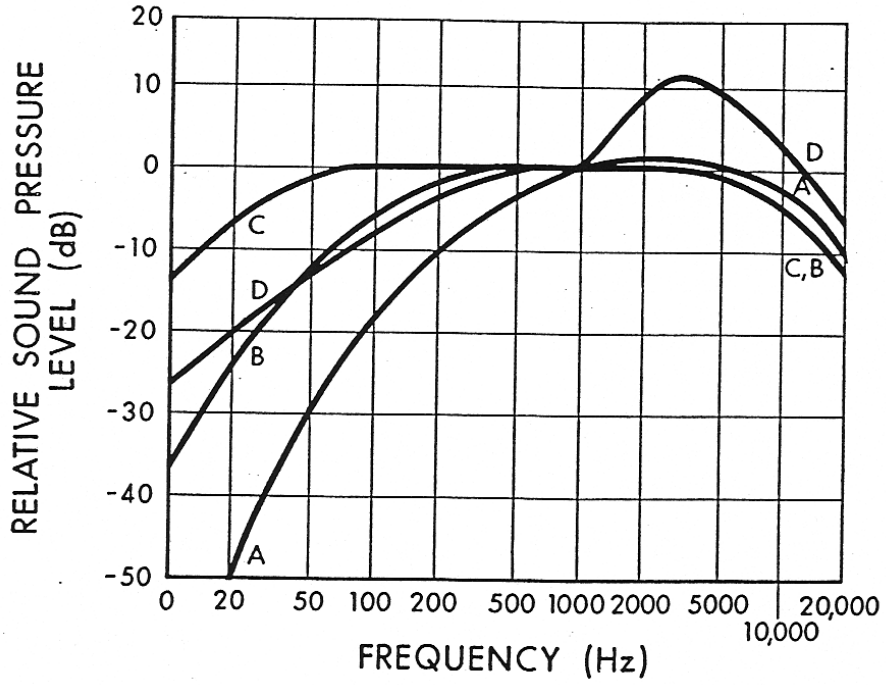
Frequency

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.

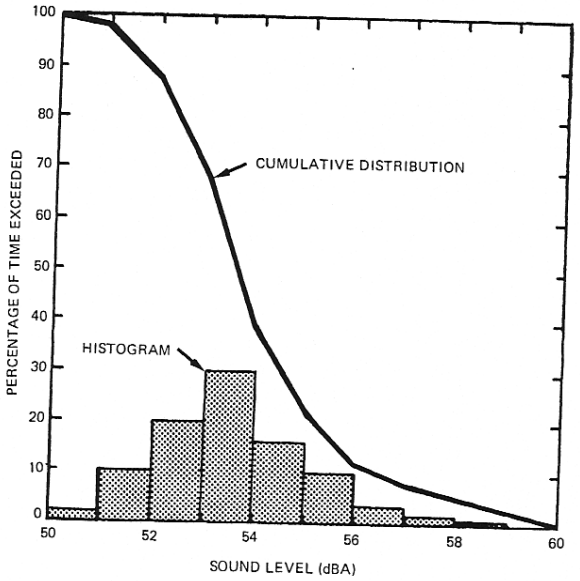


Figure 16.6 Statistically processed community noise showing histogram and cumulative distribution of A weighted sound levels.

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

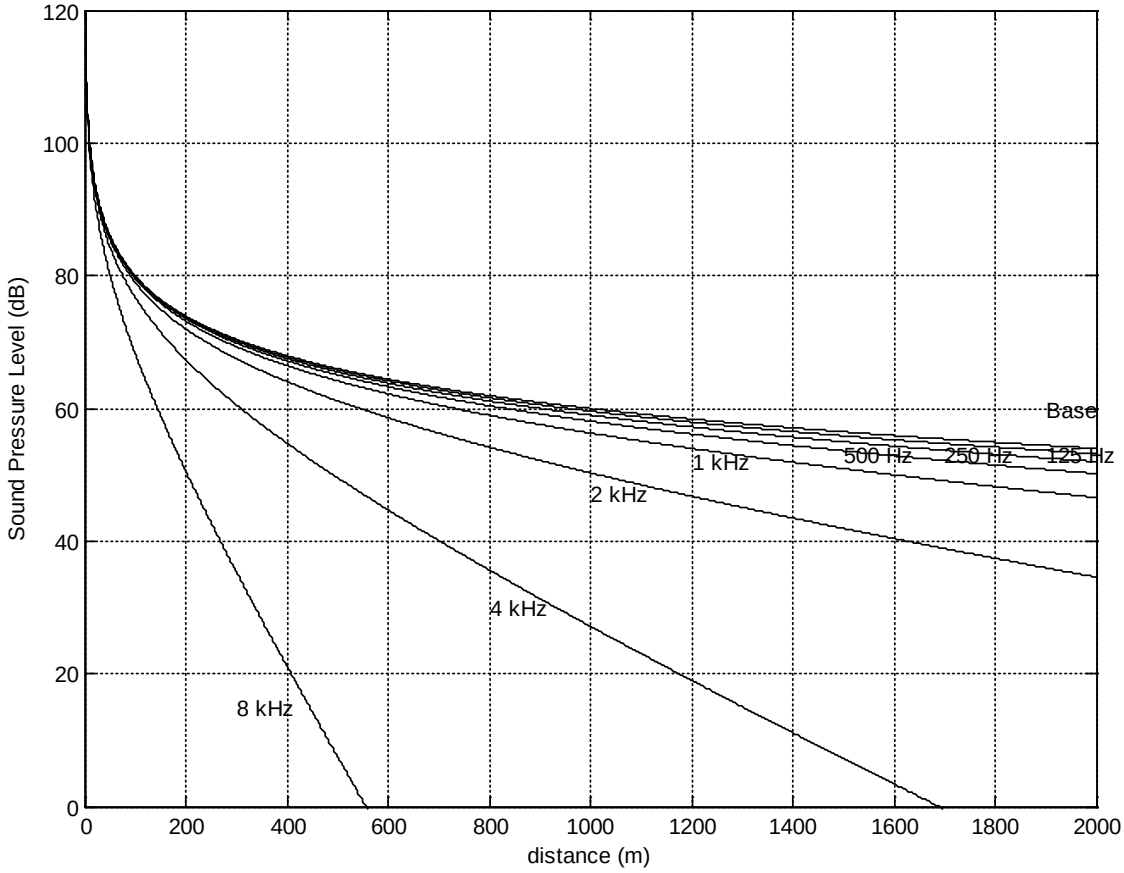
As sound transmits through a medium, there is an attenuation (or dissipation of acoustic energy) which can be attributed to three mechanisms:

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 ^{o}C	Relative Humidity (%)	Frequency (Hz)					
		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

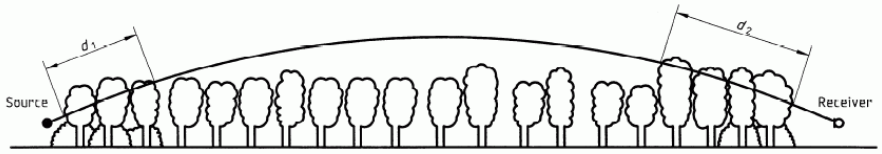
- Can be an effective absorber due to large area covered
- Only effective at low height above ground. Does not affect sound transmitted direct from source to receiver if there is line of sight.
- Typically less absorption than atmospheric absorption when there is line of sight.
- Approximate rule of 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:							
$10 \leqslant d_f \leqslant 20$	0	0	1	1	1	1	2	3
	Attenuation, dB/m:							
$20 \leqslant d_f \leqslant 200$	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 the Alberta Energy Regulator (AER) Directive 038

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 the Alberta Energy Regulator (AER) Directive 038

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).